

SUSTAINABILITY,
INDIVIDUAL/TEAM

FY 2016 Secretary of Defense Environmental Awards

PENNSYLVANIA ARNG

INTRODUCTION AND BACKGROUND

The Pennsylvania Army National Guard's (PAARNG) Fort Indiantown Gap National Guard Training Center (FTIG-NGTC) is the only live-fire, maneuver military training facility in the state. FTIG-NGTC is comprised of 17,150 acres and is a Tier II military installation, providing training to military personnel while also sustaining a vital habitat for rare native flora and fauna. Located in Central Pennsylvania, Fort Indiantown Gap has a military mission that supports over 18,000 PAARNG personnel each year, including one of the largest and most deployed Army and Air Guard. The Guard, Reserve, active Army, Navy and Marine units, law enforcement entities from Pennsylvania and other states, as well as Joint Service exercises with the Air Force, swell the training lands' and facilities' users to more than 130,000 personnel each year. More than \$150 million of new construction has been executed over the past 10 years at FTIG-NGTC. All the activities on the installation are designed to enhance the quality of training for the

Soldiers and environmental resources. Components of its operation effectively integrate installation chain-of-command with the interests of resource management agencies, private conservation groups, regulatory agencies and the local community to conserve resources while providing an optimal atmosphere for military training and readiness. The PAARNG commitment to installation sustainability ensures that FTIG-NGTC will continue to be among the finest training facilities in the nation.

On this premier training site and across PAARNG's readiness centers throughout the state, the Sustainability team is charged with protecting and enhancing the viability of training and readiness, both day-to-day and long-term. Taking a holistic view of PAARNG operations, the Sustainability team integrates energy security, waste stream reduction, recycling diversion, resource conservation and cost savings to achieve the highest levels of environmental excellence.

Judging Criteria



Program Management



Orientation to Mission



Impact & Outcomes



Technical Merit



Stakeholder Interaction



Transferability



The PAARNG Sustainability Team includes:

Megon Riddell

Environmental Specialist

Todd Eakin

Environmental Supervisor

CW3 Michael O'Donnell

FMS #4 Shop Supervisor

CW3 Chris Prinzivalli

FMS #4 Shop Foreman

Dreama O'Neal

Environmental Manager

 The team has achieved major sustainability milestones during the award period, particularly with waste stream reduction and diversion. Moving beyond the Qualified Recycling Program (QRP), the team established recycling, reuse and resale of solid waste and other materials through the Defense Logistics Agency (DLA) Disposition Services, resulting in more than 50 percent reductions in universal waste streams compared with the 2012 baseline, as well as 44 percent reduction in hazardous waste. The team is completing the conversion of PAARNG properties from heating oil to natural gas, a greener energy source and recycling more than 300 above-ground heating oil storage tanks. Recycling of fluorescent bulbs has also surged over the past 2 years, as the team leads LED lighting retrofits throughout PAARNG. A new pharmacy system has further reduced waste and avoided both disposal and purchase costs throughout the state.

  The Sustainability team coordinates initiatives across several departments to ensure that all project implementations are aligned. The Environmental Office is fully integrated with the Environmental Performance Assessment System (EPAS), Compliance programs and the Energy Office. Within the Environmental Office, day-to-day operations are supported by the team as well as the installation EPAS manager, federal technician, compliance manager, air/water/sewer specialist, underground storage tank (UST)/spill specialist, planning personnel and Resource Conservation and Recovery Act (RCRA) manager. This team is further supported by the post energy manager and facilities and engineering staff.

The team participates in a vibrant Environmental Management System (EMS) program with strong inter-departmental Environmental Quality Control Council (EQCC) participation and support. The eMS program is focused on significant aspects of energy reduction and Army Compatible Use Buffer (ACUB) development. They also provide input to the FTIG-NGTC recycling team to review progress towards waste diversion goals and strategize ways to encourage greater program participation and expansion. 

 In all areas, the team has helped to ensure full environmental compliance for PAARNG, maintaining strong regulatory relationships and rigorous adherence to plans and policies and 48 Spill Control and Countermeasure (SPCC) plans are reviewed annually. The range of expertise among the environmental staff means that these plans can be maintained and updated in-house at minimal cost. Maintaining the SPCC plans in-house saves between \$13,000 and \$15,000 in contracting costs each year, and the Sustainability team also performs all necessary training and refresher courses. In fact, the staff manages nearly all projects in-house, from spill response and clean up to well monitoring and soil testing.

 The team's initiatives during the award period stand out for the impressive cost savings and avoidances they've accrued. The material pharmacy program, which also incorporates hardware and specialty items, collected approximately 1,700 pounds of material for exchange; avoided \$10,908 in disposal costs and avoided \$8,603 in new purchasing costs. Hardware materials collected thus far represent \$4,631 in avoided purchase costs. Also, an increase in recycling of less common materials, for example, telephone poles 185,300 lbs) and 286 heating oil tanks (4,450 lbs) was achieved.

 The Sustainability team's efforts in waste stream reduction and diversion have been outstanding over the past 2 years, incorporating multiple approaches. Everything except glass is recycled on the installation, including batteries, tires, oil and antifreeze. The QRP generates revenue to support and expand the recycling program, health and safety initiatives, and morale, welfare, and recreation purchases.

The Sustainability team has made the most of a partnership with the local DLA Disposition Services (formerly known as DRMO) reutilization program to divert a wide range of materials that would otherwise be disposed of conventionally or as hazardous waste, including electronics, gas cylinders, bulbs and batteries. Many of the items sent to DLA may be reconditioned and sold, redistributed as-is for reuse or recycled, greatly extending the life cycle of these items. The team also works with the U.S. Property and Fiscal Officer (USPFO) to recycle materials like batteries. Highlights of expanded recycling and waste diversion during the award period include:

6,556 lbs. of bead blast, bulbs, and batteries through DLA (2016); \$3,385 disposal costs

10,496 lbs. of bulbs and batteries through DLA (2015); \$7,614 disposal costs

286 oil tanks (4,450 lbs.) to DLA (2015); \$44,499 scrap value

225,448 lbs. of mixed brass (2015-16); \$379,063 revenue

185,300 lbs. of telephone poles (2015-16); \$9,650 disposal costs

51,060 lbs. of tires (2015-16); \$2,753 disposal costs

8,620 lbs. air/gas cylinders through DLA (2016); \$0 disposal costs

125,729 lbs. of batteries through USPFO (2016); \$32,027 revenue

14,226 lbs. of batteries through USPFO (2015); \$29,325 revenue

From these waste streams, the team diverted 631,885 pounds of material from PAARNG waste stream. These figures do not include the additional QRP materials, electronic waste, crushed concrete from demolition activities, bio solids land-applied for beneficial use, lead recovery on ranges or the savings achieved by the pharmacy program.

Since FY15, the team has managed recovery of lead from rubber backstops used on FTIG-NGTC's ranges, implementing a unique solution to a common training site challenge. Rubber backstops that are

roughly 2' x1'x1' and panels that are roughly 3'x4' are used behind targets at the post's small arms ranges to prevent berm erosion. The block captures the lead rounds and prevents ground contamination – but PAARNG is left with a lead-contaminated rubber block. Instead of disposing of these materials as hazardous waste, the Sustainability team began contracting with a specialty smelter in Minnesota that employs a process of grinding up the block, recovering the lead residue, and recycling all components. The cost to PAARNG consists of transporting and recycling the blocks, which is 70 percent less than their disposal cost as hazardous waste. As demolition projects continue on FTIG-NGTC, concrete is recovered using grinders on site; the crushed concrete is then reused for road material in training corridors and on erosion control projects. The Sustainability team's recovery of construction and demolition (C&D) debris simultaneously avoids disposal costs and expenditures for the purchase of new gravel and construction material.

Material Management

This year, the team succeeded in formalizing a pharmacy exchange program for materials throughout PAARNG, linking FTIG-NGTC with shops, readiness centers and smaller training areas across the state. Previously, units would often simply turn in items they no longer needed to the Sustainability program, including items that were excess or past their shelf life and the team would do its best to redistribute those materials. With the acquisition of a dedicated pharmacy warehouse this year, in conjunction with the intake of excess materials from readiness centers undergoing renovations, the pharmacy program has rapidly expanded. The team maintains a detailed spreadsheet of inventory acquired statewide, including everything from cleaning supplies to drywall screws, with dates of acquisition, dates of expiration, product volumes and more data instantly accessible. The facilities that acquire items from the pharmacy are also included in tracking to avoid unnecessary purchasing. Each month, facility managers are alerted to new products available and asked to turn in any materials their facilities no longer need or will not use before expiration. Materials are also collected during facility training and site visits, particularly as the team updates Safety Data Sheet (SDS) information.



Distribution takes place on a first come-first served basis. In less than 1 year, the pharmacy has acquired hundreds of items and avoided a minimum of \$15,540 in disposal costs and redundant purchases.

The Sustainability team is seeking out additional materials for recapture and reuse; when the team receives excess fuels, for instance, it consults with the PAARNG forestry department to see if those fuels are appropriate for use in the prescribed fire program. The team is consulting now with the state regulator and DLA office to explore the possibility of using fuels not appropriate for forestry as an alternative heating source through an off-spec exemption. These measures allow the team to avoid needlessly disposing of around five drums of fuel each year as hazardous waste or purchasing more. By-products from the forestry program, as well as woody organic waste, landscaping waste and pallets, are incorporated into the team’s recycling efforts. These materials are chipped on site, generating around 2,000 cubic yards of mulch each year for use throughout FTIG-NGTC.

Material Substitution and Process Improvement

With recycling and material management well in hand, the team has turned their attention to material substitution in PAARNG shops and facilities. At FTIG-NGTC’s largest maintenance shop, the team has helped painting personnel reduce their inventory and types of paints and solvents since the shop was opened in 2013. The shop features a water jet system that reuses water and extracts paint sludge, reducing hazardous waste to an absolute minimum. The team helped to identify a solvent recycler for the solvent-based paint recovered in this system. The team is also assisting with a shift away from solvent-based Safety-Kleen parts washers, introducing bio-cycle, aqueous-based Crystal Clean systems as an alternative. The new machines eliminate the health and safety hazards of solvent exposure and flammability that the previous machines created. The bio-cycle machines use a microorganism solution that consumes petroleum molecules without creating air emissions or volatile organic compounds. This technology, once only available in larger-scale water treatment operations, is now being employed on a smaller scale in PAARNG shops. The team continues to sample the

parts cleaners and their by-products to validate waste determination.

While the team continues to assist PAARNG in developing a formal green procurement program, it works closely with unit coordinators and shop managers to identify materials for substitution. Over the past 2 years, Field Maintenance Shop (FMS) #4 has implemented the following safer, greener alternatives:

Product	Use
Safe Soap	Replaces soaps/detergents that emulsify oils which then pass through the oil/water separator (OWS) for shop floor cleaning
Safety Prep	Non-flammable replacement for aerosol brake cleaners, such as CRC Brake-Kleen
Teksol EP Aerosol	Non-flammable, citrus-based electronic degreaser/cleaner that replaces more harmful chemicals such as MEK
Citra Safe	Degreaser replacing chlorinated cleaners such as carburetor cleaners, mineral spirits and petroleum naphtha
Bio-Blast Aerosol	Non-flammable penetrating oil, replaces more harmful chemicals such as PB blaster
Fluid Film	Non-toxic, non-flammable corrosion prevention compound
Blue Bear Paint & Urethane Stripper	Non-flammable replacement for more harmful paint strippers

These alternatives will now be shared with the remaining PAARNG maintenance shops. The team maintains safety data sheets (SDS) for all products on PAARNG’s Pennsylvania Knowledge Online (PKO) website and in shop and readiness center locations, where they are used.

Sustainable Landscaping

Since acquiring a sludge press at the FTIG-NGTC wastewater treatment plant several years ago, the

team has successfully diverted huge quantities of organic material from PAARNG’s waste streams. Under a permit with the Pennsylvania Department of Environmental Protection (DEP), the team is able to capture bio solids from the wastewater treatment plant for use in fertilizing hay fields spanning 25 acres, an example of sustainable landscaping. The fields, in turn, produce Timothy Hay which is harvested and used for sedimentation control, erosion repair, construction and land stabilization throughout FTIG-NGTC. This sustainable agricultural practice eliminates the cost associated with sludge disposal at the landfill as well as the cost of purchasing hay used for establishing vegetation at construction projects on the installation. Each year, the fields produce around 400 bales, or 10 tons, of hay.

Biosolid Diversion	Dry Tons	Wet Tons	Avoided Disposal Cost
2015	60.06	327.50	\$21,369.37
2016 (to August)	11.58	304.75	\$19,884.94
Total	71.64	632.25	\$41,254.31

Energy Conservation and Green Construction

The team has targeted energy independence and sustainable construction on several fronts. The conversion of FTIG-NGTC to natural gas for heating rather than fuel oil has been a project for several years, updating infrastructure and establishing a cleaner, more affordable fuel source throughout the post. Elimination of fuel oil tanks also minimizes the risk of spills or leaks, as well as the need for permits, inspections and repairs. There are fewer than 40 heating oil tanks remaining on FTIG-NGTC, down from 155 at the beginning of the performance period, i.e., the beginning of FY15.

Working with the Energy Office, the Sustainability team has supported conversion of lighting systems throughout the state to more efficient LED systems, including recycling obsolete lighting. New construction features efficient HVAC, LED lighting, occupancy sensors and water conserving fixtures, and these features are being expanded through facility

retrofits around the state. New construction and renovations follow the Leadership in Energy and Environmental Design (LEED) Silver standards to enhance energy efficiency. The team audits approximately 35-40 statewide facilities each year. As part of their environmental audits, the team assists facilities in identifying readily visible energy waste. For example, open windows and doors during heating season, excessive air conditioning, additional desk-side appliances like miniature refrigerators and individual coffee pots.

All the undertakings of the Sustainability team are done with the intent of protecting and enhancing the training and readiness capabilities of PAARNG through better use of resources and funding—as well as through avoidance of costs and compliance issues. The Sustainability team has demonstrated its commitment to instilling an ethic of shared accountability and stewardship throughout each facility and unit operating in PAARNG. Every unit has an environmental officer to manage pollution prevention, energy and resource conservation, waste and material management, and environmental awareness. The Sustainability team coordinates with these officers to ensure that all internal stakeholders are fully trained multiple times a year in addition to the assistance offered on facility site visits. Extensive training, tailored management plans and regular review of sustainability processes all combine to create continuity throughout the installation and ensure compliance, which in turn protects operations from regulatory issues. The projects and accomplishments of the Sustainability program over the past 2 years have also enhanced efficiency and cost savings, thereby freeing ever greater resources to support other mission needs. The team’s dedication to meeting PAARNG’s goals for waste reduction, waste diversion and resource efficiency all contribute to the guarantee of quality training access and uninterrupted operations.

Several of the team’s recent initiatives could be adopted by other military installation and agencies. The implementation of pharmacy programs with more formalized controls could be easily tailored to other organizations. The team’s material substitutions could also be transferred to other organizations, particularly those that are in the early phases of implementing green procurement programs. On



larger training sites where wastewater treatment is conducted on post, the team's success with recapture and use of bio solids is an example to follow.

Internally, the team has established rigorous planning documents and networks of support within the EMS, EPAS, Energy, Facilities and Command directorates

 to ensure that Sustainability remains at the forefront of PAARNG's attention and priorities. At the unit level, environmental officer classes are offered three times each year in addition to annual spill prevention and waste management training. The team has been especially proactive in reaching out to shops and facilities, soliciting their ideas for new initiatives in Sustainability. In total, the team conducts around 100 training sessions each year among the readiness centers and FTIG-NGTC.

 PAARNG is well-known for its award-winning, community outreach and education programs and the Sustainability team is active in supporting those interactions. FTIG-NGTC is an open post, with an extremely robust hunting and fishing program, as well as popular resources related to its growing populations of endangered Regal Fritillary butterflies and its rich cultural and military history. The installation hosts National Public Lands Day events every year and receives grant funding to conduct special projects to beautify and maintain unique natural and cultural features at the training site. One longstanding partnership involves the Milton Hershey School, through which disadvantaged children are invited to participate in environmental service days on the installation and learn more about sustainability and PAARNG. Earth Day events are held every year, and these involve aspects unique to the Sustainability program, with the Sustainability team hosting displays and presentations emphasizing recycling and energy conservation.

 During the award period, the team contributed booths, education displays, educational materials and discussion opportunities at the Annual Armed Forces Day, Historic Annville Days, Cleanup Open House events, Annual Guard Day at the state Capital, Annual Diversity Day at FTIG-NGTC, multiple Chamber of Commerce events, annual FTIG-NGTC Earth Day celebrations and displays in the FTIG-NGTC Administrative Building. The installation's ACUB has led to even greater partnership expansion. In addition to

local landowners and conservation groups, FTIG-NGTC and its Sustainability team work closely with the Swatara Watershed Group, the Conservation Fund and multiple utility companies. These relationships help to expand the installation Sustainability program's capacity for outreach and education among the communities that PAARNG serves.