

NDCEE NEWSLETTER



Fall 2005

MATCHING INSTALLATION NEEDS WITH TECHNOLOGY SOLUTIONS

As part of ongoing technology transfer efforts, the NDCEE and U.S. Army Environmental Center (USAEC) visited six Army installations in early 2005 to identify current site technical needs, review alternative solutions with site managers, and facilitate technology transfer and implementation. In addition, the team witnessed facility best practices as well as shared success stories and lessons learned from other installations. Participants were Radford Army Ammunition Plant (RFAAP) and Forts Hood, Bliss, Lewis, Carson, and Stewart.

To ensure the most value from its installation visits, the team specialized in the following four focus areas:

- Nonpainting hazardous air pollutant (HAP) sources
- Sustainable Painting Operations for the Total Army (SPOTA) (i.e., HAPs from surface coating operations)
- Lead-based paint
- Solid waste reduction

Through the open cooperation of the Army installation personnel, the NDCEE and USAEC formulated nearly 90 potential solutions in the form of alternative technology recommendations, equipment upgrades, and material substitutions. Furthermore, many of these solutions support installations' 25-year sustainability goals. Depending on a facility's specific requirements, solutions included the use of a water-dispersible chemical agent resistant coating (WD-CARC), in-line paint fluid monitoring, and a paint distribution system to improve painting operations; installation of a Venturi-type wet scrubber to control HAP emissions from decontamination ovens; use of ozone, dry calcium hypochlorite, or chlorine dioxide for drinking water disinfection; and wood chippers, balers, and composting programs for landfill diversion of solid waste.

Each installation received a follow-up report that described its respective needs



This screen shot is from RFAAP's environmental management system, which provides near real-time data on wastewater discharges and air emissions. It is a best practice that could benefit other installations including Forts Bliss, Lewis, and Stewart and their unique monitoring needs.

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NDCEE HOLDS PROGRAM REVIEW AND TECHNOLOGY OPEN HOUSE

More than 100 people attended the NDCEE Program Review that was held on August 30, 2005, in Arlington, Virginia. The theme of the event was "Transferring Technology Solutions: Supporting DoD Readiness, Sustainability, and Transformation." In accordance with the event theme, the Program Review and associated breakout sessions highlighted recent fiscal year 2005 program accomplishments and environmental technologies that are available through the NDCEE.

Throughout the morning and early afternoon, platform presentations were given in the areas of sustainable ranges and unexploded ordnance, sustainable installations and operations, pollution prevention and recycle/reuse/recovery, and environmental management systems and technologies. The presentations highlighted a variety of technology demonstration and transfer success stories, challenges, and lessons learned.

Breakout sessions were held in the afternoon that focused on technology transfer modeling and roadmapping along with sustainability and environmental management tools and best practices. In addition, a Technology Open House was held where a variety of technology posters and displays were available for attendees to view and engage in dialogue with principle investigators. Key participants in the day's events included representatives from all Services, the DOE, and ESTCP/SERDP.

For more information on the NDCEE Program Review and associated events, please contact:

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NDCEE FACILITATES ASTM STANDARD FOR COLD WEATHER ADMIXTURE SYSTEMS

The NDCEE has successfully facilitated an initiative that, in less than three years, resulted in a new American Society for Testing and Materials (ASTM) standard for cold weather admixture systems. The ASTM designation is ASTM C 1622 and is described in the September 2005 issue of *ASTM Standardization News*. While the standards development process can typically take from 5–10 years, the NDCEE effectively included and coordinated key industry stakeholders to expedite the lengthy ASTM process. The NDCEE's effort was in support of an undertaking by the U.S. Army Engineer Research and Development Center - Cold Regions Research and Engineering Laboratory (ERDC-CRREL), Hanover, New Hampshire, to develop a cold weather admixture system (CWAS).

The new ASTM standard represents a vast departure from conventional cold weather concreting and promises to greatly reduce costly thermal protection practices. The original standards require that concrete shall not cure below 40°F ambient temperature, requiring contractors to use expensive temperature control methods. The new standard establishes the basis for concrete manufacturers to pour concrete at temperatures down to 23°F. It also provides concrete admixture manufacturers with the justification to make CWAS commercially available on a much wider basis. CWAS allows concrete to cure down to 23°F concrete temperature while gaining strength properly. It is similar to other low-temperature admixtures, but is distinctive in that it enables concrete to cure while the temperature of the concrete itself is below water freezing temperature. Most low-temperature admixtures allow concrete placement while ambient temperature is below freezing, but in many cases, the water additive, aggregates, or the mix itself must be heated to maintain sufficient reaction temperatures. CWAS, on the other hand, does not require the additional heating process.

Despite having developed cold weather admixture prototypes, the industry has been hesitant to accept them, due, in part, to the potential liability of use without proper ASTM and American Concrete Institute certification. Current specifications do not prohibit cold weather concreting without tenting, heating, and insulation, but admixture manufacturers and contractors are liable for damage caused by unspecified/faulty products and improper curing conditions, respectively. Therefore, for the cold weather admixture technology to significantly penetrate the chemical admixture market, a standard was required to be written and demonstrated thoroughly.

The NDCEE co-invested in a successful pour test that occurred in February 2004 at Grand Forks Air Force Base, North Dakota. The test resulted in a request for a formal Army Corps of Engineer's Engineering Technical Letter (ETL) to validate the admixture. Combined with the approved ASTM specification, the ETL will allow for



The NDCEE has facilitated a new ASTM standard that will allow construction projects to use a new CWAS. The CWAS is unique in that it can cure concrete down to 23°F concrete temperature without the need for additional heating or tenting, as required with other systems. Based on cost-benefit findings from a cold weather pour demonstration (a 7 cubic meter area), the CWAS could offer cost savings of \$6,000 in labor and material.

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NDCEE DEVELOPS COMPREHENSIVE PLANNING TOOLS FOR DECONSTRUCTION AND BUILDING MATERIAL RECOVERY

Disposal of construction and demolition (C&D) debris is an emerging major issue within the DoD as landfill capacity diminishes, tipping fees continue to escalate, and solid waste management regulations become more stringent. This issue is particularly acute for the Army, which is in the process of replacing millions of square feet of wooden buildings, many dating to World War II, with modern facilities. To assist the Army with its building removal efforts, the NDCEE, on behalf of the U.S. Army Engineer Research and Development Center - Construction Engineering Research Laboratory (ERDC-CERL), developed comprehensive guidance and planning tools that will greatly assist DoD users in implementing deconstruction within their installations. Deconstruction is an emerging removal method by which a building is methodically disassembled to recover reusable, recyclable, and saleable materials. Presently, the most widely used removal method is mechanical demolition with landfill disposal.

For this effort, the NDCEE documented two deconstruction projects: Camp Roberts, a large Army National Guard installation in west-central California; and Fort Chaffee, a former Army installation in Fort Smith, Arkansas. These projects entailed the deconstruction of World War II-era, wood-framed barracks and the remanufacturing of wood building materials, including those that were coated with hazardous lead-based paint (LBP). Both projects utilized an innovative Mobile LBP Removal System to effectively plane LBP from the wood and then mill the de-leaded wood into marketable products such as tongue and groove flooring and V-groove paneling.

Findings that were gathered from these deconstruction activities and past NDCEE efforts led to the development of two powerful planning tools: the Contracting Model and the Deconstruction Material Estimation Tool (DMET). The Contracting Model is a base-planning tool and guidance document that helps to identify the contractual needs of a deconstruction project. The DMET is a user-friendly estimation tool (MS® Excel™ spreadsheet) that utilizes user inputs to estimate a deconstruction project's preliminary feasibility, total quantities and type of building materials, amount of recoverable materials, expected labor hours, expected costs, and potential revenue from the sale of salvaged materials.

These planning tools and accompanying guidance documents that are provided by the NDCEE will greatly assist in streamlining the deconstruction process and make this removal process a more viable alternative to traditional "smash and trash" demolition. Assuming that it evolves into a more economically viable and widely accepted process, deconstruction could conceivably reduce C&D waste volumes by 50%–80% within the DoD, thereby significantly contributing to the DoD's overall pollution prevention and sustainability goals.

For more information on deconstruction, please contact:

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The NDCEE has developed a Contracting Model that helps to identify the contractual requirements of a deconstruction project. This photo shows a wooden Army barracks that is undergoing deconstruction at Fort Chaffee. A majority of the exterior wood siding and other salvageable materials have already been removed from the structure.

| Building Components | | Quantity | Salvage Percent |
|---------------------------------------|-------------------|--------------|-----------------|
| Foundation | | | |
| Foundation Type: | Pier | 40 unit | 62% |
| Brick Chimney Height: | | 25 linear ft | 95% |
| Exterior Walls | | | |
| Wall Construction: | Wood Frame (2x4) | 4610 sq ft | 95% |
| Exterior Wall Sheathing: | Brick Masonry | | |
| | Concrete Masonry | | |
| Exterior Wall Finish (1): | Wood Frame (2x4) | 4610 sq ft | 95% |
| Exterior Wall Finish (2): | Wood Frame (2x6) | | |
| | Wood Frame (2x8) | | |
| Exterior Wall Finish (3): | Wood Frame (2x10) | | |
| | Wood Frame (2x12) | | |
| Insulation (1" thick): | | | |
| Interior Walls | | | |
| Interior Partition Wall Construction: | Wood Frame (2x4) | 1717 sq ft | 95% |
| Interior Wall Sheathing: | Wood | | |
| Interior Wall Finish (1): | | 7000 sq ft | |

The NDCEE developed the DMET to help streamline the process of surveying buildings that are candidates for deconstruction. This figure contains a screen shot of the DMET's Building Material Survey Form.

NEWS TO KNOW:

AMMUNITION ENGINEERING DRAWINGS AVAILABLE ON JEDMICS

In May 2005, the NDCEE successfully converted 71,000 ammunition engineering drawings from photoprints into an electronic format. Housed at Lake City Army Ammunition Plant (LCAAP) and dating from 1890–1950, the drawings contain pertinent information on projectiles, mortars, grenades, fuses, practice munitions, and other miscellaneous material. In addition to protecting data from degradation, the conversion of the photoprint drawings to an electronic format reduces the space and cost requirements for the LCAAP repository.

The drawings have been uploaded into the Joint Engineering Data Management Information and Control System (JEDMICS) Database. They will also be available through the Munitions Items Disposition Action System (MIDAS) Database. JEDMICS is the DoD standard engineering data management and repository system and is used by more than 36,000 Government personnel. In particular, the information contained in the drawings will be beneficial to environmental remediation efforts at munitions response sites by providing data related to old/obsolete ammunition, which would be otherwise difficult to find.

Access to the JEDMICS and MIDAS databases are available to DoD employees and current DoD contractors only.

For more information on the ammunition engineering drawings conversion effort, please contact:

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NDCEE PROJECT STATUS

RECENTLY INITIATED AND CONTINUING EFFORTS:

FY05 STAPP Bullet Catcher (Task N.0414)

In 2004, the NDCEE successfully conducted demonstration/validation testing on a bullet trap technology at Fort A.P. Hill, Virginia. Under this task, the NDCEE will conduct additional testing under realistic training and controlled conditions operating environments to determine the general military utility and cost-reduction potential of this technology. Demonstration sites will include Fort A.P. Hill, Massachusetts Military Reservation, and two other sites that are to be determined. Expected rounds to be fired upon the bullet traps include 5.56mm, 7.62mm, 9mm, .50 caliber, and associated tracers.



Troops firing upon the STAPP Bullet Catcher at Fort A.P. Hill, Virginia.

Sustainability Accounting for I&E/ESOH Oversight for Identifying and Tracking Cost Measures (Task N.0423)

The Army Strategy for the Environment (ASE) transitions the Army's compliance-based environmental program to a mission-oriented approach based on the principles of sustainability. To successfully implement the ASE, a fundamental understanding is needed of the relationships between Army resources and requirements to sustain training, mobilization, deployment, and other installation missions. Through this task, which is sponsored by the Army Environmental Policy Institute (AEPI), the NDCEE will develop an approach to identify and integrate sustainability resourcing concepts and practices into Army processes.

Solid Waste Sustainability (SWS) Project (Task N.0424)

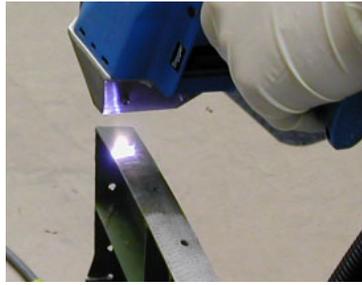
As a means of implementing a cost-effective approach to site characterization and building removal for DoD programs, such as Facility Reduction and Military Construction, the focus of SWS is to integrate applicable solid waste tools, technologies, and best practices into an installation's overall planning process. Through enhanced material reuse and recycling approaches, an installation can impact its sustainability progress towards achieving "net-zero waste" while ensuring mission readiness.

Demonstration of a Commercial Environmental Management Information System (EMIS) at DoD Installations (Task N.0425)

The NDCEE will be demonstrating and evaluating a Web-based EMIS for managing the planning, integration, monitoring, and reporting requirements that are dictated by an Environmental Management System that meets the standards of ISO 14001. By providing a functioning EMIS to military installations, the NDCEE will help the DoD to raise awareness, adopt a proactive compliance posture, and provide a comprehensive environmental regulatory management tool that will increase installations' confidence in their compliance strategies and efficiency in executing environmental management activities.

Laser Applications to Improve Air Force Aerospace Maintenance and Sustainment Operations (Task N.0426)

The Air Force is identifying, testing, and implementing laser coating removal technology as an environmentally acceptable and cost-effective alternative to current Air Force and other DoD operations. This task focuses on combining laser technology with automated robotic systems for large area coatings removal from off-equipment components and the outer mold line of selected aircraft and other processes such as surface preparation and inorganic coating operations. In addition, the NDCEE hosted a DoD Information Exchange on the state-of-the-art of laser technology on July 6–7, 2005, under this project.



Laser decoating can remove coatings from a variety of substrates.

Commercialization of Technologies to Lower Defense Costs (Task N.0427)

Using a unique integrated approach to technology transfer and commercialization services, the NDCEE helps to identify, assess, demonstrate, and transfer technologies that meet a validated DoD need, particularly those that yield environmental, occupational health and safety improvements. The task focuses on technologies that have the potential for dual use (i.e., having both DoD and commercial application). By commercializing dual-use technologies, defense costs are lowered through economies of scale in production and implementation.

Environmental Technology Verification Coatings and Coating Equipment Pilot (ETV CCEP) FY06 (Task N.0428)

The U.S. Environmental Protection Agency's ETV Program has partnered with the NDCEE, the verification organization for the CCEP, to verify environmental and performance characteristics of innovative technologies related to organic finishing operations. Under the ETV CCEP, the NDCEE develops generic test protocols with input from major stakeholders and customer groups that are associated with a given technology area, develops technology specific test plans, conducts or provides oversight for the verification tests, and develops the technology-specific Verification Reports. This task will verify three technologies and close out the pilot.

Environmental Considerations in Global Basing and Operations (Task N.0430)

In support of AEPI, the NDCEE will identify natural infrastructure capabilities to sustain operations at forward operating sites in support of global basing actions, and it will develop an analytical model to evaluate the long-term sustainability of those sites. This task also will provide an assessment of environmental intelligence required across the life cycle of contingency operations—including pre-deployment planning, deployment, post-conflict, reconstruction, and redeployment. It will identify open source data and emerging technologies to supplement baseline environmental intelligence that is available for contingency operations and forward deployments.

Regional Pilot Study for Strategic Sustainability Assessment (Task N.0433)

The Strategic Sustainability Assessment (SSA) is a long-term project to provide the Army with a fact-based visualization of future trends and issues that are critical to sustainability. In support of AEPI, the NDCEE will develop, demonstrate and validate a methodology for evaluating regional sustainability in support of the SSA that leverages existing data/models and identifies new sources of information. This effort will enable the Army to identify emerging issues and courses of action to keep the Army on track towards achieving its strategic goals and objectives across regional landscapes.

REGULATORY INSIGHT: MEK REMOVED FROM TRI LIST

Because of a recent court ruling, military and civilian operations that use methyl ethyl ketone (MEK) will no longer have to track and report their use of this popular solvent under the U.S. Environmental Protection Agency's (EPA's) Toxic Release Inventory (TRI) program. On May 10, 2005, the U.S. Court of Appeals for the D.C. Circuit ruled against the EPA and found that MEK should be deleted from the list of toxic chemicals subject to the TRI program. MEK is a colorless, highly volatile, and highly flammable liquid that is used primarily as a solvent in surface coating, electroplating, and related operations. According to the most recent TRI data, more than 26 million pounds of MEK was released to the environment in 2003.

The federal appeals court determined that Congress, in enacting the Emergency Planning and Community Right-To-Know Act (EPCRA) that authorizes the TRI Program, intended that only toxic chemicals should be regulated under the program. The court found that MEK did not meet EPCRA's criteria for listing a substance as a toxic chemical because, among other things, MEK by itself does not cause harm upon exposure. The court went on to say that the "EPA's preferred definition [of 'toxic chemical'] is clearly inconsistent with the statute." Ruling that MEK is not a toxic chemical "as the term toxic is used in ordinary parlance," the appeals court sent the case back to the district court so the district court could order the EPA to delist MEK from the TRI. On June 13, 2005, the district court decreed that facilities are not required to report releases of MEK for the 2004 TRI reporting year or beyond.

For further information, please visit the following EPA web site: www.epa.gov/tri/tridata/mek/index.htm.

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CALENDAR OF EVENTS

2005 DoD Maintenance Symposium & Exhibition, Birmingham, AL, October 24–27, 2005, www.sae.org/events/dod/

Fuel Cell Seminar 2005, Palm Springs Convention Center, Palm Springs, CA, November 14–17, 2005, www.fuelcellseminar.com/

Partners in Environmental Technology Technical Symposium & Workshop, Washington, DC, November 29–December 1, 2005, www.serdp.org

Sixteenth Annual Cleaner, Safer Industrial Materials & Processes Workshop (formerly International Workshop on Solvent Substitution), San Diego, CA, December 6–9, 2005, www.exchangemonitor.com

Joint Services Environmental Management Conference & Exposition (JSEM), Denver, CO, March 20–23, 2006, www.jsemconference.com/2006/

Matching Installation Needs With Technology Solutions

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and potential solutions. As applicable, information on other installations' best practices was included along with points of contact. For instance, Fort Hood worked with a supplier to design and implement an automated aerosol can puncturing system than can process 700 cans per hour. It also has a closed-loop, high-pressure wash system for washing fuel tanks. This system can clean two 5,000-gallon truck tanks simultaneously, with a cleaning time of approximately 1–2 hours per truck. This information was useful to other Army installations with similar needs and issues.

As part of their visits, the NDCEE and USAEC evaluated compliance issues that are associated with proposed National Emission Standards for Hazardous Air Pollutants (NESHAPs). As a result, Fort Lewis did not need to issue a \$70,000 contract as planned for an external consultant to assess its painting, reciprocating internal combustion engines, and engine test cell activities for three related NESHAP-compliance issues.

The NDCEE and USAEC intend to conduct additional installation outreach visits during fiscal year 2006. In addition, they have developed WD-CARC and Compost Technology Transfer Implementation Plans to transfer those solutions across multiple installations. These plans detail the opportunity, solution, and sequence of steps that are required to implement a new technology—tailored to the specific installation and identified process.

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NDCEE Facilitates ASTM Standard for Cold Weather Admixture Systems

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broad use of the admixture at DoD installations that perform small- to medium-sized construction projects in cold weather climates. The NDCEE has received a letter of support from the Pavements Program Manager at the Air Force Civil Engineer Support Agency, Tyndall Air Force Base, Florida. The NDCEE will continue its work to develop the cold weather admixture market through outreach to industry and military stakeholders, raising awareness, and stimulating demand, thereby creating an attractive opportunity for admixture manufacturers, as well as the potential for DoD cost savings.

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