

The 2014
Chief of Engineers
**AWARDS OF
EXCELLENCE**



DESIGN

ENVIRONMENTAL

SUSTAINABILITY



**US Army Corps
of Engineers**®





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SCOTT C. WICK, AIA, LEED AP, PMP
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DEBRA G. BIEDENHARN
Website Support

DREW L. ANDERSON
Website Support



Message from the Chief

Congratulations to the winners of the 2014 Chief's Awards of Excellence Program! Through their innovation and continued pursuit of excellence, we are helping the Army and the nation reach its energy security and sustainability goals.

The Chief's Awards of Excellence Program recognizes some of the most innovative projects accomplished by U.S. Army Corps of Engineers (USACE) teammates and our private sector design and construction community around the world. A jury composed of nationally recognized design and environmental professionals collectively selected 34 projects and individuals for awards from the 50 entries submitted by USACE. The quality and number of awards provide evidence that our designs continue to meet the highest professional standards and commitment to satisfying our customer, building the USACE team, and serving the Army, the Air Force, the Department of Defense, and the nation through our high-quality work.

I appreciate the jury members who gave enthusiastically of their time and expertise to make this program a success. In addition, I extend my personal appreciation to the USACE team members and to the private sector contractors who designed, constructed and presented the projects offered for judging this year. I look forward to continued excellence and encourage you all to begin considering your submissions for the 2016 competition!

Essays...Building Strong...Army Strong!

Thomas P. Bostick
LTG, US ARMY
53rd Chief of Engineers

The Chief of Engineers Awards of Excellence Program Dates to 1965 when it was first held as the Chief of Engineers Distinguished Architectural Achievement Awards with ten entries, for which two awards were given.

In 1966, the name was changed to the Chief of Engineers Distinguished Architectural and Engineering Achievement Awards. The program continued to expand to include Landscape Design in 1968, and in 1969 the name was changed to the Chief of Engineers Distinguished Design Awards. In 1978, a greater emphasis was placed on the environment and the program became the Chief of Engineers Design and Environmental Awards Program. In 2012, the program expanded once again to include the USACE Sustainability Awards to become the Chief of Engineers Awards of Excellence. This combination of awards programs supports the Corps' commitment to implementation of Executive Order (EO) 13514 Federal Leadership in Environment, Energy, and Economic Performance.

From 1965 through 2010, 531 awards have been given. A number of these projects also received other awards, including Department of Defense Design Awards, Federal Design Achievement Awards, and Presidential Design Awards.

CATEGORIES OF COMPETITION

The program recognizes a wide range of projects and professional work. New this year: recognition for innovation and success in sustainability.

DESIGN AND ENVIRONMENTAL AWARDS

These awards recognize large-scale USACE projects that demonstrate excellence in design and construction and complete supply chain management, community engagement, employee involvement, and innovation.

Chief of Engineers Awards of Excellence

Requiring unanimous support by the jury, this award goes to an entry that exhibits excellence in sustainability.

Honor Awards

Honor Awards are given to entries that demonstrate or stimulate excellence in each of the design disciplines

Merit Awards

Merit Awards are given for projects in a variety of individual disciplines including landscape architecture, interior design, planning, historic preservation, adaptive reuse, sustainable design, and discipline-specific engineering.

SUSTAINABILITY AWARDS

This combination of awards programs supports the Corps' commitment to implementation of Executive Order (EO) 13514 Federal Leadership in Environment, Energy, and Economic Performance.

Sustainability Hero Award

This award recognizes an individual whose outstanding leadership in sustainable practices and energy and environmental management is a true sustainability champion and agent of change within USACE.

Green Innovation Award

This award recognizes an innovation or idea with clear potential to transform the federal community's overall energy and environmental performance. It is presented to an individual or team for the development and execution of a novel new product, project, program, design, or revolutionary idea.

Lean, Clean, and Green Award

Recognizing outstanding organizational achievement in building or fleet energy efficiency or renewable energy development and deployment, this award recognizes innovative projects that dramatically improve energy efficiency.

Good Neighbor Award

This award recognizes a USACE team, project, or facility actively engaged in community planning and sustainability initiatives, pursuing collaborative sustainability goals, and demonstrating success in aligning policies and practices with community partners to achieve those goals.

Green Dream Team Award

Winners of this award exhibit exceptional leadership in an interagency green team to effectively place a federal sustainability idea into action. It highlights collaboration through regional councils, federal executive boards, workgroups or other interagency organizations.



DESIGN

- 4** Award of Excellence
Mission Training Complex
- 6** Honor Award
Barkley Elementary School
- 8** Merit Award: Engineering
Army Maneuver Center of Excellence
- 10** Merit Award: Restoration
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ENVIRONMENTAL

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SUSTAINABILITY

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Antonia R. Giardina
Richard Gifaldi





Mission Training Complex – Fort Bragg, North Carolina

The Fort Bragg Mission Training Complex (MTC) was developed as a prototypical design intended to increase and enhance the operational readiness of the United States Army by providing a specialized facility to train commanders and staff under simulated battlefield conditions. The MTC provides space for conducting individual and collective battle staff training. The facility consists of work cells, classrooms, and an after-action review room; a reconfigurable Tactical Operations Center (TOC), an outdoor Tactical Operations Center (TOC Pad), a SCIF room, a Temporary Secure Working Area (TSWA), executive conference rooms / VTC, and administrative areas; storage and secure storage areas; soldier support center and canteen area; training library, communication rooms and restrooms; detached smoking facility and gate house.

USGBC awarded LEED Gold Certification to the Fort Bragg Mission Training Complex in March 2013. The award reflects the success of the coordinated partnership between Owner, Design Team, and Constructor. The MTC incorporates most of the elements that have become associated with such projects such as reduced parking impact, reserved space signage, bike racks, low-flow plumbing fixtures, occupant surveys and recycling collection. However, at a cellular level, this project was conceived with sustainability and system-wide efficiency in mind and in many ways goes above and beyond. The following description attempts to summarize just how this was accomplished.

The MTC uses many integrated concepts to reach their efficiency goal. These include innovative solutions for daylight systems, water and energy use, storm water management, heat island reduction, and reforestation. The materials used for this project are just as impressive. 98% of the wood in the project was harvested from a Forest Stewardship Council certified forest, 30% of the building materials were manufactured or harvested within 500 miles of the site, and 80% of the construction waste generated onsite was diverted from landfills, additionally, 31% of the building materials were manufactured using recycled materials 100%, and of the indoor building materials including paint, coatings, and carpet, adhesives and wood products meet low VOC limit requirements.

OWNER:

U.S. Army

DESIGN DISTRICT:

Savannah District, U.S. Army Corps of Engineers

DESIGN FIRM:

Jacobs – Arlington VA

CONTRACTOR:

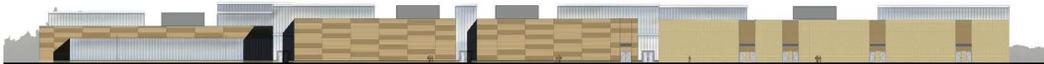
Yates Construction



SOUTH ELEVATION



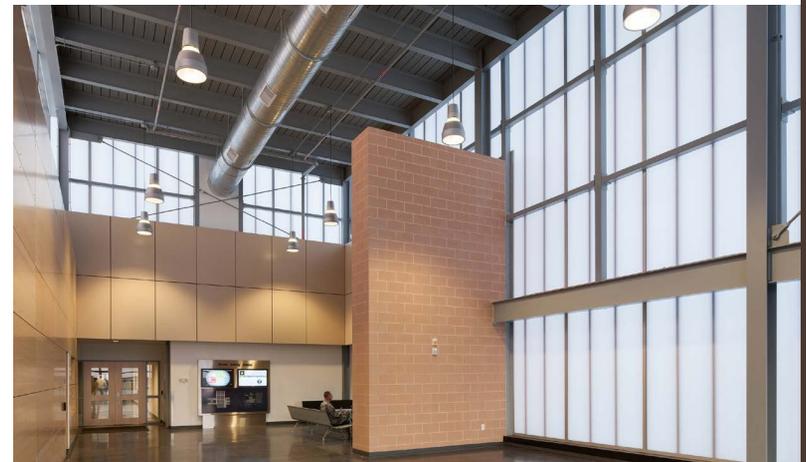
EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION





Barkley Elementary School – Fort Campbell, Kentucky

As one of the first schools designed under the new 21st Century Education Initiative set forth by the Department of Defense Education Activities (DoDEA), Barkley Elementary School now enables a modern school environment, equipped with technology to aid in the results-oriented learning process. As many schools in DoDEA's inventory exceeded 50 years and became obsolete, the five year program to fund replacements offered the opportunity to make major advancements in layout and function. These improvements included the ability to inspire new teaching methods as well as accommodate educational changes in the future. This leading-edge facility will provide a bold illustration of student engagement in learning and teachers' creativity with exciting new resources.

The team's fundamental strategy was to integrate 21st century education and Green School concepts. The school footprint was reinvented—compacting and minimizing long, exposed walls while supporting the circulation between neighborhoods, dining, gym and other spaces. The building, oriented in an east-west direction, provides for abundant daylighting into all the learning spaces. Tubular daylighting devices transfer daylight from the roof to illuminate myriad spaces on the second and first floors to meet predetermined goals and provide comfortable levels of lighting. Insulated concrete form (ICF) construction composes the main structure. The large thermal mass and airtight barrier has helped to decrease heating and air conditioning loads by 30%. The geothermal mechanical system makes optimum use of the ground's natural resources and achieves major savings of 59% in energy use. The building is also equipped with LED lighting inside and out, solar hot water heating and a photovoltaic infrastructure, ready to accept solar arrays and help the school become Net Zero. An energy dashboard located near the main entrance will highlight what energy is being used throughout the building, allowing the students to compare between class groups and understand how their actions impact cost and climate. Detailed energy modeling using Trane Trace 700 and eQUEST indicates that the design will achieve 18 kBtu/sf/year, compared to the national school average of 64 kBtu/sf/year.

To match its impressive interior, the exterior includes rainwater harvesting, pervious pavements to manage stormwater, bioswales and an amphitheater which serves as an outdoor classroom. Additional elements include pocket learning courtyards, a learning garden with rain barrels, a bikeway bisecting the site and a creative use of stormwater best management practices (BMPs) throughout the site and recreational hardscapes. The combination of these green building systems in an interconnected, cooperative design has enabled Barkley to emerge as a leader in nationwide schools.

OWNER:

Department of Defense Education Activity

DESIGN DISTRICT:

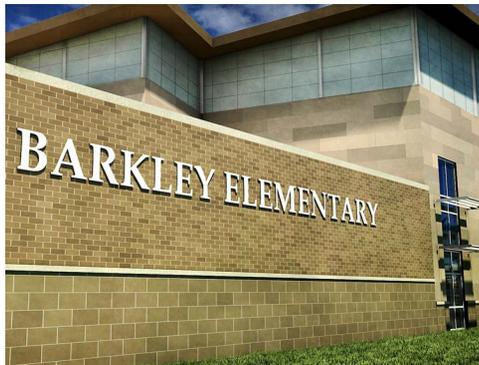
Norfolk District, U.S. Army Corps of Engineers

DESIGN FIRM:

Woolpert, Inc.

CONTRACTOR:

CORE Construction





Army Maneuver Center of Excellence – Fort Knox, Kentucky

The result of the consolidation of the Armor School at Kentucky's Fort Knox and the Infantry School at Fort Benning, the Maneuver Center of Excellence (MCoE), is headquartered at Fort Benning in Building 4- the Infantry School's original home. New tenants of the building include four generals and their staff.

Constructed in 1964, Building 4 consists of a six-story tower, a four-story, 1,500 person auditorium; a two-story mechanical plant; and two larger one-story classroom wings. The 500,000 square foot building was taken back to the structure, modernized, and given a new architectural expression. The architectural design seeks to embody the Georgian influence of the post while creating a signature iconic command structure. The four "towers" symbolize the four flag officers present but also help modulate the building's length and bulk.

The project includes new infrastructure, AT/FP upgrades, new exterior facades, and new interior finishes. Building 4 was originally configured into multiple 100- and 200- person classrooms designed for larger classes of military students. To accommodate changes in class size and training needs, the new floor plate includes four 200- person classrooms and 40 smaller classrooms. The building contains SIPRNet secure Internet connections to accommodate the needs of high-level military personnel. Classrooms have unique power systems for hands-on training in field communications.

Structural renovation work on the tower includes new mechanical penetrations at floors and roof, stairs, façade support, and retrofits to meet progressive collapse requirements. Sustainable features of the LEED Gold registered building include rainwater collection

that saves up to 4.4 million gallons of domestic water annually, and a rooftop solar array that delivers up to 150kW of power. In September 2011, Phase 1 of the MCoE was renamed McGinnis-Wickham Hall in memory of two Medal of Honor recipients.

OWNER:

Fort Benning Directorate of Public Works

DESIGN DISTRICT:

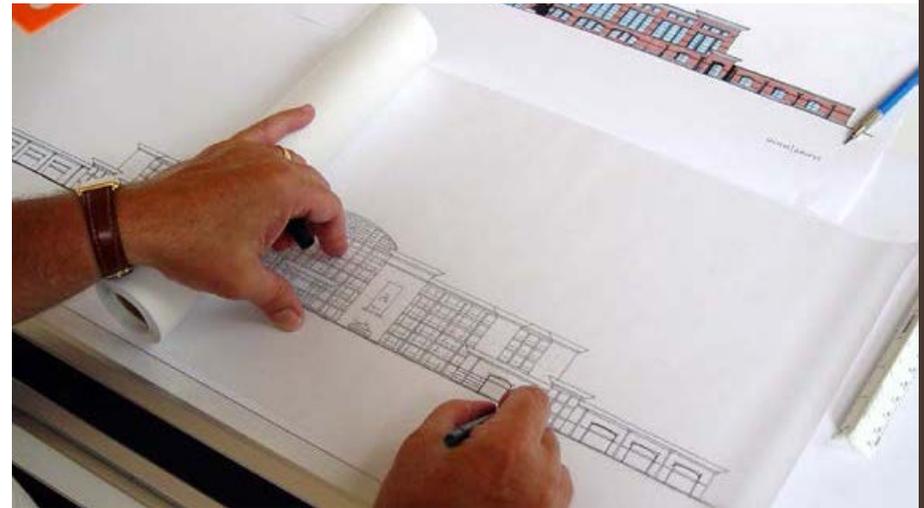
Savannah District, U.S. Army Corps of Engineers

DESIGN FIRM:

AECOM

CONTRACTOR:

McCarty Corporation





EAB Company Operations Facility – Fort Carson, Colorado

This utilitarian facility proves that exceptional sustainability and facility excellence can be achieved at all levels of building quality and function. The Echelons Above Brigade (EAB) Company Operations Facility (COF) is a 46,608 square foot facility accommodating three Army Companies and serving approximately 500 soldiers. The project includes an administrative module, readiness module, and an exterior covered hardstand. The COF is located in close strategic proximity to other related EAB facilities including the new Tactical Equipment Maintenance Facilities (TEMF's).

Through the project bidding process, USACE required LEED Gold as part of the base bid. The Contracting Officer exercised the photovoltaic system bid option at award. The PDT integrated energy & sustainability features into the design from the project's beginning. This COF contains a number of innovative and high efficiency systems. The precast concrete wall and spray foam system supported meeting the air infiltration standard by attaining an initial air barrier test (no corrective actions required) of only 0.22 cfm/sf at 75 Pa. This is significantly below the required 0.25 cfm/sf level requirement. Innovation in design and construction included occupancy, vacancy, and day-lighting sensors, efficient lighting systems and innovative programming controls to save energy. The building also includes efficient geo-thermal heating and cooling to reduce energy usage by 54.6% over the ASHRAE 90.1-2004 baseline model. The roof top 25 kW photovoltaic field generates approximately 87,000 kWh of energy annually which reduces the annual energy cost by nearly 11%. The COF also includes water saving technologies providing a 58.9% savings over the baseline annual water consumption. This earned the project additional LEED points for Innovation in Design and Innovative Waste Water.

Due to the diligence of the combined team, this project was able to meet or exceed the Installation goals on energy, water, and construction waste reduction with a facility type not normally associated with sustainable design, while utilizing the Army's Standard for facilities of this type. The facility was also able to help clean-up and reuse an existing site, enhance community connectivity and development, and provide our Soldier's a safe and functional working environment within the projects budget.

Complying with Army directives, utilizing current energy and light modeling systems, and incorporating LCCA analysis, the team was able to construct a realistically functional and sustainable facility. Attaining LEED v2.2 Platinum certification (53 points), this industrial type facility positively reflects a continued Fort Carson legacy for excellence in sustainability and energy reduction and is an example for others to follow.

OWNER:

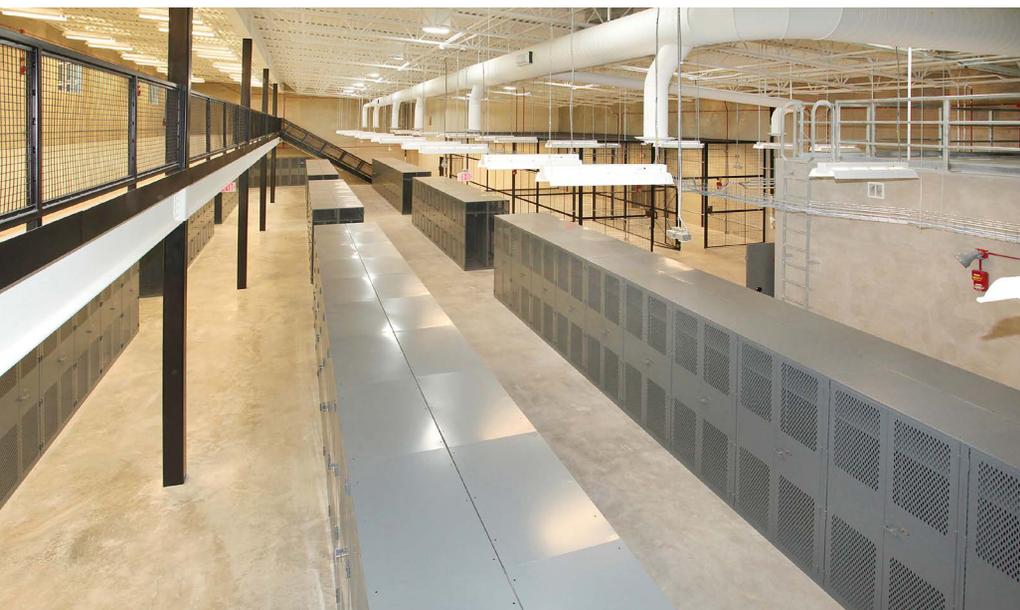
Fort Carson Army Installation

DESIGN DISTRICT:

Omaha District, U.S. Army Corps of Engineers

CONTRACTOR:

TEPA Construction





Gulf Intracoastal Waterway West Closure Complex – Greater New Orleans

The Gulf Intracoastal Waterway (GIWW) West Closure Complex (WCC) project was authorized as part of the Hurricane and Storm Damage Risk Reduction System (HSDRRS) to provide 100-year level of risk reduction to the Greater New Orleans area. The WCC involved some of the largest and most complex civil, mechanical, electrical, hydraulic, structural, and geotechnical challenges that USACE has faced. The design of the pump station required extensive physical and numeric hydraulic modeling to ensure pump performance and optimal water passage through the structure. The 19,140 cfs pump station is the largest in the world and is designed to handle a 10-year frequency storm event over the West Bank watershed, and keep the Algiers and Harvey canal water levels below critical elevations. The pump station is 82' tall and 480' long and contains 11-1,740 cfs pumps with 5,400 hp diesel engines, right angle gear speed reducers. Each pump assembly weighs over 70 tons and includes a 12'8" diameter flower pot type discharge cone and pump impeller. These innovative pumps were designed with a non-siphonic discharge, which allows them to operate at full capacity even at high storm surge levels. The 225' sector gate is the largest of its kind in the United States. Each gate leaf weighs 750 tons and is founded on a 10' thick concrete slab founded on 416 steel pipe piles.

The WCC was substantially completed in June 2011 to provide 100 year interim level of risk reduction against hurricane storm surge. The WCC performed as designed in 2012 during Hurricane Isaac, and provided storm damage reduction benefits to the 245,000 citizens of the West Bank of New Orleans. With commissioning completed in April 2014, the WCC will provide significant reduction in risks to the residents of the West Bank for many years to come.

The WCC is a mega project that would normally require 25 years or more to work through the traditional Corps process. The keys to completing this project in less than 6 years included full funding at the start of the project, use of the Early Contractor Involvement (ECI) contracting strategy, the use of regional resources for execution, and extensive outreach and coordination with Federal, state and local authorities and agencies as well as the public. Full funding allowed sufficient resources to be provided throughout the project's timeline.

Completion of the WCC has restored public confidence in Federal response and service to the nation with regard to storm damage risk reduction. The experiences and lessons learned from the regional execution of this project are being applied in the formation of Corps of Engineers Inland Navigation Design Center.

OWNER:

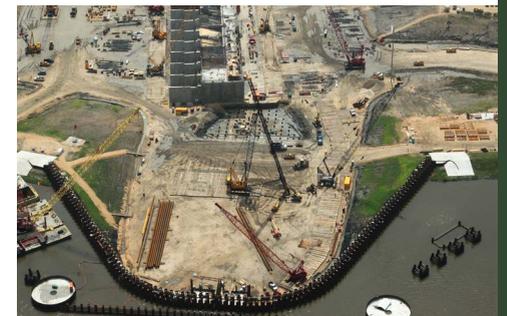
Coastal Protection and Restoration Authority of Louisiana

DESIGN DISTRICT:

New Orleans District, U.S. Army Corps of Engineers

CONTRACTOR:

Gulf IntraCoastal Constructors





 Chicago Botanic Garden Section 206 – Chicago, Illinois

CBG is a world-renowned living plant museum and recognized leader in conservation science. The Project Delivery Team (PDT) was faced with the challenge to restore the highly eroded shoreline using natural features while managing costs and preserving aquatic habitats and aesthetic image of the CBG. The project area consists of a lake system within the Chicago Botanic Garden (CBG) that includes nine islands and an overflow control structures. The Skokie River bypasses the system under normal flow conditions. However, during major storm events, floodwaters enter the lake system through the control structure. The goal of the project is to restore the aquatic and terrestrial habitats and stabilize 6400 feet of shoreline degraded by flooding. More than 120,000 native plants and shrubs were used to stabilize the shoreline soils. Stone berms were also placed for shoreline stabilization to protect the newly-installed aquatic plantings. At shoreline areas with limited space, vinyl sheet pile was installed. The project was awarded for construction in September 2011, and

was 100% completed in September 2012, with majority of the work completed in July 2012 in preparation of the CBG's 40th Anniversary ceremonies.

The CBG shoreline restoration project, though uniquely challenging, was successful due to the dedication and innovative design and implementation approach from the PDT. Since the completion of the construction work in 2012, the lake experienced one of the worst floods in the history of the CBG. In April 2013, a rain storm dropped over 5 inches of rain in the Chicago area. The CBG's lake levels soared by more than 5 feet and inundated the entire shoreline. Chris Bentley, from WBEZ 91.5, described the site in his web publication stating "the scene looked more like a swamp. And it was the actions of native plants, and the U.S. Army, that saved it. In the past, such flooding would have sucked soil away from the garden shorelines". The project shoreline withstood one of the worst floods and proved that unconventional methods of shoreline

stabilization are effective and sustainable. In 2013, the CBG and Chicago District received a Chicago Wilderness Conservation and Native Landscaping Award presented by the Chicago Wilderness for the exceptional work to restore the region's natural areas to benefit both people and nature.

This project can also be replicated on other shoreline stabilization projects within the federal government. The use of native plants has been well established as a sustainable ecological approach to ecosystem restoration. Successful methods of installation and establishment of native plants for bank stabilization along shorelines have shown to be challenging and still evolving. This project displays the use of innovative engineering techniques that prove the success of native plants establishment for shoreline applications.

OWNER:

Chicago Botanic Garden

DESIGN DISTRICT:

Chicago District, U.S. Army Corps of Engineers

CONTRACTOR:

John Keno and Company





Upper Mississippi River Restoration: Batchtown Habitat Rehabilitation and Enhancement Project – Upper Mississippi River

The Batchtown Ecosystem Restoration - Rehabilitation Project is part of the Upper Mississippi River Restoration-Environmental Management Program (UMRR-EMP). The project is located on the Illinois side of the Mississippi River, upstream of Lock and Dam No. 25 (LD25). This significant environmental project is approximately 3,300 acres of important habitat that includes bottomland hardwood, terrestrial, wetland and aquatic habitat. The project area's diverse habitat has been significantly impacted by the installation of LD25 during the 1930's. Since the project is immediately upstream of LD25 it is directly influenced by operation of the dam, which is designed to provide a minimum 9 foot Navigation Pool on the Mississippi River. The operational conditions of LD25 cause at different operating conditions, artificially high and or artificially low hydrographic conditions in the project area. As a result the project wetlands and aquatic habitat have been adversely degraded and impacted.

The project goal is to rehabilitate the project areas riverine habitat diversity to benefit fish, wildlife and fresh-water mussels. Project objectives include; provide diversity of wetlands; create independent water level management from LD25; reduce the rate of siltation; improve the habitat quality and quantity of bottomland forest; improve spawning habitat for riverine fishes; improve overwintering of fish inside channels and back-water; improve side channel habitat by preventing river-borne sediment; and ensure long-term water flow over the fresh water mussel bed. In addition, Batchtown also provides a significant vital connectivity link for the seasonal movements of numerous migratory bird species on the Mississippi flyway.

Sedimentation deposition entering the project has been reduced with the design of river training structures called chevrons. Chevron design utilizes the river's energy to move sands and sediments; this concept was expanded for use on the interior of the project. This new implementation allows for increased overwintering habitat for fish as chevrons create plunge pools off the trailing edge of the structure.

The ability to protect the wildlife area from fluctuating water levels has enabled the site to provide 1,025 acres of moist soils plant production and mudflats on an annual basis. Immediately after construction the IDNR and USFWS observed a steady increase in the use of the property by migratory birds, shorebirds, and by the general public. During the 2011 Spring Flood the exterior deflection berms and the water controls operated as designed and minimized the amount of sedimentation deposition from water carrying sediment. Similarly, the designing of the floating pump has already been proved successful, as the Batchtown complex has been exposed to several high water events since the construction and deployment of the pump to the project site.

OWNER:

Illinois Department of Natural Resources

DESIGN DISTRICT:

St. Louis District, U.S. Army Corps of Engineers





CAT ISLAND DMDF – Green Bay, Wisconsin

The project delivery team (PDT) was presented with a dredged material disposal issue that focused on the closure of the Corps owned Confined Disposal Facility (CDF) and the diminishing capacity at the locally owned CDF.

The Project serves as a single purpose project for navigation, while providing secondary environmental benefits by re-creating the Cat Island chain (274 acres) and the restoration of Pete's Marsh and Duck Creek Delta Wetland combined providing 1,440 acres of wetland wildlife refuge.

The project consists of constructing 4.3 miles of in water dikes enclosed on three sides to contain 2.3M cy of the clean dredged material from the outer 8 miles of Federal Navigation Channel and the expansion of the locally owned CDF for the material from the inner 3 miles of the channel. This design approach addresses an estimated 25 years of disposal capacity.

The PDT effectively found ways to reduce the time it took to conduct Quality Assurance on this project without reducing Quality Control. By using the Contractor supplied Global Positioning System (GPS) installed on the trucks and a state owned highway truck scale the PDT effectively eliminated the need for onsite scales to track the 400+ trucks of stone required each day for this project. This change eliminated the bottleneck at the site and reduced delivery time by 4 minutes per truck. In addition, the PDT authorized the designed finished cross section of the dikes to temporarily be widened to accommodate two-way traffic without additional cost to the project. This effectively reduced the delivery time by an additional 2 minutes and increased safety at the construction site. This project finished 1 year ahead of schedule at completion and \$10M under budget. This project has already produced tangible results before any material has been placed at this site. Specifically the wild rice species (Manoomin) that is indigenous to this area of Wisconsin has taken root in the newly protected marsh area and is expected to proliferate to a sustainable population. In addition, this site has accumulated 30 of the 35 migratory shorebird species and has since become the number one migratory bird site in Wisconsin and is expected to grow as the surrounding habitat develops to sustain more nesting opportunities.

This project is a benchmark of accomplishing the USACE goal to maintain Navigation Channels by incorporating beneficial use and collaboration to achieve multiple national goals. The project changed the stigma surrounding dredged material and encouraged resource agencies to evaluate dredged material as a potential asset instead of a liability.

OWNER:

Brown County Port & Resource Recovery Department

DESIGN DISTRICT:

Detroit District, U.S. Army Corps of Engineers

CONTRACTOR:

Michels Foundations





Jameson Island Unit Shallow Water Habitat Restoration Project – Arrow Rock, Missouri

The Jameson Island Unit Shallow Water Habitat Restoration Project is a critical component of the Missouri River Recovery Program (MRRP) which creates Shallow Water Habitat (SWH) as outlined in the US Fish and Wildlife Service's (USFWS) Biological Opinion on Operation of the Missouri River Main Stem System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System. The project will restore 30 acres of Shallow Water Habitat (SWH) and the dynamic river processes which maintain it for the benefit of native fish and wildlife species, including the endangered Pallid Sturgeon.

The role of sediment in the aquatic ecosystem has been poorly understood, and the general consensus of regulatory agencies has been that all sediment is harmful to aquatic life. Although the overarching purpose of the Clean Water Act is to maintain the physical, chemical and biological integrity of our Nations waters, this common misunderstanding has led regulatory bodies to fail to consider the

natural sediment load of the receiving waterbody or the conditions in which native species evolved when making permit determinations.

The Missouri River, also known as the "Big Muddy", has had a serious sediment decline since the Corps' Mainstem Reservoir System and Bank Stabilization and Navigation Projects were constructed. This sediment decline has led to serious bed degradation, which has impacted infrastructure, native fish and wildlife species and contributed to the sediment deficiency at the Gulf of Mexico. The programmatic and site specific water quality monitoring that occurred prior to and during construction allowed the design team to provide the public and regulatory agencies a better understanding of baseline conditions on the Missouri River, and the project related impacts and benefits.

The success of the design team's efforts was realized in November 2012, when the Missouri Clean Water Commis-

sion voted unanimously to direct MDNR to prepare a DRAFT 401 Water Quality Certification for the project. Although MDNR eventually waived this certification, the District Commander approved the Finding of No Significant Impacts (FONSI) in April 2013. The design team, working with our State/Federal natural resource management agency partners, has clearly created a better understanding of the role sediment plays in the chemical, physical and biological integrity of the Missouri River.

The success of the design team's efforts have clearly created a better understanding of the role sediment plays in the chemical, physical and biological integrity of the Missouri River. This knowledge has been shared other Federal agencies including the US Geological Survey (USGS), USFWS, US Department of Agriculture Natural Resource Conservation Service (NRCS), USEPA, as well as our partners in the States of Missouri, Kansas, Iowa and Nebraska.

OWNER:

USFWS Big Muddy National Fish & Wildlife Refuge

DESIGN DISTRICT:

Kansas City District, U.S. Army Corps of Engineers

CONTRACTOR:

Western Contracting Corporation





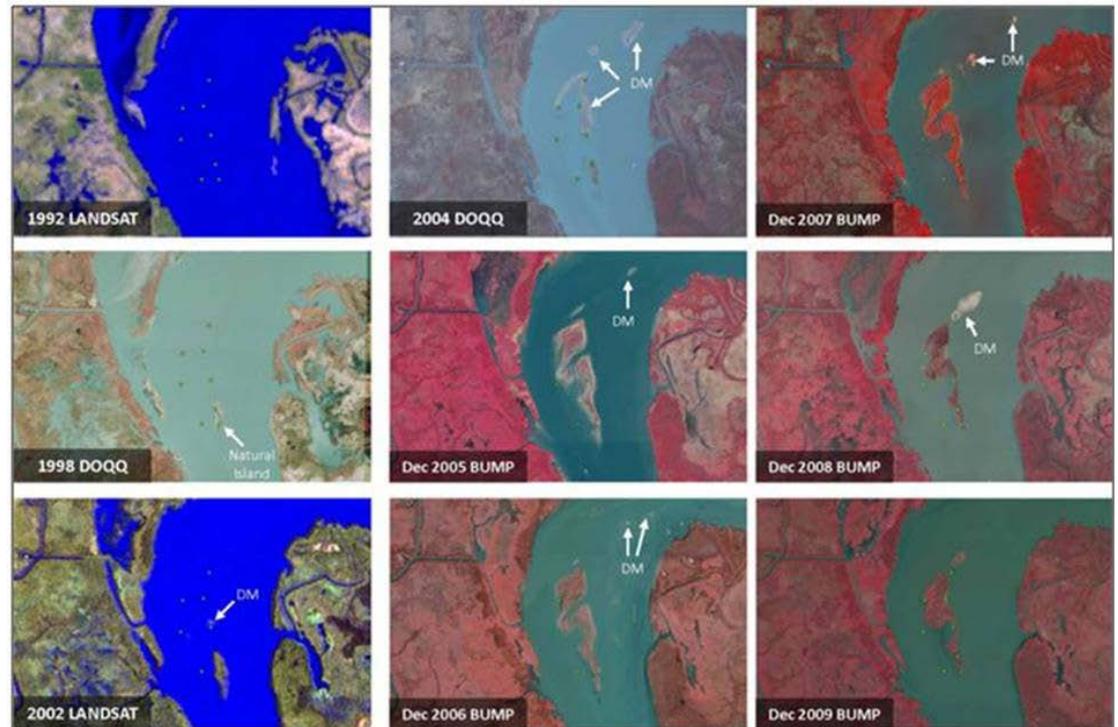
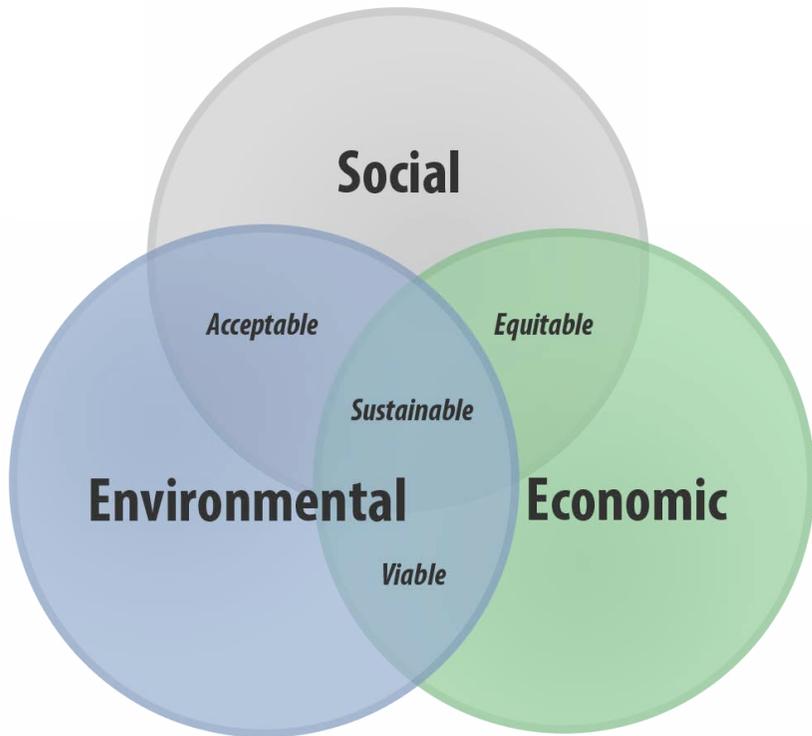
Engineering With Nature (EWN) for Sustainable Solutions

In accordance with Executive Order 13514, the US Army Corps of Engineers' (USACE) Engineering With Nature (EWN) initiative promotes sustainability by advancing technical and communication practices across multiple USACE missions and business lines. EWN intentionally aligns natural and engineering processes and uses collaborative efforts to efficiently and sustainably deliver economic, environmental, and social benefits. The innovative tools and projects developed through EWN support planning, engineering, and operational practices that beneficially integrate engineering and natural systems to produce more socially acceptable, economically viable, and environmentally sustainable projects. The EWN initiative's focus on developing practical methods provides an achievable path toward an ecosystem approach to project development and operations.

Science, engineering, and demonstration projects within the EWN initiative illustrate the use of science and engineering to produce operational efficiencies supporting sustainable delivery of project benefits, natural processes to maximum benefit, thereby reducing demands on limited resources, minimizing the environmental footprint of projects, and enhancing the quality of project benefits, approaches that broaden and extend the base of benefits provided by projects to include substantiated economic, social, and environmental benefits, and science-based collaborative processes to organize and focus interests, stakeholders, and partners so project delays are reduced while more broadly acceptable projects are produced.

By combining innovative science and engineering with advanced communication practices, the EWN initiative is providing a robust foundation for collaborative project development. It is being pursued through innovative research, field demonstrations, communication of lessons learned, and active engagement with field practitioners across a wide range of organizations. The capabilities and practices being developed through the EWN initiative provide direct support to the USACE Civil Works Strategic Plan, the USACE Campaign Plan (USACE 2011), as well as the reinvigorated USACE Environmental Operating Principles (USACE 2012).

The EWN initiative is developing and demonstrating, through a diversity of projects, the capabilities that are needed to achieve sustainable, triple-win project outcomes. There is a range of supporting projects that are completed or underway including sustainable sediment management through strategic placement and innovative beneficial use practices, science that informs how biology makes use of engineering, incorporation of habitat into navigation infrastructure, sustainable management of contaminated sediment, and coastal resilience research.





Green Remediation Technologies for Munitions Constituent Management on Impact Areas

Numerous Department of Defense (DoD) ranges across the US are impacted by the transport of munitions constituents (MCs) such as 1,3,5-Trinitro-1,3,5-triazacyclohexane (RDX) and 2,4,6-trinitrotoluene (TNT). Providing an environmentally friendly and sustainable best management practice for the safe operation of demolitions and training ranges and providing a green remediation alternative to treating MCs leaving the range are prudent environmental strategies for the DoD. By employing solutions that enable good stewardship of training lands and by making smart investments, the DoD will reduce total infrastructure ownership costs. These efforts also directly support the DoD's mission, by protecting resources critical to maintaining military readiness and by supporting deterrence.

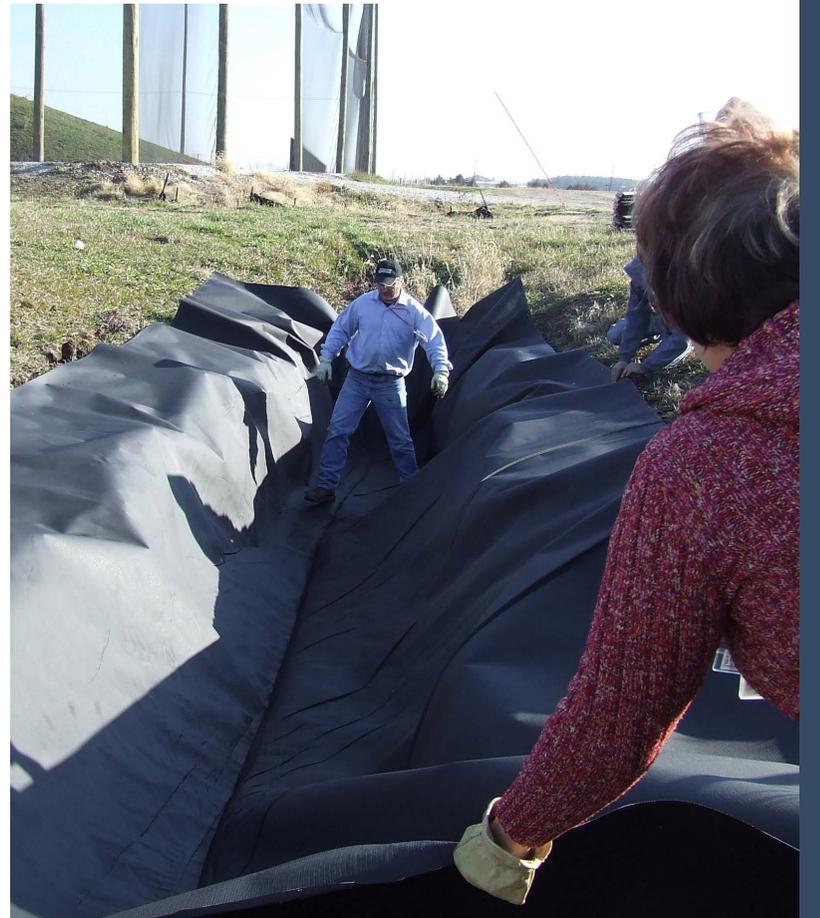
Drs. David L. Smith and Heather M. Smith are two Environmental Laboratory (EL), US Army Engineer Research

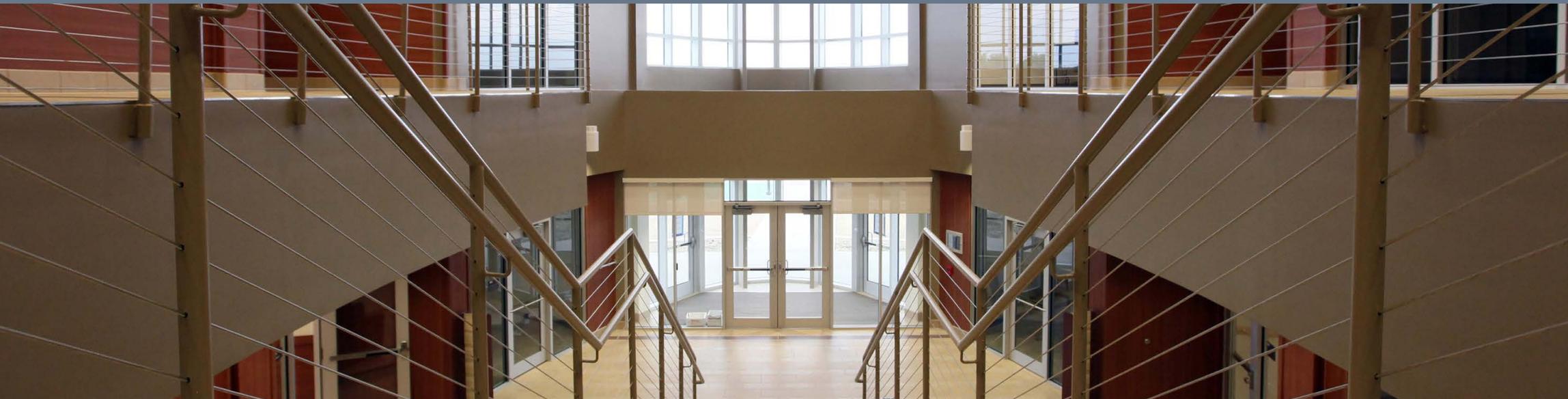
and Development Center (ERDC), researchers who have developed and tested innovative environmental technologies. Recently, they led a diverse team of scientists and engineers to develop three field-ready treatment solutions that can function independently or together to proactively mitigate MCs from ranges. The research and development strategy adopted by this team was to address environmental needs through: identifying technologies that provide the highest return on investment; investing in far sighted technologies; engaging in partnerships that facilitate the development of multipurpose, innovative technologies; and accelerating the use and commercialization of these types of green technologies.

Specifically, these technologies include: the Iron Bioreactor, developed by Dr. Heather M. Smith (Figures 1-4); the Sorptive Barrier, developed by Dr. Afrachanna D. Butler,

also of EL, (Figure 5); and the Transgenic Grasses, developed by Mr. Timothy J. Cary of ERDC's Cold Regions Research and Engineering Laboratory (CRREL) (Figures 6-7). All three of these green remediation technologies were incorporated by Dr. Billy E. Johnson, EL, into the Green Range Computational Toolkit.

The US Army alone can spend millions of dollars on the development and implementation of the research and development strategy adopted by this team. The goal was to address environmental needs through: identifying technologies that provide the highest return on investment, investing in far-sighted technologies, engaging in partnerships that facilitate the development of innovative, multipurpose technologies, and accelerating the use and commercialization of these types of green technologies.





Army Reserve Center and Organizational Maintenance Shop

The Denton ARC was designed and constructed for the U.S. Army Reserve to support combat readiness training for 240 Reserve soldiers in preparation for deployments to Afghanistan and other overseas locations. The center includes: A 37,000-square-foot, two-story, multi-functional training building with assembly hall, five classrooms, reading library, weapons simulator, unit and individual equipment storage areas, administrative offices, fitness center, and shower/locker facilities; An 8,000-square-foot, three-bay military vehicle maintenance shop with parts, tool and equipment storage areas, shop offices, lubricant distribution systems, vehicle exhaust systems, and 10-ton bridge crane; and A 2,000-square-foot unheated storage building for military equipment storage.

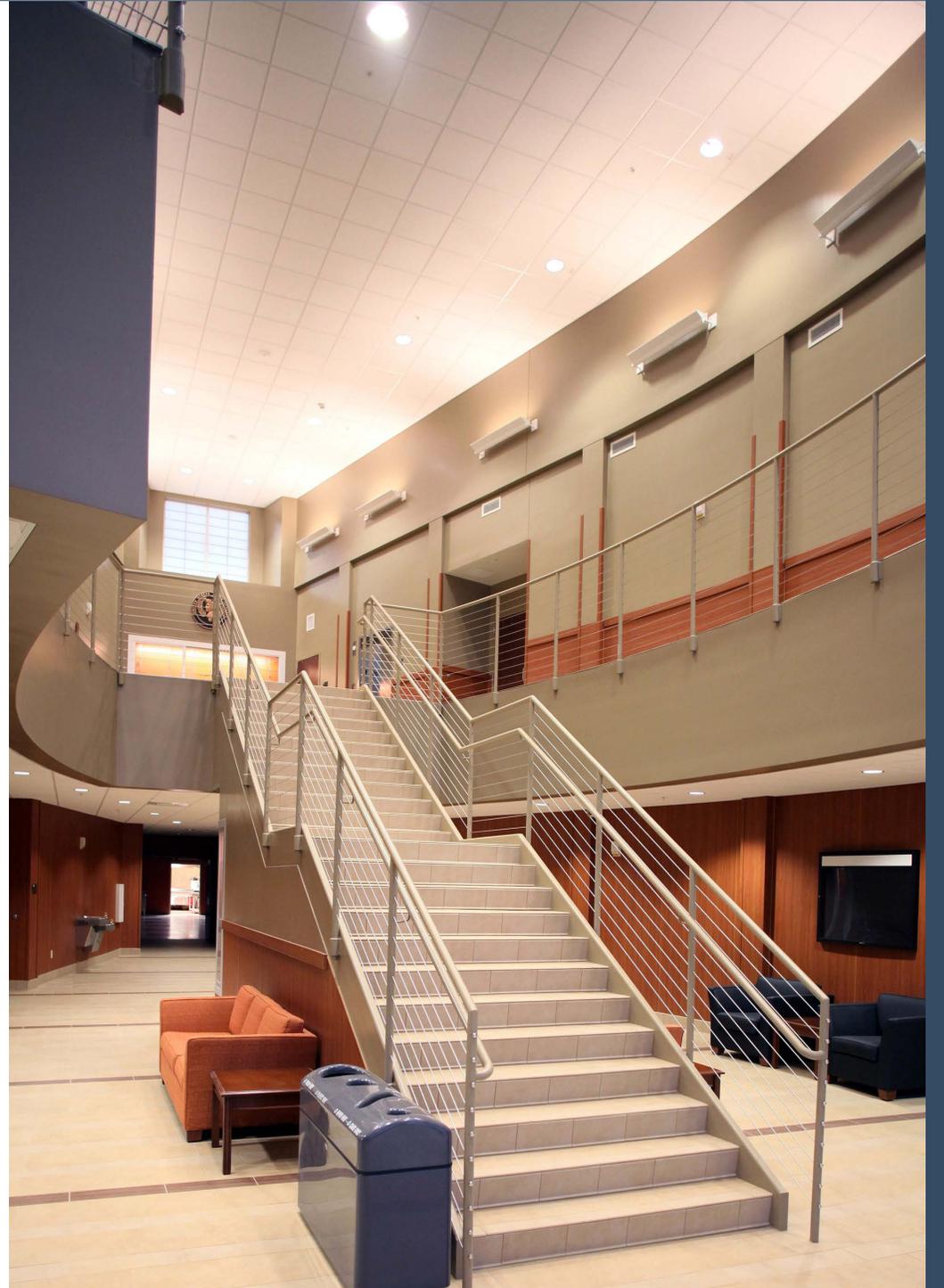
The project began with Available Site Identification and Validation (ASIV) to select a sustainable site for the orientation, massing, and configuration of ARC buildings. This

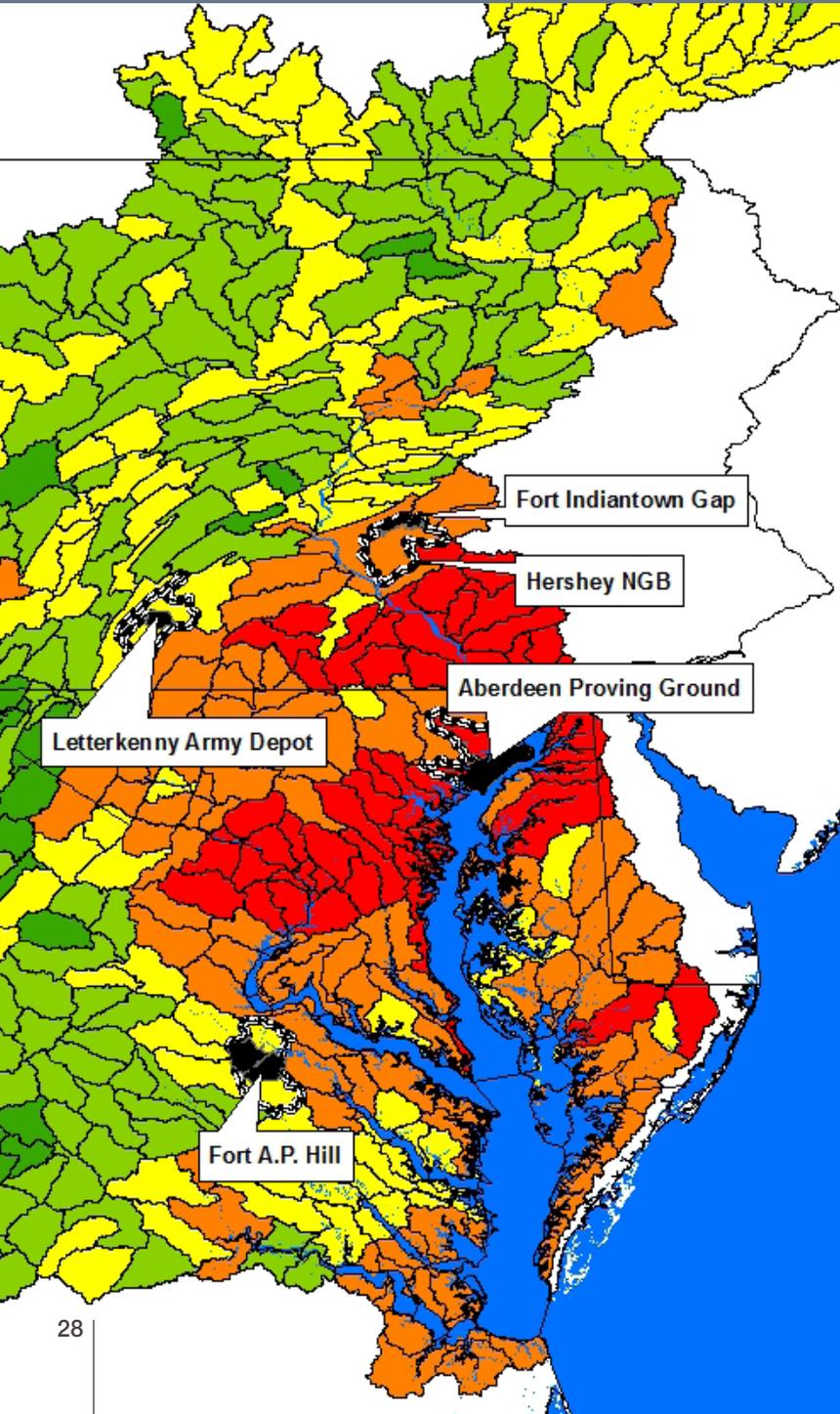
process emphasized optimal energy efficiency and water conservation through a detailed analysis of site features and climatic and topographic conditions. The ASIV team also evaluated vehicular accessibility and force protection standoff requirements and determined the site adequately met all selection criteria.

The technologies used at this complex will provide an estimated annual savings of 130,000 kWh, and solar heating provides hot water for men's and women's showers, adding an additional savings of 47,000 kBtu (13,770 kW) annually.

It is anticipated that the building performance and energy efficiency will improve as the facility managers become more familiar with how to use the building's technology and develop operating procedures to optimize building usage. The Reserve provided eight months of utilities data that combined both the training building and vehicle maintenance

shop. The monitoring system has the ability to isolate and interpret utilities consumption of each building, because separate gas and electrical meters are installed on each building. In addition, water meters will provide data to calculate annual water savings as a result of using the rainwater collection system, but the facility managers are not yet utilizing this tool.





Army Chesapeake Bay Comprehensive Plan

The Army Chesapeake Bay Comprehensive Plan resulted in an Army Chesapeake Bay planning tool that can be used by the Army to prioritize resources and funding to watershed improvement projects at installations and facilities that contribute to impairment of the Chesapeake Bay watershed. The tool can also be used to plan for the Army's environmental compliance requirements within the Chesapeake Bay. Furthermore, any Federal, State, or local government or non-profit organization can also use this tool to prioritize their efforts in sub-watersheds towards the greater restoration of the Chesapeake Bay.

The GIS process and tool generated from this effort is currently being used by NAB for completion of other watershed assessments, in particular the North Atlantic Coast Comprehensive Study in response to Hurricane Sandy. The GIS tool also serves as an example for prioritization of watershed restoration efforts that can be implemented for other watersheds through the Nation.

The Army Chesapeake Bay Comprehensive Plan demonstrated leadership in sustainability and reduced environmental impact through developing a watershed approach to determining where the Army could most effectively allocate resources towards Chesapeake Bay watershed restoration. The methodology, GIS process, and tool can and is being used by the Army to prioritize funding for projects that will have the greatest beneficial impacts to the Chesapeake Bay watershed in a cost-effective manner. This project recommended a new approach for the Army to allocate resources towards watershed restoration on military facilities taking a comprehensive and holistic view outside of the installation boundary to contribute to a larger watershed benefit. This approach allows the Army to demonstrate and execute environmental stewardship on a larger scale while still making cost-effective decisions.

Within the Chesapeake Bay, the results and GIS tool developed through this project can be used by other Federal, State and local entities as well as non-profit organizations to further identify watershed restoration projects that will be most effective at improving the Chesapeake Bay watershed. This methodology can also be applied to other watersheds throughout the Nation.

The GIS process and tool developed through this project can be replicated for other watersheds throughout the Nation to assist with prioritizing projects and Army funding. By taking a comprehensive and holistic view when prioritizing water resource projects on Army installations throughout the Nation, the Army can provide for greater watershed benefits both on the installation and outside the fence line.



Elizabeth Mine Superfund Site – Strafford and Thetford, Vermont

The Elizabeth Mine Site is an abandoned copper mine located in the towns of Strafford and Thetford, VT that was designated as a Superfund site in 1999. It is one of the largest and most intact historic mining sites in New England, operated for 100+ years producing over 3.25 million tons of ore and 50,000 tons of copper. After the mine closed in 1957, mine tailings, waste rock, and smelter waste remained. These wastes discharged acid rock drainage (ARD) and dissolved metals, resulting in surface water impacts far downstream. Dissolved copper and pH readings in the Copperas Brook were close to 4000 ppm and 4.5, respectively, posing a danger to the downstream ecosystem. Starting in 2005 and continuing thru 2013, EPA Region 1 retained New England District (NAE) to design and cleanup the Superfund site. NAE project delivery team (PDT) initially focused their efforts on constructing surface water and groundwater diversion structures, stabilizing the steep slopes of the tailing piles, and capturing and treating the contaminated discharge

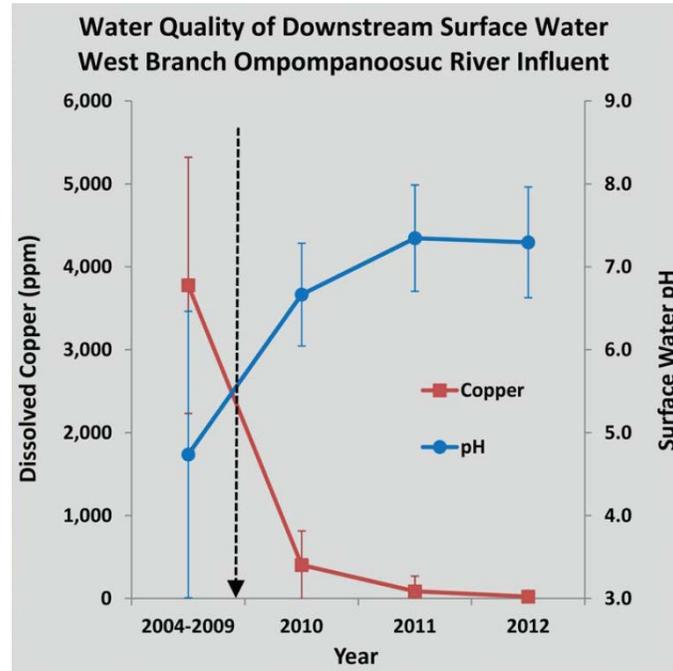
At the onset of the cleanup actions, the PDT recognized that the remediation of the 250+ acre site could impact the natural and cultural resources in the immediate area. This included increased air emissions, degradation of natural resources, potential impacts to historic structures and increased waste stream. In response the NAE PDT implemented a “Green Remediation Strategy” at the site that would identify measures to minimize the impacts to the local environmental. NAE’s Green Remediation Strategy reduces air contaminants associated with onsite or offsite fuel consumption; uses onsite rather than imported material for backfill and site restoration; establishes processes for maximum recycling or reuse of waste materials; and initiates a procurement process for environmentally preferred products. In addition, the strategy calls for reducing the volume of materials entering the waste stream (refuse) and assuring preservation of the site’s historic aspects and ecosystem.

By creating and implementing a “Green Remediation Strategy” specific to the Elizabeth Mine Superfund remediation, the NAE PDT executed a solution that was cost effective, project focused, while being environmentally responsible. The strategy not only sought to minimize environmental impacts, but also created a project execution process that requires that all project delivery team members and contractors formally consider environmental impacts as part of the project management decision making process. The strategy that was executed by the NAE PDT also used existing and commonly available materials and methods to eliminate or reduce environmental impacts. By doing this, the team was able to implement green remediation practices within the project management framework while emphasizing efficiency, cost effectiveness through reduced waste.

OWNER:
US EPA Region 1

DESIGN DISTRICT:
New England District, U.S. Army Corps of Engineers

CONTRACTOR:
Nobis Engineering





Antonia R. Giardina

Ms. Antonia Giardina has been awarded the Sustainability Hero Award due to her outstanding leadership and passion for sustainability and energy conservation. As the Senior HQUSACE National Sustainability Program Manager, Ms. Giardina provides exceptional leadership and guidance managing the USACE Sustainability Program. She is the expert and trusted advisor, making significant progress towards meeting federal requirements, and advancing USACE's contributions to reductions in the uses of water, electricity, petroleum, and greenhouse gas (GHG) emissions.

Ms. Giardina is responsible for assuring USACE's adherence to current and next generation Administration, DoD, and Army sustainability and energy policies. She performs these duties in accordance with the USACE Campaign Plan, the principles of USACE 2012, the USACE Environmental Operating Principles, and the Army Environmental Strategy. She is the focal point, liaison, and technical expert on sustainability and maintains the professional understanding of the social, environmental, engineering and economic elements found within the sustainability concept.



Richard Gifaldi

Mr. Richard Gifaldi, PE, has received the 2014 Sustainability Hero Award for his outstanding contributions to the advancement of the national USACE sustainability mission. As the USACE Europe District Sustainable Engineering Program Manager (SEPM) since January 2010, Mr. Gifaldi has been responsible for the effective oversight and implementation of Sustainability on all projects in Europe while also participating on the Regional and HQ Community of Practice virtual teams.

Throughout his years as the Europe SEPM Rich worked across functional boundaries with the Planning Division to initiate and establish the District Net Zero Project Delivery Team (PDT) to provide DOD Garrisons and other customers with comprehensive net-zero planning and technical support, facility audit performance, energy/water savings, and strategy development for net zero implementation. He is currently Project Manager and Team Leader for two in-house net zero studies for OCONUS Army installations, one of which resulted in over \$6.5M in executable life cycle cost effective projects. He also provides technical oversight for five additional studies, including the USAG Kaiserslautern Sembach Kaserne Net Zero Energy Installation Plan which received the 2012 award for Outstanding Sustainable Planning, Design, or Development Initiative by the American Planning Association. Not only is he on the leading edge of the net zero initiative, but he is ensuring excellent visibility of the USACE net zero capability. This makes him a true sustainability hero.

THE JURY



Eric Anderson

US Green Building Council Senior LEED Specialist

Mr. Anderson works with some of the most complex technical issues pertaining to the LEED rating system. Before joining USGBC, he practiced architecture and design for 13 years in Georgia and Maryland, originally with the A&E firm of Leo A. Daly, and then in two architectural and consulting practices of his own. He has an undergraduate degree in architecture (summa cum laude) from the University of Maryland at College Park, and a Masters Degree in Architecture from the Georgia Institute of Technology. After graduate school, he taught in design studios as an adjunct professor in the architecture departments of the Georgia Institute of Technology, Auburn University, and Southern Polytechnic State University. Mr. Anderson was a member of the steering committee that organized an international conference on sacred architecture at the Catholic University of America in 2010, and conducted the international design competition during that event.



Stephen Ayers, FAIA, LEED AP

Architect of the Capitol

Stephen T. Ayers is the eleventh Architect of the Capitol. Mr. Ayers is responsible for the facilities maintenance and operation of the historic U.S. Capitol Building, the care and improvement of more than 553 acres of grounds. He also cares for the operation and maintenance of 17.4 million square feet of buildings including the House and Senate Congressional Office Buildings, the Capitol Visitor Center, the Library of Congress Buildings, the U.S. Supreme Court Building, the Thurgood Marshall Federal Judiciary Building and other facilities. He is responsible for the care of all works of art in the Capitol under the direction of the Joint Committee on the Library, and the maintenance and restoration of murals, outdoor sculpture and other architectural elements throughout the Capitol complex. He also serves as Acting Director of the U.S. Botanic Garden and the National Garden.



Loida Begley, P.E.

National Nuclear Security Administration and Chair FCC Standing Committee on Sustainable Design and Construction

Loida Begley serves as the sustainable buildings lead within the Office of Sustainability for the National Nuclear Security Administration (NNSA), the programmatic office within the Department of Energy responsible for the management and security of the nation's nuclear weapons, nuclear nonproliferation, and naval reactor programs. In her role at NNSA, Mrs. Begley advances enterprise-wide efforts across the eight geographically dispersed sites to integrate elements of recognized sustainable building requirements and practices into construction and operations.

Before joining NNSA, Mrs. Begley worked as a design and construction engineer for Parsons and Lee and Ro, Inc., and developed civil and mechanical designs for large-scale civil systems such as waste water treatment, light-rail and coastal protection in the Los Angeles and San Francisco metropolitan areas.



Pamela Loeffelman, FAIA, NCARB, LEED AP

Principal SHW Group and Vice President of the American Institute of Architects (2009-2012)

Pamela Loeffelman is a Principal and the K-12 Practice Director for the SHW Group. Ms. Loeffelman will provide strategic leadership and direction for the firm's K-12 practice in the eastern region, which includes offices in Detroit, Baltimore, Washington, D.C., and Charlottesville, Va. Ms. Loeffelman's 30-year career includes more than 20 years at Hardy Holzman Pfeiffer. In addition, she served as a principal and board member at Perkins Eastman. Her portfolio includes notable K-12 and higher education projects nationally and internationally. Ms. Loeffelman has been an active member of the architectural profession, serving as an AIA National Vice President, Secretary for the AIA New York Board of Directors, and Chair of the AIA Committee on Architecture for Education (CAE). She is also a frequent presenter at national and international conferences including Council of Educational Facility Planners, Society for College and University Planning, and CAE and has published articles in *Learning by Design* and *American School & University*.



Kevin Stover, P.E.

Green Building Initiative, Commercial Program Consultant

Mr. Stover is a Commercial Program Consultant with the Green Building Initiative (GBI), starting in early 2006. He works with the Green Globes™ green building assessment and rating system, and the GBI Guiding Principles Compliance rating program. He provides program and technical support for current and prospective users with design, construction and operation of commercial buildings.

Mr. Stover joined GBI after completing a 30 year career with the Indian Health Service, an agency in the Federal Department of Health and Human Services. His experience includes engineering, design, construction engineering and management, healthcare facilities engineering, operations and management. From 2003 – 2005 he was the national Sustainability Director for the agency.

Mr. Stover has a Bachelor of Science degree in Civil Engineering from the University of Pittsburgh, and a Master of Science degree in Construction Engineering from the University of Washington. He is a registered professional engineer in the states of Washington and Arizona.



Elizabeth Thompson

US Green Building Council Senior LEED Specialist

Ms. Thompson brings expertise in the design and restoration of public places, landmarks, transit systems, K-12 schools and education spaces, landscapes, and mixed-use and residential projects. As part of the LEED Support Team at USGBC, she helps project teams navigate design, construction, and operations to achieve the requirements of LEED, facilitates education, and fosters participation in the sustainable design community. Before coming to USGBC, Ms. Thompson co-founded an award-winning architectural, landscape design and sustainability consulting firm. Her accolades include AIA Henry Adams Medal Scholarship for Design Excellence; Certificate of Distinguished Service for Teaching from the Washington Architectural Foundation; and Design Award for Adaptive Reuse Competition of Greywater Gardens. Ms. Thompson served on the board of a building materials reuse and deconstruction for Home Resource, helped found a tour of sustainable projects in Missoula, Montana, and created curriculum for civic/architecture/urban design classes as part of the Washington Architectural Foundation's Architecture in the Schools program.



Kim Toufectis

AICP, Master Planning Program Manager, National Aeronautics and Space Administration

Kim Toufectis is a facilities strategist and NASA's Facilities Master Planning Program Manager. A registered architect and certified planner, Mr. Toufectis left private practice for NASA's Goddard Space Flight Center in 1991, eventually developing a comprehensive facilities master plan for Goddard's main site in Greenbelt, Maryland. Having led Goddard's Facilities Planning Office for seven years, Mr. Toufectis moved to NASA Headquarters in Washington, D.C., in 2008 to lead an agency-wide planning community tasked with transforming Apollo-era installations to advanced 21st century research and exploration programs, with particular responsibility for adapting to climate change.

Mr. Toufectis received a Master of Architecture from Rice University in 1987 and a Bachelor of Science in Architecture from the University of Virginia in 1983. He completed the Senior Executive Fellows Program at Harvard University's Kennedy School of Government in 2011.

