

The

# Chesapeake Engineer

Magazine

Data drives  
solutions for  
Ocean City

**Also...**

*Advancing drinking water, flood risk management in nation's capital*

*Decommissioning historic former nuclear power plant*

*Responding to disasters*



R.V. BILL R. CURTIS

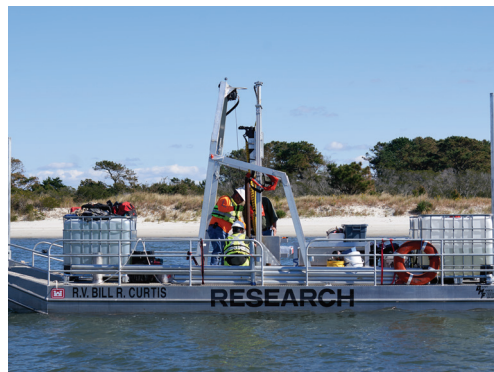
RESEARCH



U.S. Army Corps of Engineers  
Baltimore District

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**On the Cover:** Experts with the U.S. Army Corps of Engineers' Engineer Research and Development Center's (ERDC) Coastal and Hydraulics Laboratory help Baltimore District collect data in Ocean City, Maryland, Oct. 18, 2018. (U.S. Army photo by Andrew Roach)



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The mission of the U.S. Army Corps of Engineers, Baltimore District, is to deliver vital engineering solutions in collaboration with our partners to serve and strengthen the Nation, energize the economy and reduce disaster risks.

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This past summer, alongside Nick Krupa, Baltimore District operations manager, at right, and Alicia Palmer, Raystown Lake park ranger, I was honored to present a Certificate of Appreciation to Hunter Tremain, who, while recreating at Raystown Lake, observed a gentleman in distress and immediately responded by rendering aid. (U.S. Army photo by David Gray)

I am extremely proud to share with all of you our latest edition of "The Chesapeake Engineer."

From workshops to studies and projects to disaster response, we truly do it all here at Baltimore District.

This issue features, as always, some of our unique and diverse capabilities. You can read about how our radiological center of expertise is taking its first steps in a years-long effort to decommission and dismantle a former nuclear reactor located on Fort Belvoir, Virginia. You can also learn about how we are managing flood risk — at our dams and through collaborative workshops. In fiscal 2018, Baltimore District reservoirs and levees prevented \$568.3 million in flood damages. We also showcase how we are partnering with our Engineering and Research Design Center to evaluate solutions for a large scour hole formed off the coast of Ocean City, Maryland. We also unveiled the first mitigation banking instrument for the Department of Defense in Maryland and are working on a complex pilot study to make advancements to our nation's drinking water.

In 2018, the U.S. Army Corps of Engineers responded to 52 events and deployed more than 2,000 employees to 17 floods, 12 hurricanes, five tropical

storms, five wildfires, three severe storms and two ice jams, just to name a few events. Since May, Baltimore District, alone, deployed approximately 70 team members to assist in disaster response missions, including more than 40 personnel for Hurricane Michael support. One of these deployments focused on conducting infrastructure assessments and providing engineering expertise for Tyndall Air Force Base, in order to help them expeditiously rebuild following Michael.

Our more than 1,000 Baltimore District teammates keep us on the edge of the Army Corps' support to our communities and our military and civil works partners throughout the Mid-Atlantic region and around the world. We do so out of immense pride in our capabilities to support collective efforts to strengthen and support this great Nation, and we look forward to continued success in 2019 and for years to come.

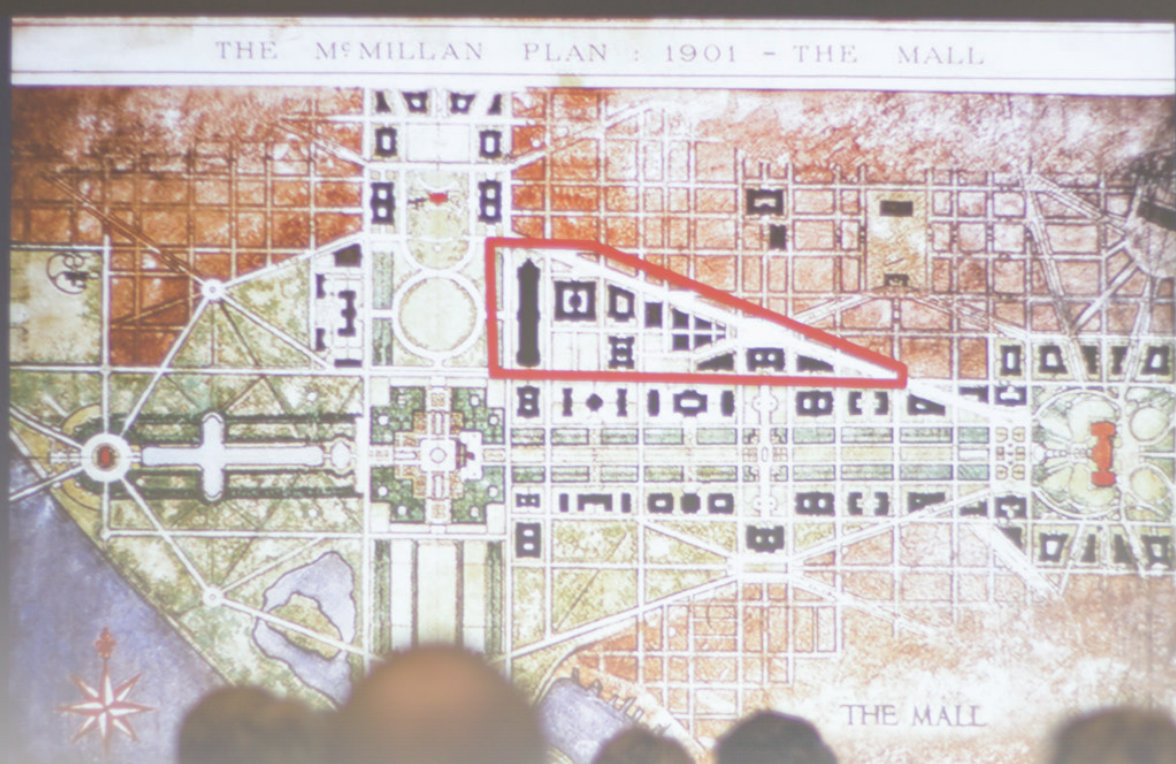
Essays!

**BUILDING STRONG!**

COL John Litz  
Commander and District Engineer  
Baltimore District

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# Workshops tackle interior flooding in Nation's capital

By Sarah Lazo

*The Federal Triangle and its surrounding area is the center of tourism in the District of Columbia. The area includes the National Mall and is home to some of our nation's most iconic and significant buildings, including the Smithsonian Institution, Internal Revenue Service Headquarters, U.S. Commerce and Justice departments, and National Archives.*

*This means there is a lot at risk when it comes to flooding.*

The District of Columbia is situated in an area that makes it prone to flooding. It can be flooded via three ways: Potomac River freshwater flooding from the upper watershed, Potomac River tidal/storm surge flooding and interior flooding.

The District of Columbia Levee System, which was constructed by the U.S. Army Corps of Engineers and is maintained by the National Park Service (NPS), reduces risks from major flooding along the Potomac River; however, the threat of interior flooding remains.

Interior flooding is caused by heavy localized rainfall that descends directly over the District in a short period of time and overwhelms stormwater systems.

The Federal Triangle area experienced a major interior flood in summer 2006 that resulted in the disruption of key services and millions of dollars in damages to buildings, utilities and the Metro system.

Double digit rainfall totals affected parts of the region over the course of five days. At Reagan National Airport, nearly 8 inches of rain fell in a 24-hour period, surpassing the previous rainfall record by more than one inch.

Since this time, a few studies have been conducted and various agencies have worked to flood proof their individual buildings; however, a comprehensive solution does not yet exist. This lingering hazard led the District of Columbia Silver Jackets to host two workshops in summer 2018 specifically focused on interior flood risk in the Federal Triangle, bringing together more than 75 facility managers, planners, architects, engineers, environmental specialists and emergency managers from federal and district agencies, international embassies, non-profit organizations and academia.

Agencies represented included the Army

Corps, NPS, District Department of Energy and Environment (DOEE), National Capital Planning Commission, Architect of the Capitol, General Services Administration, National Archives and Records Administration, National Gallery of Art, U.S. Commissions of Fine Arts, and the Smithsonian Institution.

"We cannot wait for another event like the 2006 flooding before we take further action," said DOEE DC Floodplain Manager and DC Silver Jackets Co-leader Phetmano Phannavong. "These workshops provided a forum for stakeholders to openly discuss potential solutions to the flooding risks we face together. As flood risk management leaders in the District of Columbia, the DC Silver Jackets team is always seeking solutions to reduce flood risks in collaborative and creative ways."

The intent of the first workshop held at the University of DC June 6 was to provide attendees with an overview of the flood history and risk in the Federal Triangle; discuss steps individual agencies are currently taking to flood proof their properties via a panel discussion; present types of interior flood risk management measures; and engage through an interactive breakout session on key opportunities and challenges related to interior flooding in the area.

"We were provided with everything a new or even a seasoned facilities manager needs to learn about the history of flooding in the Federal Triangle area, and, more importantly, dialogue with leading experts on how to best mitigate flood risk to our own facilities in the future," said National Gallery of Art, Facilities Management Chief Dave Samec. "During the panel discussions, we learned about the flood proofing techniques that other facilities are currently employing, as well as other larger-scale holistic options, and this was followed up with frank conversations during the breakout session regarding the pros and cons, costs and other considerations for each."

The second workshop, also held at the University of DC, Sept. 5 focused on potential relevant interior flood risk management solutions based on input gathered from the first workshop. Types of projects discussed included underground storage and/or conveyance out of the Federal Triangle, underground storage with parking, upstream detention techniques, restoration of natural drainage, and flood proofing of buildings. Breakout sessions focused on the identification of potential advantages and challenges associated with each type of project; potential funding opportunities and partnerships; and short-term interim interior flood risk management actions.

"With participants from various agencies with different backgrounds and responsibilities, including an international perspective with representation from the Danish, Dutch and Seoul governments, the afternoon breakout sessions were lively," said Army Corps, Baltimore District, Silver Jackets Coordinator Stacey Underwood. "The flooding problem and potential solutions are challenging, especially with the number of invested stakeholders in the area, and everyone was able to come to the table and share their views and learn from one another."

"The workshops make clear that cultural institutions, federal and district agencies and utilities must collaborate in the near term to develop shared solutions and seek funding to protect our assets and make them more resilient," said Smithsonian Institution, Associate Director for Planning Ann Trowbridge.

The project team is planning to meet with executive leaders of the area's primary agencies to discuss the flooding issue and next steps.

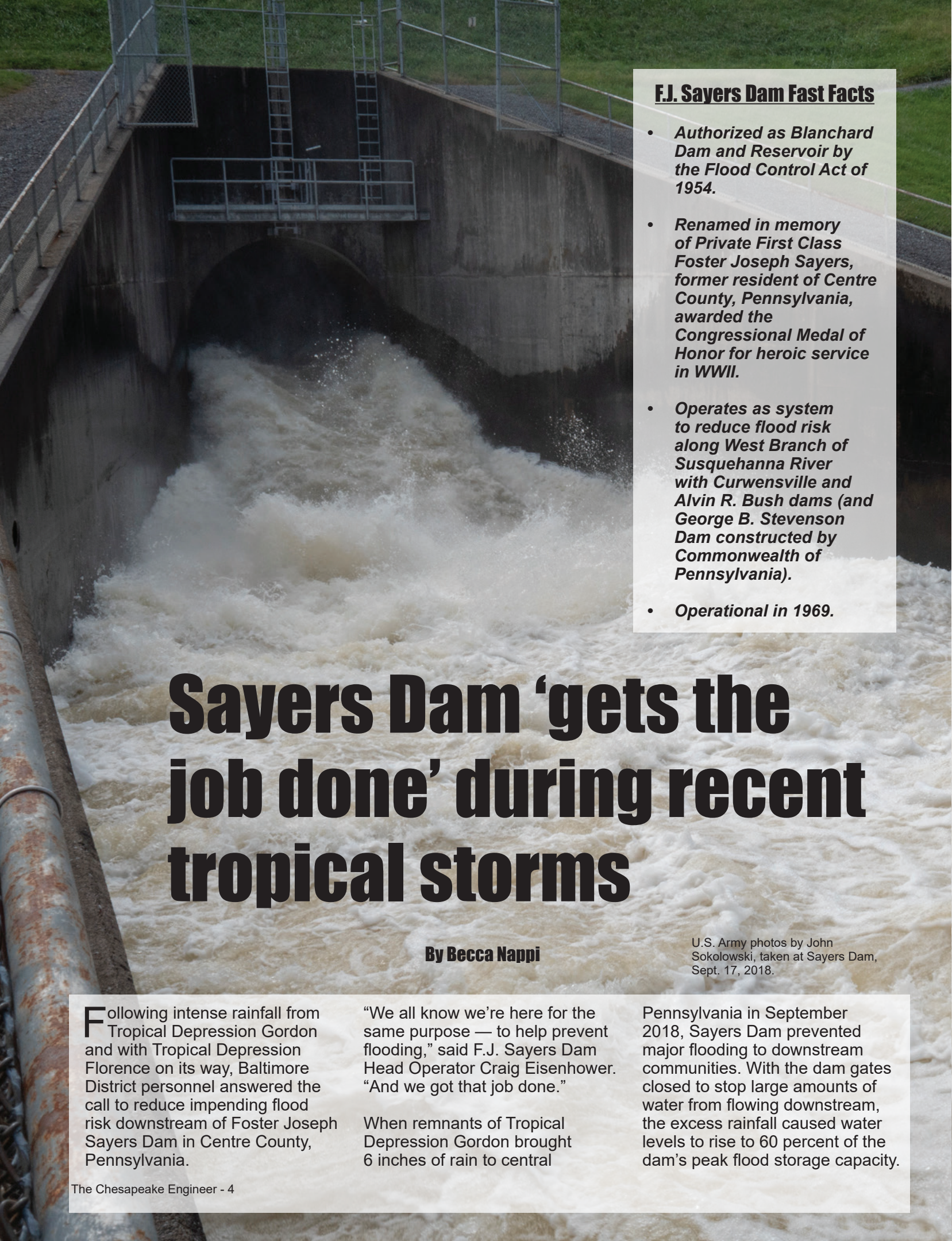
"Because of the information gathered from these workshops, we are now armed with a wealth of perspectives and ideas to provide stakeholder leadership with the goal of achieving consensus on a path forward for reducing interior flood risk in this critical area," said Underwood. ■



Stacey Underwood, U.S. Army Corps of Engineers, Baltimore District, Silver Jackets coordinator, speaks to participants during a workshop held at the University of the District of Columbia, Sept. 5, 2018. (U.S. Army photo by John Sokolowski)



Representatives from various agencies discuss strategies to reduce interior flooding in the Federal Triangle during a breakout session at a workshop held at the University of the District of Columbia, June 6, 2018. (U.S. Army photo by John Sokolowski)



### **F.J. Sayers Dam Fast Facts**

- **Authorized as Blanchard Dam and Reservoir by the Flood Control Act of 1954.**
- **Renamed in memory of Private First Class Foster Joseph Sayers, former resident of Centre County, Pennsylvania, awarded the Congressional Medal of Honor for heroic service in WWII.**
- **Operates as system to reduce flood risk along West Branch of Susquehanna River with Curwensville and Alvin R. Bush dams (and George B. Stevenson Dam constructed by Commonwealth of Pennsylvania).**
- **Operational in 1969.**

# Sayers Dam 'gets the job done' during recent tropical storms

**By Becca Nappi**

U.S. Army photos by John Sokolowski, taken at Sayers Dam, Sept. 17, 2018.

Following intense rainfall from Tropical Depression Gordon and with Tropical Depression Florence on its way, Baltimore District personnel answered the call to reduce impending flood risk downstream of Foster Joseph Sayers Dam in Centre County, Pennsylvania.

"We all know we're here for the same purpose — to help prevent flooding," said F.J. Sayers Dam Head Operator Craig Eisenhower. "And we got that job done."

When remnants of Tropical Depression Gordon brought 6 inches of rain to central

Pennsylvania in September 2018, Sayers Dam prevented major flooding to downstream communities. With the dam gates closed to stop large amounts of water from flowing downstream, the excess rainfall caused water levels to rise to 60 percent of the dam's peak flood storage capacity.

Then, Tropical Depression Florence began to work its way up the East Coast in late September, forecasting a surplus of rain.

Committed to ensuring the public's safety, Baltimore District employees from various disciplines jumped in to provide emergency support.



"We activated the Sayers Dam Emergency Action Plan," said Baltimore District Emergency Management Chief Dorie Murphy. "Our Emergency Operations Center coordinated for additional personnel at the dam as well as communicated with downstream emergency management agencies regarding water levels and monitoring activities."

Dam operators and engineers provided 24/7 monitoring to measure water level, water pressure against the dam, and outflows.



Ponding near Howard Levee System

"Throughout Tropical Depressions Gordon and Florence, operations and engineering staff conducted regular inspections and monitoring to ensure the greatest care and safety for the community," said Dam Safety Program Manager Brian Glock.

Before Tropical Depression Florence's arrival, dam operators and tenders were able to perform

controlled water releases through the dam's gates, allowing the lake level to come down 4.5 feet from its highest point during Gordon to make room for Florence's rains and further prevent downstream flooding.

Dam operators also worked to pump water from a ponding area near the Howard Levee System into Sayers to make room for additional stormwater capacity and prevent stormwater runoff from flooding the nearby neighborhood.

Sayers stood around 15 feet above normal summer pool before Hurricane Florence's arrival, which is the fourth highest elevation since its construction in 1969. Other large rain events occurred in 1993, 1994 and 1972 during Hurricane Agnes, in which the dam also successfully stored water to prevent major flooding downstream.

"We want the community to understand that this



Civil Engineers Yusuf Sharif, at left, and Brian Glock

project is here for the purpose of managing flood risk below the dam," Eisenhower said. "This has been an extremely wet season, and the Corps of Engineers team has done a great job maintaining the project and keeping flood levels below the dam to a minimum."

Sayers is a part of the comprehensive flood control plan for communities in the West Branch of the Susquehanna River Basin. The dam is designed to store more than 32 billion gallons of water — the quantity of more than 48,000 Olympic-sized swimming pools.

"While we provided additional support during this high-water event, our operators at Sayers work incredibly hard every day to provide flood damage reduction and water quality to the area," said Glock.

Sayers Dam has prevented an estimated \$212 million in flood damages since its construction. ■

# Solutions for Ocean City

By Chris Gardner

The seafloor surrounding Ocean City Inlet is very dynamic. Not only is the channel constantly filling in with sediment from all angles to create headaches for mariners, but behind the inlet is a large scour hole that continues to grow — potentially affecting nearby coastal communities.

That's why the state of Maryland, in partnership with the Town of Ocean City and Worcester County, has asked the U.S. Army Corps of Engineers, Baltimore District, for its water resources expertise to study and develop potential solutions for both of these pressing issues.

The scour hole, just northwest of Ocean City Inlet near Homer Gudelsky Park in West Ocean City, has deepened over the years to the point where it's more than 50 feet deep at its deepest point. This presents a significant contrast to the nearby navigation channel where recurring dredging is part of an ongoing struggle to maintain the channel's authorized depth of 10 feet.

"The scour hole may be contributing to shoreline erosion along the adjacent shoreline, which has the potential to put structures in jeopardy of damage," said Andrew Roach, Baltimore District Plan Formulation program manager. "Erosion of the scour hole may contribute to other problems in the area like creating shallow spots in the federal navigation channels."

This navigation channel is regularly used by commercial fishermen, recreational boaters, the U.S. Coast Guard and others. Even with the Corps of Engineers working to remove material from the inlet through dredging two or more times per year, shoaling — or the filling in of the inlet with sand over time — has been a recurring concern.

Both scour hole and navigation-focused study efforts are being conducted concurrently through what is called the Continuing Authorities Program, which allows the Corps to work with state and local partners on smaller water resources issues without the need for Congressional authorization.

Photos: Bottom middle, Andrew Roach, Baltimore District Plan Formulation program manager, is interviewed by WBOC-TV about the scour hole in Ocean City, Maryland, Oct. 18, 2018. (U.S. Army photo by Brianna Dandridge); Other photos show ERDC team members collecting data in Ocean City, Oct. 18. (U.S. Army photos by Andrew Roach)

Baltimore District personnel are working closely on many aspects of the scour hole study with coastal engineering experts from the U.S. Army Corps of Engineers' Engineer Research and Development Center's (ERDC) Coastal and Hydraulics Laboratory based out of North Carolina.

"ERDC brings to bear not just top observational scientists like those on my team, but also scientists who run and develop some of the most state-of-the-art numerical models available," said ERDC Research Oceanographer Heidi Wadman. "We are measuring waves and currents, as well as layers of sediment under the seafloor, calculating their ability to erode and scour sediment."

Baltimore District and ERDC crews began work in 2017 to gather field data to better understand the scour hole, including collecting water samples, deploying instrument suites, and mapping the region with a sub-bottom profiler to obtain information about the movement of sediment in and around the scour hole. In 2019, the team hopes to use this data to begin modelling potential alternatives for addressing the scour hole.

Baltimore District is also studying ways to address the chronic shoaling in Ocean City Inlet to improve navigation. This effort could result in recommending channel modifications, like deepening its authorized dimensions, or structural solutions like jetties.

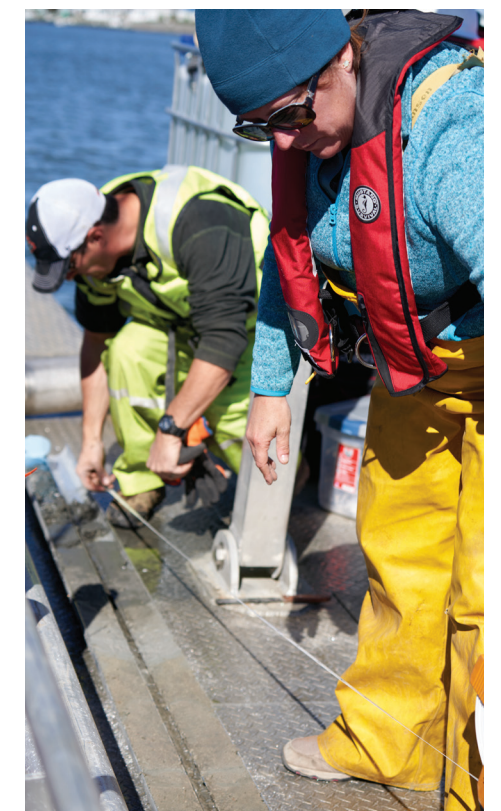
The study team is also considering the beneficial reuse of material dredged from Ocean City Inlet as part of navigation improvements. Beneficial reuse could include anything from ecosystem restoration, such as restoring islands for bird habitat to potentially providing material to fill the nearby scour hole.

While each study effort has a specific focus, data gathered and analyzed is being shared between the two efforts in order to increase efficiency, reduce costs and expedite the delivery of solutions for the community.

"You can't just look at one challenge separate from the whole system because everything in the region is linked," Wadman said. "By looking at all of the parts together, we can provide a more accurate and quantitative picture of how different parts of the system impact others. This allows us to, hopefully, better predict how future engineering solutions might impact not just the scour but the overall system, which helps the District in its decision-making." ■



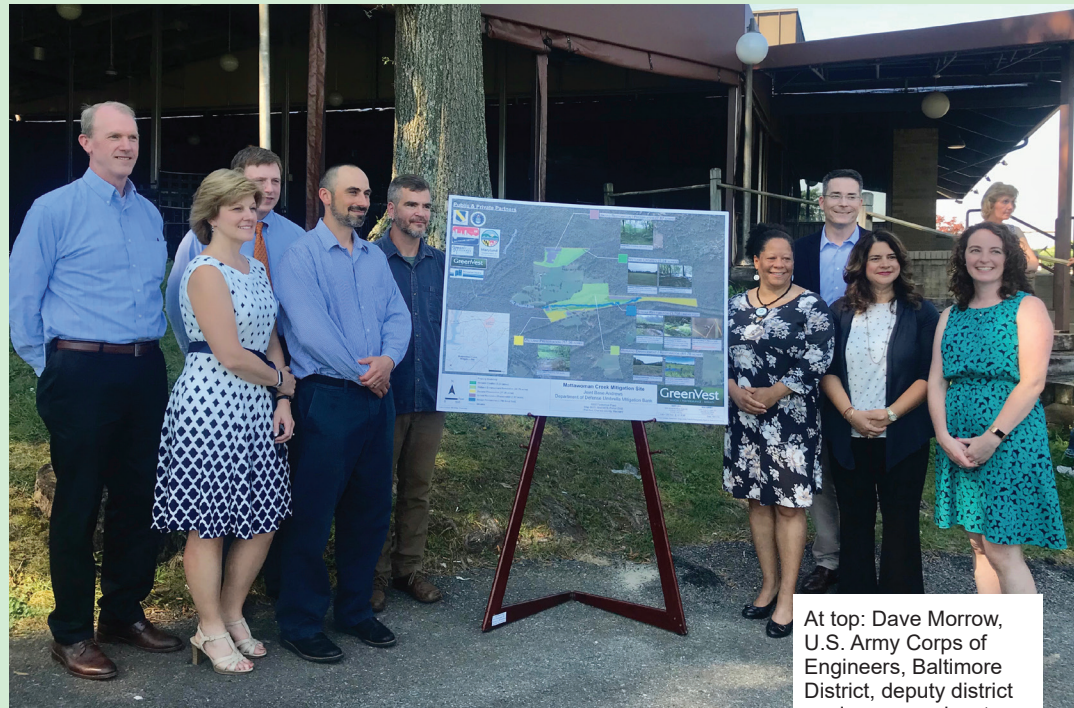
**You can't just look at one challenge separate from the whole system because everything in the region is linked."**



Over the summer, a small group of representatives from federal, state, private and non-profit agencies gathered to celebrate the launch of a pioneering tool for the state of Maryland — a tool that assists essential military development, while benefiting the environment.

The U.S. Army Corps of Engineers, U.S. Air Force at Joint Base Andrews (JBA), Maryland Department of the Environment (MDE), GreenTrust Alliance and GreenVest LLC announced the completion of the first Umbrella Mitigation Banking Instrument (UMBI) for the Department of Defense in Maryland during an event held at The Courses at Andrews, Sept. 6, 2018.

“This instrument acts as an advanced solution and will help facilitate timely permit issuance and meet requirements outlined in permits for essential planned capital improvement projects,” said Col. Andrew Purath, JBA 11th Wing commander. “We are the backdrop for some of the most important pieces of American history. We have an obligation to maintain the airfield and our mission, and this bank is historic for the base, the state and the community.”



At top: Dave Morrow, U.S. Army Corps of Engineers, Baltimore District, deputy district engineer, speaks at a ceremony for the first wetlands mitigation banking instrument for the DOD in Maryland on Joint Base Andrews, Maryland, Sept. 6, 2018. (U.S. Air Force photo by Airman 1st Class Michael S. Murphy)  
At bottom: Baltimore District team members pose for a group photo following the ceremony. (U.S. Army photo by Sarah Lazo)

# First mitigation banking instrument for DOD in Maryland unveiled

By Sarah Lazo

## With this bank, the environment wins, we win, and the DOD wins

The first site to be restored under the UMBI is Mattawoman Creek in Pomfret, which is in Charles County. The entire project yields nearly 38 wetland credits and almost 1,600 stream credits to provide potential mitigation for planned construction efforts on JBA, such as runway repairs.

Agencies with projects potentially impacting wetlands or navigable waterways in Maryland must first receive a permit to start construction from the U.S. Army Corps of Engineers, Baltimore District, or MDE, depending on the size of the project. A permit is issued when it is anticipated the project benefits will outweigh the impacts, and, many times, includes special conditions that the applicant must follow to reduce harmful impacts to the environment. An applicant must ensure there is no net loss of wetlands resulting from the project; therefore, as part of the permit, the applicant must agree to protect, create or restore the number of acres they are impacting.

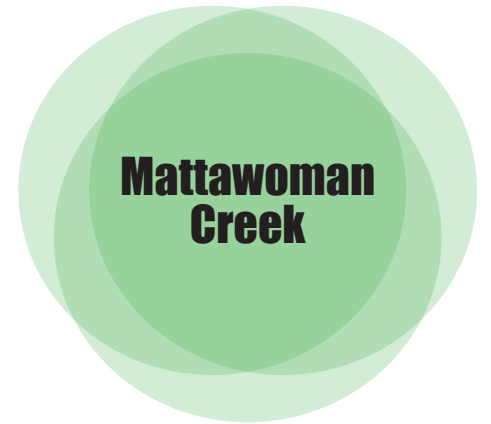
“Having a bank of pre-approved suitable land to pull credits from for mitigation requirements reduces the costs and time commitments associated with having to find mitigation elsewhere,” said Purath.

More than 80 acres of land at the Mattawoman Creek mitigation site is now permanently protected via a conservation easement held by GreenTrust Alliance.

“Our team of in-house experts assisted Joint Base Andrews in identifying and investigating potential areas to perform the wetland mitigation,” said Dave Morrow, U.S. Army Corps of Engineers, Baltimore District, deputy district engineer. “Through an Army Corps contract, our team managed the efforts of GreenVest and Princeton Hydro to complete the design; engineering and modeling; and permitting of the Mattawoman site. This is a true public-private partnership success with everyone pitching in and working together.”

Mattawoman Creek is classified by the Maryland Department of Natural Resources as highly significant for biodiversity conservation to support critical species and habitats. At this site, more than 65 acres of wetlands will be restored, created, enhanced or preserved, which is estimated to capture approximately 75 tons of carbon per year. Streams will be restored along nearly 3,800 feet through re-establishment of historic floodplain. More than 28,500 native trees and shrubs will also be planted, creating habitat for the state-threatened Selys’ Sundragon.

“Mattawoman Creek is a very highly valued tributary to the Chesapeake Bay,” said Lynn Buhl, MDE assistant secretary. “I applaud JBA and this team for voluntarily setting up this sort of savings account. Maryland is strident and motivated to protect the Bay, and this project blazed the trail for all Department of Defense agencies. With this bank, the environment wins, we win, and the DOD wins.”



First site to be restored under the banking instrument

More than 65 acres of wetlands will be restored, created, enhanced or preserved

Yields 38 wetland credits and ~1,600 stream credits

75 tons of carbon estimated for capture annually

80 acres of land permanently protected

3,800 feet of stream restoration

Classified as highly significant for biodiversity conservation

28,500 native trees and shrubs will be planted

# STEM

Safety Day with Safety Squirrel, Fallon Federal Building, Baltimore, June 2018

Flood proofing workshops, Maryland and Pennsylvania, August 2018

5th annual Turkey Hunt for persons with disabilities, Jennings Randolph Lake, April 2018

Free tours of our deployable Emergency Management communications vehicle at the Military Bowl, Annapolis, Maryland, Dec. 31, 2018

# In the Community

# Education

# Tours

Free tours aboard Corps survey and debris vessels during Fleet Week in Baltimore, October 2018

US Army Corps of Engineers Deployment Operations

Career Day at Fort George G. Meade High School, Maryland

# Water Safety

Ice jam trainings, Pennsylvania, December 2018

Earth Day 2018 at Jennings Randolph Lake

# Recreation

Exhibitor at the Maryland Association of Environmental and Outdoor Education, Green Schools Youth Summit, Sandy Point State Park, Maryland, May 31, 2018

# Careers

Career presentations at Fort George G. Meade High School, Maryland

Keyser Middle School students take a field trip to Jennings Randolph Lake

Science, Technology, Engineering & Math with Baltimore District

Patrolling Raystown Lake to ensure and to educate on water safety

By Chris Gardner



SM-1 nuclear reactor on Fort Belvoir, Virginia

**A**pril 8, 1957, Fort Belvoir was the site of a very unique and historic milestone in America — its recently completed nuclear power plant, known as SM-1, was the first of its kind to connect to the commercial power grid.

Developed by the Army as part of a movement to harness atomic energy for peaceful purposes, SM-1, which stands for Stationary Medium Power Plant 1, was the Army's first functioning nuclear power plant and served as the basis for the development of more reactor facilities in the following years.

SM-1 provided partial power to Fort Belvoir but was primarily used as a training facility for nuclear power plant technicians from all military branches before being deactivated and partially decommissioned in the early 1970s — with the majority of the site's radioactivity removed.

Now, 45 years later, plans are in development for the facility to be fully decommissioned and dismantled. A team of experts from the U.S. Army Corps of Engineers is working closely with Fort Belvoir staff on these plans, in accordance with regulations by the Army Reactor Office.

Baltimore District is home to the Corps of Engineers' Regional Radiological Center of Expertise and is leading the way on this project. In addition to the work on Fort Belvoir, Baltimore District's team is also managing the decommissioning of the Army's other two remaining deactivated nuclear reactors — one on Fort Greely, Alaska, and the STURGIS floating nuclear power plant in Texas.

"Baltimore District's expert team brings decades of experience working on a broad array of projects around the world and just recently and

safely completed the decommissioning of the MH-1A on the STURGIS barge in Galveston," said Baltimore District Project Manager Brenda Barber. "The team is really excited to build on that record of success as planning moves forward for the SM-1 decommissioning on Belvoir."

The initial decommissioning effort of SM-1 in 1974 consisted of the removal of the nuclear fuel and shipment of the radioactive waste, minor decontamination, sealing of the reactor pressure vessel, and installment of appropriate security, warning signs and monitoring devices.

Since this time, the facility has remained in safe storage while

much of the remaining radioactivity has been allowed to decay. Baltimore District has conducted quarterly monitoring to ensure the site does not pose any hazards to the surrounding installation tenants, the community or the environment.

The majority of SM-1's remaining low-level radioactivity is activated metals and the components of the former reactor system, which are all secured within the walls of the facility's containment vessel. This greatly reduces any potential risks to human health or the environment.

During the final decommissioning effort, the work will be completed in

containment, and all waste will be properly packaged in compliance with Department of Transportation protocols prior to leaving the containment area(s). The facility itself will also be dismantled, and the site will be restored for future use by the installation.

"This is likely not what people think of when they think of radiological work," said Barber. "There are no drums of liquid waste, no control rods, or anything like that. With the activated metals and large pieces of the old reactor, there's also minimal risk of any sort of a 'release' into the air or a 'spill' of waste during the project."

Barber also noted that in addition to all Army regulations, the project

will follow applicable local, state and federal safety regulations.

"The safety and health of the installation, the local community and our workers are paramount to the success of our project," said Barber. "We will be using proven controls and precautions to address safety and other engineering details during all stages of the decommissioning work."

The final decommissioning of SM-1 is still in the planning stages, with physical construction on site not expected to begin until 2020. Baltimore District and Fort Belvoir are planning to host public information sessions to gather feedback during the planning process. ■

# Timeline

## 1953

Eisenhower gives "Atoms for Peace" speech to United Nations outlining goal of harnessing nuclear power for peaceful purposes, like power generation



## 1955-1957

Construction of SM-1 nuclear power plant on Fort Belvoir

## 1957

April 8

SM-1 provides first nuclear-generated power to commercial grid in America



## 1957-1973

SM-1 provides partial power to Fort Belvoir but acts primarily as a training facility for nuclear power plant technicians from all military branches



Aerial view of SM-1 in the 1960s.

## 1973-1974

Partial decommissioning complete

# Decommissioning historic former nuclear plant on Fort Belvoir

## 1975-1980s

SM-1 operates as museum, highlighting history of the Army's Nuclear Power Plant Program



Col. John Litz, Baltimore District commander, and Brenda Barber, project manager, look at old SM-1 control panel, Nov. 30, 2018.

## 1974-now

SM-1's reactor and components in safe storage

U.S. Army, Air Force and Navy personnel in control room of SM-1.



## 2014

Planning formally begins for final decommissioning, dismantling of SM-1

## 2020

Decommissioning activities could begin



# Specialized team provides essential assessments for Tyndall AFB following Hurricane Michael

By Becca Nappi

Hurricane Michael made its destructive landfall October 10, 2018, with the eye of the storm directly passing over Tyndall Air Force Base in Florida.

The storm caused devastation throughout the base and the Florida panhandle, leaving communities with the hard task of recovering.

Tyndall AFB, with a mission to train and protect unrivaled combat air power, needed to find a way to recover and rebuild after Hurricane Michael, and quickly.

The 71st Detachment, Forward Engineer Support Team - Advance (FEST-A) answered the call for assistance and deployed to Tyndall.

“Our job was to go out and do physical assessments of structures and then develop reports that entailed a scope of work and a cost estimate for repairs or rebuilding,” said Maj. Andrew Petrie, 71st Detachment commander. “We were helping to get Tyndall Air Force Base rebuilt as quickly as possible.”

FEST-A is Baltimore District’s rapid-response team that provides engineering solutions during and after disasters to the

U.S. military, as well as foreign governments.

The team was given a list of 60 priority structures on Tyndall AFB. FEST-A offered engineering expertise that determined critical information as to whether each building should be repaired or rebuilt.

“This has been crucial to the recovery effort in determining the path forward for the base as they prepare to rebuild,” said Jonathan Carr, U.S. Army Corps of Engineers, Tyndall Resident Office resident engineer. “This is allowing the Air Force to make decisions about what buildings to keep and repair, and what buildings to demolish and build new.”

The cost estimates and scopes of work developed by FEST-A allowed the Corps’ Mobile District, the lead Corps District assigned to hurricane recovery missions on Tyndall, to quickly develop contracts for repairs and rebuilds.

“In addition to the great technical abilities they brought, speed was an extremely valuable asset,” said Carr. “They provided detailed assessments on more than 80 facilities before any other team completed their first one.”

The FEST-A deployed to Tyndall consisted of seven members, including one officer-in-charge; one non-commissioned officer; environmental, electrical and civil engineers; as well as geospatial information systems specialists.

By the end of the team’s deployment, FEST-A had completed 85 assessments.

“The community greatly relies on the base, economically, so the faster they can get the base rebuilt, the faster people can get back to work,” said Petrie.

This mission was one of the first for many on the team, as the 71st Detachment continues to recruit in order to carry out its pilot program.

The FEST-A pilot program allows for one single detachment to be ready to deploy full-time during a one-year period for both planned and spontaneous missions. This year is the 71st Detachment’s turn to take the helm as the deployable FEST-A.

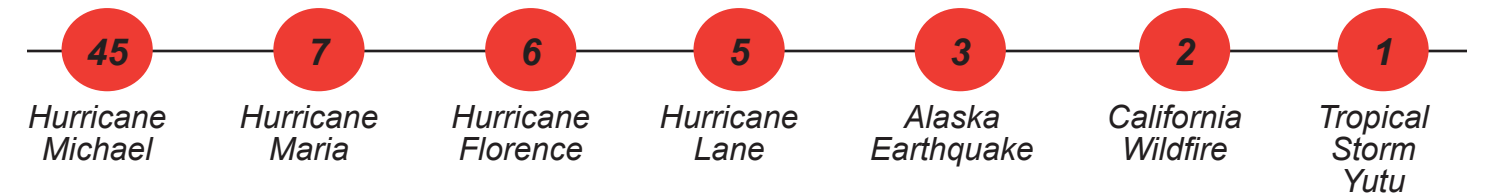
During fiscal 2019, the 71st Detachment has already deployed to Hawaii, Florida and Alaska to support numerous disaster response missions.



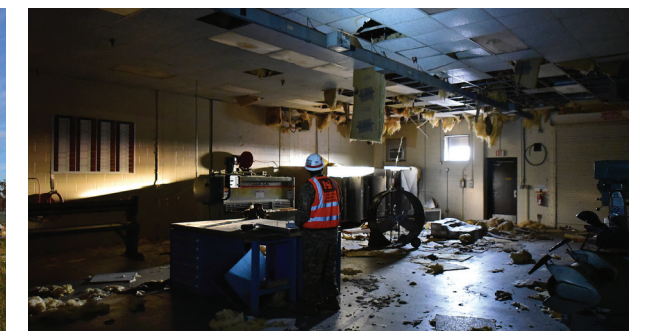
71st Detachment, Forward Engineer Support Team - Advance (FEST-A) conducts infrastructure assessments on Tyndall Air Force Base in Florida following Hurricane Michael. (Photos courtesy of Tyndall AFB)

69

Baltimore District team members deployed for **disaster response** missions since May 2018



**Mission support includes:** temporary roofing quality assurance, debris subject matter expertise, debris monitoring, GIS support, military team leaders, Deployable Tactical Operations System support and infrastructure assessments



In an unassuming blue trailer just a few miles north of the heart of the District of Columbia, work is underway to improve the drinking water that serves more than 1 million people in and around the nation's capital.

This effort is part of the Advanced Treatment Pilot Study for the Washington Aqueduct — a unique mission steeped in history. Washington Aqueduct has been owned and operated by the U.S. Army Corps of Engineers for nearly 160 years. Capt. Montgomery C. Meigs, an Army Corps officer and an 1832 graduate of the U.S. Military Academy at West Point, was personally directed by Congress to design and build an aqueduct to provide Potomac River water to the nation's capital. He did so in just a matter of years, with service beginning Jan. 3, 1859, supplying fresh water via gravity from Great Falls for domestic and commercial use, as well as firefighting.

"Washington Aqueduct, today, still benefits from Meigs' visionary engineering — with key elements of the original gravity-based system still being used," said Tom Jacobus, Washington Aqueduct general manager.

Washington Aqueduct now provides 135 million gallons of safe, reliable and cost-effective drinking water daily across 150 square miles to the District; Arlington County, Virginia; and other areas in northern Virginia to include portions of Fairfax County.

All funding for operations, maintenance, studies and capital improvements for Washington Aqueduct comes from revenue generated by selling drinking water to its three wholesale customers: DC Water, Arlington County and Fairfax Water.

The complex, multimillion-dollar pilot study, which began in summer 2018 and runs 24/7, carries out testing first envisioned within a 2009 study.

The Future Treatment Alternatives Study (FTAS)

involved Washington Aqueduct staff and customers; water treatment experts from private industry, utilities, regulatory agencies and academia; and representatives from advocacy groups and the public health sector.



Exterior view of the Advanced Treatment Pilot Study blue trailer at the McMillan Water Treatment Plant, Washington Aqueduct, District of Columbia, Dec. 19, 2018. The U.S. Capitol Building is seen in the background. (U.S. Army photo by Sarah Lazo)

"Our goal has always been to achieve excellence, from source to tap," said Jacobus. "We do this by working closely with our customers."

FTAS prioritized 14 of more than 750 potential water contaminants for further study, and an even smaller subset that could be addressed through treatment changes.

"The study investigated all foreseeable water quality and treatment challenges and prioritized them based on risk specific to Washington Aqueduct, and the outcomes paved the way for the current pilot study," said Margaret Sharkey, Washington Aqueduct environmental engineer and pilot study team member.

The primary goals of the Advanced Treatment Pilot Study include reducing taste and odor compounds; enhancing disinfection through a multi-barrier approach to provide additional protection from potential contaminants in the

A panoramic view of the Georgetown Reservoir, part of the Washington Aqueduct in the District of Columbia, Jan. 8, 2016. The reservoir provides natural settling. Washington Aqueduct is comprised of two drinking water treatment plants, two large pumping stations and related infrastructure. (U.S. Army photo by Sarah Lazo)



# By Sarah Lazo Pilot study seeks drinking water advancements for nation's capital



A view inside the Advanced Treatment Pilot Study trailer at the McMillan Water Treatment Plant, Washington Aqueduct, District of Columbia, Dec. 19, 2018. Ben Orchard, environmental engineer and pilot operator with CDM Smith, is pictured. (U.S. Army photos by Sarah Lazo)



source water; and achieving year-round water production capacity of 120 million gallons per day at the McMillan Water Treatment Plant (WTP). The pilot study is also designed to evaluate changes in disinfection byproducts and corrosion in the distribution system piping that might result from new treatment processes, if implemented.

"We are and have been meeting safe drinking water standards; however, to be proper stewards of our customers' money, we must anticipate the needs of the future and continue to modernize our processes and infrastructure," said Sharkey.

Within the little blue trailer at McMillan WTP, engineering consultants ARCADIS and CDM Smith have personnel on site testing three advanced treatment processes: ozone contact (gas generated on site that oxidizes organic carbon and other contaminants), biofiltration (natural treatment) and ultraviolet light disinfection (as an additional barrier alongside chlorine).

"Experts involved in FTAS and the subsequent advanced treatment study concluded these are the best treatment processes to mitigate the highest risk contaminants, while renewing aging infrastructure at Washington Aqueduct," said Sharkey.

Ten gallons of water per minute or 0.02 percent of the full-scale operation at McMillan WTP is being diverted for pilot testing. Controls



in the workspace are set up to compare current processes with future processes for both filtration and disinfection.

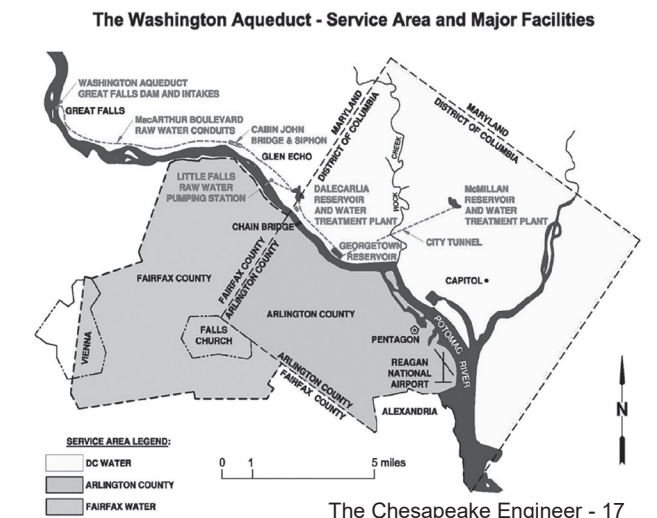
The first year of pilot testing is anticipated to wrap up in summer 2019 and consists of ozone and biofiltration operations at McMillan WTP. The second year will entail ultraviolet light disinfection and distribution system corrosion control testing in which synthesized "finished" drinking water is run through an assortment of pipes made of lead, copper and cast iron to monitor degrees of corrosion. Similar testing will also be executed at Washington Aqueduct's other WTP, Dalecarlia.

"Pilot testing is necessary to confirm performance and establish design and is just one of the many steps needed to implement new processes," said Anna Hayden, Washington Aqueduct engineer and pilot team member. "Fitting in these new processes and squeezing new infrastructure into tight spaces without interrupting operations are just some of our future potential engineering challenges."

Depending on the outcomes from this pilot study, stakeholder input and future funding opportunities, both treatment plants

may eventually be retrofitted to implement various recommended improvement measures.

"I understand the gravity of what we're doing every day here at the Washington Aqueduct," said Laura Gallimore, Washington Aqueduct physical scientist. "Water is life, and we're providing that." ■



# \$100-million construction boom underway at Letterkenny Army Depot

By Brianna Dandridge



First route clearance vehicle in new Metal Treatment Annex blast booth on Letterkenny Army Depot, Chambersburg, Pennsylvania, Sept. 24, 2018. (Photo courtesy of Joseph Petrusek, Army Aviation and Missile Command)

Letterkenny Army Depot is changing, and Baltimore District is helping to shape its future.

Headquartered in Chambersburg, Pennsylvania, the 18,000-acre installation was originally established as an ammunition depot. Today, the installation serves as the Army's Capabilities Based Depot, employing more than 3,500 workers and contributing more than a quarter of a billion dollars annually to the regional economy.

In July 2017, representatives from the District took part in a ceremony to celebrate Letterkenny's 75th anniversary.

As Army and garrison leaders initiate projects to modernize this historic depot, Baltimore District serves as a key stakeholder and partner by helping to implement improvements to mission facilities and installation infrastructure.

"We have a vast amount of expertise and experience to meet the military constructions needs of Letterkenny," said Robert Williams, Baltimore District project manager.

Currently, the District is executing \$100 million to plan, design and construct these improvements, including work on missile maintenance buildings, roads, utility

upgrades and even railroad construction. Of particular note is the recent completion of the \$16-million component rebuild facility, known as the Metal Treatment Annex. This facility serves as an extension of Building 350, where a variety of heavy-duty military vehicles are disassembled, put through a rigorous corrosion-control and painting process, and then reassembled to return to active service.

"Even more construction projects are expected to be completed by Baltimore District, because of the effectiveness of our in-house design teams and field support," said Scott Drumheller, Baltimore District program manager. "This enables us to deliver reimbursable programs in a timely and cost-effective manner." ■



Exterior shot of the Metal Treatment Annex at the northeast corner of Building 350 that houses a wash bay, metal treatment tanks, sanding area, blast booths and surface repair areas. Sept. 7, 2018. (Photo courtesy of Pam Goodhart, Letterkenny Army Depot)

Baltimore District awarded \$248.6 million to small businesses in fiscal 2018, accounting for nearly 25 percent of the District's overall workload.

Much of the credit for accomplishing these goals goes to the small businesses, themselves, according to Tamika Gray, the District's deputy of Small Business.

Small businesses represent crucial segments of local economies. They are willing to respond to solicitations and take significant efforts to perform work across nearly every Baltimore District business line.

These awards, however, are not automatic.

It is incumbent on small business concerns to

ensure they are responding to the District's market research initiatives and solicitations and can clearly demonstrate their expertise and capabilities.

Gray regularly meets with small business concerns to help them navigate the federal government contracting process, including setting up capabilities briefings.

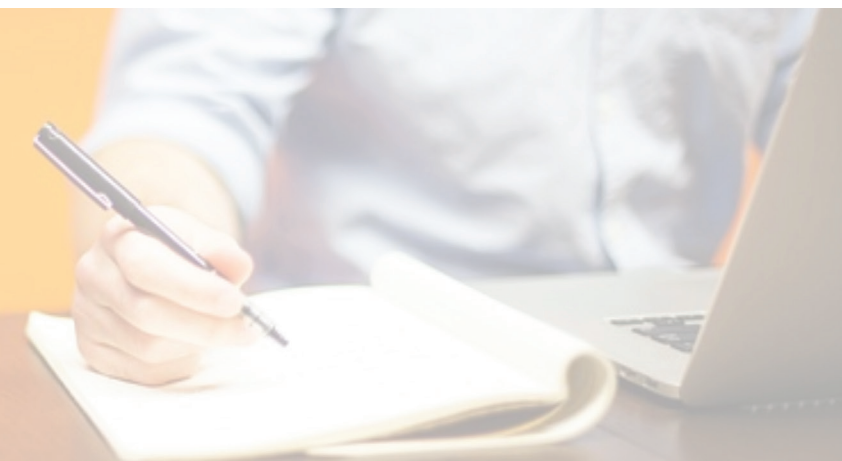
"We are tremendously proud to have capable small business concerns willing to take on some of our most important projects — projects that have an incredible impact on our military and infrastructure."

Recent Baltimore District projects executed by small businesses include oyster restoration, island expansion, and design and construction of several military facilities in and around the National Capital Region. ■

## Creating a level playing field



US Army Corps of Engineers  
Baltimore District



# \$248,687,870

Baltimore District dollars obligated to Small Business in FY18

**Key Highlights: 2018 Year in Review**

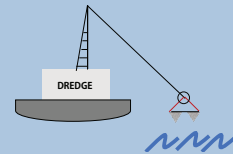
**93,000**

cubic yards of material dredged from Knapps Narrows federal navigation channel near Tilghman Island



**2.3 MILLION**

cubic yards of material dredged from Baltimore Harbor and Channels



**1 MILLION**

cubic yards of debris removed from waterways around Baltimore Harbor & DC



Completed jetties, stone sill and dredging at Rhodes Point on Smith Island to improve navigation



**2.4 MILLION**

visitors hosted @ recreation sites across Baltimore District, bringing in approximately \$1.5 million in revenue

**\$568.3 MILLION**

in flood damages prevented by Baltimore District reservoirs and levees



**1,025**

permits issued in Maryland, Pennsylvania and DC for reasonable development while protecting aquatic resources



**1,500**

feet of stone began to be placed for breakwater as part of National Park Service's Dyke Marsh Protection and Restoration Project

**\$34.7 MILLION**

construction contract award for final expansion dike on Poplar Island Ecosystem Restoration Project, following 20 years of active construction

**3,840**

candidate aquatic ecosystem restoration projects identified in Chesapeake Bay Comprehensive Water Resources and Restoration Roadmap & Plan



**1.5 MILLION**

pounds of radioactive material extracted after completion of STURGIS floating nuclear reactor decommissioning

Real Estate Division supported EPA Regions II and III through **13** projects in New Jersey, New York, West Virginia and Pennsylvania; and negotiated new leases for 14 relocations and 3 new offices to support military projects

**382,000**

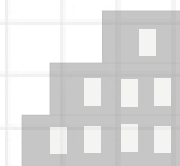
square feet of space provided for U.S. Army Intelligence and Security Command's Secure Administration-Operations Facility on Fort Belvoir

**\$10.98 MILLION**

construction contract award for Joint Base Myer-Henderson Hall Arlington National Cemetery perimeter security fence

**\$46.5 MILLION**

facility delivered for ISO skills training for U.S. Special Operations Command on Fort Belvoir, consisting of 65,000 square feet of admin space and 29,000 square feet for physical training

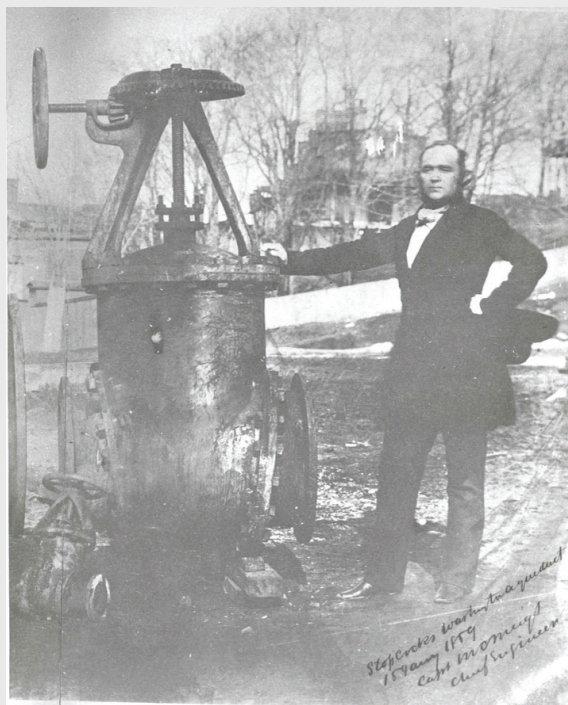


Delivered several **multi-million-dollar projects** in support of the Intelligence Community



2 Hopkins Plaza  
Baltimore, MD 21201

## Looking Back...



Capt. Montgomery C. Meigs inspects valves at Washington Aqueduct Wharf. Each valve has Capt. M.C. Meigs, Chief Engineer, cast onto its body.

Meigs, an Army Corps officer and 1832 graduate of the U.S. Military Academy at West Point, was personally directed by Congress to design and build an aqueduct to provide Potomac River water to the nation's capital. Washington Aqueduct was operational in 1859, after only a matter of years.

Valves were used in the network of water mains part of the distribution system for delivering Potomac River water into Washington. A few are likely still in service.

The wharf was specially constructed on the Potomac River in Georgetown as the off-loading point for components of the fledging system, as well as stones and other building materials used for the construction of bridges and conduits.