2011 YEAR IN REVIEW

Nearly a Century of Providing Integrated Sciences, Technology and Engineering Solutions

U.S. ARMY
EDGEWOOD
CHEMICAL
BIOLOGICAL
CENTER

U.S. ARMY RDECOM
TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

EDGEWOOD CHEMICAL BIOLOGICAL CENTER
A U.S. Army RDECOM Laboratory

“I’m **proud** to say that I work at **ECBC** and am grateful for the **opportunity** to serve within this **organization**.”

Mary Martinez | Supervisory Workforce Management Officer | 31 years of service

MESSAGE FROM THE TECHNICAL DIRECTOR

It is my pleasure to present the 2011 issue of the U.S. Army Edgewood Chemical Biological Center's (ECBC) Year in Review. I encourage you to peruse the pages of this publication to learn about the significant scientific and technological contributions the Center has made to Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) Defense this past year. As you read, you will see the connections between ECBC's accomplishments and our three strategic goals:

1. Ensure that ECBC sustains and grows the core competencies required to counter enduring and emerging chemical and biological threats;

2. Create success for warfighter and CBRNE clients by consistently delivering quality customer service;

3. Grow and develop the workforce to ensure the continued competencies of the organization to meet evolving CBRNE Defense needs.

As I reflect back on 2011, it is the progress of furthering these goals that I am most proud.

The world has witnessed the unpredictability of terrorist events and an uncertain future regarding the emerging threat of chemical and biological weapons. Our nation and U.S. Forces require the defense measures and innovative solutions ECBC provides to counter these threats. The stories told within these pages specifically illustrate those unique capabilities the Center holds. Yet, they also highlight our commitment to offering stakeholders the utmost in customer service and our dedication to cultivating expert personnel.

In 2011, the Center took strides to connect more personally with our customers—working with them one-on-one to clarify their requirements—ensuring the best resulting products. The Department of Defense Base Realignment and Closure initiative that concluded this year also helped locate our partners at the Edgewood Area of Aberdeen Proving Ground—uniting a full Team CBRNE right here in Maryland. Proximity and open communication—as noted in the forthcoming pages—will only bolster our collaborative efforts going forward.

ECBC also took time this past year to reflect upon, engage in and develop initiatives that will further enhance the abilities of our workforce. ECBC staff members are the lifeblood of our organization and we recognize the necessity for their development—not only in 2011, but for years to come. Through developmental assignments, mentorship opportunities, team-building exercises and other activities, ECBC personnel will have the tools necessary to excel in creating the technologies of tomorrow.

In the years beyond 2011 the Center's strategy and goals are sure to evolve, but our commitment will remain—to our workforce, to our customers and to the warfighter's need for the best in CBRNE Defense. With this publication, I invite you to experience our dedication firsthand.

Sincerely,

Joseph D. Wienand
ECBC Technical Director

“The ‘B’ in **ECBC** has gone from a little ‘**b**’ to a **much bigger** ‘**B**’ with more focus on the biological aspects of **detection** and **protection**.”

Jarad Tucker I Safety and Occupational Health Manager I 8 years of service

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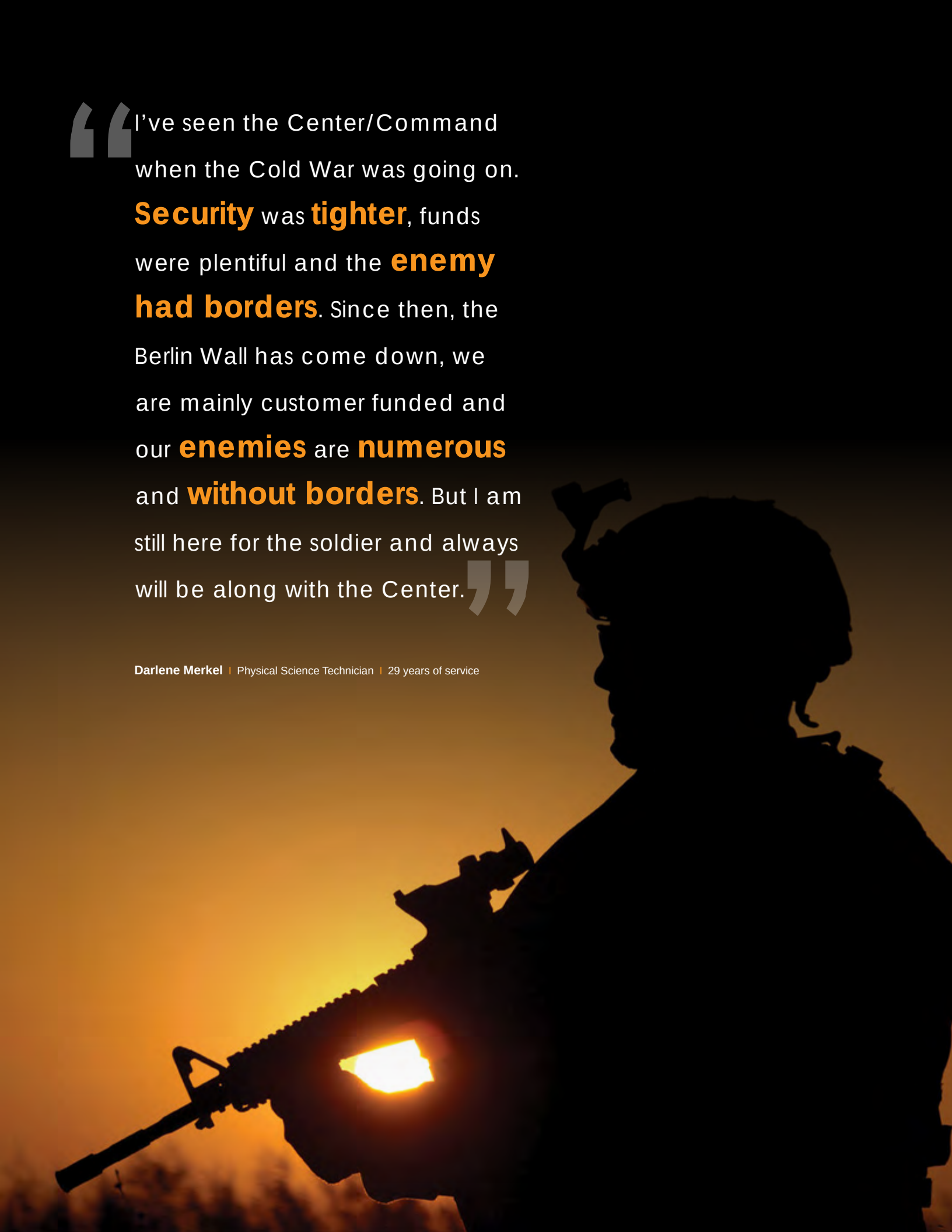


“I’ve seen the Center/Command when the Cold War was going on. **Security** was **tighter**, funds were plentiful and the **enemy had borders**. Since then, the Berlin Wall has come down, we are mainly customer funded and our **enemies** are **numerous** and **without borders**. But I am still here for the soldier and always will be along with the Center.”

Darlene Merkel | Physical Science Technician | 29 years of service

OVERVIEW

As the nation's principal research and development resource for non-medical Chemical Biological (CB) Defense, ECBC supports all phases of the acquisition lifecycle—from basic and applied research through technology development, engineering design, equipment evaluation, product support, sustainment, field operations and demilitarization—to address its customers' unique requirements. ECBC's science and technology expertise has protected the United States from the threat of chemical weapons since 1917. Since that time, the Center has expanded its mission to include Biological Defense and emerges today as the nation's premier authority on CB Defense.

The Center has a long-standing history developing technologies in the areas of CB detection, protection and decontamination. This is evidenced by inventions like the ECBC-developed Squad Homemade Explosives Screening/Cueing Kit (page 21), created to aid the warfighter in detecting homemade explosives, as well as by the Center's worldwide decontamination and remediation efforts in locations like Columboola, Australia (page 12), and Spring Valley, Washington D.C. (page 25). It is for innovations like these, that the Center's reputation and agency relationships remain strong today.

ECBC has full-time employees located at three different sites in the United States: Edgewood Area of Aberdeen Proving Ground, Md., Pine Bluff, Ark., and Rock Island, III. As a research, development and engineering center under the U.S. Army Research, Development and Engineering Command; ECBC is unique in its ability to advance the mission of the warfighter and other stakeholders by leveraging unique expertise, specialized equipment and state-of-the-art facilities.

MISSION

- Integrate lifecycle science, engineering and operations solutions to counter CB threats to U.S. Forces and the Nation.

VISION

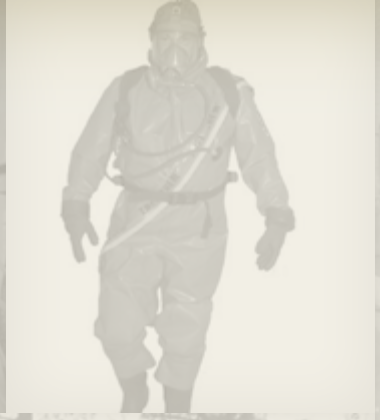
- To be the premier resource for chemical, biological, radiological, nuclear and explosives solutions, uniting and informing the national defense community.

STRATEGIC GOALS

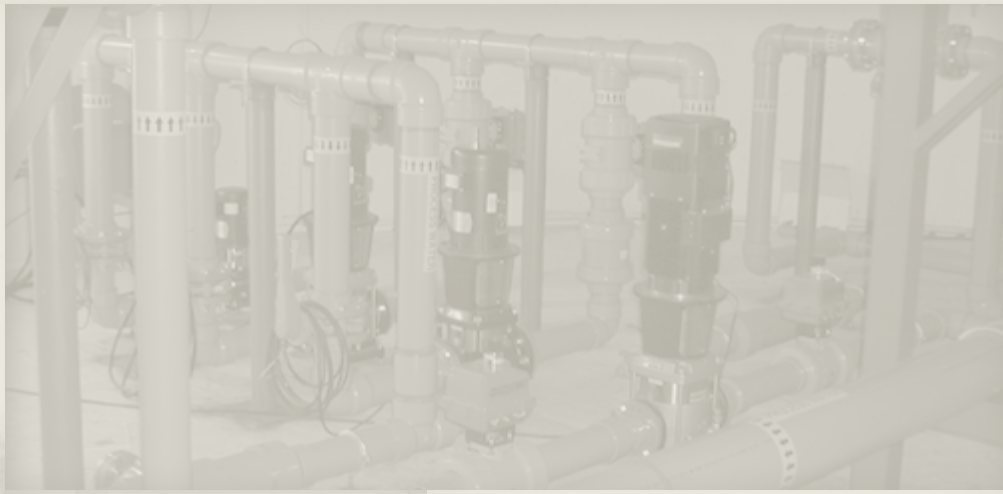
- Ensure that ECBC sustains and grows the core competencies required to counter enduring and emerging chemical and biological threats.

- Create success for warfighter and chemical, biological, radiological, nuclear and explosives clients by consistently delivering quality customer service.

- Grow and develop the workforce to ensure the continued competencies of the organization to meet evolving Chemical, Biological, Radiological, Nuclear and Explosives Defense needs.


EVOLUTION OF THE EDGEWOOD CHEMICAL BIOLOGICAL CENTER

1910

Chemical Warfare Service established

Edgewood Arsenal established to produce chemical weapons and qualify masks

1920

Medical Research Division established at Edgewood

1930

U.S. Army Industrial Hygiene Laboratory moved to Edgewood from Johns Hopkins University in Baltimore (currently known as Public Health Command)

1940

For 10 years, Edgewood focused on smoke, pyrotechnics and incendiaries

1950

Edgewood standardized the U.S. Army's first biological agent sampling kit, the M17

1960

Edgewood developed M8 Portable Automatic Chemical Agent Alarm, the first mass-produced field detector for nerve agents

1970

Edgewood standardized M157 Smoke Generator, which provided the Army with its first mobile smoke generation capability

Edgewood conducted initial work on BioDetection systems

1980

Edgewood supported Gulf War in Chemical Biological Defense

1990

Edgewood developed alternative neutralization-based technologies for disposal of U.S. chemical weapons stockpile

Nunn-Lugar-Domenici legislation enacted

Chemical Weapons Convention treaty ratified

Edgewood played critical mitigation role in the aftermath of 9/11 anthrax attacks

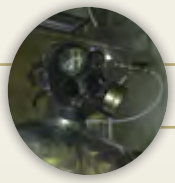
2000

Center's Domestic Preparedness Team received Hammer Award for Knowledge Transfer, Instruction Technique and Interagency Cooperation

With the National Institute for Standards and Technology and the National Institute of Occupational Safety and Health, Center developed chemical biological standards for Air Purifying Respirators and Escape Masks for civilian application

Edgewood opened new state-of-the-art Advanced Chemistry Laboratory; a 75,000-square-foot facility designed and equipped to conduct chemical agent operations

ECBC celebrated 90th birthday



Center received Research and Development Lab of the Year Award

U.S. Army Research, Development and Engineering Command received the Army Superior Unit Award

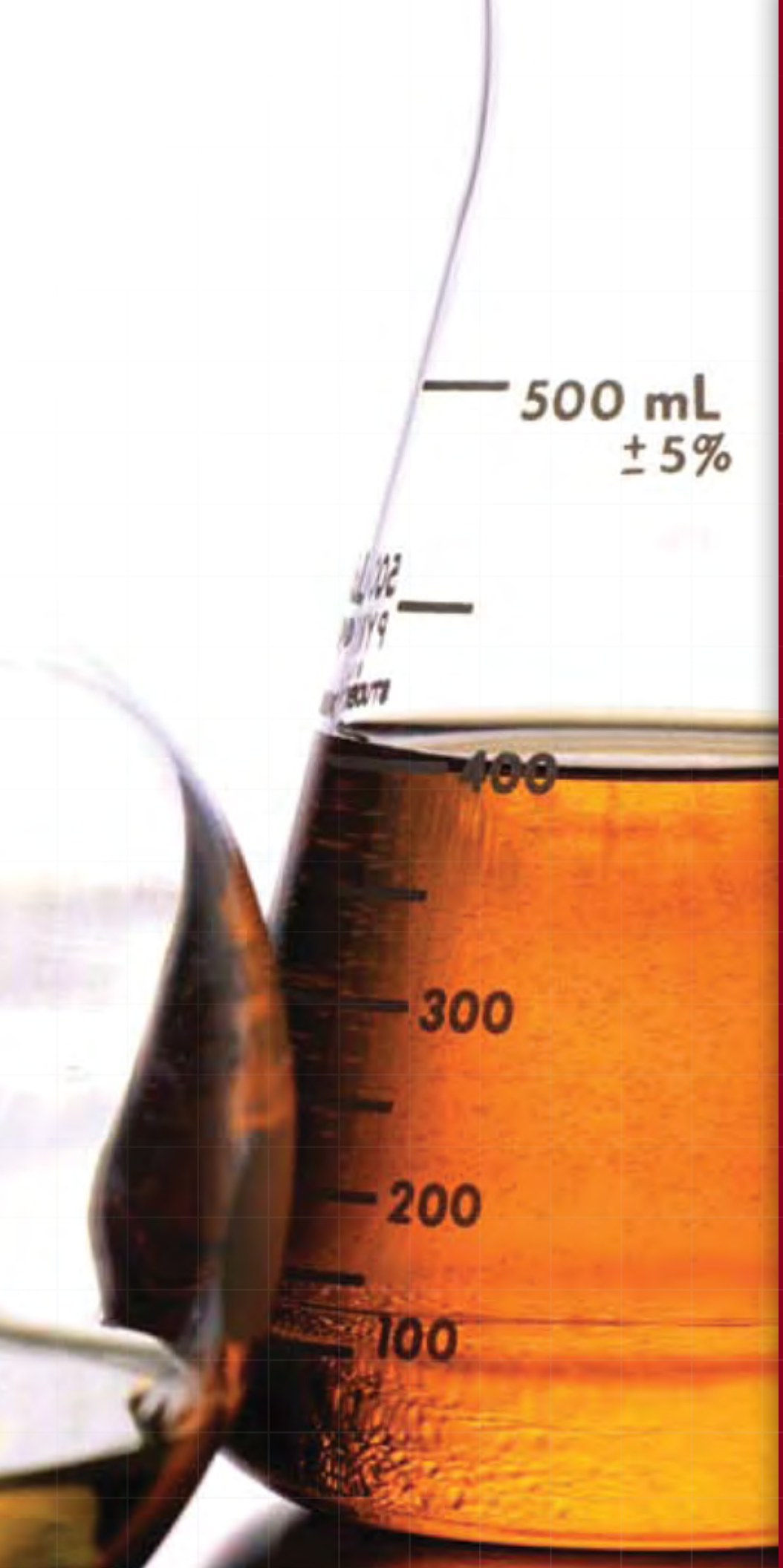
Center celebrated 10th anniversary of BioSafety Level 3 laboratory

2010

“Having never been really exposed to the military and the needs of soldiers, the Center provided an excellent environment for gaining an overall understanding of the current chemical, biological, radiological, nuclear and explosives threats to both our homeland and the world, and how our military [personnel] fight the fight.

Since I have been at the Center, I have watched the demand for explosives detection and mitigation, and subsequent training, increase to respond to the terrorist activities occurring in theater. And as the probability of a biological warfare attack becomes more prevalent, ECBC has adapted by shifting more assets toward applied biological research targeting agent identification and mitigation.”

Carrie Poore, Ph.D. | Biologist | 4 years of service



THREAT
GOAL
ACHIEVEMENTS

Ensure that ECBC sustains and grows the core competencies required to counter enduring and emerging chemical and biological threats. ▶

PROVIDING VALUABLE **TECHNICAL AND OPERATIONAL SUPPORT TO AUSTRALIA** CHEMICAL MATERIAL REMEDIATION EFFORT

ECBC's Chemical Biological Application Risk Reduction (CBARR) Business Unit has provided chemical and biological operational support all over the world, including Albania, Belgium, Canada, Guam, Hawaii, the United Kingdom, the Virgin Islands and most recently, Australia.

Currently, CBARR's work in Columboola, Australia, includes supporting the Australian Department of Defence (ADoD) chemical material remediation project. To date, CBARR has supported three phases in this effort. "Over the course of CBARR's support to ADoD, we have provided about 20 team members on multiple long-term deployments. I am extremely proud of CBARR's efforts in each of the project phases," stated CBARR Project Manager Dennis Bolt.

Phase I, the assessment phase, took place at the end of 2010. During this time CBARR worked with the U.S. Army Chemical Materials Agency, and chemical, biological, radiological, nuclear and explosives Conventional Weapons Remediation Response Team to assess 144 recovered chemical munitions. For Phase I, CBARR provided personnel and equipment needed to complete low-level chemical agent monitoring and analytical support as well as safety and program management support.

Phase II, the destruction phase, focused on destroying the recovered munitions from Phase I. Destruction operations took place from February to May 2011. During this time period, CBARR partnered with companies CH2MHILL and AECOM through two separate cooperative research and development agreements (CRADA). In supporting CH2MHILL, CBARR provided explosives operators and equipment specialists to help operate its Transportable Detonation Chamber T-60. CBARR's support to AECOM included providing near real-time (NRT), low-level chemical agent monitoring and analytical support. For the monitoring efforts, CBARR provided an analytical laboratory and the associated equipment and personnel. CBARR also provided critical infrastructure support equipment such as 5,000-cubic-feet-per-minute chemical agent filter systems, generators, power distribution equipment and personal protective equipment.

Presently, the project is in its third phase, which began in June 2011 and is ongoing. This phase involves the surveying and recovery of suspected buried chemical munitions over an area of approximately 700 hectares. For this work, ECBC has CRADAs with two companies: Milsearch and AECOM. In supporting Milsearch, CBARR has provided specially trained personnel working to recover suspected chemical warfare materials. This includes explosive ordnance disposal technicians, explosive operators, excavator operators and D2PC Modeler/command post operators. Similar to Phase II, CBARR is supporting AECOM by providing personnel and equipment needed to conduct NRT monitoring and analysis. This includes providing and operating four mobile, near-time miniature chemical agent monitor platforms and one fixed analytical laboratory. To date in Phase III, CBARR has analyzed approximately 550 soil/liquid samples and more than 1,200 depot area agent monitoring system samples.

Throughout the year, CBARR has successfully helped ADoD meet its goal and "as the investigation phase continues, CBARR will continue to provide any additional support that may be needed," said Bolt. ●

CBARR supports ADoD in both the laboratory and the field.

ECBC CELEBRATES 10TH ANNIVERSARY OF **BIOSAFETY LEVEL 3 LABORATORY**

As soon as the ECBC BioSafety Level 3 (BSL-3) Laboratory in the McNamara Life Sciences Research Facility opened on Sept. 5, 2001, the laboratory was a hotbed of activity. ECBC had been called upon by the Department of Defense to support the subsequent reaction to the anthrax-letters attack of 2001 by researching methods of monitoring and detection for chemical biological (CB)-laced mail.

In 2011, ECBC celebrated the BSL-3 laboratory's 10th anniversary. The laboratory allows ECBC to conduct research on some of the most deadly CB warfare agents in the world. This work is imperative to ensuring the safety of our nation and warfighters. One of 45 BSL-3 laboratories in the nation, it has been especially integral to ECBC's support to operations such as the War on Terror and Operation New Dawn.

"Not only have we had many accomplishments, but we have done it with precise accountability under our surety regime," said Joseph L. Corriveau, Ph.D., director of the Center's Research and Technology Directorate.

A high-containment biological facility, the BSL-3 laboratory has state-of-the art capabilities in the areas of isolation, identification, preparation, characterization and testing of highly pathogenic bacterial, viral and fungal microorganisms. Within the laboratory, ECBC scientists process a wide variety of research projects involving pathogenic organisms and their simulants in support of military and civilian agencies. These operations both enhance military biological capabilities and support the research and development needs of private industry.

One of many noteworthy achievements in the BSL-3 laboratory was the support of mail re-aerosolization studies by ECBC scientists. This interagency (Federal Bureau of Investigation, Department of Homeland Security, Environmental Protection Agency [EPA]) sponsored program investigated how anthrax spores were spread among letters during the 2001 anthrax-letters attack and had direct impact on mail safety in this country.

Another significant achievement has advanced efforts with decontamination and persistence. EPA-sponsored programs investigating the efficacy of novel decontaminants and the persistence and recovery of pathogenic biological agents in the environment, including water and landfills, has allowed the EPA to make more informed decisions on the correct course of action involving decontamination or remediation. Comparative work with select agents and their surrogates provided data in support of effectiveness of different decontamination technologies, such as vapor hydrogen peroxide, chlorine dioxide, and hot humid air in decontamination of building interior and sensitive platforms, such as large-frame aircraft interior.

"The deadly agents that our scientists and researchers handle daily are the keys to protecting humankind from these very things," said ECBC Technical Director Joseph D. Wienand. "Our research and development of CB detection technology in the next decade after these 10 successful years will help shape the face of the fight against chemical and biological terrorism." ●

A researcher assesses a sample inside a glovebox, a sealed environment within the BSL-3 laboratory

A researcher handles a toxic chemical in ECBC's BSL-3 laboratory

ECBC DEVELOPS NOVEL MEDIUM TO IMPROVE **MASK FILTRATION**

Principal Investigator Greg Peterson sets up a micro-breakthrough test system in order to determine the chemical capacity of a ZZAT variant.

T. Grant Glover, Ph.D., (ECBC-SAIC) works with air-sensitive materials in a glovebox, synthesizing candidate novel materials for use in filters.

ECBC scientists are using state-of-the-art nanotechnology and materials science to improve mask filtration. Investigators and researchers are leading efforts to increase filter and mask efficiency, broaden filter capabilities to meet emerging threats and reduce the burden to the warfighter.

Under this effort, ECBC experts developed a novel filtration medium known as ZZAT (zinc-zirconium-argentums [silver]-TEDA), with demonstrated performance over the current legacy carbon-based media, ASZM-T (activated carbon, impregnated with copper, silver, zinc, molybdenum and Triethlyenediamine).

Since World War I, air purification technologies have depended on activated, impregnated carbons for removal of toxic chemicals. Activated, impregnated carbon removes persistent vapors via physical adsorption while relying on chemical reactions to remove blood and choking agents. Although the current activated carbon formulation, ASZM-T, meets toxic vapor requirements, the medium is not without issues. First, persistent vapors are not decomposed but merely retained, requiring additional media and weight to achieve required capacity. Second, the removal capacity for many reactive chemicals depends on the deposited metals—known as impregnants—as the carbon substrate provides minimal contribution to the reaction capacity.

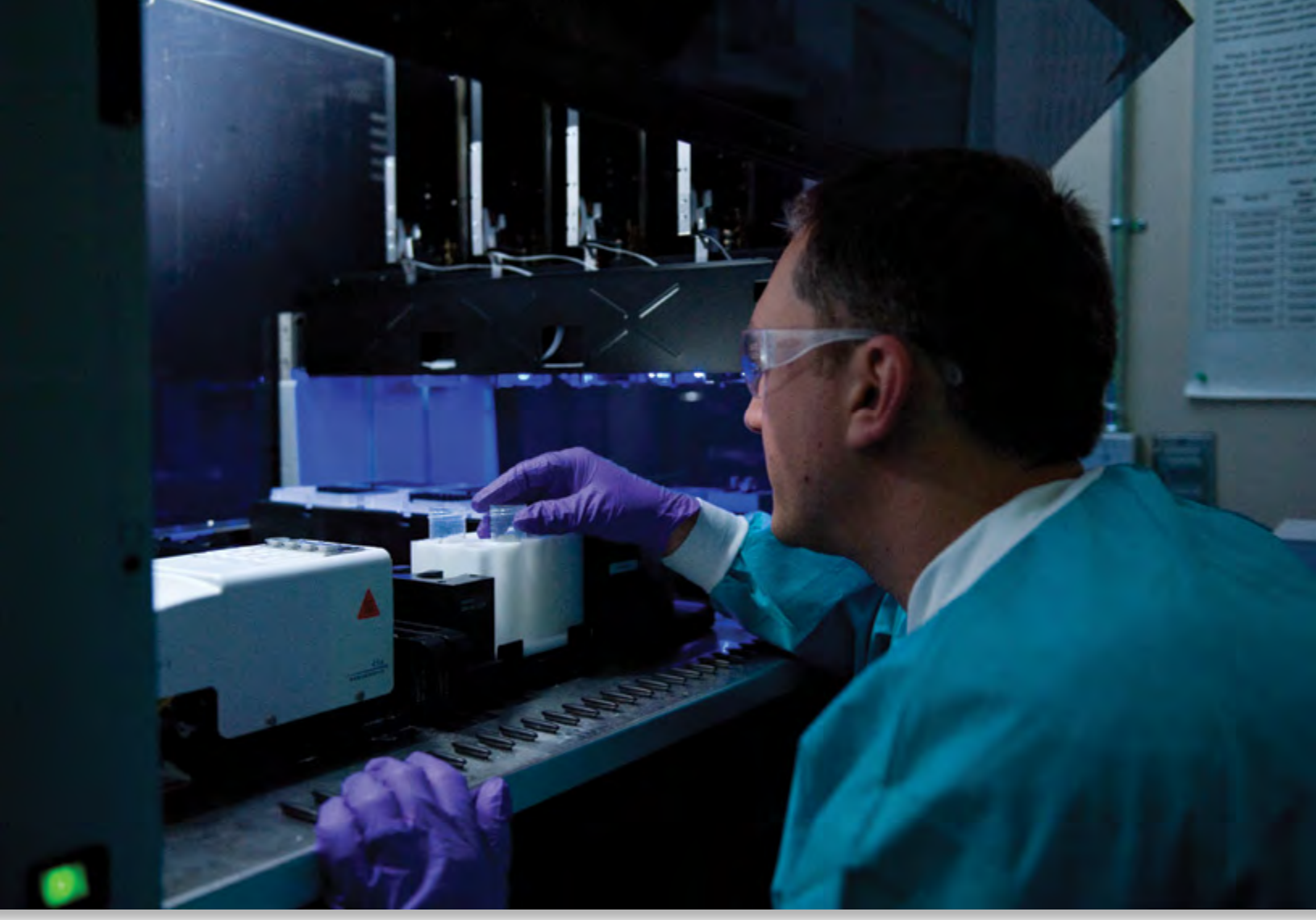
To overcome these shortcomings and increase filter capability, ECBC developed ZZAT under a Defense Threat Reduction Agency-Joint Science and Technology Office (DTRA-JSTO)-funded program. This novel medium has proven ability to far out-perform ASZM-T in its power to remove traditional military blood and choking compounds, as well as acidic/acid-forming, toxic industrial chemicals such as chlorine, hydrogen chloride and sulfur dioxide. The material was developed employing commercially available raw materials and is prepared using scalable manufacturing procedures. It is a non-carbon alternative to ASZM-T with the intention of first being transitioned into individual respirator applications. If successful, transition of the medium into collective protection filters will follow.

The new material “will provide improved physical characteristics, such as being inherently reactive; offering greater stability and capacity; and being non-flammable,” principal investigator Greg Peterson said.

ZZAT intends to outperform ASZM-T by employing a reactive substrate, meaning that the substrate itself, zirconium hydroxide, displays significant reaction capacity. Aside from contributing to the removal of toxic vapors, the reactive substrate allows for achieving a high dispersion of impregnants, plus serves to anchor the impregnants to the surface of the substrate, minimizing impregnant migration.

“It’s a paradigm shift from a filter capturing something to a filter that’s reactive and not just captures but also destroys a toxic compound,” said Rick Cox, Ph.D., chief of the Center’s Chemical, Biological and Radiological Filtration Branch

Transition of the material is scheduled for 2012, with current work focused on maturing manufacturing readiness. A technology transition agreement between DTRA-JSTO and the Joint Program Manager for Protection has been signed, and a toxicity clearance from the U.S. Army Public Health Command has already been granted. ●



GENOMIC SEQUENCING EXPERTS SUPPORT
WARFIGHTER DEFENSE NEEDS

The ECBC Genomic Sequencing Center is a Department of Defense (DoD) resource for sequencing efforts in support of the warfighter. Genomic sequencing will play a significant role in next-generation diagnostic systems.

ECBC has been supported by the Defense Threat Reduction Agency-Joint Science and Technology Office as one of the DoD sequencing labs since 2008. “What makes ECBC unique among other Department of Defense, commercial and academic sequencing efforts is that our mission is to rapidly detect and characterize pathogens through sequencing,” said Supervisory Biologist and BioSciences Division Chief Peter Emanuel, Ph.D.

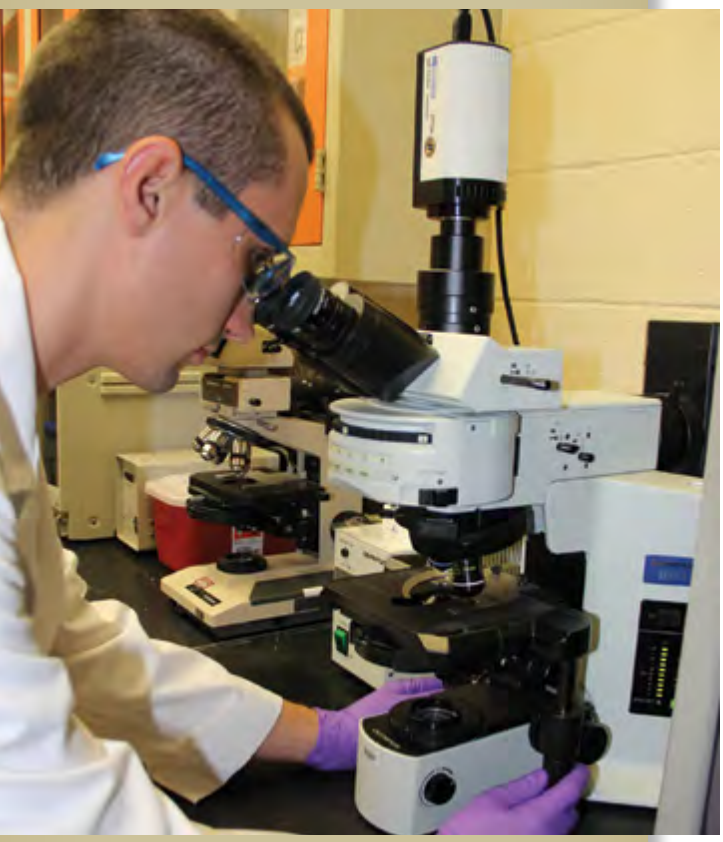
ECBC has dedicated its genomic research effort toward preparing for the eventual deployment of sequencing technologies to the field to support the warfighter. To support this end, ECBC has sequenced more than 350 bacterial pathogens of interest to the DoD. ECBC has also been involved in several studies evaluating how pathogens evolve over time. One of the first studies in this area, published this year in the journal PLoS ONE, evaluated how sequencing can support microbial forensics analysis.

“Our greatest strength is our scientific leads,” said Mary Wade, Ph.D., supervisory biologist and chief of the BioDefense Branch. “Dr. Henry Gibbons, Dr. Sofi Ibrahim, Dr. Mohamed Ait Ichou and Dr. Nicole Rosenzweig lead our bacterial, viral, metagenomics and bioinformatics efforts respectively. Each can be called to action with his supporting team should an unknown enter the door.”

ECBC can receive any biological unknown to conduct a thorough pathogen characterization. This evaluation would assist in field decision support, medical countermeasure development and detection assay improvements.

In the future, though, the DoD will improve its biological defenses by deploying sequencing capabilities into the field. Within three to five years, these technologies will be more robust, miniaturized and hardened to make deployment a possibility. ECBC is evaluating the best candidates for deployable whole genome sequencing. These capabilities still require improved sample processing techniques and analytical pipelines to translate the sequencing data into decision support tools. These are the areas ECBC will continue to pursue in fiscal year 2012. ●

BARCODED ANTHRAX SPORES REVOLUTIONIZE BIOSIMULANT TECHNOLOGY



Biology Laboratory Technician Jacob Bucher examines Bacillus thuringiensis spores for physical properties similar to anthrax.

Research Biologist Joe Kragl, with the BioSciences Division, samples barcoded Bacillius thuringiensis spores during fermentation.

Following the bioterrorism-related anthrax attacks of 2001, a total of 22 anthrax cases were identified. Eleven of those cases were confirmed as inhalation anthrax. The cleanup required was expensive and time-consuming, partially due to the inability at the time to accurately trace where the anthrax spores went and how many of those spores remained alive. ECBC researchers are developing tools that will now allow researchers to answer these questions.

ECBC has been studying anthrax in varying forms for more than 10 years. Currently, the Center is creating distinctive, non-pathogenic *Bacillus thuringiensis* simulant strains to monitor how spores respond or persist when released into the environment.

“It will allow us to tell what we are releasing today from what we released months ago; as well as tell our strains apart from what everyone else—including Mother Nature—might be releasing. It’s the best of both worlds—a natural strain signed lightly with our genetic pen,” said microbiologist Henry Gibbons, Ph.D., of the ECBC BioSciences Division who is leading the research.

Spores, including *Bacillus anthracis*—the causative agent of anthrax—are dormant and extremely hardy forms produced by certain fungi and some bacteria. The harmless *Bacillus thuringiensis* variety was chosen as a simulant because of its physical similarity to anthrax spores. The Defense Threat Reduction Agency funded ECBC research to build unique genetic tags called “barcodes” into each of the *Bacillus thuringiensis* strains. They are cultured in fermenters up to 1,500 liters and paired with a barcode-specific detection assay. Once the strains are released into the air, they will be able to learn more about how bacterial spores behave when discharged into an open environment.

Testing of this type has never been performed for this purpose, making the research beneficial to the Department of Defense, Department of Homeland Security and Environmental Protection Agency. The data collected will have endless opportunities for further research and development of anthrax-detection devices in the future.

“It is very exciting to work on a project that will change the way we perform simulant testing out in the field,” said BioSciences Research Biologist Patricia Buckley. “This technology will expand field testing capabilities here at ECBC as well as provide a new and patentable approach for the entire BioDefense community to utilize.”

Testing will take place at the Edgewood Area of Aberdeen Providing Ground, Md., between late 2011 and early 2012, a time period that affords optimal conditions for spore analysis. ●

PACKAGING BRANCH'S DEAN HANSEN PATENTS **INNOVATIVE, MILITARY PACKING CONTAINER**

ECBC Packaging Branch's Dean Hansen is thinking outside of the box—literally. After three years in the making, Hansen has successfully patented a revolutionary, reusable military packing box that will allow for increased durability, longevity and customization to remain concurrent with item design.

In 2008, Hansen was asked to attend a packaging system test of an antiquated fiberboard technology at the Aberdeen Test Center. Afterward, Hansen believed he could create an affordable, more resistant packaging technology, and within a week's time designed an aerial deliver box to meet new requirements.

After experimenting with a variety of box materials, Hansen had what some innovators would call a "light bulb moment." Two commercial off-the-shelf (COTS) items were the key to this new way of military packing—Polystyrene and truck bed liner.

Since the American Revolution, most military packing boxes have been wooden. Hansen's innovative box is made of Polystyrene—also known as Styrofoam—and sprayed with a polyurethane coating, commonly used as a truck bed liner. Originally, the idea for the materials occurred to Hansen when he discovered Polystyrene coolers, similar to the disposable ones found in grocery stores, were the basis for shipping bio-assays to warfighters in the Middle East. The packages had less-than-adequate insulation and crushed under a normal pressure load. "These new boxes are two-thirds the cost of the wooden boxes and one-third the weight of them," Hansen said. "The polyurethane truck bed liner is not only readily accessible at a moment's need, it is incredibly tough, lightweight and environmentally friendly."

Items in the military distribution chain are rarely provided additional storage protection, and are exposed to multiple handlings and modes of transport. Therefore, Hansen's new boxes are designed to offer protection to items in any global environment. "Our team dovetailed the box's joints to allow for hot and cold temperature transfer after spraying the Polystyrene container with the truck bed liner," Hansen said. "Then we subjected it to several rounds of testing—compression testing, manual handling, loose cargo, dropping it from set heights and environmental testing."

The new containers exceed requirements for current military packaging testing, resisting any deflation at 35,000 pounds of compressed-load strength. They can sustain a toss out of a helicopter moving at 110 knots air speed, 100 feet in the air or make a jolting landing on land or sea with contents unscathed. Not only water and vapor proof, the boxes also float.

By using COTS items, the Packaging Branch is now able to meet urgent requests for the new boxes, providing direct packaging assistance to the warfighter within as little as six weeks. The first shipment of the containers went out in early August 2011, with work to convert the technology to the commercial sector currently underway. ●

Senior Packaging Specialist Dean Hansen successfully patented a revolutionary, reusable military packing box that will allow for increased durability, longevity and customization to remain concurrent with item design.

CENTER PARTNERS WITH DEPARTMENT OF HOMELAND SECURITY ON THIRD-GENERATION BIOWATCH DEVICE

Public and governmental awareness of terrorism involving biological weapons increased sharply during the 2001 anthrax attacks in the United States, which left five people dead and spread fear across the country. Since then, the federal government has implemented several measures to bolster preparedness and mitigate the impacts of any future biological attacks. Among the measures pursued, the BioWatch program, supported by ECBC, stands apart for its ability to provide early warning of an airborne biological attack.

BioWatch is the only federally managed, locally operated, nationwide bio-surveillance system designed to detect the intentional release of select aerosolized biological agents. The program operates in more than 30 national, high-threat metropolitan areas and is used to support special events, including the Super Bowl and the Presidential Inauguration.

The program protects millions of people by focusing on early detection of a biological attack. Early detection is critical to the successful treatment of affected populations and provides public health decision makers more time to respond to a bioterrorist event. BioWatch may also help provide forensic evidence on the source and nature of such an attack, which is critical to law enforcement investigations.

BioWatch is managed by the Department of Homeland Security (DHS) Office of Health Affairs and operated by a team of field personnel, laboratory professionals and public health officials from city, county, state and federal organizations. This coordinated team is responsible for installing and maintaining bio-collectors, collecting daily samples, analyzing and reporting laboratory results, and planning for and responding to the detection of a positive signal.

DHS is considering plans to increase the capability of the BioWatch system by augmenting and ultimately replacing the current collection and biodetection capability with an autonomous one, called Generation-3, which will improve timeliness, population coverage and cost effectiveness. Due to ECBC's expertise in airborne pathogen detection, BioWatch approached the Center in 2010 to evaluate performance characteristics of Generation-3's aerosol collection subsystem.

"We had successfully worked with DHS on a few small projects in the past," said Daniel Wise, an aerospace engineer in ECBC's Aerosol Sciences Branch. "It was very satisfying to see our previous efforts pay off when they approached us to be the Independent Test Agency for the Gen-3 project."

During its assessment, ECBC tested two vendor systems for the ability to efficiently capture and concentrate airborne particles, which would ultimately be analyzed for pathogen identification. Long periods of sample collection were performed to provide a snapshot of the technology's retention of collected particles. ECBC's aerosol wind tunnel was also utilized to mimic actual environmental wind speeds.

The evaluation concluded in 2011, with ECBC praised for its professionalism and rapid execution. Phase II testing is expected to begin at the Center in 2012. ●

Environmentally controlled, BioSafety Level 1 chamber where testing of the Generation-3 BioWatch device was conducted

PROVIDING CRITICAL SUPPORT TO JOINT PROGRAM MANAGER FOR NUCLEAR, BIOLOGICAL AND CHEMICAL CONTAMINATION AVOIDANCE MISSION

Whether it is ECBC's ability to provide capability-based expertise to further the Joint Project Manager for Nuclear, Biological and Chemical Contamination Avoidance (JPM NBC CA) mission or to support inter-organizational activities, JPM NBC CA Col. Daniel J. McCormick and Deputy JPM NBC CA Nancy Kammerer agree, the JPM would not exist—people or capability—without ECBC.

"Our established relationships with the Center, and in particular within the Engineering Directorate, span the full lifecycle. They provide a critical foundation for the mission capabilities of JPM NBC CA," Kammerer said.

JPM NBC CA's sole purpose is to bring operational capability to the warfighter. The JPM is responsible for the development, production, integration, testing and fielding of NBC detection, obscuration and reconnaissance systems.

As the Department of Defense continues to place a greater emphasis on affordability and productivity in defense spending, the cross-level expertise across ECBC and JPM NBC CA's workforces allows the organizations to do more with less, shaping technology that is placed in the hands of the warfighter.

"We're stepping into transformational times. As our operations in Iraq and Afghanistan shift, the needs of the warfighter continue to evolve. Faced with the challenges of having to do more with less, we see an opportunity to become even more efficient," McCormick said.

The relationship between the two organizations has already allowed ECBC and JPM NBC CA to take steps toward those efficiencies.

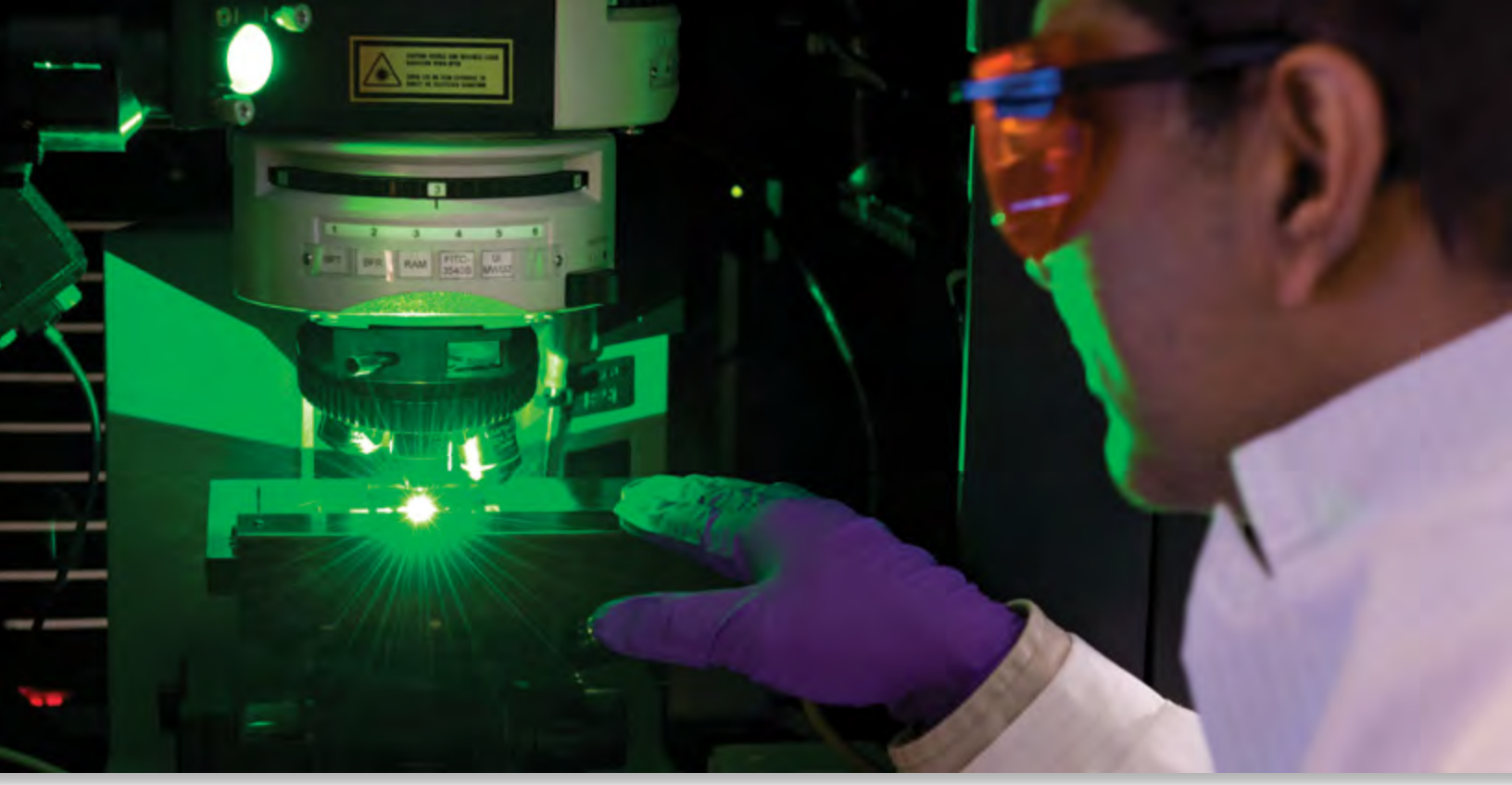
"We've been able to use each other's relationships with the Department of Homeland Security and the national security staff to strengthen our relationships at this level of government. This has allowed us to ensure that our product goes to the warfighter but also appropriately benefits our Department of Homeland Security partners," McCormick said. "Our organizational partnership allows us to ensure that our core competencies are maintained. We are able to jointly work a larger mission set, ensuring that we go through these challenging years maintaining the capabilities that ECBC and JPM NBC CA represent." ●

Col. Daniel J. McCormick

Nancy Kammerer

"**ECBC** has **improved** coordination with all **services**, **government agencies** and **other nations** to accomplish [our mission], **better utilizing** our **resources**."

Sally Clark Edler | Mechanical Engineer | 31 years of service



RAMAN CHEMICAL IMAGING DETECTS EXPLOSIVES IN **FINGERPRINTS**

As improvised explosive device (IED) attacks continue at home and abroad, linking trace evidence, such as explosive residues and other bomb-making materials, to a perpetrator has become increasingly essential in countering these terrorist events. ECBC scientists are developing the tools that enable simultaneous collection of chemical forensic information and biometric data, which could be the one-two punch that brings terrorists to justice before they can attack again.

A team in the Center's Laser Standoff Detection Branch is using a detection technique called wide-field Raman chemical imaging (RCI) to detect and identify the presence of trace explosives in contaminated fingerprints on surfaces, such as plastics and painted metals. Because this technique is non-destructive, requires no sample preparation and gives a high degree of chemical specificity, explosive materials can be identified without compromising the fingerprint sample for further biometric analysis. If visual images of the fingerprint can also be obtained without modifying the sample, then identification of the person who handled the explosive could also be obtained non-destructively.

"We've used RCI to analyze fingerprints on five types of samples, including compact disks (CD), plastic CD cases and painted car door panels. So far, there is not a surface that we cannot analyze with our method," said Jason Guicheteau, Ph.D., of the Laser Standoff Detection Branch. "We've been able to accurately discriminate 25 different explosive materials from these surfaces, including materials commonly used in the construction of IEDs."

To perform RCI for the identification of explosives in fingerprints, a complete fingerprint montage image is constructed by obtaining a series of magnified images of the fingerprint on the investigated surface. From this montage, regions suspected of containing explosive crystals are identified by an automated program simply looking for contrasting visual indications of crystals. A laser is then used to optically excite the identified areas of interest in the fingerprint, resulting in a Raman spectrum. The spectrum is processed to remove interfering background spectral information and compared to a library database of approximately 25 explosive materials of interest. RCI requires no additional processing of the fingerprint, such as sampling with a piece of tape or with dusting with powder, which significantly reduces sample contamination and damage to the print, preserving valuable biometric data.

Recently, fingerprints generated by RCI were submitted to the U.S. Army Criminal Investigation Laboratory (USACIL) and run through the automated fingerprint identification system (AFIS). The high quality of the RCI fingerprints enabled researchers to search AFIS' 771,000-print database and confirm the fingerprints as matches to real people, proving that RCI can be used to produce accurate biometric information for forensic attribution. This recently patented method demonstrates the ability to non-destructively identify explosives of fingerprints present on commonly found surfaces such that the fingerprint remains intact for further biometric analysis.

Through continued engagement with USACIL, the team plans to expand the applications of RCI to detect and identify illegal drugs and gunshot residue from fingerprints. ●

HOMEMADE EXPLOSIVES DETECTION KIT: AN URGENT RESPONSE TO THE WARFIGHTER

With terrorist attacks occurring regularly across the globe, the need for an easy-to-use, lightweight and reliable homemade explosives (HME) detector is critical. ECBC has leveraged proven colorimetric technology and engaged an advanced rapid prototyping process to engineer, from the ground up, a purpose-designed prototype for screening HME precursors with the needs of the end-user in mind: the U.S. Army Infantry Squad Soldier.

The ECBC-developed Squad HME Screening/Cueing Kit is a field prototype based upon proven colorimetric chemistry designed to screen for certain materials that are commonly used to make HME across the current theaters of operation.

The kit is small, lightweight and doesn't require a power source. Chemical reagents stored within the device produce color changes in reaction with four select HME precursors: two fuels and two oxidizers. Materials that include both a fuel and an oxidizer could possibly be explosives. The capability to determine if either or both are present in a single sample with one quick test allows the warfighter to take action immediately.

The kit is a rapid development response to an urgent need expressed by user representatives at ECBC and the U.S. Army's Maneuver Support Center of Excellence and Maneuver Support Battle Lab (MSBL) in Fort Leonard Wood, Mo.

The ECBC prototype empowers Infantry Squads and similar organizations with a self-contained capability to screen unknown materials to determine if they are legitimate agricultural or industrial products, or prohibited chemical precursors suitable for fabrication of HME.

"The Army needs this capability," said Mike Cress, ECBC technical representative to the MSBL. "And to meet their need, ECBC has created a very lightweight product—less than one percent of soldier load—that is very easy to use, needing not more than a few minutes of training, is multi-functional and is reasonably inexpensive."

The first-generation model of the kit was successfully evaluated in a Military Utility Assessment conducted by the MSBL in June 2011. The lab concluded that the kit enabled soldiers to rapidly screen HME precursors, in samples presented to them as randomized blind trials, with accuracy and confidence after minimal training.

Once the kit is fully tested and fielded, it will not only be available to the warfighter but to first responders who—due to budget, storage and time constraints—will also benefit from the device's affordability, small size and usability.

With the ever-present threat of terrorism, "this kit is built with one intention, which is to save lives," shared James Genovese, chief of ECBC's Innovative Development Engineering Acquisition Team. ●

"The most notable change that I have experienced within ECBC is the Center's ability to quickly adapt to changing technologies and current threat levels.

The Center as a whole has become more customer focused and has worked hard to ensure that it has the resources and staff to research, develop, design, build, test and support the products that sustain the warfighter. Its diligence to provide its customers with the very best product has made the Center a leading authority and recognized subject matter expert in matters relating to chemical, biological, radiological, nuclear and explosives, and I am proud to be a part of such a diverse and innovative organization."

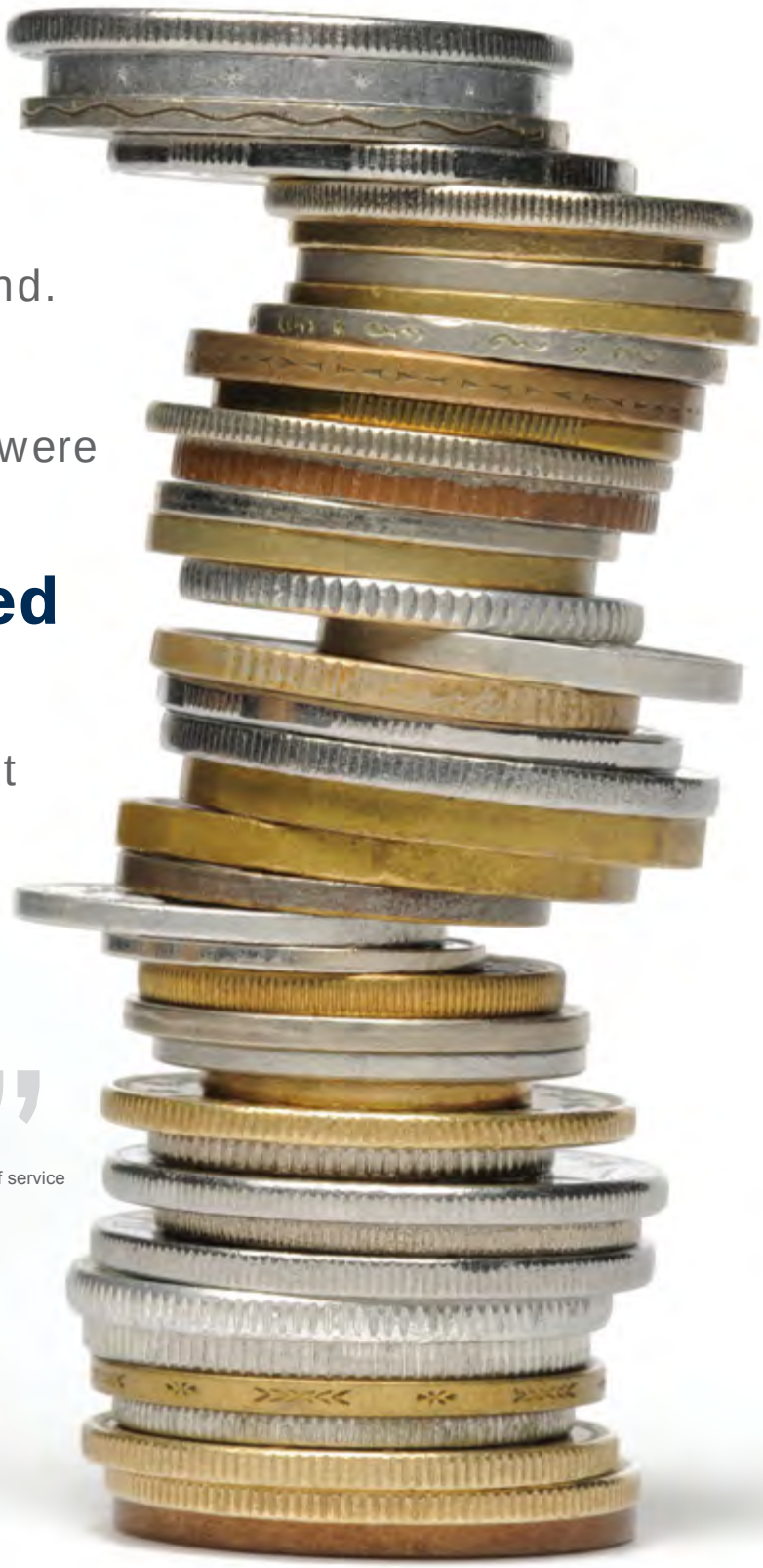
Mary McNally | Supervisory Chemist | 23 years of service

CUSTOMER GOAL ACHIEVEMENTS

Create success for warfighter and chemical, biological, radiological, nuclear and explosives clients by consistently delivering quality customer service. ►

“Being a **decision analyst** at ECBC has shown me that there are other opportunities for people with a science background. Budgets are **much tighter** now than they were when I started, which has emphasized the **need** to spend time up front on projects to **ensure** that my and my customer’s decisions provide the greatest overall benefit for the **cost**.”

Shawn E. Bowen | Chemist, Decision Analysis Team | 5 years of service



SUPPORTING THE U.S. ARMY CORPS OF ENGINEERS IN THE **SPRING VALLEY CLEANUP**

Hidden beneath the idyllic Washington, D.C. neighborhood of Spring Valley are remnants from years of chemical production and munitions testing. Originally discovered in 1993, thousands of munitions have been unearthed that were originally left in 1918 by soldiers who used the Washington, D.C. neighborhood prior to its development to make and test chemical weapons.

All cleanup efforts have been led by the U.S. Army Corps of Engineers, with ECBC's Chemical Biological Application Risk Reduction (CBARR) Business Unit first hired in the late 1990s to lend support—a charge it has been committed to for more than 12 years. "CBARR's support to the Army Corps of Engineers was originally only supposed to last six months; to still be successfully supporting the customer after so many years makes me extremely proud," said John Ditillo, CBARR remediation project manager.

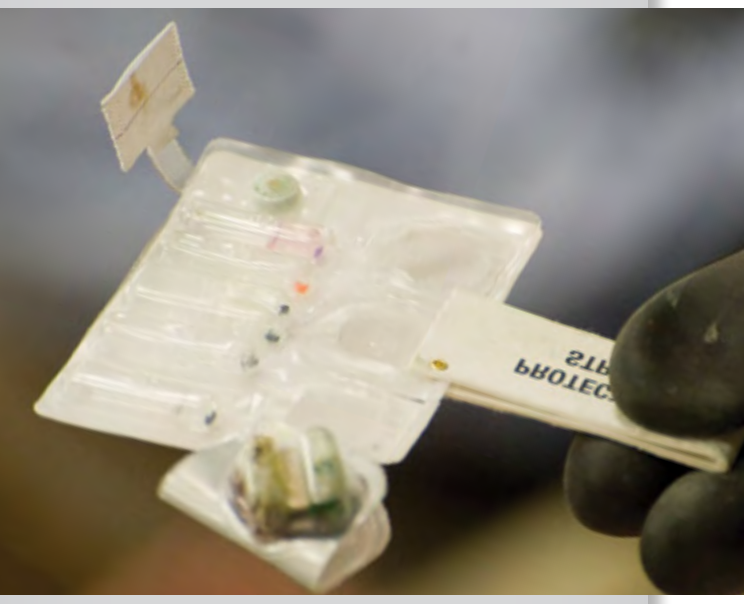
Previously, CBARR's cleanup assistance to the Army Corps of Engineers has specifically focused on decontamination and remediation. In 2011, most of CBARR's efforts have been centered on decontamination and destruction. In January 2011, CBARR brought the ECBC-owned Transportable Detonation Chamber (TDC) T-30 to Spring Valley. The TDC T-30 is used to destroy conventional explosives with no chemical agents and has the ability to destroy a large number of samples in one day. Prior to the TDC T-30, CBARR used the U.S. Army Chemical Materials Agency-owned Explosive Detection System, which neutralizes chemical agents and has the ability to handle a small amount of explosives. In the months since the TDC T-30 was first brought to site, the team has destroyed approximately 100 items, including 15 known explosives and numerous unidentifiable items.

Personnel assess CBARR equipment used in the decontamination and remediation of the Spring Valley site.

Beyond providing destruction systems, CBARR has also supported the Army Corps of Engineers by providing air monitoring, chemical analysis and air filtration systems and structures to protect residents from possible hazards. "Over the years, CBARR has provided team members with many different specialties to support the essential remediation and disposal efforts in Spring Valley," said Adam Baker, CBARR chemical engineer and explosive destruction project manager. "Together with the Army Corps of Engineers, we have been able to destroy more than 130 recovered items, helping to keep the neighborhood safe. It's rewarding to be part of such important work."

The impact of CBARR's support to the Army Corps of Engineers can be seen in the recent recognition the team received. In March 2011, Brig. Gen. Peter A. DeLuca, North Atlantic division commander and division engineer for the U.S. Army Corps of Engineers, presented CBARR members with a certificate of appreciation. The award commemorated CBARR's outstanding service during the planning and execution of the conventional munitions destruction operation at Spring Valley. The CBARR Team was lauded for the knowledge, professionalism and dedication they brought to the project. ●

DETECTION ENGINEERING BRANCH PARTNERS WITH JAPAN MINISTRY OF DEFENSE TO IMPROVE MILITARY **CHEMICAL OPERATIONS**



Engineering Directorate Detection Engineering Branch (DEB) and the Japan Ministry of Defense, Technical Research and Development Institute, Advanced Defense Technology Center, partnered in the research, design, fabrication and testing of a chemical agent detector prototype, the Palm-sized Automated Chemical Agent Detector (PACAD). Physical testing of the PACAD was completed at ECBC in October 2011. Above, DEB Chief William Argiropoulos and a member of the Japanese user test group discuss results from October's physical test.

The ECBC Detection Engineering Branch (DEB) and the Japan Ministry of Defense (MOD) Technical Research and Development Institute and Advanced Defense Technology Center (TRDI-ADTeC) have continued to partner together on a Cooperative Research Project to improve an existing chemical agent detector.

In March 2008, the two partners agreed to the project's Memorandum of Understanding (MOU) objectives to research, design, fabricate and test a chemical agent detector prototype called the Palm-sized Automated Chemical Agent Detector (PACAD), based on the chemistry of the U.S. M256A1 Chemical Agent Detector and Japanese expertise in microfluidic, electro-optical and miniaturization technologies.

As part of the MOU, TRDI-ADTeC leads fabrication efforts while DEB directs testing of the PACAD prototypes. To ensure the project's smooth progression, joint meetings and visits are regularly coordinated—like the PACAD prototype user-based assessment hosted by DEB, Feb. 28 through March 1, 2011, at the Edgewood Area of Aberdeen Proving Ground, Md. During the assessment, four soldiers from various local U.S. Army Reserve units, representing the user community, provided documented feedback on the PACAD's functional capabilities and desired features as compared to that of the baseline M256A1 Chemical Agent Training Kit.

"The overall ease of operation for the PACAD is much better compared to the M256A1," said Sgt. Ryan Waters, a chemical, biological, radiological, nuclear non-commissioned officer (74DL4), U.S. Army Reserve, 130th Chemical Company (Biological Integrated Detection System). Capt. Joseph F. Gordon, an environmental health scientist (72D), U.S. Army Reserve Consequence Management Unit, commented on the fewer required procedures by the operator and the elimination of manually crushing the ampoules as a potential benefit of the PACAD prototype. A soldier of TRDI, MOD, Japan also joined the U.S. soldiers to operate the prototype during the assessment comparison trials with the baseline M256A1 Training Kit.

The benefits resulting from the project have been recognized throughout the DEB and TRDI-ADTeC communities. Commenting on the professionalism and exceptional work of all parties involved, DEB Chief William Argiropoulos noted, "The success of this project is also attributed to the teaming efforts between the Center's DEB, Advanced Design and Manufacturing Division and other ECBC test laboratories."

A technical officer from TRDI-ADTeC also noted: "Originally, we did not have sufficient test procedures in place for the adoption of the M256A [Chemical Agent Detector] Kit to the PACAD. With this cooperative in place, we've been able to test. It's been a very beneficial cooperation." ●

Advanced Technology Demonstration Branch's Matt Brown (left), along with 16 others, recognized by Deputy Director of Engineering Randy Laye (right) at Nov. 28, 2011, Engineering Strategic Management Meeting as a part of the Directorate's Values in Action awards program.

ECBC ENGINEERING STRATEGY PAVES WAY FOR **IMPROVED CUSTOMER SERVICE WITHIN THE DIRECTORATE**

Since ECBC's Engineering Directorate Balanced Scorecard (BSC) Strategy development process began in 2005, the Directorate's workforce has remained engaged because of the strategy's relevance and accessibility. The structure of the strategy calls for continuous efforts to educate stakeholders about strategic initiatives, and these initiatives seek to improve daily operations for the workforce—including a specific initiative to improve customer service.

When Mike DeZearn, Engineering's BSC customer service team leader, first took leadership of the team, it had been dormant for some time. "One of the things I immediately jump started was a survey that had been in process before the team had become inactive," DeZearn said. "The survey was intended to form a baseline of information about what Engineering teams were doing to ensure they were providing good customer service.

DeZearn quickly revived the survey with support from ECBC's Directorate of Program Integration Decision Analysis Team (DAT), which helped develop and administer a 23-question survey between April and June 2010. Soon after, DAT collected, reviewed and analyzed the survey responses, with results presented to the Customer Service Team in July and August 2010.

The results identified several distinct obstacles hindering Engineering teams from providing good customer service, including competing priorities, administrative burdens and unclear mission objectives. As a means to overcome some of these challenges, the BSC Team is currently working with ECBC's sister site in Rock Island, Ill., to learn about its formal customer service processes.

"Establishing a formal customer service process, versus an informal process, will be key to bettering as well as measuring our customer service," DeZearn said. "Our next steps are to see how Rock Island monitors their customer satisfaction and then refer to their approach to write an Engineering-wide procedure."

Through its International Organization for Standardization (ISO) 9000 certification, Rock Island has established a formal customer feedback system that is a part of their quality management process. ISO customer surveys require face-to-face meetings with customers, or telephone calls if not local.

According to Nan Ramsey, ECBC Rock Island site manager and associate director of Engineering, maintaining a systematic way of measuring customer service is essential to determine if an organization is getting better or worse. "We go through our whole metrics system periodically and discuss customer survey results with senior staff at ISO Management Reviews," Ramsey said. "Supervisors and employees share in the responsibility for the surveys so they can understand the importance of customer service."

"Rock Island has a great customer service system in place for us to springboard off of and I look forward to working with them," DeZearn said. "There's a certain personal satisfaction that comes with working on the BSC Team, knowing you'll help leave the organization better than it was." ●

"HOMEGROWN TALENTS" FROM ECBC WELCOMED ASSETS IN JOINT PROJECT MANAGER FOR BIOLOGICAL DEFENSE

The Joint Project Manager for Biological Defense (JPM-BD) has maintained a partnership with ECBC for nearly 15 years. With a robust mission to create and sustain affordable materiel solutions that can detect, identify, warn, deter and defeat biological threats to the joint forces, Deputy JPM-BD Joe Cartelli says the "homegrown talents" of ECBC's Engineering and Research and Technology Directorates have been welcomed assets to achieve the JPM's mission.

"We've been grateful to use the expertise of ECBC," Cartelli said. "We have a strong relationship with the Center."

ECBC provides lifecycle acquisition personnel and engineering services to the Joint Program Executive Office for Chemical Biological Defense and its JPMs throughout all acquisition phases of Chemical and Biological Defense equipment programs. Currently, 53 ECBC Engineering employees are matrixed to JPM-BD.

JPM-BD's biological threat detection systems collect and assimilate data for commanders who require an understanding of natural and man-made biological hazards in their areas of operation. Its work in system acquisition falls into two primary areas: point and standoff detection. The systems are critical to the areas of sense, shield and sustain, and work to warn U.S. Armed Forces personnel of biological attacks.

BIDS M31 Non-developmental item, one of three models in the BIDS family

In order to detect the micron-sized biological particles that mimic what already exists in the environment, near real-time biological agent detection and identification relies upon the development of unique sensing technology, algorithms and procedures. Unlike chemical agents, detecting and identifying biological agents requires the acquisition of the orthogonal technologies currently under development by JPM-BD and JPM-Chemical Biological Medical Systems.

"Chemical warfare agents are unnatural, making them easier to detect," said JPM-BD Deputy of Point Biological Systems Tom Buonaugurio. "With biological detectors, the air must be sampled and concentrated first to determine if there are any agents in the air. Scientists look for toxins, spores and bacteria in order to detect biological contamination."

In response to the 1991 Gulf War, one of the most notable projects ECBC undertook in Biological Defense was a point detection system called the Biological Integrated Detection System (BIDS). It combined a variety of standard laboratory equipment into a military vehicle to provide early warning and identification capabilities for a large-area biological warfare attack. Since then, ECBC has also assisted JPM-BD in the development of their complex family of standoff detection systems as well as in the current development of an environmental biological surveillance system.

"JPM-BD has a strong relationship with ECBC partly because we are co-located at Edgewood and partly because the folks in Engineering are looking to partner and share information for the purpose of bettering the state of BioTechnology and Department of Defense's BioDefense capabilities," Cartelli said. "We are able to accomplish a lot of things because we are both committed to the warfighter, and we look forward to continuing our relationship with ECBC." ●

Photos by U.S. Army Research, Development and Engineering Command Public Affairs Office

TEAM CBRNE CAPABILITIES SHOWCASE PROMOTES **NETWORKING AMONG EMPLOYEES AND CUSTOMERS**

On a late summer day, members of Aberdeen Proving Ground Edgewood Area's (APG-EA) chemical, biological, radiological, nuclear and explosives (CBRNE) community came together to network and present their respective capabilities among colleagues and area leaders at the 2011 Team CBRNE Showcase.

Approximately 750 Team CBRNE stakeholders participated in the second annual Showcase on Sept. 22 at Downer Hall located on APG-EA. It featured more than 40 exhibitor booths as well as vehicles and mobile laboratories highlighting CBRNE technologies, such as mechanisms for testing chemical threats, an explosive ordnance disposal bomb suit to protect the warfighter and a Sentinel truck equipped with secure mobile communications devices. The exhibits intended to expand the understanding of Team CBRNE's role in providing life-saving solutions to the warfighter.

During the event, ECBC Technical Director Joseph D. Wienand shared the significance of the Showcase with attendees, stating that it was to educate, inform and build partnerships among the participating organizations, which in addition to ECBC included the Assembled Chemical Weapons Alternatives, Chemical Materials Agency, Defense Threat Reduction Agency-Joint Science and Technology Office, Joint Program Executive Office for Chemical and Biological Defense, Medical Research Institute of Chemical Defense, U.S. Army Public Health Command and 20th Support Command.

"We are fortunate; by being able to share the important work that each Team CBRNE organization does here at Edgewood we are helping to better protect the nation and the warfighter against current and future chemical and biological threats," he noted.

The Showcase was followed the next day by a Science, Technology, Engineering and Mathematics (STEM) Educational Outreach Day for nearly 400 local students from Harford and Cecil counties. Exhibitors provided hands-on and instructional activities to help the students experience real-world CBRNE technologies and research techniques that are usually beyond their reach. The event also gave students a snapshot of careers in various STEM fields.

From the events, Team CBRNE employees and community members learned the benefits that come from working together in creating a safer future for the warfighter and the nation. As described by Brig. Gen. Leslie C. Smith, 20th Support Command commanding general: "Hooah! It's about protecting and serving the warfighter and staying Army Strong!"

TECHNOLOGY TRANSFER TEAM CELEBRATES A BANNER YEAR WITH **MORE THAN 90 AGREEMENTS SIGNED**

ECBC's experienced scientists, engineers and technicians are constantly developing and refining innovative technologies, many of which assist not only the warfighter but also government agencies, corporations and academia. As part of its mission to provide exceptional customer service to stakeholders, through its Technology Transfer program, ECBC offers a broad range of chemical and biological services and facilities.

The Technology Transfer Team strives to successfully facilitate and initiate collaborations between ECBC and other organizations. It makes the transfer of technology as smooth as possible through a variety of agreements and funding mechanisms to help interested parties access ECBC's expertise and facilities.

In 2011, the Technology Transfer Team achieved a record number of signed agreements—more than 90 in total. Within those 90 agreements, the team signed and completed 18 cooperative research and development agreements (CRADA), 39 agreements with other government agencies, five patent license agreements (PLA) and 31 technology support agreements (TSA), with even more agreements that are currently active and have yet to be signed. CRADAs provide a means for private industry to collaborate with U.S. Army research and development activities. PLAs allow ECBC to license intellectual property rights on behalf of the government. TSAs allow industry to test their technologies and to leverage other ECBC services, facilities and equipment at the companies' expense.

One of the exciting PLAs that ECBC signed this year was with Sage-N Research, Inc., a computational proteomics company. This PLA allows the integration of the Defense Threat Reduction Agency-Joint Science and Technology Office (DTRA-JSTO)-funded programs for mass spectrometry detection and the identification of Agents of Biological Origins Identification (ABOID) system into Sage-N Research's existing SORCERER™ proteomics platform—enabling rapid and cost-effective detection and identification of microorganisms.

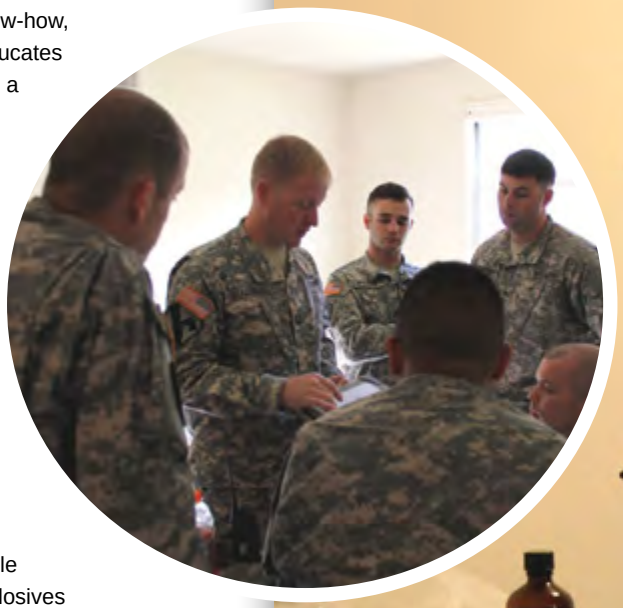
According to Charles Wick, Ph.D., retired research physical scientist who led the ABOID team, "This cutting-edge technology enables identification of microorganisms down to strain level in minutes, rather than hours…[proving] very successful for infectious-disease identification and a range of other potential applications in military, medical, pharmaceutical, food and public safety areas."

Sage-N Research Vice President of Marketing Ali Pervez echoed: "The technology will ultimately have the ability to save thousands of lives by allowing for faster response and corrective measures to be taken against emerging and unknown biological threats."

The signing of the ABOID license in July 2011 as well as the Center's overall record year are not only due to the incredible work that ECBC scientists and engineers perform on a daily basis and support from DTRA-JSTO, but are also a credit to the hard work the Technology Transfer Team does to facilitate these important agreements. ●

TRAINING TEAM PREPARES WARFIGHTER FOR **CBRNE THREATS**

In an effort to arm today's warfighter with mission-critical chemical, biological, radiological, nuclear and explosives (CBRNE) know-how, the U.S. Army Advanced CBRNE Training Team at ECBC educates military personnel in current CBRNE Defense tactics through a variety of methods. By directly connecting trainees with key subject matter experts at Aberdeen Proving Ground (APG), Md., the team offers customizable training to meet their customers' specific objectives and educational needs.



"We train students in the classroom on threats that they may encounter in theater," a team instructor noted. "The hands-on training that is integrated into the course after the classroom briefs reinforces concepts and allows them to get their hands dirty by directly experiencing different types of lab scenarios."

Training topics—developed by experts with extensive field and laboratory experience—include Basic and Advanced CBRNE Weapons of Mass Destruction, Small and Large-scale Chemical and Biological Agent Production, Chemistry of Explosives and more. Course formats range from lecture and discussion, to small hands-on projects, to large group activities—all with a chemical biological (CB) emphasis. Due to changes in threats over time, focus has also been expanded to include toxic industrial agents, illicit drugs and high-energetic materials.

To fully benefit from ECBC's expertise and unique CB facilities, personnel typically train on the Edgewood Area of APG (APG-EA), at the Center's BioEngineering Laboratory and Chemical Transfer Facility, among other locations. Here, students gain confidence in their field-detection skills, so that they can safely operate during a real-time event. Sensitive site exploitation and full-team exercises are also conducted at Skipper's Point housing area on APG-EA, where numerous CB clandestine laboratory targets are currently in place for soldier training. Sessions can last from one day up to two weeks.

"The training facilities at Skipper's Point provide the most realistic, mission-specific training opportunities available to the technical escort CBRN Response Teams of the 22nd Chemical Battalion (TE) at APG," said Maj. Jennifer L. Striegel, formerly of the 22nd Chemical Battalion (TE). "The expertise provided by the [training] team in creating highly technical chemical, biological and radiological training targets is unmatched."

Dependent on the specific objectives of the trainings, students who have completed courses should be able to display a working knowledge to mastery-level understanding of the subject matter. Past trainees of the program include the 20th Support Command, 22nd and 110th Chemical Battalions, National Guard Bureau Weapons of Mass Destruction Civil Support Teams, Specialized Department of Homeland Defense First Responders, Tech Escort J5 School and the U.S. Army CBRN School.

"The classroom is a good way to become familiar with the information," said Spc. Adam Newman, 22nd Chemical Battalion (TE). "The different activities help solidify [the threat-detection techniques] in your memory and give you more confidence in the job that you're doing." ●

“In my 10 years working at ECBC as a scientist supporting chemical biological programs, one of the biggest changes I have seen is ECBC’s concentration on the development of our next generation leaders. The Center has a strong commitment for nurturing its people, and I’ve benefitted greatly from the Mentorship and Leadership Cohort programs.”

Rebecca Brown | Physical Scientist | 10 year of service

PEOPLE GOAL ACHIEVEMENTS

Grow and develop the workforce to ensure the continued competencies of the organization to meet evolving Chemical, Biological, Radiological, Nuclear and Explosives Defense needs. ▶

CENTER INDUCTS FIRST FEMALE INTO **SENIOR EXECUTIVE SERVICE**

With nearly 30 years of public service experience, Suzanne Milchling built her career in Chemical and Biological Defense with aspirations of one day finding a role that would accurately showcase her leadership talents. Milchling fulfilled that goal in April 2011 when she was inducted into Senior Executive Service (SES) as ECBC's director of the Directorate of Program Integration (DPI). Not only did her induction mark a significant personal milestone, but one for the Center as well—Milchling is the first female promoted to SES in ECBC history. She joins an elite group of approximately 6,800 SES members that represent less than one percent of the federal workforce. As of 2010, female leaders comprised 31 percent of the SES.

Gary Martin, executive deputy to the commanding general at the U.S. Army Research, Development and Engineering Command, ceremoniously pinned Milchling—symbolic of her accession to the SES—and administered her service oath on May 26, 2011. "Suzanne's promotion speaks not only to her past performance, but also to the quality of her character," Martin said. "She proactively mentors others on what it means to be a leader and exemplifies how to retain a team focus. There's no doubt she'll succeed as a leader within ECBC, but also a great asset for Team Aberdeen."

As director of DPI, Milchling manages the business activities and operating processes at ECBC. Her responsibilities include oversight of chemical and biological surety and policy; Center-wide strategic and business planning; infrastructure support; and financial systems integration. Additionally, Milchling directs interagency activities with agencies such as the Department of Homeland Security, Environmental Protection Agency and Department of Energy, as well as various state and local government and commercial entities with chemical and biological protection homeland security responsibilities.

"Suzanne has a reputation for bringing people from different parts of the organization, and even across many organizations, together and achieving results," said ECBC Technical Director Joseph D. Wienand. "She cares about people; she helps people. I'm very proud to know her and we think she's very deserving of SES."

Committed to public service and democratic values of the constitution, the SES was established in 1978. Together with the U.S. Office of Personnel Management, it seeks to ensure that the executive management of the U.S. government is responsive to the needs, policies and goals of the nation, and is of the highest quality.

Milchling first began her civilian career with the U.S. Army as a chemist, and since then has continued to excel and build her leadership skills in the areas of Engineering, Chemical and Biological Defense. Milchling holds a bachelor's degree in chemistry from Westhampton College at the University of Richmond. ●

From left to right: moderator Nicole Funk with panelists Ron Pojunas, Alvin D. "AJay" Thornton, Suzanne Milchling, Randy Laye, Nan Ramsey and Bill Klein

CENTER HOSTS "**LEADERSHIP IN ACTION**" PANEL DISCUSSION

On Oct. 5, 2011, ECBC hosted a leadership question-and-answer panel for Engineering Directorate employees. The 40-plus in attendance had the chance to candidly question senior leadership about career development, discussing topics ranging from staying connected to ECBC to adjusting to the shifts in Department of Defense spending.

Panel members included Engineering Directorate's Alvin D. "AJay" Thornton, director; Randy Laye, deputy director; Nan Ramsey, associate director and Rock Island site manager; Bill Klein, associate director; Ron Pojunas, associate director; as well as Suzanne Milchling, director, Directorate of Program Integration.

In his opening address, Thornton welcomed attendees and stressed the importance of experienced employees encouraging the younger workforce to involve themselves in the Center's leadership development opportunities."I've always believed that people are the best and most critical resource to any organization. At ECBC we offer opportunities like this panel discussion because we have a responsibility to grow our people toward those leadership positions down the road," he said.

Following Thornton's remarks and brief introductions of the panelists, Ramsey tackled the first questions about how the current government job culture will impact employees who want to advance within the Center. Ramsey noted that her hope is Baby Boomer retirements will create job vacancies for younger employees to step into, subsequently offsetting the potential economical problems the country faces.

Next, Laye was asked to highlight characteristics that he believed necessary for a leader to be successful. Among some of the traits he listed were: a positive attitude, intellectual intuitiveness and the ability to share bad news appropriately. "The old saying that bad news doesn't get better with time is always true. You don't want to blindside your boss when a problem is critical," Laye said. "When problems do arise make sure the employee has a resolution in mind, taking some ownership over the situation."

Other themes discussed included taking advantage of opportunities that arise, allowing for breaks in everyday work to expand an individual's skill set, and making intentional attempts to gain a broader perspective of ECBC and its work to support the warfighter. Panelists also expressed the idea of working collaboratively across directorates and teams as an area of focus for the 2012 fiscal year.

"Collaborating with teams across the Center will allow ECBC to attract and maintain its wide customer base," Thornton said. He went on to explain that understanding the work others are doing across ECBC can help the organization as a whole, by being able to promote all of the Center's capabilities.

The event closed with steps to stay connected to ECBC and a final urge to be involved in the organization in a meaningful way. ●

IN THEIR SHOES: ENGINEER ASSISTS WARFIGHTERS IN IRAQ AS CIVILIAN SCIENCE AND TECHNOLOGY ASSISTANT

For Chemical Engineer Teddy Damour, the most rewarding part of his work at the Center is to see equipment developed by ECBC and the U.S. Army Research, Development and Engineering Command (RDECOM) in the hands of the warfighter. For six months, Damour had the opportunity to do just that.

As a part of RDECOM's Field Assistance Science and Technology Team (RFAST) program, Damour worked alongside warfighters in Iraq as a civilian science and technology adviser—assisting with several projects and providing onsite solutions to any technological issues that arose. His specific objectives included helping identify technology gaps to improve the survival and well-being of the warfighter; provide technological advice to operational commanders; implement new operational systems; and conduct technology assessments.

RFAST deploys both soldiers and Department of the Army civilians across locations in Iraq and Afghanistan to address technology issues impacting the warfighter's mission. "I traveled throughout Iraq—North, South, East and West—talking to the warfighters to understand the issues they had with their equipment," said Damour, who spent February through August 2011 at Camp Victory in Baghdad. "For example, there was an issue with the vehicles not having enough power to support additional lights; we went to the RDECOM labs to determine how we could supplement the power on the vehicle to be used at full capacity during night missions."

Damour first discovered RFAST through his work with the Center's Smoke Grenade and Counter Improvised Explosive Devices (IED) programs. In addition to wanting to support the warfighter, he sought the program as a chance to gain a new understanding for the work done at ECBC. "It is something that most scientists and engineers might not always have the opportunity to see—the end result of their hard work, directly supporting and increasing the efficiency of the warfighters' missions," Damour said.

Damour also tackled a real-time threat while overseas: developing solutions to mitigate or prevent rocket and mortar attacks through timely notification measures. "That was one of the primary technologies I worked on, gathering 'real-world' information on how to survive and minimize casualties from rocket attacks," Damour said.

Damour's day-to-day work in Iraq varied. Sometimes working in an office setting with scientists or lacing up his boots to join the warfighters on the road to find IEDs, Damour was enthralled by the fast-paced excitement and unpredictability of the project, as well as his chance to learn about a different culture.

"It was great to be over there and to see how the warfighters conduct their business," Damour said. "Directly experiencing the culture has also given me an added perspective on the work the United States is doing over there. I would definitely go back if the opportunity presented itself again." ●

Chemical Engineer Teddy Damour on location during his 2011 RFAST stint in Iraq.

LEADERS BUILD KNOWLEDGE AND RELATIONSHIPS THROUGH APG **SENIOR LEADERSHIP COHORT**

Created to promote a self-sustaining leadership community across the Garrison, the Aberdeen Proving Ground Senior Leadership Cohort (APG Cohort) is an 11-month program that facilitates employees at the GS-14/15 grade level to cultivate relationships through special training sessions and events. During their participation, members build an active line of communication that can institute change and growth on several levels.

In its third year, the APG Cohort seeks to provide future leaders with opportunities to create connections among individuals from different organizations, practice leadership in a "live environment," work in Community-based Projects (CBPs) that benefit all members of APG and promote social responsibility. The course accomplishes these tasks by hosting members of organizations such as ECBC; the U.S. Army Communications-Electronics Research, Development and Engineering Center; and the U.S. Army Research Laboratory, at networking seminars and volunteer events.

Debra Thedford, an APG Cohort participant and associate director of Program Integration, noted that the program has helped strengthen her relationships with individuals and organizations APG-wide: "We're all busy, but carving out the time for the Cohort has value because it provides the opportunity to work with people I would have not met otherwise. If I ever need to contact someone from a different organization, I can always pick up the phone and call someone who I've met at the Cohort who can point me in the right direction," Thedford said.

The program is divided into eight sessions and 19 class days, CBPs and coaching events over the 11-month period. The group of roughly 30 leaders meets monthly for a two-and-a-half day session where they collaborate on team-building projects, hands-on exercises, self assessments and more. Group discussion topics range from "Teams and Organizations" to "Leading with Integrity." All activities are facilitated by professionals who are subject matter or field experts in their given topic.

The APG Cohort also retains past participants through an alumni group, allowing them to attend current sessions so they may share their experiences directly with new participants. Each year, the program evolves offering different opportunities than in years past. The alumni initiative gives former participants the continuous ability of developing their leadership skills from the enhancements in the program.

"It's the gift that keeps on giving as far as knowledge goes," said ECBC Associate Director of Engineering Bill Klein. "There were some outstanding sessions offered this year that weren't an option when I did the Cohort." Klein was a participant in the 2009 Leadership Cohort and remains an active alumnus of the program.

APG Cohort sessions include classroom discussions and hands-on team-building exercises meant to foster relationships and build leadership skills.

The APG Cohort allows participants to exchange knowledge among colleagues from across the Garrison.

"Over the years we have changed **organizations**, **names** and **missions** but what remains **constant** is that ECBC is a **great place** to work and is **inhabited** by a **great family** with whom to work."

James A. Baker, Ph.D. | Associate Technical Director | 42 years of service

NEW HUMAN RESOURCES INITIATIVES HELP FURTHER DEVELOP ECBC WORKFORCE

This year brought with it extensive planning for a number of exciting human resources initiatives meant to develop all levels of the ECBC workforce. From designing a new supervisors' development plan to revitalizing the Center's mentoring program, the ECBC Workforce Management Office (WMO) has been working on several opportunities to give employees chances to grow their knowledge base and skills.

In 2011, one of Technical Director Joseph D. Wienand's main goals was to further develop supervisors. "Much of ECBC's success as an organization depends on our supervisors and their ability to learn and grow as leaders," he said.

The kickoff for this new initiative took place in December 2010 with a supervisors' brown bag lunch. Shortly thereafter, through the Office of Personnel Management, ECBC entered into a contract with PerformTech, a training and performance improvement company, to provide enhanced human capital support to the Center.

In May 2011, based on feedback from the initial lunch session, PerformTech conducted interviews with various supervisors across ECBC to assess the climate and identify common supervisor needs.

From information gathered during the interviews, a plan was designed that outlined events and activities to help cultivate growth among supervisors. The first event, "An Afternoon with ECBC Supervisors," was held in September 2011 and provided attendees an opportunity to network as well as participate in team- and leadership-building exercises.

Beyond supporting supervisors, Wienand and the WMO also believe in the importance of having a strong, knowledgeable workforce—across the board. To that end, one area that was identified as needing enhancement was the Center's mentoring program. To begin the program's revitalization process, WMO took a hard look at previous mentoring programs, studying their successes as well as what aspects needed improvement.

After much research and planning, ECBC is now poised to unveil its brand new mentoring program to the Center. Mary Martinez, supervisory workforce management officer, explained, "We spent much of 2011 getting ready to launch this new program, digging into what went well with previous mentoring programs and what new material we could add to make our program even better. We are excited to share this new program with the workforce."

Another workforce initiative for which development is nearing completion is a Mid-level Career Development Cohort program. Aimed at GS-09 through GS-12 grade-level employees, the program focuses on skill development and tools that will improve teamwork and communication, while also focusing on career development.

Both initiatives are set to begin in early 2012.

"Through these new and upcoming programs, employees will get the opportunity to work with other individuals within the Center and continue to excel in the workplace," said Martinez. ●

PRIDE PROGRAM OFFERS ECBC WORKFORCE NEW CAREER DEVELOPMENT OPPORTUNITIES

ECBC is committed to people development and offering its workforce continuous opportunities to develop critical skills. Just ask Roderick A. Fry, Ph.D., ECBC chemist and a team member on one of the ECBC Engineering Directorate Balanced Scorecard (BSC) strategy initiatives—the Progressive Rotational Inter-Divisional Exchange (PRIDE) Program.

"The PRIDE program exemplifies the kind of practical application and growth initiatives that are offered via the BSC strategic management process," Fry said. "It decentralizes the Engineering Directorate's strategic planning, allowing the workforce to bring ideas like PRIDE to leadership for consideration, develop the program and receive the needed buy-in and support from senior management."

Currently, PRIDE is designed for GS-11/12 grade-level employees in the Career Path-16 career field to gain diversified experience within the Engineering Directorate. It is composed of two consecutive six-month rotational assignments in branches outside of the employee's current division. Once concluded, the employee will return to their home branch with new understanding through which to better serve their customers.

PRIDE kicked off its first pilot rotation in May 2011. The idea for the program was birthed out of a 2010 Leadership Cohort project. Fry is one of the six PRIDE members who helped design the program and now voluntarily manage it. Realizing the potential for the program, the team circulated the idea amongst the Engineering Directorate's strategic planning Core Team as a possible initiative. As a tangible means to execute against one of the BSC's three key perspectives—People, Learning and Growth—the BSC Core Team was quick to approve PRIDE as an official initiative under the Directorate's strategy.

"This is the kind of strategic planning any organization's leadership likes to see—initiatives whose inception begins with members of the workforce," said Chief of the Strategic Planning and Business Operations Branch Ed Bowen. "When this happens, there is a greater sense of ownership in the strategic planning process; it's not just a mandate from leadership."

The PRIDE Program is following a phased roll-out approach, with Phase I, the pilot rotation in which the Engineering Directorate exchanges began, already underway. Phase II will begin in May 2012, when the program will broaden its scope by incorporating exchanges within the Directorate of Program Integration and the Research and Technology Directorate. Finally, three years down the road, Phase III intends to allow for exchanges between the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD) until the program evolves to exchanges between the JPEO-CBD and ECBC's three directorates.

"PRIDE offers numerous benefits not just for the employee, but for the Center," said Engineering's PRIDE member Mark Ciampaglio. "Employees will be returning to their home branches with broadened perspectives and improved organizational awareness. And their expanded network will provide for improved customer service and greater opportunities for collaboration across divisions." ●

From left to right: Pat Barrett, Suzanne Milchling, Nancy Kammerer, Nan Ramsey and Carol Eason. Not pictured: Debra Thedford and Nicole Funk (moderator)

ECBC FOSTERS WORKFORCE AND LEADERSHIP DEVELOPMENT THROUGH OPEN DIALOGUE AT **WOMEN IN SCIENCE AND ENGINEERING PANEL EVENT**

On March 2, 2011, ECBC hosted a "Women in Science and Engineering Panel Discussion" in honor of National Women's History Month. More than 100 ECBC employees turned out to participate in the event, with the Center's entire senior leadership in attendance. Sponsored by the Engineering Directorate's Balanced Scorecard Strategy, this event marked the first time in recent history that ECBC has offered such a forum to engage in dialogue about people-development topics related to women in the workforce.

"I think it's a really good thing to have [events like this] so women can see how to advance their career," Nichole Au, a chemical engineer in the Center's Detection, Decontamination Division, said during the networking time before the event.

"A lot of work goes into strategic planning," Director of Engineering Alvin D. "AJay" Thornton said. "We call it 'Balanced Scorecard' but it's strategic planning, and this is one of the ways we focus on growing our people."

Following Thornton's remarks, Nancy Kammerer, deputy joint project manager for Nuclear Biological and Chemical Contamination Avoidance, delivered an inspiring keynote address, citing the changes she has seen over the course of her career.

"Things have really changed in the 29-plus years that I've been with this organization," Kammerer said. "There are so many young faces that are here…look at the first two rows in this auditorium—that was the number of women we had in our organization when myself and the other panel members started here."

Kammerer also described the path she has taken to leadership within the Department of the Army. "I was probably about 27 years old and, during one of the [reorganizations] they put me onto a BioTech team. I went down to talk it over with my new boss and he said: 'I don't want you working for me; I don't think you have the right education.' I could have gone back to my old boss because he and I had a good relationship, but I just stuck it out and proved myself."

During the remainder of the event, a panel of six senior female leaders from the organization answered questions submitted by the workforce. Panel members included Kammerer; Suzanne Milchling, director of Program Integration; Nan Ramsey, Rock Island site manager and associate director of Engineering; Carol Eason, supervisory safety engineer; Debra Thedford, associate director of Program Integration; and Pam Barrett, a former ECBC employee with a doctorate in human development.

Photo by U.S. Army Research, Development and Engineering Command Public Affairs Office

WORKFORCE DEVELOPMENT STRATEGY EMBRACES EDUCATIONAL OUTREACH, AIMS TO **FILL JOBS OF THE FUTURE**

Even though the United States has historically been a leader in innovation and technology, one study after another has shown that the number of students pursuing career pathways in science, technology, engineering and mathematics (STEM) has decreased significantly. Furthermore, our current high-tech workforce continues to grow older. At ECBC alone, 44 percent of its employees will be eligible for retirement in the next 10 years.

If we do not invest in the development of a technically skilled workforce, the United States will fall even further behind the rest of the world in math and science and will not be able to fill positions crucial to our national security and defense.

To sustain both ECBC research and U.S. leadership in technology, the Center has intensified its efforts to inspire, develop and attract the STEM talent essential to delivering innovative solutions. This year, nearly 270 of its subject matter experts shared their expertise to help bolster the teaching of school subjects that lead to careers that will be in great demand.

In recognition of its contributions to STEM education in Maryland, ECBC received the 2011 Governor's Service Award for Excellence in the Community.

"On behalf of the staff and students of Harford County's public school system, it is our privilege to nominate ECBC for the Governor's Service Award for Excellence in the Community," said Harford County Public Schools Coordinator of Partnerships for Special Programs and Student Achievement Michelle Shaivitz. "We are very grateful for the continuum of educational experiences ECBC has provided our schools and programs to advance students' interest and performance in STEM."

Through support from the National Defense Education Program, the Center's Community and Educational Outreach Program delivered approximately 100 outreach initiatives geared to enhance STEM education within and beyond its local community. Formal Partnership in Education Agreements with Cecil and Harford counties' public school systems facilitated the execution of educational outreach programs that reached about 7,500 students and 700 educators.

Focused on boosting technical and problem-solving skills in the classroom, ECBC provided students from kindergarten through college and their educators with hands-on STEM experiences. Some of this year's most impactful teacher initiatives included professional trainings in Smart Sensors, Nanotechnology, Food Packaging and Polymers to supplement traditional lessons with the real-world application of STEM concepts. For nearly 400 local students, ECBC hosted an inaugural Team CBRNE STEM Educational Outreach Day that brought together key players in the Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) Defense community who offered 35 different interactive STEM activities.

In an effort to help secure America's leading position in research and development, ECBC will continue to leverage Department of Defense resources to excite students about the pursuit of STEM career pathways. ●

In recognition of ECBC's outstanding support of the community, Harford County Public Schools Coordinator of Partnerships for Special Programs and Student Achievement Michelle Shaivitz (left) and ECBC Technical Director Joseph D. Wienand (right) attended the Governor's Service Awards ceremony.

Joppatowne High School Homeland Security Teacher Zachary Lovelace, ECBC Materials Scientist Christopher Karwacki, Ph.D., ECBC Packaging Specialist Karyn Rafferty and Elkton High School Lead Science Teacher Alison Hapka (from left to right) collectively design a working model of a nanoscale imaging apparatus.

“I was fortunate to start my career in the Monitoring Branch working alongside some of the veterans of ECBC. You hear all the stories about how things were done in the “early days.” The focus was on conducting monitoring mostly for areas on post and the equipment was rudimentary. It is great to be part of the many technological advancements on various types of analytical instrumentation that we have acquired and used to develop operational methods. These techniques have been successfully implemented around the United States as well as internationally in order to safely secure and eradicate chemical warfare material.”

Laura K. Elliott | Biologist | 8 years of service

March 2, 2011
Department of the Army Meritorious Civilian Service Award of Excellence
For Civilian Employees

Nan Ramsey
Rock Island Site Manager and Associate Director of Engineering

March 28, 2011
U.S. Army Corps of Engineers Certificate of Appreciation
For CBARR's support of Spring Valley cleanup efforts

Adam Baker
Chemical Engineer

Raymond DiBerardo
Mechanical Engineer

Frank Evans
Chemical Operations Manager

Kim Fink

Steve Freeland
Chemical Engineering Technician

Dennis Hall
Chemical Operations Manager

Amos Henderson
Chemical Engineering Technician

Michael Laws
Chemical Engineering Technician

Andre McGill
Chemical Engineering Technician

Jeff Mott
Chemical Engineering Technician

April 21, 2011
Scientific Achievement Awards Technical Cooperation Program Team Achievement Award
For Key Technology Area 4-32 "Development of Environmental Tolerance Values for Defense Sites Contaminated with Energetic Materials" from 2004 to 2010

Ron Checkai, Ph.D.
Supervisory Research Biological Scientist

Roman Kuperman, Ph.D.
Research Biological Scientist

Mike Simini, Ph.D.
Research Biological Scientist

May 6, 2011
Baltimore Federal Executive Board Excellence in Federal Career Awards
In recognition of federal employees exhibiting excellence in job performance

Silver

Chika Nzelibe
Mechanical Engineer

William Spangler
Engineering Technician

Gregory Thompson
Industrial Designer

Bronze

Sandra Leonard
Project Support Assistant

Lisa S. Smith
Research Biologist

Lalena Wallace
Research Biologist

Lawrence Oswald
Engineering Technician

Linda Thompson
Budget Analyst

May 20, 2011
Governor's Service Award for Excellence in the Community
In recognition of Science, Technology, Engineering and Mathematics (STEM) Educational Outreach contributions to education in Maryland

July 14, 2011
Exclusive Licensing Agreement Signed by ECBC and Sage-N Research
For Agents of Biological Origins Identification system

Charles Wick, Ph.D.
Retired Research Physical Scientist

August 1, 2011
U.S. Army Chemical, Biological, Radiological and Nuclear School Enterprise Adaption Award
Presented for exemplary efforts in advancing the USACBRNS Enterprise

Carrie Poore, Ph.D.
Biologist

August 23, 2011
Federal Women's Program Award
For activity most supportive of Federal Women's Program goals

August 25, 2011
STEM Educational Outreach Hero Awards
Honoring 270 ECBC employees and their support of programs and initiatives targeted toward furthering STEM education within and beyond Maryland's Cecil and Harford Counties

2011 ACCOMPLISHMENTS

2011 FISCAL YEAR TECHNICAL REPORTS

4 Classified

78 Unclassified

2011 AWARDED PATENTS AND PATENT LICENSING AGREEMENTS

PATENTS

#7,790,452 / #7,910,365 / #7,993,844 / #8,017,330
Artificial Chimeras Engineered to Simulate Multiple Biological Threat Agents

Monica Carrera, Ph.D.
Jose-Luis Sagripanti, Ph.D.
Research Scientist

#7,829,519 / #7,910,537
Decontamination of Chemical Warfare Agents Using Benign Household Chemicals

George W. Wagner, Ph.D.
Research Chemist

#7,838,227
Simultaneous Detection of Biological Agents by Solid-state Hybridization and Naked Eye Visualization

Jose-Luis Sagripanti, Ph.D.
Research Scientist

#7,838,476
Generation of Residue-free Decontaminant Using Hydrogen Peroxide, Ammonia and Carbon Dioxide

George W. Wagner, Ph.D.
Research Chemist

"As a **scientist** here at ECBC, I have seen a **direct impact** of the **research** conducted on the warfighter, which is **extremely rewarding** and **fulfilling**."

Mary Wade, Ph.D. | Supervisory Biologist, BioDefense Branch Chief | 4 year of service

#7,850,908 / #8,021,884
Detecting Bacteria by Direct Counting of Structural Protein Units or Pili by Integrated Virus Detection System and Mass Spectrometry

Charles Wick, Ph.D.
Retired Research Physical Scientist

#7,851,207
Multiplex Field Device to Detect and Identify a Variety of Microbial Agents Simultaneously

Jose-Luis Sagripanti, Ph.D.
Research Scientist

#7,852,469
Particle Detector

Virginia E. Foot
Dean Payne
David W. Sickenberger
Branch Chief of Chemical Biological Systems Integration

#7,861,719
High Surface Area Chemical/Biological Air-Purifying Filter

Daniel J. Barker
Operations Research Analyst
Stephen E. Chase, Ph.D.
Former Engineering Technician
Corey M. Grove
Chemical Engineer

PATENTS (Continued)

#7,896,182
Coated-poly Containers

Jeffrey A. Gross, Ph.D.
Dean Hansen
Packaging Specialist

#7,934,497
Modular Helmet-Mask Assembly

Stephen E. Chase
Former Engineering Technician
Corey M. Grove
Chemical Engineer

#7,943,148
Amino Acid Sites in Flavivirus E Proteins Useful for Development of Diagnostics and Vaccines

Cathy Huey-Hwa Wu, Ph.D.
Raja Mazumder, Ph.D.
Jose-Luis Sagripanti, Ph.D.
Research Scientist

#7,985,382
Mobile All Hazards Receipt Facility/Analytical Laboratory

Luis E. Faure
Mechanical Engineer
Charles E. Henry
Retired Physical Scientist
Monica J. Heyl
Retired Supervisory Physical Scientist
George J. Noya
Lead Mechanical Engineer
Dennis J. Reutter
Retired Supervisory Chemist

#7,997,300
Aerosol Inlet Flow Modulator

Lawrence J. Hyttinen, Ph.D.
Chemical Engineer
Daniel Wise
Aerospace Engineer

PATENT LICENSING AGREEMENTS

#1,002P
Laboratory Information Management System for Genomic Sequencing

Lauren McNew
Former Research Microbiologist
C. Nicole Rosenzweig, Ph.D.
Research Biologist
OptiMetrics, Inc.

#1,101P
ECBC Integrated Virus Detection System Technology

Rabih Jabbour, Ph.D.
Research Chemist
Charles Wick, Ph.D.
Retired Research Physical Scientist
NanoEngineering Corp.

#1,102P
Filtration Media and Process for the Removal of Hazardous Material from Air Streams and Zirconium Hydroxide for Decontaminating Toxic Agents

Greg Peterson
Research Chemical Engineer
George W. Wagner, Ph.D.
Research Chemist
Guild Associates, Inc.

#1,103P
Nanoencapsulation Technology

Dupont Durst, Ph.D.
Research Chemist
Peter Emanuel, Ph.D.
Supervisory Biologist and BioSciences Division Chief
ANP Technologies, Inc.

#1,105P
Microbial Detection and Identification by Using Mass Spectrometry Data for Diagnostic Purposes

Samir Deshpande, Ph.D.
Bioinformatics Software Analyst (STC)
Jacek Dworzanski, Ph.D.
(SAIC)
Rabih Jabbour, Ph.D.
Research Chemist
Patrick McCubbin, Ph.D.
Senior Scientist (OptiMetrics, Inc.)
Michael Stanford, Ph.D.
Research Physicist
Charles Wick, Ph.D.
Retired Research Physical Scientist
Alan Zulich
Supervisory Physical Scientist
Sage-N Research, Inc.

2011 FISCAL YEAR FILINGS

19 Invention Disclosures Filed

24 Patent Applications Filed

4 Provisional Patent Applications Filed

2011 WORKFORCE FIGURES

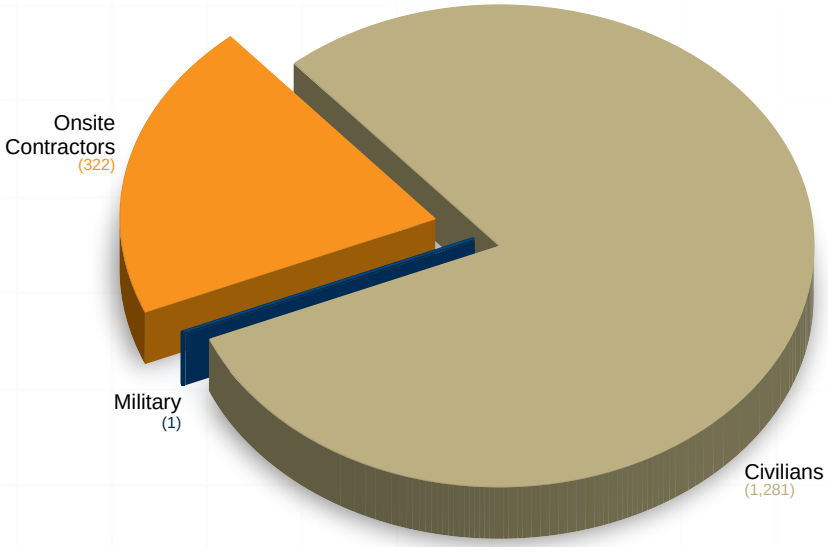
As of Sept. 30, 2011

MANPOWER

Total Manpower I 1,604

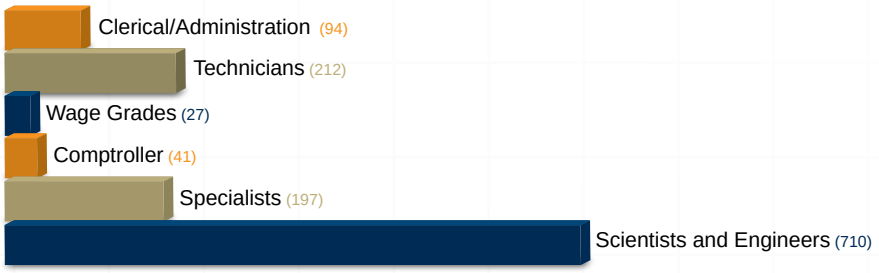
Average Age I 44.62

Average Years of Scientists and Engineers Experience I 15.62
(average years of service of total workforce)



EXPERTISE*

of Government Employees



*Numbers are based on 1,281 civilians

SCIENTISTS AND ENGINEERS*

- Biologists (88)
- Chemists (145)
- Computer Scientists (13)
- Mathematicians (2)
- Operations Research Analysts (11)
- Physical Scientists (58)
- Physicists (10)
- Physiologists (3)
- Toxicologists (2)
- Aerospace Engineers (3)
- Chemical Engineers (125)
- Computer Engineers (8)
- Electrical Engineers (18)
- Electronic Engineers (24)
- Environmental Engineers (4)
- General Engineers (93)
- Industrial Engineers (13)
- Mechanical Engineers (86)
- QA Engineers (1)
- Research Biomedical Engineers (1)
- Safety Engineers (2)

DEGREES

Held by Government Employees

Ph.D. I 95
Master I 174
Bachelor I 574
Associate I 81

*Numbers are based on 1,281 civilians

EDGEWOOD
CHEMICAL BIOLOGICAL CENTER
A U.S. Army RDECOM Laboratory

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