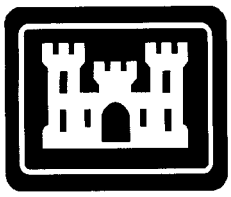

U.S. Army Corps of Engineers
Huntsville Center
Mandatory Center of Expertise & Design Center
Ordnance and Explosive Waste

FINAL

Explosives Safety Site Plan and Safety Submission For the Interim Holding Facility Fort McClellan, Alabama

Contract No. DACA87 – 95 – D - 0018

Prepared By:

PARSONS ENGINEERING SCIENCE, INC.
Norcross, Georgia

May 2001

Names: See Below Date: 12 June 2001			**Comment Response Matrix for the DRAFT ESS For the Interim Holding Facility, Fort McClellan, AL., May 2001**	
Who	**Page**	**Line**	**Comment and Rationale**	**Response to Comment**
BRS			Bill R. Shanks, TF Environmental Office	
PEJ			Paul E. James, TF Environmental Office	
LMK			Lisa M. Kingsbury, TF Environmental Office	
MBM			Michael Moore, TF Safety Officer	
SJB			Scott Bolton, TF Security Officer	
PEJ LMK	2-2	12	Last word in paragraph 2.2.2 should be changed from "indefinitely" to "until remedial actions are complete." Rationale: As originally written implies there may be no turn-over. As rewritten provides for any number of options that might be involved for a solution, including LUC's.	The text will be changed as recommended.
BRS	3-3	Table 3.2	Change transmission and distribution lines from "1,650 feet" to "900" feet. Rationale: Power lines to the ASP are only 900 feet away.	The text in Table 3.2 and Section 3.4.2 will be changed as recommended.
BRS	3-4	9	Change "Waverly Road" to "ASP." Rationale: See previous entry. Same rationale applies.	The roads within the ASP do not qualify as Public Traffic Routes unless they are routinely used by the general public for through traffic. See DoD 6055.9 STD, AP1.1.1.76. The text will remain unchanged.
BRS	4-1	16	Delete "(same distance as the IBD)" from the end of paragraph 4.2. Rationale: Not in accordance with Table 3.2, p.3-3.	The text will be changed as recommended.
SJB	5-1	6	Reviewing paragraph 1, raises a possible future problem. TF Security can handle the requirement now, but there needs to be a caveat added that as the work force becomes smaller, Mobile District Corps of Engineers (MDCE) may have to take action to assume responsibility for this action. Rationale: Reduction in staffing may require the caveat to be implemented.	The text "or other organization designated by the Mobile District Corps of Engineers" will be added to the end of the sentence. This revision will allow control of the keys to be changed if needed in the future.
SJB	5-1	25	In paragraph 4, after "24 hour" insert "contracted." Rationale: Clarify that they are not DoD/DA/TF assets.	The text will be changed as recommended.

Names: See Below Date: 12 June 2001			**Comment Response Matrix for the DRAFT ESS For the Interim Holding Facility, Fort McClellan, AL., May 2001**	
Who	**Page**	**Line**	**Comment and Rationale**	**Response to Comment**
PEJ	5-1	40-41	Last sentence of paragraph 6 should be changed to read, "During...will be responsible for the keys and maintenance." Rationale: See Encl 3, p.7-3	The text will be changed as recommended.
BRS	2 Encl 3		Delete undated Cover Sheet for the Enclosure. Keep page 3 which is dated. Rationale: Extra page not needed.	The extra page will be removed.
MBM	8-2, Encl 3	18	Change "Hershel Chapman" to Major James F. Morrison, Jr. 291 Jimmy Parks Blvd Fort McClellan, AL 36205-5000 Phone: (256) 848-6574/3497 e-mail: james.Morrison@mcclellan.army.mil	The contact name will be changed. An insert page with the change will be added to the beginning of Enclosure 3.

U. S. ARMY ENGINEERING & SUPPORT CENTER, HUNTSVILLE | CN: 04-330-01 S: 27 Apr 01 | CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT: Fort McClellan IHF Siting Plan

☐ SITE DEV & GEO	☐ MECHANICAL	☐ SAFETY	☐ SYSTEMS ENG	REVIEW: Draft
☐ ENVIR PROT& UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE: Thursday, May 10, 2001
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☒ OE CX TECH REVIEW TEAM	NAME: Hank Hubbard 256-895-1586
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS		

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1.	Page 1	para 1.0.1, last sentence, need to add "and chemical agent siting" before the word requirements and after storage	The text will be revised as recommended.
2.	Page 3	para 3.1.1, 5th line, insert the word "non-explosively configured" between recovered and CWM	The text will be revised as recommended.
3.	Page 3	para 3.1.3, 4th line, replace the word "doubtful" with unlikely.	The text will be revised as recommended.
4.	Page 3	add new paragraph 3.1.4. The MCE for the IHF at Ft. McClellan is the storage of one each 155mm, MK II projectile with an explosive burster and fuze, filled with phosgene (CG) agent. This item will produce the largest 1% Lethality Distance of all possible CWM items expected to be encountered on Fort McClellan. See paragraph 3.1.5 for discussion on propagation. This MCE produces a 1% lethality distance of 545 feet as calculated using the D2PC Downwind Hazard Modeling program. The parameters used to obtain these calculations were: 3.1.4.1 Anniston Army Depot geographical profile 3.1.4.2 155mm as munition type 3.1.4.3 CG as agent type 3.1.4.4 11 pounds of agent 3.1.4.5 windspeed of 1 MPS 3.1.4.6 stability factor of "D" 3.1.4.7 instantaneous release	The MCE will be revised to include one 155m, MK II projectile with an explosive burster and fuze, filled with phosgene (CG). The wording will be changed from your proposed wording of "...all possible CWM items expected to be encountered..." to "... all possible CWM items potentially associated with training at..." since we do not 'expect' to encounter explosively configured CWM.
5.	Page 4	para 3.3.1, change wording to read, The proposed IBD for the IHF is 200 feet based on a NEW of under 30 pounds in Hazard Division 1.2.1 (Table C9.T6A and C9.T6B of DOD 6055.9).	The text will be changed.
6.	Table 3.1	Need to change Public Withdrawal Distance from 545 feet to 5,496 feet. This distance is the no significant effects distance. You also need to show this QD arc on your map(s). As a side note, you need to be able to reference somewhere in	The Public Withdrawal Distance will be increased to 5,496 feet, which is the NOSE for the MCE of a phosgene-filled 155mm projectile as described in

ACTION CODES
A - ACCEPTED/CONCUR
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VE - VE POTENTIAL/VEP ATTACHED

U. S. ARM.. ENGINEERING & SUPPORT CENTER, HUNTSVILLE — CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT

☐ SITE DEV & GEO ☐ MECHANICAL ☐ SAFETY ☐ SYSTEMS ENG
☐ ENVIR PROT& UTIL ☐ MFG TECHNOLOGY ☐ ADV TECH ☐ VALUE ENG
☐ ARCHITECTURAL ☐ ELECTRICAL ☐ ESTIMATING ☒ OE CX TECH REVIEW TEAM
☐ STRUCTURAL ☐ INST & CONTROLS ☐ SPECIFICATIONS

REVIEW
DATE Thursday, May 10, 2001
NAME Hank Hubbard 256-895-1586

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
		the SSS, or here, how you will evacuate, shelter-in-place, or whatever for the "public" within this arc should the MCE occur. Add 1% Lethality Distance under Features and 545 feet under Distance	Comment 4 above. In addition, a plan will be developed for procedures to be followed within the PWD in the event of the occurrence of the MCE. The 1% Lethality Distance will be added to Table 3.2
7.	Page 3	para 3.2, need to change the NEW of CWM in MRCs from 42.6 pounds to read under 30 pounds. This is based on our MCE of 1 ea 155mm, CG filled. (CG was used as a filler in the MK II projectile, the fuze and burster for the MK II is 1.924 lbs maximum. I assume you took your NEW per item and multiplied it by 15. If you do this to this figure, it comes up to 28.86 pounds. If we start to recover a lot of 155 mm, M105 rounds with fuzes and bursters (unlikely) we will need to possibly recalculate.) Do not put info in parens in the IHFSP.	The NEW will be changed to read "under 30 lbs."
8.	Page 5	para 3.5, last line, delete the words "the lack of" from the sentence.	The text will be deleted.
9.	General	Look at Michelle Crull's comments and incorporate. She added a sheet to her Form 7. Make the text a new paragraph 3.1.5, make the chart a new Figure 3.1 or Table or whatever falls into sequence here. We will need to get with the contractor on the fabrication of these steel boxes for the 155s. The purpose of the steel boxes is to prevent propagation from one MRC to another for the 155s. The MRCs themselves will prevent propagation for 4.2" mortars. Relative to paragraph 11-9, DA PAM 385-61, we will need to develop a program of some sort to satisfy this area of concern.	Michelle Crull's recommended text will be incorporated. Following approval of this plan, we will have a box fabricated for storage of a single 155mm. This will allow 2 such items to be stored in the IHF. Paragraph 11-9 requires efforts to be made to evacuate or take other protective action for all unprotected personnel within the NOSE. Section 6 will be expanded to describe the measures to be taken in response to a release from the IHF.

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U. S. ARMY ENGINEER DIVISION HUNTSVILLE — CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT: IHF Siting Plan for Former Ft McClellan CN 4-330-01

☐ SITE DEV & GEO	☐ MECHANICAL	☐ SAFETY	☐ SYSTEMS ENG	REVIEW	Draft, dated April 25, 2001
☒ ENVIR PROT& UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE	27 April 2001
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	Kellie Williams
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1.	Page 1, Par 1.0.1, Line 6	The sentence on this line states that, "Non-CWM ordnance will not be stored in the facility". This is not a true statement. Because we do not assess items until the end of the project we may store a smoke round until the end of the project in the IHF. Correct the statement.	The text will be revised to state that non-CWM ordnance might be stored in the IHF because assessment of the items will not occur until later in the project.
2.	Page 3, par 3.2 Line 4	Recommend using another acronym for hazard division. HD is commonly used for mustard. This could cause confusion.	HD will be reserved for distilled mustard. Hazard Division will be spelled out.
3.	Page 5, par 4.0.1, 3rd sentence	Recommend stating that the placement and monitoring of CWM in the IHF will be handled by SBCCOM. ECBC will provide first entry monitoring while intrusive activities are on-going. After that, during long-term storage, TEU will probably provide the monitoring support. Using SBCCOM takes care of both times.	The text will be changed as recommended.
4.	Page 6, par 5	"Keys to the gates are controlled by the Fort McClellan Transition Force Security." During intrusive activities CEHNC and TEU should be in control of the keys.	The Transition Force maintains control of the gate keys by signing them out base on need. During intrusive activities, CEHNC and TEU will have access to gate keys.
5.	Page 6, par 5	Guard Force. Please state where the guard can be located and what training and qualifications he must have to guard the IHF. Recommend stating "suspect CWM" instead of "CWM".	The security guard will be located outside the gate the Area T-38 where the IHF can be viewed. The guard must be licensed in the State of Alabama and will be given site-specific training.
6.	Page 6, par 5	Locks and Keys. Why does TEU maintain control of the IHF key while the transition force maintains control of the fence keys. Also, during long term storage, after the project is complete, what organization will maintain the keys?	Only TEU will have keys to the IHF and its perimeter gate while it is in use. The other gates are controlled by Transition Force because of the need for other groups to pass through those gates. For long term storage, CESAM will maintain keys to the IHF.

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U. S. ARMY ENGINEER DIVISION HUNTSVILLE

CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT Interim Holding Facility (IHF) for Recovered Chemical Warfare Material (CWM, Fort McClellan, Alabama

☐ SITE DEV & GEO ☐ MECHANICAL ☒ OE SAFETY ☐ SYSTEMS ENG
☐ ENVIR PROT& UTIL ☐ MFG TECHNOLOGY ☐ ADV TECH ☐ VALUE ENG
☐ ARCHITECTURAL ☐ ELECTRICAL ☐ ESTIMATING ☐ OTHER
☐ STRUCTURAL ☐ INST & CONTROLS ☐ SPECIFICATIONS

REVIEW Site Safety Submissin
DATE 26 Apr 01
NAME Douglas F. Rhodes/256-895-1508

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1.	General	Numbering of pages is not IAW standard Army policy. Recommend the author of this document review the proper standards and apply them to this document.	The document format will be corrected.
2.	General	Cover letter should be written in approved Army format. Recommend the author of this document review the proper standards and apply them to this document.	Parsons will not be the generator of the cover letter as shown. The information in the cover letter was provided to assist the generator of the official cover letter.
3.	Para 2.1.4	In two locations in the para the term "Lightning Suppression" is used. The correct terminology should be "Lightning Protection". Recommend the author make the appropriate corrections.	The correction will be made.
4.	General	No drawing has been furnished that reflects the actual layout of the electrical service that has been buried. Recommend a line drawing be furnished that reflects the location of all service utilities in the site. This would assist future planning operations and servicing of the facility.	A drawing will be added that shows the layout of the electrical service to the IHF.
5.	Para. 3.2	Last line states "The hazard division (HD) of the CWM will be 1.2 since all CWM with explosive components will be stored in MRC's." This is first of all incorrect in that the CWM does not have a HD, the ordnance has a HD. Secondly the word "all" should be changed to "only" since only 1.2 ordnance items will be placed in the IHF. Recommend this entire para be revisited and reworked. Although we are storing items with CWM in them, the items are still ordnance. For example, the NEW of an ordnance item or container can be 50 lbs or less but the NEW of CWM is zero.	The text will be clarified to state that the HD relates to the explosive components. The paragraph will be reworded.
6.	Para. 3.6	Public Withdrawal distance is incorrect. Recommend the author recalculate Public Withdrawal Distance.	The Public Withdrawal Distance will be increased to 5,496 feet to meet the NOSE of the revised MCE. See Hank Hubbard's Comments No. 6 and 9.
7.	Para 3.3.2	This statement is in error. At the current time, TEU is using the building to store Assessment equipment. Safety for the equipment must be addressed.	When the IHF is in use, Building T-4454 will no longer be used for storage so that safety of the equipment can be maintained.

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U. S. ARMY ENGINEER DIVISION HUNTSVILLE

CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT Interim Holding Facility (IHF) for Recovered Chemical Warfare Material (CWM, Fort McClellan, Alabama

☐ SITE DEV & GEO	☐ MECHANICAL	☒ OE SAFETY	☐ SYSTEMS ENG	REVIEW Site Safety Submissin
☐ ENVIR PROT& UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE 26 Apr 01
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME Douglas F. Rhodes/256-895-1508
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS		

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
8.	General	No plans for the evacuation and notification of personnel in the 1% lethality zone are included. DA Pam 385-61, para 11-2 requires details of an evacuation plan be included in lieu of absolute exclusion.	Section 6 will be expanded to include evacuation and notification of personnel within the 1% Lethality Distance as well as measures to be taken within the Public Withdrawal Distance in the event of a release from the IHF.

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U. S. ARMY ENGINEERING & SUPPORT CENTER, HUNTSVILLE — CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT: CN 04-330-01, Ft McClellan, IHF Siting Plan

☐ SITE DEV & GEO	☐ MECHANICAL	☐ SAFETY	☐ SYSTEMS ENG	REVIEW: Draft
☐ ENVIR PROT& UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE: 26 April 2001
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME: Michelle Crull, PhD, PE (256) 895-1653
☒ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS		

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1	General	Make sure that all enclosures are labeled (i.e. "Enclosure 1", "Enclosure 2", and "Enclosure 3") and, if a separate page is used for these labels, the page is inserted in the correct place. Currently, Enclosure 1 is not labeled, Enclosure 2 is labeled between it's text and it's figures, and Enclosure 3 has two labels but Enclosure 3 is not included.	The enclosure covers will be placed in the correct locations. Enclosure 3 was not included because it has already been submitted as part of the SSS. It will be included in the next revision.
2	Inhabited Building Distance, Public Traffic Route, & Intraline Distance	This comment includes only explosive considerations not chemical agent considerations. If the MCE is restricted to one explosively configured round, the NEW/MCE is less than 31 lbs. Based on Table C9.T6B of DoD 6055.9-STD, Inhabited Building Distance (IBD), Public Traffic Route (PTR) distance, and Intraline Distance (ILD) are 200 ft when stored in structures which can contribute to the debris hazard (such as the IHF). Use these distances throughout this document.	The IBD, PTR distance, and ILD will be set at 200 feet.
3	Section 3.1	Recommend adding a paragraph discussing the method used to ensure that the MCE is restricted to one explosively configured round. Some suggested wording for such a paragraph is attached to this form.	The text will be revised to reflect the concept of providing extra protection from sympathetic detonation of multiple rounds.

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3.1.5 In order to prevent the 1% lethality distance from exceeding 545 feet, the MCE must be restricted to one agent-filled munition sealed in an MRC. If the fragment from an explosively-configured agent-filled munition perforates its MRC and another MRC, the MCE may be larger than one munition. If the second munition is explosively configured, this munition may detonate as well as the first. The walls of the MRC are 0.134 inch thick stainless steel. The attached table shows the thickness of mild steel required to prevent perforation by fragments from various explosively-configured agent-filled munitions. For munitions whose fragments are predicted to perforate the MRC, the MRC will be placed inside a steel box of sufficient thickness (as shown on the attached table) to defeat the fragments. In this manner there will be no propagation due to fragment impact so the MCE will be restricted to one agent-filled munition sealed in an MRC.

Penetration of Fragments from Explosively-Configured Agent-Filled Munitions

Chemical Round	Thickness of Mild Steel Required to Prevent Perforation (in)	Thickness of Mild Steel Required to Prevent Perforation After Perforation of MRC (in)
4.2" M2/M2A1 (Chemical)	0.1	0.00
105 mm Gas M360	0.46	0.33
155 mm Mk 2	0.59	0.46
155 mm M122 (Chemical)	0.66	0.53
75 mm M1/M8 (Chemical)	0.11	0.00
8 in Livens	0.11	0.00
4 in Stokes Mortar	0.11	0.00

Notes: Penetration is based on design fragment weight and velocity calculated in accordance with HNC-ED-CS-S-98-1 and penetration of mild steel using the THOR equations.

Figure 3.1

ENCLOSURE 1

EXPLOSIVE SAFETY SUBMISSION INFORMATION

The following items are keyed to the subparagraphs of DOD 6055.9, Chapter 5, paragraph 5.6.2 and identify where, in the Site Safety Submission, information pertaining to that subparagraph can be found.

5.6.2.2 Drawings of Site Plans.....Enclosure 2, Figures 2.1, 2.2, 2.3, 2.4, and 2.5

5.6.2.3 Distances to Installation Boundary, Public Railways, etc....Enclosure 2, Section 3.4 and Table 3.1

5.6.2.4 Other Facilities within Inhabited Building Distance.....Enclosure 2, Section 3.3 and Table 3.1

5.6.2.5 Description of Hazardous Materials or Items.....Enclosure 2, Sections 1.1 and 4.1, and Enclosure 3, Appendix A, Section 2.5.

5.6.2.6 Quantities, Hazard Class and Division .....Enclosure 2, Section 3.2

5.6.2.7 Personnel Limits .....Enclosure 2, Section 4.2

5.6.2.8 General Construction Details .....Enclosure 2, Section 2.1 and Figure 2.1

5.6.2.9 Brief Summary of Design Considerations to Reduce Q-D .....Not Applicable

5.6.2.10 Type and Arrangement of Operations .....Enclosure 2, Section 4.1

5.6.2.11 Topographic Map.....Enclosure 2, Figures 2.2, 2.3, and 2.4

5.6.2.12 Provisions Applicable when Chemical Agents are Present

Personnel Protective Clothing and Equipment.....Enclosure 3, Sections 3.5.2 and 4.1.1.

Treatment of Effluent and Waste.....Enclosure 3, Section 6.5 Contingency Plans

Adequacy of Medical Support.....Enclosure 3, Section 6.4.3

Average Wind Speed and Direction .....Enclosure 3,

Warning and Detection Systems.....Enclosure 3, Section 5.0, Security

Hazards Analysis.....Enclosure 3, Appendix A

5.6.2.13 Deviations from Safety Standards.....Not Applicable.

The following items are keyed to the subparagraphs of DA PAM 385-61, Chapter 11, Separation Distance Criteria, and identify where, in the Site Safety Submission, information pertaining to that subparagraph can be found.

11-2 Public access exclusion distance (PAED) .....Enclosure 2, Section 3.5 and Table 3.1

11-3 Maximum credible event .....Enclosure 2, Section 3.1 and Enclosure 3, Appendix A, Section 4.

11-4 1-percent lethality distance .....Enclosure 2, Section 3.5

11-5 Inhabited building distance ..... Enclosure 2, Section 3.3 and Table 3.1

11-6 Intraline distance.....Enclosure 2, Section 3.7 and Table 3.1

11-7 Magazine distance.....Enclosure 2, Section 3.8 and Table 3.1

11-8 Public traffic route distance..... Enclosure 2, Section 3.4.1 and Table 3.1

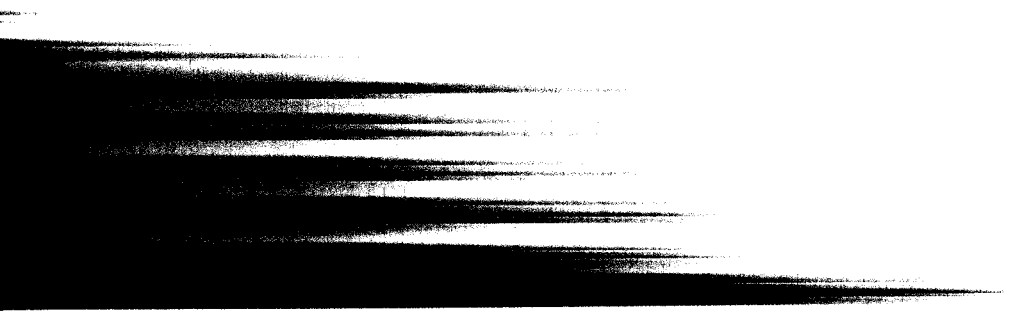
11-9 Evacuation/protective distance .....Enclosure 2, Section 3.6 and Figure 2.2

ENCLOSURE 2

Final

EXPLOSIVES SAFETY SITE PLAN AND SAFETY SUBMISSION FOR THE INTERIM HOLDING FACILITY FORT MCCLELLAN, ALABAMA

Contract No. DACA87 – 95 – D - 0018



Prepared for
U.S. Army Corps of Engineers
Huntsville Center

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EXPLOSIVES SAFETY SITE PLAN AND SAFETY SUBMISSION FOR THE INTERIM HOLDING FACILITY FORT MCCLELLAN, ALABAMA

1.0 INTRODUCTION

1.1 As part of the Engineering Evaluation and Cost Analysis (EE/CA) being conducted on former chemical warfare materiel (CWM) training sites at Fort McClellan, Alabama, provisions must be made for the storage of explosively configured CWM ordnance and other items potentially contaminated with chemical warfare agents. An Interim Holding Facility (IHF) will be used for the storage of recovered CWM and suspected CWM until disposal equipment can be brought to the site, or final assessment indicates the items are not CWM. Conventional ordnance is not intended to be stored in the facility. However, some items recovered during this investigation may be suspected CWM and contain explosives. Since the assessment of items will not be addressed until the end of the project, non-CWM ordnance could be temporarily stored in the IHF until assessed and removed. This plan addresses the explosives storage and chemical agent siting requirements for the IHF.

1.2 This Explosives Safety Site Plan has been prepared as a result of the Department of Defense Explosives Safety Board (DDESB) memorandum "Final Site Safety Submission, Chemical Warfare Materiel (CWM) Site Engineering Evaluation/Cost Analysis (EE/CA) for Fort McClellan, AL," DDESB-KO, dated February 8, 2001. In addition, this plan is based on requirements outlined in:

1. "DOD Ammunition and Explosives Safety Standards," DOD 6055.9-STD,
2. "Toxic Chemical Agent Safety Standards," DA PAM 385-61,
3. "Ammunition and Explosives Safety Standards," DA PAM 385-64,
4. "Site and General Construction Plan Developer's Guide," USATCESP 385-02.

2.0 IHF DESCRIPTION

2.1 Construction and Systems

2.1.1 The IHF is a portable storage building designed to store hazardous wastes, specifically recovered CWM. The building is a prefabricated, single-story, modular unit constructed of insulated metal panels (Figure 2.1). Its external dimensions are 15.5 feet long by 7.25 feet wide by 8 feet high. There are double doors (each 54 inches wide by 78 inches high) located on the front of the IHF. The doors are equipped with a high-security locking hasp to accommodate a padlock.

2.1.2 The building has interior and exterior light fixtures, heating and air conditioning, and a fire suppression system. The interior of the IHF is approximately 100 square feet of clear space for storage and walkway. This area is sufficient to store up to 15 containers with a 15 x 15 inch footprint and to provide enough room to maneuver the containers within the building. An integral leak-tight secondary containment sump is located beneath the metal grating floor and is equipped with an accessible exterior drain.

2.1.3 The IHF is ventilated by passive airflow through louvered vents located on each end. The controls for the louvered vents are accessible from outside the IHF. The vents are normally closed when CWM is being stored. The IHF is equipped with an internal self-actuating dry chemical fire suppression unit and is constructed with 2-hour fire-rated walls.

2.1.4 A lightning protection system has been installed at the IHF in accordance with DA PAM 385-64 and AR 385-64, Chapter 12. The lightning protection system has been tested in accordance with Army procedures.

2.1.5 The IHF is supplied with electric power to operate the lights, heating, and air conditioning. The power is provided by underground conduit that extends from a utility pole over 50 feet from the IHF. The waterproof internal light fixture is Underwriters Laboratory (UL)-tested for Class 1, Division 1 hazardous locations. The external lights are photocell activated for automatic lighting during periods of darkness.

2.1.6 The IHF has two monitoring ports near the entry doors, one 6 inches from the floor and one 6 inches from the ceiling, for sampling the interior air quality of the IHF. Each port is 2.5 inches in diameter and has a threaded cap, which allows the monitoring sample lines to be placed inside the IHF. When CWM is stored inside, the air quality of the IHF will be monitored before personnel enter. First entry monitoring procedures are discussed in Section 5 of the Interim Holding Facility Plan (Work Plan/Site Safety Submission, Volume III, Section I – included herein as Enclosure 3).

2.2 Location and Layout

2.2.1 The IHF is within the fenced area of the former TEU Training Area (T-38) located on Reservoir Ridge at Fort McClellan, Alabama. Figures 2.2 through 2.5 show the location of the IHF at various scales. The IHF has been placed on an existing concrete slab that remains from former Building T-4456. The IHF is surrounded by a 6-foot high chain link fence. The area enclosed by the fence is roughly 85 feet by 95 feet. Access to the IHF is through a 16-ft wide gate in the eastern section of fence. The gate is secured by a padlock.

2.2.2 The IHF was sited within the T-38 area because of its remote location. Many areas of Fort McClellan have already been transferred to the City of Anniston or other government agencies. The Army plans to retain control of T-38 and the surrounding areas until remedial actions are complete.

3.0 IHF HAZARD ANALYSIS

This section provides a discussion of the various hazards related to the explosive component of recovered CWM waste. Discussions are provided on the maximum credible events and the various distances pertaining to the IHF.

3.1 Maximum Credible Event

3.1.1 Appendix A of the Interim Holding Facility Plan contains a hazard analysis (HA) for the IHF including a procedure for identification of a Maximum Credible Event (MCE). An accident scenario meeting the requirement of being credible and leading to a release of agent was not identified by that HA, which considered scenarios relating to storage, handling, and onsite transportation of recovered non-explosively configured CWM sealed inside multiple-round containers (MRCs). The HA was based on the storage of five MRCs in the IHF:

- three MRCs containing chemical agent identification set (CAIS) items
  - one with mustard agent (H or HD),
  - one with lewisite (L), and
  - one with nitrogen mustard (HN-1);
- one MRC containing either
  - a 155mm projectile containing Sarin (GB), HD, or phosgene (CG), or
  - a 4.2-inch mortar containing HD or CG; and
- one MRC containing a drum with 5 gallons of HD.

3.1.2 Two additional MCEs are considered: one non-explosively configured agent-filled munition sealed in an MRC and one explosively-configured agent-filled munition sealed in an MRC.

3.1.3 In the case of the non-explosive agent-filled munition, it is assumed that the amount of leakage will be very small because none of the munitions are pressure filled and the leak must also penetrate the leak sealing performed by TEU during packaging as well as the seal in the MRC. It is unlikely that the agent would be detectable anywhere outside of the IHF, due to cross-ventilation of the IHF and air movement outside the IHF.

3.1.4 The MCE for the IHF at Fort McClellan is based on the complete release from one 155mm MK II projectile with an explosive burster and fuze, filled with phosgene (CG) agent. This item will produce the largest 1% Lethality Distance of all possible CWM items potentially associated with training at Fort McClellan. See paragraph 3.1.5 for a discussion on propagation. This MCE produces a 1% Lethality Distance of 545 feet as calculated using the D2PC Downwind Hazard Modeling program. The parameters used to obtain these calculations were:

- Anniston Army Depot geographical profile
- 155 mm as munition type
- CG as agent type

- 11 pounds of agent
- windspeed of 1 MPS
- stability factor of "D"
- instantaneous release.

3.1.5 The MCE, based on a single release from one agent-filled munition, is credible only if a single round is stored, or if the possibility of sympathetic detonations of multiple rounds is of very low probability. If the fragment from an explosively-configured agent-filled munition perforates its MRC, another MRC, and detonates or otherwise causes chemical release from a second chemical round, the MCE may be larger than one munition. The walls of the MRC are 0.134-inch thick stainless steel. Table 3.1 shows the thickness of mild steel required to prevent perforation by fragments from various explosively-configured agent-filled munitions. For munitions whose fragments are predicted to perforate the MRC, the MRC will be placed inside a steel box so that the total thickness of steel (as shown on Table 3.1) which, when combined with the thickness of the second MRC, will defeat the fragments. In this manner, there will be no propagation due to fragment impact so the MCE will be restricted to one agent-filled munition sealed in an MRC.

Table 3.1
Penetration of Fragments from Explosively-Configured Agent-Filled Munitions

Chemical Round	Thickness of Mild Steel Required to Prevent Perforation (in)	Thickness of Mild Steel Required to Prevent Perforation After Perforation of MRC (in)
4.2" M2/M2A1 (Chemical)	0.1	0.00
105 mm Gas M360	0.46	0.33
155 mm Mk II	0.59	0.46
155 mm M122 (Chemical)	0.66	0.53
75 mm M1/M8 (Chemical)	0.11	0.00
8 in Livens	0.11	0.00
4 in Stokes Mortar	0.11	0.00

Notes: Penetration is based on design fragment weight and velocity calculated in accordance with HNC-ED-CS-S-98-1 and penetration of mild steel using the THOR equations.

3.2 Expected IHF Contents

3.2.1 The IHF will be used to store items which are determined or suspected to be CWM. These items will be packaged within MRCs. Some of these items may have explosive components. Based on worst-case projections for the amount and types of items to be recovered, the net explosives weight (NEW) of explosive-components sealed in MRCs will be under 30 lbs. The maximum NEW for the IHF will therefore be 30 lbs.

That amount will not be exceeded without approval of a variance. The only items that may be stored in the IHF and that could have explosive components would be ordnance under Hazard Division 1.2.1.

3.2.2 The types of chemical warfare agents that may be stored in the IHF are those listed above as used in the HA. They are:

- mustard (H or HD),
- nitrogen mustard (HN-1),
- lewisite (L),
- phosgene (CG) if stored in a munition, and
- Sarin (GB).

3.3 Inhabited Building Distance (IBD)

3.3.1 The proposed IBD for the IHF is 200 feet based on a NEW of under 30 lbs in Hazard Division 1.2.1 (Table C9.T6A and C9.T6B of DOD 6055.9). Table 3.2 shows the distances from the IHF to various features.

3.3.2 T-4454 is a storage building that is no longer being maintained and is in disrepair. TEU has temporarily placed assessment equipment in Building T-4454, but that equipment will be moved to another location outside the IBD prior to storing CWM with explosive components in the IHF. At a distance of 107 feet, this building would be within the IBD of the IHF once explosive items are stored.

Table 3.2
Distances from IHF

Facility or Feature	Distance from IHF
Inhabited Building Distance (IBD)	200 feet
Public Withdrawal Distance	5,496 feet
Public Access Exclusion Distance (PAED)	545 feet
1% Lethality Distance	545 feet
Intraline Distance (ILD)	200 feet
Public Traffic Route (PTR) Distance	200 feet
Building T-4454 (within IBD and vacant)	107 feet
Installation Boundary	7,250 feet
ASP Boundary	808 feet
Waverly Road (closest Public Traffic Route)	1,575 feet
Railroad spur to ASP	1,659 feet
Power distribution lines (to ASP)	900 feet
Power transmission lines and transformer stations	Greater than 1,650 feet

3.4 Public Traffic Routes and Power Distribution

3.4.1 Based on a NEW of 30 lbs, the Public Traffic Route Distance is 200 feet. The closest public road to the IHF is Waverly Road, which dead-ends into the ASP. The traffic on Waverly Road is very light and is limited to vehicles accessing the ASP and the IHF. A rail spur leading to the ASP is the closest railway to the IHF. No public traffic routes occur within the IBD for the IHF. It should be noted that the Public Traffic Route Distance is based on the explosive component of items in the IHF not chemical agents.

3.4.2 No power transmission lines, distribution lines, or transformer stations exist closer than Waverly Road, other than the power lines and transformers needed to supply power to the IHF and to the ASP.

3.5 Public Access Exclusion Distance

The Public Access Exclusion Distance (PAED) is defined to be the calculated distance arc from the agent source at which no more than 10.0, 4.3, and 150 mg per minute per cubic meter is present for GB, VX, and mustard, respectively. The PAED is taken as the greater of the 1% lethality distance or the IBD. The 1% lethality distance is greater than the IBD of 200 feet under the MCE of an explosively-configured munition in the IHF. In the worst case, the 1% lethality distance for the explosive release of CG from an explosively-configured 155mm munition sealed in an MRC is 166 meters (545 feet). For a nonexplosively-configured munition, the line of 1% lethality will not extend beyond the MRC containing the chemical agent. If explosive components cannot be positively determined, the item is assumed to be explosively-configured.

3.6 Evacuation/Protective Distance

The Public Withdrawal Distance or Evacuation/Protective Distance is normally taken to be the distance at which no significant effects dosages (NOSE) or less occur. For the MCE, the NOSE is 5, 496 feet. The Public Withdrawal Distance will be 5, 496 feet.

3.7 Intraline Distance

The Intraline Distance is applicable to separation of related operations, facilities, and support facilities within an operating area such as maintenance buildings, change houses, lunch rooms, field offices, laboratories, laundries, and magazines. Based on the NEW and HD of the IHF, the Intraline Distance will be 200 feet considering that the debris from the IHF itself can contribute to the hazard.

3.8 Magazine Distance

No explosives storage facilities are within the IBD for the IHF. The Ammunition Supply Point (ASP) constitutes the closest explosives storage facility to the IHF. Most magazines at the ASP no longer contain explosives. The closest magazine that holds explosives is Building 4412, which is located near the center of the ASP. Since the use of

the various magazines may change, the ASP boundary distance of 808 feet will be used as the magazine distance. The IBD for the ASP is 1,200 feet and extends over the IHF as shown on Figure 2.4.

4.0 IHF USE AND OCCUPANCY

4.1 The IHF will be used to store MRCs potentially containing both explosively or non-explosively configured CWM ordnance and other items potentially containing chemical warfare agents. Only sealed MRCs will be stored in the IHF. The placement and monitoring of CWM in the IHF will be handled by SBCCOM. Once CWM is stored in the IHF, first entry monitoring will be first conducted prior to entry into the IHF by personnel wearing the appropriate protective clothing. Facilities for decontamination, showers, and clothes changing will be provided at the PAED.

4.2 The maximum number of personnel in the IHF at any given time will be limited to those needed to move the MRCs (expected to be 2 or 3 persons). Unless MRCs are being inspected, moved in or moved out of the IHF, no personnel will be present and the IHF will be locked along with the gate in the security fence. Prior to initiating inspection or moving of MRCs in the IHF, all non-essential personnel will be excluded from the area enclosed by the PAED.

5.0 SECURITY

The IHF will have the following physical security requirements to reduce potential risks associated with the storage of recovered CWM at Fort McClellan.

1. *Barriers.* A chain link fence surrounds the IHF site. The fence is a deterrent for casual observers and provides a clear boundary. Access to Area T-38 is restricted and can only be made through locked gates. Entry to the IHF must be made through the gate of Area T-38. Keys to the gates will be controlled by the Fort McClellan Transition Force Security or other organization designated by the Mobile District Corps of Engineers. If an explosively-configured chemical munition is placed in the IHF, the locks to the gates leading to Area T-38 will be changed and separately controlled by Security. Signs denoting the restricted access will be posted at the gates and at the PAED of all access roads to Area T-38.

2. *Lighting.* Security lighting for the area will be provided by photocell-activated lights mounted on the exterior of the IHF.

3. *Signs.* The fence surrounding the IHF will be posted with signs that indicate the area is restricted, dangerous, and that unauthorized entry is illegal. When chemical agents are actually being stored in the IHF, appropriate placards will be placed on the front of the IHF to show the types of chemical agents present.

4. *Guard Force.* When suspect CWM is in storage, the IHF will be protected by a contracted 24-hour armed guard or an intrusion detection system plus periodic surveillance and inspections of the gate and locks. Security guards will be required to be licensed in the State of Alabama and will be provided site-specific training regarding the IHF, duties to be performed, and any restrictions.

5. *Access Control.* When the IHF is being operated during receipt and storage of suspect CWM, access controls will be implemented in the vicinity of the IHF so that direct access to recovered suspect CWM will be limited to the TEU.

6. *Locks and Keys.* The gate to the fence and the doors of the IHF will be locked when not in use. TEU will maintain control of the keys to the IHF during intrusive activities. During long-term storage, the Mobile District, U.S. Army Corps of Engineers will be responsible for the keys.

6.0 EVACUATION

Evacuation of personnel can occur under two sets of circumstances. The first instance is the evacuation of non-essential personnel from within the 1% Lethality Distance (PAED) when the IHF is to be opened for placement, monitoring, or removal of explosively-configured CWM. The second instance is evacuation of personnel from within the Public Withdrawal Distance in the event of a release of chemical agent from the IHF.

6.1 Evacuation for IHF Entry

6.1.1 The evacuation of the PAED around the IHF will consist of several components: notification, evacuation, verification of evacuation, monitoring of perimeter during IHF entry, and notification of safe return.

6.1.2 When it becomes necessary to enter the IHF with potentially explosive items present, the following personnel will be notified by the SSO:

- Transition Force
- Contractors with personnel known to be working in the general area
- Project Personnel
- USAESCH Site Safety

Notification should include the likely duration of the entry event.

6.1.3 Following notification, the area will be evacuated of all personnel not directly involved in the IHF entry operation. Visitors, administrative staff, and other project staff not required for the operation will evacuate. Complete evacuation will be confirmed by visual observation of all areas within the PAED. Once satisfied that evacuation is complete, the SSO will allow operations to begin.

6.1.4 While entry operations are occurring, the perimeter of the PAED will be monitored at all roads or other likely points of entry to prevent non-essential personnel from moving into the evacuated area.

6.1.5 Once the IHF entry is safely completed, the same organizations notified of the evacuation will be notified that the operation is complete.

6.2 Evacuation in the Event of a Release

6.2.1 Upon discovery that chemical agent may have been released from the IHF, the evacuation procedures in this section shall be implemented. The evacuation of the Public Withdrawal Distance around the IHF will consist of several components: preliminary communication, notification, evacuation, verification of evacuation, monitoring of perimeter, and notification of safe return.

6.2.2 Once it is known that CWM with explosive components will be moved to the IHF, it becomes necessary to communicate the potential hazards to all persons that may be

impacted. Specifically, all persons who work in or frequently enter the Public Withdrawal Distance will need to be notified of the potential hazard and of the actions to be taken if a release occurs. Notably, evacuation routes and safe areas will need to be designated.

6.2.3 When it becomes necessary to immediately evacuate, the following organizations will be notified by the quickest means possible:

- Transition Force
- Contractors with personnel known to be working in the general area
- Project Personnel
- USAESCH Site Safety

The notification should express the nature of the release (if known), the immediate need for evacuation and where safety can be found. Note that other notifications may be required in the event of a chemical release.

6.2.4 Because of the large area and number of parties within the Public Withdrawal Distance, it will be necessary to rely on the assistance of Transition Force and security personnel to assist with the notifications and evacuation. The following organizations are known to have personnel working within the evacuation area:

- U.S. Army (ASP, Security, others)
- Alabama National Guard
- Department of Justice
- Parsons Corporation and subcontractors
- Foster-Wheeler Corporation and subcontractors
- IT Corporation and subcontractors
- Joint Powers Authority.

6.2.5 Following notification, the area will be evacuated of all personnel not directly involved in containment or cleanup of the release. Visitors, administrative staff, and other project staff not required for the operation will evacuate. Complete evacuation will be confirmed by visual observation of all areas within the Public Withdrawal Distance.

6.2.6 While unsafe conditions remain, the perimeter of the Public Withdrawal Distance will be monitored at all roads or other likely points of entry to prevent non-essential personnel from moving into the evacuated area. Because of the large number of roads, it will be necessary to include assistance from Transition Force.

6.2.7 Once the SSO and USAESCH Safety Representative are satisfied that the danger has passed, the same organizations notified of the evacuation will be notified that personnel may safely re-enter the evacuated area.

Figure 2.1: Photos of IHF

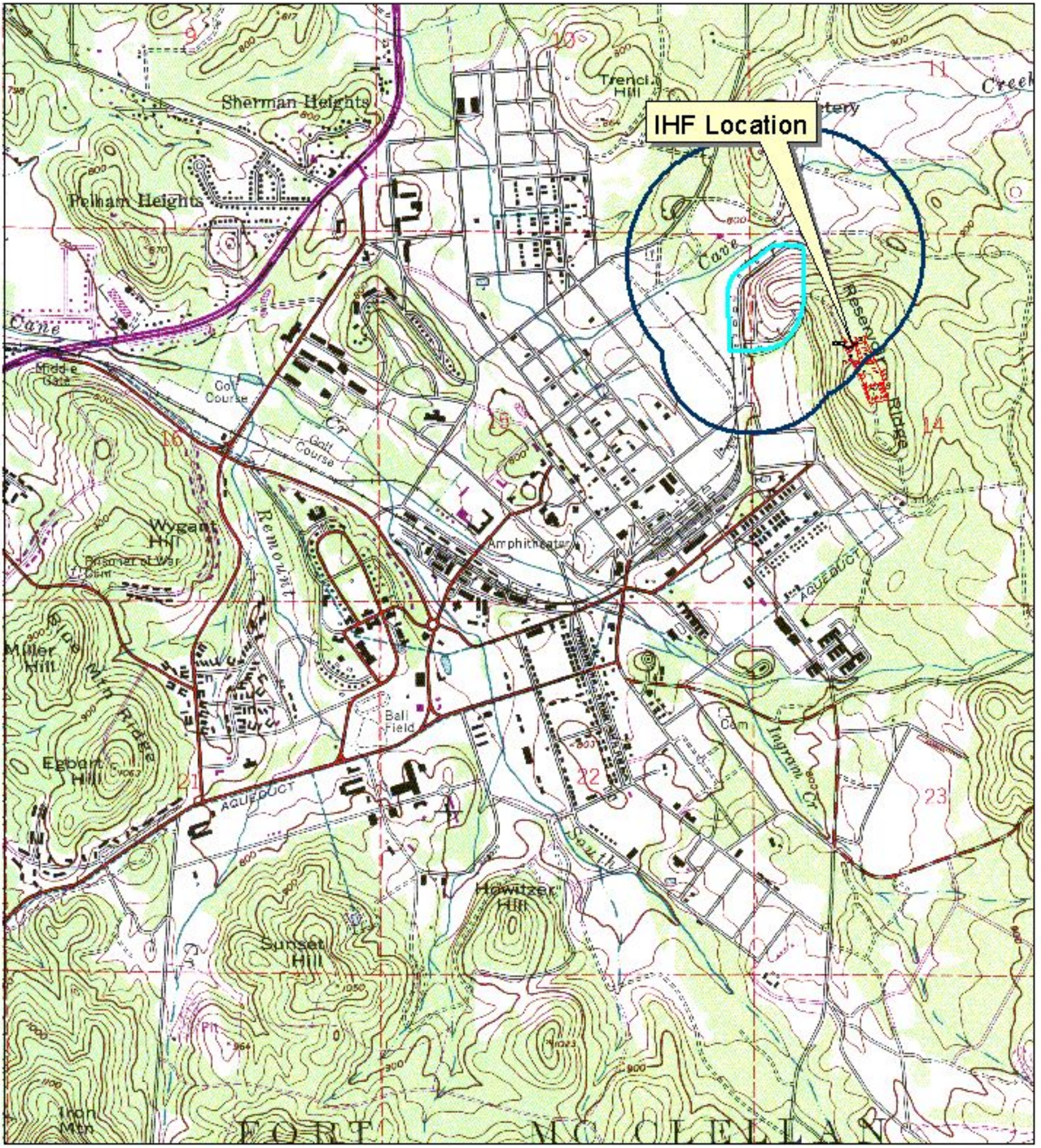


Figure 2.2

Fort McClellan
IHF Site Map

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER
Parsons ES	FORT McCLELLAN ANNISTON, ALABAMA CALHOUN COUNTY
Parsons ES	
Parsons ES	1:24000 — 734543
Parsons ES	April 2001
Parsons ES	

Note: Contour Interval = 20 feet

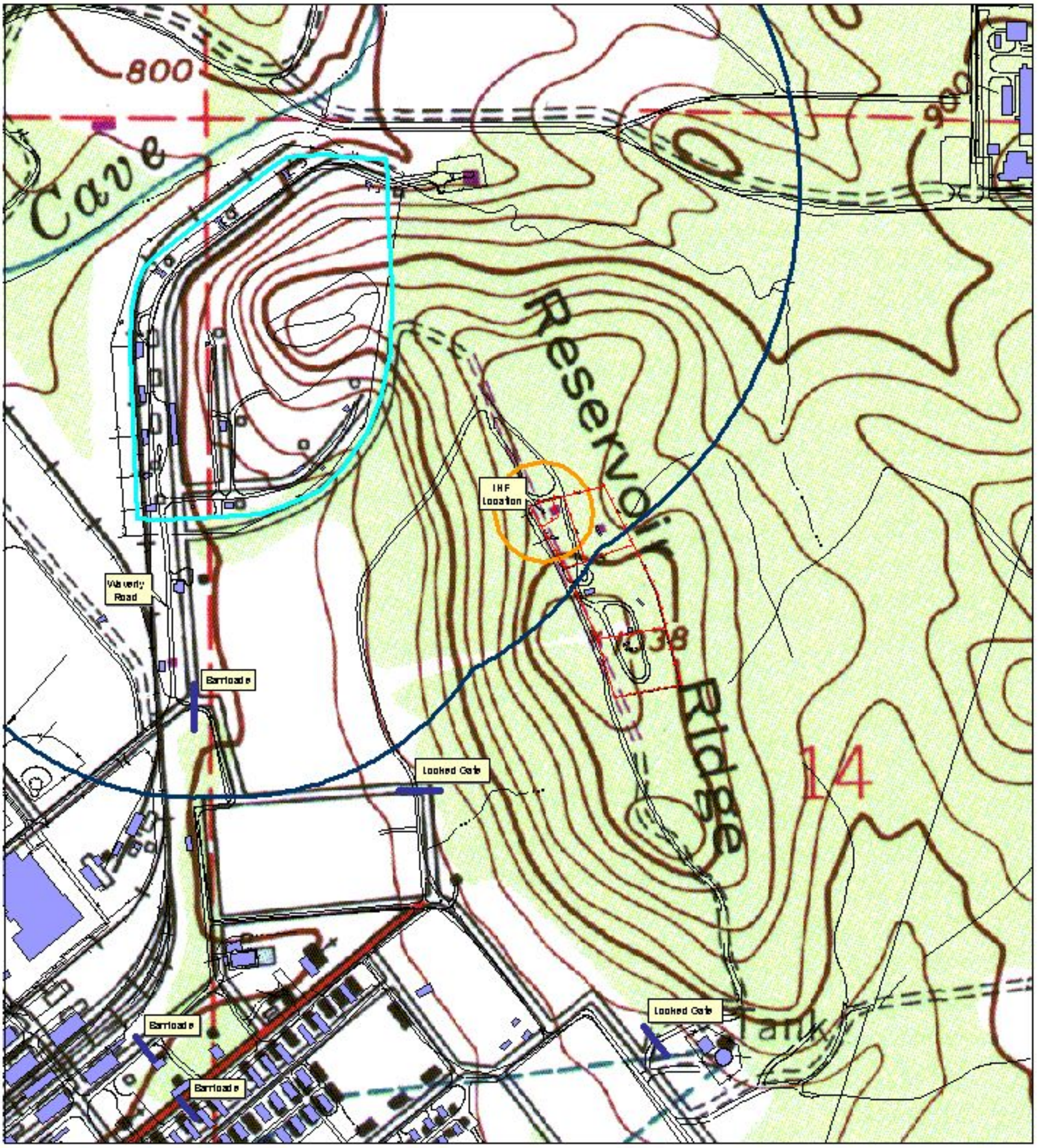


Figure 2.3

Fort McClellan IHF Site Map

Legend

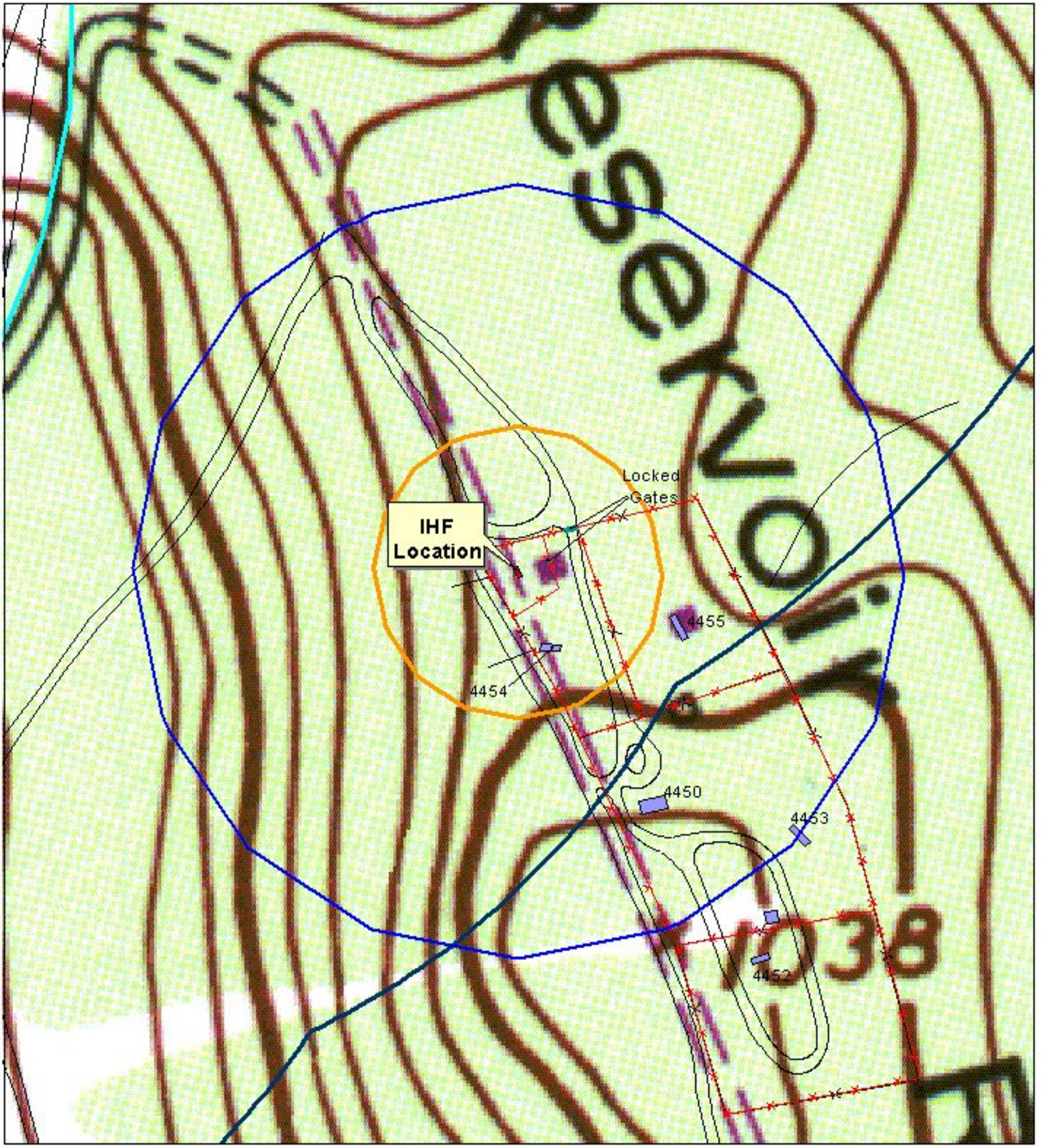
- Proposed IHF Location
- Buildings
- ASP Boundary
- Fence Line
- Road Outline
- Hazard Zone 200 feet (IBD)
- ASP IBD

N

500 0 500 Feet

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER
Drawn: Parsons ES	FORT McCLELLAN ANNISTON, ALABAMA CALHOUN COUNTY
Designed: Parsons ES	Scale: 1:7000
Checked: Parsons ES	Date: April 2001
Submitted: Parsons ES	File:

Note: Contour Interval = 20 feet



Legend

- Proposed IHF Location
- Buildings
- Fence Line
- Road Outline
- Hazard Zone 200 feet (IBD)
- Public Access Exclusion Distance (545 feet)
- ASP IBD

Figure 2.4

Fort McClellan IHF Site Map

N

100 0 100 Feet

PARSONS ENGINEERING SCIENCE, INC.	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER
Parsons ES	FORT McCLELLAN ANNISTON, ALABAMA CALHOUN COUNTY
Parsons ES	
Parsons ES	1:2400 / 734643
Parsons ES	April 2001

Note: Contour Interval = 20 feet

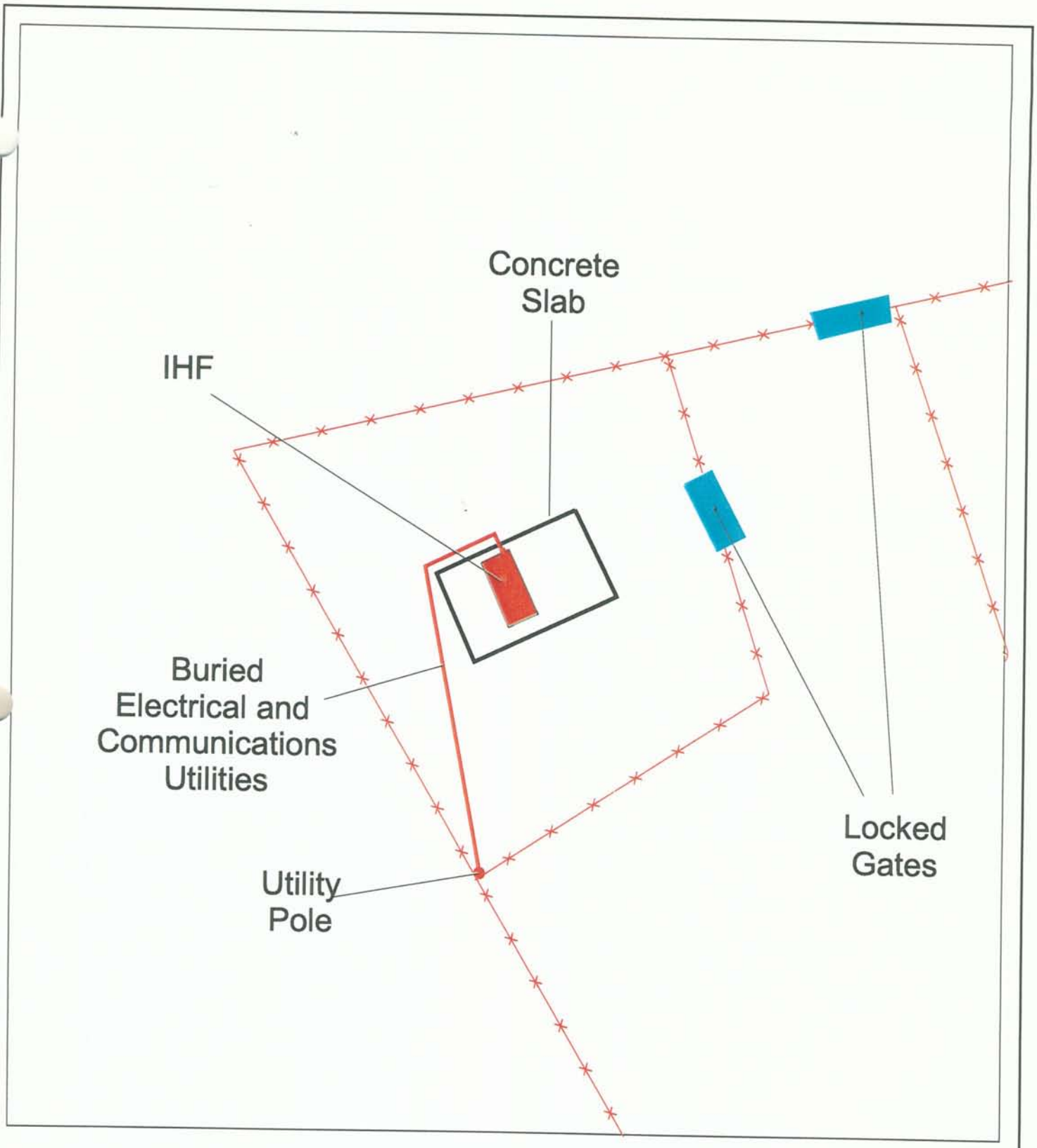


Figure 2.5

Fort McClellan
IHF Site Map

N

30 0 30 Feet

PARSONS ENGINEERING SCIENCE, INC.		U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER
DESIGNED BY: Parsons ES	FORT McCLELLAN ANNISTON, ALABAMA CALHOUN COUNTY	
DRAWN BY: Parsons ES		
CHECKED BY: Parsons ES	SCALE: 1:360	PROJECT NUMBER: 734643
SUBMITTED BY: Parsons ES	DATE: April 2001	PAGE NUMBER:
	FILE:	

ENCLOSURE 3

U.S. Army
Program Manager for
Chemical Demilitarization

Product Manager for
Non-Stockpile Chemical Materiel

Fort McClellan, Alabama
Interim Holding Facility Plan

Final
Revision 2

April 2001

Revision to Section 8, page 8-2, point of contact for Fort McClellan:

Change "Hershel Chapman" to:

Major James F. Morrison, Jr.
291 Jimmy Parks Blvd
Fort McClellan, AL 36205-5000

Phone: (256)848-6574/3497
Email: james.morrison@mcclellan.army.mil

EXECUTIVE SUMMARY

This Interim Holding Facility (IHF) Plan provides a scope of effort intended to support the onsite transportation and storage of recovered chemical warfare materiel (CWM) at Fort McClellan (FTMC), Alabama. This IHF Plan was prepared in conjunction with the Site Safety Submission.

The U.S. Army Program Manager for Chemical Demilitarization (PMCD) is responsible for the destruction of all United States CWM. The Product Manager for Non-Stockpile Chemical Materiel (PMNSCM) is responsible for destroying non-stockpile chemical materiel (NSCM) which includes recovered CWM. The PMNSCM will support the U.S. Army Corps of Engineers, Mobile District (CESAM) and the U.S. Army Technical Escort Unit (TEU) activities at FTMC. The onsite transportation and storage of recovered CWM is the responsibility of PMCD.

The PMCD is committed to public input and to timely and accurate information exchange with all stakeholders. This commitment includes a continuing pro-active public outreach and involvement program. PMCD Public Outreach and Information Office (POIO) has initiated a national strategy that encompasses exchanging information with partners at the national, regional, and local levels prior to initiating disposal or treatment options.

Telephone numbers and points of contact for FTMC and the U.S. Army Engineering and Support Center, Huntsville (CEHNC) are located in section 8 of this IHF Plan.

For additional information and comments, contact:

Ms. Louise Dyson
Project Manager for Non-Stockpile Chemical Materiel
Attn: SFAE-CD-P
Aberdeen Proving Ground, Maryland 21010-5401
Phone: 800-488-0648 or 410-436-4557
FAX: 410-436-7442
E-mail: ldyson@pmcd.apgea.army.mil.

FTMC is located in eastern Alabama approximately half way between Birmingham, Alabama, and Atlanta, Georgia.

If CWM is recovered during the remedial investigation, it will be stored in an IHF at FTMC. Currently, the State of Alabama will not allow offsite transport to another chemical storage site within the state, therefore any recovered CWM will remain in storage at FTMC until onsite disposal equipment can be brought to the site. This option will be reevaluated at the conclusion of the project to ensure it remains the most prudent alternative.

The IHF hazard analysis (HA) presented in annex A examines the risks associated with onsite transportation and storage of recovered CWM. Potential incidents are discussed qualitatively and procedures that may be implemented to mitigate the incidents are provided. To assign quantitative values to potential risk, risk assessment codes (RACs) are identified for each potential accident scenario. The HA concludes that the CWM should not challenge the integrity of the IHF, the IHF protects the public and environment, and the operation can be safely performed. In addition, the total carrier accident risk for transporting CWM onsite is 1.45×10^{-7}.

The HA is based on the storage of five MRCs in the IHF: three MRCs containing chemical agent identification set (CAIS) items [one with mustard agent (H or HD), one with lewisite (L), and one with nitrogen mustard (HN-1)]; one MRC containing either a

155mm projectile containing sarin (GB), HD, or phosgene (CG), or a 4.2-inch mortar containing HD or CG; and one MRC containing a drum with 5 gallons of HD.

The maximum credible event (MCE) is defined as a worst-case accident scenario resulting in the release of chemical warfare agent and has a reasonable probability of occurrence. An accident scenario meeting the requirement of being credible and leading to a release of agent was not identified by the HA, which considered accident scenarios relating to storage, handling, and onsite transportation of recovered CWM sealed inside MRCs.

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LIST OF ILLUSTRATIONS

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SECTION 1
INTRODUCTION

The Department of Defense (DoD) has designated the Department of the Army (DA) as the Defense Executive Agent for the destruction of all United States chemical warfare materiel (CWM). The U.S. Army Program Manager for Chemical Demilitarization (PMCD) has, in turn, been given the responsibility for destroying CWM. The Product Manager for Non-Stockpile Chemical Materiel (PMNSCM) is responsible for destroying the five categories of non-stockpile chemical materiel (NSCM), one of which is recovered CWM. This document examines the handling, onsite transportation, and temporary storage of recovered CWM at Fort McClellan (FTMC), Alabama. Figure 1-1 shows the location of FTMC.

1.1 Objectives

This Interim Holding Facility (IHF) Plan provides information about the plans to perform onsite transportation and storage of CWM in a safe, secure, and environmentally sound manner.

To support the premise that the CWM can be transported and stored safely, a hazard analysis (HA) was performed to evaluate the plans and procedures presented in this IHF Plan. The complete HA is presented in annex A.

1.2 Assumptions

When required, assumptions about site conditions and applicable regulations to CWM storage activities are made to complete the work assignment. This Plan was prepared using the following assumptions:

a. The recovered CWM is packaged in Department of Transportation (DOT)-approved containers known as multiple round containers (MRCs).

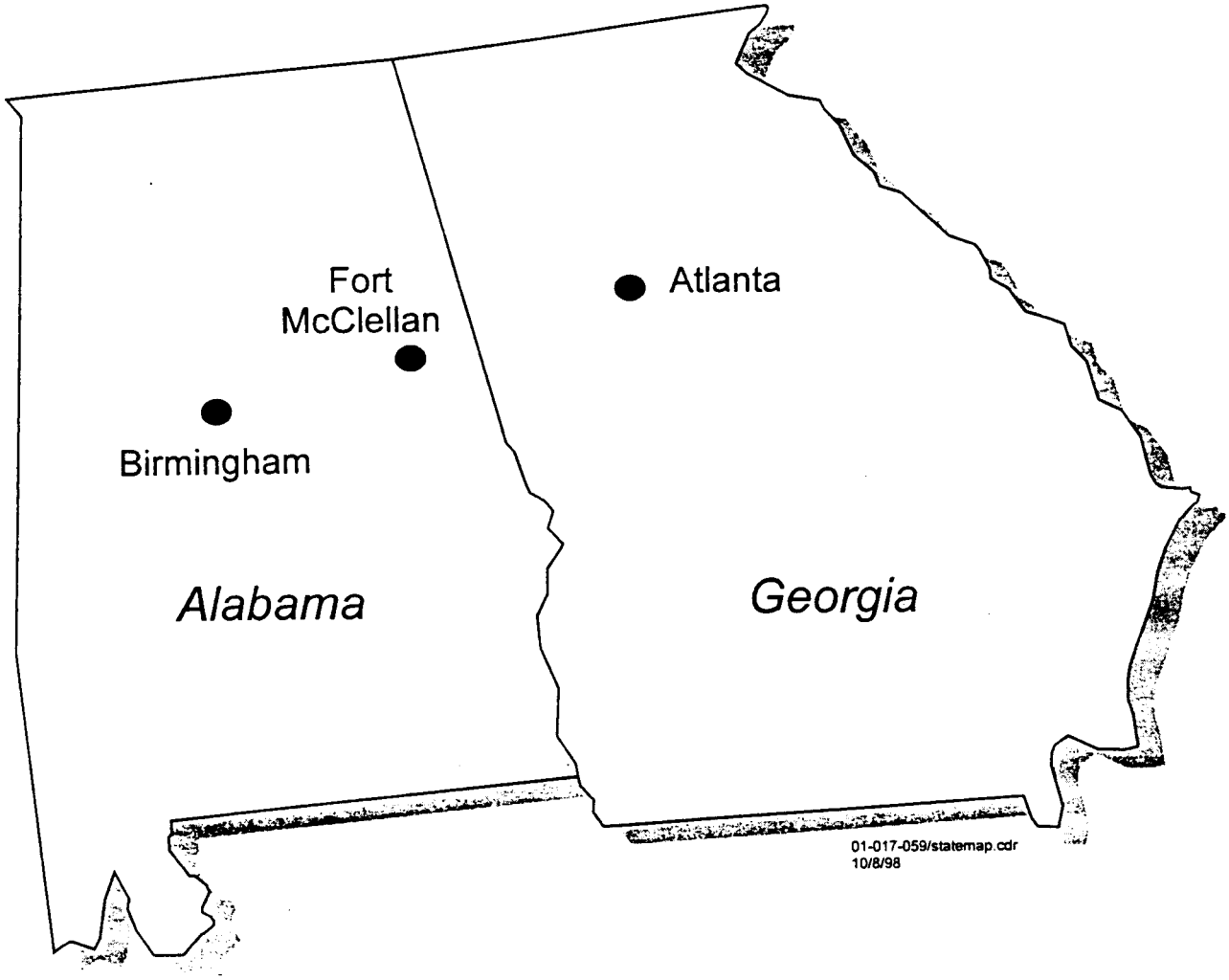


Figure 1-1. Location of FTMC

b. The recovered CWM is classified as hazardous waste by Army Regulation (AR) 50-6, Chemical Surety.

c. All required environmental studies and documentation will be determined and completed by FTMC in accordance with federal and state environmental laws and regulations prior to the execution of this Plan.

d. IHF-related operations will be performed in a manner that is protective of workers, the public, and the environment.

1.3 Interim Holding Facility Regulatory Requirements

IHF operations will follow DA and other regulatory guidelines. An evaluation of regulatory requirements that may be applicable to IHF operations is presented in the Generic Site Scoping Study [U.S. Army Chemical Materiel Destruction Agency (USACMDA, 1993)]. Some of the major requirements for this plan include the following:

a. The U.S. Environmental Protection Agency (USEPA) identification number must be obtained [40 Code of Federal Regulations (CFR) 264.11] by FTMC as a generator of the CWM.

b. Applicable federal and state requirements for worker training and for the storage of hazardous waste must be met. These requirements include those found in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Occupational Safety and Health Act (OSHA).

c. Security guidelines in AR 190-11 and AR 50-6 must be followed.

d. The IHF must comply with the requirements for a hazardous waste storage facility, which include a secondary containment system

(40 CFR 264.175) and separate storage of incompatible wastes with separate containment structures (40 CFR 264.172).

e. CWM hazardous waste must be characterized according to 40 CFR 264.13, then manifested, labeled, and reported in accordance with 40 CFR 264.70 through 76, and applicable state regulatory requirements.

f. Appropriate signs must be posted restricting access to the facility (40 CFR 264.14).

g. Inspection procedures (40 CFR 264.15) for the IHF must be recorded and available onsite for inspection (40 CFR 264.74).

h. All facility personnel involved with hazardous waste management must be properly trained in Hazardous Waste and Emergency Response (HAZWOPER) in accordance with 40 CFR 1910. Personnel must be familiar with 40 CFR 264.50 through 56 to deal with emergency procedures and activate a facility contingency plan.

i. The Alabama Department of Environmental Management (ADEM) will regulate the IHF according to hazardous waste regulations found in ADEM Administrative Code 335-14.

1.4 Background

FTMC began as an artillery range for the Fourth Alabama Artillery during the Spanish American War. It was established as Camp McClellan during World War I and became FTMC in 1929. The Chemical Corps School was established at FTMC in 1951 and deactivated in 1973. Two major areas at FTMC involved the use of chemical agents: the Chemical Corps School and Replacement Center for the Chemical Corps, which

was active from 1951 to 1973; and the U.S. Army Combat Developments Command Chemical, Biological, Radiological Agency, which was active from 1962 to 1973.

Potential CWM that may exist at FTMC is a result of training exercises conducted by the Chemical Corps School. These exercises trained soldiers to handle chemical munitions, to detect contamination, and to conduct decontamination.

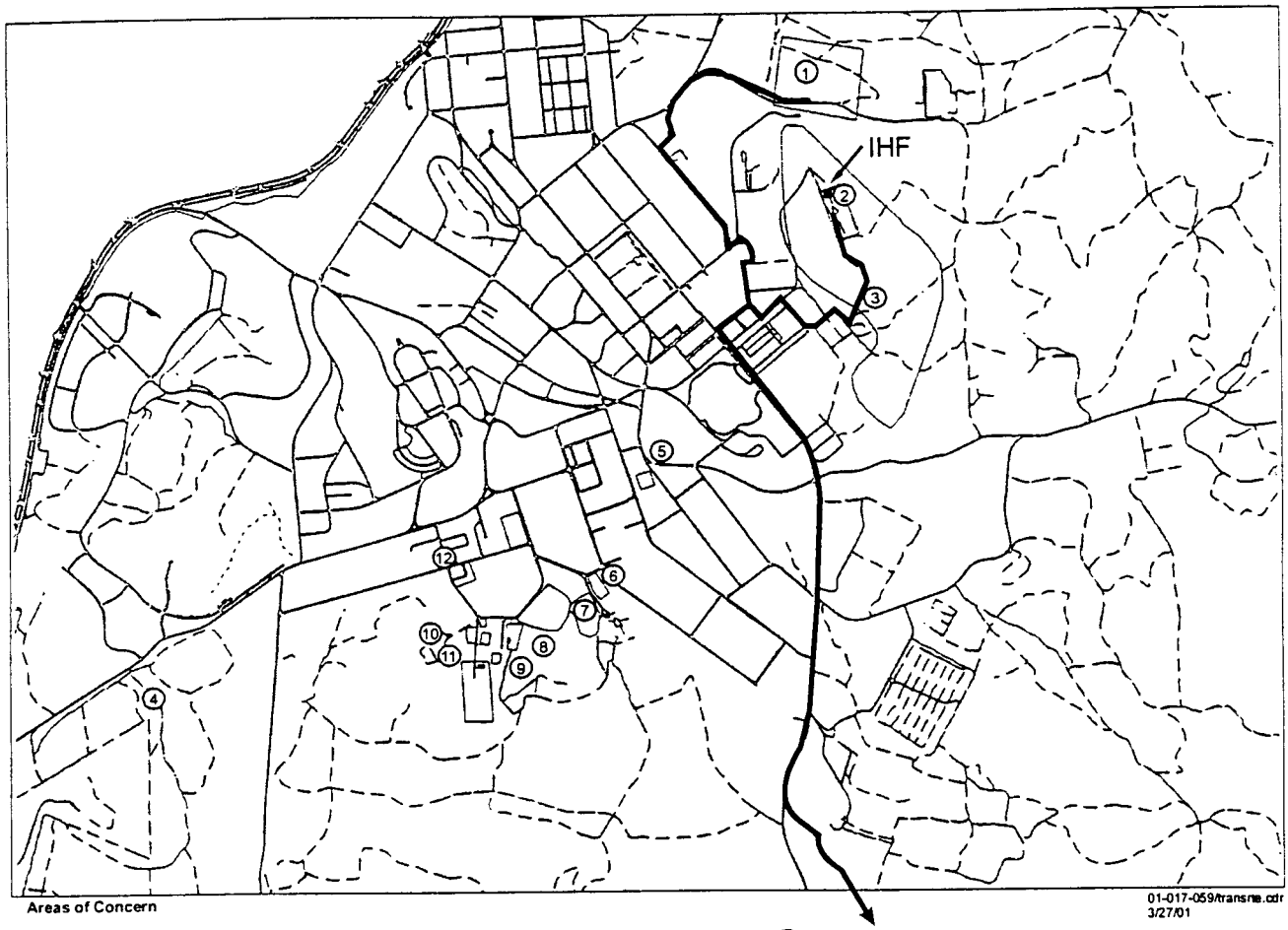
Fieldwork for a remedial investigation/feasibility study (RI/FS) began in April 1994. To date, no chemical warfare agents or their breakdown products have been detected. The current project involves investigation of 14 sites. Work at nine of these sites will involve excavation of pits or trenches. Four of the nine sites where excavations will be performed may contain buried chemical munitions (sites 1, 2, 3, and 14 in figure 1-2). Also, one site (site 2) may contain a buried mustard drum. Figure 1-2 shows the location of the 14 sites. The figure also indicates proposed transportation routes from the four sites where munitions or a mustard drum may be recovered to the IHF.

FTMC is in the process of being closed under the provisions of the Base Realignment and Closure (BRAC) Program. By the time this IHF Plan is implemented, most of the military activities at FTMC will have ceased and the installation will be under the control of a BRAC Office with a BRAC Environmental Coordinator exercising responsibility for environmental matters.

1.5 Potential Chemical Warfare Materiel

For purposes of developing this plan and conducting the HA, it is assumed that five MRCs containing items recovered from four different locations will be stored in the IHF. The five MRCs consist of:

- An MRC 7 x 27 containing recovered CAIS items filled with mustard (H or HD)
- An MRC 7 x 27 containing recovered CAIS items filled with lewisite (L)



Areas of Concern

① Training Area 31
② T-38 (Reservoir Ridge)
③ Smoke Ranges
④ T-4 Biological Warfare Area
⑤ Agent ID Area
⑥ Cane Creek Training Area
⑦ Naylor Field
⑧ Blacktop Training Area
⑨ Dog Training Area
⑩ Old Burn Pit
⑪ Field Personnel Decontamination Area
⑫ Old Toxic Training Area
⑬ Five Mustard Spill Sites (Not Shown)
⑭ Range 24A

Figure 1-2. Location of IHF and Investigation Sites with Suggested Transportation Routes

- An MRC 7 x 27 containing recovered CAIS items filled with nitrogen mustard (HN-1)

- An MRC 7 x 27 or an MRC 9 x 41 containing either a recovered 155mm projectile filled with sarin (GB), HD, or phosgene (CG) or a recovered 4.2-inch mortar filled with either HD or CG.

- An MRC 12 x 56 or 55-gallon drum overpack containing a recovered can or drum of HD.

Regarding the CAIS, it is possible that items from several types of CAIS may be found. CAIS contain a variety of chemical agents and industrial chemicals that are either neat, in solution, or adsorbed to charcoal. Possible chemical agents include H, HD, L, and HN-1. The industrial chemicals include chloroform (as a solvent for other chemicals), CG, cyanogen chloride (CK), chloropicrin (PS), and tabun (GA)-simulant.

A brief description of various CAIS is presented as follows:

a. *K951/952 Gas Identification Set, Instructional, M1.* Contains forty-eight 1.4-ounce Pyrex ampules: 12 containing 5 percent H in chloroform, 12 containing 5 percent L in chloroform, 12 containing 50 percent PS in chloroform, and 12 containing CG.

b. *K953/954 War Gas Identification Set, Instructional, AN-M1A1.* Contains eight 1.4-ounce ampules each of CG, L (5 percent in chloroform), HD (5 percent in chloroform), CK, HN-1 (10 percent in chloroform), and GA-simulant (a mixture of benzonitrile, diethyl malonate, heptanoic acid, ethyl caprate, ethyl myristate, and ethyl heptanoate).

c. *K941, Toxic Gas Set, M1.* Contains 24 glass bottles, each containing 3.5 ounces of H or HD.

d. *K942, Toxic Gas Set.* Consists of 28 heat-sealed glass bottles. Each bottle is 1.875 inches in diameter and approximately 4.625 inches long containing 3.8 ounces of neat HD.

Only recovered CAIS items confirmed or suspected of containing chemical agents will be placed inside an MRC and stored in the IHF.

Based on the history of FTMC, only two types of munitions are considered: a 155mm projectile and a 4.2-inch mortar. The 155mm projectile might contain either GB, HD, or CG. The 4.2-inch mortar might contain HD or CG. If any of these items are recovered, they will be stored in the IHF. There is no record of armed munitions filled with chemical agents being fired at FTMC. Therefore, it is not expected that any armed CWM munitions will be recovered. If any are discovered, explosive ordnance disposal personnel will be notified.

Finally the plan considers the possibility of recovering a drum containing up to 5 gallons of HD.

In summary, the potential chemical agents and industrial chemicals that may be recovered at FTMC are H or HD, L, HN-1, CG, CK, PS, GA-simulant, and GB. Only items confirmed or suspected of containing chemical agent H, HD, L, or GB (and CG if found in a munition) will be stored in the IHF. CAIS Items confirmed of containing industrial chemicals (CG, CK, PS, or GA-simulant) will be turned over to U.S. Army Corps of Engineers, Mobile District (CESAM) for disposal as non-chemical agent hazardous wastes.

The chemical and physical properties of the chemicals that might be recovered and stored in the IHF are presented in annex B. Health and safety information is provided in the Material Safety Data Sheets (MSDSs) or equivalent document in annex C.

Throughout the rest of this document, the term CWM will be used to refer to any or all of the recovered items unless the information being presented is peculiar to only one agent or item. In those cases, the particular agent or item will be identified.

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SECTION 2
ORGANIZATION

The primary organizations that will participate in IHF activities are presented in figure 2-1. Specific details of each organization's roles and responsibilities are provided in section 7.

2.1 U.S. Army Program Manager for Chemical Demilitarization

PMCD has the program responsibility for ensuring that the onsite transportation and storage of CWM at FTMC are accomplished in a safe and environmentally acceptable manner.

2.2 Fort McClellan

Fort McClellan will ensure that public outreach, medical support, physical security, and backup emergency response are available for IHF operations. FTMC is considered to be the generator of the recovered CWM, but will allow the U.S. Army Technical Escort Unit (TEU) to manage the CWM during storage in the IHF.

2.3 U.S. Army Corps of Engineers, Mobile District

CESAM is conducting the remedial investigation at FTMC. CESAM is responsible for oversight of its contractors.

2.4 U.S. Army Engineering and Support Center, Huntsville

The U.S. Army Engineering and Support Center, Huntsville (CEHNC) is the Army Center of Excellence for unexploded ordnance and will provide support to CESAM for intrusive investigation of the suspect CWM sites. CEHNC will have oversight of its

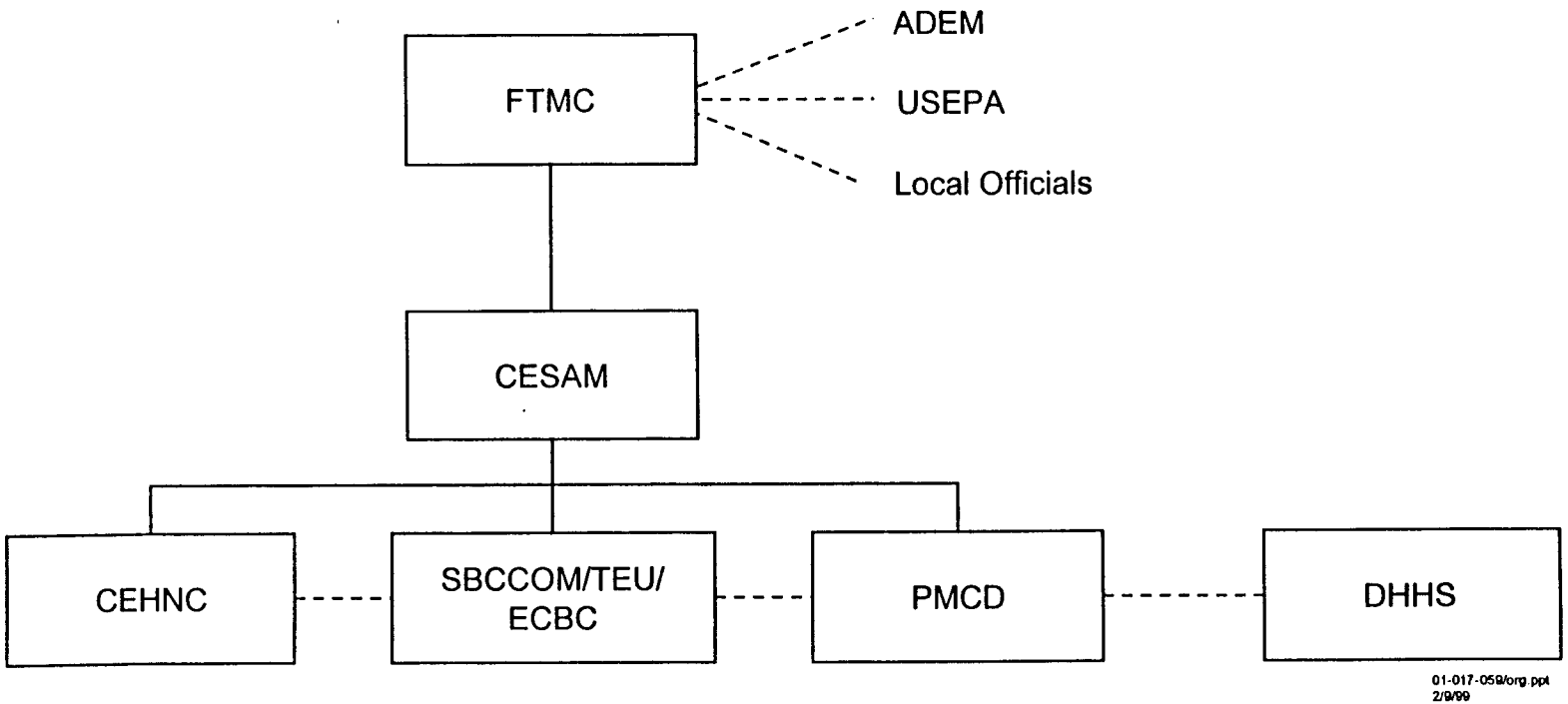

Figure 2-1. Organization for FTMC IHF Plan

contractor for work at the investigation sites. CEHNC and its contractor will provide support to TEU during a CWM recovery operation.

2.5 U.S. Army Soldier and Biological Chemical Command/U.S. Army Technical Escort Unit/U.S. Army Edgewood Chemical Biological Center

The TEU and other elements of the U.S. Army Soldier and Biological Chemical Command (SBCCOM) will be responsible for providing support for CWM recovery at FTMC, as well as for supporting the CEHNC during intrusive activities at the investigation sites. If CWM is discovered, the TEU will perform recovery and take physical custody of recovered CWM for assessment, packaging, onsite transportation, and storage in the IHF. The TEU will advise and respond as needed in emergency situations involving CWM.

The U.S. Army Edgewood Chemical Biological Center (ECBC) will provide monitoring and laboratory services for identification of CWM. A private contractor will be used for hazardous waste characterization and to run split samples with ECBC for CWM determinations. ECBC may also provide material handling equipment (such as a crane) for use during IHF operations.

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SECTION 3
INTERIM HOLDING FACILITY DESCRIPTION

3.1 Background

The IHF will be operated at FTMC to store the CWM that has been recovered during remedial investigation operations. The purpose of the IHF is to provide safe, secure, and segregated storage of recovered CWM. Figure 1-2 shows the location of the IHF at FTMC.

3.2 Interim Holding Facility Location and Accessibility

3.2.1 Location. The FTMC IHF will be located in a fence area known as Area T-38 (Area of Concern 2 in figure 1-2). The IHF will be located on an existing concrete pad just inside the north gate (figure 3-1). The IHF location is approximately 7,300 feet from the nearest installation boundary; 1,540 feet from the nearest occupied building; and 1,300 feet from the nearest public road.

3.2.2 Roads. Roads to the IHF from main roads are passable and will be maintained as passable for equipment and vehicles that will be used in mobilization, operation, and demobilization of the IHF. Anticipated vehicles with special requirements for road weight and overhead clearance are:

a. Tractor with 40-foot trailer, 60,000-pound road weight and 13.6-foot overhead clearance (to deliver the IHF to the site)

b. A 20-ton mobile crane, 51,000-pound road weight, with 11-foot overhead clearance (to off-load the IHF from its transport vehicle).

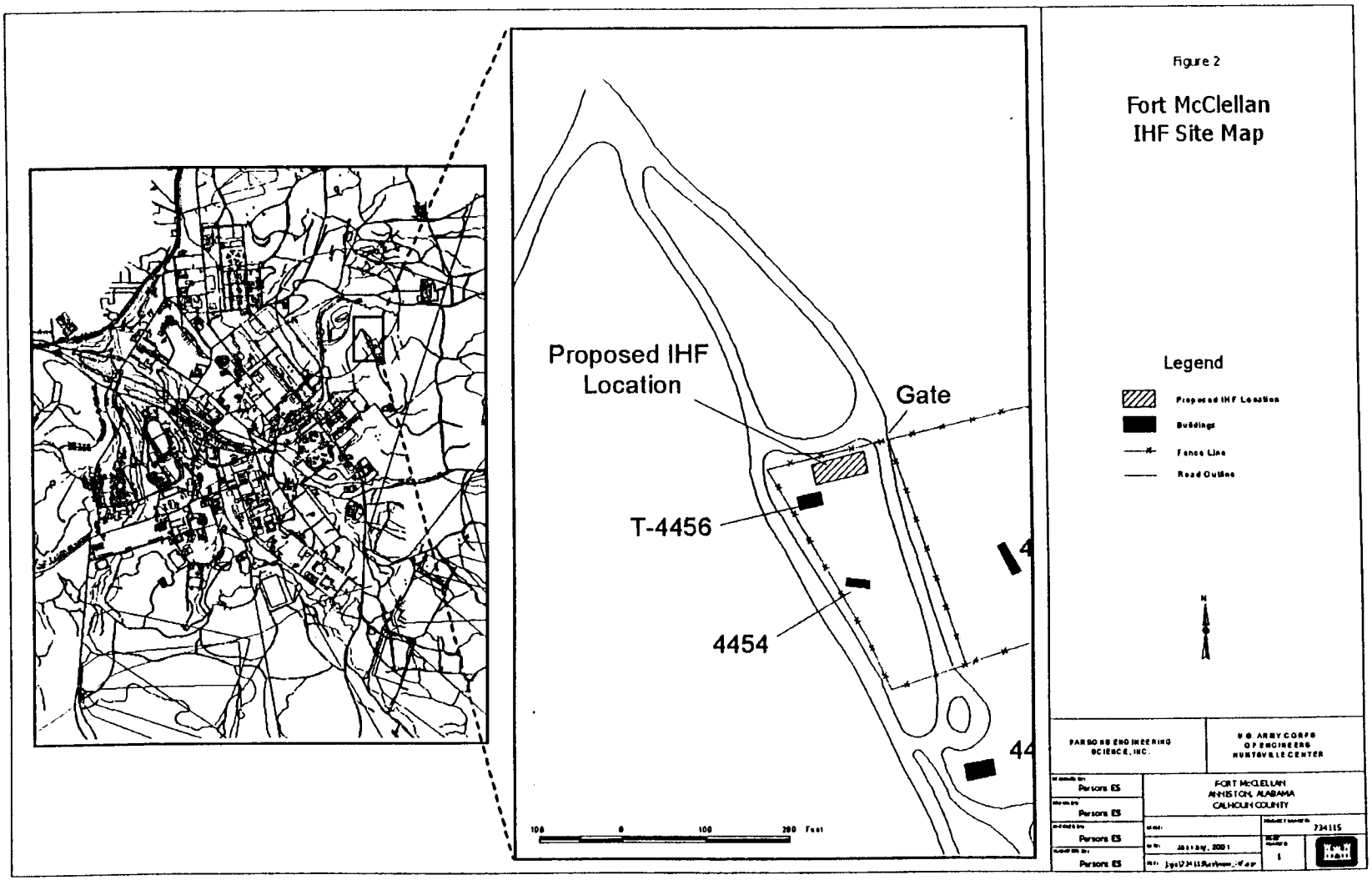

Figure 3-1. Interim Holding Facility Location

During implementation of this IHF Plan, FTMC will ensure that IHF access roads are maintained to meet the needs of the anticipated traffic. There is sufficient turnaround capability for the most demanding vehicle anticipated at the IHF site.

3.2.3 Through Traffic. The IHF site is fenced and the gate is controlled to preclude access by unauthorized persons.

3.3 Interim Holding Facility Construction

3.3.1 Design and Construction Materials. The IHF (see figure 5-1) is a portable storage building designed to store hazardous waste. The building is 8 feet wide by 16 feet long by 8 feet high and is capable of being transported on a flatbed truck without special DOT permits. The weight and size of the building require it to be loaded and unloaded with a 20-ton crane.

The interior of the IHF is approximately 100 square feet of clear space for storage and walkway. This area is sufficient to store up to 15 containers with a 15 x 15-inch footprint and to provide enough room to maneuver the containers within the building. A secondary containment sump is located below the floor and is equipped with an accessible exterior drain. The building has interior and exterior light fixtures. The door is located in the center on the long side of the building and is equipped with two hooded, high security locking hasps to accommodate padlocks.

3.3.2 Ventilation. The IHF is ventilated by passive airflow through louvered vents located on each end. The controls for the louvered vents are accessible from outside the IHF. The vents are normally closed when CWM is being stored. The IHF is equipped with air conditioning.

3.3.3 Monitoring Ports. The IHF has two monitoring ports near the entry door, one 6 inches from the floor and one 6 inches from the ceiling, for sampling the interior air quality of the IHF. Each port is 2.5 inches in diameter and has a threaded cap, which allows the monitoring sample lines to be placed inside the IHF. When CWM is stored

inside, the interior air quality of the IHF will be monitored before personnel enter. First entry monitoring procedures are discussed in section 5.

3.3.4 Fire Suppression System. The IHF is equipped with an internal self-actuating dry chemical fire suppression unit and is constructed with 2-hour fire-rated walls.

3.3.5 Lightning Protection. For the IHF to meet the requirements of AR 385-64, lightning protection will be installed in accordance with National Fire Protection Association (NFPA) Lightning Protection Code NFPA78, and testing of lightning protection will be done in accordance with Army procedures.

3.4 Interim Holding Facility Requirements

IHF requirements will be coordinated among PMCD, CESAM, FTMC, and CEHNC. CESAM will prepare the site to receive the IHF.

3.4.1 Electrical Power. A weather-protected distribution panel is located on the exterior of the IHF for connection of 100-ampere, 230/240-volt, single-phase, 60-cycle electrical service. The distribution panel is on the exterior to provide maintenance access without entering the IHF. The panel accommodates external outlets. All branch circuits are detailed inside the distribution panel.

The IHF is provided with one weather-protected external outlet positioned near the monitoring port. The outlet has ground fault interrupter circuit protection for operator safety.

The IHF is equipped with at least one waterproof interior light. The light fixture is Underwriters Laboratory (UL)-tested for class 1, division 1 hazardous locations. The light is rated for minimum of 100 watts and protected with metal guards. There is one interior light switch.

There is one externally mounted, photocell-activated lighting fixture on the front of the building. During periods of darkness, the exterior lighting is activated.

3.4.2 Physical Security Requirements. The IHF site will have the following physical security requirements to reduce potential vulnerabilities associated with the storage of recovered CWM at FTMC.

a. *Barriers.* A chain link fence surrounds the IHF site. The fence is a deterrent for casual observers and provides a clear boundary. TEU will verify that the fence is 6 feet high, constructed in accordance with commercial practice, and meets the requirements of this specification. The fence must be chain link (galvanized, aluminized, or plastic-coated woven steel) with 2-inch mesh, and 9 gauge diameter wire.

b. *Lighting.* Security lighting for the area will be provided by a fixture mounted on the outside of the IHF.

c. *Signs.* The fence surrounding the IHF must be posted with signs, which indicate that the area is restricted, dangerous, and that unauthorized entry is illegal. The signs must be approximately 18 x 24 inches and legible from a distance of 25 feet. A large sign (approximately 4 x 6 feet) describing the conditions of entry will be posted at the gate. The gate sign will read, "Danger-Unauthorized Personnel Keep Out." When chemical agents are actually being stored in the IHF, appropriate placards will be placed on the front of the IHF to show types of chemical agents present.

d. *Guard Force.* When CWM is in storage, CESAM will provide either a 24-hour armed guard or an intrusion detection system plus periodic surveillance including checking the security of the IHF gate and locks. Any out-of-the-ordinary circumstances will be immediately reported to FTMC, the TEU, and CESAM.

e. *Access Control.* When the IHF is being operated during receipt and storage of CWM, access controls will be implemented in the vicinity of the IHF so that direct access to recovered CWM will be limited to the TEU.

f. *Locks and Keys.* The gate to the fence around the IHF, as well as the doors to the IHF, will be locked when not in use. Using the proper locking hardware will provide significant delay for unauthorized entrance. TEU will maintain control of the keys to the IHF. The key to the gate in the security fence will be controlled by CESAM.

g. *Containment.* The CWM will be packaged in MRCs. Secondary containment will be provided by a built-in sump under the floor of the IHF.

3.4.3 Water. The IHF does not require connection to a water supply system. Each organization will provide drinking water for its workers. TEU will provide a portable eyewash station to be located outside of the IHF during operations. Water for fire protection and decontamination operations will be supplied by FTMC.

3.4.4 Communication. The IHF does not require installation of communication systems. Hand-held radios operating on an assigned frequency are the primary means of communication. Portable telephones may also be used.

3.5 Interim Holding Facility Equipment

3.5.1 Handling Equipment. The following CWM handling equipment will be available at the IHF:

a. *Dolly, Handcart.* To move MRCs into and around the inside of the IHF.

b. *Ramp.* A ramp is used to maneuver the dolly or handcart into and out of the IHF.

c. *Tool Kit.* Hammer, screwdrivers, pliers, and various small tools for minor repairs that may be required.

d. *Lift, 1,000-pound Capacity.* To remove larger objects from the vehicle and place them on the ground.

3.5.2 Safety Equipment. During operation of the IHF, safety equipment will be readily available to all workers. All equipment will be clearly marked, inspected to ensure operability, and conveniently located for use at the IHF. In addition to communications and lighting equipment mentioned previously, safety items that will be on hand include:

a. *Personal Protective Equipment.* Protective equipment will be available in the TEU response vehicle. The following list of items will be provided:

- Level B OSHA personal protective equipment (PPE)
- Gloves
- Eye protection
- Respirators.

b. *Eyewash.* A portable eyewash station will be located outside the entrance to the IHF.

c. *First-Aid Supplies.* A first-aid kit will be available onsite. It will be easily accessible, clearly displayed, and marked. A kit will be available in the TEU vehicle, as well.

d. *Fire Extinguishers.* Two ABC-rated fire extinguishers will be available. These are to be inspected to ensure operability.

e. *Spill Kit.* A spill kit will be available to provide quick and easy access in case of a material spill.

f. *Air Monitoring Equipment.* Air monitoring equipment includes devices for both low-level and gross-level detection. Section 5 describes the various types of monitoring equipment.

SECTION 4
IHF ACTIVITIES

4.1 General

This section covers training requirements for personnel involved in IHF operations, as well as the activities involved in the operation of the IHF and handling of the CWM. Recovery, storage, and onsite transportation of the CWM will be tracked and accurate records maintained.

4.1.1 Personal Protective Equipment. During CWM handling activities, TEU personnel will dress in OSHA Level D PPE with a slung mask, leather work gloves, and safety shoes. OSHA Level D may only be used if the following conditions are met and agent was not detected:

a. Materials were packaged within an MRC.

b. MRC and first entry monitoring were conducted in accordance with section 5 and agent concentrations were below 1.0 time-weighted average (TWA).

4.1.2 Training. Each agency participating in the IHF activities will provide an employee training program complying with, but not limited to, the requirements of 29 CFR 1910.120(e) and DA Pamphlet (Pam) 385-61. Training will be provided on hazardous waste operations, PPE use, heavy equipment operation (if needed), hazards of the chemicals that may be encountered, and any other topics of concern to the transportation activities. By the time this plan is implemented, all personnel will have completed at least 40 hours of training in health and safety issues associated with hazardous substance site work. Documentation of training requirements will be the responsibility of each agency.

4.1.2.1 Health and Safety Training. Health and safety training will be conducted prior to the job start up to ensure that personnel have a thorough understanding of the Emergency Response and Contingency Plan for the IHF activities (section 6), standing operating procedures (SOPs), and physical and chemical hazards of the site. The following topics will be addressed in the health and safety training:

a. Names and titles of employees and their duties

b. Persons responsible for safety and health

c. Acute and chronic effects of exposure to hazardous substances that may be present, potential routes of exposure for these substances, exposure limits, and the level of personal exposure that can be anticipated

d. Monitoring procedures and the functions, limitations, and maintenance of monitoring equipment

e. SOPs

f. Site control measures

g. PPE

h. Emergencies.

4.1.2.2 Site-Specific Training. Site-specific training will be provided by TEU for all employees, contractors, and subcontractors who have met the requirements of 29 CFR 1910.120. Site-specific training will include operational training and safety meetings.

4.1.2.3 Operational Training. TEU operational training will include procedures related to the storage of CWM. Topics addressed will include:

a. Handling CWM containers
b. Storing CWM
c. Storage emergency measures.

4.1.2.4 Safety Meetings. Personnel involved in the storage activities must attend a safety meeting at the beginning of the IHF operations. This meeting, conducted by the TEU, will include items such as specific health and safety issues, storage activities planned, changes in plans, PPE, personnel and equipment decontamination, potential chemical and physical hazards, and contingency actions.

4.1.2.5 Hazard Information Training.

a. *Hazard Communication Training.* In accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200 and 1926.59), copies will be available of MSDSs for each of the suspected hazardous chemical materials that are to be stored. The hazard communication training will be conducted in accordance with 29 CFR 1910.1200 and 1926.59. Training will include, but not be limited to, all hazards or potential hazards associated with transportation activities and any hazardous chemical materials to be stored.

b. *Chemical Warfare Materiel Training.* All personnel involved with storage of CWM will undergo training concerning the CWM, although site activity involving CWM or contamination resulting from these agents will only involve the TEU. The intent of this training is to inform all personnel of the hazards associated with CWM. The TEU personnel have undergone U.S. Army training required to qualify and maintain proficiency in their respective military and civilian occupational specialties.

4.1.3 Contingency Planning. If conditions are observed that threaten the health of the public, workers, or the environment, or if an agent leak is confirmed that requires immediate remedial action, a response will be performed in accordance with the Emergency Response Contingency Plan described in section 6 of this Plan and in the Site Safety Submission. The TEU will implement decontamination per TEU procedures. The site coordinator will notify the supervisory, emergency response, and contingency personnel who are not already at the storage facility to respond to an accident/incident. FTMC will be notified, and they will notify the regulators of any release of hazardous materials. Only the TEU and TEU authorized persons will enter the IHF while CWM is in storage.

4.1.4 Onsite Transportation. Onsite transportation at FTMC consists of moving the recovered and overpacked CWM from an investigation site to the IHF. From each site, the most direct route will be taken to the IHF that avoids uncessary transit through congested parts of the installation. Two escort vehicles may be used, one ahead of and one behind the cargo vehicle. All personnel participating in the transportation operation will receive a safety briefing by the TEU. Vehicle operators and assistant operators will have clear instructions and/or maps identifying the route they will follow. The TEU will verify that emergency response personnel are available, and that spill response kits and monitoring equipment are operational before execution of loading.

Preapproved procedures will be executed to load the overpack(s) onto the transport vehicle. Each overpack will be inspected and monitored to verify its integrity in accordance with section 5 of this Plan. Tie-downs and bracing will be inspected to ensure containers are adequately secured. A communication check will be made with each piece of communications equipment on each vehicle before departure, en route, and upon arrival at the IHF.

4.2 Preactivation Activities

Before activation of the IHF Plan, TEU will be responsible for ensuring that sufficient space is available for storage as planned. The facility manager will perform a

preactivation storage facility inspection of the IHF internal and external structure, IHF equipment, and IHF paperwork. The preactivation inspection procedures described below will be used in conjunction with the IHF Inspection Checklist (figure 4-1) which provides a more specific listing of the things that should be examined during an inspection. The results of the inspection will be reviewed with the TEU, PMNSCM, and the CESAM Site Safety Coordinator.

4.2.1 Inspect IHF. The storage facility manager will perform an internal and external inspection of the IHF.

a. Inspect IHF building for sound structure, water leaks, and cracks.

b. Inspect inside the IHF. Note any nonstandard conditions or deficiencies.

c. Confirm that no debris or prohibited materials (for example, paint, oil, rags, or tools) are present.

d. Confirm that aisles are adequate for CWM handling equipment and inspection.

4.2.2 Inspect Equipment. All handling equipment and safety equipment used for the CWM transfer and storage operations will be inspected to ensure that the needed equipment is on hand and operable.

a. Inspect emergency eyewash station. Water will be a steady flow and clear.

b. Confirm serviceability of radios and cellular phones. All features will be operating.

Fort McClellan

IHF Inspection Checklist

Period Covered: From _____ to _____

Inspector:
Date:
Time:

	MON		TUES		WED		THUR		FRI		SAT		SUN	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
Outside														
Signs posted on IHF entrance gate	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Area secure, gate closed and locked, IHF door closed and locked	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Storage Area														
Building structurally sound	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Area clean of debris	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Aisle space adequate for emergency response	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
All containers on pallets	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
All containers sealed	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
No leaks, spills, leaking containers, or residue	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Containers turned so that labels are visible	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Inspect container labels														
composition of waste	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
quantity of waste	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
generator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
date of acceptance	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Inspect secondary containment sumps	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Figure 4-1. Fort McClellan IHF Inspection Checklist (Sheet 1 of 3)

Fort McClellan

IHF Inspection Checklist (Continued)

Period Covered: From _____ to _____

Inspector:
Date:
Time:

	MON		TUES		WED		THUR		FRI		SAT		SUN	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
Equipment														
Emergency shower/eyewash operable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Absorbent available	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Inspect fire extinguishers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gloves available	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Eye protection available	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Respirators available	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Protective clothing available	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Spill kit available and complete	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tool kit available and complete	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Records/Reports														
Waste logs complete, accurate and up-to-date	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Manifests logged and filed	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Copies of returned manifests	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Emergency Response Contingency Plan on file	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sample records on file	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Discrepancy reports prepared and filed	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Incident reports for spills on file	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Comments:

_____

_____

Figure 4-1. Fort McClellan IHF Inspection Checklist (Sheet 2 of 3)

Fort McClellan

IHF Inspection Checklist (Continued)

Corrective Action:

Mon:	Item: _____ Date: _____		Action Taken: _____ Signature: _____	
Tue:	Item: _____ Date: _____		Action Taken: _____ Signature: _____	
Wed:	Item: _____ Date: _____		Action Taken: _____ Signature: _____	
Thur:	Item: _____ Date: _____		Action Taken: _____ Signature: _____	
Fri:	Item: _____ Date: _____		Action Taken: _____ Signature: _____	
Sat:	Item: _____ Date: _____		Action Taken: _____ Signature: _____	
Sun:	Item: _____ Date: _____		Action Taken: _____ Signature: _____	

Figure 4-1. Fort McClellan IHF Inspection Checklist (Sheet 3 of 3)

c. Inspect supply of absorbent material available for spill cleanup. Spill kit and other emergency items, including decontamination supplies, will be clearly visible and accessible.

d. Check lights for serviceability.

e. Check that safety equipment, eye protection, gloves, personal protective gear, and respirators will be available.

f. Inspect fire extinguishers. Fire extinguisher inspection tag will be up-to-date.

g. Confirm that adequate tools are available (hammer, variety of screwdrivers, pliers, duct tape, and other miscellaneous items).

4.2.3 Inspect Records/Reports Procedures. The following recordkeeping items will be reviewed. If there are any discrepancies, action must be taken to correct problems cited.

a. Review last inspection report.

b. Inspect any outstanding deficiencies from last report.

c. Ensure that all data in waste logs are complete and up-to-date.

d. Ensure that a completed copy of the hazardous waste manifest, if needed, has been returned to generator (FTMC).

The results of the inspection will be reviewed with the TEU, PMNSCM, and the CESAM Site Safety Coordinator.

4.2.4 Transportation Route. A specific transportation route from each investigation site must be verified before this IHF Plan is implemented. Figure 1-2 shows suggested routes, which will be as direct as possible.

4.3 Predeparture Activities

Before recovered CWM is taken from an investigation site, the TEU will notify FTMC, CESAM, and TEU personnel at the IHF of the pending transport. IHF personnel will prepare for receipt of the material and CESAM will notify emergency response personnel.

4.3.1 Cargo Configuration and Order of Movement. The TEU will determine cargo configuration based on the number of containers to be moved and the design of the cargo vehicle. Two escort vehicles may be used, one ahead of and one behind the cargo vehicle.

4.3.2 Safety Briefing and Route Plan. All personnel participating in the transportation operation will receive a safety briefing by the TEU. Vehicle operators and assistant operators will have clear instructions and maps identifying the route they will follow.

4.3.3 Verify Contingency Personnel and Systems in Place. The TEU will verify that emergency response personnel are available and that spill response kits and monitoring equipment are operational before execution of loading procedures.

4.3.4 Execute Loading Procedures. Preapproved procedures will be executed to load the overpack(s) onto the cargo vehicle at the investigation site.

4.3.5 Inspect and Monitor Containers. Each overpack will be inspected and monitored to verify its integrity. Tie-downs and bracing will be inspected to ensure containers are adequately secured.

4.3.6 Initiate Chain of Custody. Because all transportation is onsite, a Resource Conservation and Recovery Act (RCRA) manifest is not required. However, chain-of-custody will be initiated by completing a DD Form 1911, Materiel Courier Receipt. A DD Form 836, Shipping Paper and Emergency Response Information for Hazardous Materials Transported by Government Vehicles, will also be required. A hazardous waste manifest will be required, in accordance with 40 CFR 262, before the CWM can be transported offsite.

4.3.7 Perform Communications Check. A communications check will be made with each piece of communications equipment on each vehicle before departure in accordance with the TEU operations plan.

4.3.8 Give Notification of Departure. Upon departure of the transport vehicle, notification will be made to CESAM, PMNSCM, and FTMC.

4.4 En Route Activities

En route activities from an investigation site to the IHF will be performed by the TEU. TEU personnel in the transport vehicle will be in contact with IHF personnel. Halting procedures will be established and used when the transport vehicle is required to stop for the following circumstances.

4.4.1 Mechanical Problems. Procedures will be in place to stop the vehicle as safely and as quickly as possible. Escort personnel will attempt to move the disabled vehicle so as not to impede other traffic. PMNSCM and CESAM will be notified of the situation. The cargo will be secured until the vehicle can be repaired or a replacement vehicle has been provided. Before restarting transportation, the TEU will account for all personnel and cargo.

4.4.2 Accident without Damage to Cargo. Procedures will be in place for the transport vehicle to stop as safely and quickly as possible and for TEU personnel to

inspect the cargo for leaks, secure loose cargo, and administer first aid. PMNSCM, FTMC, and CESAM will be notified of the situation.

4.4.3 Accident with Damage to Cargo. Emergency response procedures or leaking CWM are addressed in section 6.

4.4.4 Public Disturbance or Traffic Obstruction. Procedures will be developed to allow the transportation team to respond to an unexpected blockage of the transportation route. If necessary, the transport vehicle and escorts will stop, the TEU will communicate their status to CESAM and PMNSCM, choose an alternate route, and react according to the situation.

4.5 Prearrival Activities

Prearrival activities will occur at the IHF before the CWM is delivered. To prepare for arrival of the CWM, the following tasks must be completed.

4.5.1 IHF Inspection. The TEU will perform a daily internal inspection of the IHF whenever new material enters the IHF or when material is removed from the IHF for transport or destruction. The IHF inspection will be conducted to ensure that the storage operations are conducted in accordance with CERCLA requirements and this IHF plan.

All equipment used to unload the CWM and transfer it to the storage facility will be inspected to ensure that the needed equipment is on hand and operable. Safety and contingency response equipment will be checked to ensure it is available and operational.

4.5.2 IHF Open and Close Procedures. TEU personnel will be responsible for opening the IHF and performing IHF operations. Likewise, when the operations are finished for the day, TEU personnel will close and secure the facility. Coordination with

TEU will be maintained to ensure that the facility is open and ready to receive CWM. The IHF open/close procedures are as follows.

4.5.2.1 Open the IHF. TEU will open the IHF to receive CWM and to prepare and stage CWM for offsite transportation. The procedures to open the IHF are described below.

a. Notify CESAM Site Coordinator and security of pending opening.

b. Establish site access controls at IHF.

c. Notify and position emergency response personnel for the pending arrival of the CWM as required by the contingency plans.

d. Open IHF gate.

e. Inspect IHF.

f. Perform first entry monitoring. Follow instructions for air monitoring procedures (section 5).

g. If monitoring indicates agent is not present above 1.0 TWA, begin IHF operations.

h. If monitoring indicates agent contamination, begin contingency response as required by the contingency plan (section 6).

4.5.2.2 Close the IHF. Close procedures will be observed following acceptance of the CWM items at the IHF and transfer of the items into storage at the IHF (paragraph 4.6.2), or following removal of items from the IHF for onsite disposal or offsite shipment. TEU will perform the following procedures to close the IHF.

a. Confirm that CWM is stored in designated areas, is labeled, and that labels are filled out completely and are easily visible.

b. Observe containers for signs of agent leakage. If agent leakage is suspected, all operators will exit the IHF. In case of an emergency, TEU will follow emergency response contingency plan procedures or appropriate SOP.

c. Turn off interior lights.

d. Secure IHF doors and locks.

e. Notify CESAM Site Coordinator and security of IHF closure.

f. Secure and lock IHF gate.

g. Upon closing the IHF for the last time on any given day, notify and inform the CESAM Site Coordinator and security that the IHF is being secured for the day.

4.6 Arrival Activities

4.6.1 Pretransfer Activities. When the CWM arrives at the IHF from the investigation site, an inspection and inventory of the CWM items will be performed as described below.

a. *Inspect Containers.* TEU will inspect the containers for damage during transit.

b. *Unload CWM from Vehicle.* The CWM will be placed at the entrance of the IHF.

c. *Conduct Inventory.* The TEU will conduct a joint inventory with the FTMC representative using the DD Form 1911 Materiel Courier Receipt (figure 4-2) and the Container Information Form (figure 4-3). The TEU will initial and date the receipt of CWM on the shipping form. These forms and the IHF Inventory Log (figure 4-4) will serve as a chain-of-custody inventory and will ensure that CWM has been accounted for as required. In addition, the TEU will inventory the CWM at the completion of each CWM transfer.

4.6.2 CWM Transfer Activities. The procedures for transferring the CWM into the IHF are as follows:

a. Open the IHF in accordance with paragraph 4.5.2.

b. Move containers into IHF by hand or use handcart for heavy containers.

c. Place containers so that labels are clearly visible.

d. Do not stack MRCs.

e. Leave sufficient aisle space so that emergency access to any of the containers in the IHF is possible.

f. Perform physical inventory of CWM containers received. Perform physical inventory of all CWM containers in the IHF. Compare total quantity in stock with shipping forms on file.

g. File shipping form with others previously received.

h. Close and exit the IHF in accordance with paragraph 4.5.2.

MATERIEL COURIER RECEIPT

SHIPPER	SHIPPER□S CONTROL/DOCUMENT NO.
	SUPPLY ACCOUNT NUMBER
DESTINATION	SUPPLY ACCOUNT NUMBER

PRIVACY ACT STATEMENT

AUTHORITY 5 U.S.C., Sec 552a (PL 93 579)
PRINCIPLE PURPOSES: To provide a receipt for transfer of controlled materiel. The use of the SSAN is required and is necessary to provide positive identification of the individuals receipting for the materiel.
ROUTINE USES: To document transfer of materiel from a shipper to a courier, courier to courier and/or receiver.
DISCLOSURE IS VOLUNTARY: Since the SSAN must be used, refusal to provide SSAN may be grounds for action to remove the individual concerned from duties involving the materiel transferred by use of this form.

I certify by my signature that I have received the materiel listed on this form and am aware of the applicable safety and security requirements.

SHIPMENT TRANSFERS

FIRST	LOCATION OF TRANSFER	DATE(YR/MO/DAY)
RECIPIENT□S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER
SECOND	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT□S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER
THIRD	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT□S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER
FOURTH	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT□S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER
FIFTH	LOCATION OF TRANSFER	DATE (YR/MO/DAY)
RECIPIENT□S PRINTED NAME (LAST, FIRST, M.I.)		ORGAN. OR ACCOUNT NO.
SIGNATURE		SOCIAL SECURITY NUMBER

SHIPMENT DESCRIPTION

LINE NUMBER	QUANTITY	SERIAL NUMBERS	REMARKS

DD FORM 1911, 82 MAY

PREVIOUS EDITION MAY BE USED UNTIL 31 DEC 82

Figure 4-2. DD Form 1911 (Materiel Courier Receipt)

CONTAINER INFORMATION

Generator Information:

Container #_____

Contents: 1)_____

2)_____

3)_____

4)_____

5)_____

Date: _____ Certified: _____
signature

CONTAINER INFORMATION

Generator Information:

Container #_____

Contents: 1)_____

2)_____

3)_____

4)_____

5)_____

Date: _____ Certified: _____
signature

Figure 4-3. Container Information Form

Interim Holding Facility Inventory Log

Date Rec'd	Rec'd By	Container Number	Date Shipped	Shipped By

Figure 4-4. Interim Holding Facility Inventory Log

4.6.3 Post-Transfer Activities. Following the successful transfer of CWM from the transportation vehicle to the IHF, the TEU will verify that the transport vehicle and handling equipment are not contaminated before they are released from the IHF site. This can be accomplished by physically checking the vehicle or piece of equipment, by collecting vapor samples, and by using low-level monitors and detectors listed in the monitoring procedures (section 5). If contamination is found, the truck or piece of equipment will be decontaminated and confirmed uncontaminated before it leaves the IHF site.

4.7 Support Activities

At the conclusion of the remedial investigation, storage options for CWM in the IHF will be evaluated to determine how long the items will remain at FTMC. The following activities will be performed as long as CWM is stored in the IHF at FTMC.

4.7.1 IHF Surveillance, Maintenance, and Repair. When TEU is not onsite, CESAM will ensure that monthly external inspections of the IHF and surveillance monitoring using the Depot Area Air Monitoring System (DAAMS), as described in section 5, are conducted. Maintenance and repair of the IHF structure or equipment is the responsibility of CESAM and will be performed in a timely manner. If the structure or equipment cannot be repaired, a replacement will be provided by PMCD.

4.7.2 Security. The IHF must be secure at all times. The gate to the IHF storage area and IHF doors must be secured when the facility area is unoccupied.

4.7.2.1 Security Patrol. The security patrol (provided by CESAM) will monitor security of the IHF. If no CWM is in storage, the security patrol will periodically check the building as they would any other building. When recovered CWM is stored in the IHF and if an intrusion detection system (IDS) is installed, the security patrol will visit the facility once every 24 hours to observe conditions. The patrol will check the integrity of the fence, including the gate and lock, and observe the condition of the IHF and surrounding area. If there are signs of unauthorized activity or if any out-of-the-ordinary

circumstances are noticed, FTMC, CESAM, and TEU will be notified. The security guard will not enter the IHF under any circumstances. If there is reason to suspect that the integrity of the IHF has been compromised, the TEU will conduct first entry monitoring and an inventory and inspection of stored items.

If CWM is stored in the IHF and there is no IDS, or the IDS system is not working, then there will be a 24-hour armed guard posted at a location where access to the IHF can be monitored until the IDS is operational.

4.7.2.2 Control of Site Access. Access to the storage site must be controlled to ensure that no personnel, beyond the minimum necessary, are exposed to hazards from CWM transfer and storage operations. Prior to arrival of the CWM, the IHF area will be checked to ensure that no unauthorized persons are onsite. The area will be controlled to prevent access by unauthorized or unnecessary personnel. Only authorized personnel (known or approved by the TEU supervisor) will be given access to the facility.

SECTION 5
MONITORING

The possible chemical agents and industrial chemicals of concern that may be recovered during excavation activities include HD, VX, GB, CG, and BZ. Monitoring will be performed using the sampling devices at the concentration levels specified in this plan. The frequency and location of the sampling described by this IHF Plan are based on the type of monitoring required by DA Pam 385-61.

5.1 Types of Monitoring

5.1.1 First Entry Monitoring. First entry monitoring will be conducted by the TEU prior to entering the IHF. The appropriate monitor(s) will be used for the chemical(s) of concern being stored in the IHF. First entry monitoring procedures will be based on AR 385-61, DA Pam 385-61, and AR 50-6. Before entry into the IHF, monitoring will be conducted remotely (see figure 5-1) using low-level, near real-time (NRT) air monitoring equipment (MINICAMS®) to ensure that interior airborne chemical agent concentrations are below the TWA levels.

5.1.2 Surveillance Monitoring. Surveillance monitoring of the IHF containing recovered CWM will be conducted to check the integrity of the overpack containers and to identify any chemical leakage. Surveillance monitoring will be conducted during any thirty-day period when there is CWM in storage unless first entry monitoring has been conducted. The appropriate monitor(s) will be used for the specific chemical or chemicals of concern stored in the IHF. Surveillance monitoring will not negate the requirements for first entry monitoring. CESAM will be responsible to ensure surveillance monitoring is performed.

CESAM, TEU, PMCD, and FTMC will be contacted immediately if a reading over the workplace exposure level is obtained from surveillance monitoring.

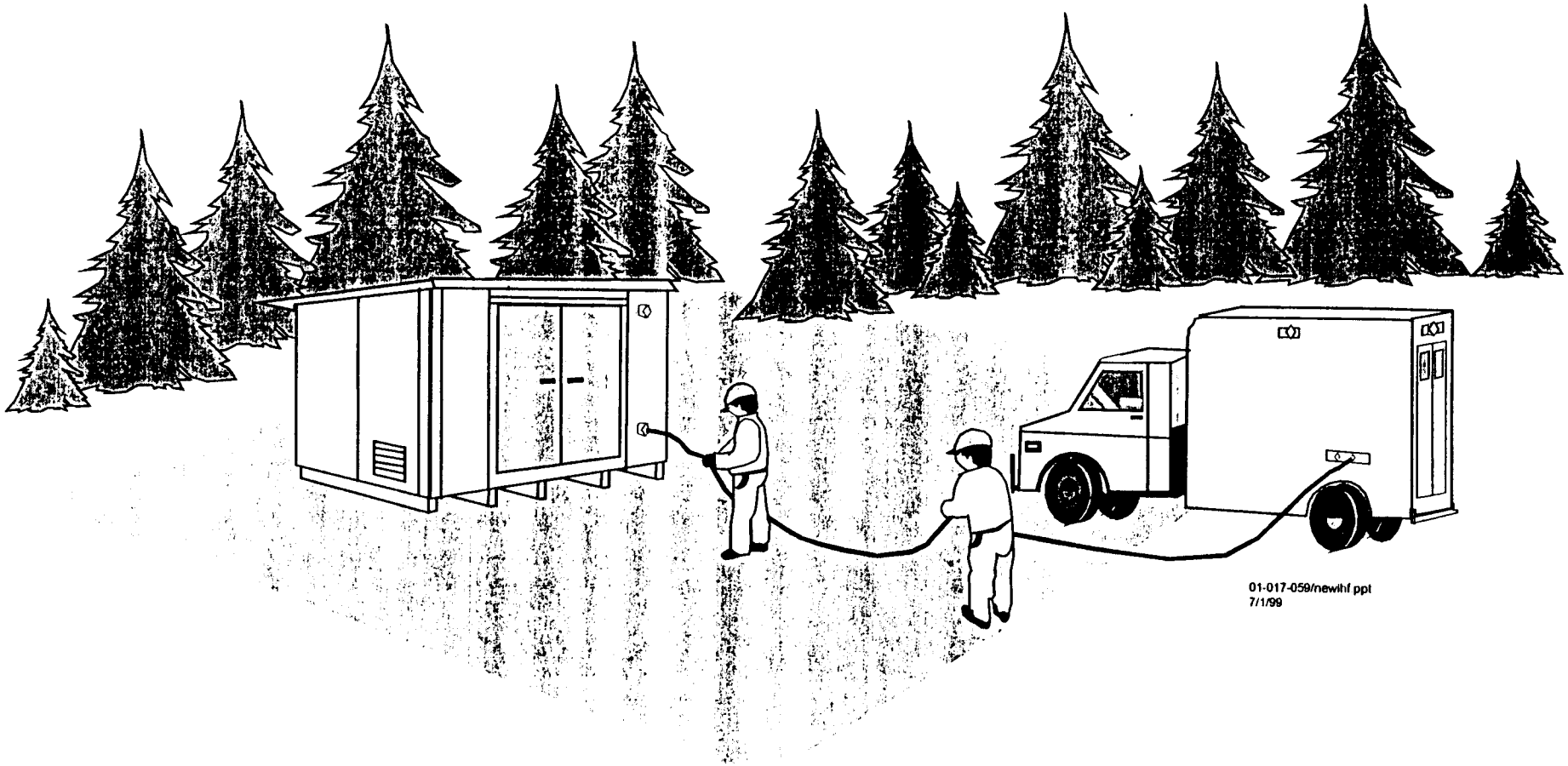

Figure 5-1. First Entry Monitoring

5.1.3 Contingency Monitoring. Contingency monitoring will be conducted during an emergency response contingency action (section 6). An emergency response will be initiated upon detection of a release in the IHF during first entry monitoring, during periodic surveillance monitoring, or as a result of a catastrophic event (damage to the IHF from external sources or an accident during onsite transportation) indicating a potential release.

5.1.3.1 Release During Storage. Upon detection of a release in the IHF by first entry or periodic surveillance monitoring, the TEU, dressed in OSHA Level B PPE, will conduct first entry monitoring using the appropriate monitoring instruments to confirm the release. The TEU will enter the IHF, identify the source of the release, and contain the leaking item in accordance with TEU operating procedures.

Once the leakage has been contained, the area will be decontaminated by the TEU according to DA Pam 50-6 or Army Technical Manual (TM) 60A-1-1-11, Explosive Ordnance Disposal Procedures, Chemical/Biological Agents and Related Materials; Characteristics, Leak Sealing, Disposal and Decontamination. Continuous monitoring will occur until readings fall below 1.0 TWA (table 5-1) for a minimum of three consecutive sampling periods.

5.1.3.2 Potential Release after Catastrophic Event. If a potential release is suspected in the general area of the IHF as the result of a catastrophic event (that is, integrity of IHF structure and/or contents is in question) or if a potential release is suspected at the scene of an accident during onsite transportation, downwind monitoring will be initiated.

An example array for monitoring at the IHF is shown in figure 5-2. Example arrays for situations involving transport of CWM are shown in figures 5-3 through 5-6. The appropriate monitors (table 5-1) will be used at each monitoring station in the monitoring array.

Table 5-1. Monitoring Equipment and Levels

Chemical of Concern	Type of Monitoring: Instrument	Workplace Exposure Level[a] TWA	Workplace Exposure Level[a] mg/m^3	Estimated Limit of Quantification[b] mg/m^3
Chemical Agent:				
Mustard (H, HD, HS)	First Entry: MINICAMS®	1.0	0.003	0.0006
	First Entry Confirmation: DAAMS	1.0	0.003	0.0006
	Surveillance: DAAMS	1.0	0.003	0.0006
	Contingency: MINICAMS®	1.0	0.003	0.0006
	Contingency Confirmation: DAAMS	1.0	0.003	0.0006
Lewisite (L)	First Entry: MINICAMS®	1.0	0.003	≤0.003
	First Entry Confirmation: DAAMS	1.0	0.003	0.0006
	Surveillance: DAAMS	1.0	0.003	0.0006
	Contingency: MINICAMS®	1.0	0.003	≤0.003
	Contingency Confirmation: DAAMS	1.0	0.003	0.0006
Sarin (GB)	First Entry: MINICAMS®	1.0	0.0001	0.00002
	First Entry Confirmation: DAAMS	1.0	0.0001	0.00002
	Surveillance: DAAMS	1.0	0.0001	0.00002
	Contingency: MINICAMS®	1.0	0.0001	0.00002
	Contingency Confirmation: DAAMS	1.0	0.0001	0.00002
HN-1	First Entry: MINICAMS®	1.0	0.003	0.0006
	First Entry Confirmation: DAAMS	1.0	0.003	0.0006
	Surveillance: DAAMS	1.0	0.003	0.0006
	Contingency: MINICAMS®	1.0	0.003	0.0006
	Contingency Confirmation: DAAMS	1.0	0.003	0.0006
Industrial Chemical:				
Phosgene (CG)	First Entry: MINICAMS®	1.0	0.4	≤0.4
	First Entry Confirmation: Colorimetric Tube	Gross Level		0.8
	Surveillance: Colorimetric Tube	Gross Level		0.8
	Contingency: MINICAMS®	1.0	0.4	≤0.4
	Contingency Confirmation: Colorimetric Tube	Gross Level		0.8

Chemical of Concern	Type of Monitoring: Instrument	Workplace Exposure Level[a] TWA	Workplace Exposure Level[a] mg/m^3	Estimated Limit of Quantification[b] mg/m^3
Chloroform ($CHCl_3$)	First Entry: MINICAMS®	1.0	9.7	≤9.7
	First Entry Confirmation: Colorimetric Tube	Gross Level		1.94
	Surveillance: Colorimetric Tube	Gross Level		1.94
	Contingency: MINICAMS®	1.0	9.7	≤9.7
	Contingency Confirmation: Colorimetric Tube	Gross Level		1.94

Notes:

[a] Workplace exposure level is an umbrella term encompassing all such levels, including the 8-hour time-weighted average, the permissible exposure limit (for industrial chemicals only), the threshold limit value (for industrial chemicals only), and other levels developed to protect the worker during normal operations. The term TWA is used in place of AEL because the concentration output of the MINICAMS® is expressed in TWA terms.

[b] The lowest level that can be reliably quantified based on sampling and analytical procedures and calibration of the monitor.

DAAMS = Depot Area Air Monitoring System
mg/m^3 = milligram per cubic meter
TWA = time-weighted average

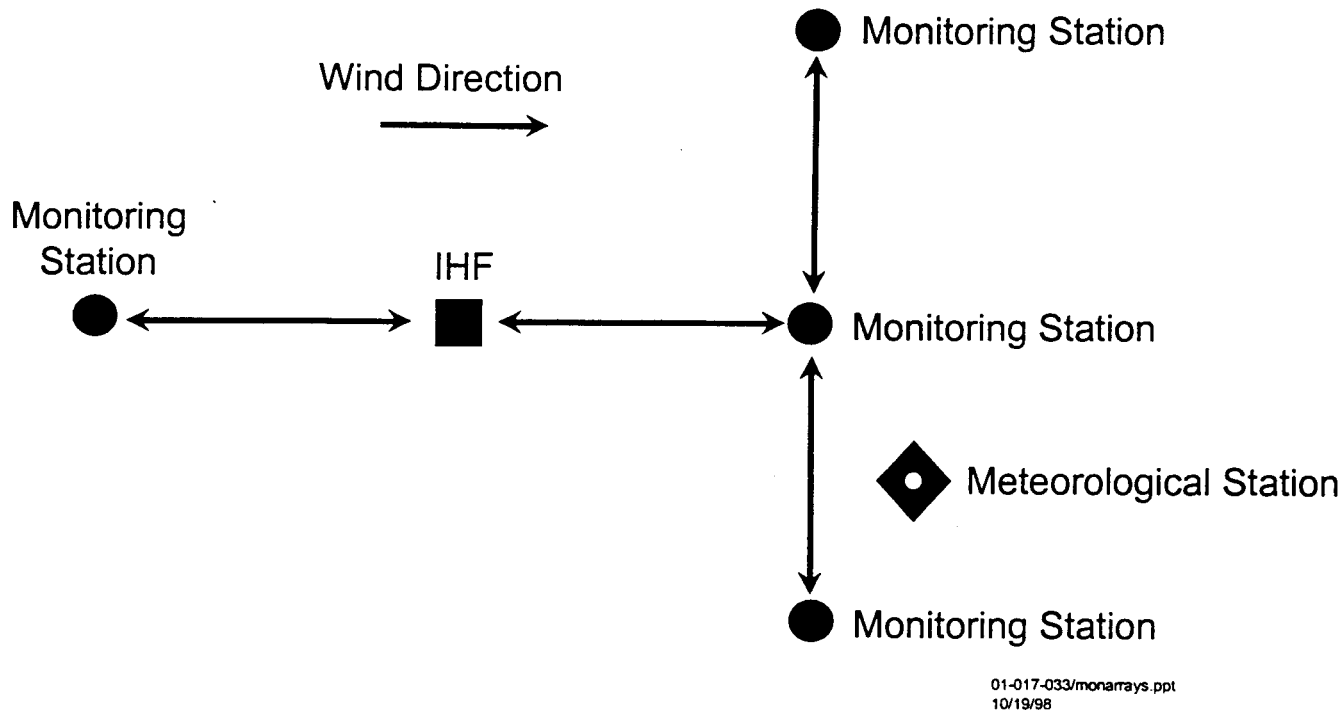

Figure 5-2. Example of a First Level Contingency Monitoring Array

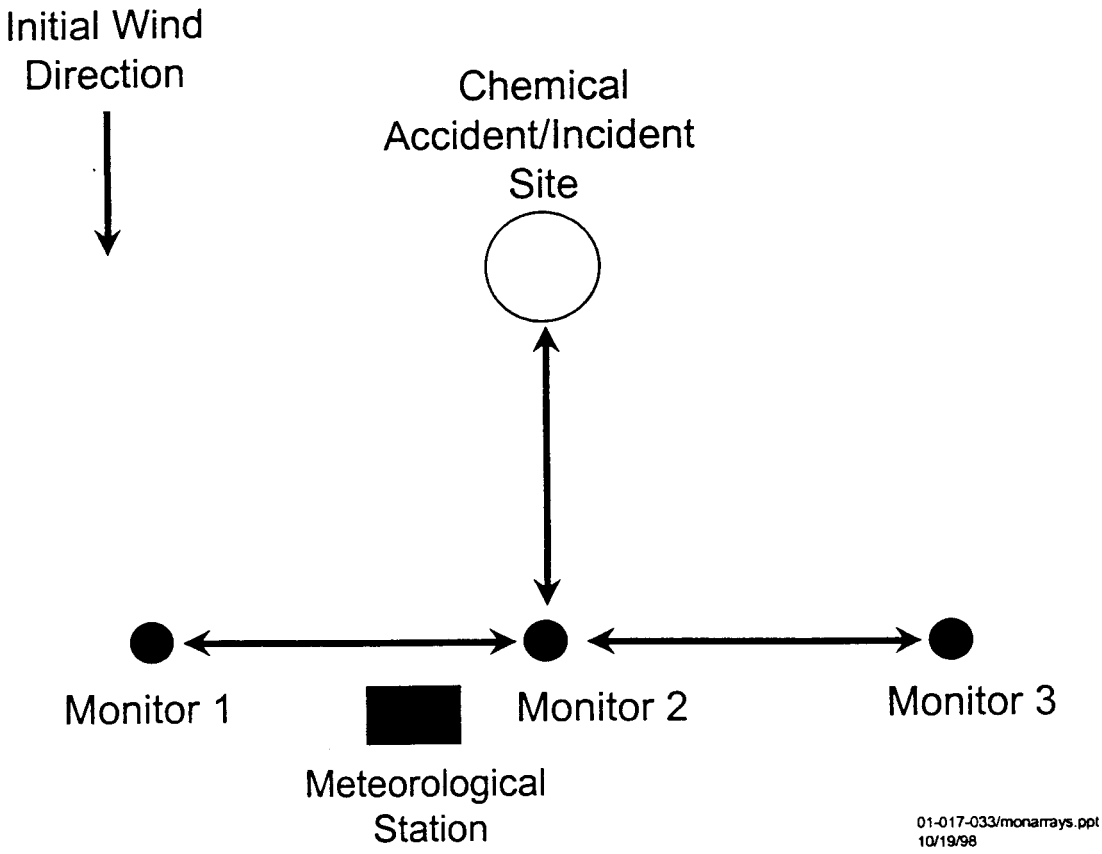

Figure 5-3. Initial Monitoring During Emergency Response

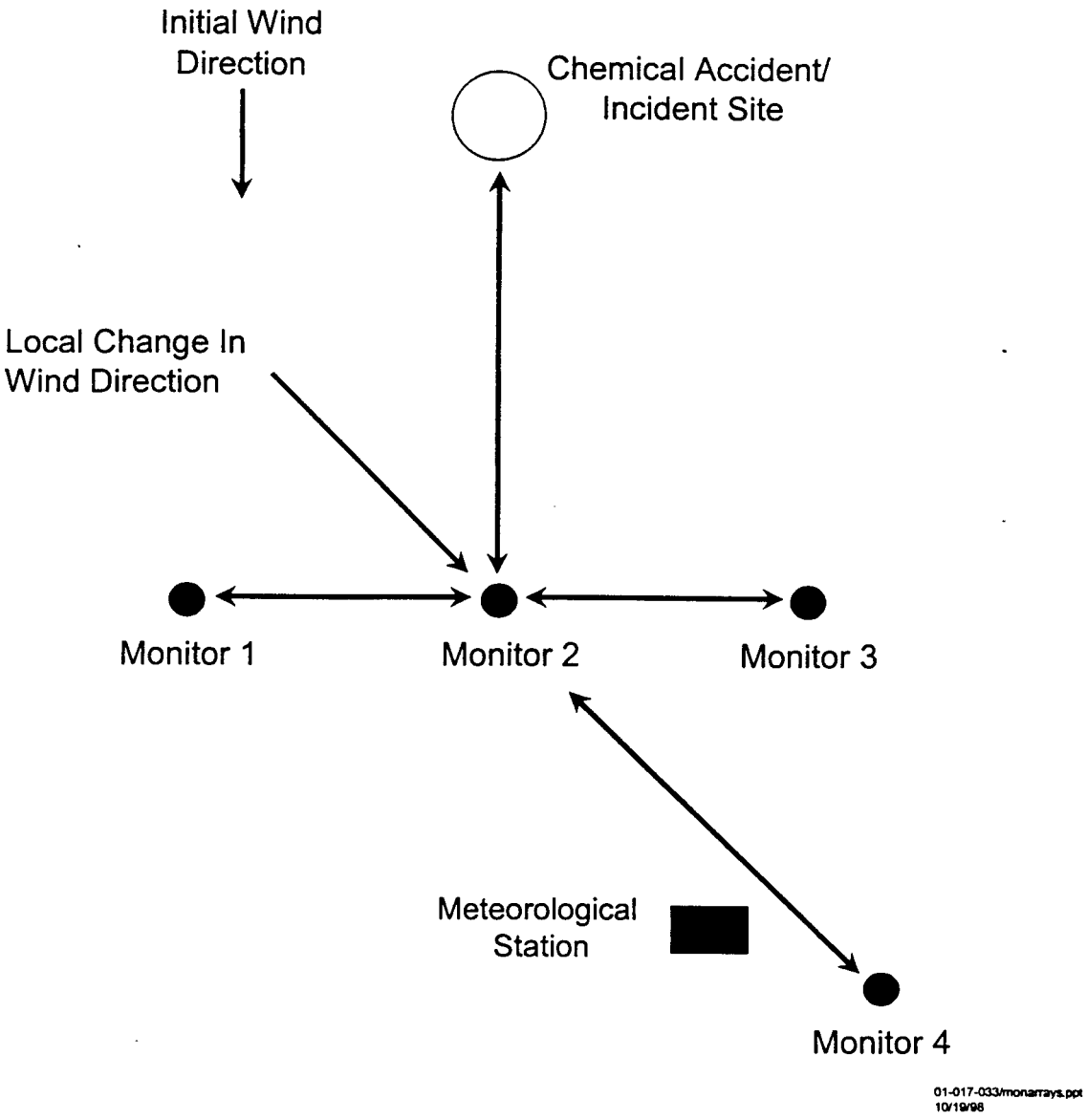

Figure 5-4. Second Array Monitoring During Emergency Response

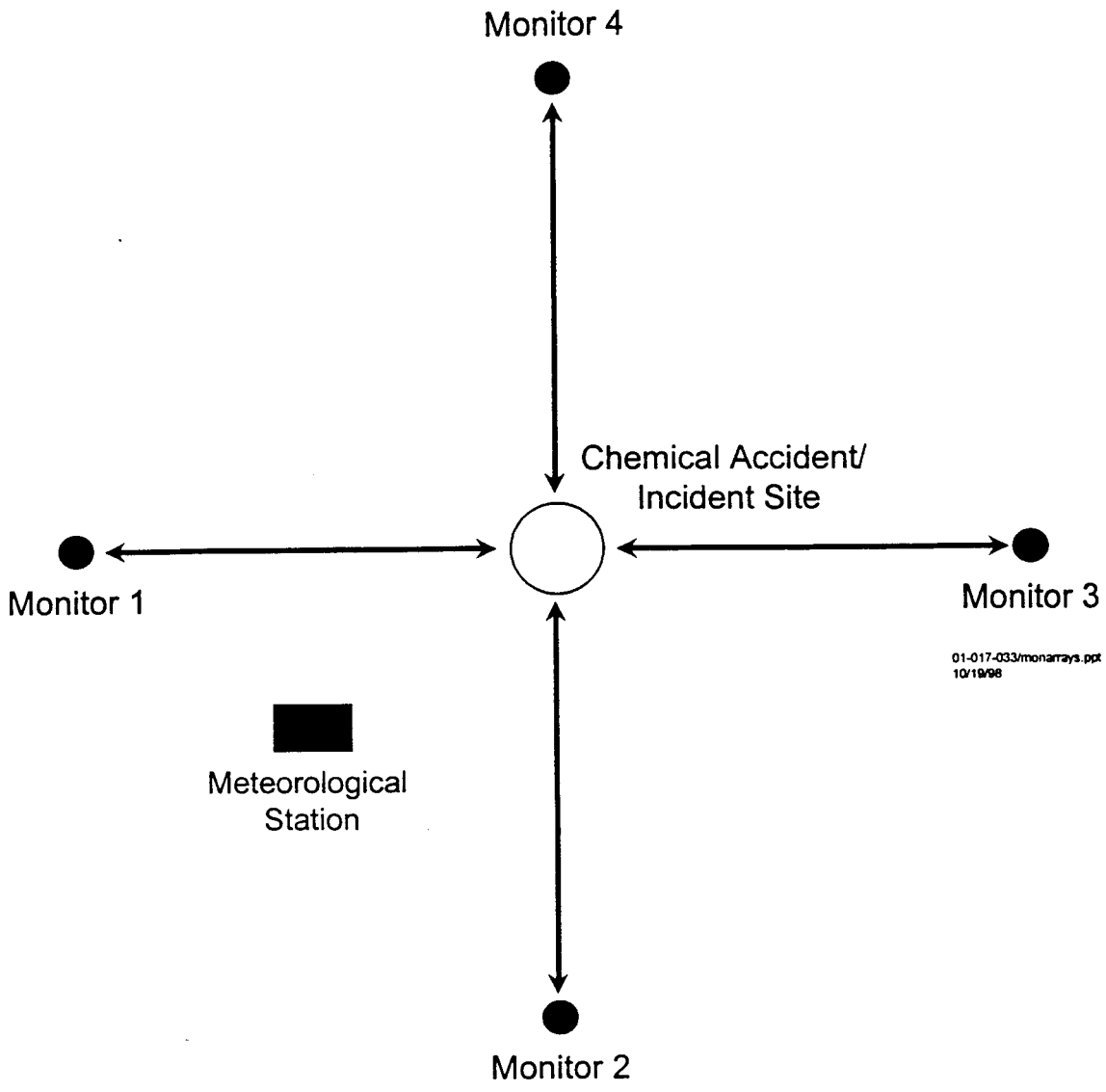

Figure 5-5. Emergency Response in No or Variable Wind Directions

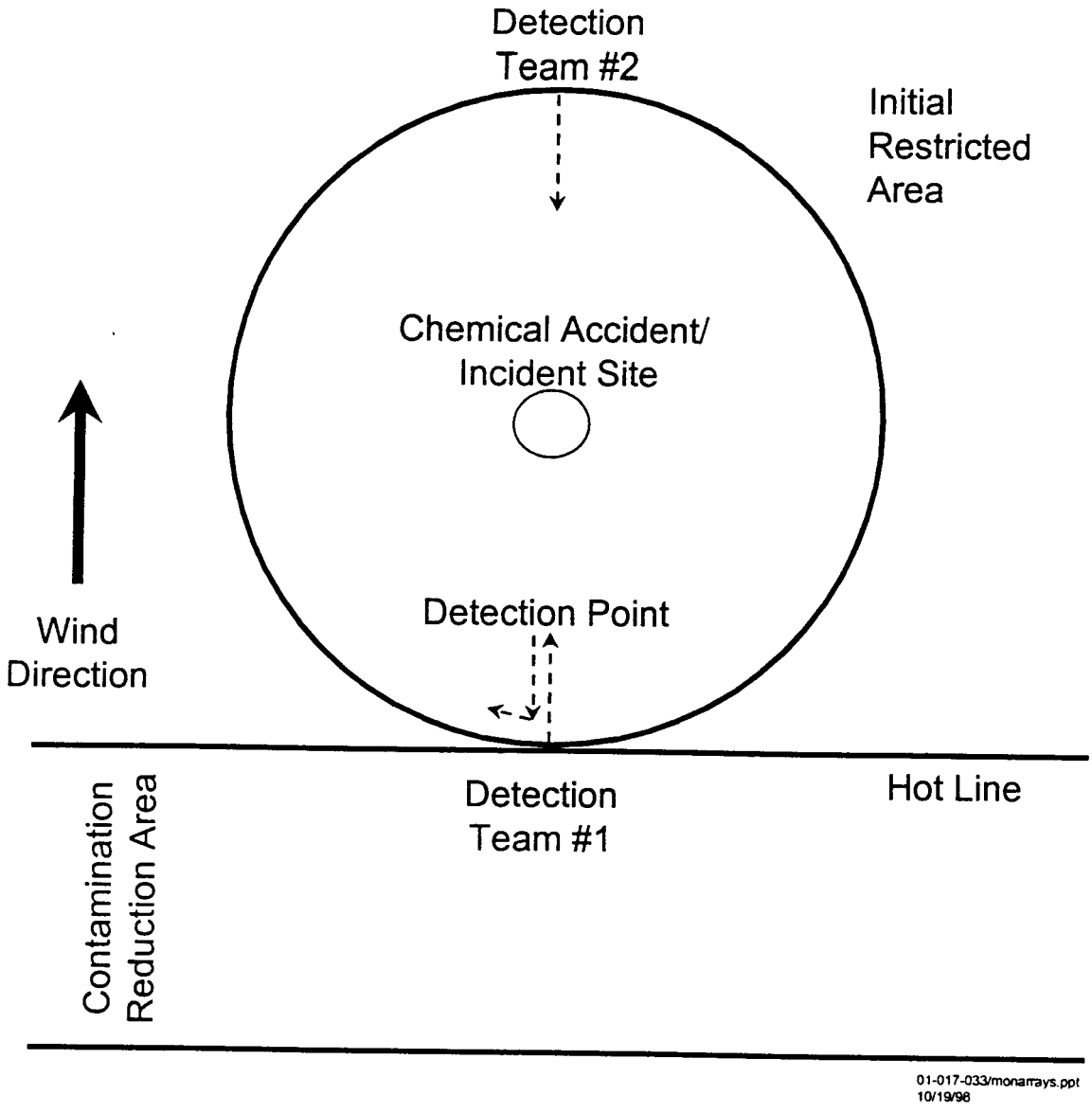

Figure 5-6. Surveillance Monitoring of the Restriction Area

5.1.4 Monitoring During Onsite Transportation. Onsite transportation consists of movements from the investigation site to the IHF. Once overpacked and inspected for onsite transportation, the item may be moved to the IHF. Monitoring of overpacks will not be required during onsite transportation unless an accident serious enough to damage the overpack occurs. Once the item has arrived at the IHF and has been unloaded, the overpacks will again be visually inspected. If the integrity of the overpacks does not appear to be sufficient, or if any evidence of leakage is observed, the item contained in the overpack will be repackaged by TEU (wearing appropriate PPE) and monitored with the appropriate equipment (table 5-1) to ensure the overpack is properly sealed.

5.2 Roles and Responsibilities

The TEU will provide qualified personnel to perform chemical agent monitoring at FTMC during recovery and onsite transportation operations. TEU will:

a. Provide and configure monitoring equipment such as the MINICAMS® and DAAMS to conduct monitoring operations for chemical agents

b. Obtain standards for CG, HD, VX, and GB

c. Obtain appropriate colorimetric tubes (Draeger 81-01521 for CG) for detection of industrial chemicals

d. Record calibration data, instrument parameters, and agent standards (when used) in instrument logbooks

e. Maintain daily printouts of calibration data and monitoring results, including hard copy MINICAMS® monitoring results.

f. Perform D2PC[1] hazard prediction modeling prior to commencing daily operations and ensure that the daily downwind hazard distance does not exceed the distance calculated for the maximum credible event (MCE) discussed in annex A of this Plan

g. Provide the required personnel, equipment, and support vehicles to conduct the operation

h. Provide logistical support and resupply assets to sustain continuous operation throughout the duration of the project

i. Coordinate with CESAM and other onsite organizations to ensure that the monitoring plan is understood and that actions to be taken are known in the event agent is detected

j. Ensure MINICAMS® and DAAMS are tested and serviceable prior to commencing daily operations.

5.3 Monitoring Chemicals of Concern

5.3.1 Chemical Agents.

5.3.1.1 Mustard (HD). The TEU will use a MINICAMS® (see paragraph 5.4.1 for description) for first entry and contingency monitoring. The workplace exposure level for HD is 1.0 TWA [0.003 milligram per cubic meter (mg/m^3)]. DAAMS tubes (see paragraph 5.4.2) will be collected for surveillance monitoring and confirmation monitoring of a MINICAMS® alarm. The estimated limit of quantification for HD using MINICAMS® or DAAMS is 0.0006 mg/m^3.

[1] D2PC is a U.S. Army-approved personal computer program for chemical hazard prediction.

5.3.1.2 Sarin (GB). GB will be monitored with the MINICAMS® (see paragraph 5.4.1) for first entry and contingency monitoring. The workplace exposure level is 1.0 TWA (0.0001 mg/m^3). DAAMS tubes will be collected for surveillance monitoring of GB and confirmation monitoring of a MINICAMS® alarm (see paragraph 5.4.2). The estimated limit of quantification for GB using DAAMS tubes or MINICAMS® is 0.00002 mg/m^3.

5.3.1.3 Lewisite. L will be monitored using a Lewisite MINICAMS® (see paragraph 5.4.1) for first entry and contingency monitoring. The MINICAMS® will be modified for the detection of L by adding a 1,2-ethanedithiol (EDT) derivative module on the intake end of the sample line and will be configured with a halogen selective detector (XSD). The workplace exposure level for L is 1.0 TWA (0.003 mg/m^3). DAAMS tubes will be collected for surveillance monitoring of L and confirmation monitoring of a MINICAMS® alarm. The estimated limit of quantification for L using DAAMS is 0.0006 mg/m^3 and less than or equal to 0.003 mg/m^3 for MINICAMS®.

5.3.1.4 Nitrogen Mustard (HN-1 and HN-3). Nitrogen mustard will be monitored as HN-3 using MINICAMS® for first entry and contingency monitoring. The workplace exposure level is 1.0 TWA (0.003 mg/m^3). DAAMS tubes will be collected for surveillance monitoring and confirmation monitoring of MINICAMS® alarms. The estimated limit of quantification using DAAMS or MINICAMS® is 0.0006 mg/m^3.

5.3.2 Industrial Chemicals.

5.3.2.1 Phosgene (CG). CG will be monitored using MINICAMS® (see paragraph 5.4.1) for first entry and contingency monitoring. The workplace exposure level is 0.4 mg/m^3. A Draeger colorimetric tube (81-01521) will be used for surveillance monitoring and confirmation of a MINICAMS® alarm. The estimated quantification limit for the Draeger tube is 0.8 mg/m^3.

5.3.2.2 Chloroform. Chloroform will be monitored using a MINICAMS® for first entry and contingency monitoring. The workplace exposure level for chloroform is 1.0 TWA

(9.7 mg/m^3). The MINICAMS® estimated limit of quantification is less than or equal to 9.7 mg/m^3. A Draeger colorimetric tube (67-28861) will be used for surveillance monitoring and confirmation of MINICAMS® alarm. The estimated limit of quantification for the Draeger tube is 1.94 mg/m^3.

5.4 Monitoring Devices

5.4.1 MINICAMS®. Air samples for first entry and contingency monitoring of HD, VX, CG, and GB will be collected and analyzed with MINICAMS®. The MINICAMS® is a low-level, NRT vapor monitor that has been designed to detect nerve and blister agents. The MINICAMS® uses a preconcentration sampler that passes air through a solid sorbent, such as a coarse mesh Tenax®, to collect the sample. The sample is collected at a known flow rate, over a timed sampling cycle, and the sample is desorbed and carried into a gas chromatograph (GC) temperature-programmed capillary column. The appropriate detector is configured for the chemical that is to be monitored.

5.4.2 Depot Area Air Monitoring System. The DAAMS is an air sampling and analysis method that provides surveillance sampling data by using sorbent tubes. The system consists of small, glass, sorbent-packed tubes, a vacuum pump, and flow control hardware. Sorbent tubes will be used for sampling all chemical agents. In the DAAMS method, air is drawn through a tube at a specified flow rate, and contaminant is collected by adsorption onto the tube sorbent packing. After sample collection, the sample is thermally desorbed from the tube into the carrier stream of a GC and subsequently detected using the appropriate detector.

5.4.3 Colorimetric Techniques. Colorimetric techniques are based on specific chemical reactions that lead to the formation of colored reaction products when agents are present above threshold concentrations. Colorimetric tubes, such as Draeger or Enmet tubes, are available for the detection of the industrial chemicals during surveillance monitoring and confirmation of a MINICAMS® alarm.