



**Annual Status Report
on the
Disposal of Chemical Weapons and Materiel
for Fiscal Year 2003**

September 30, 2003



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on the
Disposal of Chemical Weapons and Materiel
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EXECUTIVE SUMMARY

The Department of Defense is submitting this annual report for Fiscal Year (FY) 2003 to the United States (U.S.) Congress pursuant to with 50 U.S. Code, Section 1521. This report provides the status of the Chemical Demilitarization Program (CDP) as of September 30, 2003; significant activities that occurred in FY 2003; projected accomplishments for FY 2004; the status of the safety and integrity of the U.S. chemical stockpile; and a summary of funds expended to support travel by members of the Citizens' Advisory Commissions. Informational highlights contained in this report include:

- **Chemical Demilitarization Oversight** – On February 18, 2003, the Secretary of the Army transferred Headquarters, Department of the Army-level responsibility for the chemical demilitarization program from the Assistant Secretary of the Army for Installations and Environment to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA(ALT)). In conjunction with this transfer, a provisional organization, the Chemical Materials Agency (CMA), was jointly established by the Army Acquisition Executive (AAE) and Commanding General, U.S. Army Materiel Command, to store the U.S. chemical weapons stockpile; execute chemical agent disposal facility (CDF) construction, systemization, operation, and closure; and to develop systems for destruction of, and destroy, non-stockpile chemical materiel (NSCM). The CDP remains an Acquisition Category 1 Major Defense Acquisition Program with Defense oversight. The Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)), as the Defense Acquisition Executive, has oversight and program decision-making authority for the CDP. The ASA(ALT), as the AAE, is directly responsible for all policy, direction, and oversight for the CMA, including planning, programming, budgeting, and execution.

The Program Manager for Chemical Demilitarization was reassigned as the Program Manager for the Elimination of Chemical Weapons (PM ECW) and has been realigned under CMA.

The Director, CMA is assisted by two Senior Executive Service-level deputies: the PM ECW and the Director for Operations. The PM ECW is responsible for construction and systemization of the CDFs, the Non-Stockpile Chemical Materiel Product, and support to the Cooperative Threat Reduction Program. The PM ECW and subordinate project and product managers are also responsible for total life cycle management. As such, the project and product managers are responsible and accountable for cost, schedule, and performance of all chemical demilitarization activities. The Director for Operations is responsible for oversight of chemical stockpile storage, operation and closure of the CDFs, compliance with the Chemical Weapons Convention (CWC), and implementation of the Chemical Stockpile Emergency Preparedness Program (CSEPP) on chemical stockpile storage installations.

- **Defense Acquisition Board Review Process** – On February 3, 2003, the Department approved neutralization followed by supercritical water oxidation as

the technology for safe destruction of the chemical stockpile at Blue Grass Army Depot (BGAD), Kentucky. The National Environmental Policy Act environmental impact statement record of decision documenting this technology decision was signed on February 27, 2003 and was published in the Federal Register on March 6, 2003.

- **Acquisition Program Baseline** – A revised Acquisition Program Baseline (APB) was approved on April 2, 2003. The APB contains specific quantitative objectives, as well as thresholds set at the maximum allowable level for cost and schedule, and the minimum acceptable level for performance. CMA and PM ACWA report against this baseline monthly to the Department of the Army, quarterly to the Office of the Secretary of Defense, and annually to Congress.
- **Chemical Weapons Convention** – Of the original U.S. Category 1 chemical materiel, consisting of 31,500 tons of chemical agent in the stockpile and 696 tons of agent in non-stockpile chemical materiel, 1,582 tons were destroyed prior to entry into force of the CWC on April 29, 1997. Thus, the declared Category 1 chemical materiel consists of 30,614 tons of chemical agent. As of September 30, 2003, 23.3 percent of the declared Category 1 chemical materiel has been destroyed. On September 22, 2003, the United States requested an extension until December 2007 for the 45 percent destruction deadline for destruction of Category 1 chemical weapons. This extension was granted by the Organisation for the Prohibition of Chemical Weapons Conference of State Parties on October 3, 2003. In addition, the United States had destroyed nearly 79 percent of its capacity to produce chemical weapons, and is on track to meet the 80 percent destruction milestone of April 29, 2005.
- **Chemical Stockpile Disposal** – On April 11, 2003, the Johnston Atoll Chemical Agent Disposal System successfully completed thermal processing of all process-derived hazardous waste, and was therefore able to shut down the metal parts furnace 5 months ahead of schedule. Over 3.6 million pounds of process-derived hazardous waste were processed, including 668,584 pounds of secondary waste from storage operations. On March 28, 2003, the nerve agent VX processing campaign began at the Tooele Chemical Agent Disposal Facility (TOCDF). Mustard agent processing operations began at the Aberdeen Chemical Agent Disposal Facility (ABCDF) on April 23, 2003. Nerve agent GB disposal at the Anniston Chemical Agent Disposal Facility (ANCDF) began on August 9, 2003. In addition, construction of the Pine Bluff Chemical Agent Disposal Facility was completed on November 21, 2002. During FY 2003, TOCDF, ABCDF, and ANCDF destroyed approximately 135 tons of chemical agent, or approximately 0.4 percent of the original U.S. stockpile of 31,500 tons of chemical agent.
- **Non-Stockpile Chemical Materiel Product** – During FY 2003, the Product Manager for Non-Stockpile Chemical Materiel initiated and accomplished a number of important activities in meeting the mission to safely destroy NSCM. The Explosive Destruction System (EDS) successfully deployed to Spring Valley, Washington, District of Columbia, and completed the destruction of 15 recovered

munitions, most of which contained mustard agent. The Rapid Response System was deployed to Fort Richardson, Alaska, and successfully destroyed 3 contaminated drums and 11 recovered chemical agent identification set “pigs,” which are metal chemical agent identification set overpacks (and contents therein). These deployments were completed without release, accident or injury. The EDS Phase 2 system completed developmental testing in Porton Down, England, to include the successful destruction of three munitions simultaneously. Planning and destruction activities at former chemical weapons production facilities continued on schedule to meet the 80 percent CWC destruction milestone, ahead of the April 2005 deadline.

- **Assembled Chemical Weapons Alternatives** – PM ACWA is responsible for the destruction of the chemical weapons stockpile at Pueblo Chemical Depot, Colorado, and BGAD, Kentucky. In accordance with PL 107-248, Section 8122, the Assembled Chemical Weapons Alternatives Program remains a separate program, with the PM ACWA reporting directly to the Office of the Secretary of Defense. Consequently, Pueblo and Blue Grass activities are outside the purview of CMA.

PM ACWA awarded the systems contract for the Pueblo Chemical Agent-Destruction Pilot Plant to Bechtel Pueblo on September 27, 2002, and the systems contract for the Blue Grass Chemical Agent-Destruction Pilot Plant to Bechtel/Parsons Blue Grass on June 13, 2003, for design, construction, testing, operation, and closure of their respective facilities using alternative technologies.

- **Chemical Stockpile Emergency Preparedness Program** – All eight chemical stockpile storage locations in the continental United States have achieved emergency preparedness and are continually striving to improve operational readiness. The majority of the essential systems designed to protect the public are in place and operational. During FY 2003, the Director, CSEPP, continued to cooperate with personnel from the Department of Homeland Security, Federal Emergency Management Agency, the agency responsible for implementing the civilian community aspects of the program, to ensure that the public is protected in the event of an accident at any chemical stockpile storage location.
- **Risk Reduction Initiatives** – In addition to ensuring the continued security of the U.S. chemical stockpile, during FY 2003, CMA continued to study and mitigate stockpile storage risks, including reducing the stacking height of munition pallets, placing dielectric barriers between munitions and the walls of the storage igloos, and checking ton containers for pressurized hydrogen buildup. CMA also continued to identify and mitigate risks associated with the elimination of chemical weapons.

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I. CHEMICAL DEMILITARIZATION PROGRAM INTRODUCTION

The Department of Defense (DoD) is submitting this annual report for Fiscal Year (FY) 2003 to the United States (U.S.) Congress pursuant to 50 U.S. Code, Section 1521. The status of activities associated with the storage and destruction of all U.S. chemical weapons and related materiel is presented. This report reflects the status of the Chemical Demilitarization Program (CDP) as of September 30, 2003, including significant activities that occurred in FY 2003, planned activities for FY 2004, the status of the safety and integrity of the U.S. chemical stockpile, and a summary of funds expended to support travel by members of the Citizens' Advisory Commissions (CACs) during FY 2003. The Chemical Materials Agency (CMA) and the Program Manager for Assembled Chemical Weapons Alternatives (PM ACWA) carry out the CDP. CMA includes chemical stockpile storage, the Chemical Stockpile Disposal Project (CSDP), Non-Stockpile Chemical Materiel Product (NSCMP), Alternative Technologies and Approaches Project (ATAP), and funding for the Chemical Stockpile Emergency Preparedness Program (CSEPP). This edition updates the FY 2002 report, in which the DoD reported on the progress made in FY 2002 toward the safe destruction of all U.S. chemical warfare materiel (CWM).

Each section of this report provides a description of the accomplishments in specific chemical demilitarization mission areas during FY 2003. Significant activities planned for FY 2004 are described in section XIII of this report.

Chemical Demilitarization Oversight

On February 18, 2003, the Secretary of the Army transferred Headquarters, Department of the Army-level responsibility for the CDP from the Assistant Secretary of the Army for Installations and Environment to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA(ALT)). In conjunction with this transfer, a provisional organization, CMA, was jointly established by the Army Acquisition Executive (AAE) and Commanding General, U.S. Army Materiel Command, to store the U.S. chemical weapons stockpile; execute chemical agent disposal facility (CDF) construction, systemization, operation, and closure; and to develop systems for destruction of, and destroy, non stockpile chemical materiel (NSCM). The CDP remains an Acquisition Category 1 Major Defense Acquisition Program with Defense oversight. The Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)), as the Defense Acquisition Executive, has oversight and program decision making authority for the CDP. The ASA(ALT), as the AAE, is directly responsible for all policy, direction, and oversight for the CMA, including planning, programming, budgeting, and execution.

The Program Manager for Chemical Demilitarization (PMCD) was reassigned as the Program Manager for the Elimination of Chemical Weapons (PM ECW) and has been realigned under CMA.

The Director, CMA, is assisted by two Senior Executive Service-level deputies: the PM ECW and the Director for Operations. The PM ECW is responsible for construction and systemization of the CDFs, the NSCMP, and support to the

Cooperative Threat Reduction Program. The PM ECW and subordinate project and product managers are also responsible for total life cycle management. As such, the project and product managers are responsible and accountable for cost, schedule, and performance of all chemical demilitarization activities. The Director for Operations is responsible for oversight of chemical stockpile storage, operation and closure of the CDFs, compliance with the Chemical Weapons Convention (CWC), and implementation of CSEPP on chemical stockpile storage installations.

Assembled Chemical Weapons Alternatives

Pursuant to PL 104-208 and PL 105-261, PM ACWA completed demonstrations of six alternative technologies and determined that four of those technologies were viable for pilot testing: neutralization followed by biotreatment, neutralization followed by supercritical water oxidation, electrochemical oxidation, and neutralization followed by transpiring wall supercritical water oxidation and gas phase chemical reduction. The USD(AT&L) approved neutralization followed by biotreatment as the technology for the destruction of the chemical weapons stockpile stored at Pueblo Chemical Depot (PCD), Colorado, and neutralization followed by supercritical water oxidation as the destruction technology for the stockpile stored at Blue Grass Army Depot (BGAD), Kentucky.

PL 107-248 assigned PM ACWA the responsibility for the destruction of the chemical weapons stockpiles at PCD and BGAD. This required the PM ACWA to shift its focus from assessing chemical weapons destruction technologies to implementing alternative technologies at these locations. As a result, the Program changed its name from Assembled Chemical Weapons Assessment to Assembled Chemical Weapons Alternatives (ACWA) to better reflect its new goals. In accordance with PL 107-248, Section 8122, ACWA remains a separate program, with the PM ACWA reporting directly to the Office of the Secretary of Defense (OSD). Consequently, PCD and BGAD activities are outside the purview of CMA.

II. CHEMICAL WEAPONS CONVENTION

The United States continues to comply with the requirements of the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, commonly known as the CWC.

Of the original U.S. Category 1 chemical materiel, consisting of 31,500 tons of chemical agent in the stockpile and 696 tons of chemical agent in NSCM, 1,582 tons were destroyed prior to entry into force of the CWC on April 29, 1997. Thus, the declared Category 1 chemical materiel consists of 30,614 tons of chemical agent, including 696 tons of NSCM. Category 1 chemical weapons include the unitary chemical stockpile, key binary components, and some chemical samples and recovered chemical weapons. For CWC purposes, 23.3 percent of the declared Category 1 chemical materiel has been destroyed as of September 30, 2003.

The CWC-mandated deadline for destruction of 45 percent of Category 1 chemical weapons is 7 years after entry into force, or April 29, 2004; however, the CWC allows for a State Party to request an extension to this intermediate deadline. On September 22, 2003, the United States requested an extension to the 45 percent destruction deadline until December 2007. This extension was granted by the Organisation for the Prohibition of Chemical Weapons Conference of State Parties on October 3, 2003.

In addition to destruction of chemical weapons, the CWC also requires destruction or conversion of former chemical weapons production facilities (FPFs). As of September 30, 2003, the United States had destroyed nearly 79 percent of its capacity to produce chemical weapons, and is on track to meet the 80 percent destruction milestone of April 29, 2005.

The United States continued to host CWC inspectors responsible for monitoring compliance with the CWC at chemical weapons storage facilities, chemical agent disposal facilities (CDFs), and FPFs across the country. This included the continuous presence of CWC inspectors to monitor the destruction of unitary chemical weapons at Deseret Chemical Depot (DCD), Utah, which includes the Tooele Chemical Agent Disposal Facility (TOCDF) and the periodic chemical weapons destruction operations at the Oquirrh Mountain Facility (OMF)/Chemical Agent Munitions Disposal System (CAMDS); the Edgewood Area of Aberdeen Proving Ground (APG-EA), Maryland, which includes the Aberdeen Chemical Agent Disposal Facility (ABCDF), the Chemical Transfer Facility, and the Prototype Detonation Test and Destruction Facility; and the Anniston Chemical Agent Disposal Facility (ANCDF) at Anniston Army Depot (ANAD), Alabama. Inspection activities also occurred at the FPFs located at Newport Chemical Depot (NECD), Indiana; Pine Bluff Arsenal (PBA), Arkansas; and Rocky Mountain Arsenal (RMA), Colorado. All FPFs at RMA have received closure certification.

CMA prepared several documents that were submitted by the United States to the Organisation for the Prohibition of Chemical Weapons (OPCW) in accordance with CWC requirements. The annual chemical weapons and FPF destruction plans and reports prepared in FY 2003 for submission to the OPCW are shown in the following

table. These plans and reports cover the calendar years shown in their titles, not FY 2003.

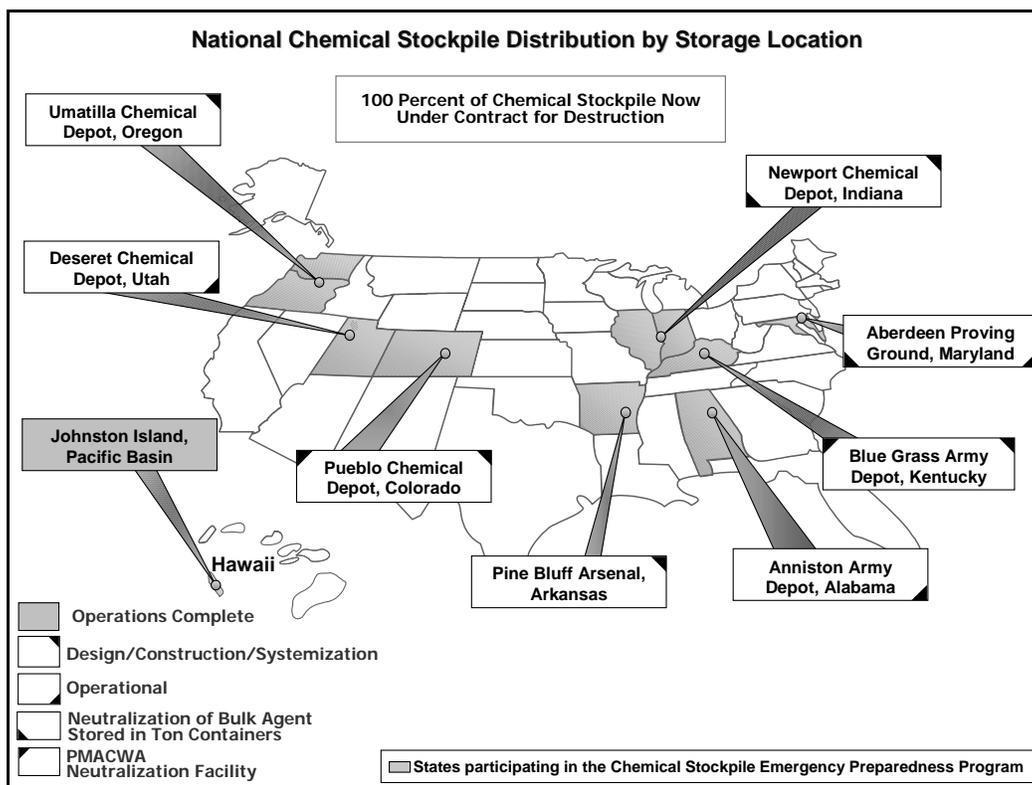
CWC Destruction Plans and Reports Prepared in FY 2003	Month and Year
United States of America, 2002 Annual Report for Destruction of Chemical Weapons	February 2003
United States of America, 2002 Annual Report for Destruction of Former Chemical Weapons Production Facilities	March 2003
United States of America, 2004 Annual Plan for Destruction of Former Chemical Weapons Production Facilities	September 2003
United States of America, 2004 Annual Plan for Destruction of Chemical Weapons	October 2003*

* To be submitted in first quarter of FY 2004

CMA continued to represent the U.S. Army at the OPCW to negotiate inspection and verification agreements for U.S. CDFs.

CMA continues to prepare for verification requirements mandated by the CWC. This preparation includes hosting coordination meetings, developing required documentation and training guides, sharing lessons learned from operational CDFs, and preparing facility-specific technical documentation. It also includes conducting pre-inspection meetings, engineering reviews, and exercises to prepare for CWC inspections.

III. CHEMICAL STOCKPILE STORAGE AND DISPOSAL



Chemical stockpile disposal is in its most complex phase, with CDFs being designed and built (in Colorado and Kentucky), in systemization (Arkansas, Indiana, and Oregon), operating (Maryland, Alabama, and Utah), and undergoing closure (Johnston Atoll). CMA and PM ACWA are prepared to meet this challenge and accomplish the mission to completely dispose of the U.S. chemical stockpile while maintaining the highest safety, occupational health, environmental, and quality standards.

FY 2003 Chemical Stockpile Disposal Accomplishments Summary

CMA and PM ACWA marked several major accomplishments during FY 2003. On May 7, 2003, the facility on Johnston Island (in the Pacific Basin) successfully completed all thermal processing of plant closure wastes, and as a result, permanently shut down the last furnace, the metal parts furnace (MPF), 5 months ahead of schedule. Agent operations at ABCDF and ANCDF commenced on April 23, 2003, and August 9, 2003, respectively, marking the first time that CDFs at three U.S. stockpile locations have operated simultaneously. As of September 30, 2003, the combined destruction total for the Johnston Atoll Chemical Agent Disposal System (JACADS), which is undergoing closure, and for ANCDF, ABCDF, and TOCDF is 26 percent (measured in tons of chemical agent) of the original U.S. stockpile of 31,500 tons of chemical agent. Systemization is ongoing at the Pine Bluff Chemical Agent Disposal Facility (PBCDF), the Umatilla Chemical Agent Disposal Facility (UMCDF), and the Newport Chemical Agent Disposal Facility (NECDF).

On February 3, 2003, the Department approved neutralization followed by supercritical water oxidation as the technology for safe destruction of the chemical stockpile at BGAD, Kentucky. The National Environmental Policy Act (NEPA) environmental impact statement (EIS) record of decision (ROD) documenting this technology decision was signed on February 27, 2003, and was subsequently published in the Federal Register.

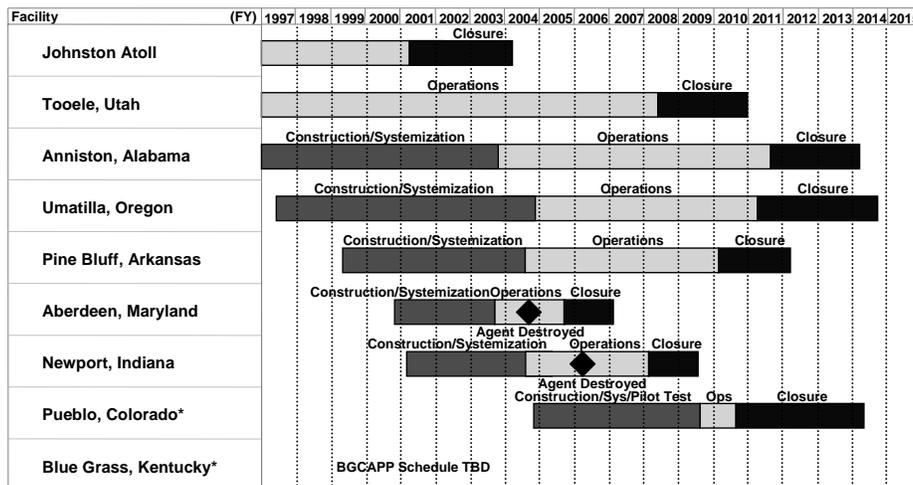
PM ACWA awarded the systems contract for the Pueblo Chemical Agent-Destruction Pilot Plant (PCAPP) to Bechtel Pueblo on September 27, 2002, and the systems contract for the Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) to Bechtel/Parsons Blue Grass on June 13, 2003. PM ACWA manages these two facilities separately from CMA in accordance with PL 107-248.

A chemical surety program ensures that chemical agent operations are conducted in a safe, secure, and reliable manner. Chemical surety is the overarching tenet and includes mission operations, safety, emergency response, security, surety management, and disposal operations.

A safety improvement program (SIP) has been established based on lessons learned from TOCDF that drives the safety culture to the individual level. Implementation of the SIP helped ANCDF complete their operational readiness review. TOCDF, UMCDF, and PBCDF are also implementing the SIP. See section VII for more information on the SIP.

The following chart depicts the master schedule for chemical demilitarization activities at each CDF by fiscal year. It is based on the objective schedule dates in the Acquisition Program Baseline approved on April 2, 2003, except where overcome by events. CMA and PM ACWA remain committed to the safe and expeditious disposal of the chemical weapons stockpile.

Chemical Stockpile Disposal Master Schedule (Fiscal Years)



*Managed separately by PM ACWA

Johnston Atoll



JACADS Systems Contractor
Washington Group International, Inc.

Hawaii Senators
Daniel Inouye (D)
Daniel Akaka (D)

Hawaii Representative
Neil Abercrombie (D-1)

The original Johnston Island stockpile of 2,031 tons of chemical agent has been completely destroyed.

Facility Undergoing Closure

JACADS continued to move forward with closure activities. On June 29, 2003, the last of 40 closure engineering change proposals required by the Resource Conservation and Recovery Act (RCRA) permit was completed. The last chemical demilitarization personnel are scheduled to depart Johnston Island by the end of the first quarter of FY 2004.

Closure

JACADS continued to play a leading role in finding innovative solutions to challenges, such as the disposal of secondary waste from chemical agent disposal operations. Activities during FY 2003 focused on processing secondary waste, and decontamination and dismantling structures and components of the demilitarization system.

On May 7, 2003, JACADS successfully completed all thermal processing of plant closure waste, and as a result, was able to permanently shut down the MPF 5 months ahead of schedule. A public availability session was held on July 24, 2003, to announce this achievement. Over 3.6 million pounds of process-derived hazardous wastes were processed, including 668,584 pounds of secondary waste from storage operations.

With Environmental Protection Agency (EPA) Region IX approval, the metal frame of the munitions demilitarization building was removed and the concrete core structure is now demolished.

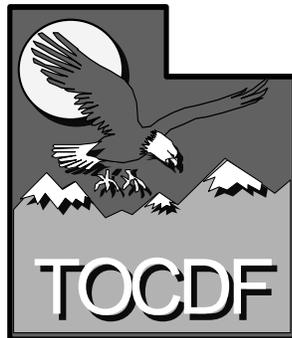
Closure verification sampling was conducted by representatives from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) and the systems contractor; results of the sampling are expected in the second quarter of FY 2004.

With JACADS closure activities nearly complete, CMA is able to apply practical closure experience and lessons learned to the development of a programmatic approach to closure for the remaining CDFs. This transfer of knowledge will continue as other CDFs progress through their life cycle. To support this effort, a closure lessons learned meeting was hosted by JACADS on September 9 and 10, 2003, with representatives from other CDFs.

As of September 30, 2003, the JACADS systems contractor had worked over 1.8 million man-hours without a lost-time injury.

JACADS is completely closed as of the departure of the last CMA and systems contractor personnel in December 2003.

Deseret Chemical Depot



TOCDF Systems Contractor
EG&G Defense Materials

Utah Senators
Orrin Hatch (R)
Robert Bennett (R)

Congressional Representative
Rob Bishop (R-1)

Elimination of the chemical stockpile stored at DCD continues. During FY 2003, TOCDF destroyed 2,896 M55 rockets and 3,805 M56 warheads, containing approximately 33.5 tons of nerve agent VX.

Operations

Agent destruction operations at TOCDF resumed on March 28, 2003. Operations had been on hold since the July 15, 2002, incident, in which a worker was exposed to nerve agent GB during changeover operations to prepare the facility for the destruction of nerve agent VX. Prior to the resumption of processing, the TOCDF systems contractor implemented safety enhancements, while an onsite team from the systems contractor's corporate headquarters reviewed progress in verifying and validating corrective action implementation and facility readiness. The DASA (ESOH) led a separate, independent investigation of the incident with a team of U.S. Army staff and industry experts from the safety and occupational health communities. In addition, the systems contractor completed an operational readiness review and closed out all Category I findings. Final corrective actions were validated and verified by PM ECW, CMA, and the Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health) [DASA(ESOH)].

In addition to corrective actions that respond directly to the recommendations in the investigation reports, PM ECW developed a safety improvement plan (SIP). The program contained specific measures that must be taken at TOCDF by the systems contractor and the government field office to complete the cleanup of residual nerve agent GB, to complete preparations for destruction of nerve agent VX, and to continually improve the safety of operations at TOCDF. The SIP also identifies corrective actions that will be implemented at other facilities to prevent the occurrence of a similar event. See section VII for more information on the SIP.

In preparation for the VX agent trial burn (ATB), the deactivation furnace system (DFS) mini-burns for VX M55 rockets were completed in June 2003. TOCDF received

an EPA Toxic Substances Control Act (TSCA) approval letter to extend the demonstration permit through September 2003. The VX ATB was completed in July 2003; however, issues were encountered regarding the analytical results from stack monitors, which indicated amounts of polychlorinated biphenyls (PCBs) in exceedence of regulatory limits. The systems contractor conducted an investigation into potential sources of contamination and discovered that the discrepancies were associated with probable contamination of surrogates. The data were sent to the EPA and a request was made to resume processing of M55 rockets; however, the EPA deemed that the data were inconclusive and has required that the TSCA demonstration portion of the ATB be re-conducted.

A TOCDF systems contractor employee filed a labor complaint in January 2003, alleging that initial training for employees involved in the operating process did not include emphasis on safety and health or emergency operations. As a result, the systems contractor received an official Occupational Safety and Health Administration (OSHA) citation. The citation was labeled "serious" with an associated penalty of \$1,500. On May 30, 2003, the systems contractor participated in an internal conference with the OSHA sub-district office in Denver, Colorado, to present evidence and views regarding the citation. While the citation was not vacated, it was reduced from "serious" to "other," and the \$1,500 penalty was not imposed.

Proposed modifications to monitoring procedures at TOCDF, based on the August 12, 2002, incident at JACADS, in which insufficient incineration of agent-contaminated secondary waste set off an alarm in the MPF discharge airlock, are being coordinated with the State of Utah. A temporary authorization request has been approved, which allows TOCDF to begin destroying nerve agent VX projectiles and ton containers while work on a Class 3 permit modification continues into FY 2004.

A chemical surety inspection was conducted by the Department of the Army Inspector General (DAIG) in May 2003. There were no failing deficiencies.

As of September 30, 2003, the TOCDF systems contractor had worked over 1.7 million man-hours without a lost-time injury.

Activities at the Oquirrh Mountain Facility

In FY 2003, OMF/CAMDS continued to support CSDP, NSCMP, and ATAP. OMF/CAMDS also supported the Assembled Chemical Weapons Alternatives (ACWA) Program in FY 2003. Activities during FY 2003 included: sampling mustard agent HD ton containers, testing a lewisite neutralization system, testing a munitions washout system for the ACWA Program, and reconfiguring 4.2-inch mustard agent HD mortars in support of future TOCDF operations.

Legal Challenges

On March 18, 2003, the U.S. Court of Appeals for the 10th Circuit affirmed the April 1996 decision of the U.S. District Court, rejecting the plaintiffs' claim that the planned incineration of chemical agents at TOCDF poses an imminent and substantial

endangerment to human health and the environment. The Chemical Weapons Working Group (CWWG) and others filed the appeal with the 10th Circuit Court of Appeals on June 14, 2000, after the judge ruled for the U.S. Army on all counts, and reiterated that TOCDF does not pose a danger to workers, the public, or the environment.

The third, fourth, and fifth requests for the Utah Division of Solid and Hazardous Waste Review Board to review the TOCDF environmental permits were filed by the CWWG on October 29, 1998; January 21, 2000; and August 2, 2002, respectively. The third and fifth requests are on hold pending CWWG amendments. The fourth request was dismissed on February 14, 2002.

On March 11, 2003, the CWWG and others filed suit in the U.S. District Court for the District of Columbia to stop the U.S. Army's chemical weapons incineration programs in Alabama, Arkansas, Oregon, and Utah. The suit alleges that the Army violated NEPA and seeks an injunction barring any further expenditure of funds for construction and/or operations at the Army's four incineration facilities until the Army prepares a Supplemental Programmatic Environmental Impact Statement (SPEIS). CWWG alleges that a SPEIS is required under NEPA because significant new information has become available since the decision to use incineration was made in 1988. On August 8, 2003, the U.S. District Court denied CWWG's motion for a temporary restraining order. Cross motions for Summary Judgment were filed on December 22, 2003 and Replies were filed on February 18, 2004. No date has been set for oral argument.

Although costly, these legal challenges have had no direct impact on continuing operations.

Other Events

On May 3, 2003, while work was being performed in the spent decontamination solution (SDS) system room at TOCDF, automatic continuous air monitoring system (ACAMS) units alarmed for nerve agent VX in the upper observation corridors. There were no personnel in the observation corridors at the time of the alarms, and the ventilation system contained the agent within engineering controls; there were no agent exposures or releases to the atmosphere. Procedures for temporary engineering changes have been revised to prevent recurrence.

A summary of the Category II chemical events that occurred at TOCDF and CAMDS during FY 2003 can be found in appendix B.

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Anniston Chemical Activity



ANCDF Systems Contractor
Washington Group International, Inc.

Alabama Senators
Richard Shelby (R)
Jeff Sessions (R)

Congressional Representative
Mike Rogers (R-3)

Elimination of the chemical stockpile stored at ANAD began on August 9, 2003, making ANCDF the fourth U.S. CDF to begin operations (after JACADS, TOCDF, and ABCDF). During FY 2003, ANCDF destroyed 4,701 M55 rockets, containing approximately 25.1 tons of nerve agent GB.

Operations

On June 4, 2003, the Department notified Congress that ANCDF was prepared to commence chemical agent destruction activities. The mandatory 30-day waiting period (required after Congressional notification and prior to starting operations) ended on July 6, 2003. On June 18, 2003, ANCDF completed a limited integrated operations demonstration, which involved several exercises designed to reconfirm that equipment, personnel, and administrative programs were ready for nerve agent GB M55 rocket processing to begin. On June 24, 2003, the EPA provided a TSCA authorization letter allowing destruction of rocket shipping and firing tubes containing PCBs. On July 30, 2003, the Alabama Department of Environmental Management (ADEM) approved the nerve agent GB DFS ATB plans, fulfilling the final environmental requirement necessary to allow commencement of agent operations. Limited chemical agent operations began on August 9, 2003, with the processing of nerve agent GB M55 rockets.

Through September 30, 2003, in agreement with the State of Alabama, transportation of munitions and agent destruction in the LIC were limited to non-school hours (the destruction of the rockets themselves, in the DFS, was not limited). However, over-pressurization of local schools was completed on September 26, 2003. After approval from DoD, transportation of munitions and agent destruction in the LIC will no longer be limited to non-school hours.

A chemical surety inspection was conducted by the DAIG in September 2003. There were no failing deficiencies.

On April 29, 2003, ANCDF personnel experienced seismic tremors throughout the plant resulting from an earthquake that registered 4.9 on the Richter scale. The epicenter of the earthquake was located near Mentone, Alabama, approximately 70 miles northeast of the facility. Conditions in the plant remained normal throughout the event. The systems contractor conducted a damage assessment and concluded that there was no structural damage. The plant's capability to withstand these tremors without structural damage is indicative of the plant's robust design and construction.

As of September 30, 2003, the ANCDF systems contractor had worked over 4.4 million man-hours without a lost-time injury.

Legal Challenges

On November 19, 2002, a collective of citizens' groups, including the CWWG, filed a lawsuit against the U.S. Army, the ANCDF systems contractor, and ADEM in the U.S. District Court for the Northern District of Alabama. The complaint seeks to permanently enjoin incineration operations at ANCDF, alleging that the Army has violated NEPA by failing to prepare a SPEIS analyzing alternative disposal technologies, that operation of the incinerator will pose an imminent and substantial endangerment in violation of RCRA, and that use of incineration rather than alternative disposal technologies near minority communities violates the "equal protection" clause of the Fifth Amendment. On March 28, 2003, the Army filed a motion to dismiss the plaintiff's RCRA and Fifth Amendment claims, and the court dismissed the NEPA and Fifth Amendment counts, and one RCRA count. Cross motions for Summary Judgment were filed on December 22, 2003.

On March 11, 2003, the CWWG and others filed suit in the U.S. District Court for the District of Columbia to stop the U.S. Army's chemical weapons incineration programs in Alabama, Arkansas, Oregon, and Utah. See the DCD legal issues section for more information.

The CWWG filed a temporary restraining order on August 5, 2003, to halt the start of agent operations at ANCDF. This temporary restraining order was denied by a federal judge on August 8, 2003. ANCDF began M55 rocket processing on August 9, 2003.

Although costly, these legal challenges have had no significant impact on systemization or continuing operations.

Umatilla Chemical Depot



UMCDF Systems Contractor
Washington Group International, Inc.

Oregon Senators
Ron Wyden (D)
Gordon Smith (R)

Congressional Representative
Greg Walden (R-2)

UMCDF systemization of all equipment required for nerve agent GB operations continues. As of September 30, 2003, the start of chemical agent operations at UMCDF is scheduled for the first quarter of FY 2004; however, as noted below, issues with the DFS surrogate trial burn (STB) may impact the start of agent operations.

The liquid incinerator 1 (LIC-1) STB was completed in February 2003, and the LIC-1 STB report was submitted for approval to the Oregon Department of Environmental Quality (ODEQ) in May 2003. The LIC ATB plan is also under ODEQ review. Approval of both documents is expected in the first quarter of FY 2004. The LIC-2 STB is scheduled for the first quarter of FY 2004.

The DFS has been undergoing surrogate testing since March 2003. Because the facility was permitted before the need for the pollution abatement filter system (PFS) was recognized, the permit currently requires monitoring upstream of the PFS. The testing has therefore been conducted to simulate maximum feed rates for rockets, without the benefit of the metals removal capability of the PFS. Based on the data from these tests, the projected rocket feed rate may be reduced to prevent the facility from exceeding the metals emission rates. ODEQ has indicated that taking credit for emissions removed by the PFS for compliance demonstration purposes will require submission of a Class III permit modification request, which must be approved prior to commencement of agent operations. While this has the potential to delay the start of agent operations, the expected increases in processing rates should mitigate delays from the permit modification request. Continued analysis to determine the best path forward is ongoing.

In preparation for agent operations, the plant began operational readiness review activities; the final portion of the process is scheduled for the second quarter of FY 2004.

Legal Challenges

The legal challenge against the U.S. Army and the UMCDF systems contractor filed on May 9, 2000, is still pending and followed tort claims filed with the U.S. Army Claims Service on September 18, 2000, which were denied on May 1, 2001. These legal actions are a result of the industrial accident that occurred at the UMCDF construction area on September 15, 1999. Investigations by the Army, the construction contractor, and the State of Oregon have ruled out chemical agent, but could not pinpoint the source of the incident. The UMCDF systems contractor settled with plaintiffs in August 2003. The first phase of the trial involving the United States took place in October 2003. The judge determined that the U.S. Army had a duty to aid the plaintiff workers. No date has been set for the second phase of the trial to determine negligence and damages.

GASP (not an acronym), a citizens' group opposing the use of incineration for the destruction of the stockpile, filed an appeal with the Oregon Circuit Court of Multnomah County in October 2000, following the Oregon Environmental Quality Commission's denial of its permit challenge on May 18, 2000. Motions were filed by April 4, 2001, and the hearings were held from October 23, 2002, until November 26, 2002. The trial phase of the lawsuit reconvened in Portland, Oregon, on March 10, 2003, and recessed again. The final 2 weeks of the 6-week trial resumed on August 11, 2003. Petitioners subsequently filed a sanctions motion against Intervenors, U.S. Army, for allegedly intimidating witnesses. The Court ruled for Intervenors, U.S. Army, denying Petitioners motion. The post-trial briefing is scheduled for completion on July 14, 2004. An adverse decision could result in a 2- to 4-year delay to the start of agent destruction at UMCDF.

On March 11, 2003, the CWWG and others filed suit in the U.S. District Court for the District of Columbia to stop the U.S. Army's chemical weapons incineration programs in Alabama, Arkansas, Oregon, and Utah. See the DCD legal issues section for more information.

Although costly, these legal challenges have had no direct impact on systemization activities.

Pine Bluff Chemical Activity



PBCDF Systems Contractor
Washington Group International, Inc.

Arkansas Senators
Blanche Lincoln (D)
Mark Pryor (D)

Congressional Representative
Mike Ross (D-4)

Construction of the PBCDF was completed on November 21, 2002, 21 days ahead of schedule. An open house was held on December 10, 2002, to mark construction completion. An additional open house, including tours for the general public, was conducted in March 2003.

Systemization activities are ongoing at PBCDF. The LIC was lit on February 7, 2003, 1 week ahead of schedule. Surrogate feed was introduced into the LIC on May 21, 2003, followed by an operational test readiness review for the facility. The U.S. Army Materiel Systems Analysis Activity's review of the fire protection system demonstration test was completed on June 11, 2003, and all fire protection system discrepancies were subsequently resolved.

On July 1, 2003, the LIC STBs were conducted according to the test plan approved by the Arkansas Department of Environmental Quality; these trial burns will help to determine the destruction and removal efficiency of the LIC and its pollution abatement system.

The DFS was lit on April 24, 2003, 1 month ahead of the original plan. The DFS STB was conducted on September 30, 2003. The MPF was lit on August 14, 2003; the MPF STB is scheduled for the second quarter of FY 2004.

As of September 30, 2003, the PBCDF systems contractor had worked over 3.0 million man-hours without a lost-time injury.

Legal Challenges

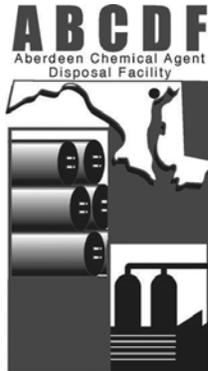
On February 12, 1999, several citizens' groups filed a joint request with the Arkansas Pollution Control and Ecology Commission for a hearing to consider revocation of the January 1999 permits issued for the construction and operation of the PBCDF. The Commission unanimously reaffirmed the permits on July 21, 2000. Petitioners appealed the decision to the Jefferson County Circuit Court, which issued a

decision on April 24, 2002, upholding the Commission's decision. On April 4, 2003, the CWWG filed an appeal before the Arkansas Court of Appeals. On 30 October 2003, the Arkansas Supreme Court upheld the circuit court's ruling in favor of the U.S. Army.

On March 11, 2003, the CWWG and others filed suit in the U.S. District Court for the District of Columbia to stop the U.S. Army's chemical weapons incineration programs in Alabama, Arkansas, Oregon, and Utah. See the DCD legal issues section for more information.

Although costly, these legal challenges have had no direct impact on the ongoing construction and systemization activities.

Edgewood Chemical Activity



ABCDF Systems Contractor
Bechtel Aberdeen

Maryland Senators
Paul Sarbanes (D)
Barbara Mikulski (D)

Congressional Representative
C.A. Dutch Ruppersberger (D-2)

ABCDF began chemical agent neutralization operations on April 23, 2003. During FY 2003, ABCDF drained 90 ton containers, and neutralized approximately 76.4 tons of mustard agent. Almost 100 truckloads of hydrolysate were shipped to the treatment and disposal contractor.

The required notification to Congress of initial facility start-up was made on January 21, 2003. The facility commenced mustard agent neutralization on April 23, 2003, after passing a pre-operational safety inspection and the operational readiness evaluation required by the DASA(ESOH).

As of September 30, 2003, construction of the ABCDF ton container cleanout (TCC) facility was complete, systemization was in progress, and the U.S. Army Materiel Systems Analysis Activity had granted approval to initiate TCC facility testing.

Operations

Neutralization operations have been delayed due to unexpected difficulties with decontaminating the exterior of ton containers after agent has been drained. In July 2003, the systems contractor imposed a safety stand-down to address difficulties with clearing the ton containers, and to implement the enhanced plant operational safety program, which was completed on August 6, 2003.

A chemical surety inspection was conducted by the DAIG in June 2003. Issues were identified in two of five areas inspected: surety management and external support. On June 6, 2003, agent operations were suspended until the concerns were resolved. Operations resumed on June 18, 2003, after corrective actions were completed to the satisfaction of the DAIG. A limited re-inspection was conducted in September 2003. There were no failing deficiencies in the re-inspection.

On August 16, 2003, the plant experienced an incident of smoke release in the on-line carbon drum filter in the neutralization process tank vent system. No workers

were exposed to agent, and no agent was released to the environment. As of September 30, 2003, the plant was in a 'pause work' mode for agent operations and an incident investigation team was reviewing the available data to determine the cause and a safe path forward.

On September 18 and 19, 2003, Hurricane Isabel moved through Maryland, causing flooding and widespread power outages. At the ABCDF, in preparation for the storm, agent and rinse tanks were reduced to residual levels, agent lines were air flushed, and undrained ton containers were returned to the storage yard. In addition, loose or light items were secured and the windows were covered with plywood. The facility was evacuated for September 18 and 19, with personnel returning to work on September 20. There was no major damage, and backup power was functional for the duration of the evacuation.

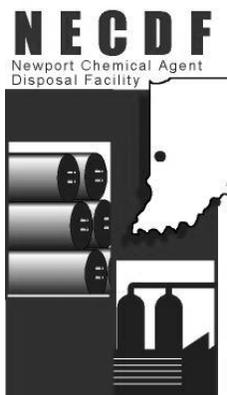
Because ABCDF is a first-of-a-kind facility, there is the potential for unforeseen difficulties, especially during the initial ramp-up period. Lessons learned are being documented for implementation at NECDF and the ACWA facilities at BGAD and PCD.

The project schedule is being revised to incorporate the extended ramp-up.

Other Events

On May 28, 2003, ABCDF experienced a power failure, during which low levels of mustard agent vapor migrated into non-processing areas within engineering controls for approximately 10 minutes. There were no agent exposures or releases to the atmosphere. A summary of this Category II chemical event can be found in appendix B.

Newport Chemical Depot



NECDF Systems Contractor
Parsons

Indiana Senators
Richard Lugar (R)
Evan Bayh (D)

Congressional Representative
John Hostettler (R-8)

As of September 30, 2003, construction of the NECDF neutralization facility was nearly complete. Activities were focused on completion of the remaining punch list items, including modification to the fire protection system in the agent processing area, and preparations for operational readiness.

Public opposition to the proposed shipment of post-neutralization hydrolysate from the NECDF to the treatment, storage, and disposal facility (TSDF) located in Dayton, Ohio, has arisen. (See legal challenges below.) The Army is working to alleviate the public's concerns.

The systems contractor notified the government that there will be a slip in the start of agent operations from the first quarter to the second quarter of FY 2004 due to delays in completing systemization, augmenting the fire protection system to meet design criteria, and addressing issues related to proposed analytical procedures for clearing hydrolysate. The project schedule is being revised to incorporate the construction and systemization delays.

Nerve Agent VX Caustic Hydrolysate Studies

In an effort to resolve discrepancies with the analytical method for analyzing hydrolysate, the waste product from the neutralization of VX nerve agent at NECDF, the Project Manager for Alternative Technologies and Approaches (PMATA) engaged the Edgewood Chemical Biological Center (ECBC) to review and refine the analytical procedures, as well as produce and clear VX hydrolysate for shipment to a TSDF for treatability studies. In order to clear the hydrolysate, the analytical results must be non-detect for nerve agent VX with a method detection limit (MDL) of less than or equal to 20 parts per billion (ppb). (Non-detect is defined as the absence of a VX measurement above the MDL.) A secondary objective of the studies was to develop a single analytical method capable of analyzing both types of stabilizer in the VX nerve agent stored at NECDF.

Problems with background interference in the 33 weight percent hydrolysate necessitated that ECBC reduce the percent weight loading to 8 weight percent to meet the offsite shipment criteria. Batches of hydrolysate generated at 8 weight percent have been able to meet the non-detect for agent criteria with an MDL less than or equal to 20ppb.

The use of 8 weight percent hydrolysate is the lowest risk approach to producing clearable hydrolysate that supports a solid path forward for the program. Efforts will continue in the second quarter of FY 2004 to refine the analytical process and increase the weight percent loading from 8 to 16 weight percent or higher.

Legal Challenges

The Legal Aid Society of Dayton, Ohio, sent a letter of complaint to the EPA on April 10, 2003, alleging noncompliance with Executive Order (EO) 12898 on environmental justice. The EPA dismissed the complaint in a letter dated June 25, 2003.

The Legal Aid Society of Dayton, Ohio, also filed suit on July 17, 2003, seeking an injunction to stop off-site shipment of hydrolysate to a TSDF. The lawsuit alleges that the Army did not comply with NEPA in making its decision, and that the Army should have supplemented the site-specific EIS of December 1998, and that the environmental assessment completed in July 2002 is insufficient to serve as a supplement. The suit was officially served on July 24, 2003. No trial date has been set.

In October 2003, it became evident that the Montgomery County, Ohio, Commission would not grant a permit to Perma-Fix, the TSDF contracted to treat VX hydrolysate from the NECDF, to discharge wastewater from hydrolysate disposal into the county's sewer system. On October 13, 2003, Parsons, the NECDF systems contractor, issued a stop work order to Perma-Fix, and began efforts to terminate the contract for convenience based on technical concerns with the Perma-Fix process. The U.S. Army and Parsons are evaluating other options for hydrolysate disposal.

Pueblo Chemical Depot



PCAPP Systems Contractor
Bechtel Pueblo

Colorado Senators
Ben Nighthorse Campbell (R)
Wayne Allard (R)

Congressional Representative
Scott McInnis (R-3)

The systems contract for the design, construction, systemization, pilot testing, operations, and closure of PCAPP was awarded to the Bechtel Pueblo Team on September 27, 2002. The Bechtel Pueblo Team is currently working on the design of the destruction facility. An initial design is scheduled to be accepted in the second quarter of FY 2004, with an intermediate design accepted in the third quarter of FY 2004 and the final design is expected to be complete by the third quarter of FY 2005.

PM ACWA investigated options to accelerate the destruction of the Pueblo stockpile. Several exercised options had a positive impact on the project schedule. The accelerated procurement action for the systems contract was completed in approximately six months. In addition, the County of Pueblo has agreed to parallel processing of the Certificate of Designation with the State permitting process, reducing the permitting cycle by 6 to 12 months.

PM ACWA also investigated the option of accelerating destruction by performing off-site treatment of uncontaminated propellant, dunnage/packaging material, and explosive and mustard agent hydrolysate. PM ACWA held two community forums and several Acceleration Options Working Group meetings and agreed with the desires of the Pueblo community to pursue off-site treatment only for uncontaminated dunnage/packaging and uncontaminated and stable propellant.

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Blue Grass Army Depot



BGCAPP Systems Contractor
Bechtel/Parsons Blue Grass

Kentucky Senators
Jim Bunning (R)
Mitch McConnell (R)

Congressional Representative
Vacant (6)

On February 3, 2003, the Department approved neutralization followed by supercritical water oxidation as the technology for the safe destruction of the chemical weapons stockpile at BGAD in Kentucky. The ROD documenting this technology decision was signed on February 27, 2003.

The systems contract for the design, construction, systemization, pilot testing, operations, and closure of BGCAPP was awarded to the Bechtel Parsons Blue Grass Team on June 13, 2003. The Bechtel Parsons Blue Grass Team is currently working on the design of the destruction facility. An initial design is scheduled to be accepted in the fourth quarter of FY 2004, the intermediate design will be accepted and the final design complete by FY 2006.

Several acceleration options have been exercised with a positive impact on the project schedule. The accelerated procurement action for the systems contract was completed in approximately six months. PM ACWA is in the process of investigating additional acceleration options to reduce the destruction schedule at Blue Grass.

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IV. NON-STOCKPILE CHEMICAL MATERIEL

During FY 2003, the Product Manager for Non-Stockpile Chemical Materiel (PMNSCM) continued to plan, prepare for, and execute disposal of U.S. CWM not classified as part of the U.S. unitary chemical stockpile. PMNSCM initiated and accomplished a number of important activities in meeting its mission to safely destroy NSCM. Details of these accomplishments are discussed in the following paragraphs.

Recovery and Destruction of Chemical Warfare Materiel

Actual Recovery or Destruction

In FY 2003, PMNSCM supported activities to recover and destroy CWM. Examples included:

- *Spring Valley, Former Camp American University, Washington, District of Columbia.* PMNSCM continued to support recovery operations conducted by the U.S. Army Corps of Engineers (USACE) and the U.S. Army Technical Escort Unit at a CWM burial location in the vicinity of the residence of the South Korean Ambassador to the United States. As of September 30, 2003, 284 initially suspect items had been recovered. Of these, 148 items were determined to be scrap, 118 items were returned to USACE for disposal as non-CWM, and 18 items were confirmed or suspect CWM. Three of the 18 confirmed or suspect CWM items were destroyed using acid digestion technology in February and March 2003. The remaining 15 75-millimeter rounds were destroyed using the Explosive Destruction System (EDS) in May and June 2003. During the EDS destruction process, 11 of the 15 munitions were determined to contain HD mustard agent. The waste from the four munitions that were not pure mustard agent HD was autopsied. The analytical results, which were discussed with British representatives, indicate that the rounds contained a British World War I choking agent known as CBR.
- *Fort Richardson, Alaska.* The Rapid Response System (RRS) was deployed in April 2003 for destruction of chemical agent identification set (CAIS) items stored at Fort Richardson, Alaska. The inventory at Fort Richardson included 11 CAIS "pigs" and 3 drums of contaminated personal protective equipment. (A "pig" is a metal CAIS overpack.) The RRS began CAIS disposal operations at Fort Richardson on July 1, 2003, and concluded on July 24, 2003.
- *Pine Bluff Arsenal, Pine Bluff, Arkansas.* A preliminary assessment of recovered CWM stored at PBA, Arkansas, was completed in February 2001. Preparations are being made to repackage the items into single-round containers and conduct a detailed assessment of each item. Facility modifications to the building in which the repackaging and assessments will be conducted are ongoing. Systemization and pre-operations are scheduled for the first quarter of FY 2004. Operation of the Pine Bluff Munitions Assessment System is scheduled to begin in the second quarter of FY 2004.

- *Coffeyville, Kansas.* Three CAIS vials were discovered in Coffeyville, Kansas, in late April 2003. One K951 vial contained mustard agent HD and was transported to APG-EA, Maryland, on June 2, 2003. It was destroyed on June 17, 2003, during Single CAIS Access and Neutralization System (SCANS) follow-on testing. The other two vials, which contained industrial compounds, were sent to Fort Riley, Kansas, for disposition.

Coordination and Support to Planning Documents

Coordination and planning for PMNSCM support of remediation efforts continued in FY 2003. Examples include:

- *Lowry Air Force Base, Denver, Colorado.* Suspect CAIS materiel was found on a former bombing and gunnery range in March 2002. Of 10 bottles recovered, 2 were intact and contained water and mustard agent HD breakdown products. The contents of the intact bottles were destroyed during analysis. The State of Colorado and USACE are addressing requirements to conduct further remediation activities. PMNSCM is providing an interim holding facility for use at Lowry Air Force Base, and prepared an interim holding facility plan, which describes the temporary storage and onsite transportation of CWM. Intrusive characterization of the area began in June 2003.
- *Brooksville, Florida.* USACE is conducting a CWM scoping and security study of the Brooksville location. PMNSCM is supporting the efforts in the event that an EDS deployment is necessary.

Support to Other Operations and Recovery

PMNSCM supported other operations and characterization of recovered items that proved not to be CWM. For example:

- *Edgewood Area of Aberdeen Proving Ground, Edgewood, Maryland.* PMNSCM continues to support the current Lauderick Creek remediation activities at APG-EA, which began in June 2000. To date, no CWM has been recovered.

Binary Chemical Weapons Disposal

Destruction of binary components (56,820 binary M20 DF canisters, 7 drums of DF, and 292 drums of QL) is scheduled to begin in FY 2005 and continue into FY 2006.* The transition agreement for temporary conversion of the DF facility at PBA was completed in August 2003. As of September 30, 2003, process and facility design were approximately 30 percent complete.

* DF is the military symbol for methylphosphonic difluoride, the critical binary precursor of the nerve agent GB₂ binary munition. QL is the military symbol for an organophosphorus ester, the critical binary precursor, which is combined with sulfur to produce nerve agent in the VX₂ binary munition.

Destruction of Former Chemical Weapons Production Facilities

Destruction activities continued at one CWC-declared FPF; a contract was awarded for the destruction of another facility. Details of these activities follow.

- *Nerve Agent VX Production Facility, Newport Chemical Depot, Newport, Indiana.* Destruction of Step 0, I, and II areas of the nerve agent VX FPF was completed during FY 2003, with the exception of the settling basins, which are due to be completed in the fourth quarter of FY 2004. Demolition of the flare tower was completed on August 5, 2003; destruction of other Step III areas began in September 2003. The facility is scheduled to be completely destroyed by the third quarter of FY 2007.
- *Integrated Binary Production Facility, Pine Bluff Arsenal, Pine Bluff, Arkansas.* A contract for the destruction of the Integrated Binary Production Facility (IBPF) was awarded in April 2003. In August 2003, the OPCW agreed to the request to temporarily convert a portion of the IBPF for use in the disposal of the binary chemical components in storage at PBA, Arkansas. Destruction of the IBPF is scheduled to begin in the first quarter of FY 2004 and be completed in FY 2007.

Miscellaneous Chemical Warfare Materiel Disposal

Ton Container Destruction

During FY 2003, planning and preparation for the destruction of ton containers continued:

- *Edgewood Area of Aberdeen Proving Ground, Maryland.* There are two ton containers that are awaiting final cleaning from the original group of 720 empty ton containers at APG-EA, Maryland. The 720 cleaned containers will be cut and shipped to Rock Island Arsenal, Illinois, for smelting and recycling, in the first quarter of FY 2004.
- *Pine Bluff Arsenal, Pine Bluff, Arkansas.* Preparations to recycle the 4,375 empty ton containers located at PBA began in FY 2001. Testing of the temporary environmental enclosure that will house part of the disposal operations continued in FY 2003. After preliminary non-intrusive assessment of all 4,375 ton containers, three were relocated—one has a high probability of containing mustard agent HD, and the other two are suspected of containing traces of mustard agent HD. Operational testing for ton container decontamination began on September 9, 2003. If this testing is successful, full decontamination operations will begin in the first quarter of FY 2004 and will be completed in FY 2005. Ton container cut and clean operations are scheduled to begin in FY 2005 and be completed in FY 2006. After the ton containers have been decontaminated, cut, and cleaned, they will be shipped to Rock Island Arsenal, Illinois, for smelting and recycling. Transport to Rock Island Arsenal is scheduled to begin in FY 2005 and be completed in FY 2006.

Category 3 Chemical Materiel

PMNSCM achieved the CWC and program milestone "Initially Declared Category 3 Chemical Weapons 100 Percent Destroyed" on March 5, 2002. However, 43 M441 shipping and firing tubes, 5 M60 training rockets, and 1 dummy rocket motor were recovered July 22, 2003, at Umatilla Chemical Depot (UMCD). The M441 shipping and firing tubes will most likely be declared as Category 3 chemical weapons. These will be the first Category 3 chemical weapons discovered and declared after the 5-year destruction deadline passed in April 2002.

Chemical Sample Disposal

Disposal of the chemical samples at APG-EA, Maryland, began in September 2000, and will be accomplished incrementally, in groups by chemical agent, through FY 2006. The chemical samples are in bottles and had been used in the past for training. Pending issuance and/or modification of applicable environmental permits, disposal of the chemical samples stored at other locations is scheduled to occur from FY 2004 through FY 2009 at the following facilities: ANCDF, BGCAPP, CAMDS, PBCDF, PCAPP, TOCDF, and UMCDF. In addition, some items will be destroyed in the EDS.

Research, Development, Test, Acquisition, and Deployment of Disposal Systems

Efforts to design, develop, test, and acquire disposal systems to access, identify, treat, and dispose of NSCM continued in FY 2003.

Rapid Response System

The RRS provides the capability to access and treat CAIS components and to package treatment wastes. Planned improvements and modifications to the RRS were completed in March 2003. The RRS was fully operational before work on the modifications was initiated, and is available to dispose of recovered CAIS materiel as required.

Munitions Assessment and Processing System

The Munitions Assessment and Processing System (MAPS) will provide a fixed capability to dispose of recovered CWM, tailored to complement existing facilities at APG-EA, Maryland. MAPS will be used to safely remove chemical agent from munitions containing explosive components. The chemical agent will be destroyed in the existing facilities and the explosive components will be disposed of in MAPS. MAPS construction and equipment installation continued in FY 2003. Construction is scheduled for completion in the first quarter of FY 2004. Testing will be completed and the system is scheduled to be operational in FY 2005.

Pine Bluff Non-Stockpile Facility

The Pine Bluff Non-Stockpile Facility (PBNSF) will provide a disposal system tailored to specific conditions and requirements at PBA, Arkansas. The facility will use technology developed for the mobile treatment systems to destroy approximately 1,238 assorted chemical munitions, including projectiles, mortars, and rockets, most filled with forms of mustard agent. Design of the PBNSF and preparation of environmental documentation continued through FY 2003.

The PMNSCM issued a stop work notice to the PBNSF systems design contractor for the process equipment design effort on November 3, 2003. Similar notification was provided to the USACE, Little Rock District, to stop design work on the PBNSF building design. PBA has notified the Arkansas Department of Environmental Quality of this decision and the respective PBNSF Air and RCRA permits have been withdrawn. This decision followed the completion of an Analysis of Alternatives to address the increasing cost and schedule risk of PBNSF construction, and to leverage technological advances from the EDS effort. The study evaluated (1) continuing design, construction, and operation of the PBNSF and (2) a multiple EDS deployment scenario. The EDS alternative was selected on the basis of its potential to provide significant reductions in schedule risk, cost, and complexity.

Explosive Destruction System

The EDS provides an alternative to the open detonation method of chemical munitions disposal. The EDS safely contains the blast and fragmentation, as well as the chemical agent, from the controlled detonation of a chemical munition. The content of the munition is then chemically treated and the waste is containerized. Three EDS units are approved to conduct CWM destruction operations (EDS Phase 1 Units 1, 2, and 3). Nineteen recovered chemical munitions were destroyed using the EDS at APG-EA from December 2002 through April 2003; 15 recovered 75-millimeter rounds were processed at Spring Valley, Washington, District of Columbia, in May and June 2003. EDS Phase 2 Unit 1 completed developmental testing in the United Kingdom on July 11, 2003. During developmental testing, the EDS Phase 2, which is designed for disposing of larger and/or multiple recovered chemical items, successfully completed multiple-round testing for mustard, sarin, and phosgene. Operational testing is scheduled to begin at APG-EA in the first quarter of FY 2004.

Mobile Munitions Assessment System

The Mobile Munitions Assessment System (MMAS) mission is to provide a mobile platform supporting assessment of recovered suspect CWM to determine contents and condition. Three MMAS units are available (at APG-EA, Maryland; PBA, Arkansas; and Dugway Proving Ground, Utah) to assess suspect CWM. The MMAS Phase 1 Unit 1 was deployed on October 2, 2002, to assess an M125 bomblet recovered at RMA, Colorado. The assessment determined that the bomblet was filled with ethylene glycol. Additional assessments were conducted at RMA in April and May 2003. The MMAS Phase 1 Unit 2 was used to assess a CAIS vial found in Coffeyville, Kansas, in late April 2003. During FY 2003, MMAS conducted assessments

at Fort Ord, California; Black Hills Ordnance Depot, South Dakota; Edwards Air Force Base, California; Spring Valley, Washington, District of Columbia; APG-EA, Maryland; and Andrews Air Force Base, Maryland.

Single CAIS Assessment and Neutralization System

The Single CAIS Assessment and Neutralization System (SCANS) is a disposable neutralization reactor, employing RRS process chemistry, used to treat individual CAIS components. After treatment is complete, the disposable reactor containing the hydrolysate is shipped to a TSDf for final destruction. Developmental and operational testing were completed on March 14, 2003. Supplemental testing, required due to a pipe thread leak that occurred during developmental and operational testing, began in June 2003 and is scheduled to be completed in the first quarter of FY 2004. A conditional release in-process review was held on September 12, 2003, and an operational fielding in-process review is scheduled for the first quarter of FY 2004.

Technology Test Program

A technology evaluation panel, including technical experts and members of the general public, met on October 16, 2002, to evaluate alternatives to incineration for treatment of EDS, RRS, and PBNSF neutralent wastes, as well as the binary munition components DF and QL. The panel's recommendation on technologies for waste treatment was included in a "partnering with industry" request for proposal. A contract was awarded on July 25, 2003, as part of the "partnering with industry" approach, to establish a partnership with one or more TSDfS to transport and dispose of NSCMP secondary wastes using non-incineration treatment technologies. Technologies that show promise and continue to be tested and evaluated include batch supercritical water oxidation, persulfate oxidation, and wet air oxidation.

V. CHEMICAL STOCKPILE EMERGENCY PREPAREDNESS

CSEPP enhances emergency preparedness at the eight chemical stockpile storage locations in the continental United States (CONUS) to protect the civilian population, workers, and the environment. Forty counties and one tribal nation in 10 states participate in CSEPP.

Since the program began in 1988, the U.S. Army Director for CSEPP (formerly the Product Manager for CSEPP) has teamed with the Department of Homeland Security Federal Emergency Management Agency (DHS-FEMA) and state and local governments to ensure that the public is protected in the event of an accident at any chemical stockpile storage location. CSEPP accomplishments are centered on enhanced command and control, as well as communication and notification systems (including automation and notification hardware and software, telephone and radio upgrades, and sirens and tone alert radios). All eight chemical agent storage locations in the CONUS have achieved emergency preparedness and are continually striving to improve operational readiness. The majority of off-post essential systems designed to protect the public are in place and operational. DHS-FEMA is responsible for implementing the civilian community aspects of the program. According to PL 105-261, Section 141, the Director of DHS-FEMA will provide a separate report to Congress outlining accomplishments of participating civilian communities.

Throughout FY 2003, community Integrated Process Teams (IPTs) continued to work day-to-day issues at each stockpile location. These stakeholder groups consider local issues and attempt to resolve problems at the community level.

Technical Support Activities

The following summarizes significant CSEPP technical support activities completed in FY 2003.

- Conducted successful joint U.S. Army, DHS-FEMA, and local civilian community chemical stockpile emergency preparedness exercises at seven of the eight chemical stockpile storage locations. (The APG-EA exercise was scaled back due to ongoing neutralization activities and a then-anticipated completion of stockpile elimination there by the end of the first quarter of FY 2004.)
- Conducted the CSEPP National Workshop in Mobile, Alabama, June 24 to 26, 2003. More than 300 federal, state, county, and contractor representatives attended.
- The Public Affairs IPT, comprised of federal, state, and local members representing all eight CSEPP locations, continued its outreach initiatives. The Public Affairs IPT supported CSEPP in the planning of a number of outreach initiatives, including public awareness surveys for five of the chemical stockpile storage locations. IPT members continue to share best practices for informing the public of protective actions; exploring new, innovative, and effective methods

of informing the public; and maximizing the impact of funding spent on public outreach.

- Through Argonne National Laboratory, provided spokesperson training to Army and state and local government officials at four chemical stockpile storage locations. This course, given at each of the eight chemical stockpile storage locations once every 2 years, is designed to give instruction and hands-on experience to officials who may be called upon to speak to the media, particularly in a news conference environment, in the event of a chemical accident or incident.
- Designed and published six public information factsheets for distribution to Army public affairs officers and civilian public information officers.
- Completed refresher training for Army and state and local government users of the D2-Puff version 4.2 hazard prediction model in seven CSEPP communities in FY 2003. The Umatilla, Oregon, community transitioned to exclusive use of the D2-Puff model in Calendar Year (CY) 2003. The remaining communities are preparing to transition to the D2-Puff model; the Army will decertify the D2 model in CY 2004. The D2-Puff model version 4.4, with enhanced automation features, will be installed at all chemical stockpile storage installations in October and November 2003.
- In the medical area, CSEPP provided support to medical training and exercise activities in all 10 CSEPP states; developed and distributed a standardized chemical, biological, and radiological medical training curriculum; and developed and distributed standardized documents for use by hospital and emergency medical services systems in conducting self-assessments of their medical capabilities.

VI. ENVIRONMENTAL COMPLIANCE AND CHEMICAL AGENT MONITORING ACTIVITIES

The CMA Risk Management Directorate environmental and monitoring offices and PM ACWA continued to implement initiatives to facilitate compliance with the EPA and other state environmental permits applicable to chemical demilitarization operations, and also to enhance environmental compliance, chemical agent monitoring, and laboratory analyses. The offices work with the OSD, Department of the Army, EPA, the Department of Health and Human Services (DHHS), National Research Council, Native American organizations, state and local governments, and other groups to monitor and ensure the safe disposal of all CWM.

Environmental Permitting Status

The Environmental Permitting Status table on the following page details the status of environmental permitting at the seven CDFs of the CSDP and ATAP, the two ACWA pilot facilities, as well as different projects of the NSCMP. In addition to the described activities, all facilities and systems continue to submit necessary permit modification requests to ensure that environmental permits remain current by incorporating programmatic lessons learned and updated environmental regulations.

National Environmental Policy Act Documentation Status

CMA and PM ACWA have continued to achieve compliance with NEPA through the completion of key documents for CDFs and other projects, as required. The status of these documents is contained in the NEPA Documentation Status table on page 37.

Environmental Permitting Status

Facility/System	Permitting Status
JACADS	A RCRA permit was issued in August 1985; a renewal of the RCRA permit was issued in June 1998, with an effective date of July 1998. The closure plan permit modification request was submitted to EPA for review in July 2000, and was approved in January 2001.
TOCDF	RCRA and Clean Air Act permits were issued in 1989; the RCRA permit renewal application was submitted in September 1998. The renewal permit is expected to be issued in the second quarter of FY 2004. A TSCA demonstration permit was issued in September 1996 and re-issued in September 1998.
ANCDF	RCRA and Clean Air Act permits were issued in June 1997. A national TSCA permit for the destruction of PCBs in M55 rocket tubes at ANCDF, UMCDF, and PBCDF was issued in June 2002. National permit operating conditions are defined after the successful conduct of a PCB trial burn.
UMCDF	RCRA and Clean Air Act permits were issued in February 1997. A national TSCA permit for the destruction of PCBs in M55 rocket tubes at ANCDF, UMCDF, and PBCDF was issued in June 2002. National permit operating conditions are defined after the successful conduct of a PCB trial burn.
PBCDF	RCRA and Clean Air Act permits were issued in January 1999. A national TSCA permit for the destruction of PCBs in M55 rocket tubes at ANCDF, UMCDF, and PBCDF was issued in June 2002. National permit operating conditions are defined after the successful conduct of a PCB trial burn.
ABCDF	RCRA, Clean Air Act, and Clean Water Act permits were issued in February 1999. However, the Clean Water Act permit has been rendered unnecessary, as ABCDF is shipping the hydrolysate to a licensed TSDF.
NECDF	RCRA, Clean Air Act, and Clean Water Act permits were issued in December 1999. However, the Clean Water Act permit will be rendered unnecessary if NECDF ships the hydrolysate to a licensed TSDF.
PCAPP	PM ACWA is pursuing a staged research, development, and demonstration (RD&D) permit. Once the full-scale pilot plant has been demonstrated, a full RCRA Part B permit will be obtained for the destruction of the stockpile and closure of PCAPP. The RCRA RD&D permit application was submitted to the State of Colorado in December 2003.
BGCAPP	PM ACWA is currently negotiating a RD&D approach with the Commonwealth of Kentucky environmental regulators.
OMF/CAMDS	The research and development (R&D) permit for the disposal of chemical agent lewisite was issued in April 1998; a renewal permit will be issued prior to lewisite operations. The RCRA permit was issued in September 1999.
MAPS	A research, development, and demonstration permit was issued for APG-EA, Maryland, in March 2001.
RRS at PBA, Arkansas	RCRA and Clean Air Act permits for use at Pine Bluff are in development and are expected to be issued during the third quarter of FY 2004.
Non-Stockpile Facility for Recovered CWM Disposal at PBA, Arkansas	The RCRA and Clean Air Act permits are expected to be issued during the second quarter of FY 2004.
EDS at PBA, Arkansas	RCRA and Clean Air Act permits are expected to be issued for deployment at Pine Bluff during the third quarter of FY 2004.
Binary at PBA, Arkansas	The Clean Air Act permit is expected to be issued in the second quarter of FY 2004. There will be no RCRA permit prepared for Binary operations at PBA.

NEPA Documentation Status

Facility/System	NEPA Status
JACADS	An EIS update was developed and a record of environmental consideration (REC) was signed in December 2001.
TOCDF	The EIS was completed in July 1989; the ROD was signed in August 1989. EIS updates and RECs were completed in July 1996 and July 1999. RECs for treatment of VX by incineration were completed in August 2002 and February 2003.
ANCDF	The EIS was completed in May 1991; the ROD was signed in July 1991. An EIS update and REC were completed in June 2003.
UMCDF	The EIS was completed in June 1996; the ROD was signed in January 1997. An EIS update is scheduled for completion in the second quarter of FY 2004.
PBCDF	The EIS was completed in June 1997; the ROD was signed in July 1997. An EIS update is scheduled for completion in the second quarter of FY 2004.
ABCDF	The EIS was completed in July 1998; the ROD was signed and published in the Federal Register in September 1998. An environmental assessment and a finding of no significant impact (FONSI) regarding offsite disposal of mustard agent hydrolysate were completed in December 2001. An environmental assessment and FONSI for accelerated neutralization were completed in May 2002.
NECDF	The EIS was completed in December 1998; the ROD was signed and published in the Federal Register in February 1999. An environmental assessment was completed in July 2002 for accelerated neutralization of chemical agent and offsite commercial treatment of liquid process effluents at NECDF, and a FONSI was completed in October 2002.
PCAPP	The EIS was completed in March 2002; the ROD was signed and published in the Federal Register in July 2002.
BGCAPP	The EIS was completed in December 2002; the ROD was signed in February 2003 and published in the Federal Register in March 2003.
NSCMP	The final NSCMP Programmatic EIS for transportable treatment systems was released in April 2001. The ROD was signed and published in the Federal Register in June 2002.
Empty Ton Container Decontamination and Recycling Operation at PBA, Arkansas	An environmental assessment and FONSI were completed in December 1999.
Non-Stockpile Facility for Recovered CWM Disposal at PBA, Arkansas	A notice of intent was published in August 2001. A public meeting was held in May 2002. An environmental assessment was completed in March 2003, and a FONSI was completed in May 2003.
Munitions Assessment System at PBA, Arkansas	An environmental assessment was completed in March 2002, and a FONSI was completed in May 2002.
EDS Support for Munitions Assessment System Operation at PBA, Arkansas	An environmental assessment was completed in December 2002, and a FONSI was completed in May 2003.
RRS Operations for CAIS at PBA, Arkansas	An environmental assessment was completed in February 2003, and a FONSI was completed in May 2003.
Binary at PBA, Arkansas	The public comment period for the environmental assessment began on September 29, 2003.

ISO 14001 Certification

EO 13148, effective April 2000, requires government facilities to establish and implement an ISO 14001-like Environmental Management System (EMS) by December 2005. ISO 14001 is a structured approach to managing the sites' environmental actions and impacts on the environment. The CMA Environmental Office developed and initiated an EMS program in order to comply with EO 13148 requirement, and teamed with USACHPPM to establish an EMS at each of the CDFs. The Environmental Office assists the CDFs in establishing the program and the USACHPPM audits the CDF program to ensure that it is in conformance with the EMS requirements. The CDFs are on schedule to be compliant by the required deadline.

Maximum Achievable Control Technology Rule

The U.S. Army has been actively pursuing compliance with the Hazardous Waste Combustor Maximum Achievable Control Technology (MACT) rule at the incineration-based CDFs in the CONUS. The MACT rule establishes technology-based emissions standards for hazardous air pollutants from hazardous waste combustors. As incineration facilities, TOCDF, ANCDF, PBCDF, and UMCDF are subject to the MACT rule. ANCDF, PBCDF, and UMCDF are equipped with pollution abatement filtration systems (PFSs) that are designed to reduce the emission rates of heavy metals to within the MACT requirements; TOCDF will reduce feed rates to comply with the MACT rule. Training requirements are being resolved with the appropriate state regulatory agencies. Interim standards were effective upon publication in February 2002, requiring facility compliance by the end of FY 2003. As of September 30, 2003, the applicable operating facilities (ANCDF and TOCDF) have met the necessary requirements. The EPA will promulgate the final standards by FY 2005. The CDFs will continue to evaluate the systems for compliance with the rule; at this time, the standards are not expected to impact the disposal of chemical weapons.

ACWA Environmental Activities

The Department has mandated that PM ACWA pursue an optimized environmental permitting process for Pueblo and Blue Grass. To fulfill this mandate, PM ACWA is pursuing a research, development and demonstration (RD&D) permit for each facility.

At Pueblo, PM ACWA will utilize a staged approach to an RD&D permit. The stages include:

- Stage 1 – Site preparation and pre-construction activities
- Stage 2 – Non-process buildings/structures construction activities
- Stage 3 – Process buildings/structures construction activities, facility systemization, and pilot testing

Once the full-scale pilot plant has been demonstrated, a full RCRA Part B permit will be obtained for the destruction of the stockpile (milestone three) and closure of PCAPP.

At Blue Grass, PM ACWA is currently negotiating a RD&D approach with the Commonwealth of Kentucky environmental regulators.

During FY 2003, PM ACWA supported Environmental Working-Level Integrated Product Teams (WIPT) in Colorado and Kentucky. The purpose of the Environmental WIPTs is to expedite the planning, development, and implementation of all aspects of the environmental permitting processes for the CDFs at Pueblo and Blue Grass. The WIPTs are used to rapidly identify and resolve specific environmental permitting issues at the working level. The membership of each WIPT is specific to the particular location, but includes representatives from key stakeholder groups, such as the EPA, state and local regulators, the public, and the military installation. The WIPTs will continue to resolve issues at the working level, enhance communications and understanding among stakeholders, and facilitate accelerated schedules for the environmental permitting process.

Chemical Agent Monitoring Activities

Monitoring efforts continued to address technical issues at programmatic as well as project- and product-specific levels. Continuation of FY 2002 R&D efforts and institution of new FY 2003 tasking in support of developing, upgrading, and validating monitoring technologies remained dominant within the monitoring community.

- *Vapor Validation Protocol.* Vapor validation testing of MINICAMS[®], depot area air monitoring system (DAAMS) units, and organic impingers progressed throughout FY 2003. FY 2003 lewisite vapor validation efforts for MINICAMS and DAAMS methods were completed, and after consultation with the National Institute for Occupational Safety and Health, gained Centers for Disease Control and Prevention (CDC) approval for use as quantitative monitors. Mustard agent HD vapor validation testing of the MINICAMS resulted in similar CDC concurrence. Lewisite impinger testing will be completed in the first quarter of FY 2004 and a final report will be prepared for review and comment in the second quarter of FY 2004.

Nerve agent VX vapor validation uncovered some inherent problems with the silver fluoride (AgF) conversion (VX to the more volatile, and thus more easily quantified, G-analog) pads at various test conditions, when subjected to a continuous VX vapor stream. Additional data identified capture efficiency issues associated with the pre-concentrator tube; these issues were investigated and corrective actions have been administered. VX vapor validation is expected to be finalized in the second quarter of FY 2004. Issues associated with AgF conversion pads promoted a solicitation and FY 2003 contract award for optimization of the VX conversion process. The VX conversion investigation will attempt to increase VX conversion efficiency by 10 percent, and completion of testing is anticipated in the fourth quarter of FY 2004. Difficulties encountered during VX vapor validation efforts delayed FY 2003 planned vapor test activities for nitrogen mustards (HN-1 and HN-3) and nerve agent GB. Nitrogen mustard and GB vapor validation efforts are anticipated to commence in the first quarter of FY 2004.

CMA, in collaboration with ECBC, is developing a solid-state vapor generator for chemical warfare agents. The system generates nerve agent GB and mustard agent vapors at very low levels to simulate field conditions by use of an agent vapor for calibration and challenge testing of ACAMS and MINICAMS units. If the instrument is not being challenged, the chemical agent stream will be ducted to a carbon filter or into plant engineering controls. No chemical agent will be intentionally released into the atmosphere.

- *Dioxin and Furan Monitoring.* Dioxin and furan monitoring efforts continued throughout FY 2003. Test efforts will continue through FY 2004. Test efforts investigated included miniaturization of the system (reducing the footprint from a bench-top unit to a more field-conducive design). After miniaturization, field testing will begin in the second quarter of FY 2004 and is expected to be completed in FY 2005.
- *Programmatic Laboratory Quality Assurance Plan Update.* To ensure laboratory and monitoring efforts were being conducted in accordance with updated requirements and to ensure effective implementation of continuous improvement, the Programmatic Laboratory Quality Assurance Plan underwent revision in FY 2003. Finalization of the revised plan is expected in the second quarter of FY 2004.

Bunning Amendment to the FY 2004 Defense Authorization Act

In May 2003, Senator Jim Bunning (Kentucky) proposed a sense of Congress amendment that was added to the National Defense Authorization Act for FY 2004. Section 1056(b) of the act states that “it is the sense of Congress that the Secretary of the Army (1) should, in coordination with relevant Department of Defense research and development agencies, invigorate and coordinate efforts to develop chemical agent monitors with improved sensitivity, specificity, and response time; and (2) should deploy improved chemical agent monitors in order to ensure the maximum protection of the general public, personnel involved in the chemical demilitarization program, and the environment.”*

CMA chemical agent monitors are fully protective of human health and the environment. The monitoring systems have been endorsed by the National Research Council, the Centers for Disease Control, and state environmental agencies. Under the CDP, the U.S. Army has for more than a decade worked to improve the monitoring of chemical weapons storage and disposal. More than 20 new technologies have been evaluated in the past 4 years alone. However, due to the extremely low levels at which monitoring is required, no new detection technology has been developed that is as sensitive, fast, discriminating, and that satisfies current quality control performance requirements, as the equipment currently being used. CMA will continue to track advancements in many of the evaluated systems, for potential future implementation as the technologies mature. The following tables list the technologies or systems reviewed, the findings, and a comparison to the monitoring system already in place.

* The National Defense Authorization Act for FY 2004 became PL 108-136 on November 24, 2003.

Chemical Agent-Monitoring Technologies/Systems Reviewed, Findings, and Comparison to Existing Systems

System	Short Description	Checked/ Tested/ Evaluated	Date	Findings	Comparison to Existing Agent Monitoring Systems	Manufacturer(s) or Model(s)
Automatic Continuous Air Monitoring System (ACAMS) with Continuous Sampling System (ACAMS-CSS); ACAMS with High Volume Sampler (ACAMS-HVS); MINICAMS [®] with CSS (MINICAMS-CSS), and Agilent/ Dynatherm Agent Monitor (A/DAM)	NRT monitor for new airborne exposure limits (AELs) for chemical agents	Evaluated with nerve agents GB & VX, and mustard agent HD at the new AELs	2002-2004 (ongoing)	ACAMS-CSS and ACAMS-HVS are not capable to monitor near real-time (NRT) at the new AEL for chemical agents; MINICAMS-CSS and A/DAM are being evaluated in the field for their efficiencies	In laboratory testing, ACAMSs did not pass the precision and accuracy (P&A) studies and were abandoned from further testing; MINICAMS and A/DAM show promising results in P&A and baseline studies.	ABB (ACAMS); CMS Field Products (Model # 3001 MINICAMS-PFPD); Agilent and Dynatherm (A/DAM)
Fourier Transform Infrared Detector (FTIR)	Closed cell for process stack monitoring for agents and pollutants of incomplete combustion (PICs)	Evaluated at the Chemical Agent Munitions Disposal System (CAMDS)	1998	Moisture interfered and detector lacked sensitivity	Failed compared to ACAMS for agent and failed for PICs	Midac

System	Short Description	Checked/ Tested/ Evaluated	Date	Findings	Comparison to Existing Agent Monitoring Systems	Manufacturer(s) or Model(s)
FTIR	Open-path FTIR systems to monitor for chemical agents in ambient air	Evaluated at the Edgewood Chemical Biological Center (ECBC)	1994	No data available for nerve agent VX; detection limit 2×10^{-3} mg/m ³ for nerve agent GB and 3×10^{-2} mg/m ³ for mustard agent HD. Detection limit is 67 times higher for GB and 75 times higher for HD than the current level. Detection limit is 2,000 times higher for GB and 1,500 times higher for HD than the new AELs.	Much higher detection levels when compared to ACAMS	Manufacturer - CEREX, (Air Sentry Open Path FTIR, Model - 282000); Kassey Field Service, Inc.; Midac
Automatic Chemical Agent Detection and Alarm (ACADA) System	Portable multi-agent detector using ion-mobility spectroscopy detection for ambient air	Evaluated	2003	Can detect agent at battlefield levels; has interferences; contains a radiation source; a NRT system	Cannot detect as low as the current ACAMS or MINICAMS systems	Graseby Dynamic Limited, UK (Model # XM22); Other Manufactures include Environics Oy; Science & Technology Research, Inc.; and Smiths Detection
Environmental Technologies Group APD2000	Portable multi-agent detector for ambient air	Evaluated	2003	Can detect agent at battlefield levels; has interferences; a NRT system	Cannot detect as low as the current ACAMS or MINICAMS systems	Environmental Technologies Group, Inc. (Mod # APD2000)

System	Short Description	Checked/ Tested/ Evaluated	Date	Findings	Comparison to Existing Agent Monitoring Systems	Manufacturer(s) or Model(s)
Functional Group Specific Ratiometric Chemosensors	Multi-agent detector for ambient air	Evaluated	2003	Research technology, not ready for field use; a NRT system	Cannot detect as low as the current ACAMS or MINICAMS systems	AIRSENSE Analytics (Mod# PEN2 and EDU2)
Surface Acoustic Wave Detectors	Portable multi-agent detector for ambient air	Evaluated	2003	Can detect agent at battlefield/ immediately dangerous to life and health (IDLH) levels; has interferences; a NRT system	Cannot detect as low as the current ACAMS or MINICAMS systems	(A research technology)
Optical Interferometry	Portable multi-agent detector for ambient air	Evaluated	2003	Research technology, not ready for field use; a NRT system	Cannot detect as low as the current ACAMS or MINICAMS systems	(A research technology)
Improved ACAMS	Improved ACAMS for ambient air	Undergoing field testing	2003	Passed P&A studies; Class 1-certified; software being revised	Meets/exceeds current ACAMS	SAIC/MRI
Near-Real-Time Confirmation Sampler	Continuous sorbent sampler for ambient air	Undergoing field testing	2003	Passed P&A studies; Class 2-certified for mustard agents HN-1, HD, and HN-3	Meets/exceeds current Depot Area Air Monitoring System (DAAMS)	Focis Associates, Inc.
Improved DAAMS	Improved selectivity, sensitivity, and less preventative maintenance than DAAMS system for ambient air and stack gases	Under development	Ongoing	To be determined	To be determined	DAAMS
Comparative Evaluation of Thermal Desorption Units	Downselect based on performance, ease of use, serviceability, cycle time, and cost	Under development	Ongoing	To be determined	To be determined	Dynatherm

System	Short Description	Checked/ Tested/ Evaluated	Date	Findings	Comparison to Existing Agent Monitoring Systems	Manufacturer(s) or Model(s)
Chemiluminescence Methods	Optical spectroscopy for ambient air	Evaluated	2001	Research technology, not ready for field use; sources of background reactions must be identified and eliminated	Poor sensitivity and specificity when compared to existing system	(A research technology)
Laser Raman Spectroscopy	Optical spectroscopy for ambient air	Evaluated	2001	Research technology, not ready for field use; interaction and portability is low and has a significant interference problem	Poor sensitivity and specificity when compared to existing system	Thermo Nicolet
Laser Photoacoustic Spectroscopy	Optical spectroscopy for ambient air	Evaluated	2001	Research technology, not ready for field use; sensitivity compromised by water absorption continuum	Poor sensitivity but adequate specificity when compared to existing system	(A research technology)
Enzyme Inhibition	Bioassay for ambient air	Evaluated	2001	Very complex and time-consuming system; performance due in part to control of purity and activity of the enzymes	Good sensitivity and specificity when compared to existing system	TECHNICON
Immunoassay Methods	Bioassay for ambient air	Evaluated	2001	Very complex and time-consuming system; problem with zero baseline drift and complexity reduces reliability	Good sensitivity and specificity when compared to existing system	(A research technology)

System	Short Description	Checked/ Tested/ Evaluated	Date	Findings	Comparison to Existing Agent Monitoring Systems	Manufacturer(s) or Model(s)
Molecular Beam Resonance-Enhanced Multi-Photon Ionization Mass Spectrometry	Optimal spectroscopy for ambient air	Evaluated	2001	Sensitivity poor due to low ionization efficiency	Poor sensitivity but adequate specificity when compared to existing system	Bruker
Atmospheric Pressure Chemical Ionization Tandem Mass Spectrometry (MS/MS)	Mass spectroscopy for ambient air	Evaluated	2001	Significant stack interference with instrument cycle time of 15 seconds	Adequate sensitivity but poor specificity when compared to existing system	Serex and Varian
Multi-Capillary Column with Field Ionization Spectrometer	Ion spectroscopy for ambient air	Evaluated	2001	Common air contaminants such as food odors and organic compounds are interferences	Poor sensitivity but adequate specificity when compared to existing system	Alltech
Cavity Ring-Down Spectroscopy	Optical spectroscopy for ambient air	Evaluated	2001	Feasibility in the parts per million (ppm) range; degree or location of halogenation may not be a sensitivity factor as with laser-based methods	Poor sensitivity but good specificity when compared to existing system	TIGER Optics LLC
Porous Silicon Interferometer	Optical spectroscopy for ambient air	Evaluated	2001	Feasibility testing detection of diisopropylfluorophosphonate at 800ppm	Poor sensitivity but good specificity when compared to existing system	(A research technology)
Laser Fluorescence Detector	Fluorescence spectroscopy for ambient air	Evaluated	2001	Specificity should exceed ACAMS by a factor of 2; projected cycle time is 12 minutes	Adequate sensitivity and specificity when compared to existing system	ESA Inc.

System	Short Description	Checked/ Tested/ Evaluated	Date	Findings	Comparison to Existing Agent Monitoring Systems	Manufacturer(s) or Model(s)
Super Critical Chromatography	Gas chromatography for ambient air	Evaluated	2001	Requires development of liquid film collector/ concentrator that samples both gases and aerosols; projected response time is 10 minutes	Adequate sensitivity and specificity when compared to existing system	Agilent Technogies

Note: Other systems are in use by the Army and were evaluated for the Army by the Soldier and Biological Chemical Command (now Research, Development and Engineering Command), but were for the detection levels required for the battlefield.

**Monitoring Technologies/Systems Reviewed, Findings, and Comparison to Existing Systems
(Non-Chemical Agent Monitoring Technology)**

System	Short Description	Checked/ Tested/ Evaluated	Date	Findings	Comparison to Existing Monitoring Systems	Manufacturer(s) or Model(s)
X-Ray Fluorescence (XRF)	X-ray spectroscopy for determination of metal alloys in solid samples	Evaluated	1997	No real-time sample analysis	The current system requires that a sample be collected and sent to a capable laboratory for analysis or the collected sample can only be analyzed locally at a higher quantification level	Rigaku International Corp (Model #ZSX 101)
Laser-Induced Breakdown Spectroscopy (LIBS)	Vapor analysis for metals in the ambient air or stack gas	Evaluated	1997	System tested could not measure arsenic and cadmium reliably; this instrument is considered to be a NRT instrument	The current system requires that a sample be collected and sent to a capable laboratory for analysis, which may take weeks for sample turnaround; a NRT analytical instrument would be preferred	Sandia National Laboratories
Mercury (Hg) Monitor	This instrument measures total mercury in a stack gas	Evaluated	2003-2004 (ongoing)	Laboratory proof of principle scheduled for late in 2003; a field test is required and would be conducted in 2004	The current system requires that a sample be collected and sent to a capable laboratory for analysis	DURAG, Inc./Verewa (HM-1400 TR); Genesis Laboratory System, Inc. (Quick Silver Sky Sentinel); Nippon Instruments Corporation (DM-6)

System	Short Description	Checked/ Tested/ Evaluated	Date	Findings	Comparison to Existing Monitoring Systems	Manufacturer(s) or Model(s)
Jet Resonance Enhanced Multiphoton Ionization/ Time-of-Flight Mass Spectroscopy (Jet REMPI-TOF)	Continuous monitor for dioxin/furan in stack gas	Evaluated	2002- 2003 (awaiting final report)	Currently in developmental stage; this instrument needs to be laboratory and field tested further. Not permit required at incineration operations for this NRT system.	The current system is to collect sample and send to a capable laboratory for analysis; this may take weeks and there is potential for contamination. NRT analysis has the potential to give faster results, but detection levels of the laboratory maybe lower.	Stanford Research Institute International (REMPI-System)

Changes to Nerve and Mustard Agent Monitoring Standards

PLs 91-121 and 91-441 mandate that the DHHS review DoD plans for disposing of chemical munitions with respect to potential hazards to public health or safety, and to recommend what precautionary measures are necessary to protect public health and safety. At the request of the U.S. Army Center for Health Promotion and Preventive Medicine, the DHHS CDC initiated a study to reevaluate the existing airborne exposure limits (AELs) and recommend changes with regard to advances in science and changing needs. The AELs are the maximum allowable concentrations of agent in the air for occupational and general population exposures. The CDC published notices of proposed changes to the AELs for nerve and mustard agents in the Federal Register in January 2002 and July 2003, respectively. The final recommendations for nerve agent AELs were published in the Federal Register on September 17, 2003, and are scheduled to go into effect in FY 2005.

Evaluation of operational impacts associated with lower nerve and mustard agent AELs continued during FY 2003. The most cost-effective approach to addressing new monitoring standards was to investigate upgrades of existing technologies. In FY 2003, an upgraded ACAMS (new software and control system) was developed. Additionally, FY 2003 hardware modifications demonstrated promise for monitoring at the new worker protection levels. The success of FY 2002 ACAMS efforts resulted in FY 2003 follow-on tasking for inclusion of hardware modifications into a production configuration for plug-and-play implementation at demilitarization facilities. In addition, software modifications will be made to allow multiple alarm setpoints, which will address the TOCDF dual alarm setpoint configuration for multi-agent monitoring. A fully integrated ACAMS configuration for use in demilitarization facilities is anticipated by the second quarter of FY 2004.

FY 2003 testing of the Agilent/Dynatherm Agent Monitor (A/DAM) demonstrated success in detection of nerve agents at the new monitoring levels. The A/DAM offers multi-agent monitoring and self-confirmation capabilities and would likely be a suitable replacement for existing monitoring systems. The pulsed-flamed photometric MINICAMS also demonstrated success in detection of nerve agents at the proposed monitoring standards. The A/DAM and MINICAMS configurations could potentially reduce the false alarms at facilities and lower detection levels to improve monitoring. These configurations will be further tested by conducting field studies, precision and accuracy studies, and baseline testing in FY 2004.

In addition to R&D efforts for detection at the new worker protection levels, FY 2003 R&D efforts also focused on methodologies that could satisfy the new general population limits for nerve agents VX and GB. Testing demonstrated that existing methodologies could be modified by focusing the sample at the front of the gas chromatography analysis.

Chemical Stockpile Disposal Monitoring Activities

The formation of EA-2192 from nerve agent VX destruction, which was of concern to State of Utah regulators, was successfully addressed by TOCDF in FY 2003,

which allowed the facility to move toward nerve agent VX destruction. However, State of Utah regulators expressed concerns over mercury emissions, which resulted in a FY 2003 tasking to test a mercury continuous emissions monitoring system (CEMS). The mercury CEMS test plan has been prepared and testing is expected to begin in the first quarter of FY 2004, and be completed in the fourth quarter of FY 2004.

CMA completed analytical testing results of third-round environmental background sampling at DCD. Analytical results indicate a variation in concentration, but no trends indicate that chemical agent disposal operations performed at DCD have negatively effected the environment. A fourth round of environmental sampling is scheduled for FY 2005.

Preparation for blister agent lewisite neutralization activities continued to progress at OMF/CAMDS. Lewisite MINICAMS and CAMDS liquid chromatography/mass spectrometry DAAMS methods received CDC concurrence for quantitative use. ECBC was tasked in FY 2003 to investigate the ability of the MINICAMS to detect L-2 and L-3. Test results concluded the MINICAMS was able to detect L-2 and L-3, but at much lower responses than L-1. After unsuccessful literature search efforts on the ability of carbon filters to strip out lewisite from airflows, ECBC was tasked to investigate the ability of carbon to adsorb lewisite vapor from an air stream. Testing results indicated carbon is an effective media for scrubbing lewisite vapors. In September 2003, a tasking was initiated to vapor-validate the OMF/CAMDS 16-point sample array, which is planned for use in the filter mid-bed. Testing was initiated as a result of data requests from State of Utah regulators.

Investigation into the design optimization of stack probes revealed that new design applications did not increase the performance of the stack probe and would therefore not offer the ability to increase agent feed rates. (The feed rate is limited by the ability of the stack monitors to accurately detect chemical agent.) No additional testing is planned.

Non-Stockpile Chemical Materiel Monitoring Activities

PMNSCM, with assistance from ECBC, continued to provide monitoring support for EDS activities in support of Spring Valley, Washington, District of Columbia, munition disposal efforts. PMNSCM monitoring and chemistry support efforts were instrumental in the destruction of 15 munitions.

PMNSCM monitoring efforts at PBA, Arkansas, continued to progress throughout FY 2003. The Pine Bluff Ton Container Cleanout facility saw the maturation of the monitoring system, development of mobile analytical laboratory procedures, successful pre-operational review of laboratory agent operations, and implementation of studies to measure a baseline for chemical agent monitors.

FY 2003 PMNSCM R&D efforts investigated a continuous DAAMS confirmation device. The device, when coupled to a near real-time (NRT) monitor, collects a sample concurrently with the NRT monitor. If the NRT monitor does not alarm, the DAAMS sample tube packing material is conditioned and a new sample is collected. The design

offers a two DAAMS tube collection approach and ensures that continuous sample collection is performed. Implementation of this device in support of PMNSCM monitoring activities offers the ability to collect a more representative NRT confirmation sample and would significantly reduce the resources required to set up, collect, and condition DAAMS sample tubes. Finalized testing of the confirmation device is expected to be completed in the third quarter of FY 2004.

Alternative Technologies and Approaches Project Monitoring Activities

Agent interference issues were overcome by ABCDF and successful initial baseline studies were completed. The baseline studies assisted in the transition from systemization to agent operations. Monitoring efforts in the fourth quarter of FY 2003 have focused on the monitoring support required to ensure that ton containers have been decontaminated sufficiently to exit from the process area. Evaluation of the monitoring support requirements will continue into the first quarter of FY 2004.

MINICAMS and DAAMS monitoring stations were installing in NECDF. Mobile perimeter monitoring stations were fabricated and field-tested. NECDF laboratory operations demonstrated success in various precision and accuracy studies.

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VII. CHEMICAL WEAPONS STORAGE AND ELIMINATION RISK REDUCTION INITIATIVES

Assessment of the Safety and Integrity of the Chemical Stockpile

The safety and integrity of the chemical stockpile continue to be evaluated through a monitoring and inspection program, as well as through analytical sampling and analysis. Quantitative risk assessments (QRAs) have been completed for the chemical stockpile storage locations in the CONUS to provide a detailed analysis to support risk management. Data continue to support that the risks of continued long-term storage outweigh the risks associated with disposal operations. Timely disposal of the chemical stockpile will reduce and eventually eliminate this risk.

The U.S. Army is continuing analytical work to address chemical stockpile storage safety issues. The following paragraphs present a more detailed status of the analytical work, as well as the safety status of the chemical stockpile at each storage location in the CONUS.

Studies of Risk Reduction for M55 Rockets

Previous risk assessments showed that the risk at most chemical stockpile storage locations is primarily due to long-term storage of M55 rockets. This risk results largely from the potential for accidents due to natural phenomena—specifically, earthquakes and lightning.

Risk reduction options have been identified to address the earthquake and lightning risks. Reduction in earthquake risk can be accomplished by reducing the height of the rocket stacks from five pallets to four pallets and banding the pallet stacks together. Reduction in lightning risk can be achieved by moving the pallets farther from the igloo walls or by placing a dielectric material, such as acrylic sheets, between the igloo walls and the pallets most susceptible to lightning.

During FY 2003, a study was completed to assess how much risk reduction might be achieved by implementing one or more risk reduction measures at ANAD, BGAD, PBA, and UMCD. The study found that the eastern stockpile locations (ANAD, BGAD, and PBA) were generally found to have greater lightning risk and, for those locations, the use of dielectric barriers was usually the most effective single option. A similar lightning risk reduction could be achieved if susceptible pallets were moved farther from the igloo walls; however, the increased risk of munition movement must be balanced against the possible reduction in lightning risk. Sufficient movement also may not be possible at some locations due to space limitations.

At the only western stockpile location assessed in the study (UMCD), lightning risk is relatively small and the only recommended options were to reduce the stacking height of the rocket pallets and to band adjacent pallets to reduce the risk from earthquakes.

As of September 30, 2003, the Army was implementing or had already implemented risk reduction measures at the four chemical stockpile storage locations analyzed in this study. The status of these activities is discussed below, in reference to each storage location.

Safety of Mustard Agent-Filled Ton Containers

Previous experience with mustard agent-filled ton containers has shown that there is a potential for pressurization. A study conducted in FY 1998 hypothesized that pressurization could be associated with the development of hydrogen gas. Several follow-up studies were completed to assess potential safety issues associated with pressurization. The result of one of these efforts was the development of a pressure test and relief device for use on ton containers. In July 2002, this device was used to take pressure readings on a small number of mustard agent ton containers stored at DCD. The gas space in the ton containers was analyzed for the presence of hydrogen and other combustible gases using a flammable-gas meter and hydrogen detector tube, and gas samples were taken. The gas samples were sent to ECBC for chemical analysis, which indicated the presence of a substantial amount of hydrogen in the pressurized ton containers.

Recently, gas samples were taken from other ton containers at DCD and the chemical analyses of these samples have recently been completed. These new analyses confirm the results from the earlier sample analysis, indicating that the pressurizing gas is primarily hydrogen. The Army is studying the implications of this finding and ways to reduce the potential for hydrogen combustion during disposal operations. A summary report on the study will be published during the first quarter of FY 2004.

Safety of the Chemical Stockpiles at Each Storage Location

The chemical stockpile continues to be safely stored at eight locations in the CONUS. Assessments of risks and possible risk reduction measures, designed to enable continuous improvement on the successful historical record of safe storage, continued in FY 2003.

As in previous years, leaking munitions were overpacked in accordance with long-standing procedures without incident. The munition leakage history is provided in section VIII of this report. The augmentation of security forces at all storage and disposal facilities that occurred as a result of the September 11, 2001, terrorist attacks continues and is expected to remain in effect at each facility until chemical agent disposal operations are complete. Other aspects of chemical stockpile safety are summarized by storage location in the following paragraphs.

- *Deseret Chemical Depot, Utah.* Updates of Phase 2 QRA results for TOCDF were issued in October and December 2002 for nerve agent VX and mustard agent campaigns, respectively. The storage risk at DCD continues to be reduced through ongoing disposal operations. CMA continues to investigate ways to maximize the efficiency of the destruction schedule while reducing public risk

from the chemical stockpile. In addition, during FY 2003, the stack height of munitions in storage has been reduced and the nerve agent VX rocket pallets have been banded together to reduce risk from earthquakes.

- *Anniston Chemical Activity, Anniston Army Depot, Alabama.* Disposal of the ANAD stockpile began at ANCDF on August 9, 2003. As nerve agent GB disposal operations continue, the storage risk at ANAD will be reduced. In addition, risk mitigation options for storage of nerve agent VX rockets are being considered. Among these options is the possible placement of dielectric barriers in igloos to reduce the potential for M55 rocket ignition due to lightning.
- *Umatilla Chemical Depot, Oregon.* The Phase 2 QRA for UMCDF was issued as final in December 2002. Earthquakes remain the dominant contributor to the public risk of storage. Options to mitigate the risk of earthquakes are being studied, including possible stack height reduction and banding of rocket pallets. The ultimate risk mitigation, disposal of the chemical stockpile, is scheduled to begin in FY 2004.
- *Pine Bluff Chemical Activity, Pine Bluff Arsenal, Arkansas.* The possibility of lightning affecting the M55 rockets is still the greatest contributor to the public risk of storage; therefore, dielectric barriers were placed in igloos during FY 2003 to mitigate the risk of M55 rocket ignition due to lightning. Efforts are currently underway to finalize the Phase 2 QRA for PBCDF to include this change; the updated QRA is scheduled for completion in the first quarter of FY 2004. There have been no new safety-related issues affecting the chemical stockpile at PBA.
- *Pueblo Chemical Depot, Colorado.* In October 2002, PCD workers discovered that sample lines for two storage igloos containing mustard agent munitions had no flow. These lines were repaired; however, subsequent inspection revealed further sample line failures. To address this issue, PCD implemented a corrective action plan that modified igloo monitoring procedures to require sample line flow checks each time an igloo is entered. Failing lines are repaired or replaced. The other chemical stockpile storage locations have been informed of the issue.
- *Blue Grass Chemical Activity, Blue Grass Army Depot, Kentucky.* Further refinements of the storage risk assessment were conducted during FY 2003 and indicated that the igloo collapse models used for simulated earthquakes were overly conservative. Based on the reassessment of these models, the risk of igloo collapse during a seismic event is no longer the dominant risk. Lightning is now the top contributor to storage risk at BGAD. Options to mitigate lightning risk to rockets, including placement of dielectric barriers in igloos, are being studied.
- *Edgewood Chemical Activity, Edgewood Area of Aberdeen Proving Ground, Maryland.* During FY 2002, four storage magazines were constructed, and half of the mustard agent ton containers stored at APG-EA were moved inside. Due to the impending start of operations and the anticipated expedited disposal schedule, the remainder of the ton containers were not moved. Disposal

operations at ABCDF began on April 23, 2003; however, the facility ramp-up has taken longer than anticipated. The storage risk at APG-EA has been and will continue to be reduced through ongoing disposal operations.

- *Newport Chemical Depot, Indiana.* Accelerated disposal is being implemented at NECDF. There are no new or outstanding safety issues regarding chemical stockpile storage at NECD.

Chemical Stockpile Disposal Initiatives

The Project Manager for Chemical Stockpile Disposal (PMCSO) and PMATA continue to meet challenges presented by the complex task of safely destroying the U.S. chemical stockpile. The following paragraphs provide a summary of key initiatives during FY 2003 designed to enhance the ability to safely and effectively accomplish this mission.

In October 2001, PMCSO implemented a formalized risk management program to help ensure effective management of the approved Defense Acquisition Board schedules. PMCSO held its most recent Risk Management Board meeting in June 2003; however, the board members are in continuous contact throughout the year to discuss progress against risk items and to identify new risk items for mitigation.

Provided in the following paragraphs are some accomplishments from FY 2003:

- *Gelled Rocket Processing.* After completion of the nerve agent GB ATBs, TOCDF discovered that portions of their stockpile included gelled rockets. Gelled rockets were not a critical path item for TOCDF, and were co-processed with nerve agent GB ton containers and projectiles. If ANCDF, PBCDF, and UMCDF are limited to TOCDF's demonstrated processing rates for gelled rockets, there will be significant schedule impacts. Therefore, the systems contractors used thermal modeling to identify optimal throughput rates and provide a basis for permit modification requests. The systems contractors at other facilities will use this data to provide their state regulators with engineering calculations to request approval for optimal processing rates.
- *Metal Parts Furnace Discharge Airlock Monitoring.* The August 12, 2002, incident at JACADS, in which insufficient incineration of agent-contaminated secondary waste set off an alarm in the MPF discharge airlock, led the systems contractor to develop a monitoring solution and model to prove agent destruction temperatures. This solution allowed resumption of scheduled processing rates. Modifications to the discharge airlock monitoring at JACADS were implemented with EPA, Region IX, approval. Proposed modifications to monitoring procedures at TOCDF are being coordinated with the State of Utah. A temporary authorization request was approved, which will allow TOCDF to destroy nerve agent VX projectiles and ton containers while work on a Class 3 permit modification continues into FY 2004.

- *Safety Improvement Program.* A SIP has been established based on lessons learned from TOCDF to enhance the safety program at each CDF. The SIP includes defining the scope of work, identifying and analyzing safety hazards, preparing a safety analysis, and establishing hazard controls. The program drives the safety culture to the individual level. In addition, a conduct of operations program institutes uniformity in the performance of tasks within acceptable ranges for safety, while permitting appropriate variability for human performance, operational readiness reviews, and lessons learned.

The PMCSD Risk Management Board continues to identify emerging risk items to study, and plans to continue with implementation of recommendations during FY 2004. Examples of emerging risk items in FY 2004 include improvement of carbon filter changeout and processing, more detailed agent characterization, optimization of PFS operations, and processing enhancements for mustard agent munitions.

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VIII. OCCURRENCES OF LEAKING CHEMICAL MUNITIONS

The occurrences of leaking munitions and overpack containers (containers used to encapsulate munitions found to be leaking) within the chemical stockpile are recorded in the following table. Since 1980, records indicate that there have been approximately 4,256 leaking munitions or overpacks. Specific totals for years prior to 1980 are not included, as early records are incomplete and any total incorporating these time frames cannot be considered accurate.

Calendar Year	Leakers by Type				Leakers by State ^a									
	M55 Rockets ^b	SUPLECAM Samples ^c and Overpack Containers	All Other Munitions	TOTAL	AL	AR	CO	IN	JI	KY	MD	OR	UT	Other
2003 ^d	14	7	14	35	14	0	0	0	0	2	0	7	12	0
2002	24	17	7	48 ^e	19	3	0	0	0	0	0	8	18	0
2001	56	34	204	294 ^e	57	3	0	0	0	2	0	7	225	0
2000	74	103	29	206 ^e	54	2	1	0	2	7	0	6	134	0
1999	93	109	156	358 ^e	76	1	0	0	0	9	0	5	267	0
1998	29	28	112	169 ^e	23	2	0	0	0	2	0	3	139	0
1997	38	11	32	81 ^e	40	1	0	0	1	0	0	8	31	0
1996	135	3	102	240 ^e	107	1	14	0	64	5	0	2	47	0
1995	146	11	29	186 ^e	99	0	0	0	6	5	0	14	62	0
1994	122	29	23	174	76	3	2	0	0	2	0	3	88	0
1993	94	3	33	130	34	1	0	0	2	11	0	9	73	0
1992	74	139	52	265	47	2	1	0	5	24	0	5	181	0
1991	72	4	37	113	44	2	1	1	4	7	0	8	46	0
1990	78	5	33	116	19	3	0	0	2	2	0	11	79	0
1989	125	7	36	168	12	14	3	0	15	5	0	7	112	0
1988	66	7	39	112	19	2	3	0	6	2	0	29	51	0
1987	32	22	31	85	26	3	1	0	3	2	0	6	44	0
1986	89	18	42	149	57	0	11	0	12	5	0	8	56	0
1985	211 ^f	4	12	227	40	0	0	0	7	14	0	9	157	0
1984	168 ^f	0	76	244	8	0	1	0	1	15	0	185	34	0
1983	12	0	47	59	7	0	2	0	4	21	0	2	23	0
1982	13	0	55	68	12	0	0	0	10	13	0	9	22	2
1981	53	0	463	516	48	1	4	0	11	17	0	6	424	5
1980	102	2	109	213	88	4	1	0	7	10	0	21	62	20
TOTAL	1,920	563	1,773	4,256	1,026	48	45	1	162	182	0	378	2,387	27

Notes:

- ^a AL Alabama (ANAD)
AR Arkansas (PBA)
CO Colorado (PCD)
IN Indiana (NECD)
JI Johnston Island
KY Kentucky (BGAD)
MD Maryland (APG-EA)
OR Oregon (UMCD)
UT Utah (DCD, Dugway Proving Ground)
Other Germany (munitions from German retrograde program that were transferred to Johnston Island in December 1990)
- ^b Includes GB and VX rockets and rocket warheads.
- ^c Surveillance Program, Lethal Chemical Agents and Munitions (SUPLECAM) (leakers from drilled and tapped holes in munitions used for chemical agent sampling).
- ^d The 2003 period covers January 1, 2003 through September 30, 2003. The numbers for October through December 2003 will be added to the 2003 totals for the FY 2004 report.
- ^e Some leaking munitions were detected during disassembly at the CDFs prior to their destruction, rather than at the storage area (5 in 1995, 64 in 1996, 11 in 1997, 102 in 1998, 161 in 1999, 24 in 2000, 168 in 2001, and 6 in 2002). All leaks detected during these operations were under engineering controls.
- ^f A large number of M55 rockets were inspected in 1984 and 1985. Quarterly storage monitoring inspections of nerve agent GB M55 rockets were conducted thereafter.

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IX. PUBLIC OUTREACH AND INVOLVEMENT

Chemical weapons stockpile destruction generates public interest and scrutiny for a variety of reasons. Proactively identifying and addressing public concerns, such as those that focus on the safety and management of chemical weapons destruction facilities is the main focus of communications. Community officials and legislators are sensitive to these concerns, remain involved in agent destruction activities in their areas, and expect a high level of communication and engagement at both the local and headquarters level to ensure that their constituents remain safe. For these reasons, public involvement and outreach is an important part of the CDP.

CMA Public Affairs Office

During FY 2003, CMA's Public Affairs Office (PAO) focused on increasing stakeholder knowledge and awareness of the CMA missions, objectives, and progress, as well as enhancing opportunities for public participation based on individual community needs. To accomplish this, CMA undertook several initiatives that ensured that a wide variety of stakeholders—including Native Americans, minority groups, and others—were fully informed about the program's progress and any other issues that interested them, and that the most appropriate media, methods, and venues were used for each stakeholder group.

These initiatives were incorporated into a multi-level public involvement program. The first level in the program is comprised of site-specific implementation of plans and activities for each of the six CONUS chemical stockpile disposal locations under CMA's purview. Implementation of these plans and activities helps CMA respond to local issues and to quickly meet the needs of the public. For example, the start of chemical agent operations at ABCDF and ANCDF increased public interest in the program during FY 2003. The PAO responded accordingly by increasing local public involvement in these locations. In each case, the PAO developed a startup plan to detail outreach strategies associated with the commencement of chemical agent operations, then implemented that plan.

Four stakeholder meetings were held in Anniston, Alabama, prior to commencement of chemical agent operations. The Anniston public affairs team increased public involvement locally, and continues to host meetings to update the public in the six surrounding counties about activities at the ANCDF.

In Aberdeen, Maryland, the Aberdeen public affairs team held two public meetings in surrounding counties prior to commencement of chemical agent operations; it continues to host meetings to inform the local public about on-going activities at the ABCDF. Other outreach efforts included presentations to civic groups and elected officials, and providing the public with an opportunity to meet with program representatives and to distribute printed information at local fairs.

The public affairs teams have developed response cards that provide the public with a means of providing comments on these initiatives, in addition to the opportunity to provide verbal input during public meetings. These direct mail response cards request

input on the information tools being used and feedback on how public information and involvement tools might be improved.

While not yet in operational status, issues surrounding the treatment of wastes that will be produced at the CDF in Newport, Indiana, created challenges for CMA's outreach team. The CMA PAO conducted a public survey in response to media coverage that raised public concerns about the transportation of hydrolysate from NECDF to a facility in Dayton, Ohio, for secondary treatment and disposal. The survey results indicated that the majority of the public living near the Dayton treatment/disposal facility was not aware of these shipments; and that they wanted more information about the treatment and disposal activities. The staff at the Dayton facility intended to use this information to focus their outreach efforts.*

The second level of CMA's public involvement program includes mission area strategies and activities. At this level, the CMA PAO develops and refines mission area strategic plans—employing site centric tools, such as meetings with local or native populations, site-specific special interest groups, minority stakeholders, and other non-governmental organizations that may play key roles in stakeholder group involvement. For example, in FY 2003 the NSCMP successfully handled increased involvement with Native American, minority, and other special interest communities, while treating recovered CWM at Fort Richardson, Alaska, and in the Spring Valley neighborhood of Washington, D.C.

The third level of the program involves development of an Agency-wide public outreach strategy and program. During FY 2003, with the exception of those disposal activities managed by PM ACWA, overall chemical weapons storage and disposal missions were consolidated into one organization. This consolidation enhances the Army's "one voice" directive, allowing the CMA PAO to produce unified, singular messages covering the entire range of U.S. chemical weapons storage and destruction issues.

PM ACWA Public Outreach

PM ACWA established a communications program in FY 2003, helped communities to plan their involvement in the Program and sought their participation in making decisions that affect destruction of the chemical weapons stockpiles in Colorado and Kentucky. This year, the ACWA public affairs team focused on three main areas: public involvement and participation, outreach (including the establishment of local outreach teams), and information product development. Because several changes took place over the course of this year, PM ACWA and the local staff used one voice to implement communications initiatives and activities to:

- Provide the greatest degree of transparency, openness and disclosure to the public

* See NECD section.

- Offer, encourage and facilitate the greatest degree of public involvement, and
- Communicate with all interested stakeholders level as frequently as possible

The PM ACWA Program sought to ensure that the program communicated critical milestones to its stakeholders. For example, The PM ACWA team shifted its focus from assessing chemical weapons destruction technologies to implementing full-scale pilot testing of alternative destruction technologies in Colorado and Kentucky, in accordance with PL 107-248. To reflect this change, the ACWA Program officially changed its name this year, from Assembled Chemical Weapons Assessment to Assembled Chemical Weapons Alternatives, to better reflect current goals.

Using the same “open dialogue” strategy that was implemented in ACWA’s assessment phase, PM ACWA worked to help communities in Colorado and Kentucky develop public involvement mechanisms to work with the PM ACWA team. PM ACWA stresses the importance of each community’s different needs and issues to be acknowledged, and of tailoring public involvement mechanisms that support their specific needs.

In Colorado, an information campaign was implemented to inform stakeholders of the systems contract award for PCAPP, and an open house was held to introduce the Bechtel Pueblo Team to the community. Approximately 700 people from the community attended the event. In addition, a community forum was held to discuss potential options for accelerating the destruction of the chemical weapons stockpile at PCD. Approximately 205 participants attended.

In Kentucky, a public meeting provided potential systems contractors an opportunity to meet the community and provide a brief overview of their service offerings. A community forum was held to help the community determine the type of involvement that it wants with the chemical weapons destruction program. Subsequently, two public involvement planning meetings led to the creation of the Chemical Destruction Community Advisory Board, or CDCAB. The CDCAB is a diverse, independent body set up to represent the community and provide advice on policy issues regarding BGCAPP. Members include the co-chairs of the Kentucky CAC, the BGAD Commander, the Blue Grass Chemical Activity Commander, and approximately 20 other leaders representing a broad range of local interests. As in Colorado, the systems contract award for BGCAPP was accompanied by information campaigns and an open house that was attended by 350 community members.

The PCD and the Blue Grass Chemical Stockpile Community Outreach Offices continually reach out to local communities by hosting a variety of local events and interacting with community members. The outreach offices hold speakers’ bureaus, conduct briefings with local civic organizations and businesses, attend community fairs and festivals, and offer Program updates to media. Public outreach personnel respond to inquiries about the Program and provide information to interested attendees at these events.

During FY 2003, the ACWA Program developed products to help educate stakeholders. Some examples include: revised factsheets, a redesigned website (www.pmacwa.army.mil) containing information for the general public, an ACWA brochure, quarterly Exchange newsletters for each facility, and systems contractor brochures.

Administration of the PM ACWA community outreach offices, located in Richmond, Kentucky, and Pueblo, Colorado, was transferred from the previous contractor to the resident systems contractors. The contract change was designed to streamline the Program's contracting mechanisms and enhance performance. A comprehensive review will be conducted after a year's implementation of this change. With the outreach work administered by the same contractor designing, building, testing, operating, and closing the facility, the outreach offices will continue to provide the same factual public information program upon which local communities have come to rely. PM ACWA will continue to oversee the outreach office mission, in coordination with the local commands, and share more responsibility with the systems contractor for providing easily accessible data and information-sharing opportunities. Not only will the systems contractor's local oversight help streamline a single source of complementary public outreach support to the community, but it is envisioned that the outreach professionals will have greater internal access to the engineers and scientists who are designing, building, and operating the facility. It is expected that the outreach teams will be able to more effectively convey the overall technical mission to the public.

Environmental Forums on the United States Chemical Weapons Destruction Program

CMA PAO and PM ACWA participated in Environmental Forum XI on the CDP. The Environmental Forums are sponsored by the Department of Defense to provide an opportunity for U.S. chemical demilitarization stakeholders to discuss environmental and related issues. They further the open exchange of information among representatives of CMA, EPA headquarters and its regional administrations, state environmental organizations, tribal nations, CACs, federal and state emergency management officials, and senior leaders of DoD and the Department of the Army. The forums are open to the public to allow the greatest possible participation. Environmental Forum XI took place on November 18 to 21, 2002, in Portland, Oregon. At this forum, a wide range of topics were discussed, including the July 2002 chemical agent exposure at TOCDF, stockpile security, regulation and oversight of chemical disposal operations in Utah, secondary waste disposal at JACADS, and updates on the ACWA Program. Environmental Forum XII was held on November 17 to 20, 2003, in Little Rock, Arkansas.

X. PROGRAM REVIEWS AND AUDITS

This section reports on program reviews and audits conducted by external oversight agencies, including the U.S. Army Audit Agency, General Accounting Office (GAO), and DoD Inspector General.

United States Army Audit Agency

Completed Army Audit Agency Audits

Follow-up on Audit of Matrix Support Requirements for the Chemical Demilitarization Program, Report Number A-2003-0120-IME, dated January 2003. The follow-up audit (reference Report Number AA-01-01, *Audit of Matrix Support Requirements for the Chemical Demilitarization Program*, dated October 2000) determined that CMA managers took the appropriate actions necessary to implement the recommendations, fix the problems and achieve the monetary benefits.

Follow-up Review of Audit Recommendations, Report Number A-2003-0129-IME, dated January 2003. The follow-up audit (reference Report Number AA-01-131, *Financial Management of Chemical Demilitarization Program*, dated January 2001) determined that CMA managers took the appropriate actions necessary to implement the recommendations, fix the problems and achieve the monetary benefits.

Army Audit Agency Audit Scheduled for FY04

Chemical Demilitarization Program Contracting Operations, Project Number A-2004-IME-0118.000, scheduled to begin January 16, 2004. The objectives of this audit will be to evaluate: the efficiency and effectiveness of the contracting operation for the CDP and the adequacy of key management controls as they relate to contracting operations for the CDP.

Defense Contract Management Agency

At the request of the ASA (ALT), the Defense Contract Management Agency (DCMA) conducted independent assessments of the six chemical agent facilities under the management and control of CMA. The purpose of the independent assessments was to assess the overall performance and management of the facility and operations.

DCMA reviewed program management, contracts, engineering, quality assurance, earned value management, and safety. The eventual results of the assessments will be corrective actions that are expected to yield improvements in CDP management and execution, which ultimately will lead to better cost and schedule performance.

General Accounting Office

Completed General Accounting Office Audit

Chemical Weapons: Sustained Leadership, Along With Key Strategic Management Tools, Is Needed to Guide DoD Destruction Program, Report Number GAO 03-1031, dated September 2003. Congress expressed concerns about the CDP cost, schedule, and management structure. In December 2001, the program underwent a shift in senior leadership, and at the September 2001 Defense Acquisition Board review, DoD revised the program schedule, which extended planned milestones and increased program cost estimates beyond the 1998 estimate of \$15 billion to \$24 billion (which included the estimates for facilities at PCD and BGAD, now under PM ACWA management and funding). The GAO was asked to examine the effect that organization changes have had on program performance and assess the progress that DoD and the Army have made in meeting the revised September 2001 cost and schedule and CWC deadlines. In its report, GAO recommended that DoD develop an overall strategy for the CDP that would articulate the program's mission, identify the long-term goals and objectives, delineate the roles and responsibilities of all DoD and Army offices, and establish near-term performance measures. GAO also recommended that DoD implement a risk management approach that anticipates and influences internal and external factors that could adversely impact program performance. Steps are being taken to address these recommendations.

Department of Defense Inspector General

Completed Inspector General Audits

Army Response to Chemical Agent Incident at Tooele Chemical Agent Disposal Facility, Report Number D-2003-068, dated March 2003. The objective of this investigation was to provide an oversight evaluation of the Army's response to a nerve agent exposure that occurred at TOCDF on July 15, 2002. The report finds that the Army correctly treated the worker exposure as a serious accident, conducted an investigation led by senior Army leadership, and used the investigation findings to generate program improvement.

A Revised Acquisition Program Baseline and Threat Assessment for the Chemical Demilitarization Program, Report Number D-2003-015, dated October 2002. The primary objective of this audit was to evaluate the overall management of the CDP and associated management controls; specifically, the Acquisition Program Baseline (APB) and the program threat assessment. The report finds that DoD needs to revise the APB and the Army needs to obtain a documented threat assessment for the CDP. The APB has subsequently been revised, and the new APB was approved in April 2003. CMA requested a waiver for a traditional system threat assessment June 11, 2003.

Acquisition of the Chemical Demilitarization Program, Report Number D-2003-088, dated May 2003. The primary objective of this audit was to evaluate the overall management of the CDP and associated management controls; specifically, efforts to establish and operate CDFs under the Program Manager for Chemical Demilitarization.

In addition, the report reviews the methodologies used for computing the chemical stockpile inventory and the life cycle cost estimate. The report finds that program acquisition managers need to improve the program's baseline performance by making better use of acquisition policy and guidance in the areas of cost estimating, earned value management, preventive maintenance, failure review, and spare part planning. As of September 30, 2003, of the 11 recommendations made in the report, 7 have subsequently been closed. Efforts are ongoing to address the remaining five recommendations.

The Chemical Demilitarization Program: Increased Costs for Stockpile and Non-Stockpile Chemical Materiel Disposal Programs, Report Number D-2003-128, dated September 2003. The objective of this investigation was to evaluate the overall management of the CDP and associated management controls; specifically, management's efforts to contain cost growth and the plans to destroy recovered NSCM. The report finds that while the Director, CMA, has made substantial progress in managing cost growth, his ability to control costs continues to be affected by delays in obtaining state permit modifications, escalation in costs and safety incidents, and rising cost for closure of CDFs. The report also finds that the PMNSCM did not have the information needed to prepare a reliable estimate of the cost and schedule to dispose of recovered (buried) CWM, but that direction to the environmental offices of the DoD components will help to identify, schedule, and fund the disposal of recovered CWM from existing and former DoD installations. Concurrently, the report commends the PMNSCM for being proactive in planning for the remediation of the buried CWM.

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XI. CITIZENS' ADVISORY COMMISSIONS TRAVEL COST SUMMARY

PL 104-106, Section 153, requires that an annual report of travel and associated travel costs for members of CACs during each fiscal year be provided to Congress. Funds expended for travel by the commissioners during FY 2003 totaled \$16,750.00. This travel was financed by the Chemical Agents and Munitions Destruction, Army (CAMD,A) account and was conducted at the invitation of the Deputy Assistant Secretary of the Army for the Elimination of Chemical Weapons under authority of the Assistant Secretary of the Army for Acquisition, Logistics and Technology. Amounts expended by individual state CACs include:

<u>State</u>	<u>Expenditures</u>
Alabama	\$ 3,550.00
Arkansas	\$ 1,110.00
Colorado	\$ 3,813.00
Indiana	\$ 0.00
Kentucky	\$ 3,297.00
Maryland	\$ 0.00
Oregon	\$ 3,360.00
Utah	\$ <u>1,620.00</u>
Total	\$ 16,750.00

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XII. FUNDING

The FY 2003 appropriation in the CAMD,A account was \$1,350.4 million for CMA and \$98.8 million for PM ACWA. The Military Construction account appropriation was \$101.0 million for CMA and \$56.6 million for PM ACWA. The table at the end of this section shows the funding allocation by project and location.

The current life cycle cost estimate, as approved in the April 2003 Acquisition Program Baseline, is approximately \$19.6 billion in current-year dollars for the disposal of chemical weapons under the CMA mission, including CSDP, ATAP, NSCMP, and CSEPP, and \$4.2 billion for PM ACWA.

CMA continues to implement cost control and cost reduction initiatives, including the expansion of the earned value management (EVM) system to enhance oversight of the mission cost, schedule, and performance. Successful implementation of EVM will provide government and systems contractor management with early warning of potential cost and schedule issues. At this time, all of the systems contractors' EVM systems have been validated, and the systems contractor at each facility is submitting monthly EVM cost performance reports. Surveillance reviews and integrated baseline reviews are scheduled as appropriate for each facility.

The Department of the Army has endorsed the concept of a revised fee approach for chemical demilitarization systems contractors that will provide greater incentive for the contractors to achieve objectives with reduced cost and risk. The objective of the CMA fee approach is to align financial incentives with programmatic guidance to the systems contractor for the timely and cost-effective destruction of the chemical stockpile in accordance with safe and environmentally sound procedures. The plan is intended to encourage and reward the systems contractor for creative and proactive solutions to complete the mission of stockpile destruction as early as safely possible. CMA uses a multiple-incentive performance-based approach structured to motivate the systems contractor to strive for continuous superior performance and improvement in safety, surety, environmental compliance, timely destruction of the chemical agent materiel stockpile, cost control, and overall management of the project. An award fee focuses on safety, environmental compliance, management, and cost, while performance-based incentives (PBIs) are tied to completion of discrete programmatic milestones or events. The establishment of PBIs is still in process at the facilities. As of September 30, 2003, definitive PBIs had been incorporated into the contracts for JACADS, ABCDF, and NECDF. PBIs will be incorporated into the contracts for TOCDF, ANCDF, UMCDF, and PBCDF during FY 2004.

**U.S. Army Chemical Demilitarization Program
FY 2003 Funding By Project (\$ in millions)**

Project/Facility	Chemical Agents and Munitions Destruction, Army				Military Construction
	RDT&E	PROC	O&M	Total	Total
Program Management		4.3	88.9	93.2	
Chemical Demilitarization Training Facility			10.5	10.5	
CAMDS		0.5	28.2	28.7	
JACADS			140.2	140.2	
TOCDF		9.9	132.5	142.4	
ANCDF		9.2	111.5	120.7	
UMCDF		18.5	121.3	139.8	
PBCDF		11.9	94.4	106.3	
NECDF	98.3			98.3	61.5
ABCDF	60.5		80.1	140.6	20.6
PCAPP	72.2			72.2	38.0
BGCAPP	14.1		0.4*	14.5	18.6
Alternative Technologies and Approaches	5.1		2.8	7.9	
Non-Stockpile Chemical Materiel	47.2		101.1	148.3	18.9
Assembled Chemical Weapons Alternatives Program Management	12.5			12.5	
Chemical Stockpile Emergency Preparedness	5.0	72.7	95.4	173.1	
TOTAL	314.9	127.0	1,007.3	1,449.2	157.6

Notes:

* Funds expended prior to technology decision that placed BGAD chemical stockpile disposal under management of ACWA Program.

O&M = operations and maintenance
 PROC = procurement
 RDT&E = research, development, testing, and evaluation

XIII. ACTIVITIES FOR FISCAL YEAR 2004

CMA and PM ACWA are committed to achieving the highest safety, surety, environmental compliance, and quality standards in disposing of U.S. CWM. CMA and PM ACWA will continue to uphold these standards and improve performance in FY 2004 and future fiscal years. Significant activities planned for FY 2004 are addressed in the following paragraphs.

During FY 2004, TOCDF, ABCDF, and ANCDF will continue safe disposal of chemical weapons and materiel, while UMCDF, PBCDF, and NECDF are scheduled to begin agent disposal operations. Closure activities at JACADS are scheduled for completion in FY 2004. In addition, implementation of the SIP at the CDFs will continue.

PMNSCM will continue to identify and develop alternative technologies for the treatment of NSCM. PMNSCM also will continue its efforts to destroy FPFs and support remediation operations where suspect CWM is discovered.

PM ACWA will continue design efforts for PCAPP and BGCAPP. Initial and intermediate designs for PCAPP and the initial design for BGCAPP are scheduled to be completed in FY 2004. The National Research Council will review all designs. PM ACWA will submit applications for the RCRA RD&D permit, air/land development permit for PCAPP and BGCAPP, and Clean Water Act permit and Clean Air Act permit for PCAPP.

Programmatic support to the CWC will continue throughout FY 2004. The U.S. Army will continue to prepare the necessary documentation and provide support to OPCW inspections at U.S. CDFs and FPFs.

During FY 2004, the CMA Risk Management Directorate environmental and monitoring offices will continue to ensure MACT compliance in applicable operating facilities, work to increase monitoring capabilities to meet the new CDC AELs, and work toward ISO 14001 conformance certification at ABCDF, TOCDF, and UMCDF.

The Department of Defense and CMA plan to host an environmental forum on the U.S. chemical weapons destruction program in FY 2004. Environmental forums are open to the public to allow for maximum participation by interested stakeholders. Environmental Forum XII is scheduled to be held November 17 to 20, 2003, in Little Rock, Arkansas.

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APPENDIX A
ABBREVIATIONS AND SYMBOLS

APPENDIX A ABBREVIATIONS AND SYMBOLS

ABCDF	Aberdeen Chemical Agent Disposal Facility
ACADA	automatic chemical agent detection and alarm [system]
ACAMS	automatic continuous air monitoring system
ACWA	Assembled Chemical Weapons Alternatives
A/DAM	Agilent/Dynatherm Agent Monitor
ADEM	Alabama Department of Environmental Management
ADM	acquisition decision memorandum
AEL	airborne exposure limit
AgF	silver fluoride
ANAD	Anniston Army Depot
ANCDF	Anniston Chemical Agent Disposal Facility
APG-EA	Edgewood Area of Aberdeen Proving Ground
ASA(ALT)	Assistant Secretary of the Army for Acquisition, Logistics and Technology
ATAP	Alternative Technologies and Approaches Project
ATB	agent trial burn
BGAD	Blue Grass Army Depot
BGCAPP	Blue Grass Chemical Agent-Destruction Pilot Plant
CAC	Citizens' Advisory Commission
CAIS	chemical agent identification set
CAMD,A	Chemical Agent Munitions Destruction, Army [account]
CAMDS	Chemical Agent Munitions Disposal System
CBR	British World War I choking agent (50 percent phosgene and 50 percent arsenic trichloride)
CDC	Centers for Disease Control and Prevention
CDCAB	Chemical Destruction Community Advisory Board
CDF	chemical agent disposal facility
CDP	Chemical Demilitarization Program
CEMS	continuous emissions monitoring system
CMA	U.S. Army Chemical Materials Agency
CONUS	continental United States
CSDP	Chemical Stockpile Disposal Project
CSEPP	Chemical Stockpile Emergency Preparedness Program
CSS	continuous sampling system
CWC	Chemical Weapons Convention
CWM	chemical warfare materiel
CWWG	Chemical Weapons Working Group
CY	calendar year [January 1 through December 31]
D	Democrat
D2-Puff	dispersion model for predicting downwind hazard distances
DAAMS	depot area air monitoring system
DAIG	Department of the Army Inspector General

DASA(ESOH)	Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health
DCD	Deseret Chemical Depot
DF	military symbol for the critical binary precursor for GB ₂ , which is methylphosphonic difluoride
DFS	deactivation furnace system
DHHS	Department of Health and Human Services
DHS	Department of Homeland Security
DoD	Department of Defense
EA-2192	experimental agent 2192, a nerve agent VX breakdown product
ECBC	U.S. Army Edgewood Chemical and Biological Center
EDS	Explosive Destruction System
EIS	environmental impact statement
EMS	environmental management system
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EVM	earned value management
FEMA	Federal Emergency Management Agency
FPF	former [chemical weapon] production facility
FTIR	Fourier transform infrared detector
FY	Fiscal Year [October 1 through September 30]
GAO	General Accounting Office
GB	military symbol for the nonpersistent nerve agent sarin
GB ₂	military symbol for the nonpersistent nerve agent sarin formed from the binary munition
HD	distilled mustard agent
Hg	mercury
HN	nitrogen mustard
HVS	high volume sampler
IBPF	Integrated Binary Production Facility [Pine Bluff Arsenal, Arkansas]
IDLH	immediately dangerous to life and health
IPT	integrated process team
ISO 14001	International Organization for Standardization's standard for environmental management systems
JACADS	Johnston Atoll Chemical Agent Disposal System
K951	military model number for a chemical agent identification set containing ampules of mustard agent, lewisite, chloropicrin, and phosgene
LIBS	laser-induced breakdown spectroscopy
LIC	liquid incinerator

M125	military model number for nerve agent GB 10-pound cluster bomb
M20	military model number for DF canister portion of the binary nerve agent GB ₂ projectile, M687
M441	military model number for fiberglass shipping/firing tube
M55	military model number for nerve agent GB or VX 115-millimeter rocket
M60	military model number for simulant-filled 115-millimeter rocket
MACT	Maximum Achievable Control Technology
MAPS	Munitions Assessment and Processing System
MDL	method detection limit
MMAS	Mobile Munitions Assessment System
MPF	metal parts furnace
MS/MS	tandem mass spectrometry
NECD	Newport Chemical Depot
NECDF	Newport Chemical Agent Disposal Facility
NEPA	National Environmental Policy Act
NRT	near real-time
NSCM	non-stockpile chemical materiel
NSCMP	Non-Stockpile Chemical Materiel Product
ODEQ	Oregon Department of Environmental Quality
O&M	operations and maintenance
OMF	Oquirrh Mountain Facility
OPCW	Organisation for the Prohibition of Chemical Weapons
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
P&A	precision and accuracy [study]
PAO	Public Affairs Office
PBA	Pine Bluff Arsenal
PBCDF	Pine Bluff Chemical Agent Disposal Facility
PBI	performance-based incentive
PBNSF	Pine Bluff Non-Stockpile Facility
PCAPP	Pueblo Chemical Agent-Destruction Pilot Plant
PCBs	polychlorinated biphenyls
PCD	Pueblo Chemical Depot
PFS	pollution abatement filter system
PICs	products of incomplete combustion
PL	Public Law
PM ACWA	Program Manager for Assembled Chemical Weapons Alternatives
PMATA	Project Manager for Alternative Technologies and Approaches
PMCD	Program Manager for Chemical Demilitarization
PMCS	Project Manager for Chemical Stockpile Disposal
PM ECW	Program Manager for the Elimination of Chemical Weapons
PMNSCM	Product Manager for Non-Stockpile Chemical Materiel
ppm	parts per million

ppb	parts per million
PROC	procurement
QL	military symbol for the critical binary precursor for VX ₂ , which is an organophosphorus ester
QRA	quantitative risk assessment
R	Republican
RCRA	Resource Conservation and Recovery Act
R&D	research and development
RD&D	research, development, and demonstration
RDT&E	research, development, test, and evaluation
REC	record of environmental consideration
REMPI-TOF	Resonance Enhanced Multiphoton Ionization/Time-of-Flight Spectroscopy
RMA	Rocky Mountain Arsenal
ROD	record of decision
RRS	Rapid Response System
SCANS	Single CAIS Assessment and Neutralization System
SDS	spent decontamination solution
SIP	safety improvement program
SPE	solid phase extraction
SPEIS	Supplemental Programmatic Environmental Impact Statement
STB	surrogate trial burn
SUPLECAM	Surveillance Program, Lethal Chemical Agents and Munitions
TCC	ton container cleanout
TOCDF	Tooele Chemical Agent Disposal Facility
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facility
UMCD	Umatilla Chemical Depot
UMCDF	Umatilla Chemical Agent Disposal Facility
U.S.	United States
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology and Logistics
VX	military symbol for a persistent nerve agent, which is o-ethyl S-(2-diisopropylaminoethyl)methylphosphonothioate
VX ₂	military symbol for a persistent nerve agent VX formed from the binary munition
WIPT	Working-Level Integrated Product Team
XRF	X-ray fluorescence

**APPENDIX B
OTHER EVENTS**

APPENDIX B OTHER EVENTS

The following entries describe selected Category II chemical events* that occurred during FY 2003 at CDFs. In addition to the four events described in this appendix, there were four Category II events involving leaking munitions in storage facilities (two at BGAD and two at DCD). Fifty-seven Category I chemical events and no Category III chemical events occurred during FY 2003.

B-1. Events at Deseret Chemical Depot

a. *ACAMS Alarm in the Chemical Test Facility.* On December 11, 2002, while conducting a routine maintenance operation in the chemical test facility at the OMF, the coordinating supervisor heard a building ventilation system differential pressure alarm, and discovered that the door between the metal parts treater room and the mezzanine was held open 8 to 12 inches by a sample line. He closed the door, and, almost immediately, the ACAMS units in the glove box room, the metal parts treater duct, and the metal parts treater verification chamber went into alarm. The four personnel present in the glove box room masked and the entire facility evacuated within a few minutes. The cascade, negative-pressure ventilation system kept the agent within engineering controls; there were no ACAMS alarms in adjacent rooms. The four personnel from the glove box room reported to the clinic for evaluation. None of the four showed clinical signs or symptoms of exposure.

To prevent recurrence, the sample line has been relocated above the door, and a limiting condition of operation has been added to the procedures to ensure that all doors are closed prior to commencement of an operation.

b. *Nerve Agent VX Alarms in Observation Corridors.* On May 3, 2003, while work was being performed in the SDS system room at TOCDF, ACAMS units alarmed for nerve agent VX in the upper observation corridors. There were no personnel in the observation corridors at the time of the alarms; personnel in the munitions demilitarization building masked and evacuated. The DAAMS unit confirmed the presence of VX agent. The ventilation system contained the agent within engineering controls; there were no agent exposures or releases to the atmosphere.

A subsequent investigation determined that the SDS piping provided a pathway for the VX to follow from the SDS system room to the upper observation corridors. Inadequate design and installation of a temporary change to the SDS piping created this pathway. Procedures for temporary engineering changes have been revised to prevent recurrence.

c. *False Positive DAAMS Reading at Smoking Shelter.* On June 30, 2003, a 12-hour DAAMS tube from the OMF maintenance smoking shelter tested positive for mustard

* This category designation is from Army Regulation 50-6 (Chemical Surety), Chapter 11 (Chemical Event Reporting Procedures). A Category I chemical event is a non-surety emergency; a Category II chemical event is a limited area/post-only emergency; and a Category III chemical event is a community emergency (that is, involves an external response).

agent. There were no mustard operations ongoing, or mustard onsite, during this time period, and there were no other monitoring alarms. As a precaution, personnel who had been in the area during the 12-hour time frame were medically evaluated, with negative results for exposure. Monitoring and laboratory error was ruled out. The cause of the reading was likely a monitoring interference.

B-2. Events at Aberdeen Proving Ground/Edgewood Chemical Activity

a. *Agent Migration After Power Loss at CDF.* On May 28, 2003, ABCDF experienced a power failure. Backup power and ventilation restored immediately, according to design. Workers in the facility exited the building consistent with standard operating procedures. During the transition of the ventilation system, low levels of mustard agent vapor migrated into non-processing areas within engineering controls for approximately 10 minutes. At the time of the power loss, level A maintenance was underway in the neutralization bay. Those workers and their backups (on breathing air) performed suit decontamination and monitoring, and exited the building. There were no agent exposures or releases to the atmosphere.

Following diagnosis of the electrical fault, power was restored and the facility transitioned from backup to main power. A second power loss occurred several hours later. Relays at the transformer were adjusted with the supplier's concurrence.