



U.S. Army Environmental Command

Aberdeen Proving Ground, MD 21010-5401

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FOR MORE INFORMATION CONTACT:

Robert E. DiMichele, USAEC Public Affairs Officer
(410) 436-2556, Robert.DiMichele@us.army.mil

Environmental stewardship strengthens U.S. ties with Korea

Aberdeen Proving Ground, Md. At the U.S. Army Garrison in Daegu, Korea, the Army not only is dedicated to being good neighbor to their host nation by being good stewards of the environment, they also are dedicated to teaching Korea's future leaders about their "green" programs.

The garrison's environmental quality team sponsored six Kyung Pook National University student interns and volunteers who spent a total of 1,990 hours volunteering with the environmental staff, working in various environmental media areas such as safe drinking water quality, hazardous waste operations and natural resources. The internship program offered students an opportunity to witness and learn about Army environmental practices culture first hand and receive college credit.

Educational outreach didn't end with university students – the environmental quality team also provided classroom instruction on garrison environmental activities to the Daegu American High School's Advanced Placement Environmental Science Class. Students learned what kinds of careers are available to those with an interest in environmental technology. A highlight of the instruction for the students was witnessing a hazardous material spill response exercise first-hand.

"The environmental quality team's work with Korean students supports our efforts to be good stewards of Korea's lands because these kids will grow up and practice what they learned here," says Davis D. Tindoll, Jr., the Director of the Installation Management Command, Southeast Region. "Our team is showing our host nation that we can successfully protect their lands and share our practices with others to ensure environmental well-being in Korea long after we're gone."

One of garrison's most successful environmental programs is its Qualitative Recycling Program. By aggressively recycling highly reusable materials such as wood and plastic, and hazardous materials such as batteries, the garrison has increased its landfill diversion rate by 250 percent in just two years.

The environmental quality team is also eliminating the risk of contamination in the local community's drinking water supply and soil by upgrading or removing fuel oil above- and underground storage tanks. To date they've salvaged 30 above ground tanks from Camp Hialeah and replaced another 48 aging tanks. Contracts awarded in 2007 replaced an additional 26 tanks and began the work of converting from a fuel oil system to natural gas, resulting in the removal of the remaining 32 heating oil underground tanks at Camp Carroll. In total U.S. Army Garrison Daegu has reduced its number of underground storage tanks by 90%.

For their efforts to be good stewards of their host nation's land and for their commitment to the surrounding community and future generations, the Environmental Quality Team at the U.S. Army Garrison Daegu received a Secretary of the Army Environmental Award in February. The award represents the Army's highest honor in environmental stewardship.

For more information on the U.S. Army Environmental Command, visit <http://aec.army.mil>

This information is provided by USAEC. USAEC is the Army's point organization for supporting the implementation of environmental programs that facilitate sustainable Army training and operations while protecting the environment. We provide environmental program management and technical support products and services in support of Army training operations, acquisition and sound stewardship.

"Sustaining the Environment for a Secure Future"

FY 2007 Secretary of Defense Environmental Awards

Environmental Quality Team, USAG Daegu, Korea

Environmental Quality, Team



Sustaining the Environment for a Secure Future

Environmental Quality Team, USAG Daegu, Korea

Environmental Quality, Team



SUMMARY

U.S. Army Garrison Daegu, Korea (USAG Daegu), part of the Installation Management Agency-Korea Region headquartered at Yongsan Garrison in Seoul, Republic of Korea, is an integral player in Army Transformation and directly supports the 8th United States Army. It also provides support and services for 43 separate units and agencies in Area IV, the largest of the U.S. Army's four geographic regions on the peninsula, where a variety of missions in the defense of the Republic of Korea are performed. USAG Daegu serves about 11,000 U.S. military personnel; Korean Augmentation To United States Army (KATUSA) Soldiers; and American and Korean civilian employees, contractors and American family members.

“An exceptional entry, highlighted by a strong environmental management system, exceptional outreach and an array of hazardous and solid waste initiatives.”

*- Michael Bird, Senior Federal Affairs Counsel,
National Conference of State Legislatures*

Highlights of USAG Daegu's environmental quality program include:

- A Qualitative Recycling Program that resulted in a solid waste diversion rate increase from local landfills of 250 percent in the past two years, with increases in revenue of 171 percent.
- On-target goal to protect vicinity of drinking water sources by upgrading/removing 20 percent of substandard above- and underground storage tanks by the end of FY 2008.
- Implementation of a water-dispersible chemical agent resistant coating paint system that will reduce emissions of volatile organic compounds by 13 tons and hazardous air pollutants by 7.5 tons per year.
- Hazardous materials management practices that average \$382K cost savings per year, in addition to a hazardous waste shelf-life extension program that saved \$300K, and an antifreeze recycling effort that saved \$74K.
- Kyung Pook National University internship program that provided practical environmental science experience for college credit.
- Time spent with the local community on special days to demonstrate the Army's environmental stewardship efforts and build host nation confidence in the environmental program at U.S. Army Garrison Daegu, Korea.

On the cover: Soldiers, civilian workers and family members from USAG Daegu participate in a mass tree planting event on Waryong Mountain, celebrating Arbor Day.

INTRODUCTION

USAG Daegu, headquartered at Camp Henry, Korea in the city of Daegu and part of the Installation Management Command Korea, is an integral player in Army Transformation and directly supports the 8th United States Army. It was activated on March 28, 2007. USAG Daegu is a subordinate unit to the Installation Management Command-Korea Region located at Yongsan Garrison in Seoul, which was activated on Oct. 7, 2002. USAG Daegu assumed the base operations mission from the 20th Area Support Group (subsequently relocated to Camp Carroll and deactivated in June 2006). Area IV is the largest of the U.S. Army's four geographic regions on the peninsula. It covers 10,000 square miles and stretches from Daejeon to Busan. USAG Daegu provides support for five installations and 10 sites. USAG Daegu is responsible for managing all aspects of U.S. Army installations in Area IV, such as: construction, family care, food management, environmental programs, well-being, logistics and public works in the lower third of the Republic of Korea. It provides support and services for 43 separate units and agencies in Area IV, which perform a variety of missions in the defense of the Republic of Korea, and about 11,000 U.S. military, KATUSA Soldiers, American and Korean civilian employees, contractors and American family members.

USAG Daegu's mission is to provide responsible management of affiliated installations, support mission readiness and execution, ensure the well-being of Soldiers, civilians and their Families, improve the installation's infrastructure and preserve the environment.



Soldiers attending the Environmental Compliance Officer Course visit the Camp Walker recycle point.

BACKGROUND

The Republic of Korea (host nation) has a high interest in the environmental impact of USAG Daegu activities, due to the proximity of many camps within densely populated cities. This presents both a challenge and an opportunity for the military community to demonstrate sound environmental stewardship.

USAG Daegu's Directorate of Public Works (DPW) is charged with the environmental management of the garrison. Each member of the Environmental Quality Team is employed by the Department of the Army. The seven-person staff brings a broad range of subject matter expertise and experience to the environmental program. This base of expertise allows assignment of secondary areas of responsibility, resulting in increased customer service by decreasing inquiry response time.

- Robert J. Chartier is Chief of the Environmental Division and Deputy Director of the Directorate of Public Works. His areas of responsibility include managing the environmental program and budgeting, acting as the installation's Environmental Management System's (EMS) management representative and sustaining and leading the Environmental Performance Assessment System. Mr. Chartier is a member of the Society of American Military Engineers

(SAME) and the Army Engineer Association. He was nominated as the garrison representative to the 2005 United States Forces Korea (USFK) "Professional of the Year" competition. In 2004, he received an Achievement Medal for Civilian Service for his efforts in Environmental Issues in Deployed Operations.

- Mark Y. Gettel is Chief of the DPW's Planning and Conservation Branch, responsible for air and noise quality, environmental training, pollution prevention and the EMS. Mr. Gettel is also in charge of contract management at Camp Walker.
- Yong Chin An is an Environmental Engineer with the DPW's Planning and Conservation Branch, responsible for lead-based paint management, pesticide management, recycling and Camp Walker digging permits.
- Dr. (Ms.) Kyong Ae Choe, also an Environmental Engineer with the Planning and Conservation Branch, is responsible for the environmental budget, conservation and planning level surveys. She is also responsible for managing natural and cultural resources and the environmental database. Ms. Choe was nominated as the garrison representative to the 2005 United States Forces Korea (USFK) "Technician of the Year" competition. As a result of her cultural resources management efforts, procedures were established through U.S. Forces Korea and the Status of Forces Agreement (SOFA) committee to process the first ever turn-over of cultural items to the Korean Governments Cultural Resources Administration, relinquishing control of 4 artifacts dating over 1,000 years old.
- Charles A. Harper is the Chief of DPW's Environmental Quality Branch and is responsible for above-ground storage tanks/underground storage tanks (AST/UST) management, contract management and EMS management at Camp Carroll.
- Chom Tong Kim is an Environmental Engineer in the Environmental Quality Branch. He is responsible for asbestos, Camp Carroll digging permits, drinking water, waste water, storm water and land farm operations.
- Hak Kyun Kim is an Environmental Protection Specialist in the Environmental Quality Branch. He is responsible for hazardous waste and PCBs and Camp Carroll recycling efforts.

Mr. Hak Kyun Kim and Mr. Chom Tong Kim were members of the environmental staff that won a USFK Environmental Award for an Industrial Installation in 1997, the Honorable Mention for the Secretary of the Army Environmental Quality Award for Non-Industrial Installation in 1998 and the Secretary of the Army Award for an Environmental Quality Overseas Installation in 1999.

Commitment to environmental stewardship earned USAG Daegu the distinction of first runner-up for the Overseas Environmental Quality category in the 2006 Secretary of the Army Environmental Awards.

ACCOMPLISHMENTS

The accomplishments of the USAG Daegu environmental program are due largely to the expertise and dedication of the Environmental Quality Team, the visibility EMS implementation has created throughout the garrison and the team's effort in promoting environmental awareness through many avenues. EMS implementation provided the mechanism for the Environmental Quality Team to clearly articulate to the community definitive objectives and assess and review them against the garrison goals. These initiatives provided natural resources benefits, tangible cost savings, cost avoidance and visibility to the environmental program while conserving critical staff hours for those issues most significantly impacting mission and the environment.

The Environmental Quality Team used a mission-focused, risk-based approach to EMS implementation that focused on the environmental program's areas of most significant concern to the environment and human health. The FY 2006 and FY 2007 environmental program's main areas of emphasis included:

- Creation of solid waste and recycling efforts
- Spills to water or soil
- Discharges to ground or surface waters.

Technical Merits: Pollution Prevention and Waste Reduction

Qualitative Recycling Program (QRP)

The USAG Daegu's QRP is a dynamic, four-part effort that includes community education and outreach, collection of common recyclables, mission unit partnerships and operation of a land farm facility. The recycling program is a concentrated effort to decrease the amount of waste the garrison brought to the City of Daegu landfill. Prior to the implementation of the QRP, recycling efforts on the garrison were barely functional. This was viewed negatively by City of Daegu officials who were launching their own initiatives to decrease landfill usage.

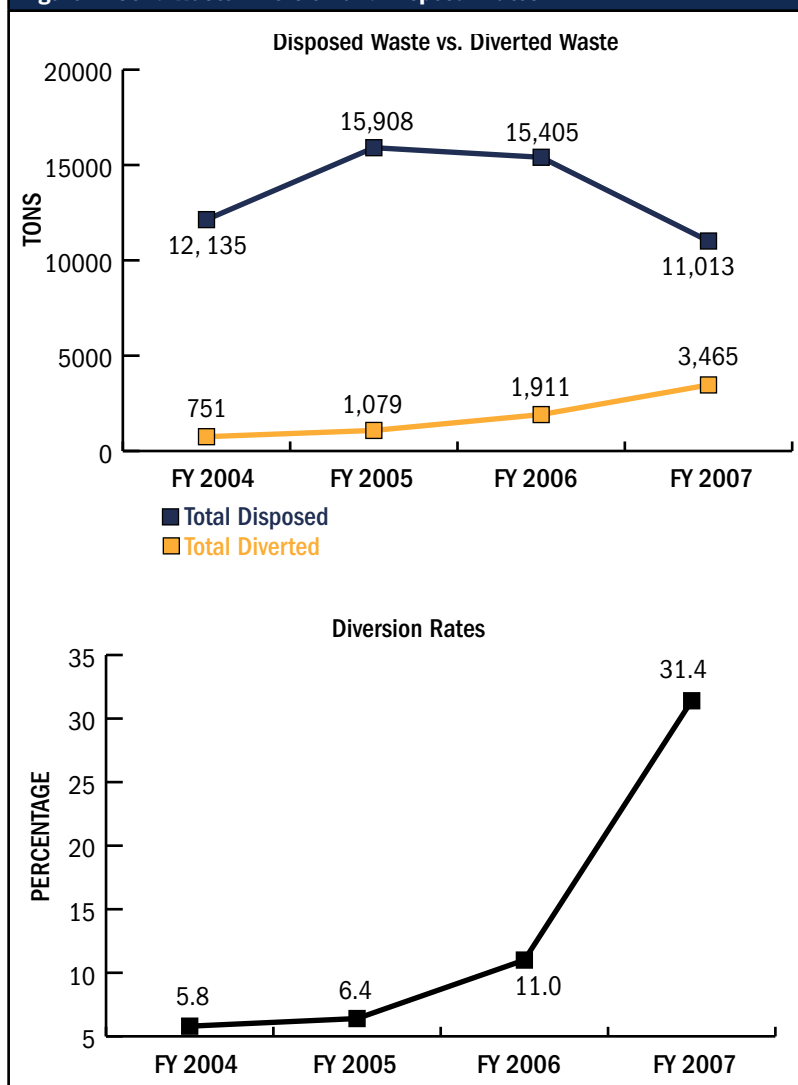
The graphs at right depicts the increased diversion rate and decreased disposal rates for solid waste at USAG Daegu between FY 2004/ FY 2005 and FY 2006/FY 2007.

These results were achieved, in part, through:

- Networking with the Defense Commissary Agency and the Army & Air Force Exchange Service to integrate them into the QRP.
- The Environmental Quality Team's involvement in a Lean Six Sigma Rapid Improvement Event evaluating the lead acid tactical battery recovery and turn-in process. This project determined that the lead acid was no longer required to be removed prior to recycling, thus eliminating over 14 tons of sulfuric acid from the hazardous waste stream and avoiding \$8,000 in disposal costs.
- Focus on the wooden pallet recycle program increased the recycling rate from 0-4,400 through FY 2007.
- Salvaging 30 recycling containers from a closing installation and achieving a \$5K disposal cost avoidance.
- Using a tub-grinder wood mulching machine to divert 100 tons of wood waste from the landfill, saving the garrison \$90K dollars annually.

The QRP resulted in a revenue increase of 171 percent and a solid waste diversion rate increase from local landfills of 250 percent.

Figure 1. Solid Waste Diversion and Disposal Rates



The Garrison QRP operates on a zero fee basis with profits split 50/50 between the Korean recycler and the garrison in accordance with their Status of Forces Agreement (SOFA). The garrison uses its share of the revenue to maintain the recycling program and related operations and maintenance costs. Cost avoidances realized by increased recycling were diverted to other mission enhancement base operations.

The USAG-Daegu QRP was so successful that the Installation Management Command-Korea Region Deputy Director, Mr. Davis D. Tindoll, Jr., recommended the program as a standard for other installations.

Storage Tank Management

USAG Daegu's implementation of the EMS highlighted the seriousness of spills associated with substandard above-ground and underground storage tanks (ASTs/

USTs) posed to water and soil resources. Of the nine petroleum, oil and lubricants (POL) contamination sites related to the AST/USTs, some were found to be in close vicinity of drinking water sources. This placed the task of mitigating and replacing substandard AST/USTs high on the garrison's Sustainment, Restoration and Modernization project priority list at the Garrison Real Property Planning Board in FY 2006/FY 2007. To date, the Environmental Quality Team is on target to meet its goal of upgrading/removing 20 percent of substandard AST/USTs by the end of FY 2008:

- Salvaging 30 Type II ASTs from Camp Hialeah prior to the camp's closure in FY 2006, thus saving the garrison \$400K on future upgrade projects.
- Replacing 48 aging AST/USTs in FY 2006/FY 2007.
- Awarding a contract in FY 2007 to replace an additional 26 tanks.
- Awarding a contract in FY 2007 to convert from a fuel oil system to natural gas, resulting in the removal of the remaining 32 heating oil USTs at Camp Carroll, for a total UST reduction throughout the garrison of 90%.

As a result of upgrading the garrison storage tank system, the Environmental Quality Team achieved its goal of reducing accidental fuel releases by 50 percent. An 8-hour semi-annual Hazardous Material/Hazardous Waste handler course conducted in FY 2006 and FY 2007 in both the Korean and English languages contributed to this success. The attention focused on substandard AST/USTs mitigated risk of future spills that averaged between \$500K to \$1M in clean up costs.

Orientation to Mission

Safe, Effective Vehicle Paint System

In keeping with the installation's mission, the Environmental Quality Team helped one of its major units at Camp Carroll, the Material Support Center Korea, replace their chemical agent resistant coating

(CARC) vehicle painting operation from a solvent-based to a water-dispersible paint system. The new paint system provides the same mission benefits as the old paint but it reduces emissions of volatile organic compounds and hazardous air pollutants by 13 tons and 7.5 tons per year, respectively. Not only is the water-based CARC system good for the environment, it also has benefits lauded by the workforce: the paint that is pre-mixed from the supplier reduces the risk of spills and the chance of error in the mixing process; it's easy to use, which promotes painting operation efficiency and consistency and saves man hours; and the backpack and wall mounted equipment is ergonomic, which decreases worker fatigue and injury.

Hazardous Waste Management

Use of the HAZMART facility by the Environmental Quality Team to track hazardous material usage, to reissue excess hazardous materials, to conduct shelf-life extension activities, and to operate an antifreeze recycler saved valuable mission unit resources for use in other priority efforts. Hazardous materials management averaged \$382K cost savings per year in FY 2006/FY 2007. The shelf-life extension program realized a cost avoidance of approximately \$300K and recycling used antifreeze saved \$74K in disposal costs. Additional savings will be realized due to hazardous waste management projects that were established in FY 2007: two hazardous waste



US Army Material Support Center Korea Korean National employee uses the new water-based CARC paint application system.

accumulation points were constructed on Camp Carroll, and a contract to construct new Hazardous Waste Accumulation Point at the Busan Storage Facility was awarded. These efforts will consolidate substandard collection points and reduce the risk and number of costly hazardous waste incidents.

The education of garrison personnel on environmental goals and objectives was achieved through semi-annual Environmental Office and the Hazardous Material/Hazardous Waste Handlers Courses. Approximately 60 and 250 personnel, respectively, across the garrison units participated in these courses throughout FY 2006 and FY 2007. Participants received training on issues and concerns likely to impact the environment and the civilian and military communities. The Environmental Quality Team also engaged recently assigned personnel by providing environmental instruction at the garrison Newcomers Orientation briefings. Information covered included the installation's EMS objectives and other high risk environmental issues such as Asbestos and PCBs. Approximately 22 briefings were provided during FY 2006 and FY 2007, reaching an estimated 900 Soldiers, Marines, Department of the Army civilians and Family members. As a result, fewer incidences associated with these environmental media areas were reported. Also, public concern over such issues as Asbestos exposure and PCB contamination was reduced.

Community Outreach

For USAG Daegu, community outreach is an invaluable way to maintain a positive relationship with the host nation. In FY 2006 and FY 2007, the Environmental Quality Team sponsored six Kyung Pook National



Mr. Mark Gettel USAG Daegu Environmental Office educates children from the School Age Services Program about the importance of recycling.

University student interns and volunteers who spent a total of 1,990 hours volunteering with the environmental staff, working in various environmental media areas such as safe drinking water quality, hazardous waste operations and natural resources. The internship program offered students an opportunity to witness the U.S. environmental culture first hand and receive college credit. The garrison also realized an opportunity to showcase its environmental programs.

The Environmental Quality Team also provided classroom instruction on garrison environmental activities to the Daegu American High School's Advanced Placement Environmental Science Class. Students learned what kinds of careers are available to those with an interest in environmental science and were able to witness a hazardous material spill response exercise first-hand.

USAG Daegu also took advantage of environmental awareness days – Earth Day and Arbor Day – to educate participants and encourage involvement in garrison environmental efforts. The garrison participated in Arbor Day mass tree planting ceremony on Waryong Mountain with garrison Soldiers, Family

members, civilian employees and the and Boy Scouts. Week-long Earth Day events included partnering with the Army Community Services Youth Center to provide field trips of the Camp Carroll Wastewater Treatment Plant. Information kiosks were set up and staffed at the Camp Walker Post Exchange and the Camp Carroll Community Activities Center. In-classroom instruction was also provided to the School Age Services program discussing the importance of recycling and caring for the natural environment.



Soldiers, Civilian workers and family members from throughout USAG Daegu participate in a mass tree planting event on Waryong Mountain in Daegu Korea celebrating Arbor Day.

CONCLUSION

USAG Daegu's Environmental Quality Team is committed to improving environmental quality not only for the benefit of the garrison's mission, but also to prove that the installation and the U.S. Department of the Army is a good steward of the host nation's land. In FY 2006 and FY 2007, implementing the Qualitative Recycling Program, upgrading the garrison storage tank system, installing a new vehicle painting system and managing hazardous wastes more efficiently garnered significant savings, both in terms of financial costs and mitigating harmful impacts to the environment. Hands-on environmental initiatives are bolstered by training and education across the garrison that extends out into the community. Through the efforts of its Environmental Quality Team, U.S. Army Garrison Daegu is demonstrating to its host nation that the Army is a good neighbor and a valuable asset in sustaining the environment in Korea.



Kyung Pook National University student intern works in the Camp Walker Hazardous Waste Storage Area. Six student interns were able to earn college credit while volunteering a total of 1,990 hours with the environmental staff.