APPENDIX B
Technical Project Planning Documentation

This page intentionally left blank.

U.S. Army Corps of Engineers

Final
Technical Project Planning Memorandum & Associated Documentation

In Support of

CWM Site Inspections for Multiple Sites

Project Site:

Former Schilling Air Force Base
Salina, Kansas

Project No. B07KS025607

December 2009

prepared for:

U.S. Army Engineering and Support Center, Huntsville

and

U.S. Army Corps of Engineers, Kansas City District

prepared by:

PARSONS
1700 Broadway, Suite 900
Denver, Colorado 80290

Contract: W912DY-04-D-0005
Task Order: 0011

TABLE OF CONTENTS

Section	*Title*
1	Technical Project Planning Memorandum
2	List of Contacts
3	TPP Meeting Attendance Sign-In Sheet
4	Technical Approach Figure 1 – DGM Investigation Area & Sampling Locations
5	Project Schedule
6	Conceptual Site Model
7	Data Quality Objectives Worksheets
8	Phase I Memorandum for Record Worksheet (EM 200-1-2)
9	Project Objectives Worksheets
10	October 20, 2009 TPP Meeting Presentation
11	Types and Components of Chemical Agent Identification Sets

LIST OF ACRONYMS

ABP	Agent Breakdown Product (for H and L)
AEL	Airborne Exposure Limit
AFB	Air Force Base
AMP	Air Monitoring Plan
AOC	Areas of Concern
ASR	Archives Search Report
CA	Chemical Agent
CAIS	Chemical Agent Identification Set(s)
CARA	CBRNE Analytical and Remediation Activity
CBRNE	chemical, biological, radiological, nuclear, explosive
CENWK	U.S. Army Corps of Engineers, Kansas City District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CDLD	chemical defense laboratory division
CG	Phosgene
CSM	Conceptual Site Model
CVAA	2-chlorovinyl arsenous acid
CVAO	2-chlorovinyl arsenous oxide
CWM	Chemical Warfare Materiel
CWM SI	Chemical Warfare Materiel Site Inspections
DAAMS	Depot Area Agent Monitoring System
DERP	Defense Environmental Restoration Program
DGM	Digital Geophysical Mapping
DoD	Department of Defense
DoD-QSM	Department of Defense Quality Service Manual
EP	Environmental Pamphlet
EPDS	Emergency Personnel Decontamination Station
EZ	Exclusion Zone
FUDS	Formerly Used Defense Sites
GIS	Geographical Information System
GPS	Global Positioning System
H	Mustard
HRS	Hazard Ranking System
HS	Sulfur Mustard
IDW	Investigative Derived Waste

LIST OF ACRONYMS (CONTINUED)

KDHE	Kansas Department of Health and Environment
L	Lewisite
MC	Munitions Constituent
MEC	Munitions and Explosives of Concern
MINICAMS	Miniature Chemical Agent Monitoring System
MMRP	Military Munitions Response Program
MRSPP	Munitions Response Site Prioritization Protocol
NCP	National Contingency Plan
NDAI	No Department of Defense Action Indicated
NOSE	No Significant Effects
PDS	Personnel Decontamination Station
PEL	Personnel Exposure Limit
PPE	Personnel Protective Equipment
PS	Chloropicrin
PSAP	Programmatic Sampling and Analysis Plan
QAPP	Quality Assurance Project Plan
RAC	Risk Assessment Code
RD	Remedial Design
RI/FS	Remedial Investigation and Feasibility Study
ROE	Right of Entry
RTK	Real Time Kinematic
SAC	Strategic Air Command
SAP	sampling and analysis plan
SI	Site Inspection
SOP	Standard Operating Procedure
SSHO	Site Safety and Health Officer
SS-SAP	Site-Specific Sampling and Analysis Plan
SS-WP	Site-Specific Work Plan
STEL	Short-Term Exposure Limit
TPP	Technical Project Planning
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Engineering and Support Center, Huntsville
UXO	Unexploded Ordnance

Technical Project Planning Memorandum

Subject: Documentation of Technical Project Planning Project Team Concurrence for CWM SI Project

Site: ***Former Schilling Air Force Base***
Salina, Kansas

Contract: Contract Number W912DY-04-D-0005, Delivery Order 0011

Date: October 28, 2009

This document serves as a record of the Technical Project Planning (TPP) meeting for the Chemical Warfare Materiel (CWM) Site Inspection (SI) of the Former Schilling Air Force Base (AFB) in Salina, Kansas. The TPP Team members listed below indicated concurrence with the technical approach as developed during the TPP meeting held at the Salina Airport Terminal Conference Hall in Salina, Kansas on October 20, 2009. Parsons and the U.S. Army Corps of Engineers (USACE) technical experts had previously collaborated to develop an initial technical approach using available site information, including the Archives Search Report (ASR), and other pertinent documents. The TPP Team discussed and refined the technical approach during the TPP meeting, yielding a final technical approach for implementation at the former Schilling AFB. The final technical approach agreed upon by the TPP Team is documented herein and will be further detailed in the forthcoming site-specific CWM SI Work Plan, which will be submitted to the TPP Team members for review.

The meeting began at 12:30 PM central time and following introductions (sign-in sheet attached), the TPP Team members participated in a windshield tour of the former Schilling AFB gas instruction area to observe site conditions. The site is located within an active airport facility; therefore, the area is fenced and access is limited to authorized personnel. The front cover of this document includes a picture taken during the site visit of the area of interest. The gas instruction building (no longer standing) was located approximately 100 yards north of the dilapidated building on the right side of the photo (the photograph was taken looking north from the access road). The location where the cover photo was taken is shown on Figure 1.As shown on the cover photo, the area of interest is leased by the Salina Airport Authority for farming and currently, grain sorghum (milo) is growing there. After returning to the conference hall a briefing was provided (attached) summarizing past Department of Defense (DoD) use of the site, and proposed CWM SI activities. As part of the TPP process, discussions were held by participants regarding the CWM SI activities.

The 4,134.72-acre former Shilling AFB was primarily used for the training of pilots for bombing missions from 1942 until 1949. The Base was reactivated in 1951 to support the Korean conflict. During its operational existence, Schilling AFB housed numerous

special weapons and conventional ordnance igloos, a gas instruction building, gas chambers, skeet ranges, an aircraft target butt, an aircraft burning/training area, and a missile maintenance building. The base was permanently closed in 1967 and the U.S. General Services Administration conveyed the majority of the base to the City of Salina for use as a municipal airport.

The TPP Team has agreed that the CWM SI data collection efforts will include a geophysical survey and soil sampling. It was agreed that digital geophysical mapping (DGM) will be conducted within a 5-acre investigation area near the former gas instruction building, presented on Figure 1. DGM will be conducted to identify potential subsurface CAIS burial/disposal. Buried, loose chemical agent identification set (CAIS) bottles are not readily identified using geophysical mapping so the intent is to locate CAIS steel shipping containers (also referred to as "pigs"). Based on geophysical mapping conducted at other sites, buried pigs are typically readily detectable with geophysical surveys. The TPP stakeholders concurred that locating pigs will provide the best means of detecting possible buried CAIS bottles. A test plot will be established using metallic items to test instrument functionality and repeatability. The test plot will be in an area with minimal background anomalies. Anomaly selection criteria will be based on comparison of data to other sites associated with CAIS shipping container (i.e., pig) burial and professional judgment of the project geophysicists (Parsons geophysicists in consultation with USAESCH geophysicists).

In addition to DGM, the TPP Team agreed that 10 soil samples will be collected from pre-determined locations, plus 10 discretionary locations to be identified by the sampling team. Soil sampling will be conducted to assess the presence of CA/ABPs resulting from historic training and decontamination activities. The locations of the pre-determined soil samples were derived using a grid based approach. The grid will be focused around the former location of the gas instruction building and the possible decontamination area presented in Figure 1.

In addition to the TPP Team determinations stated above, the following specific issues and resolutions are noted:

- During field activities if an item (e.g., CAIS vial) is found, the Salina Airport Authority will be notified, but assessment and removal of the item will not be conducted under the CWM SI program.
- It was noted that the results from the DGM could be misinterpreted due to the potential presence of farming equipment debris, abandoned electrical lines, and residual lead-shot contamination from a skeet range. The team agreed that geophysical results illustrating straight lines through the investigation area would likely be abandoned electrical lines and will be noted as cultural debris. The team discussed the potential for near-surface skeet range debris to mask large subsurface anomalies. The DGM data will be carefully reviewed by the Parsons and U.S. Army Corps of Engineers geophysicists to provide their interpretation of data results.

  Note: *Subsequent discussions with the Parsons Project Geophysicist concluded that it is unlikely that lead-shot from the former skeet range will "mask" larger subsurface anomalies. Lead had little magnetic effect and the magnetometer*

sensor can be raised so "interference" from small items on the surface can be minimized. A height optimization test could be conducted in the field. Details regarding the geophysical investigation will be included in the site-specific work plan.

- Sarah McGraw mentioned a possible surface sweep of the area. Chris tenBraak pointed out that items found on the surface would be noted by the geophysical data collection team, but no surface sweep would be conducted.
- Kenny Biecker stated that no land use changes in the area are anticipated, although demolition of the dilapidated former radio transmitter building is scheduled in the near future (as soon as asbestos issues are resolved).
- The farming till depth of soil within the site is a maximum of 12 inches; therefore, the sampling depth will range from 12 – 18 inches.
- Kenny Biecker and Gunner Wiles mentioned that the crop cycle generally includes harvesting in June and January. The team agreed to wait until June to begin field work after the harvest of the winter wheat. Kenny and Gunner will work with the farmer to communicate specific harvesting times to the team.
- No endangered or threatened species or cultural/archeological sites are known to exist at the CWM SI location.

The meeting concluded at 3:00 PM. The project team agreed with the strategy as presented for the site and parties agreed they concur with the Technical Approach of the CWM SI. SI results will be fully documented in a CWM SI Report for TPP Team review. The CWM SI Technical Approach described above will not be modified without consultation and agreement by the TPP Team members listed below.

Mr. Thomas Simmons USACE, Kansas City District Project Manager	Ms. Paula Henderson USACE, Huntsville District Project Manager
Ms. Lindsey Miller USACE, Huntsville District Project Co-Manager	Ms. Monique Nixon USACE, Huntsville District Chemist
Mr. Jorge S. Jacobs Kansas Department of Health and Environment Superfund Unit Manager	Ms. Sarah McGraw One Stop Environmental, LLC Program Manager
Mr. Kenny Biecker Salina Airport Authority Manager of Facilities & Construction	Mr. Gunner Wiles Salina Airport Authority Manger of Operations
Mr. Marc Roberts GEOMET Director of Chem. Defense Lab	Mr. Christian tenBraak Parsons Project Manager

Figure 1

DGM Investigation Area & Sampling Locations Schilling Air Force Base FUDS Project # B07KS0256

Salina, Kansas

Legend

- Soil Sample Locations
- DGM Investigation Area (5 Acres)
- Sampling Area Grid (See Note 1) Grids 60 ft x 36 ft
- Skeet Range Boundaries

Note:
1) Ten additional discretionary samples will be taken based on field observations, which may include areas outside sampling grid area.
2) The Former Radio Transmitter Building was observed during TPP site visit. The building, however, is scheduled for demolition.
3) The Former Gas Instruction Building was razed many years ago (date unknown) and the area is used for farming since approximately 1967). No stressed vegetation was observed in the area and no stressed vegetation was noted by the Salina Airport Authority representatives.

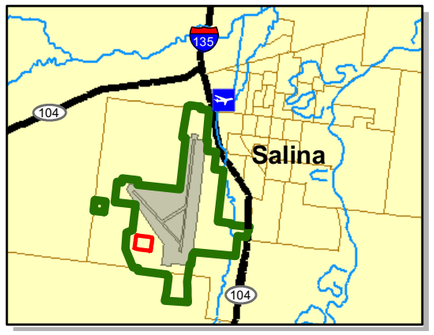


Image Source: 1954 Aerial
Projection: NAD 83 UTM Zone 14N

N

0 125 250 500 Feet

PARSONS	U.S. ARMY ENGINEERING & SUPPORT CENTER HUNTSVILLE, ALABAMA

DESIGNED BY: CR	Schilling Air Force Base		
DRAWN BY: CAtB			
CHECKED BY: JC	SCALE: As Shown	PROJECT NUMBER: 745080	
SUBMITTED BY: CAtB	DATE: December 2009	PAGE NUMBER: 1-4	
	FILE: S:\ES\shared\CWM SI Program \Schilling\GIS		

Key Contacts
Former Schilling Air Force Base
Salina, Kansas
CWM SI Project

Organization	Name	Telephone/FAX
U.S. Army Corps of Engineers, Kansas City District (CENWK) CENWK-PM 601 E 12th St, Kansas City, MO 64106	Mr. Thomas Simmons Project Manager **Email:** thomas.m.simmons@usace.army.mil	(816) 389-3372 (816) 304-6532 cell
U.S. Army Engineering and Support Center, Huntsville 4820 University Square Huntsville, AL 35816-1822	Ms. Paula Henderson Project Manager **Email:** paula.k.henderson@usace.army.mil	(256) 895-1269 (256) 655-1239 cell
U.S. Army Engineering and Support Center, Huntsville 4820 University Square Huntsville, AL 35816-1822	Ms. Lindsey Miller Project Co-Manager **Email:** lindsey.w.miller@usace.amry.mil	(256) 895-1297 (256) 714-5892 cell
U.S. Army Engineering and Support Center, Huntsville 4820 University Square Huntsville, AL 35816-1822	Ms. Monique Nixon Chemist **Email:** monique.l.nixon@usace.army.mil	(256) 895-1491
Kansas Department of Health and Environment (KDHE) Curtis State Office Building 1000 SW Jackson Topeka, KS 66612	Travis Daneke Project Manager, KDHE Superfund **Email:** tdaneke@kdheks.gov	(785) 296-6378 (785) 296-4823 fax
Kansas Department of Health and Environment (KDHE) Curtis State Office Building 1000 SW Jackson Topeka, KS 66612	Chad D. Timken Project Manager, Assessment and Restoration Section **Email:** ctimken@kdheks.gov	(785) 296-1682 (785) 296-4823 fax
U.S. EPA Region 7 901 N 5th Street Kansas City, KS 66101	Ken Rapplean Project Manager **Email:** rapplean.kenneth@epa.gov	(913) 551-7769
Parsons 800 Center Park Drive Austin, TX 78754	Ms. Kimberly Vaughn Project Manager ***Email:*** Kimberly.Vaughn@Parsons.com	(512)719-6816 (512)719-6099 fax (512)658-6828 cell
Parsons 1700 Broadway, Suite 900 Denver, CO 80290	Mr. Chris tenBraak Task Manager Email: Chris.tenbraak@Parsons.com	(303) 764-1923 (303) 831-8208 fax (303) 653-7928 cell

Key Contacts
Former Schilling Air Force Base
Salina, Kansas
CWM SI Project

Organization	Name	Telephone/FAX
Parsons 3577 Parkway Lane, Suite 100 Norcross, GA 30092	Mr. Michael Short CWM/OE Operations Manager Email: Michael.Short@Parsons.com	(678) 969-2451 (770) 446-4910 (FAX) (404) 387-0798 (cell)
CBRNE Analytical and Remediation Activity (CARA) Remediation Response Pine Bluff Arsenal Pine Bluff, AR 71602-9500	Mr. Marvin Hubanks CARA RRW Program Manager **Email:** marvin.p.hubanks@us.army.mil	(870) 540-2301 (870) 540-2304 fax (870) 550-9733 cell
CBRNE Analytical and Remediation Activity (CARA) Remediation Response Pine Bluff Arsenal Pine Bluff, AR 71602-9500	Mr. Mark W. Shelby, Jr. **Email:** mark.shelbyjr@us.army.mil	(870) 540-2303 (870) 540-2304 fax
CBRNE Analytical and Remediation Activity (CARA) Remediation Response Pine Bluff Arsenal Pine Bluff, AR 71602-9500	Mr. Jeff Musselman **Email:** jeffery.musselman@us.army.mil	(870)540-2321 (501)733-5894 cell
One Stop Environmental, LLC 4828 1st Avenue North Birmingham, AL 35222	Ms. Shannon Riley President **Email:** SRiley@onestopenv.com	(205) 595-8188 (205) 278-1434 fax (205) 296-1302 cell
One Stop Environmental, LLC 990 Explorer Blvd., Suite D Huntsville, AL 35806	Ms. Sarah McGraw Program Manager **Email:** smcgraw@onestopenv.com	(256) 513-6332, ext. 821 (256) 513-6403 fax (256) 797-6186 cell
GEOMET Technologies 20251 Century Boulevard, Suite #300 Germantown MD 20874	Mr. Marc Roberts Director, Chemical Defense Laboratory Division **Email:** lab@geomet.com	(301) 417-9605, ext. 22 (240) 374-3366 (301) 428-9482 fax
Salina Airport Authority 3237 Arnold Ave. Salina, KS 67401	Mr. Kenny Biecker Manager of Facilities & Construction **Email:** kennyb@salair.org	(785) 827-3914 (785) 827-2221 fax
Salina Airport Authority 3237 Arnold Ave. Salina, KS 67401	Mr. David "Gunner" Wiles Manager of Operations **Email:** gunner@salair.org	(785) 827-3914 (785) 827-2221 fax

Meeting Attendees
Salina Municipal Airport
October 20, 2009

Former Schilling Air Force Base
Salina, Kansas
CWM SI Project

Organization	Name / Signature	Telephone/FAX
U.S. Army Corps of Engineers, Kansas City District (CENWK)	Mr. Thomas Simmons Project Manager Email:thomas.m.simmons@usace.army.mil	(816) 389-3372 (816) 304-6532 cell
U.S. Army Engineering and Support Center, Huntsville	Ms. Paula Henderson Project Manager **Email:** paula.k.henderson@usace.army.mil	(256) 895-1269 (256) 655-1239 cell
U.S. Army Engineering and Support Center, Huntsville	Ms. Lindsey Miller Project Co-Manager **Email:** lindsey.w.miller@usace.amry.mil	(256) 895-1297 (256) 714-5892 cell
Kansas Department of Health and Environment (KDHE)	Travis Daneke Project Manager, KDHE Superfund Email: tdaneke@kdheks.gov	(785) 296-6378 (785) 296-4823 fax
Kansas Department of Health and Environment (KDHE)	Chad D. Timken Project Manager, Assessment and Restoration Section Email: ctimken@kdheks.gov	(785) 296-1682 (785) 296-4823 fax
U.S. EPA Region 7	Ken Rapplean Project Manager **Email:** rapplean.kenneth@epa.gov	(913) 551-7769
Parsons	Mr. Chris tenBraak Task Manager Email: Chris.tenbraak@Parsons.com	(303) 764-1923 (303) 831-8208 fax (303) 653-7928 cell

Meeting Attendees
Salina Municipal Airport
October 20, 2009

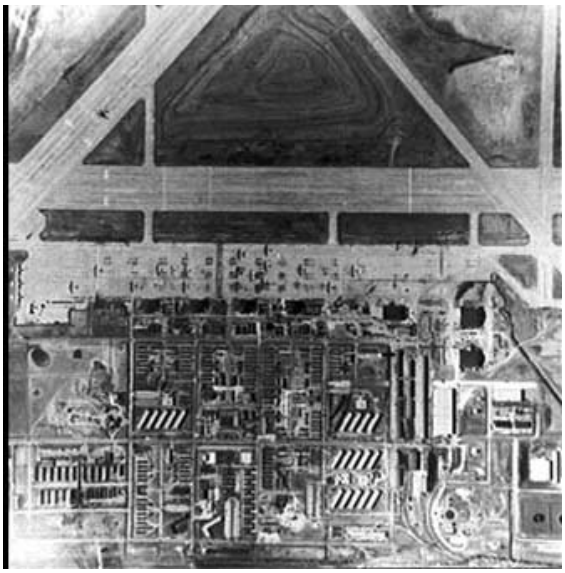
Former Schilling Air Force Base
Salina, Kansas
CWM SI Project

Organization	Name / Signature	Telephone/FAX
Parsons	Ms. Carrie Ross Deputy Task Manager Email: carrie.ross@Parsons.com	(303) 764-8736 (303) 831-8208 fax
One Stop Environmental, LLC	Ms. Sarah McGraw Program Manager **Email:** smcgraw@onestopenv.com	(256) 513-6332, ext. 821 (256) 513-6403 fax (256) 797-6186 cell
Salina Airport Authority	Mr. Kenny ~~Beaker~~ Bicker Manager of Facilities and Construction	785-827-3914 Fax 827-2221 Kennyb@SalAir.org
Salina Airport Authority	Mr. Gunner Whiles Manager of Operations	785 827 3914 gunnar@salair.org
KDHE	Jorge S. Jacobs Superfund Unit Mgr.	785-296-8801 785-296-4823
GEOMET	Marc P Roberts Director, Chem. Defense Lab	240-374-3366 301-419-9605 x22

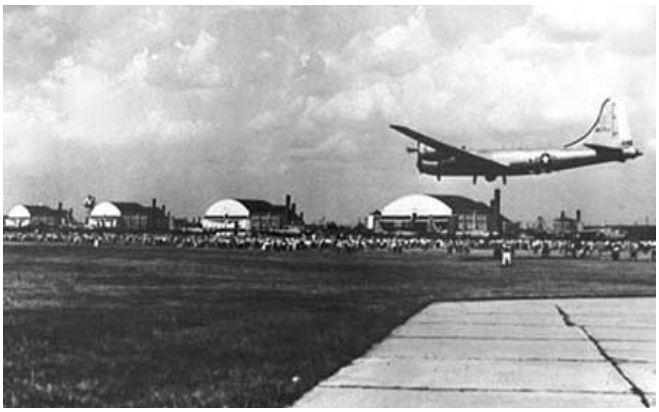
FORMER SCHILLING AIR FORCE BASE (B07KS025607)

Summary of Site Information

The U.S. Government constructed the Smoky Hill Army Air Base in 1942, renamed the Smoky Hill Air Force Base in 1946 and renamed Schilling Air Force Base (AFB) in 1957. The former Schilling AFB consisted of 4,134.72 acres located approximately 2 miles southwest of Salina, Kansas. During World War II, Schilling AFB supported the training of pilots for bombing missions.



The base was deactivated in 1949, and reactivated in 1951 to support the Korean conflict. At that time, Schilling AFB was the second largest base in the Strategic Air Command (SAC) and carried the mission to fly nuclear strike attacks with the capability of rapid deployment. In 1961 the facility became the support base for the 550th Strategic Missile Squadron for the Atlas F Inter-Continental Ballistic Missile and Nike missiles. During its operational existence, Schilling AFB housed numerous special weapons and conventional ordnance igloos, a gas instruction building, gas chamber buildings, skeet ranges, an aircraft target butt, an aircraft burning/training area, and a missile maintenance building. The base was permanently closed in 1967 and the U.S. General Services Administration conveyed the majority of the base to the City of Salina for use as a municipal airport.



The U.S. Army Corps of Engineers (USACE) conducted a site visit to the former Schilling AFB on October 23 and 24, 2002 to evaluate site conditions and in preparation of an Archives Search Report (ASR). The ASR noted that documentation existed showing that chemical agent identification sets (CAIS) were onsite, but final disposition was not noted. The ASR also indicated that live liquid mustard may have been spread over an approximate 100-square yard section of land for the purpose of decontamination training. The location of the possible mustard ground decontamination training area is unknown. According to the ASR, the gas instruction building was also presumably used for decontamination practice. The site visit team noted that only the former radio transmitter building remained standing, while the gas instruction building (not the gas chamber buildings) – which once stood 100-yards to the north – no longer existed.

The ASR separated the former training areas at Schilling AFB into different areas. "Area C" was the designation for the area which contained the "Gas Instruction Building", "West Skeet Range" and "South Skeet Range". The ASR designated a Risk Assessment Code (RAC) of "1" for Area C (recommending further action as appropriate), based on the historical documentation of the presence of

CAIS and probable decontamination exercises. An ASR Supplement was created at a later date and renamed this area as "Range Complex No.1" and included subranges: "gas instruction area", "Skeet Range No.2", and "Skeet Range No.1". A Site Inspection (SI) was conducted in December 2008 and addressed the skeet ranges as well as other areas within the former Schilling AFB. As part of the Chemical Warfare Materiel (CWM) SI program, this project addresses only the former gas instruction building and decontamination area which will be collectively referred to as the "gas instruction area". The CWM SI will be conducted under the assumption that the potential exists for CAIS burial/disposal and/or the presence of chemical agent (CA) or agent breakdown products (ABPs) in soil. This assumption is based on historical activity recorded on the site; no evidence of CWM was encountered during the ASR site visit nor has been reported since.

While the former Schilling AFB is currently used as a municipal airport, the parcel of land addressed for the CWM SI is located within the Salina Airport Authority's Aircraft Operation Area, but is currently used for farming. The Airport Authority maintains control of access to the property, limiting entrance by the general public. Vo-Tech Diesel Mechanics, along with other private businesses, currently operate on a portion of the property.

SI FIELDWORK

In accordance with ER 200-3-1 and the Performance Work Statement, sufficient data need to be collected during the SI to analyze for risks associated with CWM or munitions constituents (MC), for the U.S. Environmental Protection Agency (USEPA) to complete the Hazard Ranking System (HRS) scoring, for completion of the Munitions Response Site Prioritization Protocol (MRSPP), and ultimately for the determination of the appropriate follow-on action. The suspected gas instruction area will be evaluated during this study. Prior to the field investigation, Parsons will review available aerial photographs of the site. The Draft Military Munitions Response Program (MMRP) SI Report references 1943, 1954, and 1965 air photos of the site (Shaw, 2009). These photographs were reviewed for possible ground decontamination areas and possible CAIS disposal locations. Based on review of available historical aerials, the investigation area is proposed to be approximately five acres near the former gas instruction building. The gas instruction building can be seen on the 1954 aerial, as well as an area of disturbed vegetation (possibly the ground decontamination area) located approximately120 feet to the east of the building (Figure 1). The two skeet ranges would likely have precluded CWM training exercises being conducted within the danger zones of the skeet ranges and the five acres of investigation area will be located to surround the area of disturbed vegetation visible in the 1954 historical aerial. Based on a review of the MMRP SI report (currently draft final) no visible remnants (e.g. structures, boundaries) of the two skeet ranges remain. Remnants of a former radio transmission tower building remain nearby (refer to cover photo). Field activities for the CWM SI will be conducted during a single mobilization, and will primarily consist of a geophysical survey of the five acres and soil sampling for CA/ABPs. The geophysical survey and soil sampling field team will be comprised of three individuals. It is anticipated that the field activities will be performed by a team leader/site geophysicist, UXO Tech III/SSHO, and geophysical instrument operator/sampling technician. A summary for the proposed approach to the SI for the former Schilling Air Force Base is described below. The proposed schedule for the Schilling AFB site is included herein, at the end of this section.

Mobilization and Site Set-up – Prior to mobilizing to the site, site-specific information that may impact access and operations (e.g., weather conditions, planting schedule) will be reviewed. Thorough review and consideration of these conditions in advance can significantly reduce potential costly delays.

Geophysical Survey –The geophysical survey is expected to require approximately one and one-half weeks to complete (including mobilization/demobilization of personnel and equipment, and setup).

Digital Geophysical Mapping (DGM) will be conducted within the five-acre investigation area shown on Figure 1. Prior to data collection, the geophysical equipment will be tested and standardized at a Test/Standardization Plot. The Test Plot should be located at a position with minimal background anomalies and where it can remain for the duration of the DGM. The primary objective of the DGM will be to locate potential CAIS burial locations. During DGM, the geophysical survey team will document areas of metallic surface debris. Geophysical mapping will be conducted using a portable Geometrics G-858 magnetometer. During data collection, a real-time kinematic global positioning system (such as the Trimble 5800 RTK DGPS system, or equivalent) will be used for positioning.

Environmental Sampling – Soil samples will be collected from several locations within the investigation area as agreed upon during the Technical Project Planning (TPP) meeting. The primary objective of the sampling effort will be to identify and screen the investigation area for CA/ABP contamination. The sampling strategy includes collection of samples in areas with the highest likelihood of having MC contamination (e.g. biased sampling method). Biased sampling proves to be the best method in validating for the presence or absence of site contamination, thus remaining in accordance with the objectives of a SI.

As approved by the TPP Team, ten grid-based soil samples and 10 discretionary samples (plus associated quality control [QC] samples) will be collected around the former gas instruction building and possible decontamination area (as indicated on the 1954 air photo (Figure 1). The discretionary sample locations will be determined by the field team and may included areas outside of the sampling area grid shown on Figure 1. Before collecting a sample, the UXO Technician will use a Schonstedt magnetic locator (or equivalent) to confirm the selected sample location is free of surface and subsurface ferrous debris. If the selected location is not clear of metallic debris (based on audible signals from the instrument) an alternate sample location will be selected near the original location. This process will be conducted iteratively until the UXO Technician can deem the location safe for collecting the sample. Air monitoring for CAIS- related constituents (i.e., mustard, lewisite, phosgene, chloropicrin, and chloroform) will be conducted at each sample location.

Comprehensive details of the CA/ABP soil sampling technique are provided in the Formerly Used Defense System (FUDS) CWM SI Program Sampling Analysis Plan (PSAP – aka Programmatic SAP) and deviations (because of the TPP or state regulations) will be noted within the Site-Specific (SS)-SAP Annex. Parsons will collect two CA/ABP soil samples at each sample location in accordance with the PSAP. CA/ABP soil samples will have a split sample screened in the field (i.e. headspaced) for CA (mustard and Lewisite). No samples containing agent with headspace screening results exceeding the Airborne Exposure Limit (AEL) will leave the project site for additional analytical sampling. If headspace analytical results are below the AEL, the split sample will be shipped off-site for low-level analytical testing.

Geographical positions will be captured at each sample location for inclusion in the geographical information system (GIS) database. The sample points will be documented using a Trimble 5800 (or equivalent) Real Time Kinematic (RTK) digital global positioning system (GPS) with base station or a Trimble ProXRS GPS (or equivalent) with post processed positional data by Parsons, or locations will be recorded by a registered land surveyor. Both systems will provide better than one-foot accuracy with horizontal precision documented at every sample location.

The analytical method for CA/ABP will be Geomet CDLD SOP-44. Data validation for laboratory hardcopy reports will be performed by the Parsons Project Chemist for sample results in accordance with the requirements contained in the PSAP, Quality Assurance Project Plan (QAPP), Department of Defense Quality Service Manual (DoD QSM), applicable USEPA Region standard operation procedures (SOPs), and the USEPA National Functional Guidelines for Data Review (USEPA, 1999, 2002). Laboratory results will be assessed for compliance with required precision, accuracy, completeness, comparability, and representativeness.

Table 1 – Parsons Proposed Sampling Approach
Schilling AFB

Sample Type	Number of Samples/ Proposed Analyses	Justification
Grab Samples	20 – CA and ABP	• 10 samples collected from a grid-based pattern and 10 discretionary samples (locations determined by the field team). The purpose is to determine if CA / ABP contamination exists.
Appropriate QC samples are not included in above sample count.		

Air Monitoring – Air monitoring for chemical agents will be conducted during intrusive sample collection. An air monitoring team generally consists of one or more Miniature Chemical Agent Monitoring System (MINICAMS) operators, one mobile lab operator, and one Depot Area Agent Monitoring System (DAAMS) pump operator. One team member is designated as the supervisor. During sampling operations, the air monitoring team will provide the following:

- MINICAMS for air monitoring at the excavation (sampling) site and headspacing of soil samples and investigation-derived waste (IDW).
- DAAMS sampling tubes and analysis for confirmation of CA detection.

An air monitoring plan (AMP) will be drafted by the organization conducting air monitoring as part of the Site-Specific Work Plan (SS-WP) annex for this site. The chemicals of interest that can be monitored will be identified along with the rationale for air monitoring strategies, choice of air monitoring equipment, and appropriate action levels (e.g. Short-Term Exposure Limit (STEL), Personnel Exposure Limit (PEL)).

Personal Protective Equipment (PPE) – DGM operations will be conducted in Level D PPE, while sampling operations will be conducted in Modified Level D (slung mask). Parsons will continually evaluate safety hazards and conduct risk assessments during fieldwork. Changes in PPE may be made with information obtained from site activities and data derived from monitoring activities.

An emergency personnel decontamination station (EPDS) will be emplaced during sampling activities requiring air monitoring. In the event that CWM or other hazardous substances are encountered or detected during sampling activities, the sampling team will immediately don their protective mask and process through the EPDS. To reduce or control gross contamination at the source, an EPDS will be established in the EZ, downrange near the sampling location. The EPDS (step pan/water/bleach/brushes) is used for gross decontamination but, during a true emergency may be by-passed if there is an imminent danger to one of the team members due to an accident. Air monitoring will be available to meet the

verification of decontamination. Injured personnel will process through the EPDS and then will be monitored using air monitoring equipment.

Exclusion Zones – Safety precautions will be taken to ensure protection of the public and site workers during intrusive activities (i.e. sampling). During intrusive operations a CA exclusion zone (EZ) will be established using the a computer model (D2PC) designed to predict the no significant effects (NOSE) distance – a distance beyond which the public would not experience adverse health effects in association with the chemical agent release associated with the selected source strength. A source strength is considered the worse-possible event which would release chemical agent into the atmosphere. Thus, D2PC predicts the NOSE and 1% lethality distance based on dispersion modeling of the release by inputting meteorological data and the characteristics of the chemical agent potentially present. The source strength for the former Schilling AFB is based on a encountering a specific quantity of phosgene – it is assumed that for this site the quantity of phosgene potentially encountered would be 40 milliliters, the quantity of phosgene in one CAIS vial. Given this source strength, as well as conservative default parameters entered into D2PC, the 1% lethality for phosgene is 16-meters (52-feet).

Medical Support – Due to the low probability of encountering CA, hospital support and onsite ambulance support will not be required.

Safety – The field team will include a UXO Technician III designated as the Site Safety and Health Officer (SSHO) who is responsible for site safety and carries stop work authority. The SSHO will conduct initial site-specific safety training and CWM recognition training for site personnel prior to commencing site activities, and morning "tailgate" safety briefings throughout the rest of the duration of the project.

In the event suspected CWM or Munitions and Explosives of Concern (MEC) is discovered during the field effort, the requirements and procedures presented in the Military Munitions Center of Expertise Interim Guidance Document 06-05 will be followed. These requirements include the notification of the landowner, who in turn will notify the local authorities. If the landowner can not be reached, authorities will be notified directly by USACE. The sampling team will not handle or be responsible for disposal or destruction of CWM or MEC encountered, but will provide emergency responders with assistance in identifying the CWM or MEC.

Investigation-Derived Waste – Investigation-derived waste is not expected to be generated during the sampling activities. The sampling team will collect soil samples using disposable (one-use) equipment as much as possible. Sampling equipment which needs to be decontaminated for each use (e.g. hand auger bucket) will be decontaminated in a way which minimizes water waste. Soil remaining after sample containers have been filled for that particular sample location will be returned to the excavation from which it originated. Headspaced sample splits will be shipped off-site along with the low-level CA/ABP sample. PPE (e.g. gloves) will remain consolidated from regular waste and will be headspaced for CA by the onsite laboratory conducting air monitoring. If the headspace samples from the PPE are clear of CA, the PPE will be disposed of as non-regulated waste.

SITE INSPECTION REPORTS

Once field data collection activities have been completed and the data reviewed as necessary, Parsons will prepare a CWM SI Report for the project site. Information in the CWM SI report will incorporate information from the ASR and conventional SI Report (or other documents as applicable) and will

include data gathered during the fieldwork. As applicable, the report will describe past CWM use, pathways of concern, and potential receptors for CWM and/or CA/ABP.

In addition to presenting the historic information and data collected, the CWM SI report will contain recommendations for further actions at the project. Generally, the CWM SI Report will include one of the following recommendations:

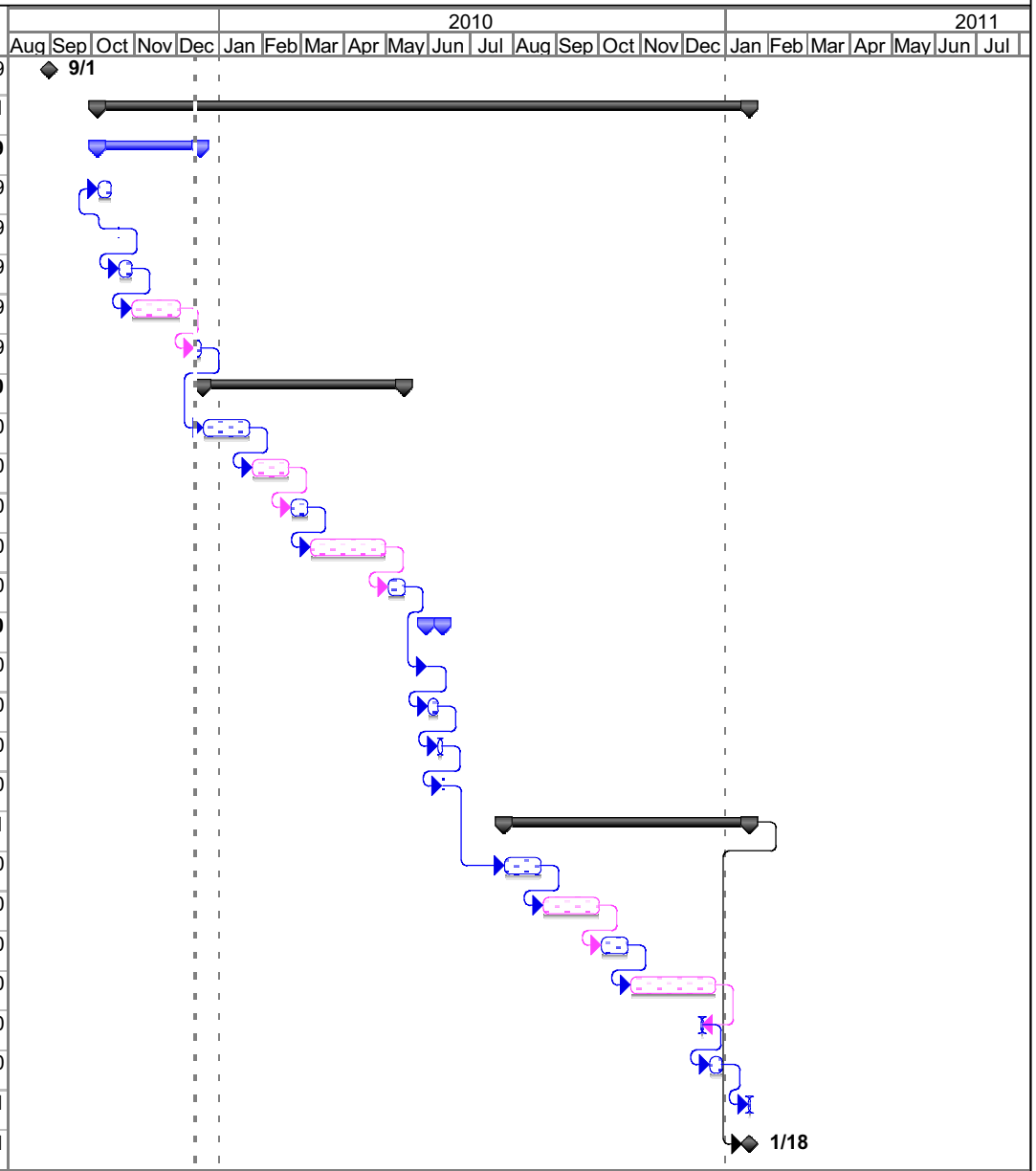
- No Department of Defense Action Indicated (NDAI);
- Removal action;
- Remedial Investigation Feasibility Study (RI/FS).

PUBLIC INVOLVEMENT

Public involvement is part of the process of establishing and maintaining a two-way dialogue with the local groups and individuals interested, affected, and perceived affected by CWM activities at a site. The public or community that is of concern includes individuals, media groups, tribal nations, and state and local politicians. Parsons, as directed by USAESCH, conducts public involvement activities consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), Defense Environmental Restoration Program (DERP) and Engineer Pamphlet (EP) 1110-3-8 (including revisions).

Schilling Schedule - CWM SI Program

ID	Task Name	Duration	Start	Finish
1	Notice to Proceed	0 days	Tue 9/1/09	Tue 9/1/09
2	**Schilling AFB**	**336 days**	**Tue 10/6/09**	**Tue 1/18/11**
3	**TPP Process**	**54 days**	**Tue 10/6/09**	**Fri 12/18/09**
4	TPP/CSM - Pre-Packet	7 days	Tue 10/6/09	Wed 10/14/09
5	TPP Meeting 1	1 day	Tue 10/20/09	Tue 10/20/09
6	TPP Memorandum Submittal	7 days	Wed 10/21/09	Thu 10/29/09
7	TPP Memorandum Review	25 days	Fri 10/30/09	Thu 12/3/09
8	TPP Memorandum Accepted	5 days	Mon 12/14/09	Fri 12/18/09
9	**Work Plans**	**105 days**	**Mon 12/21/09**	**Fri 5/14/10**
10	Draft Site Specific Work Plan	25 days	Mon 12/21/09	Fri 1/22/10
11	Government Review	20 days	Mon 1/25/10	Fri 2/19/10
12	Draft Final Site Specific Work Plan	10 days	Mon 2/22/10	Fri 3/5/10
13	Government/Regulator Review	40 days	Mon 3/8/10	Fri 4/30/10
14	Final SSWP Accepted	10 days	Mon 5/3/10	Fri 5/14/10
15	**SI Field Work - T&M**	**10 days**	**Mon 5/31/10**	**Fri 6/11/10**
16	Mobilization	1 day	Mon 5/31/10	Mon 5/31/10
17	Geophysical Surveying	5 days	Tue 6/1/10	Mon 6/7/10
18	Sampling	3 days	Tue 6/8/10	Thu 6/10/10
19	Demobilization	1 day	Fri 6/11/10	Fri 6/11/10
20	**SI Report**	**127 days**	**Mon 7/26/10**	**Tue 1/18/11**
21	Submit Draft SI Report	20 days	Mon 7/26/10	Fri 8/20/10
22	Government Review	30 days	Mon 8/23/10	Fri 10/1/10
23	Submit Draft Final SI Report	15 days	Mon 10/4/10	Fri 10/22/10
24	Government BC & Regulatory Review	45 days	Mon 10/25/10	Fri 12/24/10
25	TPP Meeting 2	1 day	Wed 12/15/10	Wed 12/15/10
26	Submit Final SI Report	7 days	Tue 12/21/10	Wed 12/29/10
27	Final SI Report Accepted	1 day	Tue 1/18/11	Tue 1/18/11
28	**Site Completion Date**	0 days	Tue 1/18/11	Tue 1/18/11



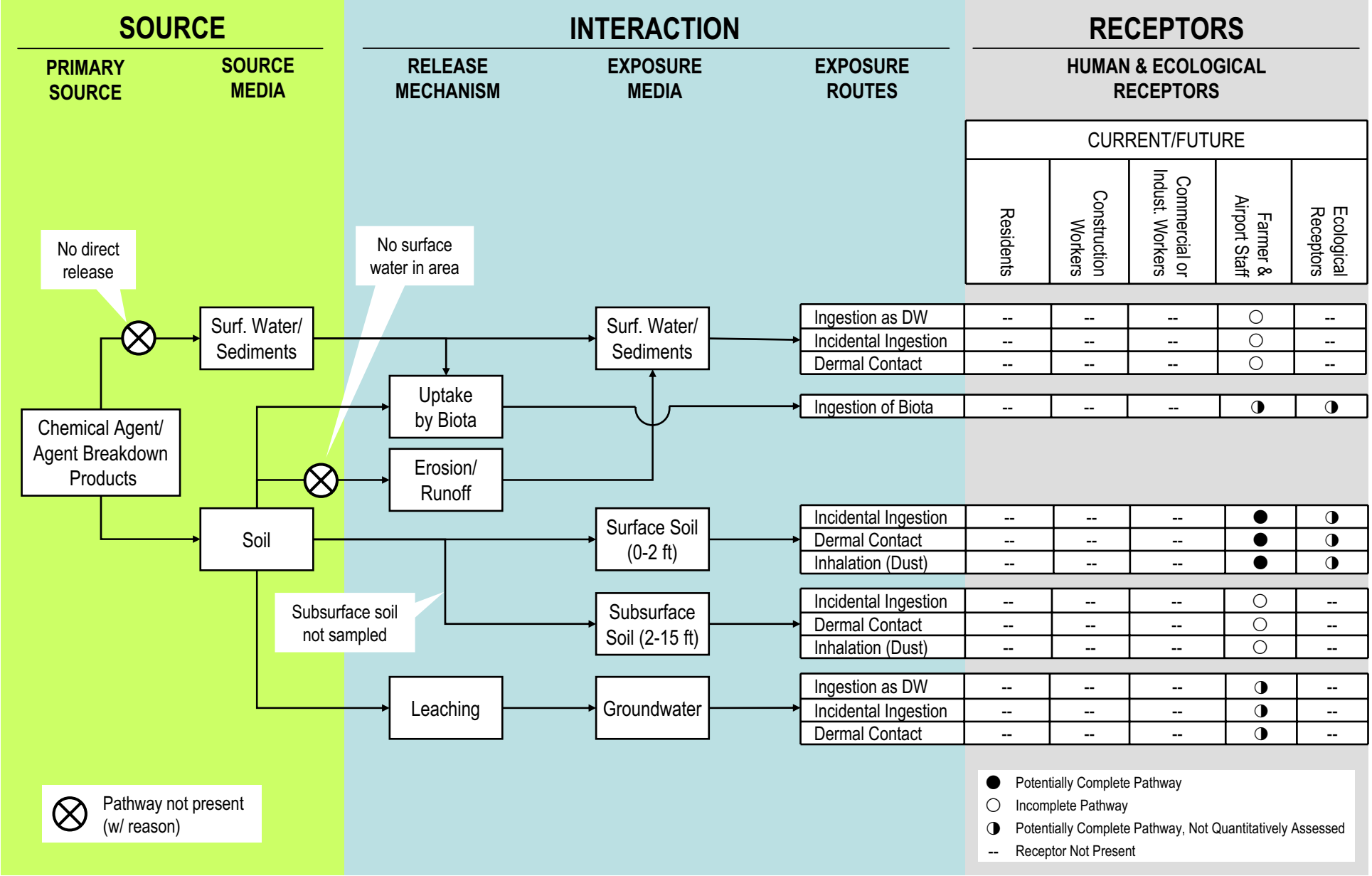
CWM SI - Project Schedule

External Task | Milestone | Rolled Up Milestone ◇
Task | Summary

PRE-CHEMICAL AGENT/AGENT BREAKDOWN PRODUCT SAMPLING CONCEPTUAL SITE EXPOSURE MODEL

MRS Name: FORMER SCHILLING AIR FORCE BASE – Range Complex No. 1, Gas Instruction Subrange

Created/Revised By: Chris tenBraak, PARSONS ***Last Revision Date:*** December 14, 2009



CONCEPTUAL SITE MODEL

FORMER SCHILLING AIR FORCE BASE

SALINA, KANSAS

Subsite/Range	Acreage	Suspect Past DoD Activities	Potential MD/MEC Presence[1]	MD/MEC Found Since Closure	Previous Investigations/ Clearance Actions	Post-DoD Land Use and Current Land Use	Potential Receptors	Potential Source and Receptor Interaction	Proposed Field Investigation
GAS INSTRUCTION AREA	~5	Chemical agent decontamination of ground and buildings[(1)] Possible CAIS burial/disposal	None	None	1991 INPR, 2007 INPR Amendment, 2003 ASR, 2009 MMRP Site Investigation Report	Agricultural	Human workers (farmer, airport staff), ecological	Yes- CA/ABP in surface or subsurface. Access controlled.	Site Visit, DGM, 20 soil samples.
TOTAL	~5								

Source:
1 = 2003 ASR

ASR = Archives Search Report
CA/ABP = Chemical Agent/Agent Breakdown Product
CAIS = Chemical Agent Identification Set(s)
DGM = Digital geophysical mapping
DoD = Department of Defense
INPR = Inventory Project Report
MEC = Munitions and explosives of concern
MD = Munitions debris
MMRP = Military Munitions Response Program

CAIS DATA QUALITY OBJECTIVE WORKSHEET

SITE: **Schilling Air Force Base**
PROJECT: **CWM Site Inspection / FUDS Project No. B07KS025607**
DQO STATEMENT NUMBER: **1 of 4**

DQO Element Number*	**DQO Element Description***	**Site-Specific DQO Statement**
Intended Data Use(s):		
1	Project Objective(s) Satisfied	Evaluate presence/lack thereof of CAIS.
Intended Need Requirements:		
2	Data User Perspective(s)	Risk, Remedy
3	Contaminant or Characteristic of Interest	CAIS
4	Media of Interest	N/A
5	Required Locations or Areas	5-acre area surrounding former gas instruction building (represents most likely location for CAIS burial)
6	Number of Samples Required	N/A. Digital Geophysical Mapping (DGM) of 5-acre area.
7	Reference Concentration of Interest or Other Performance Criteria	Identification of large anomaly that would be consistent with CAIS shipping container (Pig) burial. If identified, recommendation will be made regarding subsequent actions at the site.
Appropriate Sampling and Analysis Methods:		
8	Sampling Method	Geophysical survey
9	Analytical Method	DGM data processing and comparison to data results from known CAIS pig burial locations.

CAIS = Chemical Agent Identification Set(s), CWM = Chemical Warfare Materiel, DGM = Digital Geophysical Mapping, DQO = Data Quality Objective, FUDS = Formerly Used Defense Sites, N/A = Not applicable
* Refer to EM 200-1-2, Paragraph 4.2.1

CA/ABP DATA QUALITY OBJECTIVE WORKSHEET

SITE: **Schilling Air Force Base**
PROJECT: **CWM Site Inspection / FUDS Project No. B07KS025607**
DQO STATEMENT NUMBER: **2 of 4**

DQO Element Number*	DQO Element Description*	Site-Specific DQO Statement
Intended Data Use(s):		
1	Project Objective(s) Satisfied	Evaluate presence/lack thereof of CA/ABPs
Intended Need Requirements:		
2	Data User Perspective(s)	Risk, Remedy
3	Contaminant or Characteristic of Interest	Mustard and Lewisite and agent breakdown products (1,4-Dithiane; 1,4-Thioxane, CVAA, CVAO)
4	Media of Interest	Soil
5	Required Sampling Locations or Areas and Depths	Area immediately surrounding the former gas instruction building, including possible decontamination area indicated on 1954 air photo (bare ground noted east of gas building). Sample interval 12 to 18 inches below ground surface (below depth disturbed by farming/discing)
6	Number of Samples Required	10 grab samples from grid-based pattern plus 10 discretionary samples, as determined by the field team. Plus associated QA/QC samples.
7	Reference Concentration of Interest or Other Performance Criteria	Screening criteria for human health: H = 10 ug/kg L, CVAA, CVOA = 300 ug/kg 1,4-Dithiane = 610000 ug/kg 1,4-Thioxane = 610000 ug/kg Thiodiglycol = 24000000 ug/kg
Appropriate Sampling and Analysis Methods:		
8	Sampling Method	Soil samples collected in accordance with the PSAP and Site-Specific Work Plan SAP (to be completed after TPP process).
9	Analytical Method	Geomet CDLD SOP-44

CA/ABP = Chemical Agent/ Agent Breakdown Product, CDLD = chemical defense laboratory division, CVAA = 2-chlorovinyl arsenous acid, CVAO = 2-chlorovinyl arsenous oxide, CWM = Chemical Warfare Materiel, DQO = Data Quality Objective, H = mustard, L = Lewisite, QA/QC = Quality Assurance/Quality Control, ug/kg milligrams per kilogram, PSAP = Programmatic Sampling and Analysis Plan, SAP = Sampling and Analysis Plan, SOP = standard operating procedure, TPP = Technical Project Planning, ug/kg = microgram per kilogram.
* Refer to EM 200-1-2, Paragraph 4.2.1

MRSPP DATA QUALITY OBJECTIVE WORKSHEET

SITE: **Schilling Air Force Base**
PROJECT: **CWM Site Inspection / FUDS Project No. B07KS025607**
DQO STATEMENT NUMBER: **3 of 4**

DQO Element Number*	**DQO Element Description***	**Site-Specific DQO Statement**
Intended Data Use(s):		
1	Project Objective(s) Satisfied	Completion of MRSPP Scoring sheets
Intended Need Requirements:		
2	Data User Perspective(s)	Risk and remedy
3	Contaminant or Characteristic of Interest	CAIS, CA/ABPs
4	Media of Interest	Soil
5	Required Sampling Locations or Areas and Depths	IAW CA/ABP DQO
6	Number of Samples Required	IAW CA/ABP DQO
7	Reference Concentration of Interest or Other Performance Criteria	Completion of Explosive Hazard Evaluation (EHE) Tables 1 - 10, Chemical Hazard Evaluation (CHE) Tables 11 – 20, and Health Hazard Evaluation (HHE) Tables 21 – 25.
Appropriate Sampling and Analysis Methods:		
8	Sampling Method	N/A
9	Analytical Method	N/A

CAIS = Chemical Agent Identification Set(s), CA/ABP = Chemical Agent/ Agent Breakdown Product, CHE = Chemical Hazard Evaluation, CWM = Chemical Warfare Materiel, DQO = Data Quality Objective, EHE = Explosive Hazard Evaluation, FUDS = Formerly Used Defense Site, HHE = Health Hazard Evaluation, IAW = in accordance with, MRSPP = Munitions Response Site Prioritization Protocol
* Refer to EM 200-1-2, Paragraph 4.2.1

HRS DATA QUALITY OBJECTIVE WORKSHEET

SITE: **Schilling Air Force Base**
PROJECT: **CWM Site Inspection / FUDS Project No. B07KS025607**
DQO STATEMENT NUMBER: **4 of 4**

DQO Element Number*	**DQO Element Description***	**Site-Specific DQO Statement**
Intended Data Use(s):		
1	Project Objective(s) Satisfied	Collection of EPA HRS CA/ABP-related information
Intended Need Requirements:		
2	Data User Perspective(s)	Risk, compliance, and remedy
3	Contaminant or Characteristic of Interest	IAW CA/ABP DQO
4	Media of Interest	Soil
5	Required Sampling Locations or Areas and Depths	IAW CA/ABP DQO
6	Number of Samples Required	IAW CA/ABP DQO
7	Reference Concentration of Interest or Other Performance Criteria	Results of the CA/ABP findings in order for EPA to complete the MC-related HRS scoring.
Appropriate Sampling and Analysis Methods:		
8	Sampling Method	IAW CA/ABP DQO
9	Analytical Method	IAW CA/ABP DQO

CA/ABP = Chemical Agent/ Agent Breakdown Product, CHE = Chemical Hazard Evaluation, CWM = Chemical Warfare Materiel, DQO = Data Quality Objective, EPA = Environmental Protection Agency, FUDS = Formerly Used Defense Site, HRS = Hazardous Ranking System, IAW = in accordance with, MC = Munitions Constituents.

* Refer to EM 200-1-2, Paragraph 4.2.1

Former Schilling Air Force Base CWM SI

TPP Team	EM 200-1-2, Paragraph 1.1.1	
Decision Makers		
Customer	USACE Kansas City District (CENWK)	
Project Manager	Thomas Simmons, CENWK and Paula Henderson, USAESCH	
Regulators	Kansas Department of Health and Environment (KDHE), EPA Region 7	
Primary Stakeholders	Salina Airport Authority, City of Salina	
Data Types	**Data Users**	**Data Gatherer**
Demographics/Land Use	Risk, Responsibility, and Compliance Perspectives	Parsons (SI Team)
Site Conditions	Remedy Perspective	Parsons (SI Team)
Munitions and Explosives of Concern including CWM	Risk and Remedy Perspectives	Parsons (SI Team)
Archaeology	Compliance and Remedy Perspectives	CENWK, Parsons (avoidance)
Endangered Species	Risk and Compliance Perspectives	CENWK, Parsons (avoidance)

CUSTOMER'S GOALS		EM 200-1-2, Paragraph 1.1.2	
Areas of Concern	**Contaminant Issues**	**Future Land Use**	**Site-specific Closeout Goal (if applicable)**
Former Schilling Air Force Base, Gas Instruction Area	CWM, CA/ABPs	Agricultural, Commercial	TBD
Site Closeout Statement			
To manage CWM or CA/ABP risk (if present) through a combination of remedial action, administrative controls, and/or public education; thereby rendering the site as safe as reasonably possible to humans and the environment and conducive to the anticipated future land use.			
Customer's Schedule Requirements			
Site Inspection and Reporting Complete by December 17, 2010			
Customer's Site Budget			
Site Inspection and Reporting: Confidential			

IDENTIFY SITE APPROACH		
EXISTING SITE INFORMATION & DATA	**EM 200-1-2, Paragraph 1.1.3 and 1.2.1**	
Existing Data	**Located at Repository**	**Preliminary Conceptual Site Model**
Archives Search Report	N/A for SI Phase; Implemented in post-SI Phase as warranted	No
Site-Specific SI Work Plan	N/A for SI Phase; Implemented in post-SI Phase as warranted	Yes
POTENTIAL POINTS OF COMPLIANCE	**EM 200-1-2, Paragraph 1.2.1.3**	
Determination of absence or presence of CWM		
MEDIA OF POTENTIAL CONCERN	**EM 200-1-2, Paragraph 1.2.1.4**	
Qualitative review of CWM presence.		
SITE OBJECTIVES	**EM 200-1-2, Paragraph 1.2.2**	
Collection of sufficient DGM and CA/ABP data results		
See Programmatic and Site-Specific Work Plan (to be developed)		
See Attached Worksheets Developed by the Project Team		
REGULATOR AND STAKEHOLDER PERSPECTIVES	**EM 200-1-2, Paragraph 1.2.3**	
Regulators	**Community Interests**	**Others**
TBD	TBD	TBD
PROBABLE REMEDIES	**EM 200-1-2, Paragraph 1.2.4**	
No Department of Defense Action Indicated (NDAI)		
EXECUTABLE STAGES TO SITE CLOSEOUT	**EM 200-1-2, Paragraph 1.2.5**	
Site Inspection (SI) - possible NDAI, otherwise:		
Remedial Investigation/Feasibility Study (RI/FS)		
Proposed Plan		
Decision Document		
Remedial Design		
Remedial Action (as necessary)		
Recurring Review		
Time Critical Removal Action (as required)		

IDENTIFY CURRENT PROJECT		
SITE CONSTRAINTS AND DEPENDENCIES	**EM 200-1-2, Paragraph 1.3.1**	
Administrative Constraints and Dependencies		
Rights of Entry		
Funding beyond the SI, if required		
Concurrent planning programs		
Scheduling		
Technical Constraints and Dependencies		
Property owner/leaseholder site activities (Site access)		
Topography/vegetation		
Legal and Regulatory Milestones and Requirements		
Consistent with CERCLA and the NCP, and in compliance with all legally applicable Federal and State requirements.		
Public, stakeholder, and regulatory involvement and review of key documents (see schedule)		
Funding beyond the SI		
CURRENT EXECUTABLE STAGE	**EM 200-1-2, Paragraph 1.3.3**	
TPP Technical Memorandum		
Site-Specific Work Plan		
Site Inspection		
SI Report Recommendation		
See Attached Worksheets Developed by the Project Team		
Basic (For Current Projects)	**Optimum** (For Future Projects)	**Excessive** (Objectives that do not lead to site closeout)
Site Reconnaissance	RI/FS	

Acronyms

CA/ABP - Chemical Agent/Agent Breakdown Product
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CENWK - U.S. Army Corps of Engineers, Kansas City District
CWM - Chemical Warfare Materiel
DGM - Digital Geophysical Mapping
EPA - Environmental Protection Agency
KDHE - Kansas Department of Health and Environment
NDAI - No Department of Defense Action Indicated
NCP - National Contingency Plan
RI/FS - Remedial Investigation and Feasibility Study
SI - Site Inspection
TBD - To be determined
TPP - Technical Project Planning
USACE - U.S. Army Corps of Engineers
USAESCH - U.S. Army Engineering and Support Center, Huntsville

PROJECT OBJECTIVES WORKSHEET

SITE: **Gas Instruction Area**

PROJECT: **Former Schilling Air Force Base**

Site Objective [a]					Data Needs	Data Collection Methods	Data User(s)	Project Objective Classification [d]
Number	Executable Stage [b]		Description	Source [c]				
	Current	Future						
1	Yes		Determine presence/lack thereof of CWM and CA/ABPs	ASR, DGM, Environmental Samples	Is there any CAIS or CA/ABPs? If so what type, where and hazard posed. Current and future LU.	DGM, Environmtental sampling	Risk and Remedy Perspectives	Basic

a Refer to EM 200-1-2, Paragraph 1.2.2

b Refer to EM 200-1-2, Paragraph 1.2.5

c For example, Meeting with Customer/stakeholder/Regulator, documents.

d Classification of project objectives can only occur after the current project has been identified. Refer to EM 200-1-2, Paragraph 1.3.3.

ASR - Archives Search Report

CA/ABP - Chemical Agent/ Agent Breakdown Product

CAIS - Chemical Agent Identification Set

CWM - Chemical Warfare Materiel

DGM - Digital Geophysical Mapping

LU - Land Use

Section 10

Technical Project Planning Meeting #1
Former Schilling Air Force Base
Presentation Slides

The following slides have been provided as a copy of the TPP Meeting #1 presentation. Changes to the technical approach, schedule, proposed sampling, and any other changes made during the TPP meeting area reflected in the TPP Memorandum and the remainder of the associated documents. The slides on the following pages are shown as they were presented.

This page intentionally left blank.

Kansas City District

Former Schilling Air Force Base
Salina, Kansas

Technical Project Planning
For
Chemical Warfare Materiel Site Inspection

October 20, 2009

Kansas City District

Meeting Agenda

- Introduction
- Program Objective / Definitions
- CWM SI Overview
- Site History
- CSM
- Field Work Overview
- TPP Worksheets
- Discussion and Action Items

Kansas City District

CWM SI Program

The objective of the Chemical Warfare Materiel Site Inspection (CWM SI) program is to determine:

- whether the individual project sites within the FUDS inventory warrant further response action due to chemical warfare materiel (CWM), chemical agent (CA), munitions and explosives of concern (MEC), and munitions constituents (MC) or.
- can proceed to a no Department of Defense action indicated (NDAI) status.

Kansas City District

TPP Meeting Objectives

- ***Primary Objective:*** To solicit Project Stakeholders input and attain concurrence on the CWM SI Technical Approach, including assignment of sampling locations, to determine if further actions are necessary.

Kansas City District

Definitions

CWM – Chemical Warfare Materiel-The Army defines CWM as an item configured as a munition that contains chemical agent. The term CWM includes V- and G-series nerve agent, H and HN-series blister agent, and lewisite in other than munition configurations. Due to their hazards, prevalence, and military-unique application, dilute nerve agent and neat chemical agent identification sets (CAIS) are also considered chemical warfare materiel. **Chemical warfare materiel does not include**: riot control agents; chemical herbicides (plant/weed killers); smoke and flame producing items, regardless of configuration; or soil, water, debris or other media contaminated with chemical agents or **CAIS containing dilute agent** (other than dilute nerve agent).

CA – Chemical Agent is a chemical compound (to exclude experimental compounds) that, through its chemical properties, produces a lethal or other damaging effects on human beings and is intended for use in military operations to kill, seriously injure, or incapacitate persons through its physiological effects. **Excluded are** research, development, testing, and evaluation (RDT&E) dilute solutions; riot control agents; chemical defoliants and herbicides; smoke and other obscuration materials; flame and incendiary materials; and **industrial chemicals**.

Kansas City District

Definitions

MEC – Munitions and Explosives of Concern-Specific categories of military munitions that may pose unique explosives safety risks. MEC includes unexploded ordnance (UXO), discarded military munitions (DMM), and explosive concentrations of munitions constituents (MC).

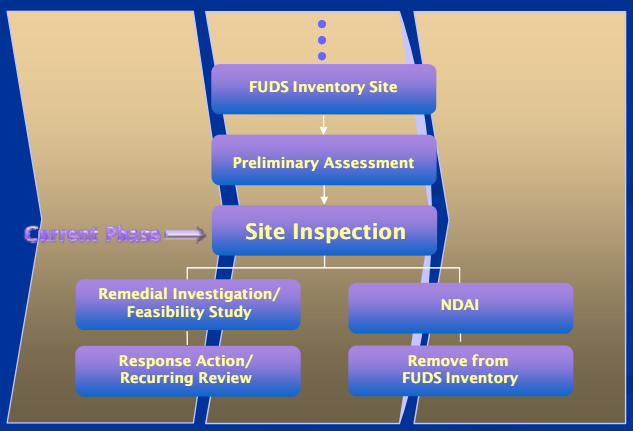
MC – Munitions Constituents-Any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials and emission, degradation, or breakdown elements of such ordnance or munitions.

ABP – Agent Breakdown Product. ABPs are chemical compound that result from the decomposition of chemical agents, such as mustard, nitrogen mustard, and Lewisite.

Kansas City District

CWM SI PROCESS FLOW

Former Schilling Air Force Base
Salina, Kansas



Kansas City District

OVERALL APPROACH FOR CONDUCTING CWM SI FIELD ACTIVITIES

Each site evaluated for applicability of Interim Guidance for CWM Response Actions (probability of encountering CWM)

Phase I:
- **Site Visit (assess conditions)**

Phase II:
- Geophysical survey
- CA/ABP Sampling
  - **Modified Level D PPE**
  - **Air monitoring (CARA)**
  - **Emergency Personnel Decontamination Station**
  - **Exclusion Zone**
- CA/ABP Analysis

If CWM, CAIS, MEC, etc. encountered, property owner notified

Kansas City District

Site History

- Smoky Hill Army Air Base constructed in 1942
  - 4,134.72 acres located ~2 miles Southwest of Salina, KS
  - During World War II, supported training of pilots for bombing missions
- Renamed Schilling Air Force Base (AFB) in 1957
- Base permanently closed in 1967 and conveyed to the City of Salina for use as a municipal airport.

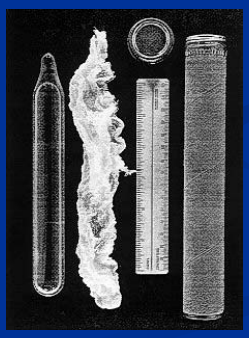
Kansas City District

Site History (CWM)

- Indication that personnel training was conducted in the familiarization of chemical agents, use of protective gear, and decontamination procedures
- ASR noted CAIS onsite - final disposition not specified
- Liquid mustard decontamination training may have occurred
  - approximate 100-square yard area used for decontamination training (location not specified).
- Gas instruction building, presumably used for decontamination practice. No longer standing, was located 100-yards north of the radio transmitter building.
- No CWM or CA contamination found to date

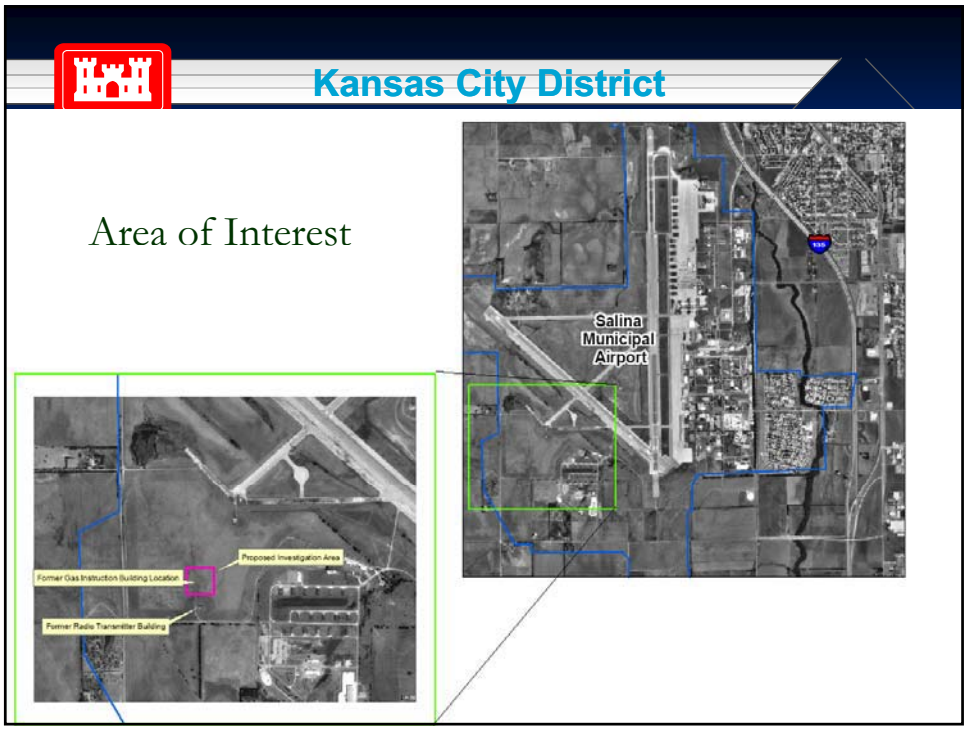
Kansas City District

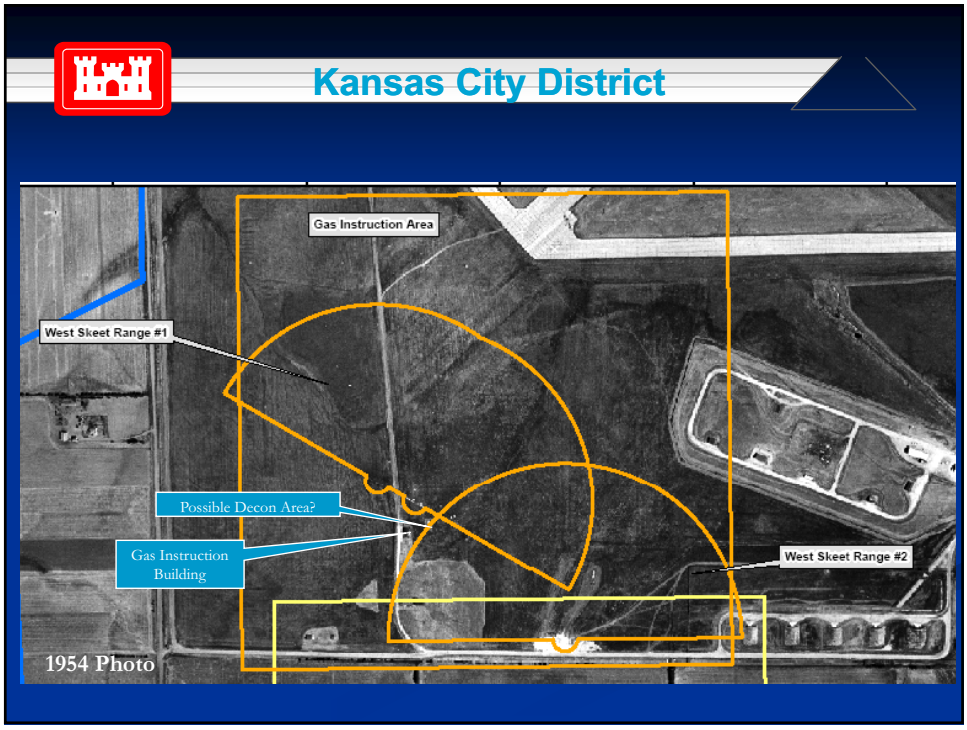
CAIS Potentially Associated with Schilling AFB



Kansas City District

Types and Components of Chemical Agent Identification Sets (CAIS)			
CAIS Type	Description	Contents	
		Chemical Type	Volume Per Container
K941	CAIS used for decontamination training – M1 Toxic Gas Set	Mustard (H), Sulfur Mustard (HS), or Distilled Mustard (HD)	3.5 ounces
K951/K952	CAIS for outdoor identification training – M1 Instructional War Gas Identification Set	Mustard (H)	2 mL of H diluted with 38 mL of chloroform.
		Lewisite (L)	2 mL of L diluted with 38 mL of chloroform
		Chloropicrin (PS)	20 mL of PS and 20 mL of chloroform
		Phosgene (CG)	40 mL


Kansas City District
Area of Interest
Salina Municipal Airport
Proposed Investigation Area
Former Gas Instruction Building Location
Former Radio Transmitter Building


Kansas City District
Gas Instruction Area
West Skeet Range #1
Possible Decon Area?
Gas Instruction Building
West Skeet Range #2
1954 Photo

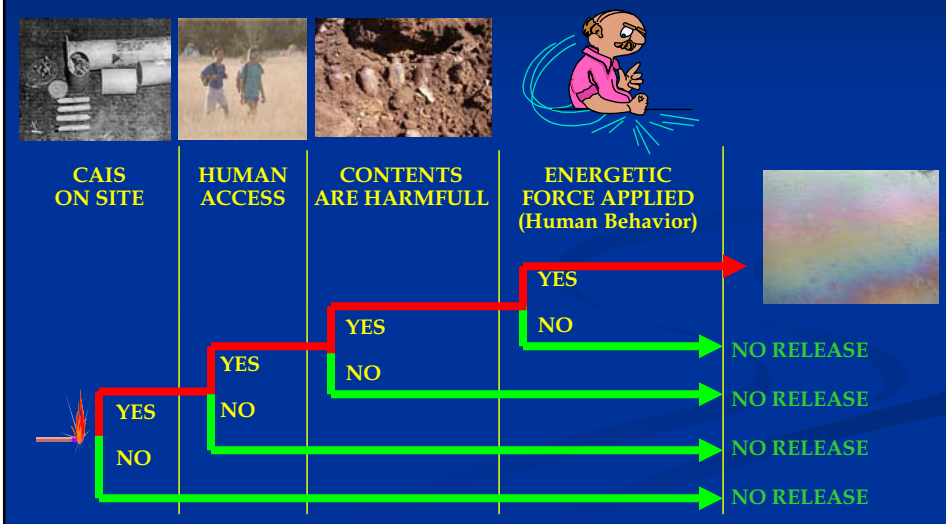
Kansas City District

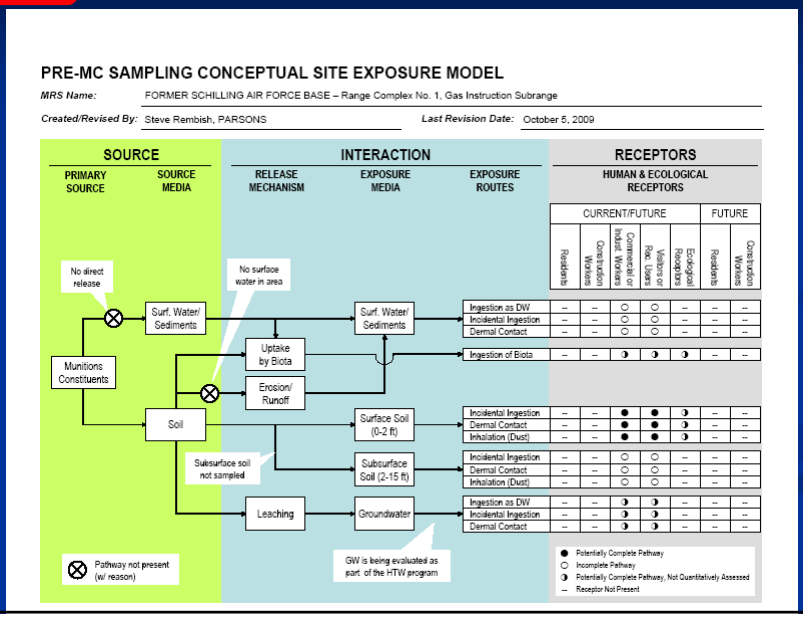
Conceptual Site Model

Subsite/ Range	Suspect Past DoD Activities	Potential CAIS Presence	CWM/CAIS Found Since Closure	Proposed Field Sampling
Gas Instruction Area	Chemical agent decontamination of ground and buildings.	Possible burial of CAIS based on disposal practices encountered at other FUDS.	No physical evidence or documentation of CAIS burial or CA contamination.	Geophysical investigation for CAIS shipping containers (Pigs). Soil samples for CA/ABP analysis.

Kansas City District

CAIS Accident Event Tree





CAIS and CA/ABP

- Items of Interest (Are they present?)
  - CAIS
- Constituents of interest (What concentration?)
  - CAIS = H, L, CG, CS, and chloroform

    Note: CG, CS, and chloroform are non-persistent

Kansas City District

SI Technical Approach

- In accordance with SI guidance, the primary objectives for the Schilling CWM site can be attained by implementation of the following Technical Approach:
  - **Digital Geophysical Mapping**

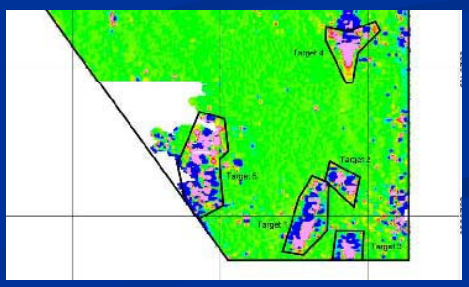
    ~5 acre area around former gas instruction building (most likely area for CAIS burial). Metal (e.g., shipping containers) typically buried with CAIS
  - **Sampling**

    Collect soil samples. Biased toward the highest potential for contamination (stressed vegetation) or grid-based.

Kansas City District

CWM Site Inspection

1. Geophysical survey of 5-acre area (mag)
2. Process data and identify anomalies consistent with CAIS burial (e.g., large anomalies)
3. Collect grab soil samples from area of interest
   - Analyze for CA/ABPs



Kansas City District

Sampling

- Sample media
  - Soil
- Analyses
  - Chemical Agents (H, L)
  - Agent Breakdown Products
    - H (1,4-oxathiane, 1,4-dithiane, TDG*)
    - L (CVAA, CVAO)

Sample Interval	Number of Samples/ Proposed Analyses	Justification
12 to 18-inches	10 – CA and ABPs	•Collected from areas exhibiting stressed vegetation or grid-based pattern. Area located around former gas instruction building

Kansas City District

SI Screening Levels

- Screening Criteria for Human Health
  - Soil criteria
    - *USACHPPM/ORNL HBESL for CA
    - **EPA residential screening level
    - ***MRSPP Guidance Document

H = 10 ug/kg*
L, CVAA, CVOA = 300 ug/kg*
1,4-Dithiane = 610000 ug/kg**
1,4-Thioxane = 610000 ug/kg**
Thiodiglycol = 24000000 ug/kg***

Kansas City District

PLANNING FOR PROJECT EXECUTION

Based On EM 200-1-2: Technical Project Planning (TPP) Process

- Identify Current Site
- Determine Data Needs
- Develop Data Collection Program
- Implementation and Assessment

Kansas City District

Introduction

- Purpose
  - To achieve site closeout within project constraints
  - To involve stakeholders in project decision making
  - To systematically address complex issues
  - Structure
  - Four phase process
  - Spirit
  - "Structured brainstorming"

Kansas City District

Overall Objective

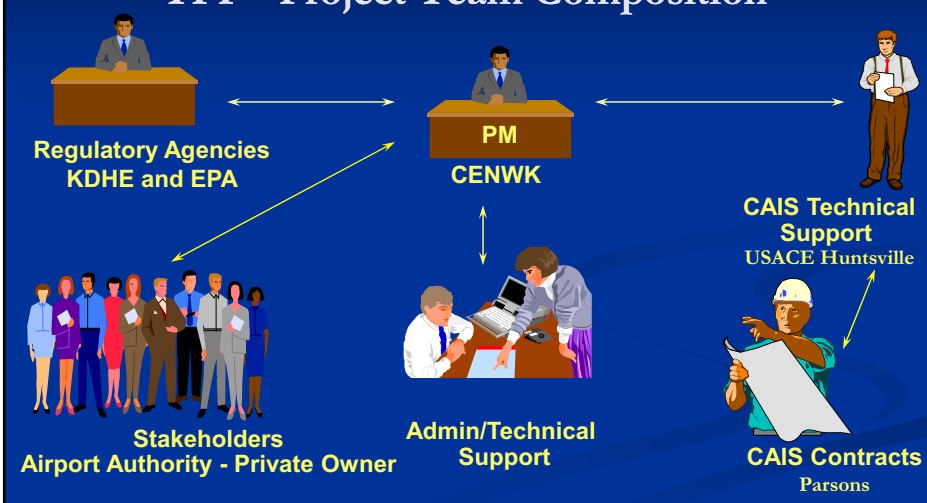
To identify the desired site closeout condition (the project goal), and create a plan with the actions necessary to reach this goal, with stakeholder acceptance

Or, said another way…

To make good decisions in the face of complex circumstances

Kansas City District

TPP - Project Team Composition



Kansas City District

Four Phases

- **Phase I - Identify the project**
  (90% of TPP effort)
- **Phase 2 - Determine data needs**
- **Phase 3 - Develop data collection options**
- **Phase 4 - Finalize data collection program**

(Phases 3 & 4 mostly pre-defined for munitions response projects.)

Describe the situation

What *do* we know?

What *don't* we know?

How best to get the information we need?

Kansas City District

Team Members

- Stakeholders
  - Government Agencies – Federal and state
    - Kansas City District COE (CENWK)
    - Kansas Dept. of Health and Environment (KDHE)
    - U. S. EPA Region 7
  - Regulators – KDHE, EPA Region 7
  - Property owner - Salina Airport Authority
- External technical resources (technical experts)
    - U.S. Army Engineering & Support Center, Huntsville
    - Parsons

Kansas City District

Key Products

- Understanding of stakeholder concerns
- Project goal (site closeout statement)
- Conceptual site model (CSM)
- Project objective (ultimate safe closure)
- Probable remedies (NDAI or RI / FS)
- Actions needed for site closeout

Kansas City District

Understanding Stakeholder Concerns

- Communicate, communicate,
- Identify stakeholders and their special interests
  - Determine key issues ("hot buttons")
- Understand special interests
- Elicit expectations and perspectives

Kansas City District

Project Goal

- Statement of site closeout
  - What is the "walk away" goal?
  - Goal may be influenced by:
    - Future land use
    - Regulatory status
    - Schedule and budget

Kansas City District

SITE CLOSEOUT STATEMENT

To manage the Chemical Agent Identification Set (CAIS) / Chemical Agent (and ABP) risk through a combination of remedial action, institutional controls, and/or public education thereby rendering the site as safe as reasonably possible to humans and the environment, and conducive to the anticipated future land use.

Kansas City District

Conceptual Site Model (CSM)

- Definition of CSM
  - A simple model of the relationships between contaminants at a site and the potential exposure pathways to human health or the environment.
- Examples of Exposure Pathways
  - CAIS becomes exposed by soil movement activities
  - Buried CAIS may be exposed by farming or construction crews
  - Human or ecological exposure to contaminated soil

Kansas City District

Project Objectives

- Definition of project objectives
  - Short- and long-term issues which need to be addressed and resolved prior to site closeout
- Impacts on Project Objectives
  - Regulatory issues
    - CERCLA, NCP
  - Future land use
  - Schedule and funding

Kansas City District

Project Objectives (Cont'd)

- Examples of project objectives
  - Determine whether the area of concern is contaminated with CA/ABP
  - Determine what the next step in the process is
  - Justify the next step to the stakeholders satisfaction

Kansas City District

Probable Remedies

- What remedial alternatives seem most suitable?
- What additional information is needed to support/discard such alternatives?
- Innovative technologies may be appropriate and should be considered
- Use of presumptive remedies (RI/FS)

Kansas City District

Actions Needed for Site Closeout

- Identify milestones for each project stage
- Define alternative actions for site closeout
  - Recognize constraints and dependencies
    - Schedule, budget, weather, ROE, etc.

Kansas City District

Quantitative Sampling

- CA/ABP samples taken subsurface
  - Below level of disturbance by farming
  - Identify concentration, if any

Digital Geophysical Survey

- Magnetometer survey of area near former gas training building (most likely location for burial)
  - Identify large anomalies consistent with CAIS burial, if any

Kansas City District

TPP Team	EM 200-1-2, Paragraph 1.1.1	
Decision Makers		
Customer	USACE Kansas City District (CENWK)	
Project Manager	Thomas Simmons, CENWK and Paula Henderson, USAESCH	
Regulators	Kansas Department of Health and Environment (KDHE), EPA Region 7	
Primary Stakeholders	Salina Airport Authority, City of Salina	
Data Types	**Data Users**	**Data Gatherer**
Demographics/Land Use	Risk, Responsibility, and Compliance Perspectives	Parsons (SI Team)
Site Conditions	Remedy Perspective	Parsons (SI Team)
Munitions and Explosives of Concern (MEC) inc. CWM	Risk and Remedy Perspectives	Parsons (SI Team)
Archaeology	Compliance and Remedy Perspectives	CENWK, Parsons (avoidance)
Endangered Species	Risk and Compliance Perspectives	CENWK, Parsons (avoidance)

CUSTOMER'S GOALS		EM 200-1-2, Paragraph 1.1.2	
Areas of Concern (AOC)	**Contaminant Issues**	**Future Land Use**	**Site-specific Closeout Goal (if applicable)**
Former Schilling AFB	CWM, MC	Agricultural, Commercial	TBD
Site Closeout Statement			
To manage CWM or MC risk (if present) through a combination of remedial action, administrative controls, and/or public education; thereby rendering the site as safe as reasonably possible to humans and the environment and conducive to the anticipated future land use.			
Customer's Schedule Requirements			
Site Inspection and Reporting Complete by December 17, 2010			
Customer's Site Budget			
Site Inspection and Reporting: Confidential			

Kansas City District

IDENTIFY SITE APPROACH		
EXISTING SITE INFORMATION & DATA	**EM 200-1-2, Paragraph 1.1.3 and 1.2.1**	
Existing Data	**Located at Repository**	**Preliminary Conceptual Site Model**
Archives Search Report	N/A for SI Phase; Implemented in post-SI Phase as warranted	No
Site-Specific SI Work Plan	N/A for SI Phase; Implemented in post-SI Phase as warranted	Yes
POTENTIAL POINTS OF COMPLIANCE	**EM 200-1-2, Paragraph 1.2.1.3**	
Determination of absence or presence of CWM		
Avoidance of sensitive conditions: wetlands, endangered species, archaeological sites		
MEDIA OF POTENTIAL CONCERN	**EM 200-1-2, Paragraph 1.2.1.4**	
Qualitative review of CWM presence.		
SITE OBJECTIVES	**EM 200-1-2, Paragraph 1.2.2**	
Collection of sufficient CWM or MC data		
See Programmatic and Site-Specific Work Plan (to be developed)		
See Attached Worksheets Developed by the Project Team		
REGULATOR AND STAKEHOLDER PERSPECTIVES	**EM 200-1-2, Paragraph 1.2.3**	
Regulators	**Community Interests**	**Others**
TBD	TBD	TBD
PROBABLE REMEDIES	**EM 200-1-2, Paragraph 1.2.4**	
No Department of Defense Action Indicated (NDAI)		
EXECUTABLE STAGES TO SITE CLOSEOUT	**EM 200-1-2, Paragraph 1.2.5**	
Site Inspection (SI) - possible NDAI, otherwise:		
Remedial Investigation/Feasibility Study (RI/FS)		
Proposed Plan		
Decision Document		
Remedial Design (RD)		
Remedial Action (as necessary)		
Recurring Review		
Time Critical Removal Action (as required)		

Kansas City District

IDENTIFY CURRENT PROJECT
SITE CONSTRAINTS AND DEPENDENCIES EM 200-1-2, Paragraph 1.3.1
Administrative Constraints and Dependencies
Rights of Entry (ROE)
Cultural Resources
Funding beyond the SI, if required
Concurrent planning programs
Scheduling
Technical Constraints and Dependencies
Property owner/leaseholder site activities (Site access)
Cultural Resources
Topography/vegetation
Environmentally sensitive areas
Legal and Regulatory Milestones and Requirements
Consistent with CERCLA and the NCP, and in compliance with all legally applicable Federal and State requirements.
Public, stakeholder, and regulatory involvement and review of key documents (see schedule)
Funding beyond the SI
CURRENT EXECUTABLE STAGE EM 200-1-2, Paragraph 1.3.3
TPP Technical Memorandum
Site-Specific Work Plan
Site Inspection
SI Report Recommendation
See Attached Worksheets Developed by the Project Team

Basic (For Current Projects)	Optimum (For Future Projects)	Excessive (Objectives that do not lead to site closeout)
Site Reconnaissance	RI/FS	

Acronyms
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
ECBC - Edgewood Chemical Biological Center
FUDS - Formerly Used Defense Sites
NCP - National Contingency Plan
TPP - Technical Project Planning
RI/FS - Remedial Investigation and Feasibility Study

Kansas City District

PROJECT OBJECTIVES WORKSHEET

SITE: **Gas Instruction Area**
PROJECT: **Former Schilling Air Force Base**

Site Objective [a]					Data Needs	Data Collection Methods	Data User(s)	Project Objective Classification [d]
Number	Executable Stage [b]		Description	Source [c]				
	Current	Future						
1	Yes		Determine presence/lack thereof of CWM and MC	ASR, DGM, Environmental Samples	Is there any CAIS or MC? If so what type, where and hazard posed. Current and future LU.	DGM, Environmental sampling	Risk and Remedy Perspectives	Basic

a Refer to EM 200-1-2, Paragraph 1.2.2
b Refer to EM 200-1-2, Paragraph 1.2.5
c For example, Meeting with Customer/stakeholder/Regulator, documents.
d Classification of project objectives can only occur after the current project has been identified. Refer to EM 200-1-2, Paragraph 1.3.3.

ASR - Archives Search Report
CWM - Chemical Warfare Materiel
DGM - Digital Geophysical Mapping
LU - Land Use
SAP - Sampling and Analysis Plan

Kansas City District

CAIS DATA QUALITY OBJECTIVE WORKSHEET

DQO Element Number*	DQO Element Description*	Site-Specific DQO Statement
Intended Data Use(s):		
1	Project Objective(s) Satisfied	Evaluate presence/lack thereof of CAIS.
Intended Need Requirements:		
2	Data User Perspective(s)	Risk, Remedy
3	Contaminant or Characteristic of Interest	CAIS
4	Media of Interest	N/A
5	Required Locations or Areas	5-acre area surrounding former gas instruction building (represents most likely location for CAIS burial)
6	Number of Samples Required	N/A. Digital Geophysical Mapping (DGM) of 5-acre area.
7	Reference Concentration of Interest or Other Performance Criteria	Identification of large anomaly that would be consistent with CAIS shipping container (Pig) burial. If identified, recommendation will be made regarding subsequent actions at the site.
Appropriate Sampling and Analysis Methods:		
8	Sampling Method	Geophysical survey
9	Analytical Method	DGM data processing and comparison to data results from known CAIS burial locations.

Kansas City District

CA/ABP DATA QUALITY OBJECTIVE WORKSHEET

DQO Element Number*	DQO Element Description*	Site-Specific DQO Statement
Intended Data Use(s):		
1	Project Objective(s) Satisfied	Evaluate presence/lack thereof of CA/ABPs
Intended Need Requirements:		
2	Data User Perspective(s)	Risk, Remedy
3	Contaminant or Characteristic of Interest	Mustard and Lewisite and agent breakdown products (1,4-Dithiane; 1,4-Thioxane)
4	Media of Interest	Soil
5	Required Sampling Locations or Areas and Depths	Within 5-acre area surrounding former gas instruction building, grab samples collected from areas of stressed vegetation or, alternatively, in a grid-based pattern. Sample interval 12 to 15 inches below ground surface
6	Number of Samples Required	10 grab samples anticipated plus associated QA/QC samples.
7	Reference Concentration of Interest or Other Performance Criteria	HBESLs for CA, *(USACHPPM/ORNL Technical Report, March 1999)*
Appropriate Sampling and Analysis Methods:		
8	Sampling Method	Soil samples collected in accordance with the PSAP and Site-Specific Work Plan SAP (to be completed after TPP process).
9	Analytical Method	Geomet Technologies SOPs

Kansas City District

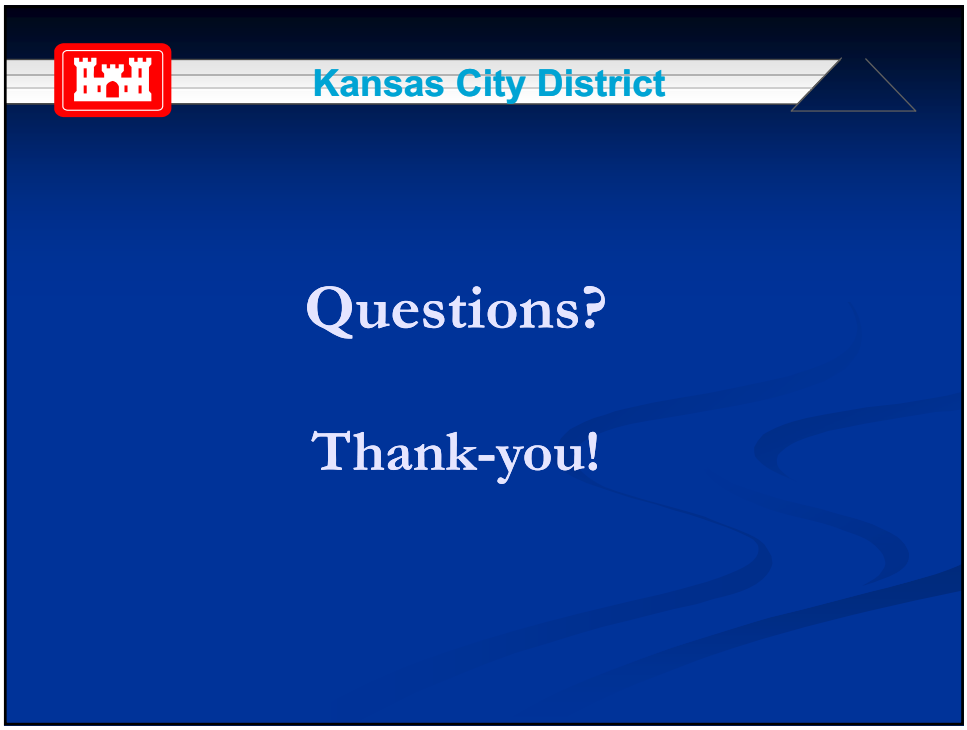
Moving Forward - Schedule

- ☑ Historical Documentation Review (ASR)
- ☑ TPP Meeting #1 (today)
  - ☑ Site Visit
- ❑ Final TPP Memorandum (Dec. 2009)
- ❑ Site-Specific Work Plan (Apr. 2010)
- ❑ Field Work (May/Jun. 2010)
  - Geophysical Survey
  - CA/ABP Sampling
- ❑ Draft Site Inspection Report (Aug. 2010)
  - Record Field Work Activities
  - Analyze Data
  - Make recommendations
- ❑ TPP Meeting #2 (Dec. 2010)

Kansas City District

TPP Meeting Closure Issues

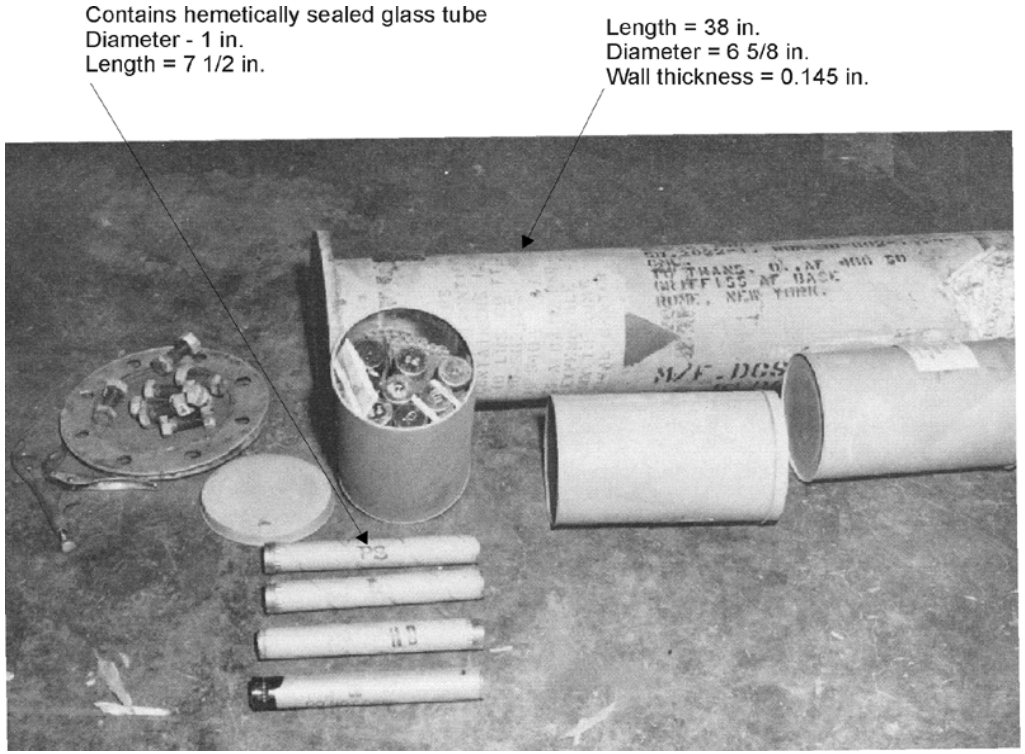
- Concurrence –
  - Number, type, and location of samples.
  - Technical Approach
  - Comparison Criteria
- Other Issues/Notes –
  - Area Access Limitations?
    - Crops
    - Weather
  - Endangered Species present? Timeframes to avoid fieldwork.


Kansas City District
Questions?
Thank-you!

Types and Components of Chemical Agent Identification Sets (CAIS)

Former Schilling Air Force Base, Salina, Kansas

CAIS Type	Description	Packaging	Contents		
			Chemical Type	No. of Containers	Volume Per Container
K951/K952	CAIS for outdoor identification training – M1 Instructional War Gas Identification Set	48 Pyrex®, flame-sealed, 7.5-inches by 1-inch ampoules. Each ampoule is packed in a cardboard screw cap container with agent type indicated on the cardboard container. Twelve cardboard containers each are packaged into 4 press fit metal cans 9¼ inches high. The cans are packed into a steel cylinder 6 5/8 inches in diameter, approximately 38 inches long, and 0.145 inches thick. The open end of the cylinder is closed by a flanged end cover which is secured by eight bolts. The only difference between the K951 and K952 is that the K951 was issued with blasting caps that were packed and shipped in a separate container. A shipping container weighs about 110 pounds when full.	Mustard (H)	12	2 mL of H diluted with 38 mL of chloroform.
			Lewisite (L)	12	2 mL of L diluted with 38 mL of chloroform
			Chloropicrin (PS)	12	20 mL of PS and 20 mL of chloroform
			Phosgene (CG)	12	40 mL



951/K952 CAIS

Types and Components of Chemical Agent Identification Sets (CAIS)

Former Schilling Air Force Base, Salina, Kansas

CAIS Type	Description	Packaging	Contents		
			Chemical Type	No. of Containers	Volume Per Container
K941	CAIS used for decontamination training – M1 Toxic Gas Set	24 round screw-top bottles with heat resistant paint indicating the contents. Four bottles are packed in a one-half inch layer of sawdust within a sealed metal can. The cans are pressure sealed, 6¼ inches high, and have a sardine-type key on the bottom. Six of these cans are placed into a steel shipping cylinder that is 6-5/8 inches in diameter, approximately 38 inches long, and 0.145 inches thick. The open end of the cylinder is closed by a flanged end cover which is secured by eight bolts. A shipping container weighs about 110 pounds when full.	Mustard (H), Sulfur Mustard (HS), or Distilled Mustard (HD)	24	3.5 ounces

K941 CAIS (M1 Toxic Gas Set)