DISPOSAL OF CONTAMINATED SOIL
AT
WINKLEPECK BURNING GROUNDS

Ravenna Army Ammunition Plant (RVAAP)
Ravenna, Ohio

Contract No. W52H09-06-C-5021

Submitted to

U.S. Army Tank-Automotive and Armaments Command
1 Rock Island Arsenal
Rock Island, IL 61299

Submitted by

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FINAL WORK PLAN

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ACRONYMS

ACM	Asbestos Containing Material
ACO	Administrative Contracting Officer
AIHA	American Industrial Hygiene Association
APP	Accident Prevention Plan
BRACO	Base Realignment and Closure Technical Support Office
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COR	Contracting Officers Representative
CRZ	Contaminant Reduction Zone
CSHM	Corporate Safety & Health Manager
CY	Cubic Yards
DSW	Division of Surface Water
EPA	Environmental Protection Agency
EZ	Exclusion Zone
FFS	Focused Feasibility Study
FSP	Field Sampling and Analysis Plan
FWSAP	Facility-Wide Sampling and Analysis Plan
GOCO	Government Owned, Contractor Operated
HQ	Headquarters
IAW	In Accordance With
IRP	Installation Restoration Program
LL	Load Line
MEC	Munitions and Explosives of Concern
MI	Multi-incremental
NGB	National Guard Bureau
NVLAP	National Voluntary Laboratory Accreditation Program
OD-2	Open Demolition 2
OEPA	Ohio Environmental Protection Agency
OHARNG	Ohio Army National Guard
OSHA	Occupational Safety and Health Administration
PIKA	PIKA International, Inc.
PLM	Polarized Light Microscopy
PM	Program Manager
PjM	Project Manager
POC	Point of Contact
QAPP	Quality Assurance Project Plan
QCM	Quality Control Manager
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation

RTC	Response to Comments
RTLS	Ravenna Training and Logistics Site
RVAAP	Ravenna Army Ammunition Plant
SOW	Scope of Work
SS	Site Asbestos Supervisor
SSHO	Site Safety and Health Officer
TACOM	US Army Tank-automotive and Armaments Command
WBG	Winklepeck Burning Grounds
WP	Work Plan
WZ	Work Zone

DOCUMENT DISTRIBUTION

Name/Organization	Hard Copies	Electronic Copies
William Wynne – BRACO	0	1
Irving Venger - RVAAP	2	2
Eileen Mohr - OEPA	1	1
Glen Beckham - USACE Louisville District	1	1
Kevin Tiemeier - USAEC	1	0
Jeffrey Gollon – TACOM	1	0
Maj. Ed Meade – OHARNG and Kathryn Elgin – RTLS	1	1

BRACO - Base Realignment and Closure Technical Support Office

RVAAP - Ravenna Army Ammunition Plant

OEPA - Ohio Environmental Protection Agency

USACE - United States Army Corps of Engineers

USAEC - United States Army Environmental Center

TACOM - US Army Tank-Automotive and Armaments Command

OHARNG - Ohio Army National Guard

RTLS - Ravenna Training and Logistics Site

1.0 INTRODUCTION

1.1 GENERAL INFORMATION

This Work Plan (WP) has been developed in response to the Scope of Work (SOW) for Disposal of Contaminated Soil at the Winklepeck Burning Grounds (WBG), at the Ravenna Army Ammunition Plant (RVAAP) in Ravenna, Ohio. A copy of the SOW is presented in Appendix A.

The plan describes the procedures, operational sequence, and resources PIKA International, Inc. (PIKA) will use to transport and dispose of an estimated maximum of six thousand (6,000) cubic yards (CY) of asbestos contaminated soil (special waste) located at the WBG. The work will be performed on behalf of the U.S. Army Tank-Automotive and Armaments Command (TACOM) and monitored by the U.S. Army Base Realignment and Closure Technical Support Office (BRACO).

1.1.1 Project Authorization and Background

Authorization for performance is contained in contract W52H09-06-C-5021 issued to PIKA by TACOM, Rock Island, Illinois.

1.1.2 RVAAP Location

When the RVAAP Installation Restoration Program (IRP) began in 1989, the RVAAP was identified as a 21,419 acre installation. The property boundary was resurveyed by the Ohio Army National Guard (OHARNG) over a two year period (2002 and 2003) and the actual total acreage of the property was found to be 21,683 acres. As of February 2006, a total of 20,403 acres of the former 21,683 acre RVAAP have been transferred to the National Guard Bureau (NGB) and subsequently licensed to the OHARNG for use as a military training site. The current RVAAP consists of 1,280 acres scattered throughout the Ravenna Training and Logistics Site (RTLS). The RTLS is in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 kilometers (3 miles) east northeast of the city of Ravenna and approximately 1.6 kilometers (1 mile) northwest of the city of Newton Falls. The RVAAP portions of the property are solely located within Portage County. The RTLS/RVAAP is a parcel of property approximately 17.7 kilometers (11 miles) long and 5.6 kilometers (3.5 miles) wide bounded by State Route 5, the Michael J. Kirwin Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east. The RTLS is surrounded by several communities: Windham on the north;

Garrettsville 9.6 kilometers (6 miles) to the northwest; Newton Falls 1.6 kilometers (1 mile) to the south east; Charlestown to the southwest; and Wayland 4.8 kilometers (3 miles) to the south. When RVAAP was operational the RTLS did not exist and the entire 21,683-acre parcel was a government-owned contractor operated (GOCO) industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP and therefore references to the RVAAP in this document are considered to be inclusive of the historical extent of the RVAAP, which is inclusive of the combined acreages of the current RTLS and RVAAP, unless otherwise specifically stated. A regional map indicating the location of the RVAAP is presented in Appendix B as Figure 1. A site map showing the location of WBG within the RVAAP is presented in Appendix B as Figure 2.

1.1.3 RVAAP History

Production at the facility began in December 1941 with the primary missions of depot storage and ammunition loading. To accomplish these two missions, the installation was divided into two separate units, the Portage Ordnance Depot and the Ravenna Ordnance Plant. The Portage Ordnance Depot's primary mission was depot storage of munitions and components, while the Ravenna Ordnance Plant's mission was loading and packing major caliber artillery ammunition and the assembly of munitions initiating components that included fuzes, boosters and percussion elements. In August 1943, the installation was redesignated the Ravenna Ordnance Center and again in November 1945 as the Ravenna Arsenal.

The plant was placed in standby status in 1950 and operations were limited to renovation, demilitarization and normal maintenance of equipment, along with storage of ammunition and components. The plant was reactivated during the Korean Conflict for the loading and packing of major caliber shells and components. All production ended in August 1957, and in October 1957 the installation was again placed in a standby condition. Rehabilitation work started in October 1960 to establish facilities in the ammonium nitrate line for the processing and explosive melt-out of bombs. These operations commenced in January 1961. In July 1961 the plant was again deactivated. In November 1961 the installation was divided into the Ravenna Ordnance Plant and an industrial section, with the entire installation then being designated as the RVAAP. In May 1968, RVAAP began loading, assembling, and packing munitions on three LLs and two component lines in support of the Southeast Asia Conflict. These facilities were deactivated in August 1972. The demilitarization of the M71A1

90MM projectile extended from June 1973 until March 1974. Demilitarization of various munitions was conducted from October 1982 through 1992.

Up until 1999, the RVAAP was a 21,683 acre installation. A total of 20,403 acres of the former 21,683 acre RVAAP was transferred to the United States Property and Fiscal Officer (USP&FO) for Ohio in 1996 and 1999 for use by OHARNG as a military training site. The current RVAAP consists of 1,280 acres in several distinct parcels scattered throughout the confines of OHARNG RTLS. The RVAAP and RTLS are co-located on contiguous parcels of property and the RTLS perimeter fence encloses both installations. Since the IRP encompasses past activities over the entire 21,683 acres of the former RVAAP, the site description of the RVAAP includes the combined RTLS and RVAAP properties.

1.1.4 Winklepeck Burning Grounds

Historical operations at WBG included burning explosives out of heavy artillery projectiles using open burning. In some instances, high-energy material such as black powder and explosives were laid out in a string along the roads and burned. Burning was known to have occurred along Road D. Prior to 1980, wastes disposed by burning included RDX, antimony sulfide, Composition B, lead oxide, lead thiocyanate, 2,4,6-TNT, propellant, black powder, sludge and sawdust from load lines, and domestic wastes. Explosives contaminated materials, such as crates and bags, were also burned. Historical records do not indicate that WBG was used as an open demolition area for disposal of munitions. However, during previous investigations, fully fuzed 40-mm grenades were found in the western portion of WBG and destroyed in place. Based on their locations, these 40-mm grenades are likely to be “kick outs” from the Open Demolition 2 (OD-2) area located immediately southwest of WBG. Several 40-mm grenades were identified around Pad 60 during the Phase I Munitions and Explosives of Concern (MEC) Density Survey which do not appear to be a result of kick-outs from OD-2. Also, small amounts of laboratory chemicals were routinely disposed during production periods. Shrapnel and other metallic munitions fragments were allowed to remain on the site after detonation, as were possible residual explosives. Waste oil was disposed in the northeast corner of WBG until 1983.

Prior to 1980, burning was carried out in four burn pits, on burn pads, and sometimes on the roads. The burn pits consisted of areas bermed on three sides, approximately 50 to 75 feet in width and length. It is suspected that the four burn pits correspond to Pads 58, 59, 60, and 61. Of the four burn pits, Pad

58 was used most frequently. The burn pads generally consisted of level areas without berms 20 to 40 feet in width and length. Seventy (70) burning pads have been identified from historical drawings and aerial photographs. Burning was conducted on bare ground. Ash from these areas was not collected. Scrap metal was reclaimed and taken to the landfill north of WBG.

After 1980 thermal treatment of munitions and explosives was conducted only in a 1-acre Resource Conservation and Recovery Act (RCRA) area at Burning Pad 37. Burning was conducted in metal, refractory-lined trays set on top of a bed of crushed slag in an area approximately 100 by 100 feet in size. Ash residues were drummed and stored in Building 1601 on the west side of WBG pending disposal. The burn trays were decontaminated and removed from Burning Pad 37 in 1998, and the site was closed under RCRA.

1.2 PROJECT DESCRIPTION AND GENERAL SCOPE

WBG has a final (approved) Remedial Investigation (RI) and a final Focused Feasibility Study (FFS) in place which proposed remedial alternatives. As such, Ohio Army National Guard (OHARNG) wants to construct a Mark 19 Grenade Machinegun Range at this location. In preparation for construction of the Range a Phase II MEC Clearance and Munitions Response was conducted in March – August 2005 to ensure surface MEC and site related chemicals of concern were removed from the areas of WBG needed for construction. During the Phase II MEC clearance operations, MEC was removed from excavated soils at select burn pad locations using a proprietary magnetic separation process. Two soil berms that were identified as being within the line of sight of planned down range targets were also excavated and processed for MEC removal. Based upon previous RI data, the processed soil from the two berms (estimated maximum of 6,000 CY) was stockpiled onsite for reuse as backfill material during subsequent Range construction operations. The stockpile has since been identified as containing asbestos containing material (ACM) (broken pieces of transite). As such, the soils can not be reused and require disposal at an approved off-site facility. Figure 3, Appendix B depicts the location of the stockpile within WBG. For more details on the WBG Phase II MEC clearance operations, refer to the Final Report for Phase II MEC Clearance and Munitions Response at Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, December 2005, prepared by MKM Engineers.

The SOW provides for the transportation and disposal of the entire WBG soil stockpile as well as other miscellaneous debris that was containerized and staged

at Load Line 4 (LL4) during the Phase II MEC clearance operations. The miscellaneous debris items at LL4 include two 1-CY Gaylord boxes and one 55-gallon drum of tar roofing material and one 1-CY Gaylord box of broken transite panels. Additionally, following removal of the WBG stockpile, confirmatory soil samples will be collected within the footprint of the stockpile to verify removal of ACM debris. A copy of the SOW is presented in Appendix A.

1.3 OBJECTIVE

The objective of this project is to remove the potential risk to human health and the environment posed by the asbestos contaminated soil stockpile at the WBG and the miscellaneous waste items stored at LL4. The project objective will be accomplished through the loading and transportation of an estimated maximum 6,000 CY of asbestos contaminated soil, two 1-CY Gaylord boxes and one 55-gallon drum of tar roofing material and one 1-CY Gaylord box of transite material to an approved offsite disposal facility. Once the stockpile has been removed a visual survey of the stockpile footprint will be performed and confirmation soil samples will be collected and analyzed for asbestos to verify that the ACM debris has been removed.

All work executed must be accomplished in a manner which ensures the health and safety of the workforce and the public at large. As such, all work will be completed in accordance with (IAW) the SOW (Appendix A), this Site-Specific WP with its integral Accident Prevention Plan (APP), and applicable Federal, State and Local rules, laws and regulations.

PIKA will execute the project in a manner that minimizes the environmental impact to the site and its surroundings. If PIKA encounters any environmentally sensitive site features that could affect cost or schedule under the current SOW, PIKA will immediately notify the Administrative Contracting Officer (ACO) Staff and Headquarters (HQ), BRACO and the Ohio Environmental Protection Agency (OEPA) and await further direction. PIKA will use reasonable caution to avoid actions that could disturb these features.

1.4 CHANGES TO THE WORK PLAN

This WP was prepared after a review of archival data, study of prior investigations, discussions with BRACO personnel, and a thorough evaluation of the site. The WP is based on the information available at the time of its preparation and may require modification if unforeseen circumstances arise

during the execution of this WP. Should the WP require modification, changes will be made using the following procedures:

- Under no circumstances will any change to the approved WP be executed without prior approval of the Contracting Officers Representative (COR), BRACO, OEPA and the PIKA Program Manager (PM).
- The PIKA Project Manager (PjM) will notify the PIKA PM of the required changes and the rationale for the changes.
- The PIKA PM will develop the changes in conjunction with the BRACO and OEPA.
- Changes to this WP will be provided in writing by PIKA to the COR, BRACO and OEPA for approval.
- On-site implementation of changes will be initiated prior to inclusion of the formal written changes, if verbal approval is provided to PIKA by the COR and/or BRACO and OEPA.

2.0 PROJECT ORGANIZATION

2.1 MANAGEMENT ROLES AND RESPONSIBILITIES

In addition to PIKA, the project team consists of Mr. William Wynne, the BRACO Project Manger, Arlington, VA., and Mr. Irving Venger, RVAAP Acting Facility Manager and COR. Table 1 depicts the overall project organization and shows the key PIKA personnel assigned to the project. All PIKA personnel assigned to this project meet the BRACO training and experience requirements for the positions to which they are assigned.

2.1.1 Program Manager (PM)

Mr. Shahrukh Kanga, Principal of PIKA is the PM for this project. Mr. Kanga will manage the PIKA resources needed for site operations and is responsible for the overall implementation of the project. Mr. Kanga has over 15 years of technical and management experience with environmental and explosive remediation projects.

2.1.2 Project Manager (PjM)

Mr. Brian Stockwell is the PjM for this project. Mr. Stockwell has substantial experience in the management of environmental remediation projects and will have the following responsibilities:

- Managing the funding, manpower, and equipment necessary to conduct site operations.
- Acting as the point of contact (POC) for communicating with the BRACO and OEPA.
- Overseeing the overall performance of all PIKA individuals assigned to the project.
- Reviewing the SOW and ensuring that necessary elements are addressed in project plans.
- Coordinating all contract and subcontract work and controlling costs and schedules.

TABLE 1: KEY PROJECT PERSONNEL

Title/Name	Responsibilities
Program Manager (PM) *Shahrukh Kanga, CHMM*	- Ensures resources are available - WP/APP Review - Conflict Resolution/Stop Work
Project Manager (PjM) *Brian Stockwell*	- Responsible Project Budget - Resolve Regulatory-Level Issues - Work Plan preparation - APP Review - Notification - Conflict Resolution/Stop Work
Corporate Safety and Health Manager (CSHM) *Drew Bryson, CIH*	- APP Preparation and Approval - APP Review and Implementation Audits - APP Modification/Deviation Recommendation - Conduct/assist with site, task & hazard specific training - Conflict Resolution/Stop Work
Site Asbestos Supervisor (SS)/Site Safety and Health Officer (SSHO) *Josh Strazewski*	- APP & WP Implementation - Documentation/Reporting - Asbestos Notifications - Coordinate and Manage ACM removal operations -Visual Inspection and Certification for asbestos clearance - Safety Inspection - Site Safety Control - Accident Prevention - Conflict Resolution/Stop Work
Quality Control Manager (QCM) *Kaizad Wadia*	- APP & WP Implementation - Documentation/Reporting - Site Inspections - Safety Inspection - Accident Prevention -Conflict Resolution/Stop Work
Field Personnel – To be determined	- APP Adherence - Accident Prevention

2.1.3 Corporate Safety and Health Manager (CSHM)

Mr. Drew Bryson is the PIKA Corporate Safety and Health Manager (CSHM). Mr. Bryson is a board certified industrial hygienist (CIH) with over 17 years of industrial hygiene, safety, and hazardous waste experience, including over 15 years experience working on projects with MEC contamination. During this project, Mr. Bryson will provide occupational safety and health management duties as presented in detail in the APP for this project.

2.1.4 Site Asbestos Supervisor/Site Safety and Health Officer (SSHO)

Mr. Josh Strazewski is the Site Asbestos Supervisor (SS) and Site Safety and Health Officer (SSHO) for this project. The Asbestos Supervisor will be responsible for the operational items listed below in addition to the safety and health responsibilities:

- Asbestos permitting and notifications.
- Asbestos worker training and certifications.
- Issuing and/or approving "Stop Work" orders for safety and health reasons.
- Conducting on-site safety and health training for PIKA and subcontractor personnel.
- Identifying and evaluating any known or potential safety problems that may interfere with or interrupt site operations and endanger site personnel.
- Consulting with the PjM on identifying and implementing any necessary safety-related corrective actions.
- Coordinating with the PjM for the implementation of the safety requirements in the APP.
- Ensuring that all site activities are conducted IAW this WP and relevant Federal and State rules, laws and regulations.

2.1.5 Quality Control Manager (QCM)

Mr. Kaizad Wadia is the Quality Control Manager (QCM) for this project. As the QCM, Mr. Wadia will have the responsibility of ensuring that all site deliverables meet the requirements of the SOW.

3.0 WBG CONTAMINATED STOCKPILE REMOVAL ACTIVITIES

3.1 MOBILIZATION AND SITE PREPARATION

3.1.1 Mobilization of Manpower and Equipment

PIKA will schedule the arrival of the work force in a manner designed to facilitate immediate productivity. All PIKA personnel mobilized to the site will meet requirements for Occupational Safety and Health Administration (OSHA) and State of Ohio Asbestos removal operations, and training and medical surveillance requirements as specified in the APP.

3.1.1.1 Site-Specific Training

As part of the mobilization process, PIKA will perform site-specific training for all on-site personnel assigned to this project. The purpose of this training is to ensure that all on-site personnel fully understand the operational procedures and methods to be used by PIKA at RVAAP. Individual responsibilities, safety and environmental concerns associated with operations will also be covered in the training. The PjM and the SS and will conduct the training sessions which will include the topics identified below.

- Field equipment operation, including the safety and health precautions, field inspection and maintenance procedures that will be used.
- Interpretation of relevant sections of this WP and APP as they relate to the tasks being performed.
- Personnel awareness of potential site and operational hazards associated with site-specific tasks and operations.
- Public relations to ensure that personnel will not make any public statements to the media without prior coordination with and approval of COR and/or BRACO.
- Environmental concerns and sensitivity including endangered/threatened species and historic, archeological, and cultural (HARC) issues.
- Additional OSHA or BRACO required training as required by the APP.
- Identification features, hazards, and reporting procedures if ordnance is encountered.

3.1.1.2 Equipment

All equipment will be inspected as it arrives to ensure it is in proper working condition. Any equipment found damaged or defective will be repaired or returned to the point of origin, and a replacement will be secured. All instruments and equipment that require routine maintenance and/or calibration

will be checked initially upon its arrival and then checked again prior to its use each day. This system of checks ensures that the equipment is functioning properly. If an equipment check indicates that any piece of equipment is not operating correctly, and field repair cannot be made, the equipment will be tagged and removed from service. A request for replacement equipment will be placed immediately. Replacement equipment will meet the same specifications for accuracy and precision as the equipment removed from service.

As part of the initial equipment set-up and testing, PIKA will also install and test its communication equipment that includes the following:

- Security Band Radios to maintain communication with RVAAP security personnel.
- Hand-held portable radios used to maintain communications between the office trailer, PjM/SS, and the field teams.
- Cellular telephones, to be used as back up communications between the office trailer, SS, and the field teams.

3.1.2 Work Zone Set Up

PIKA does not anticipate the installation of any facilities with the exception of work zones (WZ). The stockpile area will be delineated into asbestos regulated work areas as described in the APP. In general the regulated work zones will include an exclusion zone (EZ), contamination reduction zone (CRZ) and support zone (SZ) for site access control during field operations.

Due to the relatively short duration of this project, as well the proximity of the project site to the PIKA RVAAP field office, services such as water, telephone sanitary, and gas will not be installed at the work site. Potable water for decontamination of personnel and equipment will be stored in portable poly containers. Cellular and two-way radios will be used for communications and emergency notifications. Temporary sanitary facilities will be mobilized to the site and maintained by local vendors.

Upon delineation of the work zones, site access control points will be established and site control and security will be implemented. This will consist of establishing barriers such as warning cones and yellow tape to control points of site access control. The SS/SSHO will be responsible for site access.

3.1.3 Project Notifications

3.1.3.1 Permitting

Prior to initiating any stockpile removal activities at WBG, PIKA will complete the OEPA Notification of Demolition and Renovation (processed and enforced through the Akron Regional Air Quality Management District) as is required for asbestos removal operations. No other permits have been identified to be required for the execution of work under this scope of work.

3.1.3.2 Emergency Response and General Notifications

At least one week prior to the initiation of the stockpile removal operations at WBG, PIKA will contact all local emergency services to verify the availability of requisite services and to confirm the means used to summon the services. General notifications will be made to key project personnel at this time as well. This includes the following contacts:

- RVAAP Security Dispatcher (Post 1) – (330)-358-2017
- Ravenna City Fire Department (330) 296-5783
- Ravenna Police Dept. – (330) 297-6486
- RVAAP Caretaker Contractor (MKM Engineers) – (330) 358-3005
- Hospital – Robinson Memorial Hospital (330) 297-0811
- Police –Portage County Sheriff Office (330) 296-5100
- Police –Trumbull County Sheriff Office (330) 675-2508
- Ohio State Patrol – (330) 297-1441
- William Wynne –BRACO Project Manager (703) 601-1560
- Irving Venger – RVAAP COR/Acting Facility Manager (330) 358-7311
- Chris Williams - Akron Regional Air Quality Management District (330) 375-2480
- OEPA - Eileen Mohr (330) 963-1221
- OHARNG – MAJ Meade (614) 336-6790

3.1.4 Erosion Control

To minimize the migration of soil during the stockpile removal operation, the best management practices currently in place will be maintained throughout the removal process. The silt fence installed around the stockpile will be kept in place and maintained during load out of the soil. The silt fence will be adjusted as needed as the size of stockpile is reduced. The liner cover on the stockpile will removed at the beginning of each work day to facilitate load out and then replaced at the end of the day until the stockpile has been completely removed.

3.1.5 Access Road Construction

The Government will be responsible for the construction and maintenance of an access road from Greenleaf Road to the west most lane of WBG to facilitate removal of the stockpile (see Figure 2, Appendix B).

3.2 OPERATIONAL SEQUENCE

The following is the general operational sequence for the WBG stockpile removal operations

- Transportation and Disposal of asbestos contaminated stockpile.
- Confirmation sampling and analysis.
- Site restoration
- Disposal of Miscellaneous Debris at LL4.
- Weekly/Monthly Reports.
- Final Report.

Descriptions of each of the above listed tasks are discussed in the subsections that follow.

3.3 TRANSPORTATION AND DISPOSAL OF ASBESTOS CONTAMINATED STOCKPILE

Based on USACE Louisville District waste characterization sample results, all the stockpiled soil and debris will be loaded, transported and disposed of offsite as asbestos contaminated material (special waste). As such all stockpile removal operations will be conducted IAW Federal (40 Code of Federal Regulations (CFR) Part 61, Subpart M) and State of Ohio (OAC3745-20) asbestos emission control regulations. A copy of the USACE-furnished waste characterization sample results are provided in Appendix C.

All contaminated stockpile removal operations will be performed under supervision of the certified asbestos supervisor. The stockpile will be loaded out using a track mounted excavator and/or wheel loader. The heavy equipment will be equipped with closed cabs to minimize potential for exposure to contaminated media. During the load out operations, the excavated material will be adequately wetted with potable water to prevent airborne asbestos emissions. Personnel and area monitoring will be performed to verify emissions are maintained within acceptable health and safety limits.

Haul vehicles will have all required labeling and licensing and will be double-lined IAW applicable federal, state and local rules, laws and regulations. Prior to

transportation, haul vehicles will be manifested and inspected for proper marking and labeling information. A returned signed copy of each manifest provided by the disposal facility will be retained by the generator and PIKA PjM for record keeping purposes.

Weekly coordination of site activities will take place with RTLS during the regularly scheduled RVAAP contractors meeting to accommodate the Mark 19 Range schedules, if needed. In the event a weekday work restriction is required, PIKA will immediately contact TACOM Contracting, BRACO and OEPA for direction relative potential impact to the project cost and schedule, if any.

3.4 CONFIRMATION SAMPLING AND ANALYSIS

Once the stockpile is removed, an additional 3 to 6-inches of soil will be removed from the footprint area. Following visual inspection of the stockpile area by the asbestos supervisor, a total of four (4) multi-incremental (MI) soil samples will then be collected within the footprint to ensure all the asbestos contaminated material has been removed from the site.

3.4.1 Multi-incremental Sampling Methodology

All confirmatory soil samples will be collected using the MI soil sampling technique for asbestos analysis. This sampling technique consists of taking 30 1 to 2-ounce random soil samples for each represented sample. The 30 sampling points will be randomly selected using the “drunken sailor walk”. The samples will be collected using either a stainless steel step probe or stainless steel trowel and consolidated in a polyethylene-lined bucket. The samples are then typically homogenized using a process that incorporates drying and sieving the samples, grinding the samples to a uniform grain size, and then re-sieving. However, the asbestos soil samples will be homogenized in the more conventional fashion using a stainless steel trowel in order to minimize the potential loss of asbestos fibers, if any. Each sample will then be transferred to a glass sample jar and covered with a teflon lined lid.

All MI sampling operations, including decontamination of sampling equipment will be conducted IAW the previously approved Field Sampling and Analysis Plan (FSP) and Quality Assurance Project Plan (QAPP) Addendum of the MEC Clearance and Munitions Response for Winklepeck Burning Grounds at the RVAAP (MKM Engineers, March 2005). Both of these documents are intended to tier under the RVAAP Facility-Wide Sampling and Analysis Plan (FWSAP).

3.4.2 Stockpile Footprint Sampling

A total of four (4) MI soil samples will be collected from the stockpile footprint. The soil samples will consist of one MI sample from the surface (0-6 inches) of each quadrant of the stockpile footprint as shown in Appendix B, Figure 4. There will be four (4) contingency samples for possible further sampling in the event sample results indicate any detectable concentration of asbestos material. In the event sampling results do indicate detectable concentrations of asbestos, additional excavation and sampling will take place within the affected quadrant(s) in 3 to 6-inch lifts until follow-on MI sampling results indicate all asbestos containing material has been removed.

3.4.3 Sample Handling and Laboratory Analysis

Following the sample preparation activities, all sample containers will be labeled, sealed with a custody seal, and managed under chain of custody. All samples will be shipped overnight to an American Industrial Hygiene Association (AIHA), National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory (AMA Analytical Services, Inc. in Lanham, MD) for asbestos analysis using Polarized Light Microscopy (PLM). The samples will be submitted for 3-day rush turn around.

3.5 SITE RESTORATION

When confirmation sampling results indicate asbestos containing material has been removed (with OEPA concurrence), the site will be restored. The stockpile footprint will be re-graded to ensure positive drainage, seeded and mulched using RTLS approved seed mix. Erosion controls will be removed only after the site has been fully restored. Backfill material (if required) will be obtained from a local vendor with access to material from a virgin point of origin source as approved by OEPA. Per the conditions of the contract, any wear-and-tear or normal damage (except negligent damage) to the access road will be repaired and restored by the Government.

3.6 DISPOSAL OF MISCELLANEOUS DEBRIS AT LOAD LINE 4

During completion of the WBG Phase II MEC clearance operations, some miscellaneous debris items were recovered during the soils excavation and sifting operations, containerized, and staged at LL4 for subsequent disposal. As such, the SOW calls for disposal of this material which includes two 1-CY Gaylord boxes and one 55-gallon drum of tar roofing material and one Gaylord box of broken transite panels. PIKA will properly characterize the tar roofing material using TCLP analysis for proper disposal. The broken transite material will be

included with one of the truck loads of the stockpile soil for transportation and disposal as asbestos contaminated material. Prior to transportation offsite, haul vehicles will be manifested. A returned signed copy of each manifest provided by the disposal facility will be retained by the generator and PIKA for record keeping purposes.

3.7 WEEKLY/MONTHLY REPORTS

PIKA will prepare and submit electronic copies of the weekly and monthly reports to RVAAP, USACE, BRACO, OEPA and RTLS. These progress reports will document the project activities conducted by PIKA in its' performance of the project tasks. The monthly reports will be submitted for receipt by the addressee by the 5th of each month.

3.8 FINAL REPORT

At the conclusion of all field activities, PIKA will submit a Construction Completion Report. This report will include a summary of the daily activities and disposal records. The report will document in narrative form all soil removal activities and will include copies of all pertinent documents generated including asbestos 10-day notification, manifests, air monitoring results, weekly reports, sample collection forms and confirmation sampling reports.

The final report will be prepared as a preliminary draft, draft and final with 45-day comment period by the OEPA for each including two response to comments (RTC) matrices and a minimum of one RTC meeting conference call.

4.0 ENVIRONMENTAL PROTECTION PLAN

4.1 INTRODUCTION

The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract will be protected during the entire period of this contract. PIKA will confine its activities to areas defined by this WP. Environmental protection will be as stated in the following subsections.

PIKA is directly responsible for the implementation of this plan. Inspections will be made to assure field personnel's compliance with this plan. Following are several specific areas of concern that fall under environmental protection.

4.2 PRESERVATION & RECOVERY OF HISTORICAL ARCHAELOGICAL, & CULTURAL RESOURCES

Known existing historical, archaeological, and cultural resources within PIKA's work area will be designated by BRACO and RTLS-Environmental and precautions will be taken by PIKA to preserve all such resources as they existed at the time they were pointed out to PIKA. PIKA will install all protection for these resources and will be responsible for their preservation during this contract. If during stockpile removal activities PIKA observes unusual items that might have historical, archaeological, or cultural value, such items shall be protected in place and reported immediately to BRACO and RTLS-Environmental.

4.3 PROTECTION OF NATURAL RESOURCES

Prior to beginning any stockpile removal activities, PIKA will identify all land resources to be preserved within the work area. PIKA will not remove, cut, deface, injure or destroy land resources including trees, shrubs, vines, grasses, topsoil, and landforms without special permission from BRACO and RTLS.

4.3.1 Work Area Limits

Prior to any stockpile removal activities, PIKA will indicate areas where no work is to be performed under this contract. Any monuments and markers will be protected before site operations commence. PIKA will convey to its personnel the purpose of marking and/or protection of all necessary objects.

4.3.2 Protection of Landscape

Trees, shrubs, vines, grasses, landforms and other landscape features to be preserved will be clearly identified. Except in work areas, trees or shrubs will not be removed, cut, defaced, injured, or destroyed without the permission of RTLS.

Any areas accessed for the purpose of transporting or transferring materials will be protected.

4.3.3 Temporary Embankments

Temporary embankments for project work areas will be controlled to protect adjacent areas from despoilment.

4.3.4 Protection of Erodible Soil

The best management practices currently in place will be maintained throughout the removal process. The silt fence installed around the stockpile will be kept in place and maintained during load out of the soil. The silt fence will be adjusted as needed as the size of stockpile is reduced. The liner cover on the stockpile will removed at the beginning of each work day to facilitate load out and then will be replaced at the end of the day until the stockpile has been completely removed.

4.3.5 Disposal of Solid Waste

Solid wastes will be placed in appropriate containers, which will be emptied regularly. All handling and disposal will be conducted to prevent further contamination and/or contaminant migration. PIKA will dispose of all waste in compliance with Federal, State, and Local rule, laws, and regulations for solid waste disposal.

4.3.6 Disposal of Waste Materials

Disposal of any materials, waste, effluents, trash, garbage, unsatisfactorily decontaminated materials, oil, grease, chemicals etc., in areas adjacent to streams, rivers, or lakes is not authorized and will not be permitted for waste disposal. If any waste material is dumped or deposited in unauthorized areas, PIKA will remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, ground which has been contaminated through the fault or negligence of PIKA will be restored to preexisting conditions, all at PIKA's expense. Disposal of waste, trash, and other materials off the project site will be IAW all applicable Federal, State, and Local rules, laws and regulations.

4.3.7 Disposal of Hazardous Waste

Although not anticipated for the stockpile removal operations, hazardous waste will be removed from the work area and disposed of IAW applicable Federal, State, and Local rules, laws and regulations.

4.4 PROTECTION OF WATER RESOURCES

PIKA will keep stockpile removal activities under surveillance, management, and control to avoid pollution of surface and ground waters. Special management techniques as set out below shall be implemented to control water pollution by the stockpile removal activities.

4.4.1 Spillage

Appropriate measures will be taken to prevent chemicals, fuels, oils, greases, bituminous materials, sawdust, waste washings, herbicides, insecticides, rubbish or sewage, and other pollutants from entering public waters.

4.4.2 Waste Water

Wastewater will not be allowed to enter streams, rivers, or lakes unless it meets OEPA Water Quality Standards set forth in chapter 3745-1 of the Ohio Administrative Code. Direct discharge to any surface water body will require prior approval from the OEPA Division of Surface Water (DSW).

4.5 PROTECTION OF AIR RESOURCES

PIKA will keep stockpile removal activities under surveillance, management, and control to minimize pollution of air resources. All activities, equipment processes, and work operated or performed by PIKA will be in strict accordance with all Federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency (EPA) will be maintained for all site operations specified in this WP. Special Management techniques as set out below shall be implemented to control air pollution by the construction activities, which are included in the contract.

4.5.1 Particulate Control

Dust particles and particulates etc. from stockpile removal activities will be controlled by wetting the stockpile with clean potable water as needed during the removal effort and replacing the liner cover at the end of each day until the stockpile is completely removed.

4.5.2 Odors, Hydrocarbons, Carbon Monoxide, and Oxides of Nitrogen and Sulfur

Hydrocarbon, carbon monoxide, oxides of nitrogen and sulfur emissions are the emissions associated with heavy equipment used at the site. These emissions will be controlled through proper vehicle maintenance, use of mufflers etc., IAW applicable Federal, State, and local rules, laws and regulations.

4.5.3 Monitoring of Air Quality

Monitoring of air quality for stockpile removal activities will be the responsibility of PIKA IAW with 29 CFR 1910 as detailed in the APP prepared for this project.

4.6 PROTECTION FROM SOUND INTRUSIONS

PIKA will keep stockpile removal activities under surveillance and control to minimize damage to the environment by noise.

4.7 POST CONSTRUCTION CLEANUP OR OBLITERATION

PIKA will obliterate all signs of temporary facilities such as work areas, structures, fencing, stakes, or any other signs of construction within the work, storage, and access areas. The areas will be restored to near natural conditions.

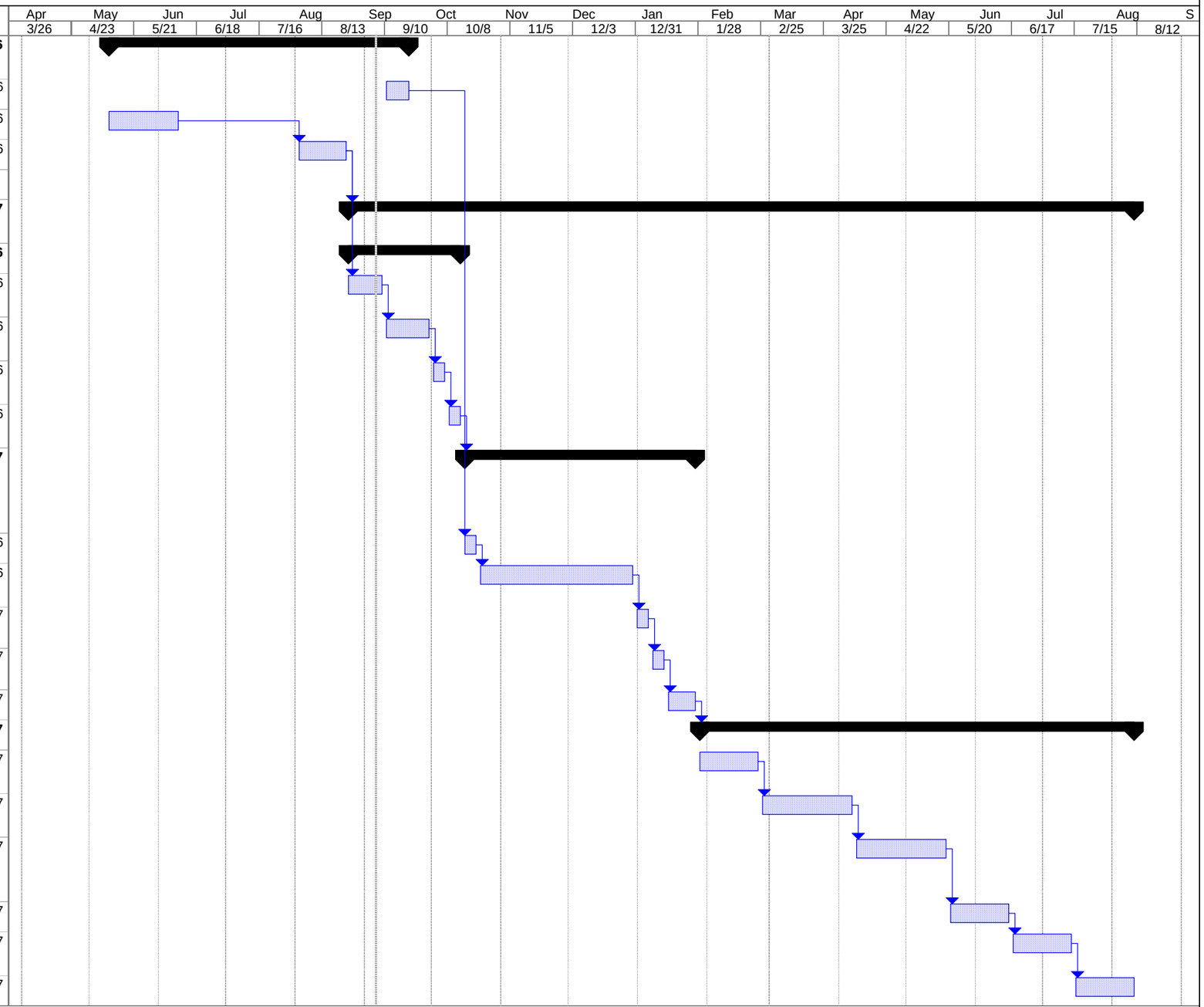
5.0 PROJECT SCHEDULE

PIKA has developed a proposed Project Schedule for the completion of all tasks presented in this WP. The Project Schedule for disposal of contaminated soil at WBG at the RVAAP is shown in Table 2. If changes in the PIKA personnel or changes to the SOW require a change to this project schedule, PIKA will immediately notify BRACO and OEPA and provide an amended project schedule. It must be noted that Table 2 Line ID number 15 *Collection of the confirmation samples and ship to lab* is an Order Milestone Date. As such, by January 05, 2007 the stockpiled material will be removed and the confirmation samples will be collected from within the footprint and submitted to the laboratory with a 3 day turnaround time.

TABLE 2: PROJECT SCHEDULE

Table 2
Preliminary Schedule
Disposal of Contaminated Soil at WBG
Ravenna Army Ammunition Plant

ID	Task Name	Duration	Start	Finish
1	**Solicitation W52H09-05-R-5019**	**96 days**	**Wed 5/10/06**	**Wed 9/20/06**
2	Installation of Access Road by others	8 days	Mon 9/11/06	Wed 9/20/06
3	Submission of PIKA Proposal	23 days	Wed 5/10/06	Fri 6/9/06
4	Contract Negotiations & Award	15 days	Thu 8/3/06	Wed 8/23/06
5				
6	**Disposal of Contaminated Soil at WBG**	**251 days**	**Fri 8/25/06**	**Fri 8/10/07**
7	**WBG Work Plans**	**36 days**	**Fri 8/25/06**	**Fri 10/13/06**
8	Draft WP & SSHP	11 days	Fri 8/25/06	Fri 9/8/06
9	OEPA Review of Draft WP & SSHP	15 days	Mon 9/11/06	Fri 9/29/06
10	Comment Response and Submit Final WP & SSHP	5 days	Mon 10/2/06	Fri 10/6/06
11	Ohio Review of Final WP & SSHP	5 days	Mon 10/9/06	Fri 10/13/06
12	**Transportation & Disposal of non-haz soil and 4 Gaylord boxes of ACM and non-haz tar roofing at LL4**	**75 days**	**Mon 10/16/06**	**Fri 1/26/07**
13	Mobilization and Site Preparation	5 days	Mon 10/16/06	Fri 10/20/06
14	Transportaton and disposal of soil and gaylord boxes	50 days	Mon 10/23/06	Fri 12/29/06
15	Collect confirmation samples and ship to lab	5 days	Mon 1/1/07	Fri 1/5/07
16	OEPA Review of confirmation sample results	5 days	Mon 1/8/07	Fri 1/12/07
17	Site Restoration	10 days	Mon 1/15/07	Fri 1/26/07
18	**WBG Soils Disposal Final Report**	**140 days**	**Mon 1/29/07**	**Fri 8/10/07**
19	Preliminary Draft Report Preparation	20 days	Mon 1/29/07	Fri 2/23/07
20	OEPA Review of Preliminary Draft Report	30 days	Mon 2/26/07	Fri 4/6/07
21	Comment Resolution for Prelim Draft and Submittal of Draft Report	30 days	Mon 4/9/07	Fri 5/18/07
22	OEPA Review of Draft Report	20 days	Mon 5/21/07	Fri 6/15/07
23	Comment Resolution and Submittal of Final Report	20 days	Mon 6/18/07	Fri 7/13/07
24	OEPA Review of Final Report	20 days	Mon 7/16/07	Fri 8/10/07



Prepared by: PIKA International Inc.
Date: Wed 9/6/06

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

APPENDIX A

SCOPE OF WORK

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION SF 1449 - CONTINUATION SHEET

The following have been modified:
SECTION C

Scope of Work
for the
Disposal of Contaminated Soil
at the Winklepeck Burning Grounds,
Ravenna Army Ammunition Plant

1.0 Introduction:

Approximately six thousand (6,000) cubic yards of soil were generated as a result of a Munitions and Explosives Concern (MEC) removal action at the Winklepeck Burning Grounds (WBG). The soil contains visible pieces of asbestos cement (transite) and possible explosives and/or other chemicals of concern. The soil is located at the Winklepeck Burning Grounds awaiting disposition.

All parties believe the soil should be non-hazardous except for the pieces of transite. Until laboratory testing is complete, we are not sure what the pile contains. This scope is written to address the two possibilities of non-hazardous special waste disposal or partial or total hazardous content.

The Army Corps of Engineers, Louisville District will test the soil pile under the direction of the Ohio Environmental Protection Agency (OEPA) to determine the nature and extent of contamination. As directed the OEPA, 6 multi-increment samples will be taken from the soil pile for testing.

If the soil tests non-hazardous, i.e., the chemicals of concern are below clean up goal levels, the material will be transported as 'special waste', because of the asbestos, to an approved landfill. This action will be described under Task 1 of this scope.

If all or part of the soil piles tests above cleanup goals, that portion will be transported to a hazardous materials landfill and will incur substantially increased disposal and transportation costs. Additional confirmation sampling will be required to assure all materials above the clean-up goals are removed. This task will be described under Task 2 of this scope.

2.0 Task 1 Disposal of Non-Hazardous Soil Pile

Provide labor and material to transport and dispose of all soil in an approved disposal facility. The area is to be left free of any substances that could be deemed a hazard as a result of the presence of the soil pile.

Perform up to 4 confirmatory multi-increment samples on the ground under the pile to assure that no residual contamination above clean-up goals remains.

Document the condition of installation roads and driving lanes prior to removal operations. Repair or restore roads to an equivalent condition upon completion.

Dispose of one Gaylord box of ACM transite, two Gaylord boxes and one 55-gallon drum of tar roofing material stored in Load Line 4. Provide weekly and final reports with photographic documentation of the activities associated with the execution of this scope.

3.0 Task 2 Disposal of all or Part of the Soil Pile as Hazardous Material

Provide labor and material to transport and dispose of all soil found to be above clean-up goals of chemical contamination to an approved landfill. The Area is to be left free of any substances that could be deemed a hazard as a result of the presence of the soil pile.

If a portion of the pile tests hazardous, up to 6 additional confirmatory multi-increment samples may be taken along the walls of the excavation to assure that all soil above clean-up goals is removed. This sampling will be done under supervision of the OEPA.

Perform up to 4 confirmatory multi-increment samples on the ground under the pile to assure that no residual contamination above clean-up goals remains.

Provide labor and material to transport and dispose of all uncontaminated soil to a special waste disposal facility for the asbestos containing soil.

Document the condition of installation roads, driving lanes and bridges/culverts prior to removal operations. If roads, driving lanes or bridges/culverts are damaged due to the negligence of the contractor the contractor shall repair or restore the roads, driving lanes and bridges/culverts to an equivalent condition upon completion.

Dispose of one Gaylord box of ACM transite, two Gaylord boxes and one 55-gallon drum of tar roofing material stored in Load Line 4. Provide weekly and final reports with photographic documentation of the activities associated with the execution of this scope.

4.0 Requirements for Task 1 & 2

The work plan and health and safety plan describing the procedures and requirements needed to complete this contract will be submitted as a draft for review and comment. Subsequent to comment resolution, if needed, a final document, incorporating all required changes shall be submitted. Copies are to be furnished to the US Army Corps of Engineers, Ohio Environmental Protection Agency and the Ohio Army National Guard Ravenna Training and Logistics Site. The plans will be submitted in draft and final form after review.

All work will comply with the RVAAP Plant Protection Plan.

All tasks will be accomplished in accordance with (IAW) the provisions contained in this SOW.

The contractor will ensure that none of the materials used contain Class I ozone-depleting chemicals as defined by Public Law 102-484, Section 326.

All physical work will be accomplished within 6 months after the contract award. Contract closeout will take place as soon as possible after final acceptance by the contracting officer.

Work will be performed in accordance with (IAW) the following document(s):

IOC Pamphlet 385-1 Classification and Remediation of Explosive Contamination

March 2001 Facility-Wide Sampling and Analysis Plan for Environmental Investigations at the Ravenna Army Ammunition Plant

Director's Final Findings and Orders, June 2004.

In case of conflict between reference documents and provisions contained in this SOW, BRAC Rock Island Field Office will resolve conflicting specifications. If environmental issues are involved, Ohio EPA will be consulted for resolution.

The contractor will exercise care near existing groundwater monitoring wells to ensure that no damage to such wells occurs. Damage to these wells will be the responsibility of the contractor to either repair or replace IAW regulations In the event that damage to monitoring well(s) occurs; Ohio EPA will be notified immediately and consulted prior to any repair/replacement work being conducted.

The contractor will prepare weekly progress reports during field activities. Progress will be photographically documented. An electronic copy will be sent to BRAC Rock Island Field Office, RVAAP, Ravenna Training and Logistics Site, Ohio EPA, Louisville Corps of Engineers.

5.0 Safety and Environmental

The contractor is responsible for complying with all federal, state, local, Army, and installation specific rules, laws, regulations, and policies pertaining to environmental, human health and safety, and security issues.

6.0 Final Report

To include preliminary draft, draft and final versions inclusive of sampling and test results from the Louisville Corps of Engineers.

7.0 Inspection and Final Acceptance

The Ravenna AAP COR Staff will monitor contractor performance against this SOW. The final acceptance of this project will take place upon receipt by the contractor of written final approval from the Contracting Officer.

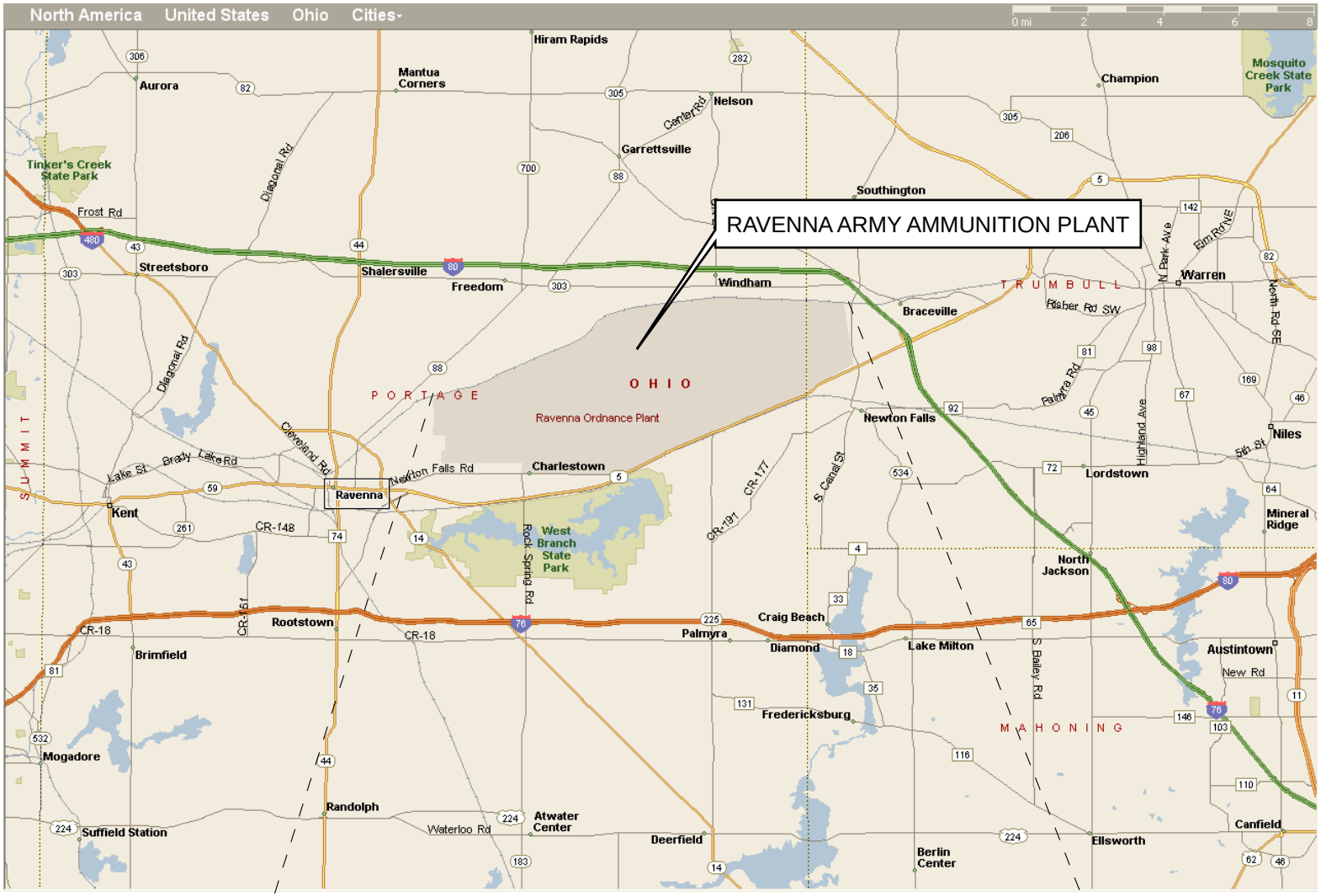
8.0 Manpower Report

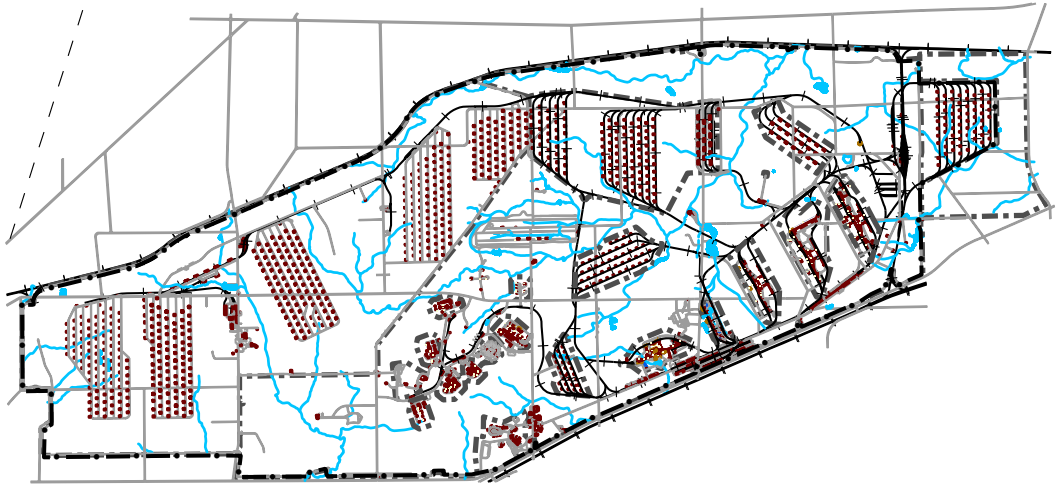
The Office of the Assistant Secretary of the Army (Manpower & Reserve Affairs) operates and maintains a secure Army data collection site the contractor will report ALL contractor manpower (including subcontractor manpower) required for performance of the contract. The contractor is required to completely fill in all the information in the format using the following web address https://contractormanpower/army.pentagon.mil. The required information includes: (1) Contracting Office, Contracting Officer's Technical Representative; (2) Contract number, including task and delivery order number; (3) Beginning and ending dates covered by the reporting period; (4) Contractor name, address, phone number, e-mail address, identity of contractor employee entering data; (5) Estimated direct labor hours (including subcontractors); (6) Estimated direct labor dollars paid this reporting period (including subcontractors); (7) Total Payments (including subcontractors); (8) Predominant Federal Service Code (FSC) reflecting services provided by contractor (and separate predominant FSC for each subcontractor, if different); (9) Estimated data collection cost; (10) Organizational title associated with the Unit Identification Code (UIC) for the Army Requiring Activity (the Army Requiring Activity is responsible for providing the contractor with its UIC for the purposes of reporting this information); (11) Locations where contractor and subcontractors perform the work (specified by zip code in the United States and nearest city, country, when in an overseas location, using standardized nomenclature provided on website); (12) Presence of deployment or contingency contract language; and (13) Number of contractor and subcontractor employees deployed in theater this reporting period (by country). As part of its submission, the contractor will also provide the estimated total cost (if any) incurred to comply with this reporting requirement. Reporting period will be the period of performance not to exceed 12 months ending September 30 of each government fiscal year and must be reported by 31 October of each calendar year. Contractors may use a direct XML data transfer to the database server or fill in the fields on the website. The XML direct transfer is a format for transferring files from a contractor's systems to the secure web site without the need for separate data entries for each required data element at the web site. The specific formats for the XML direct transfer may be downloaded from the web site.

(End of Summary of Changes)

APPENDIX B

FIGURES





Legend

- Water Bodies
- Buildings
- Walkways
- Railroads
- Berms
- Installation Boundary

N
W E
S

0 2,100 4,200 8,400 12,600 16,800
Feet

FIGURE 1 - GENERAL LOCATION AND ORIENTATION OF RVAAP

Ravenna Army Ammunition Plant
Ravenna, OH

PIKA INTERNATIONAL, INC.

Drawn On: 05/22/2006 Drawn By: CVJ
12919 Southwest Frwy. #190
Stafford, TX 77477

Legend

Roads

Fence

Building

WBG Stockpile

WinklePeck Burning Grounds

Bridge

RVAAP Main Gate

N

0 1,250 2,500 5,000 7,500 10,000 Feet

Truck Haul Route - for Soils Transportation and Disposal

Driving Route for PIKA personnel (Office to WBG site)

Access Road constructed by the Army

FIGURE 2
LOCATION OF WBG WITHIN THE RVAAP

Ravenna Army Ammunition Plant
Ravenna, OH

PIKA INTERNATIONAL, INC.
Drawn On: 09/05/2006 Drawn By: CVJ
12919 Southwest Frwy. #190
Stafford, TX 77477

Legend

Roads

Fence

Building

WBG Stockpile

GREENLEAF ROAD

AOC BOUNDARY

ROAD E

ROAD D

ROAD C

ROAD B

ROAD A

WINKLEPECK ROAD

BUILDING 1602

37 (RCRA)

DEMOLITION AREA NO. 2

WinklePeck Burning Grounds

N

0 187.5 375 750 1,125 1,500 Feet

FIGURE 3
LOCATION OF WBG STOCKPILE

Ravenna Army Ammunition Plant
Ravenna, OH

PIKA INTERNATIONAL, INC.

Drawn On: 09/05/2006 Drawn By: CVJ

12919 Southwest Frwy. #190
Stafford, TX 77477

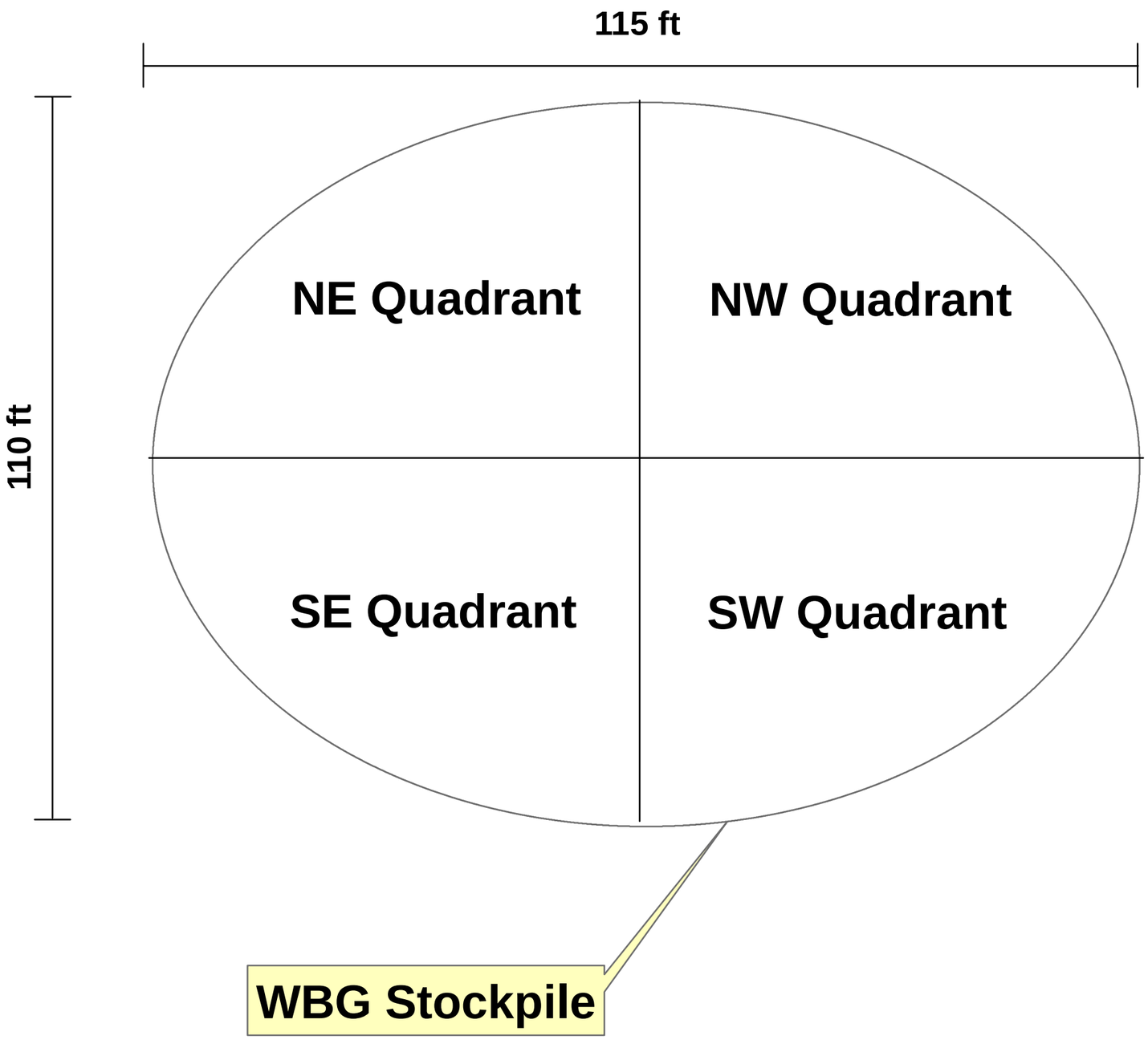


FIGURE 4
MI Sampling Areas for Stockpile Footprint
Ravenna Army Ammunition Plant
Ravenna, OH

PIKA INTERNATIONAL, INC.

Drawn On: 09/05/2006 Drawn By: CVJ
12919 Southwest Frwy. #190
Stafford, TX 77477

APPENDIX C

STOCKPILE WASTE CHARACTERIZATION SAMPLE RESULTS

SEVERN TRENT STL

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720

Tel: 330 497 9396 Fax: 330 497 0772
www.stl-inc.com

ANALYTICAL REPORT

RVAAP,WBG SPOIL PILE,RAVENNA

Lot #: A6C030125

Paul Zorko

U.S. Army Corps of Engineers
600 Martin Luther King Place
Room 921
Louisville, KY 40202

SEVERN TRENT LABORATORIES, INC.

Frank J. Calovini
Project Manager

March 22, 2006

SEVERN TRENT STL

CASE NARRATIVE

CASE NARRATIVE

A6C030125

The following report contains the analytical results for twelve solid samples submitted to STL North Canton by U.S. Army Corps of Engineers from the RVAAP, WBG Spoil Pile, Ravenna Site. The samples were received March 03, 2006, according to documented sample acceptance procedures.

The Explosives analysis was performed at the STL Knoxville laboratory.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. Preliminary results were provided to Paul Zorko on March 16, 2006. A summary of QC data for these analyses is included at the back of the report.

STL North Canton attests to the validity of the laboratory data generated by STL facilities reported herein. All analyses performed by STL facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. STL's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by a dry weight adjustment footnote at the bottom of the analytical report page. The list of parameters, which are never reported on a dry weight basis, is included on the Sample Summary.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

If you have any questions, please call the Project Manager, Frank J. Calovini, at 330-497-9396.

This report is sequentially paginated. The final page of the report is labeled as "END OF REPORT."

CASE NARRATIVE (continued)

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

The temperature of the cooler upon sample receipt was 5.7°C.

See STL's Cooler Receipt Form for additional information.

GC/MS VOLATILES

The matrix spike/matrix spike duplicate(s) for batch(es) 6066493 had RPD's and recoveries outside acceptance limits. However, since the associated method blank(s) and laboratory control sample(s) were in control, no corrective action was necessary.

GC/MS SEMIVOLATILES

The sample(s) that contain results between the MDL and the RL were flagged with "J". There is a possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

The matrix spike/matrix spike duplicate(s) for WBG06-SPOIL PILE-01-MI had RPD's and recoveries outside acceptance limits. However, since the associated method blank(s) and laboratory control sample(s) were in control, no corrective action was necessary.

Sample(s) WBG06-SPOIL PILE-01-MI, WBG06-SPOIL PILE-02-MI, WBG06-SPOIL PILE-03-MI, WBG06-SPOIL PILE-04-MI, WBG06-SPOIL PILE-05-MI, and WBG06-SPOIL PILE-06-MI had elevated reporting limits due to matrix interferences.

METALS

The sample(s) that contain results between the MDL and the RL were flagged with "B". There is the possibility of false positive of mis-identification at these quantitation levels. The acceptance criteria for the ICB, CCB, and Method Blank are +/- the standard reporting limit (SRL).

GENERAL CHEMISTRY

The analytical results met the requirements of the laboratory's QA/QC program.

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

STL North Canton conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program, which is described in detail in QA Policy, QA-003. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. STL North Canton requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. All control analytes indicated by a bold type in the LCS must meet acceptance criteria. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND (non-detected) for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). If the RPD fails for an LCS/LCSD and yet the recoveries are within acceptance criteria, the batch is still acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except under the following circumstances:

- Common organic contaminants may be present at concentrations up to 5 times the reporting limits. Common metals contaminants may be present at concentrations up to 2 times the reporting limit, or the reported blank concentration must be twenty fold less than the concentration reported in the associated environmental samples. (See common laboratory contaminants listed below.)

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride	Phthalate Esters	Copper
Acetone		Iron
2-Butanone		Zinc
		Lead*

- *for analyses run on TJA Trace ICP or ICPMS.*

QUALITY CONTROL ELEMENTS OF SW-846 METHODS
(Continued)

- Organic blanks will be accepted if compounds detected in the blank are present in the associated samples at levels 10 times the blank level. Inorganic blanks will be accepted if elements detected in the blank are present in the associated samples at 20 times the blank level.

- Blanks will be accepted if the compounds/elements detected are not present in any of the associated environmental samples.

Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. Due to the potential variability of the matrix of each sample, the MS/MSD results may not have an immediate bearing on any samples except the one spiked; therefore, the associated batch MS/MSD may not reflect the same compounds as the samples contained in the analytical report. When these MS/MSD results fail to meet acceptance criteria, the data is evaluated. If the LCS is within acceptance criteria, the batch is considered acceptable. The acceptance criteria do not apply to samples that are diluted for organics if the native sample amount is 4x the concentration of the spike.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch. However, a Sample Duplicate is less likely to provide usable precision statistics depending on the likelihood of finding concentrations below the standard reporting limit. When the Sample Duplicate result fails to meet acceptance criteria, the data is evaluated.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample is spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

If surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank, and the associated sample(s) are ND, the batch is acceptable. Otherwise, if the LCS, LCSD, or Method Blank surrogate(s) fail to meet recovery criteria, the entire sample batch is reprepped and reanalyzed. If the surrogate recoveries are outside criteria for environmental samples, the samples will be reprepped and reanalyzed unless there is objective evidence of matrix interference or if the sample dilution is greater than the threshold outlined in the associated method SOP.

For the GC/MS BNA methods, the surrogate criterion is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide, PCB, and PAH methods, the surrogate criterion is that one of two surrogate compounds must meet acceptance criteria.

STL North Canton Certifications and Approvals:

California (#01144CA), Connecticut (#PH-0590), Florida (#E87225), Illinois (#200004), Kansas (#E10336), Minnesota (#39-999-348), New Jersey (#OH001), New York (#10975), Ohio (#6090), OhioVAP (#CL0024), Utah (#QUAN9), West Virginia (#210), Wisconsin (#999518190),NAVY, ARMY, USDA Soil Permit, ACIL Seal of Excellence – Participating Lab Status Award (#82)

SEVERN TRENT STL

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY - Detection Highlights

A6C030125

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
WBG06-SPOIL PILE-01-SO 03/02/06 10:05 001				
Flashpoint	>180		deg F	SW846 1010
WBG06-SPOIL PILE-02-SO 03/02/06 12:45 002				
Flashpoint	>180		deg F	SW846 1010
WBG06-SPOIL PILE-03-SO 03/02/06 13:45 003				
Flashpoint	>180		deg F	SW846 1010
WBG06-SPOIL PILE-04-SO 03/02/06 14:30 004				
Flashpoint	>180		deg F	SW846 1010
WBG06-SPOIL PILE-05-SO 03/02/06 15:15 005				
Flashpoint	>180		deg F	SW846 1010
WBG06-SPOIL PILE-06-SO 03/02/06 16:00 006				
Flashpoint	>180		deg F	SW846 1010
WBG06-SPOIL PILE-01-MI 03/02/06 11:45 007				
2,4,6-Trinitrotoluene	0.25	0.25	mg/kg	SW846 8330
4-Amino-2,6-dinitrotoluene	0.16 J	0.25	mg/kg	SW846 8330
2-Amino-4,6-dinitrotoluene	0.071 J	0.25	mg/kg	SW846 8330
Arsenic - TCLP	0.0067 B	0.50	mg/L	SW846 6010B
Barium - TCLP	0.80 B	10.0	mg/L	SW846 6010B
Cadmium - TCLP	0.0012 B	0.10	mg/L	SW846 6010B
Chromium - TCLP	0.0070 B	0.50	mg/L	SW846 6010B
Selenium - TCLP	0.011 B	0.25	mg/L	SW846 6010B
Benzo(a)anthracene	1600	67	ug/kg	SW846 8270C
Benzo(b)fluoranthene	1400	67	ug/kg	SW846 8270C
Benzo(a)pyrene	1100	67	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	160	67	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	630	67	ug/kg	SW846 8270C
pH (solid)	10.2		No Units	SW846 9045C
Percent Solids	98.2	10.0	%	MCAWW 160.3 MOD

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EXECUTIVE SUMMARY - Detection Highlights

A6C030125

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
WBG06-SPOIL PILE-02-MI 03/02/06 12:45 008				
1,3,5-Trinitrobenzene	0.027 J	0.25	mg/kg	SW846 8330
2,4,6-Trinitrotoluene	3.0	0.25	mg/kg	SW846 8330
HMX	0.064 J	0.50	mg/kg	SW846 8330
RDX	0.083 J	0.50	mg/kg	SW846 8330
4-Amino-2,6-dinitrotoluene	0.18 J	0.25	mg/kg	SW846 8330
2-Amino-4,6-dinitrotoluene	0.11 J	0.25	mg/kg	SW846 8330
Barium - TCLP	1.2 B	10.0	mg/L	SW846 6010B
Cadmium - TCLP	0.010 B	0.10	mg/L	SW846 6010B
Chromium - TCLP	0.038 B	0.50	mg/L	SW846 6010B
Lead - TCLP	0.016 B	0.50	mg/L	SW846 6010B
Selenium - TCLP	0.0073 B	0.25	mg/L	SW846 6010B
Benzo(a)anthracene	2800	130	ug/kg	SW846 8270C
Benzo(b)fluoranthene	2700	130	ug/kg	SW846 8270C
Benzo(a)pyrene	2000	130	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	300	130	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	1100	130	ug/kg	SW846 8270C
pH (solid)	8.9		No Units	SW846 9045C
Percent Solids	98.3	10.0	%	MCAWW 160.3 MOD
WBG06-SPOIL PILE-03-MI 03/02/06 13:45 009				
1,3,5-Trinitrobenzene	0.061 J	0.25	mg/kg	SW846 8330
2,4,6-Trinitrotoluene	0.63	0.25	mg/kg	SW846 8330
HMX	0.10 J	0.50	mg/kg	SW846 8330
RDX	0.25 J	0.50	mg/kg	SW846 8330
4-Amino-2,6-dinitrotoluene	0.31	0.25	mg/kg	SW846 8330
2-Amino-4,6-dinitrotoluene	0.16 J	0.25	mg/kg	SW846 8330
Barium - TCLP	1.4 B	10.0	mg/L	SW846 6010B
Cadmium - TCLP	0.016 B	0.10	mg/L	SW846 6010B
Chromium - TCLP	0.0077 B	0.50	mg/L	SW846 6010B
Lead - TCLP	0.030 B	0.50	mg/L	SW846 6010B
Selenium - TCLP	0.0065 B	0.25	mg/L	SW846 6010B
Benzo(a)anthracene	2600	67	ug/kg	SW846 8270C
Benzo(b)fluoranthene	2600	67	ug/kg	SW846 8270C
Benzo(a)pyrene	2000	67	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	340	67	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	1200	67	ug/kg	SW846 8270C
pH (solid)	8.4		No Units	SW846 9045C
Percent Solids	98.2	10.0	%	MCAWW 160.3 MOD

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EXECUTIVE SUMMARY - Detection Highlights

A6C030125

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
WBG06-SPOIL PILE-04-MI 03/02/06 14:30 010				
2,4,6-Trinitrotoluene	0.093 J	0.25	mg/kg	SW846 8330
RDX	0.080 J	0.50	mg/kg	SW846 8330
4-Amino-2,6-dinitrotoluene	0.10 J	0.25	mg/kg	SW846 8330
Barium - TCLP	0.78 B	10.0	mg/L	SW846 6010B
Cadmium - TCLP	0.0014 B	0.10	mg/L	SW846 6010B
Chromium - TCLP	0.0046 B	0.50	mg/L	SW846 6010B
Selenium - TCLP	0.0095 B	0.25	mg/L	SW846 6010B
Benzo(a)anthracene	1700	67	ug/kg	SW846 8270C
Benzo(b)fluoranthene	1600	67	ug/kg	SW846 8270C
Benzo(a)pyrene	1200	67	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	170	67	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	670	67	ug/kg	SW846 8270C
pH (solid)	10.1		No Units	SW846 9045C
Percent Solids	98.2	10.0	%	MCAWW 160.3 MOD
WBG06-SPOIL PILE-05-MI 03/02/06 15:15 011				
1,3,5-Trinitrobenzene	0.035 J	0.25	mg/kg	SW846 8330
2,4,6-Trinitrotoluene	7.1	0.25	mg/kg	SW846 8330
RDX	0.21 J	0.50	mg/kg	SW846 8330
4-Amino-2,6-dinitrotoluene	0.23 Qualifiers: J,COL	0.25	mg/kg	SW846 8330
2-Amino-4,6-dinitrotoluene	0.19 J	0.25	mg/kg	SW846 8330
Barium - TCLP	1.1 B	10.0	mg/L	SW846 6010B
Cadmium - TCLP	0.019 B	0.10	mg/L	SW846 6010B
Chromium - TCLP	0.0032 B	0.50	mg/L	SW846 6010B
Lead - TCLP	0.011 B	0.50	mg/L	SW846 6010B
Selenium - TCLP	0.0038 B	0.25	mg/L	SW846 6010B
Benzo(a)anthracene	1500	67	ug/kg	SW846 8270C
Benzo(b)fluoranthene	1300	67	ug/kg	SW846 8270C
Benzo(a)pyrene	1100	67	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	140	67	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	560	67	ug/kg	SW846 8270C
pH (solid)	9.0		No Units	SW846 9045C
Percent Solids	97.7	10.0	%	MCAWW 160.3 MOD
WBG06-SPOIL PILE-06-MI 03/02/06 16:00 012				
1,3,5-Trinitrobenzene	0.038 J	0.25	mg/kg	SW846 8330
2,4,6-Trinitrotoluene	0.47	0.25	mg/kg	SW846 8330
HMX	2.1	0.50	mg/kg	SW846 8330

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EXECUTIVE SUMMARY - Detection Highlights

A6C030125

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
WBG06-SPOIL PILE-06-MI 03/02/06 16:00 012				
RDX	0.50	0.50	mg/kg	SW846 8330
4-Amino-2,6-dinitrotoluene	0.29	0.25	mg/kg	SW846 8330
2-Amino-4,6-dinitrotoluene	0.27	0.25	mg/kg	SW846 8330
Barium - TCLP	1.3 B	10.0	mg/L	SW846 6010B
Cadmium - TCLP	0.037 B	0.10	mg/L	SW846 6010B
Chromium - TCLP	0.0034 B	0.50	mg/L	SW846 6010B
Lead - TCLP	0.19 B	0.50	mg/L	SW846 6010B
Selenium - TCLP	0.0062 B	0.25	mg/L	SW846 6010B
Benzo(a)anthracene	3100	67	ug/kg	SW846 8270C
Benzo(b)fluoranthene	2800	67	ug/kg	SW846 8270C
Benzo(a)pyrene	2100	67	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	320	67	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	1200	67	ug/kg	SW846 8270C
pH (solid)	8.0		No Units	SW846 9045C
Percent Solids	98.1	10.0	%	MCAWW 160.3 MOD