



## 2014 Secretary of Defense Environmental Awards Program

### Fort George G. Meade, Maryland Environmental Restoration - Team



#### INTRODUCTION

Fort George G. Meade (FGGM) has been a permanent U.S. Army installation since 1917 and occupies approximately 5,500 acres in northwestern Anne Arundel County, Maryland, midway between Baltimore, Maryland, and Washington D.C. The Phoenix Military Reservation (PMR) located in northern Baltimore County is a sub-installation of FGGM.

The Installation Restoration (IR) and Military Munitions Response (MMR) Program Team's (Team) major achievements include:

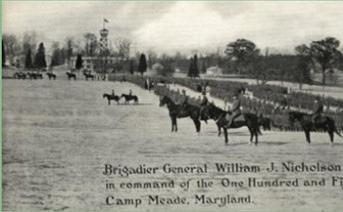
- Restored 134 acres of land for beneficial reuse
- Achieved \$17.5 million in cumulative costs savings
- Accelerated progress and reduced costs with technology and management innovations
- Established partnerships with federal, state, and local agencies ensuring mission alignment and design acceptance
- Provided broad, sustained, and highly effective outreach programs
- Reduced risk and successfully protected human health and the environment
- Maximized recycling and minimized carbon footprint through green remediation/sustainability



#### BACKGROUND

For almost 100 years, FGGM has contributed to our national defense from cavalry to mechanized units and, more recently, to information, intelligence and cyber. With the application of the Defense Environmental Restoration Program, the environmental impacts from these activities have diminished significantly. Past storage, handling and disposal of chemical material has always been consistent with those of the time; however, some of those historic practices have left adverse impacts to our environment.

#### FGGM TIMELINE



**World War I Era:** More than 400,000 soldiers passed through Camp Meade, a training site for infantry.



**World War II Era:** FGGM ranges and other facilities were used by approximately 3,500,000 soldiers.



**Cold War Era:** FGGM reverted to routine peacetime activities.



**Modern Era:** FGGM evolved into the preeminent center of information, intelligence and cyber.

#### Judging Criteria

Program Management	
Technical Merit	
Stakeholder Involvement	
Orientation to Mission	
Transferability	
Program Impact	

#### Environmental Restoration Team

Name	Title	Position Description
Paul V. Fluck, P.G., REP	Program Manager (Army)	Responsible for the overall execution of the program. Identifies potential liabilities and develops timely and cost efficient strategies to meet established Army goals.
George B. Knight, P.G.	Project Manager (Army)	Responsible for the execution of specific projects, monitors performance and executes corrective actions to optimize objective attainment.
Denise A. Tegtmeier, PE	Project Manager, Osage of Virginia, Inc. (Contract Spt)	Responsible for the execution of specific projects, monitors performance and executes corrective actions to optimize objective attainment.
Erin L. McKinley	Technical Support, Osage of Virginia, Inc. (Contract Spt)	Provides technical support including in-field monitoring and supporting GIS requirements.



Fort George G. Meade, Maryland, Environmental Restoration - Team

**Team/Individual Awards**

- Letter of Appreciation (Team), National Security Agency (NSA), Director, Installations & Logistics, FY12
- Society of American Military Engineers (SAME) National Young Member Medal, FY12
- Commanding General, National Capital Region, Award for Excellence Coin, FY12
- Fort George G. Meade Commanders Certificate of Excellence, Energy Awareness Month FY12
- Fort George G. Meade Commanders Certificates of Excellence, Earth Day FY12 and FY13
- Fort George G. Meade Performance Awards, FY12 and FY13
- U.S. Army Environmental Command (AEC), Commander, Outstanding Performance Coin, FY13
- Inductee to the SAME Academy of Fellows FY13
- Engineering Society of Baltimore, Project of the Year Finalist, FY13



**POSITION DESCRIPTION**

The Team’s mission is to promptly identify, investigate, and clean up threats to human health and the environment; conduct actions in a timely and cost efficient manner; and ensure mission readiness while promoting public participation and confidence. To meet our mission, force multipliers are fully and thoughtfully applied, including the use of subject matter experts inside and outside the Army (FGGM Public Affairs Office, AEC, Army Public Health Command, Army Corps of Engineers and their Centers of Excellence, and contractors), state of the art technical and management processes, and a robust and sustained internal and external stakeholder participation process to ensure situational awareness and alignment with the many missions performed at FGGM and the surrounding communities. Our Team works closely with other environmental programs such as Storm Water Management, Pollution Prevention, Cultural Resources, and Natural Resources to ensure coordination and compliance with all programs.

FGGM has 31 IR and 3 MMR program sites with 83 active areas of interest (AOIs). The primary contaminants of concern include; heavy metals, pesticides, polychlorinated biphenyls and solvents in soil, sediment, and groundwater on-post and solvents (carbon tetrachloride, trichloroethene, and tetrachloroethene) off-post in the Town of Odenton and the Patuxent Wildlife Research Refuge-North Tract. On July 28, 1998, FGGM was added to the National Priorities List and in October 2009 executed a multi-agency Federal Facilities Agreement (FFA) with the Environmental Protection Agency (EPA), Architect of the Capitol (AOC), and Department of the Interior (DOI).



**ACCOMPLISHMENTS**

The Team’s highly motivated and skilled professionals work within the framework of the applicable laws and Executive Orders (EOs), DoD and Army guidance, interagency agreements (i.e. FFA), Environmental Management System, and best management practices to accomplish our mission.

**Significant accomplishments completed in FY12-FY13:**

- 5 Decision Documents (DD) signed
- 2 Remedial Investigations (RI) finalized
- 3 RI Addendums finalized
- 2 Remedial Design (RD) documents completed
- 2 Engineering Evaluation/Cost Analysis completed
- 2 state lead soil removal actions
- Approximately 10,000 tons of excess soil reused as make-up fill
- 2 Interim Removal Actions; 1 complete, 1 ongoing
- 1 Final Remedial Action completed
- 14 Preliminary Assessment / Site Inspection AOIs closed
- 1 Focused Enhanced Site Inspection completed
- Over \$17.5 million in cumulative cost savings
- 134 acres of land returned to beneficial reuse
- 20 military homes available for re-occupancy
- Approximately 36,000 tons of debris and contaminated soil removed off-post



“We are extremely fortunate to have a dedicated and hardworking team of professionals on our staff. To have official recognition that our environmental restoration program is the best in the Army by a panel of experts is particularly gratifying. Environmental stewardship is a responsibility we owe the American people and in particular our local Maryland community. We take this responsibility seriously and will continue maximum effort to ensure a healthy and sustainable environment for future generations.”  
 - Brian P. Foley, Colonel, Signal Corps, Commanding





Fort George G. Meade, Maryland, Environmental Restoration - Team

### Accelerated Environmental Cleanup

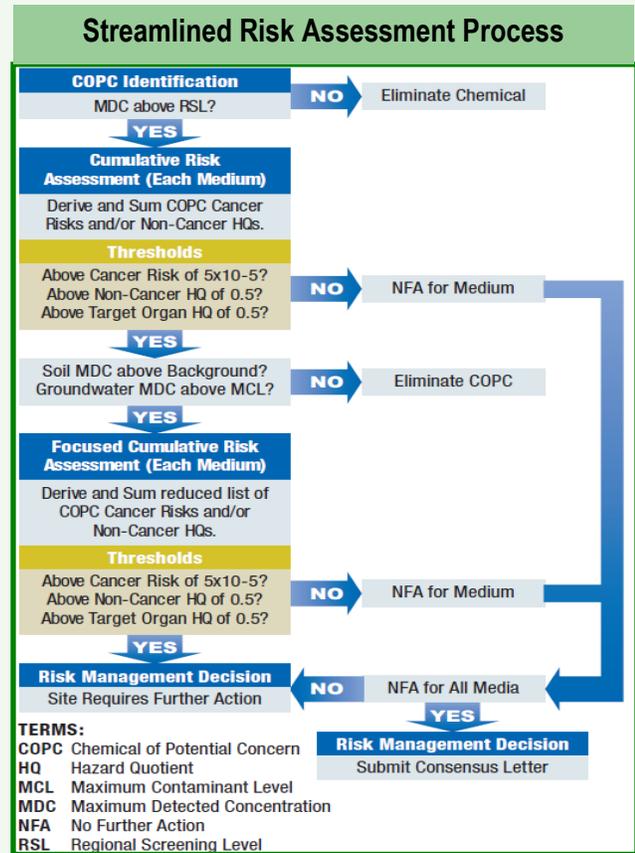
The Team performed a top-down review of the IR and MMR programs that included an extensive evaluation of existing documents, aerial and other photographs taken from FGGM's WWI era to the present. This review identified over 120 AOIs and Resource Conservation and Recovery Act solid waste management units that required additional data in order to determine if releases had occurred. Confronted with such a large task and the anticipated time and cost associated with these sites progressing through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, an innovative approach was needed. Working collaboratively with the EPA, Maryland Department of the Environment (MDE) and the community, the Team developed a "Streamlined Risk Assessment Process" to minimize project life-cycles and costs. This approach (as illustrated on the adjacent flow chart) resulted in the accelerated closure of 14 AOIs saving an estimated \$7.5 million in RI costs alone and releasing 134 acres of land back to beneficial reuse. Using this innovative approach, we anticipate the closure of 23 additional AOIs in FY14 and several more in the coming years with continued savings in time and money.



Hazardous levels of lead were detected in FGGM's former Golf Course coincident with the first stage of the NSA's multi-billion dollar expansion. The initial CERCLA approach revealed unacceptable project timeframes (approximately 1 to 1.5 years) which would have severely impacted the project and caused a significant domino effect on the following phases of site development. In collaboration with the regulators, the Team developed an expedited process focusing on the use of real-time data collection and analysis to define the architecture of soil contamination and off-site disposal using X-Ray Fluorescence techniques. Thus, 1,734 tons of hazardous lead contaminated soil was removed, and the original project life-cycle was reduced by approximately 10 months.



The WWII-era Manor View Dump Site was lost to history as a school and military housing units were constructed around the site. However, hazardous levels of methane gas from the buried dump site were threatening the adjacent school and military housing. Twenty homes were evacuated, and an emergency gas recovery system was installed and projected to run for decades (i.e., following the concept of addressing the symptom and not the cause). A CERCLA RI was initiated, but the Team, realizing the potential for eminent and substantial endangerment to human health and the environment, changed the cleanup strategy from addressing the symptom to a permanent solution; excavation and off-site disposal of methane-generating waste. The use of innovative investigative technologies (e.g., advanced cone penetration tests (CPT)) further optimized the removal action by establishing only 2 acres of the 10 acre site produced significant levels of methane gas. Over 20,000 tons of methane-generating waste was removed, and the homes became available for re-occupancy years sooner than the original approach. Additionally, two acres were returned to beneficial use. The innovations applied to the site accelerated the time to cleanup and re-occupancy by about one year, are permanent, and cost \$2.5 million dollars, saving an estimated \$10 million dollars.



"The Environmental Office's understanding and active guidance to us during this process reflects greatly on the quality of your organization and your workforce."  
 – Dr. Harvey Davis, Director NSA

"A collaborative approach among Ft. Meade's Environmental Restoration team and federal, state and local environmental communities has been highly effective in progressing site restorations efforts at Ft. Meade. This was especially evident in the remediation of the Manor View Dump site. The team changed its initial approach which advanced the removal of methane generating trash by about a year. This eliminated unsafe methane levels freeing up 20 military homes for occupancy and opened 2 acres of land for beneficial reuse."  
 -James Daniel, Chief Cleanup and Munitions Response Div., U.S. Army Environmental Command, IMCOM



Fort George G. Meade, Maryland, Environmental Restoration - Team

**Innovative Technology Demonstration/Validation and Implementation**

Operable Unit 4 (OU-4) includes 13 IR sites and 7 AOs collectively representing FGGM's former industrial area where automobiles, tanks, missiles, and heavy guns were maintained and repaired, as well as general repair shops and a laundry facility. Past practices created one of EPA Region 3's largest solvent groundwater plumes (estimated at over 500 million gallons of contaminated water and several miles long).



**Objective:** Reduce risk without adversely impacting tenant organization missions.

**Innovative Management Approach:**

- Performance-based contract (PBC): FGGM's PBC includes 19 sites and incentivizes innovation and expedites attainment of performance objectives (i.e., remedy-in-place, response complete, and long-term management/long-term operation (LTM/LTO)).
- Triad Management Approach: This involves systematic planning, dynamic work strategies, and real-time measurement systems to accelerate and improve the cleanup process.



The Triad Management Approach was successfully used to streamline work at OU-4 and Manor View Dump Site.

**Innovative Investigative Approach:**

- Rotosonic Drilling: This employs simultaneous high-frequency vibration and low-speed rotational motion along with downward pressure to advance the core barrel without use of drilling fluid or air. The advantage is lack of drilling fluids and decreased likelihood of contaminating the underlying aquifer.
- Vertical Aquifer Profiling: This advances sensors in the borehole to give real-time analytical data at depth during monitoring well installation.
- Advanced CPTs: The CPT is an in-situ testing method used to determine the geotechnical properties and delineate the lithology of the soil.



**Innovative Removal Action Approach:**

- Hydraulic Containment: Contaminated groundwater is extracted at strategic locations, purified, and re-injected back into the aquifer to optimize groundwater flow patterns and produce a front of clean water.
- In-situ Chemical Oxidation: Injection of an oxidizing chemical directly into the affected media to destroy the contaminant. The advantages are cost effectiveness and minimal infrastructure requirements.
- Air Sparging/Soil Vapor Extraction: Clean air is pumped into contaminated groundwater allowing chemicals to partition from liquid to gas phase. A vacuum is applied to closely spaced connected well points to remove the gas which is treated and vented into the atmosphere.
- Vapor Barriers: Requirements for a vapor barrier have been incorporated into design plans for three new buildings within OU-4 to prevent solvent gas entering the buildings.



**Outcome:** The original CERCLA remedial authority approach was changed to removal authority to expedite the time to implementation. The PBC rolled-up numerous previous contracts that were using a piecemeal approach. The Triad approach brought together decision makers and real-time data, so real-time decisions could be made streamlining the decision making process. The aggressive removal actions constructed at the source areas in conjunction with downgradient hydraulic containment will reduce the timeline to protective levels and compliance, and reduce the LTM/LTO costs. Overall we reduced the time to begin removal actions by approximately 1 year (all three removal actions are currently under construction but began in FY12). This aggressive approach will reduce the project life-cycle to an estimated 20 to 40 years and realize LTM/LTO savings in the tens of millions of dollars. Communication with community members was instrumental to expediting the drilling and monitoring well installation process and gaining community acceptance. The Triad management approach with virtual conferencing brought together real-time information with decision makers, and real-time decisions were made. This accelerated the off-post investigation to the benefit of the Army and the off-post community.



**OU-4**



Rotosonic drilling for monitoring well installation



Hydraulic Containment: extraction wells and injection wells connect via buried lines. A similar process is used for air sparging and vapor extraction.



Annual sampling of wells in the Town of Odenton to monitor groundwater contamination.



Fort George G. Meade, Maryland, Environmental Restoration - Team

### Partnerships Addressing Environmental Restoration Issues Between DoD and Other Entities

Through partnerships and communications, our Team has achieved one of the hallmarks of success: positive feedback and lack of negative feedback. The Team devotes a significant amount of time and resources in partnerships and communications ranging from DoD/State Memorandum Of Agreement, Installation Action Plans, technical meetings, and direct communications with stakeholders. We take pride in the exceptional relationships we have created with federal, state, and local regulators and other stakeholders, a product of which is our exceptional success rate that can only be achieved with very positive and productive working relationships between the Team and our partners. To date, all parties are in agreement with our cleanup approach and exit strategies. Prime examples include public response to several major projects; Manor View, OU-4, and PMR. In all the public, installation, and regulatory meetings; letters; factsheets; and direct communications, no critical or negative feedback has been received.



"Fort Meade isn't about the fence line; it's about the community,"

-COL. Edward C. Rothstein  
Garrison Commander,  
SoundOff! March 28, 2012

Partnerships have been established with EPA, MDE, AOC, DOI, and the Restoration Advisory Board (RAB) where we engage in regular communications on project status, direction, and challenges. To expand public outreach we significantly revised the installation's webpage, published a regular series of articles in the Post newspaper, and authored press releases for RABs and other important activities.



Team actions to ensure mission alignment, readiness, and situational awareness on a routine basis:

- Bi-monthly Community Council meetings consist of local government representatives, regional business, and civic and educational leaders.
- Quarterly Environmental Quality Control Committee meetings consist of FGGM tenants, federal/state/local organizations, and infrastructure partners.
- Quarterly FFA meetings include EPA, AOC and DOI. The intent of these meetings is to identify potential risks to milestones and develop alternatives to help ensure they're met.
- Geographical Information System (GIS) database consolidated geospatial and metadata for use on a routine basis by Army planners (e.g., well locations, land use control (LUC) boundaries).
- Multi-lateral partnerships were developed with Anne Arundel County, AOC, and DOI specifically to address sites which impacted their property. This resulted in the December 2011 DD (Manor View Dump Site) and the July 2013 DD (OU-4).
- Bi-lateral partnership with MDE led to a more aggressive remedy and the September 2013 DD for PMR.



Earth Day Interview with Team on Local TV

### Community Outreach

The Team employed a multimedia approach to communicate with the public and stakeholders:

- Military munitions training, fact sheets, website updates, data repositories, press releases, articles in local online news outlets, articles in SoundOff (Post newspaper), and Facebook updates
- Arbor Day, Earth Day, Family Fun Day, and the Safety Wellness & Resiliency Expo displays
- Educational outreach with SAME including Day with an Engineer, Introduce a Girl to Engineering, and Summer Engineering and Construction Camps



The most active community outreach program is the FGGM RAB. Established in April 1995, the RAB is open to the public and includes 11 community members and local, state, and federal representatives. The RAB meets every other month and training consists of educational briefings and remediation site tours. At a RAB member's recommendation, FGGM was included in the Christian Broadcasting Network documentary on living near landfills as a success story. The overall sense of the community is trust and respect which has extended into other IR and MMR projects and will long outlive the current projects.

"I would say that the RAB is a vital institution in the effort to remediate and restore the land and water resources at the fort for reuse. ... Additionally, the way that you managed the clean-up of the Manor View landfill was impressive, especially considering the proximity to the Manor View Elementary School and the base housing."

-David Tibbetts, M.A., Esquire  
FGGM RAB Community  
Co-Chair





### Reducing Risk to Human Health and the Environment

Risk reduction to human health and the environment is the foundation of the IR and MMR Programs. Actions that eliminate, reduce, or otherwise prevent potential exposure to known or potential hazards have been taken throughout FGGM.



**Manor View Dump Site:** Approximately 20,000 tons of methane generating waste were excavated and disposed of at a licensed off-post facility. This removed the risk of continued methane generation threatening the adjacent school and homes. The homes are now available for re-occupancy.



Manor View

Project Area

**Former Mortar Range:** After extensive investigations over a 300-acre WWII era mortar range, the Team determined the risk level to be low. In September 2012, a Record of Decision (ROD) was signed and a RD completed. The remedial action objections (RAOs) were based on human health and environmental factors and provided the basis for the formulation and development of the selected remedy: annotations to the master plan, annual site inspections, placement of warning signs, educational programs, notation in our GIS Database, and unexploded ordnance construction support as appropriate.



Excavating buried waste

**Former Pesticide Shop:** The building was used as a pesticide shop for 20 years between 1958 and 1978. During its operation, the building also housed a maintenance facility for lawn mowers, tractors, and other landscaping equipment. In September 2012, a ROD was signed, and a RD was subsequently completed. The RAOs are based on human health and environmental factors and provided the basis for the formulation and development of the selected remedy: excavation and off-site disposal of approximately 850 cubic yards (CYs) of chlordane-contaminated soil, enhanced dechlorination to reduce solvent concentrations in groundwater, and LUCs.



Artistic rendering of restored land

**Inactive Landfill No. 2:** This Cold War era landfill was determined too hazardous and costly for conventional investigative approaches; additionally, it is located in a former range. Protection against exposure is provided by a perimeter fence and signs that are inspected and repaired annually.

**OU-4 Interim Measure:** Solvents were detected in monitoring wells in the Town of Odenton during a groundwater investigation associated with our closed sanitary landfill. The Team immediately mobilized to determine if any homes within a 1-mile radius had drinking water wells. A robust public outreach process occurred with close coordination with local environmental officials to locate the drinking water wells. To validate and ensure no homes were missed, we canvassed the 1-mile radius, determined the exact number of drinking water wells, and provided the homeowners bottled water. The outreach and logistics of managing data from the 2,500 homes surveyed proved to be challenging; however, the Team's processes have been applied to a similar situation at Ft. Detrick who has improved upon the process by reducing paperwork and digitizing more data.



### Inactive Landfill No. 2



Fence and signs surrounding former landfill

**Pershing Hill:** Approximately 20,000 CYs of petroleum hydrocarbon and dioxin contaminated soil were removed and disposed of at an off-site facility.



**Reducing Risk to Human Health and the Environment (Continued)**

**Site Y:** The Team showcases 1940s era artifacts uncovered during the Manor View Dump Site removal project at community events such as Earth Day to illustrate the need to recycle. Garrison personnel, while viewing the items during the 2012 Earth Day celebration, discussed with the Team an area where similar items were seen. A site inspection by the Team uncovered a previously unknown uncontrolled dump site (Site Y). Our Team quickly mobilized, fenced off the area, and characterized the waste piles. A contract was then awarded, and the remediation at Site Y was completed with 3,674 tons of soil/debris removed and 22 tons of concrete recycled. This success story was broadcast on local TV for FGGM's celebration of Earth Day 2013.



**Site Y**



Dumped piles of soil and debris



Loading of soil and debris



Post cleanup

**Green and Sustainable Remediation & Operations**

The Team is always evaluating possible opportunities to reduce our carbon footprint and recycle as outlined in EOs 13514 and 13423. In addition to using our electric vehicle whenever possible, we have established a relationship with the post wastewater treatment plant to facilitate the disposal of investigative-derived waste. Disposing of waste on-post as opposed to trucking it to an off-post disposal facility saves fuel, reduces truck traffic, limits exhaust, and saves the Army money. In FY13, approximately 45,000 gallons of investigative derived waste water was disposed on-post saving the taxpayer \$20,000 to \$150,000 in off-post disposal costs (based on disposal characteristics).



Reusing fill material has several positive benefits including reducing project cost (importing or exporting fill) and reducing trucking (lower fuel costs, traffic, and emissions), thus, reducing the project's carbon footprint. Multiple construction and remediation projects use on-post fill to meet project needs. For example, approximately 10,000 tons of replacement fill came from on-post sources for Manor View Dump Site.

To address the significant consumption of electricity to operate the OU-4 groundwater extraction system for the estimated 40 to 60 years, the Team is exploring alternative electricity supplied by a micro-turbine supplemented with solar panels and batteries to reduce LTO costs. This system would be independent of the existing electrical grid and could be used as a technology demonstration if determined cost-effective.



Our Team also maximizes the recycling potential at all construction sites. The former Troop Housing Boiler Plant groundwater treatment systems, which involved the extraction of separate phase fuel hydrocarbons and treatment of impacted groundwater, was deconstructed this year following regulatory closure. System deconstruction, as opposed to demolition, maximized the amount of material suitable for recycling. Of the total 90.2 tons of material associated with the treatment system, 7.17 tons of steel and 82.59 tons of aggregate were recycled; a recycling rate of 99.5% material by weight. Additionally, 22 tons of concrete were removed and recycled from the uncontrolled dump site (Site Y) in FY13.



**Former Troop Boiler Plant**



System deconstruction achieved over 99% of material recycled

**Use of Small and Disadvantaged Businesses**

FGGM works closely with our neighboring communities to develop local businesses. In FY12 and FY13, the IR and MMR Programs spent \$9.1 million on companies within 50 miles of FGGM with \$3.2 million being spent using small and/or disadvantaged businesses; including a small, Native American, woman owned business; to provide equipment, data validation, drilling, and laboratory services. Our commitment to using local businesses has greatly benefitted our local community.

