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WASHINGTON, DC 20301-3050

NUCLEAR AND CHEMICAL
AND BIOLOGICAL DEFENSE
PROGRAMS

December 17, 2008

MEMORANDUM FOR THE OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR COUNTER NARCOTICS, COUNTERPROLIFERATION AND GLOBAL THREATS

SUBJECT: Detailed Facility Information (DFI) Addendum 4 for the Recovered Chemical Weapons Destruction Facility (RCWDF)

The enclosure to the attachment is an addendum to the RCWDF DFI providing technical information on the open detonation destruction process. Army prepared and this office reviewed the addendum.

Request your office transmit the DFI addendum and draft letter to the Department of State for transmittal to the Technical Secretariat. Request any changes be coordinated with this office. Point of contact is Mr. John Wilkerson, telephone (703) 767-2739, email john.wilkerson@dtra.mil or Ms. Jacqueline Simchick, telephone (703)767-2741, email jacqueline.simchick_contractor@dtra.mil.

For the DoD CW Treaty Manager:

Lynn M. Hoggins
Chief, OSAC

Attachment:
As stated

cc:
Chief, International Negotiations Division, Global Strategic Partnerships Directorate, Office of the Joint Chiefs of Staff
Chief, Combating WMD & Proliferation Policy Division, Deputy Chief of Staff, G-3/5/7, Department of the Army
Chief, Center for Treaty Implementation and Compliance, U.S. Army Chemical Materials Agency, Department of the Army
Chief, Chemical and Biological Division, On-Site Inspection Directorate, Defense Threat Reduction Agency

United States Department of State
Bureau of International Security and Nonproliferation
U.S. National Authority for the Chemical Weapons Convention
Washington, D.C. 20520

NACS #177768

December 18, 2008

Mr. Horst Reeps
Director of Verification
Technical Secretariat
Organization for the Prohibition of Chemical Weapons
Johan de Wittlaan 32
2517 JR The Hague
The Netherlands

Dear Mr. Reeps:

The enclosed addendum to the detailed facility information for the Recovered Chemical Weapons Destruction Facility provides information on the open detonation process to be used in emergency situations where recovered chemical weapons cannot be safely moved or stored.

Sincerely,

Robert Mikulak

Robert Mikulak
Executive Director

Enclosure:
As stated

cc: U.S. Delegation

Addendum 4 to the Detailed Facility Information for the Recovered Chemical Weapons Destruction Facility

Open Detonation Destruction

Final

December 2008

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SECTION 1
INTRODUCTION

This Detailed Facility Information (DFI) Addendum is provided to the Technical Secretariat (TS) of the Organization for the Prohibition of Chemical Weapons (OPCW) in accordance with Article IV and Part IV (A) of the Verification Annex of the Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction (CWC). This addendum adds the Open Detonation (OD) destruction process to the DFI for the Recovered Chemical Weapons Destruction Facility (RCWDF), dated 29 July 2005. This DFI addendum provides information as to the conditions under which OD destruction is carried out.

1.1 Background

OD has been the method of destroying recovered unexploded munitions and containers filled with chemical agent that cannot be safely moved. U.S. laws have placed restrictions on this form of remediation for safety and environmental reasons. The availability of enclosed mobile destruction systems now provides a means by which range recovered munitions can be safely destroyed; however, open detonation remains the only method of chemical weapons (CW) destruction for those emergency situations and conditions described in Section 2.

OD destruction for suspect CW is considered an emergency procedure and is used under conditions wherein the recovered CW cannot be moved or safely stored. In such cases, the TS will be notified of the pending destruction as soon as feasible and the item will subsequently be declared. In these cases, CW destruction verification will be accomplished after the fact as stated in Section 4 of this document.

SECTION 2
MUNITION/CONTAINER IDENTIFICATION PROCESS

2.1 Explosive Ordnance Disposal (EOD) Notification

Upon discovery of suspect chemical munition/container, EOD personnel perform an initial assessment and, if a liquid fill is suspected, specialized assistance is requested. Until their arrival, the suspect liquid–filled munition is safely packaged in an over–pack container, if possible, and secured.

2.2 Initial Steps

The following steps are taken to identify a suspect recovered chemical weapon (RCW) containing a liquid fill:

a. Assess the general area around the munition. Emphasis is on safety of all individuals surrounding the item.

b. Inspect the item (when not previously over–packed).

- Assess the general physical condition of the exterior of the munition or container.
- Observe any physical markings that may be on the item and measure the item.
- Photograph the item; if possible, include any physical markings on the item along with a measuring device in the photograph.

- Note the condition of the rotating bands, when present; determine whether the munition has been fired.

- Note the condition of the fuze (armed or unarmed)

c. X–ray the item using a non–intrusive Digital Radiography and Computed Tomography (DRCT) system to determine if it contains a fuze, burster or fill.

d. When a fill line is detected, take spectra of the item using portable isotopic neutron spectroscopy (PINS) to assist in liquid fill identification.

e. When armed and fuzed, determine whether the item can be rendered safe. Over–pack the item if possible.

f. Report findings to the Materiel Assessment Review Board (MARB).

g. Provide arrangements to secure the item until disposition of approved MARB recommendations.

2.3 Materiel Assessment Review Board

Using experts and technical specialists in explosives, ordnance, and scientific fields, the MARB convenes to review all of the data accumulated on recovered munitions. Short–notice MARB meetings are convened in those cases where immediate assessment and recommendations are required for reasons of safety. The MARB reviews data only on munitions and containers in which their X–rays reveal a possible liquid fill. PINS, photographs, and historical data are also used to assess the recovered item.

From its review of the recovery data, the MARB will make one of the following recommendations:

a. Explosive system demilitarization is recommended. The container or munition is suspect of containing chemical agent and is explosively configured.

b. Non–explosive system demilitarization is recommended. The container or munition is suspect of containing chemical agent and is non–explosively configured.

c. Armed and Fuzed–Chemical. The container or munition is explosively configured, is suspect of containing chemical agent, and has fuzes in an armed condition.

d. Armed and Fuzed–Conventional. These items do not contain chemical agent, but are armed and fuzed.

e. Conventional Disposition to be Determined Locally. These items do not contain chemical agent and may or may not be explosively configured.

f. Additional data required. Additional data is required before an assessment can be made.

Items falling into recommendations a, b, or c which are suspected of containing a CW fill, based on a detailed review of the MARB nondestructive evaluation/examination (NDE) data, will be considered CW and will be declared and destroyed as such.

2.4 Items Determined To Be Safe For Transport and Storage

Suspect CW items which can be safely over–packed and transported, will be moved to a declared chemical weapons storage facility (CWSF) at the earliest possible time in accordance with environmental regulations. Items not moved to a CWSF will remain at

or near the recovery site in a secure Interim Holding Facility until their destruction. Once the MARB recommendations are approved by the director of the Chemical Materials Agency, the items are declared within 180 days and scheduled for destruction.

2.5 CW Items Determined To Be Unsafe for Transport or Storage

The criteria used to determine whether a suspect CW munition is unsafe for transport or storage is based on the following physical conditions:

a. The condition of munition fuze is either unknown or is known to be armed.

b. The condition of the container or munition body is leaking or deteriorated to the extent that it cannot be placed into an over–pack and moved.

Suspect CW items determined to be unsafe for transport or storage will be secured at or near the recovery site and destroyed in place by OD emergency destruction as soon as possible.

SECTION 3
OPEN DETONATION (OD) EMERGENCY DESTRUCTION PROCESS

3.1 General

Open air detonation of the chemical filled items using donor explosives is an approved method for destroying chemical agent filled items that cannot be safely moved or stored. The area where the OD process takes place must be of sufficient size to contain the hazards of the immediate explosion, flying debris, and possible ground and downwind contamination. A typical OD operation area is depicted in Figure 3–1.

3.2 Exclusion Zone

If during the initial assessment a liquid fill is suspected in a munition, an initial exclusion zone of a 450–meter (m) fragmentation–distance–radius is cordoned off around the item. A 2,000-m downwind hazard area, also a part of the exclusion zone, is plotted as shown in Figure 3–1. The initial exclusion zone is based on a worst–case scenario. A new exclusion zone is determined when the recommendation of the MARB is known and a decision is made to destroy the suspect CW using OD.

General meteorological data for the area at the OD location, along with explosive weight, surface texture, and chemical agent type information, is entered into a computer program. From this program a new fragmentation distance and downwind hazard area is developed that identifies the maximum downwind distance (one–percent lethality distance) at which there will be no chemical agent effects. The new fan appearance is the same as the fan described above; however, the calculated distances are usually less.

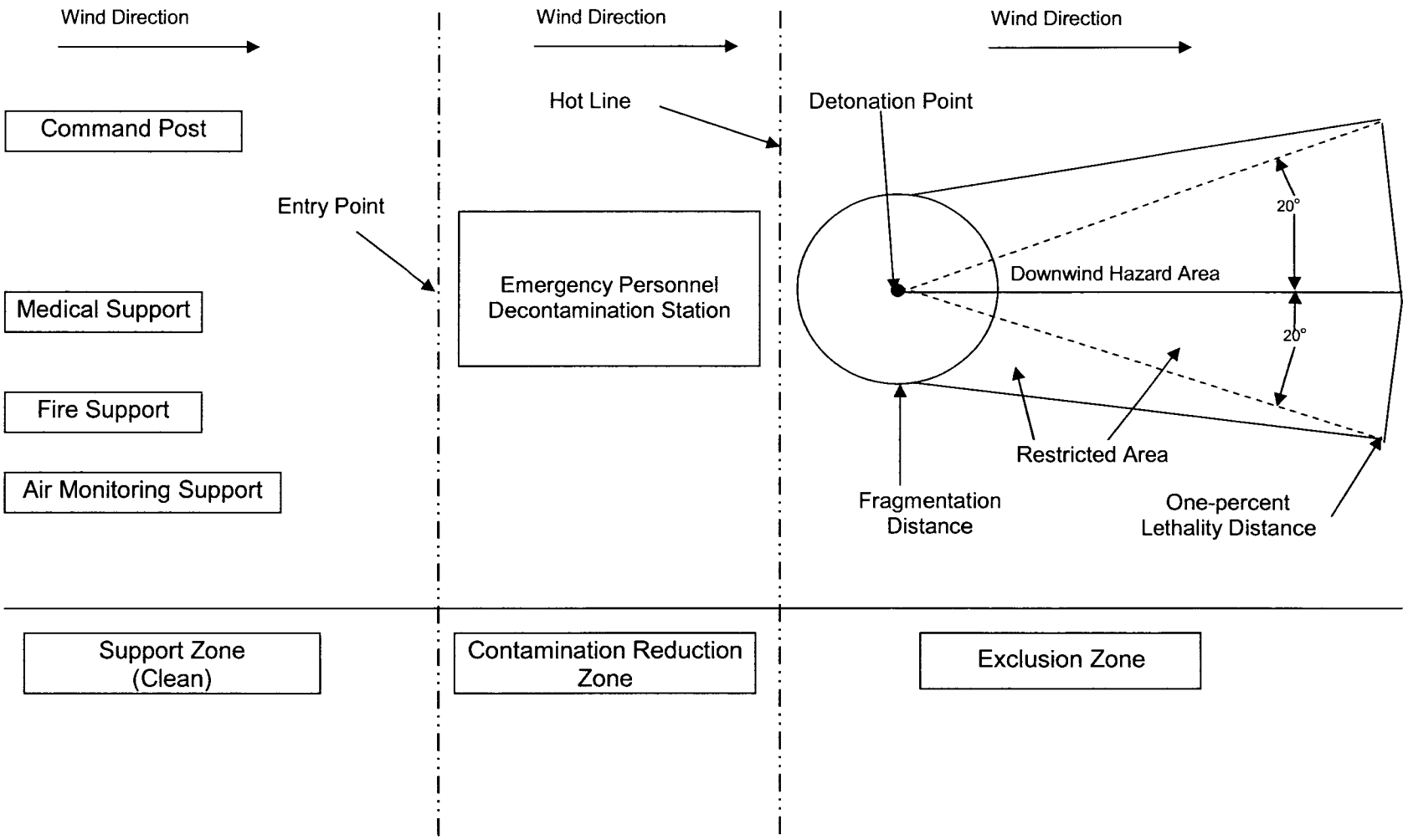

Figure 3-1 Open Detonation Operation Area

3.3 Contamination Reduction Zone

Figure 3–1 contains two imaginary vertical lines, one bordering the support zone and the other bordering the exclusion zone, or hotline. The hot line is tangent to the exclusion zone and is the border to the emergency personnel decontamination station (EPDS). Personnel must enter or egress the exclusion zone through the EPDS. The entry point is the entrance to the EPDS and is the border between the support zone and the contamination reduction zone.

3.4 Support Zone

The support zone contains those activities necessary for the operation and safety of the OD process. Their location can be anywhere upwind of the EPDS and may or may not be defined by a shelter. These activities include the following:

- Medical support personnel, usually in an ambulance.
- Fire truck support and safety operators.
- Air monitoring. The type of monitoring equipment will dictate the need for a shelter.
- Command Post. Personnel in this area may include a site safety and health officer (SSHO), the senior military EOD, and other personnel required for the destruction mission.

3.5 Air Monitoring

Site air monitoring will not normally be conducted before destruction unless the item is leaking. If needed, air monitoring devices for the chemical agent being destroyed will be placed downwind along the periphery of the exclusion zone. Monitoring may also extend to the extreme of the measured downwind hazard. The specific locations along the boundary will be in accordance with local air monitoring requirements or the EOD unit standing operating procedures (SOPs). The types of monitoring devices that may be used, depending on agent being destroyed will be selected from, but not limited to the following:

- Depot Area Air Monitoring System (DAAMS)
- MINICAMS®
- Improved Chemical Agent Monitor (ICAM)
- Drager tubes
- M8 paper.

3.6 OD Setup and Destruction

Once all required support personnel are in place, the SSHO conducts a safety briefing and mechanical monitoring devices are initiated around the exclusion zone. A military EOD places the required amount of explosives around the munition to be destroyed (a minimum of 5 pounds of explosive per 1 pound of chemical agent) and dual primes with blasting caps. Detonation is initiated in accordance with EOD SOPs at any point upwind and outside the exclusion zone. The military EOD conducts the necessary pre–firing checks and connects the firing circuit to the blasting machine. A countdown is initiated and the explosives are detonated. This is the end–point of destruction for the item being destroyed.

3.7 Area Clean Up

After detonation, EOD military personnel will accomplish the following:

a. Survey the area and remove any un–detonated explosive material.

b. Conduct air and surface monitoring, and identify areas requiring decontamination.

c. Retrieve any large metal parts or explosives scattered by the detonation. The metal parts are bagged, monitored, and disposed of.

Contaminated areas are decontaminated by personnel trained in large area decontamination procedures.

SECTION 4
MEASURES TO FACILITATE INSPECTIONS

4.1 General

The TS will be notified as soon as possible as to when the emergency OD destruction is to take place. Attachment 4, Part C of the RCWDF Facility Agreement (FA) requires the U.S. to notify the TS 30 days before the onset of CW destruction. An emergency exists wherein safety or environmental circumstances may exist that do not allow for a timely notification. In such cases, the TS will be notified as soon as feasible following the determination to conduct emergency OD destruction.

4.2 Verification

In the event that inspectors are unable to be present during OD destruction operations, the inspected State Party will provide records associated with the destruction for inspector review as agreed in the RCWDF FA.

Records associated with the emergency destruction of CW may be reviewed during the annual review of such records at Aberdeen Proving Ground, Maryland. The following records may be reviewed:

a. Photographs of the recovered container or munition before OD.
b. Post destruction photographs: include munition metals parts, if available.
c X–ray images taken during the assessment
d. PINS assessment data
e. Analytical records from perimeter monitoring devices as available
f. Certificates of destruction
g. Analytical records of any soil and liquid samples taken during the operation.

4.3 On–Site Verification

Explosive safety restrictions may prohibit the inspection team access to the area where the item is to be destroyed. Should an inspection team be on–site to verify the destruction activity, the pre–inspection briefing (PIB) will contain the necessary information to ensure the safety of the team.

The following verification activities may be accomplished by the TS during on–site OD destruction:

a. View the records cited in paragraph 4.2 above.

b. Verify the CW to be destroyed at its location. This may be subject to personal protective equipment (PPE) requirements established by the EOD military supervisor and range safety officer.

c. Observe the destruction of the CW, subject to safety restrictions.

d. Observe air sampling.

e. Observe post–detonation survey by EOD military personnel for unexploded ordnance (UXO) and contamination.

f. Observe destroyed metal parts, if available.

SECTION 5
SAFETY AND MEDICAL SYSTEMS IN FORCE

This section describes the safety and support systems, actions, and requirements imposed by the U.S. to ensure safety of all personnel, inspectors, escorts, and observers during OD operations. Safety planning and requirements will adhere to the installation or local Health and Safety Plan, (HASP); the Site–Specific Monitoring Plan (SSMP); the Process Safety Management program for chemical agent operations; site–specific health and safety documents; and other applicable federal, state, and local laws and regulations specified in the RCWDF FA and technical supplements. Further information about the safety and medical systems available will be found in the OD site–specific technical supplement and Site Safety Plan or EOD unit SOPs.

TS inspectors will receive a PIB that will address general site– and OD mission–specific safety practices, procedures, and restrictions. The briefing will describe the nature of the operation, the potential hazards, the level of PPE required for access to include respiratory protection, medical screening, and other safety orientations, as necessary.

5.1 Preparation of the Item for Detonation

Hazards associated with the preparation of the item for detonation are difficult to quantify. Physical deterioration, configuration (explosives, energetics, fuzes, etc.), age, and other factors may decrease the integrity of the item and increase the possibility for leaks, spills, or unexpected detonation. These hazards are mitigated or minimized by the following procedures and actions:

- Nondestructive evaluation/examination (NDE) by EOD military personnel and the MARB

- Records review of items, if available
- Adequate clear space for detonation.
- Correct selection and use of PPE for all operations
- Paired operators (two–person rule)
- Use of highly trained personnel for the preparation of the item for destruction.
- Ready access to emergency and safety equipment during the operation.

Work areas and the operational perimeter may be monitored for chemical fill vapors. Specific air monitoring techniques will be identified in the PIB.

5.2 On–Site OD Safety Measures and Systems

On–site safety and escort personnel are familiar with the safety risks associated with OD operations. They are responsible for ensuring that inspectors comply with all safety precautions and procedures before entering potentially hazardous areas. A medical officer may restrict inspector access when medical conditions preclude the safe use of PPE or impede egress from potentially hazardous areas.

Inspectors have the right for escorted access to the OD operation–site. However, the on–site EOD military safety officer has the authority to deny any access should the hazard be such that the access would endanger the inspection team. Any access will require some level of PPE, as specified by the Military EOD Team Leader and EOD SOPs for OD. Inspectors must be certified to wear and use any of the prescribed PPE.

5.2.1 Site Safety and Emergency Equipment. Site equipment for decontamination, breathing air supply, monitoring, and surveying equipment is staged in the support area of the OD operation–site. Fire safety equipment and support vehicles are also staged in the support area. Backup equipment is provided by the local fire department, as necessary.

5.2.2 Site Medical Services. On–site medical personnel are capable of providing immediate emergency care for chemical causalities. Initial ambulance evacuation will be made to the local military installation medical facility. Coordination with civilian medical facilities for backup or contingency medical capabilities and assistance will be provided. Medical service information for inspectors, including information regarding access to 24–hour medical service throughout the course of inspection activities, will be provided in the site–specific technical supplement or PIB.

5.2.3 Communication Systems. The communications procedures in effect will be as described in the EOD unit communications SOP.

5.2.4 Monitoring Systems. Pre–destruction air monitoring for the chemical agent to be destroyed will be performed as needed. Air monitoring during and after CW destruction will be accomplished to ensure that operations are safely conducted and to detect any chemical agent that may be outside the one–percent lethality arc (see figure 3–1).

5.2.5 On–Site Emergency Services. In the event of a chemical accident/incident (CAI), emergency response teams will respond to the site, assess the CAI, notify the appropriate medical and emergency support providers, initiate casualty care, safeguard surety materiel and government equipment, and attempt to minimize or mitigate potential hazards. Each response team operates in compliance with local regulations. For their own safety, all personnel, inspectors, and escorts must follow instructions provided by the emergency response team. Information regarding emergency response teams will be provided in the site–specific technical supplement and PIB.

5.3 PPE

The level of PPE to be worn during an OD operation will be as directed by the military EOD team leader in accordance with the EOD unit SOP.

5.3.1 General PPE Requirements. PPE selection for OD operations is based upon Occupational Safety and Health Administration (OSHA) and U.S. Army requirements. EOD unit SOPs and any available Health Hazard Analysis (HHA) for the area where the OD is to take place, will be used in selecting the level of PPE required for the OD operation. The HHA evaluates the performance and containment characteristics of the OD in conjunction with the scope of the activity, environmental conditions, duration of activities, chemical and equipment use, site– or circumstance–specific hazards, and other factors.

5.3.2 Inspector PPE Requirements. Inspectors must comply with the PPE requirements specified in the RCWDF FA and as directed by the military EOD team leader for the types of activities they perform and observe. Inspectors will furnish the site with certification/documentation enabling them to wear and use the specified PPE. If certification/documentation is not provided, inspectors must accede to U.S. standards for training, medical evaluation, qualification, and certification for PPE use.

5.4 Personnel Decontamination

Routine exposure of personnel to hazardous material is not expected for OD operations. However, some workers may process through the multistep EPDS before departing the operational site. This process will limit personnel exposure, as well as the potential transfer of contaminated material to "clean" areas.

5.5 Equipment Decontamination

Should chemical agent be detected on equipment outside the exclusion zone, the equipment will be encapsulated, monitored, and, if necessary, decontaminated in accordance with the CAI Response and Assistance Plan or equivalent plan.

SECTION 6
WORKING AND LIVING CONDITIONS

6.1 Administrative Work Space

A description of a typical administrative work space is as described in the RCWDF DFI section 7. The specific work space accommodation will be furnished in the site–specific supplement.

APPENDIX A
ACRONYMS/ABBREVIATIONS

APPENDIX A
ACRONYMS/ABBREVIATIONS

CAI	chemical accident/incident
CW	chemical weapons
CWC	Chemical Weapons Convention
CWSF	Chemical Weapons Storage Facility
DAAMS	Depot Area Air Monitoring System
DFI	detailed facility information
DRCT	Digital Radiography and Computed Tomography
EOD	Explosive Ordnance Disposal
EPDS	Emergency Personnel Decontamination Station
FA	Facility Agreement
HASP	Health and Safety Plan
HHA	Health Hazard Assessment
ICAM	Improved Chemical Agent Monitor
m	meter
MARB	Materiel Assessment Review Board
NDE	nondestructive evaluation/examination
OD	open detonation
OPCW	Organisation for the Prohibition of Chemical Weapons
OSHA	Occupation Safety and Health Administration

PIB	pre–inspection briefing
PINS	portable isotopic neutron spectroscopy
PPE	personal protective equipment
RCW	recovered chemical weapons
RCWDF	Recovered Chemical Weapons Destruction Facility
SOP	Standing Operating Procedure
SSHO	site safety and health officer
SSMP	Site–Specific Monitoring Plan
TS	Technical Secretariat
UXO	unexploded ordnance