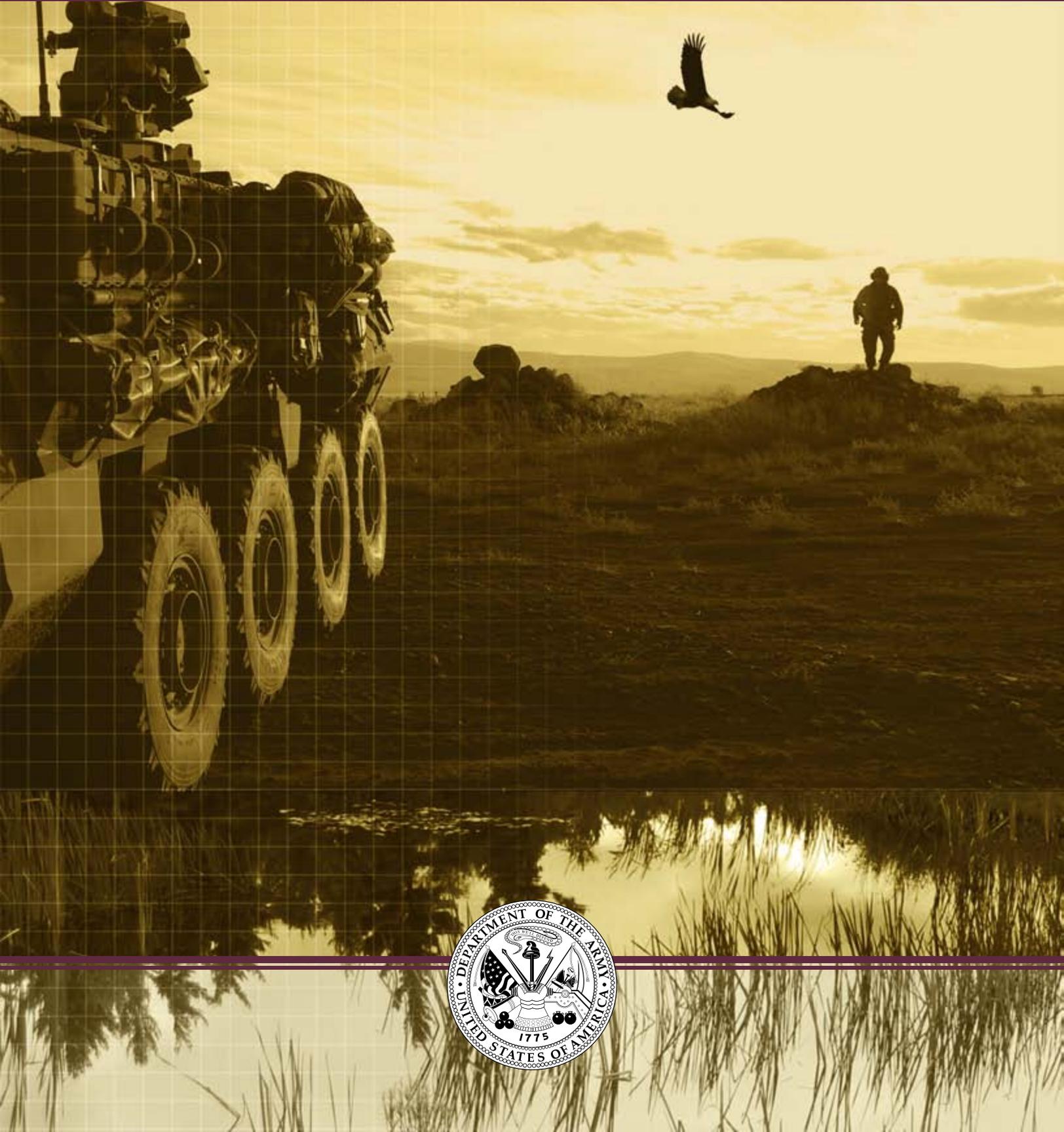


Fiscal Year 2004 Secretary of the Army

**ENVIRONMENTAL AWARD WINNERS**

**BEST PRACTICES**

Sustain the Mission. Secure the Future.



Sustain the Mission. Secure the Future.

**FY04 SECRETARY OF THE ARMY  
ENVIRONMENTAL AWARD WINNERS:  
BEST PRACTICES**

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Fiscal Year 2004 Secretary of Defense Environmental Awards Nomination

**CULTURAL RESOURCES MANAGEMENT**

**LTC MICHAEL TARPLEY  
CAMP BEAUREGARD, LA**



*Sustain the Mission. Secure the Future.*



## BACKGROUND

Based at Camp Beauregard, La., Lieutenant Colonel Michael Tarpley serves as Cultural Resources manager for the Louisiana Army National Guard (LAARNG).

## POSITION DESCRIPTION

In line with the Army’s move away from mere compliance-driven cultural resources management to that which also supports mission sustainability, LTC Tarpley created and leads a comprehensive National Guard program—managing cultural resources at five major installations and 80 armories across the Pelican State. Collectively known as Fort Louisiana, they comprise 1,352 buildings and 29,000 acres of training land. Since founding the program in 1997, he has also been responsible for two National Register Historic Districts, 43 National Register structures and 511 American Indian cultural sites to date (including traditional fishing grounds, sacred areas and flint-knapping sites). LTC Tarpley’s goals as cultural resources manager are detailed below in Figure 1.

**Figure 1.**  
**LAARNG Cultural Resources Program Goals**

- To create innovative cultural resources programs that are transferable to state, federal and military agencies across the country,
- To achieve a successful balance between mission accomplishment and cultural resources protection,
- To provide for the optimum quality and quantity of training lands for Soldiers; and
- To achieve full compliance with all cultural resources laws and regulations.

## ACCOMPLISHMENTS

### Mission Enhancement

The success of LTC Tarpley’s programs greatly enhances the training lands for the LAARNG, serving the military mission of readiness. Balancing Soldier training needs with cultural resources protection and sensitivity to the community leads him to unique and diplomatic solutions. For example, in

FY 2002, when the LAARNG created the Mechanized Engineer Training Area, LTC Tarpley consulted with tribal elders on three Native American cultural sites facing impacts. Elders agreed to mitigation of the sites, while LTC Tarpley adapted the original construction plans to protect another cultural site near the original construction.

“LTC Tarpley’s innovative style and foresight has allowed all of us to accomplish what we are supposed to as Soldiers and to train in a much more efficient manner. He truly has the Soldiers and Airmen at heart...”

- BG (Retired) Robert A. Lee, Mississippi Army National Guard

### Overall Cultural Resources Management

LTC Tarpley combines his passion for cultural resources with a keen instinct for managing budgets. Under his watch, his program’s budget grew from \$130,000 to over \$400,000, and trained personnel increased fivefold from FY 2002 to FY 2004. To reduce costs, he implements creative staffing approaches; for example, he is the only National Guard Bureau (NGB) cultural resources manager to employ a Native American Affairs coordinator as referenced by AR 200-4. This has saved the LAARNG over \$500,000 in consultant fees and consultation costs associated with National Environmental Policy Act (NEPA) clearances. If training or construction activities result in accidental damage, military and tribal representatives can mediate the issue internally without incurring prohibitive legal fees.

LTC Tarpley coordinates cultural resources management with and provides training to the Chief Facilities and Maintenance Officer, Chief of Staff, troop units and the State Historic Preservation Office (SHPO) to ensure compliance. Because he is also responsible for natural resources management, LTC Tarpley works to ensure the integration of each program’s resources and goals. Before any construction begins, he uses the NEPA process, Geographic Information Systems (GIS) maps and a national database that identifies and tracks characteristics of historic structures to ensure construction activity will not damage archaeological sites or historical structures.

**Figure 2. Status Summary**

**ICRMP:** Fully approved and updated

**Inventory surveyed to date:**

- 96 percent of military lands
- 2 National Register Historic Districts
- 43 National Register structures
- 511 American Indian cultural sites

**Historic Buildings and Structures**

LTC Tarpley manages historic structures statewide including the Carville National Register Historic Districts and Jackson Barracks, which is comprised of the most significant Greek-Revival complex nationally and 17 buildings listed on the National Register of Historic Places (NRHP). He also assessed 100 percent of all armory structures, determined their NRHP status and recorded the results in a national database. LTC Tarpley ensured that all 43 National Register buildings in the Jackson Barracks and Carville Historic Districts and all WWII-era Camp Beauregard buildings were adaptively reused for office space and storage, achieving the goals identified in Section 110 of the National Historic Preservation Act (NHPA)—and avoiding the expenses associated with constructing new work and storage areas.

**Archaeological Resources**

LTC Tarpley identified more than 500 previously unknown archaeological sites during Phase I Archaeological Surveys and four new sites eligible for the NRHP in FY 2004 during Phase II Testing. Additionally, advancing the LAARNG’s state mission to “preserve and protect life, property, peace, order and public safety,” LTC Tarpley combined site protection and vulnerability assessment programs to reduce multiple annual looting crimes to zero incidents in FY 2004. To do so, he developed the only comprehensive Department of Defense (DoD) site protection program to incorporate military police trained in the requirements of the Archaeological Resources Protection Act (ARPA), crime scene preservation techniques, on-site surveillance and remote-sensing surveillance. He also partnered with the SHPO in FY 2003 to successfully lobby the state legislature to increase archaeological crime penalties on state lands to equal ARPA penalties on federal lands.

Additionally, as part of his comprehensive site protection program, LTC Tarpley provides ARPA training, with coordination from the US Forest Service (USFS), for military and tribal police. With USFS, LTC Tarpley developed a unique DoD program using GIS spatial and aerial data, along with artifact density, site visibility and previous damage data to organize surveillance needs. With his emphasis on transferability, he provided support in the use of remote surveillance techniques when Fort Carson created a comparable site protection program for its archaeological resources.



▲ As part of LTC Tarpley’s site protection program, Soldiers install remote cameras and sensors to monitor and protect archeological and culturally significant sites on LAARNG lands.

**Native American and Native Hawaiian Programs/ Curation Efforts**

**Community Partnerships.** LTC Tarpley’s successful and unique partnering with Native American tribes has earned him high praise. He developed four formal Native American Consultation Agreements from FY 1999 to FY 2003, one of which was the first and only programmatic agreement for implementation of Section 106 of the NHPA on National Guard land, forged between the Advisory Council on Historic Preservation (ACHP), the SHPO, the NGB, the LAARNG and tribal nations. The ACHP’s chairman, John Nau, officially commended this effort and accomplishment in FY 2003.

LTC Tarpley held the first NGB-approved seminar to train Guardsmen in consultation protocols, agreements and tribal relations. The seminar

assembled 30 Guard states/active-duty installations and 24 tribal nations and Alaskan villages. The seminar was elevated to NGB control and now serves as a national workshop model.

LTC Tarpley created a Native American Memorandum of Understanding (MOU) with Louisiana and displaced tribes that significantly increased tribal access to military lands for collection of plants for ceremonial and other uses. Additionally, he helped develop the Native American Historical Initiative (NAHI), a US Army Environmental Center (USAEC)-funded and NGB-approved pilot project that incorporates the unique knowledge, resources and expertise of federally recognized tribes into ICRMP development. Begun in 1999, this MOU project serves as a model for government-to-government consultation. The Initiative's report was endorsed by the United South and Eastern Tribes (USET) and is now used as guidance for conducting Native American programs by numerous tribal governments, state and federal agencies and military installations.

Beginning in FY 2002, LTC Tarpley conducted the first DoD Traditional Cultural Property (TCP) inventory of places of religious and cultural significance to federally recognized tribes affiliated with Fort Louisiana. In partnership with key tribal leaders and federal agencies, LTC Tarpley funded and organized this intensive survey of TCPs and produced a report suggesting a reevaluation of Bulletin 38 of the National Register governing TCPs.

*Artifact Curation and Lands.* LTC Tarpley values artifact curation as an integral part of his cultural resources program. He negotiated an agreement with the SHPO for artifacts from LAARNG lands to



▲ A concept later adopted by Fort Benning, Ga., is LTC Tarpley's Native American Keepsafe Cemetery, shown above. It is a mitigation resource for inadvertent discoveries of Native American human remains by dedicating military land for their re-interment and is the first of its type on DoD land.

be selectively curated at Native American tribal museums upon tribal request. He also administers a curation contract with Northwestern State University (NSU) of more than 21,300 Native American artifacts uncovered during training land surveys. In addition, during several consultation meetings, LTC Tarpley initiated planning for a five-year internship program with NSU for tribal members to support archeological surveys and assist with development of interpretive museum displays of Native American cultural materials.

In FY 2004, LTC Tarpley began the planning phase of the first African-American archaeological and military history program on National Guard military lands. The implementation phase will include archival studies of and excavations at 19th century African-American commercial sites at Camp Minden to help the public understand how this historic community developed and shaped the lives of succeeding generations. It also involves development of a permanent African-American exhibit at the Louisiana Maneuvers and Military Museum.

*Consultation and Transferability.* He assisted Fort Benning with the transfer of lands containing sacred sites to the city of Columbus, Ga., creating a national precedent by upholding the Native American Graves Protection and Repatriation Act (NAGPRA) on federal lands once transferred out of federal control.

"Mike recognized the importance of bringing federal tribes to the table to participate in ICRMP development. He built the smoothest consultation process and his tutelage extends beyond the Army. The Federal Highway Administration and the Louisiana Department of Transportation have since developed similar programs."

- Dr. Tom Eubanks, state archaeologist for Louisiana

Additionally, from FY 2002 to FY 2003, LTC Tarpley's consultation skills proved invaluable when tribal nations and Native Hawaiians were overwhelmed by Federal Communications Commission (FCC) requests for cultural site clearance for proposed cell tower locations. Given their limited resources, it was impossible for the tribes to comply with the 30-day timeframe for response, leading the FCC to interpret non-response as consent and begin construction. LTC Tarpley partnered with USET and legal counsel, and agreements were negotiated with FCC Chairman Michael Powell. Using the LAARNG model, an MOU was created requiring the FCC to engage in government-to-government consultation and tribal reimbursement.

LTC Tarpley also began providing assistance in FY 2002 for ICRMP development and Native Hawaiian consultation. Based on the LAARNG ICRMP model, the Hawaii Army National Guard (HIARNG) hired a Native Hawaiian cultural practitioner to negotiate consultation and to foster cultural exchange. Furthermore, LTC Tarpley assisted the HIARNG for two years in developing its overall cultural resources management program.

**Cultural Resources Awareness and Education**

Training Soldiers is an important component of the LAARNG's mission, and educating troops about the value of our nation's cultural resources is part of that training. LTC Tarpley has successfully coordinated several programs to enhance cultural resources awareness and education. For example, he ensures all Soldiers training on Louisiana military lands are briefed about cultural resources protection. He also educates the troops and public through the Jackson Barracks Military Museum and the Louisiana Maneuvers and Military Museum.

He secured funding to create a permanent Native American Cultural Resources Interpretive Exhibit display for FY 2005 in the Louisiana Maneuvers and Military Museum. In addition, in FY 2004, he negotiated the permanent loan to the LAARNG of the 6,000-volume private research library of the late Bill Day, former tribal historic preservation officer for the Poarch Band of Creek Indians—making this rich resource available to the public.

LTC Tarpley also developed the Fort Louisiana Leaders' Environmental Handbook and Soldiers' Environmental Field Card in-house and provided cultural resources awareness training to soldiers, with over 20,000 copies distributed to date. These materials inform Soldiers about such topics as spill containment procedures, no-dig areas and the care of unearthed artifacts.

*"LTC Tarpley's dedication to historic preservation and to involving tribes in the management of ancestral places is an example of what is possible, not what is required. As a result of his tireless efforts, LAARNG has forged unprecedented relationships with the state, Indian tribes and other federal agencies, to establish a first-rate cultural resources management program."*

*- Valerie Hauser, ACHP Native American program coordinator*

In FY 2004, LTC Tarpley initiated a program to expand upon the heightened cultural sensitivity of troops returning from Operations Enduring Freedom and Iraqi Freedom. The briefings given to troops deploying and training on Louisiana military lands have been expanded to build upon the new heightened awareness for overall cultural resources protection.



▲ LTC Tarpley documented the oral history of the Choctaw code talkers of WWI and the Comanche code talkers of WWII, who trained at Camp Beauregard prior to overseas deployments during the wars. He poses above, with Charlie Chibity, the last surviving Comanche code talker of WWII.

**Community Relations**

The LAARNG’s cultural resources management program realizes its true value with community involvement. LTC Tarpley adheres to the LAARNG’s community mission of enhancing community relationships and providing mutually beneficial support. In FY 2003, he hosted and coordinated the Native American Fish and Wildlife Society’s Tribal Summer Youth Practicum for cultural and natural resources awareness—the first time the society has ever conducted its Youth Practicum on a military installation. Youth from 10 different tribal nations across the Southeast participated. This event further expanded the access already enjoyed by the community in the form of open hunting, fishing, camping, hiking and other recreational activities on the installation. Although troop activity prevented the installation from hosting the summer youth practicum in FY 2004, LTC Tarpley helped plan a second one, which was held at the tribal center of the Mississippi Band of Choctaw Indians.



▲ LTC Tarpley talks with Mary Jones of the Jena Band of the Choctaw Indians. His strong partnerships with key tribal leaders like Jones help make cooperative initiatives, such as this Native American cultural site assessment at Camp Beauregard, reality.

the USFS, the Louisiana SHPO, the ACHP, the Natural Resources Conservation Service, USET and numerous sovereign tribal nations concerning government-to-government consultation and archaeological site protection.

“LTC Tarpley’s commitment to environmental and cultural issues as they affect American Indians is outstanding. His willingness to take the initiative and to do the right thing has gained not only my respect but that of the tribes in the Eastern Region. His vision and dedication is a wonderful example of military professionalism.”

- Franklin Keel, director, Eastern Region, Bureau of Indian Affairs, US Department of the Interior

“LTC Tarpley has a sincere cultural sensitivity and particularly in his respectful manner of working with tribal leaders on the protection of traditional cultural properties. Here in Hawaii, we refer to such principles of respect as Aloha. LTC Tarpley has truly learned to hold this code of ethics close to his heart while conducting his work. I hope the DoD honors the fine standards LTC Tarpley has illustrated for others to follow...”

- Toni Auld Yardley, traditional cultural resource management specialist, Kanakamaoli Religious Institute, Hawaii

**Environmental Enhancement**

With the assistance of the Colorado Center for Ecological Management of Military Lands, he completed a community vegetative survey to help locate and protect native river cane, a type of bamboo that tribes use to make cane baskets.

**Cultural Resources Compliance**

Interaction with federal, state and community groups has advanced the LAARNG goal of full compliance with the law. LTC Tarpley achieved 100 percent cultural compliance through involvement of the Joint Staff, Army major command staff and trainers in the NEPA process. LTC Tarpley and his staff partner with the National Park Service,

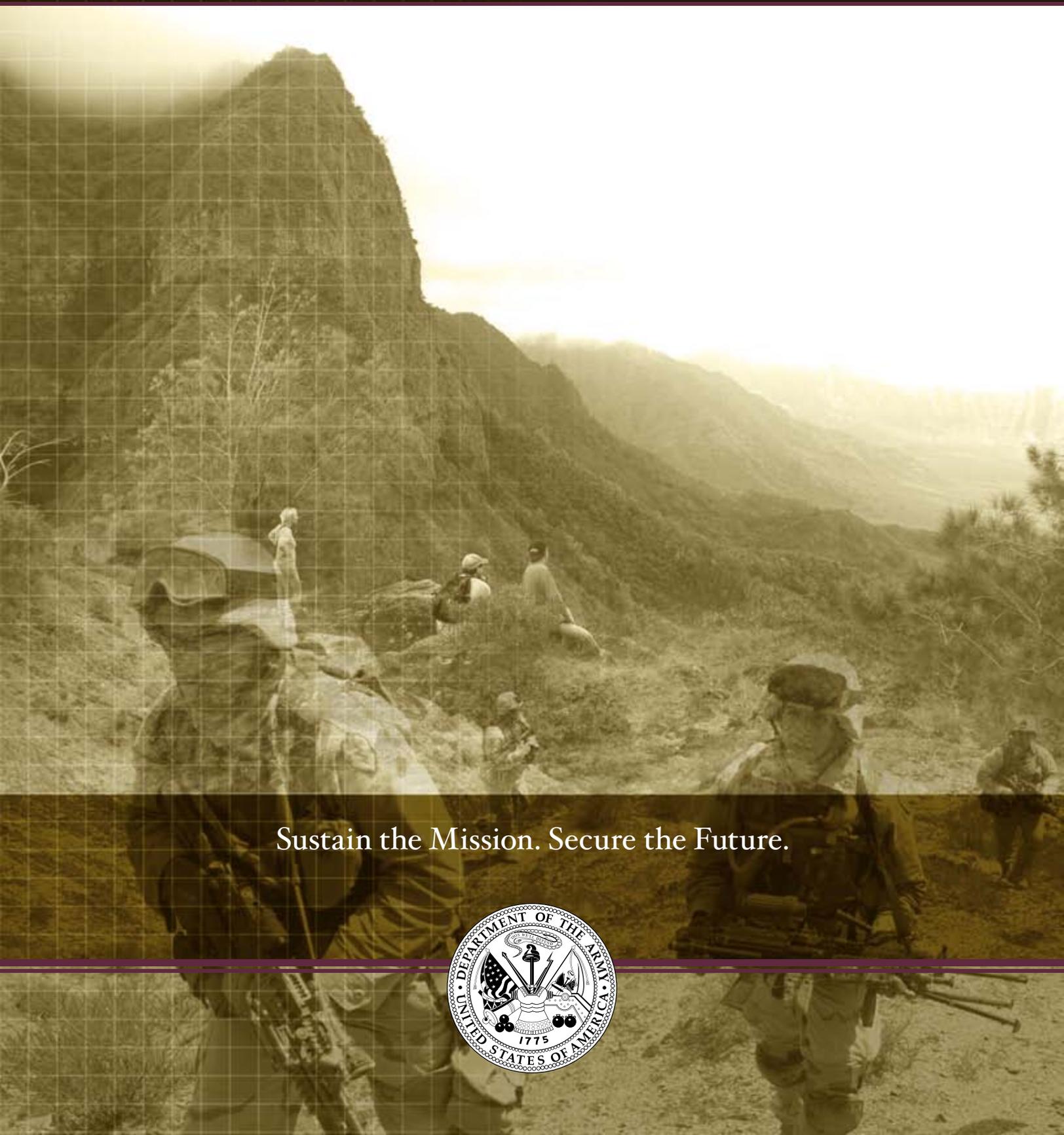
**CONCLUSION**

LTC Tarpley’s energy, compassion, character and strong sense of duty power the LAARNG’s complex cultural resources management program, making it a model for other installations. He is dedicated to his stakeholders; he launches and drives forward efficient and successful programs that have proven transferable; he partners with key tribal, community, state and federal leaders; and he works hard to ensure his programs advance the federal, state and community missions of LAARNG.

Fiscal Year 2004 Secretary of Defense Environmental Awards Nomination

**CULTURAL RESOURCES MANAGEMENT**

**U.S. ARMY GARRISON, HI**



Sustain the Mission. Secure the Future.



## INTRODUCTION

The US Army Garrison Hawaii (USAG-HI) consists of two major installations—Schofield Barracks and Fort Shafter, and 25 smaller installations covering a total of 167,919 acres on two islands. It is home to the US Army’s 25th Infantry Division (ID), who depends on the Garrison’s training lands to fulfill its military and training objectives, and to the United States Army Pacific Command. The 25th ID’s training encompasses mounted and dismounted maneuver, reconnaissance training, live-fire training, deployment training, aviation training, combined live-fire/maneuver, force on force training and service support operations.

The importance of USAG-HI’s training facilities became evident in early 2004 when the Division deployed over 10,000 Soldiers to Iraq and Afghanistan. In addition, the past year has also seen thousands of Marine Corps, Air Force, Army Reserve and Army National Guard Units use USAG-HI facilities in preparation for deployment in support of the Global War on Terror.



▲ A shrine at Pohakuloa Training Area is one of hundreds of religious sites under the care of the USAG-HI Cultural Resources Management staff. [photo: K. Sherry]

The historical development of Hawaii produced a large breadth of cultural resources that exist on USAG-HI training lands and require management to support military readiness. First settled between 100 and 800 AD by people from the Marquesas Islands in the South Pacific, the Hawaiian Islands saw its greatest population expansion between 1150 and 1400, a time when lineages of the high chiefs of Oahu and Hawaii were founded. By 1700, the Hawaiian social structure had developed into population centers with intensive dry land and irrigated agricultural fields, royal centers and temple complexes. American and European missionaries

## USAG-HI FACTS

*Population:* 15,000 soldiers, 26,000 family members and 9,600 civilians

*Location:* Islands of Oahu and Hawaii

*Acreage:* 167,919 acres

*Major Cantonments:* Schofield Barracks, Fort Shafter and Wheeler Army Airfield

*Training Grounds:* Pohakuloa Training Area, Kahuku Training Area, Kawaihoa Training Area, Dillingham Military Reservation, Makua Military Reservation, Schofield Barracks East and South Ranges

began arriving in 1820 and were soon followed by an influx of settlers, traders and farmers who brought about great changes in Hawaii’s social structure, economy and natural environment. In the last half of the 19th century, construction of multiple military installations began including Schofield Barracks and Fort Shafter and the buildup increased in the 1930s and 1940s with the threats of impending war and the events of 7 December 1941.

Today, the Garrison Cultural Resources Management (CRM) team manages over 900 archeological resources including heiau (religious structures), ko’a (small shrines), fishponds, fishing shrines, habitation sites, caves and rock shelters, mounds, burial platforms, earth ovens, stone walls and enclosures and agricultural terraces linked to the original Hawaiian population of the islands. The CRM staff also oversees 795 historic buildings and structures ranging from gun emplacements, concrete revetments and tunnels complexes, to military housing, structures and landscapes, many of which are a part of the five historic districts and National Historic Landmarks that represent the history of the United States’ military presence in the Pacific.

## BACKGROUND

The USAG-HI CRM Program staff, which is under the Directorate of Public Works (DPW), consists of a Cultural Resources Manager, two archaeologists, an architectural historian and seven cultural resources specialists. They strive to fulfill the Cultural

Resources Management mission of providing outstanding stewardship and increased appreciation of cultural resources while supporting the training mission, range sustainment efforts and programs that provide an excellent quality of life for Soldiers of the 25th ID and their families.

Prior to 2001, USAG-HI completed Integrated Cultural Resource Management Plans (ICRMPs) for four training ranges, Fort Shafter, Wheeler Army Airfield, Schofield Barracks and Kilauea Military Camp. However, due to emerging Army organizational changes and installation facility

operations initiatives, such as transformation of the 2nd Brigade to a Stryker Brigade Combat Team (SBCT) and the privatization of utilities and family housing, cultural resources inventory efforts and Programmatic Agreements (PAs) were refocused to respond to these revamped missions. Six PAs and a Memorandum of Agreement (MOA) were completed for the following:

- Routine training activities at Makua Military Reservation, September 2000;
- Management of Ukanipo Heiau at Makua Military Reservation, October 2001;
- All actions taking place between 2004 and 2010 for establishing an SBCT, February 2004;
- The Whole Barracks Renewal (WBR) Projects for the Aviation Brigade at Wheeler Army Airfield MOA, June 2004;
- The Residential Community Initiative housing privatization, August 2004; and
- The renovation of four Quadrangle Barracks in the Schofield Barracks Historic District (currently being staffed for signature).

Additionally, the USAG-HI ICRMPs were consolidated to cover all 27 sub-installations in one document, expected to be final in June 2005. Funding for the actions outlined in these agreements is programmed through 2011.

The USAG-HI CRM team understands that oversight and management of cultural resources and historic properties can have an impact on Garrison initiatives, as well as the local community. As such, the team has made it a priority to work closely across the board on all project-planning committees with a wide variety of organizations. Staff members routinely participate in master planning design charettes, Real Property Planning Board meetings, the Range Control Steering Committee, Process Action Teams and Project Development Teams for major Garrison undertakings. This has enabled the Garrison to save time, manpower and money on many of its projects while preserving and maintaining many of its valuable resources. The Garrison Cultural Resources Manager also sits on the State of Hawaii Historic Review Board.



▲ One of two rare pictographs known to exist on Pohakuloa Training Area, serves as an example of the hundreds of cultural resources found on USAG-HI training lands. Thought to be a marker indicating a stream, it was discovered during a cultural resources survey.

“[The Garrison’s program shows an] extremely impressive breadth of responsibilities and accomplishments. Staff changes reflect a solid understanding of and commitment to the cultural resources program... and saved money for the Army.”  
 - Robin L. Burgess, federal preservation officer for the Bureau of Land Management

## PROGRAM SUMMARY

The USAG-HI has a long standing and very active CRM Program covering identification of resources, evaluation of properties for National Register eligibility, monitoring of archaeological sites during training events, maintenance of a geographical information systems (GIS) database for historic buildings and archaeological sites, and public outreach and Native Hawaiian consultation. The program seeks to engage stakeholders, as well as increase cultural resources awareness on and off the Garrison. Partnerships and relationships that have been developed with regulators, local officials and the public in general have produced positive impacts to readiness and garnered long-term benefits for the Garrison in its role as a responsible neighbor. These efforts are very highly regarded and are continually supported at the highest Garrison Command levels.

Efficient and effective CRM comes from experience, understanding and a consideration of the relevance of the Cultural Resources Program. Most importantly, it leads to integration with other programs, thus meeting broader missions. The greatest challenge to the CRM Program at USAG-HI is the physical organization of the Garrison and the number of commands and tenant organizations from which undertakings originate and with which cultural resources issues must be coordinated. The USAG-HI CRM Program focuses on archaeological, historical and traditional resources, but functionally has three goals, to support the Garrison's larger mission:

1. Eliminate impacts to military missions;
2. Meet compliance requirements; and
3. Identify and enhance program efficiencies.

Major objectives outlined in the ICRMPs, MOAs and PAs to help meet these goals include: 1) effective cultural resources staffing; 2) surveys of all high priority range areas; 3) evaluations of buildings 50 years of age for National Register eligibility; and 4) better integration of information with range operation and training and the various divisions within Directorate of Public Works.

As one of the early organizations leading the way in the Transformation of the Army, the 25th ID (L) is going through sweeping changes in how it is

organized and trains. The USAG-HI CRM Program responded to the expanding Army Transformation initiatives by more than doubling its staff in 2004 from one Cultural Resources Manager and four contract archaeologists, to a diversified staff of 11. In support of the many time-critical mission support projects, this growth reaped substantial cost savings, reducing contract expenses by an estimated \$2 million (equivalent to more than 80 percent reduction) and cutting work performance time in half.

“The Garrison has an exceptional record of stewardship for cultural resources, fulfilling the letter and the spirit of the National Historic Preservation Act.”

- Laura Skaggs, director of Federal Agency Affairs, National Trust for Historic Preservation

In 2003-2004 the Garrison surveyed 28,063 acres of training lands in direct support of 35 range development and upgrade projects, identifying 249 new archaeological sites, completed evaluation of 183 archaeological sites for National Register of Historic Places eligibility and monitored 161 sites for training impacts. Only 20 percent of rangelands remain to be surveyed.

In the same time period, the Garrison CRM staff prepared 10 Historic Structure Reports in support of 25 construction projects. These reports documented for the first time the condition of 677 buildings and structures. These assessments included 138 buildings at Pohakuloa Training Area (PTA), 15 buildings at Kilauea Military Camp, 420 historic housing units at various sub-installations and 22 buildings and structures at the Nike Missile Site at Kahuku Training Area in preparation for it being converted to a Combined Arms Collective Training Facility.

## ACCOMPLISHMENTS

The USAG-HI CRM Program is very proud of its contributions in supporting the Garrison and 25th ID and US Army Hawaii's (USARHAW) missions. These contributions reflect the Program's goal to effectively manage the vast cultural resources under the Garrison's care in a manner that facilitates and expedites the training of each and every Soldier

and unit. Highlighted below are the Garrison CRM Program accomplishments in 2003 and 2004:

**Program Management**

The CRM staff worked closely with the installation's Range Control and Integrated Training Area Management staff to establish a shared GIS database that includes archaeological and cultural information used in developing training scenarios, range projects and long-term range development planning initiatives. This database has recently been used to avoid cultural sites during planning of 28 major construction projects in support of the Transformation of the 25th ID, reducing data recovery requirements and saving \$500,000 – \$1 million per site in excavation and curation costs.

CRM staff developed a unique historic resource identifier which has been integrated into the automated facilities work management system and the DPW GIS system, greatly improving management and preservation of historic resources. The new data sharing process helps alert facilities managers, estimators and project planners to the presence of historic properties and the need for Section 106 consultation requirements early in the planning process.

**Historic Buildings and Environmental Enhancement**

The Section 106 agreement documents prepared for the Quadrangle Barracks and Aviation Brigade Whole Barracks Renewal projects covered the multi-million dollar rehabilitation and upgrade for four historic barracks quadrangles in the Schofield Barracks Historic District, and the rehabilitation of existing buildings and construction of new Aviation Brigade barracks and operations buildings within and adjacent to the National Historic Landmark at Wheeler Army Airfield. The projects included adaptive rehabilitation of historic facilities, retention of significant architectural features and sensitive design of new buildings while fulfilling new barracks upgrade and force protection standards, thus greatly enhancing Soldier quality of life.

Additionally, the PA for the Garrison's Residential Community Initiative, the Army's largest housing privatization effort, covered 462 historic housing units located on four USAG-HI sub-installations. It



▲ The Quadrangle Barracks.

stipulates specific requirements for constructing new, and repairing and maintaining existing structures in and around historic districts and landmarks. It also provides guidelines for rehabilitating and retaining significant architectural features of eligible historic structures. Hickam US Air Force Base (AFB), Hawaii used this PA as a model for its Section 106 consultations for housing privatization, thus expanding cost savings across the Services.

**Archaeological Resources**

CRM staff at Pohakuloa Training Area established a unique partnership with a group of volunteers from the National Speleological Society and the Cave Conservancy of Hawaii to explore and map several hundred meters of lava-tube caves at PTA at no cost to the Garrison. These surveys addressed long-standing community concerns about cultural sites in the caves, documenting how early Hawaiians used the caves of the Hawaii Saddle Region for shelter, burials and to gather water.

**Native Hawaiian Consultation**

USAG-HI established Cultural Advisory Committees (CACs) consisting of Native Hawaiians with lineal ties to range areas on both Oahu and the Island of Hawaii. The CACs have helped facilitate Section 106 consultations and nurture cooperation with the Native Hawaiian community to expand and share knowledge on cultural site locations and their significance. The Garrison also began using cultural monitors on archaeological survey teams and during construction projects.

**Curation**

In late 2003, the Garrison established the first and only curation facility in Hawaii that meets federal curation standards. The 350 square-foot facility at PTA keeps artifacts in a humidity-controlled room for public viewing. The Native Hawaiian Community praised the Garrison for its efforts to retain artifacts and associated documents close to the original sites from which they were obtained, helping to preserve the spiritual link of the materials to the land.

**Cultural Resources Awareness**

In partnership with the Department of Education and the 25th ID Commanding General, staff organized a series of 12 cultural enrichment lectures and performances by Native Hawaiian experts and kumu (teachers) for Soldiers, their families and Garrison civilian staff. These events were broadcast on the installation television channel and were so successful that Hickam AFB used the series as a benchmark for establishing its Hawaiian Cultural Awareness Program.

**Mission Enhancement**

CRM staff worked with 25th ID Training staff and Operational units to develop a “Dig” Standard Operating Procedure and GIS maps showing dig/no dig areas that allow the trainers to choose sites with the least environmental impact thus facilitating the field training planning process.

Furthermore, in preparing troops in late 2003 and early 2004 for deployment to Iraq and Afghanistan, CRM staff worked closely with 25th ID units to complete Section 106 consultations within a week for critical high altitude helicopter training and live fire convoy training. As Section 106 consultations generally take two to four months, success in supporting these emergency requirements is credited to the strong relationships established between the installation, regulators and the Hawaiian people.

**Community Relations**

The Garrison funded, secured locations for and initiated design for two environmental/cultural visitors centers at Makua Military Reservation and PTA to educate the public on Army’s environmental programs and aid in Soldier environmental and cultural awareness.



▲ A group of students from Nanakuli High School pose while observing petroglyphs during a tour at Makua Military Reservation as part of an environmental awareness class supported by cultural resources staff supported in November 2004.

Education efforts have also initiated a partnership with Imi Pono no ka Aina (Excellence for the Land), a high school environmental education program to teach students how to identify, preserve and protect cultural resources. In turn, students have helped install permanent site markers, interpretive trail markers and protective barriers at cave sites across the Garrison.

The CRM staff also supported over 100 cultural accesses, open houses, lectures, exhibits and educational tours at several of its training areas over the past two years. These activities helped promote cultural resources practices and protection of significant sites, while supporting the Army’s training mission. Participants included Native Hawaiians, educators, concerned community members and university and high school students from Hawaii and abroad.

**CONCLUSION**

The USAG-HI CRM Program proactively pushes itself to seek out challenges and identify solutions to fulfill the larger training mission of the men and women of the 25th ID. It fulfills the letter and spirit of all the objectives and values in the Army Strategy for the Environment, which places the Soldier as the centerpiece of its mission statement. USAG-HI’s Cultural Resources Program embodies this premise, as it is consistently able to successfully combine environmental stewardship with military readiness and sustainability goals.

Fiscal Year 2004 Secretary of Defense Environmental Awards Nomination

**ENVIRONMENTAL QUALITY**

**TOBYHANNA ARMY DEPOT**



*Sustain the Mission. Secure the Future.*



## INTRODUCTION

Tobyhanna Army Depot (TYAD) is the largest, full-service electronics maintenance facility in the Department of Defense (DoD). Its mission, as a major element of the US Army Communications-Electronics Life Cycle Management Command, is comprehensive repair, overhaul and fabrication, and support of command, control, computers, communications, intelligence, surveillance and reconnaissance (C4ISR) systems. The Depot sustains all branches of the Armed Forces, maintaining critical US Air Force “go-to-war” ground communications-electronics systems, US Marine Corps microwave communications systems, and Air Force and US Navy tactical missile guidance and control systems. TYAD ensures that war fighters have critical systems and support to succeed in the Global War on Terror.

Located in Monroe County, Pa., in the Poconos resort region, the 1,296-acre Depot is bounded by state parks and game lands, and houses a 161-acre wetlands preserve and the headwaters of Hummler Run, a high quality-cold water fishing stream. No federally listed threatened or endangered species reside on the Depot, although the Natural Resources Program supports stewardship for seven state-listed rare species such as the osprey.

Memories of past environmental impacts from the anthracite coal mining era make these natural resources precious to the local community, which has transitioned to a tourism-based economy. As the region’s leading industrial center and employer, the Depot makes an annual economic impact of more than \$1 billion. It houses 27 tenant organizations, employs nearly 4,300 workers from 10 counties and serves as home to 200 military personnel and family members.

## BACKGROUND

TYAD’s full integration of environmental stewardship with mission operations has helped to ensure its success as a recognized DoD leader in automated test equipment, systems integration and downsizing of electronics systems.

From FY 2003 to FY 2004, the Environmental Management Division (EMD) faced the challenge



▲ The Blue Force Tracking System, shown above, helps the war fighter to pinpoint the vehicle’s location and improve situational awareness. TYAD personnel fabricate BFT installation kits and have integrated the systems into thousands of Army vehicles.

of accommodating a 40 percent increase in the maintenance (overhaul and repair) of C4ISR systems. The increase required the addition of a third shift and more than 1,100 additional workers. Given this challenge, as well as the Depot’s reliance on business revenues as a Working Capital Fund installation, TYAD’s EMD realized that full environmental compliance is essential to maintaining top-level operational capacity. It met the challenge head on, and despite the sudden and dramatic increase, achieved or surpassed requirements, receiving no violations for Title V air emissions, National Pollutant Discharge Elimination System (NPDES) waste/storm water discharges, drinking water or Resource Conservation Recovery Act (RCRA) hazardous waste (HW) limits.

The EMD’s consistently smart staffing choices, strong community partnerships and effective strategic planning and agreements all contribute to an overall management approach that positioned TYAD to effectively adapt to the increase in operations.

### Staffing

The EMD operates within the Directorate of Industrial Risk Management, which reports to the Commander. The division’s 15 employees provide expertise in pollution prevention (P2), hazardous materials (HM) management, recycling, air quality, water quality and management of natural/cultural

resources. Staff work together, to not only meet, but excel in stewardship practices. This commitment has created a tradition of excellence and has won TYAD 31 environmental awards since 1992, including a Closing the Circle (Environmental Preferability) Award, National Association for Environmental Professionals' Environmental Excellence Award, Energy Efficiency Building Award, Pocono Chamber of Commerce "Save Our Planet" Award and the Governor's Award for Environmental Excellence.

### **Strategic Planning**

TYAD is committed to attaining success through strategic, long-term planning to guide its environmental programs. It has a mature Environmental Management System (EMS) and recently surpassed Army EMS goals, becoming ISO 14001 certified in November 2003 through a third party audit by Orion Registrar, Inc. The audit demonstrated that TYAD has a fully implemented EMS that meets the highest international standards. Additionally, 23 plans help strategically manage and govern the EMD, the most significant of which include its 2003 Spill Response Plan; 2003 Pollution Prevention Plan; 2005 Recycling Plan; 2004 Hazardous Waste Management Plan; and 2001 Cultural Resources Management Plan. The TYAD EMS and these associated plans help ensure

"The entire Tobyhanna Army Depot community is committed to sustaining an outstanding environmental program that ranks with the best in the Defense Department and the private sector — meeting or exceeding all requirements and standards for environmental compliance. This effort makes us more efficient and effective in our mission performance; supports our obligation and commitment to be proper stewards of resources; and is simply the right thing to do. ISO 14001 and our Environmental Management System give us the framework for every employee and community member to contribute, and they underscore our organizational commitment to continuous improvement, which will ultimately bring us to the goal of environmental sustainability in all of our operations."

- COL Tracy Ellis, Commander

full compliance with all applicable Army, state, federal and local environmental regulations.

### **Partnerships**

The program has developed diverse stakeholder partnerships within the Depot community, throughout Pennsylvania and across the country. TYAD became the first federal facility to enter the voluntary US Environmental Protection Agency (USEPA) National Waste Minimization Partnership; and is a charter member of the Pennsylvania Environmental Partnership of military installations, USEPA Region III and Pennsylvania Department of Environmental Protection (PADEP). It is involved in the local Restoration Advisory Board, the Hazardous Material Management System (HMMS) DoD Program Management Team, the Northeastern Pennsylvania Pollution Prevention Roundtable, the Monroe County Solid Waste Advisory Committee and the Pocono Mountains Chamber of Commerce Environmental Committee. TYAD's participation in internal boards, committees and forums include the Depot's Risk Management Committee, Hazardous Material Management Committee, ISO 14001 Directorate Representatives and Home Team Meetings.

### **Agreements**

Under a 1991 Federal Facilities Agreement, the installation resolved 62 of 65 environmental areas of concern. A final Record of Environmental Decision (ROD) was issued in September 2000, requiring long term groundwater monitoring at three sites and concurrent USEPA/PADEP and Army review of the ROD every five years. The Depot received its first review in September 2002, which showed that natural attenuation is effectively lowering contamination levels. The 1994 clean up cost estimate was \$33 million – actual expenditures were kept to \$16 million – and in 2001, TYAD became the first site in USEPA Region III to be partially de-listed from the National Priorities List.

### **PROGRAM SUMMARY**

As a command priority, TYAD's environmental program has a clear goal: To sustain the Depot's mission while upholding the four key objectives of its environmental policy—prevent pollution, minimize impacts, ensure environmental compliance and continuous improvement. TYAD solidified

its commitment to environmental excellence, taking an already strong and mature program to the next level. The accomplishments highlighted below demonstrate how the Depot has effectively managed its significant environmental aspects to achieve environmental objectives and long-term mission sustainability.

## ACCOMPLISHMENTS

At TYAD, a workforce culture infused with ownership of environmental stewardship responsibilities ensures that little happens without consideration of the four tenets of the Depot's environmental policy. The Depot environmental program is well integrated with facilities planning, safety management, quality control and mission sustainment—ensuring the best possible environmental outcome from new processes. This coordinated approach helped TYAD become ISO 9000 certified for its quality management processes in February 2003 and the first DoD Occupational Safety and Health Administration (OSHA) Voluntary Protection Star Site in September 2000.

### ***Implementing an Environmental Management System***

In 2003, TYAD further demonstrated through a third-party audit how its integrated environmental program improved business efficiencies through P2, compliance, minimization and continuous improvement. As a result, the Depot, including its 25 Forward Repair Activities worldwide, became one of the first Army and DoD installations to be ISO 14001 certified. This certification positions the Depot for increased teaming and competitiveness in the international marketplace, helping to ensure success with private industry customers.

### ***Environmental Management System***

***Implementation Highlights:*** All TYAD employees receive ISO 14001 awareness training. The following details implementation activities.

- Shop employees reviewed products, services and day-to-day activities to realize their effect on the environment and to determine the environmental aspects of those processes. To address results of the review, TYAD established six Objective and Target Teams consisting of environmental managers, engineers, shop workers and ISO coordinators for each of the Depot's 17

directorates. Focus areas include: contractor compliance; emissions reduction; water quality protection; reduction of HW generation; and reduction of industrial wastewater pollutants.

- Continuous improvement is emphasized through programs like the Lean Initiative that reviews processes and develops plans to improve flow and timeliness. As part of this initiative, should a shop employee identify a needed environmental improvement, a special team is formed to find and implement a solution within a week. This has helped to create an open dialogue between shop employees, environmental and quality managers and administrators.
- A Corrective Action Procedure is used to monitor deficiencies, identify their causes and track corrective actions. This information is shared with all concerned shops to prevent the repetition of the same deficiencies in other areas.
- An ongoing awareness campaign refreshes employees' knowledge and provides updates on the ISO 14001 process through bulletins, newspaper articles, posters and a Depot-wide television network. An environmental Intranet site provides easy access to all regulations, procedures, documents, points of contact and forms. A card distributed to employees, contractors and visitors lists key aspects of the environmental policy and reminders about recycling, energy conservation and HM safety.

The TYAD EMS management review process is supported by a policy instituted by the Commander establishing a commitment to continuous improvement and environmental compliance that reflects the core elements of the ISO 14001 standard. A Risk Management Committee, made up of top management and the Depot commander, reviews the EMS process quarterly. A core group of ISO 14001 coordinators from throughout the Depot is trained to conduct internal audits that oversee EMS implementation and maintenance. Members have authority within their directorates to oversee compliance with the ISO 14001 standard. TYAD passed an annual surveillance audit in August 2004, maintaining their certification. TYAD credits the passing grade to their vigorous checks and balances incorporated into the Depot-wide EMS.

**Creating a Cleaner Environment**

TYAD has an extensive P2 and waste reduction program in all media areas and maintains numerous permits to accomplish its mission while surpassing environmental compliance requirements. Major sources of HW, air emissions and wastewater are painting, plating and sandblasting operations. Two computerized tracking and monitoring systems help the Depot meet its P2 goals. The first is the Facility Environmental Management and Monitoring System, which monitors and remotely manages operations involving drinking water, sewage treatment, industrial wastewater treatment, air emissions and storage of HM and HW. For example, the system can detect open doors, leaks and other conditions that pose a risk. The second is the HMMS, which tracks and monitors the life cycle of more than 5,000 HMs. A Hazardous Materials Review Board approves new purchases, seeks less harmful HMs and maintains authorized user lists for each order dispensed by the Depot's 11 HM pharmacies.

Overall, TYAD has implemented 70 source/use reduction projects since 1985. Despite its 40 percent production increase, TYAD held HW generation to a 22 percent increase and reduced wastewater nitrogen levels by seven percent in FY 2004. In CY 2003, TYAD decreased air emissions by 23 percent (23.35 tons).

**Pollution Prevention and Waste Reduction Efforts at the Industrial Operations Facility (IOF):** The Depot's new IOF came on line in September 2004. Planning for the new IOF included efforts to replace older metal plating, painting and sand blasting shops, involving all aspects of environmental and quality control. EMD worked with facilities, engineering and quality management to incorporate P2 into design and equipment acquisition decisions. Improvements include monitored air scrubbers, water chillers and a new industrial wastewater treatment plant that conserves resources, greatly curtails HW and substantially reduces discharges to the sewage treatment plant. Based on first quarter operations, water reuse processes at the new IOF will save 2.1 million gallons (\$15,000/month) and an anticipated \$32,500 in annual HW costs. The metal plating shop changes alone could reduce

recurring waste streams from an average of 12,182 pounds/quarter to around 1,000 pounds/quarter.

**Recycling Program:** In FY 2004 alone, the Depot recycled 40.6 percent (2.6 million pounds) of waste, surpassing the Army recycle goal of 40 percent.

Recycled materials included steel, aluminum, cardboard, office paper, newspapers, magazines, plastics, cans, fluorescent light tubes and batteries. Recycling centers exist throughout the Depot (in the cafeteria and every office), and employees avidly use them. The EMD and Risk Management Committee oversee the program, weekly inspections and follow ups occur to reinforce policies, and recycling markets for industrial by-products are consistently monitored. In FY 2004, recycling efforts avoided \$61,137 in disposal costs, a 37 percent increase over the previous year.



▲ Pollution prevention at TYAD has drastically reduced waste from industrial shop activities such as painting for C4ISR maintenance.

**Ensuring Environmental Compliance**

The EMD performs more than 20 environmental inspections per month using checklists specialized to all media areas and actively partners with USEPA and PADEP in compliance and restoration programs. For example, EMD worked closely with regulators to become one of the first to complete an unexploded

“Tobyhanna is on the national edge of [the MMRP] program. Over the years, we have developed a very effective team approach, making projects more timely and cost effective.”  
 - John Mellow, PADEP regional project manager

ordinance survey for the Military Munitions Response Program. The success of TYAD's collaborative approach was reflected in its 2002 Environmental Compliance Assessment (performed by Army Materiel Command Installation and Activity Services) with no findings.

**National Environmental Protection Act (NEPA):**

A streamlined process ensures that all projects falling under NEPA receive a thorough environmental review within seven to 14 days. EMD processed 109 NEPA records of environmental consideration in FY 2003 and 108 in FY 2004. Staff evaluate each project for 35 functional areas, including air quality, cultural resources, energy conservation, water quality, P2, lead, asbestos, erosion control and pest management. The NEPA officer also reviews project contracts prior to issue. Once a review is issued, EMD ensures compliance through regular follow up inspections and corrective actions. To streamline NEPA-required Environmental Assessments (EA), EMD is preparing a five-year Master Plan EA in coordination with the US Army Corps of Engineers.

“Tobyhanna Army Depot’s environmental programs represent the very best efforts by very concerned employees that make them a model for Monroe County, and indeed the entire Northeastern Region of Pennsylvania. The fact that so many folks all reflect so great an amount of caring for their work environment is a tribute to not only themselves, but to their leadership. There has never been a successful environmental program anywhere without substantial commitment and involvement from management at all levels.”

- Dean D.W. DeLong, executive director, Monroe County Municipal Waste Management Authority

The plan documents the environmental and socioeconomic effects associated with 15 proposed construction or renovation projects identified by public works and engineering. Estimated cost savings of preparing a Master Plan EA versus separate EAs for each project is approximately \$488,000.

**Reaching Out to the Community**

EMD participates in many outreach programs that reinforce its well-developed and positive relationships with the surrounding community. Each year, EMD provides environmental education to over 3,500 depot employees at the Depot’s Earth Day event and to approximately 5,000 area residents at its open house, which features exhibits such as a spill response decontamination demonstration, displays and tours. EMD staff also participate in a multitude of national, state and local committees such as the

Local Emergency Planning Committee and Monroe County Office of Emergency Services, working closely with local and state officials on emergency response plans and annual response drills for HM spills, weapons of mass destruction and mass casualty events.



▲ EMD staff demonstrate spill response equipment to children during the Depot’s Armed Forces Salute and Take Your Children to Work Day in June 2004.

**CONCLUSION**

TYAD’s industrial mission presents environmental aspects and challenges similar to those any industrial plant would face. TYAD meets these challenges to excel as a leader in environmental quality and compliance through a mature EMS that is as integral to the fabrication of communications and electronics devices as the parts used to build them. It also employs processes to monitor activities that generate HW, air emissions and industrial wastewater. Finally, TYAD has also successfully created and nurtured a workforce culture that promotes and integrates environmental stewardship responsibilities into its mission to support the nation’s war fighters each and every day.

Fiscal Year 2004 Secretary of Defense Environmental Awards Nomination

## ENVIRONMENTAL RESTORATION

# FORT RILEY, KS



Sustain the Mission. Secure the Future.



## INTRODUCTION

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

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

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

## BACKGROUND

### *Meeting Environmental Challenges*

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

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

**Figure 1. Fort Riley Installation Restoration Program Milestones**

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

### *Maintaining a Unified Team*

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

### *Managing Toward Goals*

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

**Involving the Community**

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



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

**PROGRAM SUMMARY**

Fort Riley was added to the National Priority List in 1990. IRP staff initiated field work in 1993. The objective of Fort Riley’s IRP is to attain the Defense Environmental Restoration

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

Program (DERP) goals in a manner that supports the installation’s mission and efficiently uses budgetary and personnel resources. Specifically, the IRP team strives to meet two components outlined in the DERP’s first statutory goal:

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

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

## ACCOMPLISHMENTS

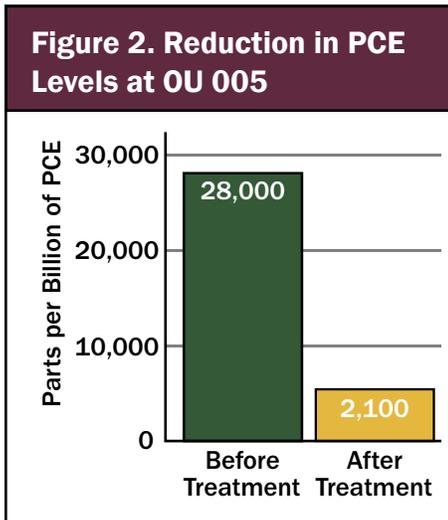
### *Innovative Technologies: Soil Remediation Pilot Study (OU 005)*

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

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

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

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



### In-situ Potassium Permanganate Treatment



▲ Asphalt removal.



▲ Potassium permanganate being added to soil.



▲ Digging and blending.

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

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

The IRP staff is remediating two areas contaminated with PCE at the Dry Cleaning Facilities Area. In 2003, the projected completion date for the Feasibility Study

Addendum was October 2007. Fort Riley, with regulator concurrence, bypassed preparing a technical memo and began work early on the addendum, which was completed in February 2005.

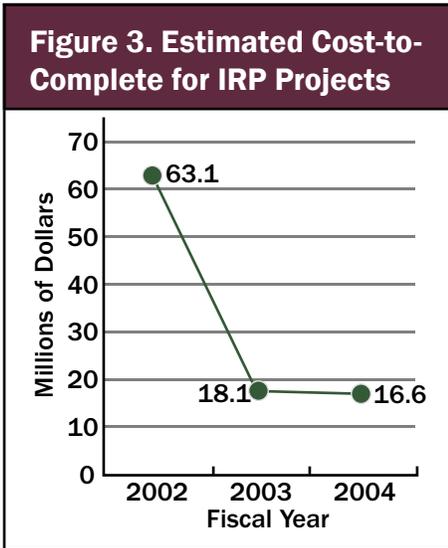
This spring, Fort Riley will initiate a pilot study to test removal technologies for the contaminant source. Soil excavation will be conducted at one area of concern to determine if MNA will reduce groundwater contaminant levels after the excavation has been completed. In the second area of concern with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

**Partnerships with Regulators**

By maintaining an excellent working relationship with the installation’s regulators and support agencies, Fort Riley informally resolves issues that could lead

to schedule delays or formal disputes. For example, in July 2003 the Fort Riley IRP staff worked with the USEPA and the KDHE to reduce the total cost-to-complete for Fort Riley restoration projects by \$45 million. In 2004, the IRP staff collaborated with the KDHE and USEPA to shorten the time required to complete Fort Riley’s three outstanding OUs by as much as one year per OU, which reduced the total cost-to-complete figure by an additional \$1.5 million.

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



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

– Rob Weber, KDHE

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

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

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

**Collaboration with Small and Disadvantaged Businesses**

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

**CONCLUSION**

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



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



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

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

– U.S. Congressman Jerry Moran

Fiscal Year 2004 Secretary of Defense Environmental Awards Nomination

**NATURAL RESOURCES CONSERVATION**

**FORT DRUM, NY**



*Sustain the Mission. Secure the Future.*



## INTRODUCTION

Fort Drum is home to the 10th Mountain Division (Light Infantry) – the most deployed unit in the Army and a key participant in Operations Enduring Freedom and Iraqi Freedom. At Fort Drum, environmental sustainment of training ranges is integral to the success of its mission: To provide facilities and services to US Armed Forces requiring land and airspace to practice combat skills and operations on a year-round basis. This training and mobilization mission supports nearly 80,000 troops each year.

Nearly 15,000 military and 2,500 civilian personnel work at Fort Drum and up to 270 Reserve Component units train at Fort Drum annually, with peak training occurring during summer. Fort Drum also supports about 20,000 reservists from all services for weekend training and about 9,000 active Army, Marine and Canadian troops for winter training. The post is also home to 28 tenant organizations.

The installation’s 107,265 acres managed under the Installation Natural Resources Management Plan (INRMP) are divided into a 11,650-acre cantonment area (including Wheeler-Sack Army Airfield), a 20,030-acre impact area and 75,585 acres of 18 training areas and 28 ranges which accommodate weapon systems from small arms to artillery, from tanks to aircraft. Many of Fort Drum’s lands, nearly 75,000 acres, are open to the public by permit for hunting, fishing and trapping. Fort Drum’s 130 miles of streams and 11 lakes and ponds provide excellent opportunities for anglers. Figure 1 details the various types of acreage that make up Fort Drum.

Figure 1. Component Acreage	
Land use	Acres
Urban / disturbed	5,270
Upland rangeland	16,072
Upland forest	65,976
Wetland	16,500
Open water	3,447
Total	107,265

The mosaic of natural communities found on Fort Drum provides the US Armed Forces with a variety of realistic training scenarios. For example, forested areas are used for infantry training and as bivouac sites; and forest clearings serve as artillery firing



▲ Training and recreation benefit from Fort Drum’s rich natural resources.

points and helicopter landing zones. Open grass and shrub lands provide space necessary for tracked and wheeled vehicle maneuvers.

**Natural Features:** Located about 10 miles northeast of Watertown, N.Y., and 30 miles from Canada, this premier Power Projection Platform has the St. Lawrence River and Thousand Islands to the north; Lake Ontario to the west and Adirondack Mountains to the east. Most of Fort Drum is located in the St. Lawrence River Basin. Major glaciations carved out the lakes and Adirondack foothills that form the topography of Fort Drum. The installation’s landscape is a mix of northern hardwood and coniferous forests interspersed with rangelands and wetland areas. Wetlands and open water occupy a relatively large amount of acreage on Fort Drum (about 20 percent), and types found throughout the installation include forested wetlands, freshwater marshes, riparian areas, scrub-shrub wetlands and wet meadows.

These diverse lands provide varied habitats that support a rich array of faunal and floral populations. Inventories have confirmed the occurrence of 44 mammal, 216 bird, 46 fish, 11 reptile and 19 amphibian species and 993 plant species on the installation. No known federally listed threatened or endangered species (fauna or flora) reside on Fort Drum at the present time.

## BACKGROUND

Fort Drum’s Natural Resources Management Program works in close coordination with numerous federal and state agencies. The US Fish and Wildlife Service (USFWS) and New York State Department of

Environmental Conservation (NYSDEC) are signatory cooperators in implementation of Fort Drum’s 2001-2005 INRMP, which is currently being revised. As part of this revision, the installation’s Natural Resources Management Program is incorporating plans to accommodate an anticipated 50 percent increase in active duty Soldiers and heightened demands on training lands.

**Cooperative Agreements:** Fort Drum utilizes formal partnership agreements with the US Natural Resources Conservation Service for technical support in land rehabilitation activities, Colorado State University, Cornell University, Jefferson Community College, State University of New York College at Brockport and the USFWS for inventory and monitoring of natural resources.

**Organization and Staffing:** The Natural Resources Branch, Environmental Division, Directorate of Public Works is comprised of four programs: Fish & Wildlife Management, Forest Management, Wetlands Management and National Environmental Policy Act (NEPA). A staff of 14 (10 federal and four contract support personnel) provides expertise within each program area. Figure 2 provides an overview of staff titles and management organization.

**Committee Involvement:** To help ensure successful implementation, all three INRMP signatories attend a semi-annual Natural Resources Conservation Meeting chaired by the Garrison Commander; and the installation’s Environmental Quality Control Committee provides program oversight. Coordination efforts with the USFWS typically involve wetland permitting and aquatic resource sampling.

Efforts with NYSDEC typically address hunting, fishing and trapping; law enforcement, nuisance wildlife issues and permits and other fish and wildlife management issues including state-listed species (through the Natural Heritage Program). Additionally, Fort Drum coordinates with the US Forest Service in programs such as prescribed burning and forest tent caterpillar monitoring; and the US Army Corps of Engineers (USACE) and US Environmental Protection Agency (USEPA) for wetland permitting needs.

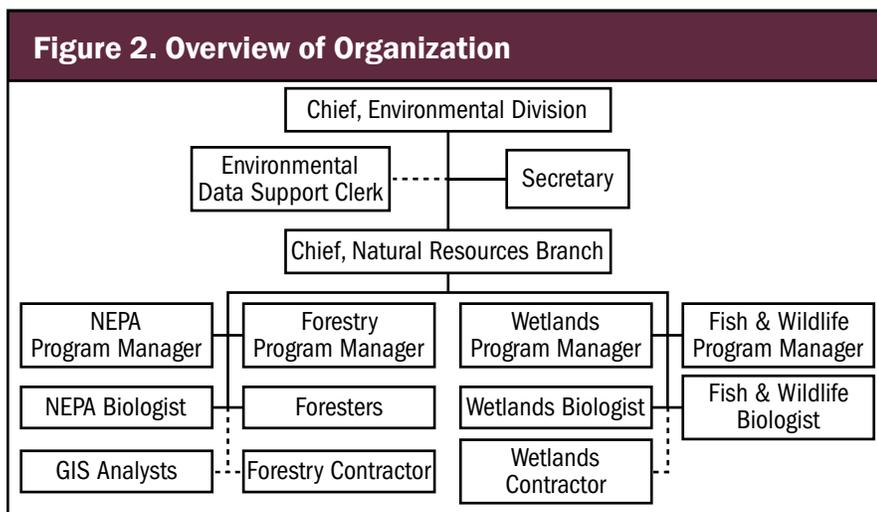
**PROGRAM SUMMARY**

During the award period, Fort Drum has advanced its Natural Resources Management Program to ensure range sustainability, mission success and sound professional stewardship. By employing pioneering technology such as the Natural Resources Management Unit (NRMU) framework and Automated Environmental Review, and streamlined management approaches such as the Wetland Mitigation Bank and Local Commercial Forestry Initiatives, the installation continues to make progress against the major goals/objectives of its INRMP, as outlined in the table on the following page.

**ACCOMPLISHMENTS**

**Overall Conservation Management: Natural Resources Management Unit Framework**

In an unprecedented effort spearheaded by the Forest Management Program, along with Fort Drum’s Geographical Information System (GIS) personnel, the installation established a unique spatial data framework called Natural Resources



“The natural resources management team at Fort Drum has been visionary in their development of a natural resource classification standard. I am especially impressed that a relatively small installation staff have single handedly developed and implemented this classification system.”

- Laura Henze, National Sikes Act coordinator, USFWS

Management Units (NRMUs) for all of its land. In terms of scale, this framework is the largest effort accomplished in the Army. In doing so, the Natural Resources Management Program created the first large-scale, land cover map of the entire installation,

and developed a means to integrate program-specific data to manage Fort Drum lands with an ecosystem approach, rather than with a micro-scale approach.

Using aerial photos, Fort Drum’s entire acreage was delineated into a land cover classification (based on the Federal Geographic Data Committee’s National Vegetation Classification Standard) and assigned an NRMU number. From 2003-2004, each accessible NRMU was field-checked and dominant vegetation data collected. Natural resources programs collected a variety of floral, faunal and management-related information for each NRMU; program-specific data for individual NRMUs is linked together in a Microsoft Access database.

Fort Drum now has access to a landscape-level snapshot of 15,000 individual NRMUs, each of which encompasses forest, fish/wildlife and wetlands management data and goes one step further by integrating this data with training activities. The NRMU database will act as a driving force in determining initial management actions; a means to continually monitor the quantity and quality of the various land cover types that exist on post; and a feedback tool to evaluate the effect of recently implemented actions and to determine future management actions. For example, the Forest Management Program can determine which areas should be salvaged first to support training actions by linking areas in need of salvage with training frequency data. Planners and trainers can enhance Cross-Country Maneuver Modeling (shows how variables – vegetation, soils, topography, etc. – affect speed and mobility of HMMWVs) to determine which areas would benefit the most from vegetation management options used to create maneuver lanes, firing points and landing zones. The Natural Resources Management Program is using the NRMU database to expand its coordination with programs across the installation to further mission sustainability.

NRMU implementation would be beneficial to any large landholder (30,000+ acres) with the desire to proactively conserve and/or enhance the environment and increase sustainability.

<i>Major INRMP Goals/Objectives</i>	<i>Degree of Attainment</i>
Provide quality natural resources as a critical training asset upon which to accomplish the military mission of Fort Drum.	Fort Drum continues to work closely with the training community to provide realistic and sustainable training landscapes, who have started to embrace the NRMU framework as another critical tool to facilitate sustainable management of Fort Drum’s natural resources.
Comply with laws and regulations that pertain to management of Fort Drum natural resources.	Fort Drum is compliant with all 27 laws, regulations and Executive Orders governing natural resources. The installation is proud of its longstanding and exceptional relationship with all affected regulatory agencies and personnel. Fort Drum has never received a Notice of Violation regarding natural resources management activities.
Manage natural resources on Fort Drum to ensure good stewardship of public lands entrusted to the care of the Army.	Fort Drum maintains active relationships with NYSDEC and USFWS. NYSDEC has mentioned Fort Drum’s outstanding stewardship role in press releases and presentations at professional conferences. Fort Drum is routinely invited to make formal presentations to various conservation groups regarding their proactive stewardship programs.
Improve the quality of life of the Fort Drum and surrounding communities through quality natural resources-based recreation opportunities.	Fort Drum annually issues approximately 2,800 recreational use permits. The installation regularly receives positive feedback regarding outdoor recreation opportunities and the overall quality of life at Fort Drum.

Fort Drum has responded to many inquiries from other military installations about NRMU database development and in August 2004, briefed the NRMU Framework project at the Department of Defense (DoD) Conservation Conference, where it was extremely well received.

**Ecosystem Management: Wetlands**

Fort Drum established a Wetland Mitigation Bank by constructing, enhancing and preserving wetlands and associated uplands to provide wetland “credits” for non-Military Construction Army (MCA) projects that require wetland mitigation. This is a significant benefit to the mission of Fort Drum, as many of these smaller projects would otherwise be cancelled or delayed due to legal requirements to replace impacted wetlands with compensatory wetlands elsewhere on the installation. The Mitigation Bank is currently built to provide a maximum of 24 credits upon achievement of all wetland success criteria, and includes 14.96 acres of newly established wetland, 12.47 acres of enhanced wetland, and 17.3 acres of protected wetland. Overall, the Mitigation Bank contains more than 130 acres of preserved lands providing many benefits, including wildlife habitat. It is only the second of its kind within the Army and several Army installations have requested documentation to use the bank as a model. As part of the development process, a Mitigation Bank Review Team was formed with Fort Drum’s Directorate of Public Works, the USACE, USEPA, USFWS and NYSDEC. Each agency acted as a signatory to the official guidance document for the bank. The total cost is favorable when compared to the typical per acre cost for compensatory mitigation on a project-by-project basis.

**Forest Management: Commercial Forestry Benefits Training Areas**

From FY 2003 to FY 2004, Fort Drum raised \$425,000 in timber sales, approximately \$99,000 of which was derived from local sales, representing the largest amount of local sales in the DoD. A successful firewood program is the largest of its kind and provides low-cost wood to community members and assists the Forest Management Program by removing dead and downed trees. The Forest Management Program uses the NRMU system to coordinate timber sales to maximize benefits to the training community by targeting



▲ A man-made, compensatory wetland at Fort Drum.

harvests in areas most frequently utilized for training, which enhances maneuverability and provides overhead cover for concealment. Prescribed burning is utilized to remove competing vegetation and to aid in the regeneration of certain desirable tree species.

**Fish and Wildlife Enhancement: Lake Liming and Brook Trout Restoration**

In response to NYSDEC requests for assistance, the Fish & Wildlife Management Program coordinated efforts with the state and four military units to restore two lakes in a designated wilderness area located in the nearby Adirondack Park that were long ago devastated by acid rain. Forty-five tons of agricultural lime were added to the lakes to raise pH levels and create healthier aquatic habitats. The process of air lifting the lime over the surface of the frozen lakes served as a slingload training exercise in extreme cold weather for the military units involved. The environmental result: two lakes considered “dead” for more than 50 years are returned to life; fish populations including one state listed endangered species are thriving; recreational opportunities for the community are improved; and loons are now successfully reproducing on one lake.

**Other Natural Resources: Outdoor Recreation**

For years, the general public has considered Fort Drum a prime area for hunting, trapping and fishing; the general public comprises 50 percent of recreation permit holders on Fort Drum. In the aftermath of Sept. 11, 2001, Fort Drum was closed to the public prompting concern from the community. In response, the Fish & Wildlife Management Program spearheaded a successful effort to re-open Fort Drum training areas for recreational use by the general public in



▲ A fisheries expert with USFWS, Kofi Fynn-Aikins, said of the Lake Liming project shown above, "Our relationship with them has been really good and they really care about the environment. The natural resources staff have been really good partners."

FY 2003. A new permit office was established, a computerized photo identification permit card system helped address security concerns, and new regulations were implemented. On average, 2,800 recreationists utilize Fort Drum lands annually with revenues from permit sales averaging \$26,000. The outdoor recreation program further bolsters the positive relationship between Fort Drum and local communities, and provides additional quality of life opportunities to Soldiers and their families.

### **Conservation Education and Community Relations**

Fort Drum's excellent environmental record and outreach program have solidified a positive community relationship. As a result, no major conflicts have arisen regarding natural resources management on the installation. The program educates military personnel, their families and local community members about Fort Drum's natural resources and promotes environmentally-responsible training and recreation to minimize impacts to Fort Drum lands. As part of the program, natural resources personnel have: conducted 112 Environmental Awareness training briefings to approximately 2,240 military personnel; presented a natural resources management briefing in all on post Environmental Compliance Officer (ECO) training sessions; sponsored an annual Arbor Day tree-planting activity; co-sponsored an annual free fishing day & fishing derby; exhibited at on-post events including the annual Earth Day fair and Safety Day; presented to local K-12 schools and

scouting organizations; and supported five successful Eagle Scout projects. The Natural Resources Branch also produces two free brochures and a bi-annual newsletter designed to inform and educate recreationists about outdoor sporting opportunities on post. In FY 2003, the installation mailed the newsletter to all 4,272 Fort Drum housing residents (on/off post) and all current permit holders.

### **Automated Environmental Review**

Full National Environmental Policy Act (NEPA) compliance is essential to maintaining maximum training capacity, and the installation processes nearly 600 NEPA Records of Environmental Consideration (REC) a year in support of range activities. To streamline submittal, review and approval, Fort Drum's NEPA Program developed an electronic REC process that uses Microsoft Outlook forms capabilities in conjunction with a Microsoft Access database. This automation reduced processing time by 15 hours per week for natural resources staff, and entry and paper copies (supporting the Paper Reduction Act). It also reduced the time spent by Soldiers hand-carrying RECs for review, minimizing their time away from the mission and reducing their personal vehicle use with associated fuel costs. In addition, automation enabled NEPA information to be readily linked with the NRMU database and GIS for spatial analysis and monitoring of cumulative impacts. Fort Drum's automated REC review process is highly applicable to and could benefit any military or federal NEPA Program.

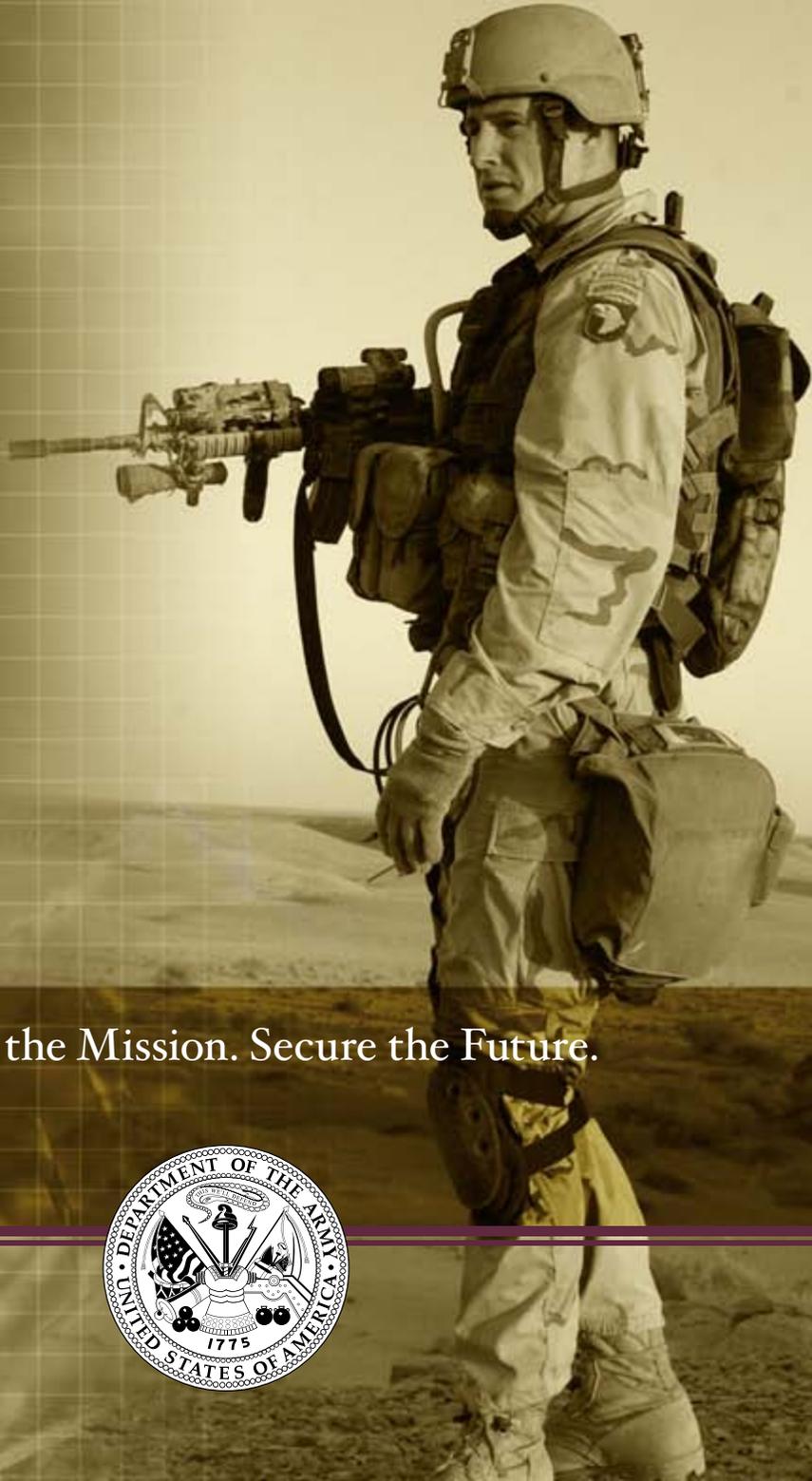
### **CONCLUSION**

At Fort Drum, excellence in natural resources stewardship is essential to sustaining full use of one of the US Military's most valuable assets. The initiative and professionalism exhibited by Fort Drum's Natural Resources Management Program have been integral to sustaining the ever-changing and expanding military mission, conserving natural resources, and maintaining positive community relations and quality of life for all. Their noteworthy success relies on employing unique management approaches, expanding the use of innovative technologies, and fostering improved communication and coordination with other installation staff to conserve natural resources, ensure sound land use management and promote the conservation ethic.

Fiscal Year 2004 Secretary of Defense Environmental Awards Nomination

**POLLUTION PREVENTION**

**FORT CAMPBELL, KY**



Sustain the Mission. Secure the Future.



## INTRODUCTION

Fort Campbell is one of the Department of Defense's (DoD) premier training and power projection platforms, capable of deploying ready troops to any theatre of combat in the world. Postured on the Tennessee—Kentucky border, Fort Campbell boasts the third largest military population in the US Army, and seventh within DoD and is home to the 101st Airborne Division. With over 93,000 acres of training and firing ranges it is easy to imagine the impressive mission this installation fulfills. However, the training and training support Fort Campbell staff provides to the 101st comes with vast potential impacts to the environment, which is why Fort Campbell compliments its heavy training

Fort Campbell Quick Facts	
Total acres	105,068
Military population	24,916
Dependant population (on post)	14,588
Dependant population (off post)	31,589
Civilian employees	4,317

needs with a comprehensive Pollution Prevention (P2) Program. The P2 Program's overall mission is to further mitigate environmental challenges and impacts associated with training, and prepare the 101st Airborne division for its role in the Global War on Terror.

## BACKGROUND

Units located throughout Fort Campbell use and dispose of hazardous materials on a daily basis, potentially increasing compliance costs and posing risks to the environment. As a result, P2 staff must positively impact all of the activities shared between the 101st and other combat ready units divided among Infantry, Aviation, Field Artillery and Defense Artillery.

To meet this challenge, Fort Campbell took a collaborative approach toward Environmental Management System (EMS) implementation and hosted a Training and Sustainability Challenges Development Workshop in February 2003. The workshop, attended by the Garrison Commander, environmental staff, and the Army Deputy Chief



▲ Based out of Fort Campbell, KY, these Soldiers of the 101st Airborne Division rely on Pollution Prevention Operations Center hazardous material contingency packages to support them while fighting the Global War on Terror.

of Staff/G3 hashed out mission core competencies and generated Installation Sustainability Program (ISP) topic areas and sustainability challenge statements. Directorates came together from all over Fort Campbell to analyze mission activities and determine significant aspects that focus ISP and EMS support and future development. Resulting actions are fully integrated into the ISP, the Strategic Readiness System, P2 practices and initiatives and Fort Campbell's EMS, which is now 60 percent conformant with ISO 14001 standards.

Accomplishing EMS goals require a multifaceted management approach. At Fort Campbell an innovative solid waste and recycling program coupled with an award winning Pollution Prevention Operation Center (PPOC) creates unprecedented results. Both programs, with separate objectives that support the installation's overall P2 goals, are overseen by Fort Campbell's Environmental Division and play integral roles in minimizing waste, ensuring environmental compliance and maintaining combat effectiveness, saving valuable installation dollars.

The Army currently owns 100 million square feet of unneeded building space on its installations, and is projected to spend \$130 million per year over the next five years eliminating much of this excess infrastructure. Fort Campbell's Solid Waste/Recycling Program is positioned to operate and maintain Fort Campbell's World War II



▲ C&D waste makes up 80 percent of Fort Campbell's total solid waste stream.

Deconstruction Program, which constitutes nearly 80 percent of the installation's construction and demolition (C&D) waste. The Solid Waste/Recycling Program office, staffed by two engineers and an environmental specialist, has made Fort Campbell a leader in waste reduction. It helps eliminate C&D waste under budget while making room on the installation for mission operations, modularity initiatives and frees up valuable resources for modernization of the Army.

The PPOC consists of several programs, each having an integral role in minimizing waste, ensuring environmental compliance, maintaining combat effectiveness and saving valuable installation dollars. Thirty-five people staff the PPOC across seven facility buildings, nine hazardous waste buildings and 44 hazardous material (HAZMAT) portable storage locker buildings. PPOC programs ensure proper management for the requisition, receipt, distribution and storage of all HAZMAT, hazardous waste and recyclable fuels and oils on Fort Campbell. PPOC personnel enthusiastically integrate sustainability principals with installation strategic planning and utilize Fort Campbell's EMS to connect various mission support activities that reduce pollution.

### PROGRAM SUMMARY

Fort Campbell sees its EMS as an opportunity to improve an already distinguished P2 Program. Upon receipt of EMS guidance and direction, the Fort Campbell Environmental Division immediately set ambitious objectives for all programs to meet,



▲ As part of PPOC waste management efforts, hazardous waste personnel pick up waste from generator locations and transport to the 90-day accumulation point.

and helped each of Fort Campbell's directorates construct an aggressive EMS implementation plan that to date has met or exceeded all Army metrics for EMS implementation. Fort Campbell's rigorous sustainability objectives are integrated with P2 activities and enable the installation to make vast strides in its EMS goals and implementation. Some of these objectives and achievements include:

**Objective:** Infrastructure Sustainability by 2012

**Achievements:** Implemented a Sustainable Facilities and Operation Program to consider renewable energy alternatives; to conduct outreach, education and technology transfer; and to improve post-wide energy and resources conservation program for efficiency and force protection. For example, Fort Campbell identified point source activities such as tactical vehicle use of wash racks that impact water quality, and is implementing efficient water use practices that will dramatically reduce reliance on water by 2010.

**Objective:** Efficient Procurement

**Achievements:** Implemented C&D Waste Initiative that will eliminate more than 90 percent of all C&D by 2012; and the Reduce Industrial Waste Initiative that through source reduction, reuse and recycling, will eliminate 40 percent of Fort Campbell's industrial waste by 2012. This initiative has already saved Fort Campbell \$160,000 in procurement of raw materials for road construction.

**Objective:** Sustainability Awareness

**Achievements:** Identified existing training to integrate sustainability awareness, such as: Environmental Quality Officer 40-hour course, Facility Manager Training, strategic planning, professional development, Soldier In Processing and environmental outreach programs.

Each of these initiatives will result in 100 percent installation-wide sustainability by the year 2028.

## ACCOMPLISHMENTS

Fort Campbell Soldiers present the best testimony to P2 accomplishments by reporting increases in unit readiness of 25-30 percent, and can tout as much as 69 percent in cost savings to their units. The installation's extensive P2 initiatives are recognized by regulators and state officials throughout Tennessee as being proactive and delivering the type of results that keep the installation running efficiently and on target to complete its mission.

The state of Tennessee honored Fort Campbell with the Governor's Award for Excellence in Local Government Stewardship in 2004; and the Governor's Award for Excellence in Hazardous Waste Management in both 2003 and 2004. Fort Campbell was awarded the White House Closing the Circle Award for Model Facility; was one of the 50 finalists for the Harvard Innovation Award for their PPOC and received honorable mention in the White House Closing the Circle Award for Solid Waste and Recycling. These awards only further demonstrate the impact and success of Fort Campbell's P2 program.

### Improving Material Management

Fort Campbell personnel have identified many opportunities to improve waste management while enhancing readiness. PPOC programs are cornerstones of this effort by alleviating and



▲ PPOC Personnel provide safety, P2 and storage information for all HAZMAT raising awareness and ensuring compliance.

relieving HAZMAT management from the unit and the Soldier. This was most recently evident when the PPOC efficiently packaged 141 unit contingency packages and handled 2,635 walk-in orders in support of mass emergency deployment of over 20,000 Campbell personnel. PPOC efficiency ensured no unit experienced delays due to packaging or material availability, in contrast to units across the country stopped at port due to improper packaging. PPOC staff followed up this comprehensive HAZMAT management by closing storage lockers and waste lockers of deployed units. These materials were brought to the centralized facility to be used by remaining reserve units on post.



▲ Soldiers retrieve HAZMAT from their PPOC managed HAZMAT storage lockers.

The mission readiness, cost savings and P2 accomplishments of the PPOC illustrate the important role P2 programs play at Fort Campbell. All PPOC programs have broad reaching impacts to mission sustainability and cost avoidance. These impacts are described in Figure 1. For example, the parts washers and weapons cleaner program saves Soldiers countless hours of hand scrubbing parts/weapons, and the Hazardous Waste Management Program provides single point product screening and tracking to minimize material disposal and costs by over 80 percent.

<b>Figure 1. Pollution Prevention Operations Center Programs</b>	
<b>Program</b>	<b>Description</b>
Shelf Life Management	Inspects for deterioration of specific materials and extends those materials that would otherwise be disposed as waste.
Battery Management	Provides single point control and accountability for requisition, receipt, distribution, storage, testing and disposal of batteries.
Freon Reclamation	Recovers refrigerants, recycles on-site, sends to a US Environmental Protection Agency approved company for Quality Assurance tests, and reissues as appropriate to units, cost free.
Parts Washers/ Weapons Cleaners	Recycles 20,000 gallons of parts washer solvent on-site annually.
Used Oil Management	Collects, assesses, stores and recycles used petroleum, oils and lubricants (POL) generated at unit level or maintenance level.
Spill Response Materials	Assists units in managing environmental impacts during deployments and while performing maintenance operations. Uses PPOC designed spill kits made on-site and specially designed for the Soldier's actual needs in the field.
Hazardous Waste Management	Operates a "You Call We Haul" service to maximize customer service. Customers can schedule pick-up of waste and within 72 hours the PPOC will go to the unit location and remove material.
Contingency Support Operations	Maintains a unit specific contingency stock developed by the unit commander to support specific needs. Pulls from unit specific inventories, inspects for serviceability, assembles and then issues. Packages all HAZMAT in Performance Oriented Packaging as required by Department of Transportation and United Nations regulations.

***Saving Through Recycling and Innovative Practices***

Fort Campbell’s robust recycling program has demonstrated results and cost savings that far exceed other installation programs. Overall, the Fort Campbell P2 Program saved the government over \$1.5 million in FY 2003 and reduced the quantity of waste by more than 80 percent over the 1992 baseline.

**Figure 2. Reductions Achieved Through Proper Environmental Management**

<i>Initiative</i>	<i>Cost Savings</i>
Building deconstruction/ concrete grinding	\$800,000
PPOC series of programs	\$760,000

***Promoting Pollution Prevention Involvement***

Fort Campbell personnel realize successful P2 and sustainability programs are the result of a team effort and that education, outreach and partnerships are critical to success. “It takes a village,” conceptualizes every aspect of Fort Campbell’s program initiatives. Not only are stakeholders targeted with P2 initiatives through mass media publications and cable television programming, but, P2 Program staff also develop training focusing on different topics, some of which are offered through online learning centers targeted to Soldiers, the local community and personnel at other installations.

Additionally, in September 2004, Fort Campbell hosted a three-day goal-setting sustainability workshop and invited local political leaders, state agencies, other federal agencies, other installation

staffs and its own units and tenants to attend. Two hundred twenty-five participants attended in the first day alone. By the end of the workshop cross-functional teams focusing on infrastructure, procurement, regional development, transportation and training support developed nine 25-year goals, 18 near-term objectives and 114 separate actions for the installation to meet its 25-year goals. Fort Campbell personnel included all objectives and action items in their installation strategic plan.

“Fort Campbell very effectively integrates suitable principles into military responses, as well as environmental stewardship... it sets a model for other federal, state and local facilities to emulate.”

*-Juan Lopez, senior program manager at the Office of the Federal Environmental Executive*

**SUMMARY**

Fort Campbell’s P2 efforts result in installation-wide improvements in materials management, increased mission readiness, improved environmental compliance and cost savings. Furthermore, P2 and the entire environmental staff tie together the installation’s EMS, sustainability plan and strategic plan into every practice and initiative, ensuring effective management and a more sustainable fighting force. The fruit of their efforts is knowledge and reassurance that the Soldiers and units they support are combat ready and highly deployable.

“I believe Fort Campbell has definitely succeeded in establishing an impressive blueprint and operative system for strategic Sustainable Installation Management within DoD, and a model to the rest of the federal government. It is apparent that installation-wide environmental awareness and cross-functional management cooperation has resulted in an organization designed for sustainability.”

*- TJ Granito, EMS/P2 program manager, US Coast Guard*

Fiscal Year 2004 Secretary of Defense Environmental Awards Nomination

**POLLUTION PREVENTION**

**RADFORD ARMY AMMUNITION PLANT**



Sustain the Mission. Secure the Future.



## BACKGROUND

Virtually every Soldier fighting the Global War on Terror in Iraq and around the world handles, transports, fires or detonates the propellants and explosives manufactured at Radford Army Ammunition Plant. Nitrocellulose (NC), from Radford, is the primary base material used in virtually all DoD propellants. In fact, this 6,900 acre facility is North America's only military grade NC producer. Land-based weapon systems from 5.56mm for the M16 to 155mm (for artillery) and air-based platforms from attack helicopters to the Air Force A10 use Radford NC or propellants.

Because of the nature of propellant and explosive manufacturing, Radford's operations also produce large quantities of hazardous waste. Given this fact, Team Radford is working to build a successful and innovative closed loop pollution prevention (P2) and hazardous waste recycling program. Backed by the Garrison Commander and reinforced through Army civilian and ATK personnel, Radford's P2 Team diligently works to ensure the proper treatment and most effective handling processes for the elimination of millions of pounds of waste. The installation's core P2 Team, which works to fully integrate environmental quality principals into their jobs each day, includes:

- Mr. Brad Jennings, Radford Army Ammunition Plant, Army Environmental Coordinator;
- Ms. Carolyn Jake, ATK Environmental Chief; and

**Figure 1. Radford Quick Facts**

Soldiers	1 Garrison Commander
Civilians	26
Contractors	1,250 Alliant Ammunition and Powder Company (ATK)

- Dr. Sharon Wetzel, ATK Special Environmental Projects Coordinator.

The Radford Team also works with an extended team that supports specific tasks associated with the installation's successful NC recycling program. These team members include:

- Mr. Bill Lusk, Radford Army Ammunition Plant, Nitrocellulose Manufacturing Area Operations Supervisor;
- Mr. Barry Nichols, Radford Army Ammunition Plant, Nitrocellulose Manufacturing Area Operations Supervisor; and
- Mr. Joe Loveday, ATK Utilities Foreman.

## POSITION DESCRIPTION

Radford continues to play a unique role in American history. Since the facility's inception in the closing months of 1940, propellant, explosives and munitions produced at Radford have been a mainstay in every US combat operation to the present day. The Department of Defense (DoD) depends on Radford to efficiently use its resources to provide all Services the firepower needed to be ready and effective on the battlefield. For example, Radford manufactures the NC that is used in 78



▲ Radford manufactures the propellants used by weapons platforms like the M1A1 Abrams tank and the AH-64 Apache attack helicopter to fight the Global War on Terror.



percent of DoD's conventional munitions. Radford produces enough propellants annually to arm 1,100 attack helicopters, and enough propellants monthly so that 660 tanks can train for combat.

Team Radford's role is to further support this readiness mission. The Team's goal is to help make Radford a completely self-sustaining and efficient industrial community despite an aging 1940s infrastructure, lack of resources and impending restrictions on the facility's resident operating explosive waste incinerator.



▲ *This employee is performing a final inspection of the finished 25mm rounds manufactured at Radford. Team Radford continuously works to incorporate P2 in manufacturing processes.*

As good stewards of the environment working towards this goal, Team Radford knows that strong management goes hand-in-hand with well-established programs. Dr. Sharon Wetzel leads the P2 work at Radford with government oversight from Mr. Jennings and from senior ATK Environmental Chief, Ms. Carolyn Jake. Dr. Wetzel's responsibilities involve coordinating the primary efforts of the P2 program to include all biodegradation and optimization efforts. She also coordinates with the extended P2 Team members who take on NC operations supervision, maintenance of the NC production area, utility oversight and the transportation and management of NC waste streams.

## AWARDS

Since 1999, Radford has garnered four awards in P2. Recognized for its outstanding efforts in P2 and resourcefulness in innovation, Team Radford has made headway in P2 and waste reduction that virtually no other industrial installations can claim. These awards include a Governor's Environmental Excellence Award for Manufacturers, 2000; DoD Pollution Prevention Award, 1999; and Secretary of the Army Pollution Prevention Award, 1999.

## ACCOMPLISHMENTS

Since November 2002, Team Radford saved the installation more than \$1.5 million in hazardous waste incineration, disposal, labor costs and energy consumption. This was achieved despite a one million pound increase in NC production from FY 2002 to FY 2003. Additionally, since 1998, Radford has attracted over \$13 million in research, development, test and evaluation (RDT&E), pilot environmental and environmental security-related pilot projects.

### ***Modifying and Improving Processes***

Team Radford continuously searches for ways to improve waste treatment operations. They recently began reusing NC Fines (the chief waste stream in NC production) and a sizeable liquid caustic hazardous waste stream generated during process cleaning. A hybrid biodegradation process conceived by Dr. Wetzel reuses these two primary waste streams in a closed loop system; the first of its kind in the nation. As a result, Team Radford has been able to drastically reduce NC Fines by 690,000 pounds to date, and eliminate 500,000 pounds of caustic material (previously considered hazardous waste) from off-site disposal, cutting costs and further protecting the community and environment.

Radford previously incinerated NC Fines at great cost to the installation while expending a large amount of natural gas and electricity<sup>1</sup> to treat the NC Fines waste. Using Dr. Wetzel's approach, Team Radford initiated the biodegradation process utilizing soil microbes harvested at the installation's own landfills. The microbes, having spent decades

<sup>1</sup> *Natural gas and electricity are used to power the installation's incinerator.*

in contact with landfilled propellant wastes, were already acclimated to degrade NC waste. The Team used one of Radford’s existing 100,000-gallon tanks to mix NC Fines with spent caustic material from the installation’s cleaning processes, and added the microbes to break down both waste streams. The slurry is then allowed to settle creating a top layer of decant, rich in chemical oxygen demand (COD). The P2 Team now transports this decant to the installation’s industrial wastewater treatment plant (Bioplant) as a food source for biological treatment microbes. This makes the Bioplant more efficient and is yet another source of cost savings, as additional Bioplant feed stock no longer needs to be purchased.

Radford established specific milestones from pilot scale research to full implementation to ensure this program was a success. These goals are outlined in Figure 2.



▲ Thermal balls are used in the Bioplant to retain heat in the winter, optimizing biological activity and digestion of waste solids.

\$10,000 versus \$400,000 to incinerate that same amount of waste.

<b>Figure 2</b>	
<b>Goal</b>	<b>Milestone Met</b>
Process Safety Study for bench top NC Fines degradation project	November 2001
Concept Engineering Report (CER) submittal for pilot test	October 2002
CER approval	November 2002
Remediation of all NC Fines destined for incineration	March 2004
Remediation of NC Fines in production area*	August 2004
* Marks the beginning of treatment of legacy NC waste treatment.	

The closed loop system is an innovative alternative to incineration that saves Radford valuable dollars. Radford is now reinvesting in scaling up the biodegradation process necessary to expanding NC production. The Team, using only an anaerobic microbe colony as their weapon of choice, has completely diverted NC Fines and spent caustic material from traditional disposal methods.

Additionally, the Team contracts out the use of a large vacuum truck that can move 200,000 pounds of NC Fines in two days to the mixing pit at a cost of

“The biodegradation effort is innovative, environmentally-sustainable and great in reducing the use of incineration of hazardous wastestreams. And by avoiding incineration... it enhances the air quality in Radford and surrounding communities.”

- Juan Lopez, Senior Program Manager at the Office of Federal Environmental Executive

**Improving Material Management**

Team Radford proactively seeks out methods to reduce the procurement of raw materials. Team members from the manufacturing area help to optimize the waste diversion process by purifying and reclaiming nearly 50 percent of some NC production waste. By reintroducing these NC Fines back into the production cycle, Radford now expends less money on the procurement of raw materials and dramatically reduces time and labor on the transport of this waste stream to transient storage sites throughout the installation.

Furthermore, NC production supervisors are now reusing nine previously out-of-service poacher tubs to remove excess water from NC waste. The poacher tubs allow for more complete de-watering of the NC Fines while still maintaining the fines in a safe-to-handle “water wet” condition. In doing so, they are

conserving valuable space in the 100,000-gallon mixing pit for more solid waste, while preventing excess water from lowering the pH and stressing the microbe colony. By optimizing use of the poacher tubs, production managers are able to move five times more NC Fines for treatment, while reducing labor costs and vacuum truck rental fees. This makes the process even more efficient, saving the installation more than \$10,000 with each load.

Team Radford continually competes for Congressional Research and Development (R&D) funds that could allow them to modify this biodegradation process to treat many other DoD waste streams.

**Ensuring Compliance**

*Executive Order (EO) 13123, "Greening the Government Through Efficient Energy Management," 3 June 1999.* Executive Order 13123 demands that installations make strides in energy conservation and energy management. Team Radford realizes that they can make a difference in the overall health of the environment through implementing changes in propellant waste handling. By removing NC Fines from incineration, Team Radford reduced the total hazardous air emissions, resulting in improved air quality around the region. Reductions in specific air emissions are as follows:

- Reduction in particulate matter 10 micrometers in size (PM<sub>10</sub>) by 1,632 pounds;
- Reduction in carbon monoxide by 3,450 pounds;
- Reduction in nitrogen oxides (NO<sub>x</sub>) by 1,235 pounds;
- Reduction in carbon dioxide (CO<sub>2</sub>) by 2,415 pounds;
- Reduction in hazardous ash by 1,632 pounds; and
- Reduction in Toxic Release Inventory (TRI)-reportable dioxins by 0.2 grams.

*Executive Order (EO) 13148, "Greening the Government Through Leadership in Environmental Management," 26 April 2000.* DoD and the US Environmental Protection Agency (USEPA) developed the Environmental Planning and Community Right-to-Know Act (EPCRA) TRI to minimize the overall use of EPCRA-listed chemicals. As responsible staff on the installation, and dually concerned citizens

of the surrounding community, Team Radford integrates environmental accountability not only into their day-to-day decision-making, but also into its long-term planning processes. Radford generates 90 percent of DoD's total reportable nitrates, and EO 13148 requires a 10 percent reduction annually or an overall 40 percent reduction in TRI releases by 31 December 2006. Radford acted proactively through a Six Sigma process to identify, measure and reduce nitrate losses. By installing new filtration screens in their nitration building and throughout the production process, Team Radford successfully reduced their reportable nitrates by 16 percent in 2003, saving the installation over two million pounds of acid loss annually. This was accomplished even as propellant production increased, moving Radford closer to TRI reduction goals.

Upon receipt of Army guidance, Radford staff immediately began planning and executing an aggressive schedule towards implementation of an Environmental Management System (EMS). A primary component driving Radford's already successful P2 program is the coming implementation of its EMS. The Team understands that an installation-wide EMS will allow for flexibility in addressing different operational readiness requirements while continuing to expand their already robust P2 and waste diversion programs. Team Radford expects to have a management review completed before the 31 December 2005 deadline, and to be fully compliant with ISO 14001 and DoD EMS standards by mid-2006.

**Reducing Wastes**

Throughout the nation, military installations increasingly face reductions in funding and resources. Through innovative thinking, Team Radford uses their available resources to optimize production and recycling processes on a daily basis. They achieve results that enable the installation to preserve valuable installation dollars while protecting the health and safety of employees and the surrounding community. Figure 3 clearly

"Radford has distinguished itself as a leader with its clever twist on an existing, environmentally sound technology."  
 -T. J. Granito, Environmental Management System/  
 Pollution Prevention Program Manager, US Coast Guard

<b>Figure 3. Waste Reductions</b>			
<b>Waste</b>	<b>Treatment Method</b>	<b>Date Implemented</b>	<b>Achievement</b>
NC Fines	<ul style="list-style-type: none"> <li>· 50% reclaimed</li> <li>· 50% biodegraded</li> </ul>	November 2002	<ul style="list-style-type: none"> <li>· 100% removed from incineration</li> <li>· 690,000 lbs. treated</li> <li>· \$900,000 cost avoidance</li> <li>· 30 million cubic feet natural gas saved from use in incineration</li> </ul>
Spent caustic material	Biodegraded/ beneficial reuse	November 2002	<ul style="list-style-type: none"> <li>· 500,000 lbs. recycled to date</li> <li>· 100% removed from off-site disposal</li> <li>· \$75,000 cost avoidance</li> </ul>
Decant liquid rich in COD (by product of mixing NC Fines and spent caustic material)	Liquid removed from the mixture and taken to Bioplant as food source for microbes	November 2002	<ul style="list-style-type: none"> <li>· 160,000 gallons recycled</li> <li>· \$35,000 cost savings</li> </ul>

presents the outstanding results Team Radford has attained throughout the achievement period.

**Partnering and Educating for Success**

Long-established partnerships with state and local environmental regulators are crucial to mission success at Radford Army Ammunition Plant. For example, Mr. Jennings and the rest of the Team have continued to foster this relationship by encouraging and including regulator participation during all phases of planning. They know that a positive public image for this project will help the installation to preserve its mission.

Educating Radford’s propellant and munitions manufacturing community about P2 is not only critical to creating an increased P2 awareness to ensure efficiency, but it also helps to protect its valuable workforce. The Team ensures that installation staff are fully trained in the handling of hazardous material and educated in responsible hazardous material management. Team Radford works closely with installation staff to provide training for process optimization on-the-job. Awareness training is also required through computer-based training programs. In addition, Radford provides public access to its P2 technologies and programs by presenting at technical forums around the country, including the 2004 USEPA Environmental Colloquium held in Williamsburg, Va.

**CONCLUSION**

Radford undoubtedly benefits from the hard work and waste management techniques this team oversees daily. The installation can now efficiently and economically treat their chief waste streams and begin to successfully eliminate the installation’s legacy NC Fines. Through this Team’s efforts and the help of every installation employee, Radford will continue to meet the increasing demands of an Army at war. The important role Radford plays in our nation’s defense is evident; and yet like its sister production facilities, its mission is almost unknown to those outside of DoD. Radford’s mission fulfillment contributes not only to the safety of the nation, but the work of this Team also helps to ensure the continued protection of the pristine wilderness areas that surround the installation. Radford continues to meet its mission requirements in a sustainable, environmentally responsible, safe and innovative manner.

For more information about the Secretary of the Army's  
Environmental Awards Program, go to  
<http://aec.army.mil.usaec/publicaffairs/awards00.html>  
or call the U.S. Army Environmental Center Public Affairs  
Office at 410-436-2556.

