CBARR NEWS

Edgewood Chemical Biological Center

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A worldwide leader in CB solutions

At the heart of every chemical and biological operation are the fundamental principles of operating safely, securely and in an environmentally sound manner. This April, as the world celebrates Earth Day , the Chemical Biological Application and Risk Reduction (CBARR) Business Unit of the U.S. Army Edgewood Chemical Biological Center (ECBC) recognizes the importance of a healthy environment at sites like Redstone Arsenal or Maribyrnong, Australia. And nothing could make employees more conscious of their workspace then spotting a bald eagle on Post. Understanding nature is also part of CBARR's expanding biological testing capability, as researchers study how effective decontaminants perform on surfaces coated with common environmental substances like salt water. It's all relative to the work we do, and drives how we do it.

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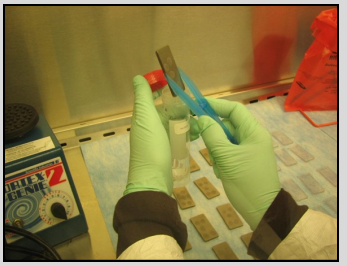
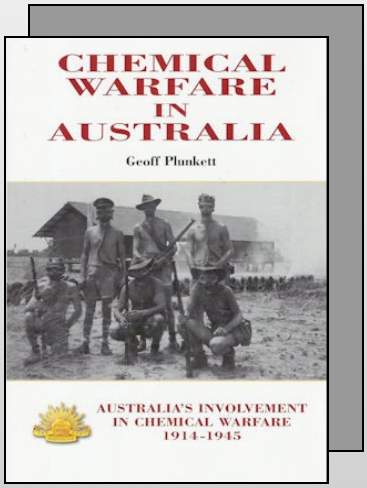


An Unlikely Encounter

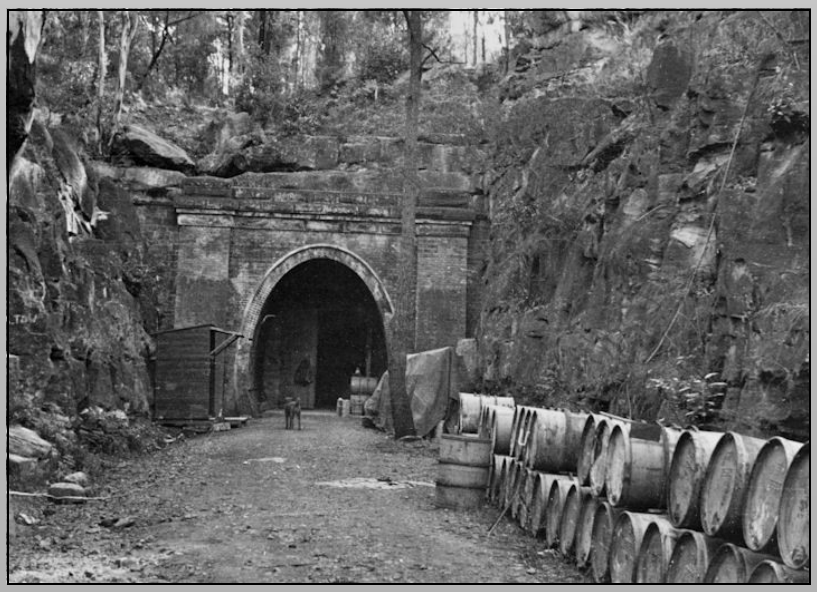
World War II veteran and former chemical warfare armourer spends time touring former facilities in Australia

Dennis Bolt, CBARR mechanical engineer, is currently serving a one-year secondment to the Australia Department of Defence (ADoD), and recently had the unique opportunity to visit a few former chemical warfare (CW) facilities while abroad. During his tours, he met Arthur Lewis — a World War II veteran who had actually worked at a number of the former defense sites Bolt visited, including Marrangaroo Depot and Glenbrook Depot and Tunnel.



At age 19, Lewis was a chemical armourer in the Australian Army who not only worked at numerous CW storage depots but was involved in several CW agent trials. "He discussed the operations in great detail and enjoyed the opportunity to share his experience with others," Bolt said of Lewis.

Bolt was accompanied by Gareth Johnson, from the United Kingdom Science and Technology Laboratory (DSTL), and Geoff Plunkett of the ADoD. Plunkett recently published a book independent of ADoD, titled "Chemical Warfare in Australia: 1914-1945," which recounts Australia's importation and storage of chemical weapons during that time period. Chemical warfare armourers like Lewis were responsible for handling the dangerous chemicals.



Bolt is the primary program manager with the Defence Science and Technology Organisation (DSTO) Precinct. The project involves a chemical warfare investigation and assessment of various buildings, laboratories and the surrounding environment at sites such as Maribyrnong, Columboola and most recently, John Brewer Reef.

Left: *Drums of the chemical agent mustard line the right side of the entrance to the Glenbrook Tunnel in 1943. In November 2012, the ADoD invited Bolt to visit the site, along with the Marrangaroo Depot and the Kingwood/Orchard Hill Depot.* ***Top****: Dennis Bolt with Arthur Lewis at Marrangaroo project site. [Photos courtesy the ADoD]*

Under Secretary of the Army visits ECBC for Team CBRNE demo

CBARR collaborates with ADM, demonstrates field deployable solutions

ABERDEEN PROVING GROUND, Md. – The Under Secretary of the Army, Joseph W. Westphal, Ph.D., visited ECBC on March 28 as part of a demonstration organized by the Joint Program Executive Office for Chemical Biological Defense (JPEO-CBD).

Tim Blades, CBARR director of operations, met with Westphal on his tour of ECBC facilities, which included several static displays of destruction equipment that has been used on past deployments around the world for the elimination of chemical agents. Additionally, the rapid prototype integration facility displayed recent engineering designs for new prototype elimination systems.

Westphal also toured the Prototype Detonation and Test Destruction Facility, which showed ECBC's capability to provide field deployable solutions for weapons of mass destruction elimination (WMDE). A field site was set up at J-Field to illustrate the kinds of deployable equipment — the vapor containment structure, electrical generators, chemical agent filtration systems and the Multiple Power Distribution System— that are used to support an onsite elimination or remediation mission at home and abroad.

"ECBC's role was to provide some visibility of our rapid prototyping solutions for weapons of mass destruction elimination," Blades said. "We've been working with ADM for the last two months on a high-priority project and it has really been an excellent learning experience. ADM has some neat design tools that have worked well with the things that CBARR does."

CBARR's partnership with the Advanced Design and Manufacturing Division within ECBC's Engineering Directorate was highlighted during Westphal's visit. ECBC's highly skilled workforce has expertise in research and technology, engineering and operations, and has a proven history of successful field remediation missions. The rapid prototyping capability allows CBARR maintenance technicians, operators and chemists to work with ADM's engineers to design new solutions for elimination.

"This is the first time CBARR is working with ADM in this capacity," Blades said. "It's a collaborative effort to formulate a concept into a working solution, and they've really been a part of that. Working together we can take a problem, figure out the tool that best works for the job, test it using ADM's rapid prototyping capability and then implement it into our missions—and that's pretty powerful."

During his visit, Westphal met with soldiers and civilians, and emphasized the immeasurable role Team CBRNE has in informing the national defense community and protecting the Warfighter and society against CBRNE threats. Team CBRNE is comprised of ECBC, JPEO-CBD, the Defense Threat Reduction Agency-Joint Science and Technology Office, the 20th Support Command, the Chemical Materials Activity, Program Executive Office-Assembled Chemical Weapons Alternative, the U.S. Army Medical Research Institute of Chemical Defense, and the U.S. Army Public Health Command.

Above: *Tim Blades, CBARR director of operations, shows Under Secretary of the Army, Dr. Joseph Westphal, ECBC's field equipment during a March 28 tour. [Photos courtesy JPEO]*

Above: *The 20th Support Command's CBRNE response team demonstrates decontamination procedures.* ***Below:*** *Blades and Westphal discuss solutions for WMDE elimination.*

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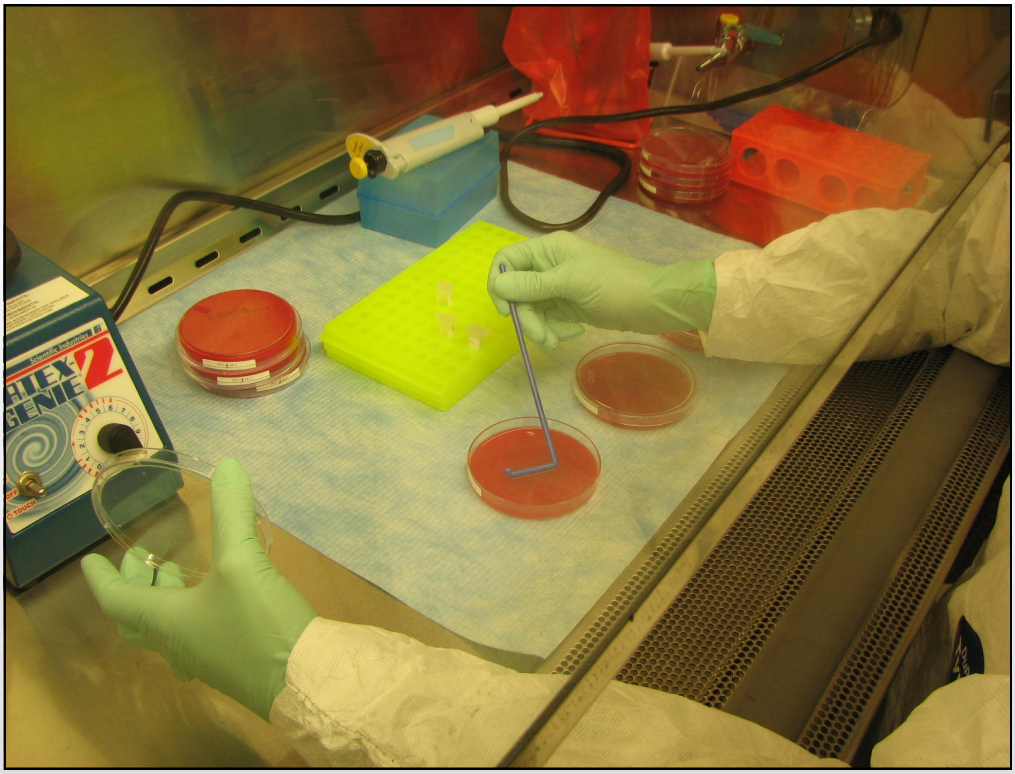
CBARR launches pre-operational study for bio efficacy decon testing

Follow-on project to test decontaminants in diverse environmental conditions



ABERDEEN PROVING GROUND, Md. – In March, CBARR was tasked to design a pre-operational study to test whether or not biological microorganisms survive on hardened military equipment surfaces coated with petroleums, oils and lubricants (POLs). The pre-study supports the Decontamination Family of Systems (DFOS) General Purpose Decontaminants (GPD) Biological Efficacy testing for the Joint Project Manager-Protection.

In preparation for the testing, there are two major factors that must be answered about the testability of the POLs: can biological agents survive on surfaces contaminated with POLs and does the presence of POLs on surfaces impact the current biological test methodologies?

"Before we launch into testing, JPM-P wants to make sure that the biological agent actually survives on surfaces contaminated with POLs because in order to measure the efficacy of decontaminants, a live agent is needed," said Debbie Menking, a CBARR biologist and project manager. "The idea here is to see if POL-treated surfaces will kill the bio agent, which would make the decontamination a moot point."

The pre-study will begin in June and last through September. According to Menking, the preliminary test results could impact the parameters for the second phase investigation, depending on whether the microorganisms survive the POL conditions.

The three biological microorganisms being studied are *Bacillus anthracis* Sterne spores, *Pantoea agglomerans* vegetative cell and Vaccinia virus Western Reserve. The biological microorganisms will be dispensed on five different materials representative of surfaces from tactical vehicles, shipboard and weapons used in theater by the Warfighter.

Small rectangular coupons will be fabricated from stainless steel, aluminum non-skid and chemical agent resistant coating (CARC), silicon rubber and polycarbonate to simulate the hardened military equipment surfaces. However, these surfaces will not be clean. Petroleums, oils and lubricants will coat the coupon surfaces to replicate real-life conditions where metal and CARC surfaces are likely to be dirty. For example, the shipboard coupons will be coated with salt water, dried saltwater and diesel fuels. Lubricants will also cover the coupons that replicate tactical vehicles and crew weapons.

The new POL piece to the decontamination efficacy puzzle has Menking convinced her team is up to the challenge.

"I want us to be known as the test lab for biological decontamination testing. I want it to be right here at ECBC, and right here at CBARR. That's the goal."

-Debbie Menking, CBARR biologist and project manager

"Each one of the coupon types, times three organisms, times three vendor decontaminants, times three climatic conditions—the test matrix is absolutely huge," Menking said. "This is a whole new capability for CBARR and one that I'm very proud of. It has made us more multi-dimensional."

(CONTINUED P. 6)

Redstone Arsenal cleans up

Air, water, sediment to be sampled, analyzed at ECBC

REDSTONE ARSENAL, Ala. — Known for supporting clean-up activities at former defense sites, CBARR now turns its focus to supporting an active installation. The Redstone Arsenal in Alabama is the site where 17 suspected chemical warfare burial sites will be investigated. These sites date back to the end of World War II when chemical weapons were drained, burned or buried in trenches.

"The big one that we're chasing now is Redstone. This could be the monster of all clean-up projects," said John Ditillo, CBARR chemist. "The initial field work will begin later this month and last for approximately 30 days. But the overall, large-scale clean-up effort at Redstone has been projected to last 25 years."

The long-term remediation effort is expected to be divided into small manageable tasks and CBARR's supporting role begins with this first phase of sample monitoring. The U.S. Army Corps of Engineers (COE) in Huntsville, Ala. where the arsenal is located, sought CBARR's expertise in providing chemical and biological (CB) solutions to conduct air monitoring and laboratory sample analysis of approximately 135 sediment and water samples that will be screened onsite and then shipped to ECBC, whose headquarters is located at Aberdeen Proving Ground (APG), Md., for a more thorough analysis.

Utilizing state-of-the-art analytical instrumentation capable of 24-hour operation, CBARR's deployable laboratory services and mobile analytic platforms will monitor for chemical warfare agents as well as their breakdown products.

Without a permanent presence in Huntsville, CBARR relies on laboratory analysis at APG or labs located at Pine Bluff Arsenal (PBA) in Arkansas, which requires the long-distance shipping of samples. The shipment of these samples to APG or PBA require timely coordination efforts with commercial laboratories that receive the corresponding split samples for the final hazardous waste analysis.

"Soil samples that require shipment off site must first be cleared by headspace analysis to ensure that they are safe for transport. Once cleared, the samples are put in coolers and sent by commercial courier to be analyzed at the CBARR laboratories at APG or PBA," explained Ditillo. "Our analysis must be completed within 24 to 48 hours so that the corresponding split can be sent to the commercial laboratory. They can't touch it until we clear it, and they have specific hold time requirements that cannot be exceeded. All of this requires careful coordination."

CBARR has a history of supporting the COE in the remediation of formerly used defense sites, including locations in Florida, Oklahoma, Hawaii, New Jersey, Kansas, Guam, the Virgin Islands and Washington, D.C. Active installations, disposal sites and former CB process facilities are also places where CBARR has provided CB analysis of environmental samples.

"We've been very busy the last couple of years and there's very few people who can do this kind of work," Ditillo said.

Built in 1941, the arsenal produced conventional chemical ammunition such as small arms and light weapons for the Warfighter until demilitarization efforts called for a reduction of surplus munitions through proper CB remediation processes. Redstone Arsenal covers 38,125 acres of land in the middle Tennessee River valley and employs more than 35,000 people, including active duty military personnel, government civilians and contractors. Today, it serves as the headquarters for the U.S. Army Material Command as well as the Aviation and Missile Command.

ECBC CONNECTION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TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

The RDECOM Insider

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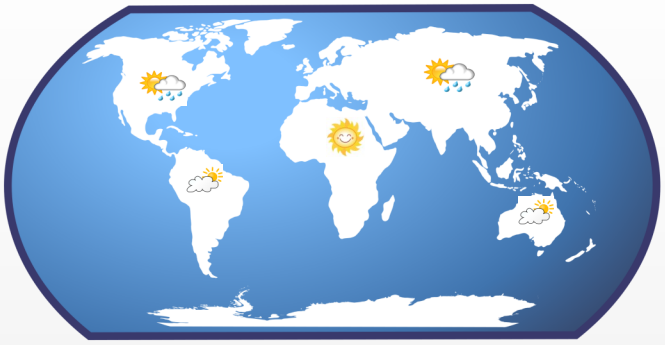
APRIL forecasts



WEATHER AROUND THE WORLD

CBARR LOCATIONS	AVG. HIGH (F)	AVG. LOW (F)	AVG. PRECIP. (in)
Aberdeen Proving Ground, Md.	64	44	3.67
Pine Bluff Arsenal, Ark.	74	52	4.87
Washington, D.C.	67	47	3.06
Deseret Chemical Depot, Utah	63	40	2.29
Umatilla, Ore.	64	41	0.61
Redstone Arsenal	74	50	4.32
Melbourne, Australia	69	53	2.10

CONTINUED FROM P.4

Decon bio study

The collaboration across ECBC's three directorates is one of the reasons CBARR had early success with the DFOS work in February 2012 and resulted in securing the follow-on project to test the decontamination samples under more austere conditions. Last year, the Engineering Directorate manufactured the testbed materials while the Research and Technology (R&T) Directorate produced and tested the Vaccinia virus. The Directorate of Program Integration performed the biological efficacy decontamination testing for the bacterial spore and vegetative cell.

"This project allows us to utilize ECBC's most valuable resource – its people," Menking said. "What we're doing now is tapping into the diverse talent and expertise of individuals within the three directorates to provide solutions for the client, and it's been working for us."

Scientists from the R&T and Engineering directorates continue their work with CBARR personnel using proven test procedures and methodologies developed the previous year by CBARR under a Technology Support Agreement (TSA) with Joint Research and Development, Inc. (JRAD). CBARR biologists successfully executed a Verification and Validation (V&V) plan for biological decontamination efficacy, which eventually laid the foundation for standardized procedures and protocols needed to meet key performance parameters.

Measurements such as the amount of material to spike on the coupons, the length of dry time and the most effective extraction processes for each type of organism were determined during the first phase of the DFOS project, which was completed in April 2012.

"Having standardized protocols like this allows the whole Test and Evaluation (T&E) community to compare one test bed to another," said Menking, a 22-year employee at ECBC.

As CBARR expands its biological capability with support from Center directorates, ECBC offers a seamless beginning-to-end process for chemical and biological research, development and analysis. The ability to turn results into practical solutions is not only invaluable to the Warfighter, but the national defense community as well.

"Biological efficacy is a very special piece that's kind of new to this decontamination arena, so I think we're very fortunate to jump into this," Menking said. "I want us to be known as the test lab for biological decontamination testing. I want it to be right here at ECBC, and right here at CBARR. That's the goal."

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As the weather gets warmer and the sun shines brighter, we're more excited than ever to stretch our legs and become more active outdoors. But don't let slips, trips and falls become a common occurrence. As a friendly reminder to practice preventative safety measures—including protecting your skin with sunscreen— and in celebration of National Poetry Month in April, chemist Adam Baker found a poem that speaks to the value of preventative safety, a founding principle of CBARR's mission.

Safety Speaks:

National Poetry Month

A Fence or an Ambulance
by Joseph Malins (1895)

'Twas a dangerous cliff, as they freely confessed,
Though to walk near its crest was so pleasant;
But over its terrible edge there had slipped a duke
And full many a peasant.

So the people said something would have to be done,
But their projects did not at all tally;
Some said, "Put a fence 'round the edge of the cliff,"
Some, "An ambulance down in the valley."

But the cry for the ambulance carried the day,
For it spread through the neighboring city;
A fence may be useful or not, it is true,
But each heart became full of pity

For those who slipped over the dangerous cliff;
And the dwellers in highway and alley
Gave pound and pence, not to put up a fence,
But an ambulance down in the valley.

"For the cliff is all right, if you're careful," they said.
"And if folks even slip and are dropping,
It isn't the slipping that hurt them so much
As the shock down below when they're stopping."

So day after day, as these mishaps occurred,
Quick forth would those rescuers sally
To pick up the victims who fell off the cliff,
With their ambulance down in the valley.

Then an old sage remarked: "It's a marvel to me
That people give far more attention
To repairing results than to stopping the cause,
When they'd much better aim at prevention.

"Let us stop at its source all this mischief," cried he.
"Come, neighbors and friends, let us rally!
If the cliff we will fence, we might almost dispense
With the ambulance down in the valley."

Mid-winter survey shows above average bald eagle population on APG

Eagle Awareness Training in effective for employees who work downrange

ABERDEEN PROVING GROUND, Md. – Our national bird is making a comeback! Nearly six years since being removed from the federal list of threatened and endangered species, the bald eagle is now flourishing across the nation—particularly at Aberdeen Proving Ground (APG), Md. where 72,000 acres of land and water provide an ideal nesting ground for the birds.

According to the Garrison's Department of Public Works – Environmental Division, 203 bald eagles were counted on post with an additional 25 birds counted along the Susquehanna River during the 2013 Mid-Winter Bald Eagle Survey, which was conducted on Jan. 6. The 228 total bird count is above average for the last six annual surveys. The population increase was not unexpected, the report stated, given the cold weather in the Northeast and mild weather in Maryland. The survey route included shoreline and tributaries of APG, as well as the shoreline of the Susquehanna River north to Peach Bottom power plant.

CBARR resident photographers Leah Usmari (credit above) and Dave Kline (credit below) snapped photos of bald eagles on Jan. 29 near Building 3942.

"As far as ECBC goes, Maxwell Point has several bald eagle nests," said Matt Jones, environmental scientist for ECBC's Environmental Quality Office. "The eagles, as you can tell by their population, have adapted and obviously thrived here, even through 10 years of war and a very busy workload. APG has done a good job of implementing policies to protect the eagles and ECBC has supported those policies."

APG is home to the highest density of bald eagles in the northern Chesapeake Bay region and comprises 7 percent of Maryland's breeding population. Though bald eagles are no longer endangered, they are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, which prohibits the killing, wounding or trapping of eagles. Attempting to disturb the eagles is also prohibited. The Army, in cooperation with the U.S Fish and Wildlife Service's Chesapeake Bay Field Office, developed a Bald Eagle Management Plan requiring mandatory workforce awareness training for any activities that can cause significant environment impacts, including testing and training operations that may interfere with the breeding, feeding or roosting of the birds.

According to Jones, the designated nesting season on APG is from Dec. 15 to June 15, and the 500-meter buffer zone around nests is fully enforced during this time. The mandatory Eagle Awareness Training must be completed on an annual basis for employees who work down range near the eagle nests, which typically have between one and three eggs in the nest by the end of March. Cameras monitor the nests to know when the last eaglets fledge the nest, usually in late May or early June, Jones said. Aerial surveys in helicopters are also conducted at least once a year. Employees are encouraged to adhere to the signage downrange and avoid outdoor work during the nesting season, however regular traffic on main roads through the buffer zones is accepted.

"They're curious creatures," said Jones, who also gives the training to visitors traveling down range and writes record of environmental considerations twice a year for M-Field activities. "Though the numbers have gone down considerably, it's not uncommon for the eagles to fly into the power lines."

According to Jones, a heightened number of these incidents nearly 10 years ago resulted in protective actions by APG. Thousands of reflective flappers have been installed on electrical power lines and insulators now cover the conductors and transformers, which have significantly reduced the number of eagle mortalities on Post. In 2012, there was one mortality and two injuries that resulted in euthanasia for eagles on APG. But there was also a success story when an adult male eagle that had sustained electrocution burns from power lines at the Aberdeen Test Center in Aberdeen, was released on Edgewood's campus after being rehabilitated at the Tri-State Bird Rescue in Newark, Del.