FY 2015 SECRETARY OF DEFENSE ENVIRONMENTAL AWARD
NAVAL SUPPORT ACTIVITY MECHANICSBURG
ENVIRONMENTAL QUALITY,
NON-INDUSTRIAL INSTALLATION

Introduction: Naval Support Activity Mechanicsburg (NSA-M), consists of three installations located in Pennsylvania. The bases are the command namesake NSA-M, Naval Support Activity Philadelphia (NSA-P) and the Philadelphia Naval Yard Annex (PNYA). Collectively the installations are comprised of over 70 tenant commands, employ approximately 12,000 people and have a nearly $2 billion economic impact.

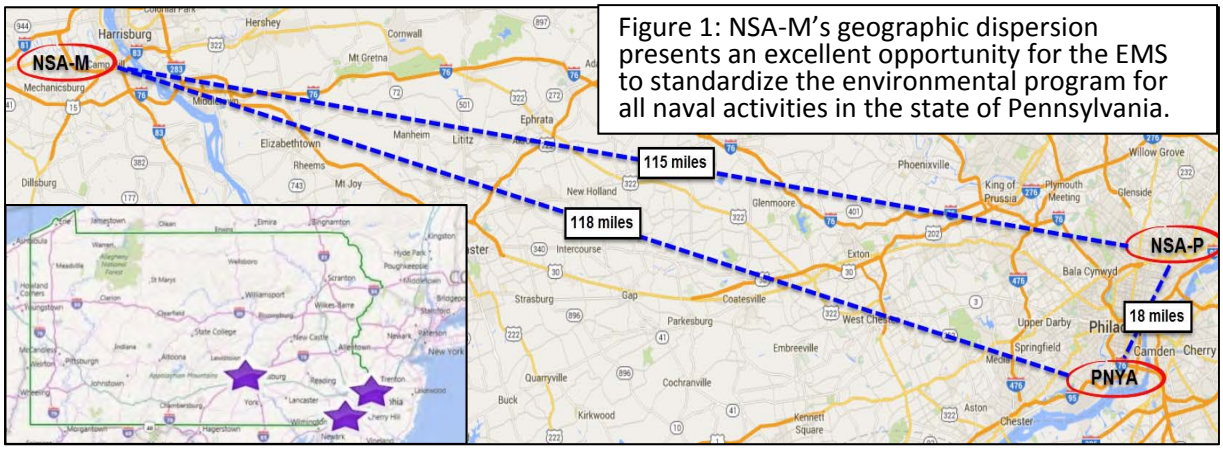



Figure 1: NSA-M's geographic dispersion presents an excellent opportunity for the EMS to standardize the environmental program for all naval activities in the state of Pennsylvania.

NSA-M
- 806 Acres
- 150 Buildings
- 35 Tenant commands
- 8.4 Million square feet of occupied space

NSA-P
- 135 Acres
- 38 Buildings
- 34 Tenant Commands
- 2.25 Million square feet of occupied space

PNYA
- 262 Acres on 9 parcels
- 42 Buildings
- 8 Tenant Commands
- 2.6 Million square feet of occupied space

Major Accomplishments During the Award Period:

- Reduced energy use 9.5 percent, saving over $4 million dollars.
- Reduced the storm water bill at PNYA by over $200,000 per year.
- Negotiated an agreement with National Marine Fisheries for Threatened and Endangered Species to allow on time completion of a $45 million dollar pier repair.
- Awarded over $3.1M, for projects to meet Chesapeake Bay pollutant reduction requirements which will reduce storm water pollution runoff by over 11 tons.
- Exceeded EISA 2007 and EO13423 mandated energy reductions.
- Partnered with over 25 outside stakeholder groups in implementing the Environmental Management System (EMS).
- Removed three previously unknown tanks and over thirty-five hundred gallons of oil in five weeks from property that had been turned over to a private developer.
- Saved over $50,000 by conducting environmental mitigation projects in-house.
- Worked with the State Historic Preservation Office in the rehabilitation of Bld. 531.
- PLATINUM SECNAV Energy Award 2014 one of 16 bases in the world at this level.

- Implemented biogeochemical transformation technology to remediate a restoration site. Once complete, this action will facilitate removal from the National Priority List.
- Supported over $275 million of design and construction with no environmental issues.
- Selected for a demonstration project with the University of California-Davis to test the effectiveness of a newly developed sealant to improve energy efficiency in older buildings.
- Qualified for over $600,000 in energy rebates saving both energy and money.

Environmental Program Management: The environmental program is managed through an ISO 14001:2004 conformant Environmental Management System (EMS). The EMS promotes compliance and sustainability by creating multidiscipline, cross functional teams to address environmental challenges. In addition to transparency, this approach drives cost savings and shared accountability. The Environmental team meets monthly to review the most recent internal compliance findings, prioritize short and long term objectives and discuss opportunities for improvement.

**SIGNIFICANT ASPECTS**

- **Improve host tenant coordination.**
- **Reduce spills.**
- **Reduce incidence of unknown and unlabeled drums.**
- **Improve best management practices for storm water compliance.**

Figure 2: Front of EMS Wallet "CARE" Card. Cards are distributed to all NSA-M personnel.

Figure 3: NSA-M Staff discuss the significant aspects on a CARE card

NSA-M has integrated environmental accountability into both day-to-day decision making and long-term planning from the executive suite down to the shop level. Our EMS focuses on significant aspects and aligns with the DOD strategic sustainability plan. To achieve this level of alignment, EMS training is required for everyone at NSA-M, ensuring the entire workforce understands compliance, conservation and pollution prevention. Training is reinforced with the distribution of wallet cards which feature the "CARE" logo on the front and the significant aspects on the back.

Our significant aspect to **improve host tenant coordination** has been so successful that it has grown to include a large number of stakeholders. This partnering not only ensures a positive compliance posture, but also optimizes resources by creating multidiscipline, multifunction teams that leverage each group's core competencies in problem solving. During the award period, NSA-M has built partnerships with the community and tenant commands including:

- Participated with the Philadelphia City Planning Commission on the 2035 Plan.
- Participated in the Hampden Township Development District Committee and Storm water Advisory Council.
- Participated in spill response drills with the Emergency Response Team including fire and police as part of Operation Citadel Shield.
- Participated in the Philadelphia Industrial Development Corporation's 2014/2015 Energy Awareness Festival.

Figure 4: Planning for a Spill Response Drill

- Signed an agreement with Cumberland County Special Response Team, Dauphin County K9, and the Pennsylvania State Police regarding emergency response procedures.
- Participated in the Delaware Valley and Hampden Township Planning Commissions.
- Signed Agreements with Norfolk Navy Shipyard and Naval Sea Systems Command.
- Routinely consulted on issues potentially impacting historical resources with the Stockbridge-Munsee, Delaware Nation, and Delaware Tribes; Preservation Alliance of Greater Philadelphia, Philadelphia Historical Commission, Chemical Heritage Foundation, Pennsylvania Museum Bureau, and Advisory Counsel for Historic Preservation.

Our significant aspect to **reduce spills** is a priority because our three sites have over 1.2 million gallons of petroleum storage including three gas stations and 169 regulated tanks ranging from 275 to 250,000 gallons. PNYA is located at the confluence of the Delaware and Schuylkill Rivers. As part of the spill response plan we run seven response drills a year at PNYA. Spill prevention, preparedness and countermeasures are a major part of annual EMS and oil handling personnel training.

Following an EMS data review in 2013, a significant aspect was developed to **reduce incidences of unknown and unlabeled drums**. Root cause analysis determined the two contributing sources were lack of employee knowledge and contractors dumping drums on Navy property. The first issue was addressed by improving training and communication to all stakeholders. The second cause was alleviated by partnering with the base police to improve surveillance in "high dump" areas.

Figure 5: Number of unlabeled and unknown drums by year

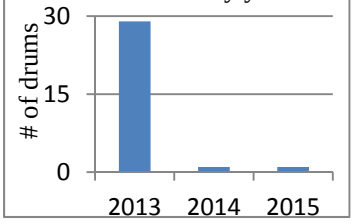
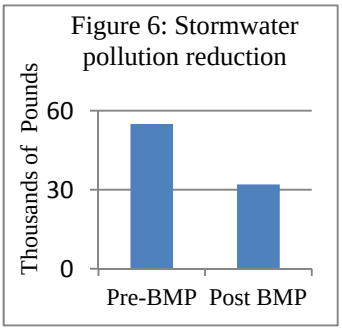



Figure 6: Stormwater pollution reduction




Our final significant aspect to **improve best management practices for storm water compliance** is critical to achieving Chesapeake Bay regulatory requirements for pollution runoff. Over the award period, NSA-M has implemented Storm Water Management and Chesapeake Bay Pollutant Reduction Plans, conducted a Best Management Practices (BMP) Assessment, developed a Concept Design package for 15 BMPs, and awarded over $3.1 million for projects to meet pollutant reduction permit requirements. Working closely with the Pennsylvania Department of Environmental Protection (PADEP) and Cumberland County Conservation District was essential to project success. The projects implemented during the award period will reduce storm water runoff of nitrogen, phosphorus, and suspended solids by over 11 tons per year. Additional BMPs planned during the award period (including roof-disconnect planter boxes, dry and vegetated swales, rain gardens and bio retention facilities) and implemented in future years will further reduce pollution from storm water runoff.

Figure 7: Construction site for a 600' x 200' BMP

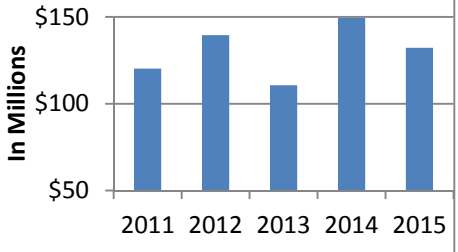
The City of Philadelphia began billing for storm water based primarily on the amount of impervious surface discharging to city-owned infrastructure. At PNYA, the original bill from the City of Philadelphia was over $500,000 per year. Diligent field and record investigations enabled NSA-M to successfully prove that over 40 percent of the storm water was flowing to Navy owned conveyances and therefore not billable. This effort resulted in a $200,000 annual cost savings.

An excellent test of the NSA-M EMS and emergency response procedures occurred 12 March 2014. A contractor building a new parking lot for a private developer (on former Navy property) discovered three unidentified underground storage tanks. There was no record of the previously unknown tanks although their construction suggests they were at least 100 years old. To open on time, the developer needed the parking lot completed in seven weeks. In addition to legal ramifications of delaying a building opening, the tanks contained approximately 3,500 gallons of oil. The weather was forecasting heavy rains for 18 March which (since oil floats on water and the tanks were now open) would have resulted in a large oil spill. NSA-M activated our oil emergency response contract to immediately pump out and secure the tanks. Follow on actions, including tank removal and soil testing were completed in five weeks. In addition to preventing environmental contamination from the hundred year old oil present in the tanks, the project's rapid execution avoided legal action against the Navy by allowing the building to open on time.

Figure 8: A worker pumps out tanks prior to removal. These tanks were "discovered" during construction

Construction Support: Our EMS is structured to effectively and efficiently support facility construction and maintenance. The NSA-M engineering team designed and managed 198 contract actions valued at over a quarter of a billion dollars in 2014 and 2015. Each of these actions was reviewed through the NEPA process for environmental impacts. The Environmental team developed a project tracking system which optimized review periods by allowing staffs in planning, environmental, engineering and acquisition to concurrently view project status to ensure timely actions. This improved process has resulted in on time project execution with no environmental issues.

Figure 9: Design and Construction at NSA Mech




An innovative environmental action to minimize impacts and avoid construction delays was the project to replace electrical feeders for all buildings at NSA-P. Although NSA-M manages an air program with three operating permits and over 450 regulated sources, this project was unique because electricity had to be shut down for over 250 hours base wide. Since NSA-P hosts mission-critical activities with uninterruptable power requirements,

emergency generators were required to run extended hours which would have exceeded emission limits. In order to meet the mission requirement and facilitate timely execution of work, the emergency generators were retrofitted with emission control systems. Additionally, NSA-M opted to buy and submit nitrous oxide emissions credits to the State of Pennsylvania, which is the first time this process was conducted in Navy Region Mid-Atlantic.

In 2014, a change in National Marine Fisheries Service (NMFS) methodology for modeling noise impacts to the endangered Short Nose and Atlantic Sturgeon threatened to cancel a $45 million pier repair at PNYA. NSA-M staff, working with subject matter experts, conducted modeling to negotiate an agreement with NFMS and allow intermittent pile driving (in 30 minute intervals). Simultaneously, NSA-M developed a process to compress the striking period for each pile driving event to less than 30 minutes by optimizing pile setting techniques and a combination of vibratory and impact pile driving. This multidisciplinary approach allowed the project to progress without delay, additional cost, or environmental impacts.

Figure 10: Pier 4 being repaired.

Cultural Resources Management: Cultural Resources management is a major part of the NSA-M EMS, including responsibility for the Philadelphia Navy Shipyard Historic District and Naval Aviation Supply Office Historic District at PNYA and NSA-P respectively. Two innovative examples of cultural resources management are demonstrated with the rehabilitation of building 531 and the use of oral histories as mitigation for construction of a new DLA headquarters in the historic district at NSA-P.

Figure 11 Building 531 in 1939 (top) and (2015) following rehabilitation (bottom). Note the addition of the wheelchair ramp on the right side.

Building 531: Constructed in 1939, Building 531 at PNYA was planned for demolition in the late 2000s. This facility played an integral role in the research and design of shipboard boilers throughout the Cold War. Fortunately, the demolition was successfully avoided when a new PNYA mission was able to reutilize this historic building. NSA-M staff worked with the Pennsylvania State Historic Preservation Officer and local historical groups to develop an ingenious design which upgraded the interior to a state-of-the-art training and conference facility and fully restored the exterior to its 1939 appearance with minor ADA access modifications.

New Building at NSA-P: When Defense Logistics Agency designed a new headquarters at NSA-P, the only available footprint was in the Aviation Supply Historic Distinct. As part of the consultation with the State Historic Preservation Office, the Navy was asked to conduct cultural resources mitigation. To streamline

Figure 12: Drawing of new DLA Headquarters

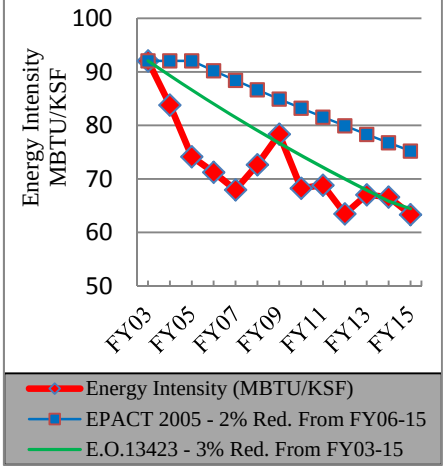
the process and reduce costs, oral histories were conducted as mitigation for the project. In addition to meeting the mitigation requirements at a significantly reduced cost, this innovative outreach effort produced invaluable historical documentation of NSA Philadelphia. This document has been archived by the Navy, Pennsylvania Museum Bureau and Chemical Heritage Foundation.

Restoration Program: Over the past 25 years, staff at NSA-M has partnered with the EPA, PADEP, USFWS, and the public on over $35 million in cleanup projects at 51 Areas of Concern and 15 Installation Restoration sites. During the award period, we have begun implementing biogeochemical transformation on the final remediation site. This method of innovative technology degrades contaminants using minerals that are biogenically targeted to the contaminants. Geologic and hydraulic profiling along with vertical borehole flow allows interval specific characterization and targeted treatment directly to the areas of highest contamination. Once complete, this action will facilitate overall site closure and removal from the National Priority List.

Energy Management Initiates: The Installation Energy Board partnered with the Encroachment Working Group to develop an Energy and Encroachment Leadership Council, which significantly increased leadership's involvement in energy reduction efforts and accelerated the change in employee culture towards energy conservation. This commitment was demonstrated by a 9.5% reduction in energy use and a 29% reduction in utility costs (over $4 million saved) during the award period.

The key to meeting these energy reductions has been the establishment of a building monitor and energy audit program. This program has generated seven additional projects which will save approximately 27,101 million British Thermal Units (MMBTU) and $480,000 annually. As a result of these types of efforts, NSA-M has exceeded EISA 2007 and EO13423 energy goals requiring each installation to achieve a 30% reduction (3% annually) by FY15 from an FY03 baseline.

Figure 13: Energy Reduction Progress




To further reduce energy use in future years, energy audits were completed in 2015 for 32 facilities totaling over 2.3 million square feet. These audits provided a list of potential energy conservation measures equivalent to 15,620 (MMBTU) and $458,000 in cost savings.

Over the award period, NSA-M worked with the local utility providers and qualified for over $600,000 in energy rebates. NSA-M has enrolled 2.5 MW of capacity in an emergency demand response program. This enrollment generates $75,000 in annual savings. In addition, staff at PNYA participated in an Emergency Demand Response Program with the local utility supplier by conforming to demand reduction strategies on "high peak demand" days.

In recognition of our reputation as an energy innovator, NSA-M was chosen to host a demonstration project through the Environmental Security Technology Certification Program

with the University of California-Davis Western Cooling Efficiency Center. This demonstration project will investigate a new aerosol sealant product's ability to reduce air infiltration and leakage in old facilities to improve energy efficiency.

Figure 14: Staging area for National Guard to support the September 2015 Papal Visit

Support for National Events: NSA-M supported the September 2015 Papal visit to Philadelphia by hosting over eight hundred National Guard and Marines deployed for rapid response at NSA-P. Our EMS successfully managed the challenges posed by mobile gas tanks, generators, and large volume of solid waste.

Community Relations: NSA-M has worked with the local community at a number of venues most notably for Earth Day and energy awareness events. In 2014 and 2015, Earth Day activities were conducted in coordination with Bring Your Child to Work Day where children built their own mini bio retention facility and learned the science behind filtered storm water and point source discharge. This innovative project idea was a featured success story in the Region's Chesapeake Bay Journal. Another Earth Day activity that combined outreach, education and support for our storm water management program, was when high school Ambassador Girl Scouts conducted a storm water drain marking activity at NSA-M in 2014.

Figure 15: Earth Day Events

Figure 16: Earth Day storm drain marking event


Figure 17: Energy Awareness Festival


NSA-M has run an aggressive Energy Awareness campaign over the last few years and has worked to inform employees about energy conservation both at work and at home. NSA-M staff has worked with the local Navy Yard developer (Philadelphia Industrial Development Corporation) for the past three years to host an Energy **Awareness Festival. Participants included Delaware** River Keeper, Clean Air Council, EPA, NAVFAC, Pennsylvania Environmental Council, Philadelphia Gas Works, and Philadelphia Water Department. NSA-M has also worked with PIDC to support an Earth Day bike tour at the Navy Yard as well as an electric vehicle demonstration of the Navy's fleet. In August 2014 the Navy Energy Mascot "Brite" visited NSA-M to discuss the importance of energy awareness and conservation.