

LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

CHRONOLOGICAL INDEX

Volume 8 of 25

2007

Bate Stamp Numbers

00047932 - 00048894

Prepared for

**Department of the Army
Longhorn Army Ammunition Plant**

1976 – 2007

***LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX***

VOLUME 8 of 25

2007

Note: Volume 8 of 25, Year 2007, Letters A, B and C Bate Stamp Numbers are out of date sequence.

- A. Title: Report – Final DERPMIS/RMIS Resolution Document
Author(s): U. S. Army Corps of Engineers – Tulsa District
Recipient: All Stakeholders
Date: April 1996
Bate Stamp: 00047932 - 00048112

- B. Title: Minutes – Longhorn Army Ammunition Plant Restoration Advisory Board Meeting
Author(s): Shaw
Recipient: All Stakeholders
Date: December 12, 2006
Bate Stamp: 00048113 - 00048120

- C. Title: Minutes – Longhorn Army Ammunition Plant Restoration Advisory Board Meeting
Author(s): Shaw
Recipient: All Stakeholders
Date: March 13, 2007
Bate Stamp: 00048121 - 00048130

- D. Title: Minutes – Longhorn Army Ammunition Plant Restoration Advisory Board Meeting
Author(s): Shaw
Recipient: All Stakeholders
Date: June, 12, 2007
Bate Stamp: 00048131 - 00048141

- E. Title: Letter - Authorization and Registration of Class V Aquifer Remediation Injection Wells TCEQ Authorization No. 5X2600464; WWC12121358; CN600696025/ RN101264505
Author(s): Bryan Smith, TCEQ
Recipient: Rose Zeiler, Site Manager LHAAP
Date: July 5, 2007
Bate Stamp: 00048142 – 00048143

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- F. Title: Report – Final Results of Modeling for Natural Attenuation of Chlorinated Solvents in Groundwater at LHAAP-35B(37) and LHAAP-67
Author(s): Shaw
Recipient: All Stakeholders
Date: July 12, 2007
Bate Stamp: 00048144 - 00048165
- G. Title: Report – Baseline Ecological Risk Assessment Surface Water Sampling Plan for Goose Prairie Creek
Author(s): Shaw
Recipient: All Stakeholders
Date: July 13, 2007
Bate Stamp: 00048166 - 00048186
- H. Title: Minutes – Monthly Managers Meeting
Author(s): Shaw
Recipient: All Stakeholders
Date: July 17, 2007
Bate Stamp: 00048187 - 00048198
- I. Title: Report – Sampling and Analysis Plan Groundwater Treatment Plant and Well Fields, Revision 1
Author(s): Shaw
Recipient: All Stakeholders
Date: July 19, 2007
Bate Stamp: 00048199 - 00048283
- J. Title: Letter – Prohibition of Water Well Installation on the Landfill 12 Parcel at the Former Longhorn Army Ammunition Plant located in Harrison County, Texas near the town of Karnack
Author(s): Dr. Rose Zeiler, Site Manager LHAAP
Recipient: Texas Department of Licensing and Regulation
Date: July 23, 2007
Bate Stamp: 00048284 - 00048297
- K. Title: Report – Final Site Investigation Report LHAAP-59
Author(s): Shaw
Recipient: All Stakeholders
Date: August 2, 2007
Bate Stamp: 00048298 - 00048717

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- L. Title: Letter – Draft Final Environmental Condition of Property V (ECOP V)
Author(s): Fay Duke, TCEQ Project Manager
Recipient: Dr. Rose Zeiler, Site Manager LHAAP
Date: August 8, 2007
Bate Stamp: 00048718

- M. Title: Minutes – Monthly Managers Meeting
Author(s): Shaw
Recipient: All Stakeholders
Date: August 14, 2007
Bate Stamp: 00048719 - 00048730

- N. Title: Report – Final Operating Properly and Successfully Demonstration Report
Landfill 12 (LHAAP-12)
Author(s): Shaw
Recipient: All Stakeholders
Date: September 7, 2007
Bate Stamp: 00048731 - 00048847

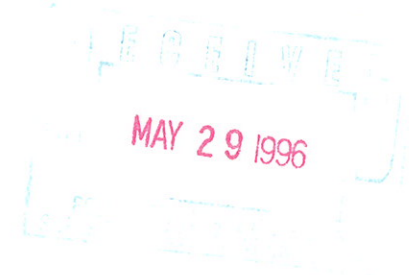
- O. Title: Report – Final Environmental Condition of Property V (ECOP V)
Author(s): Shaw
Recipient: All Stakeholders
Date: September 11, 2007
Bate Stamp: 00048848 - 00048872

- P. Title: Minutes – Longhorn Army Ammunition Plant Restoration Advisory Board Meeting
Author(s): Shaw
Recipient: All Stakeholders
Date: September 11, 2007
Bate Stamp: 00048873 - 00048882

- Q. Title: Minutes – Monthly Managers Meeting
Author(s): Shaw
Recipient: All Stakeholders
Date: September 11, 2007
Bate Stamp: 00048883 - 00048894

LONGHORN ARMY AMMUNITION PLANT

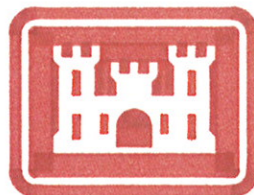
Marshall, Texas 75671-1059



FINAL DERPMIS/RMIS RESOLUTION DOCUMENT

PREPARED BY:
U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT

APRIL 1996



US Army Corps
of Engineers
Tulsa District

LONGHORN ARMY AMMUNITION PLANT
Marshall, Texas 75671-1059

MAY 29 1996

FINAL
DERPMIS/RMIS⁺
RESOLUTION
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TULSA DISTRICT

MARCH 1996

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PREFACE

The Restoration Management Information System (RMIS) is the modified version of the Defense Environmental Restoration Program Management Information System (DERPMIS). RMIS captures the site information for operating military installations and properties under the control of the Department of Defense (DOD) components. The RMIS information is used by the DOD to provide status of the Defense Environmental Restoration Program (DERP) in the Annual Report to Congress. The Army uses the RMIS to report to DOD on sites that are addressed in the Installation Action Plan (IAP), except the cost estimating section has been removed, since it contains procurement-sensitive information. The IAP is the Army's program planning tool for all sites in the DERP.

The DERPMIS/RMIS Resolution Document has been prepared to provide the regulatory community information on active and potential hazardous, toxic, and radioactive waste (HTRW) sites at Longhorn Army Ammunition Plant (LHAAP). When DERPMIS was initially developed primarily using the "Installation Assessment of Longhorn Army Ammunition Plant Report No. 150, February 1980". A copy of this document is included in the LHAAP's Administrative Record.

The RMIS list had not been thoroughly reviewed for accuracy until recently. The RMIS has been updated to remove duplicate sites, sites contained within other sites, sites that are not a part of the restoration program, and sites that never existed. The numbering system in the RMIS has also been changed to reflect those assigned by the Texas Natural Resource Conservation Commission (TNRCC) during the Resource Conservation and Recovery Act Facility Assessment (RFA) in April 1988. The numbering change prohibits one identifier from representing two different sites. The data sheets from the RFA are also located in the Administrative Record.

ABBREVIATIONS AND ACRONYMS

CERCLA	Comprehensive Environmental, Response, Compensation and Liability Act
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DERPMIS	Defense Environmental Restoration Program/ Management Information System
DRMS	Defense Reutilization and Marketing Service
EPA	Environmental Protection Agency
FFA	Federal Facility Agreement
FS	Feasibility Study
FY	Fiscal Year
GOCO	Government Owned, Contractor Operated
IAG	Interagency Agreement
IAP	Installation Action Plan
INF	Intermediate-Range Nuclear Force
IRA	Interim Remedial Action
IRP	Installation Restoration Program
LAP	Load, Assemble, and Pack
LTM	Long-Term Monitoring
LHAAP	Longhorn Army Ammunition Plant
NPL	National Priority List
OB/OD	Open Burn/Open Detonation
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyls
PVC	Polyvinyl Chloride
Qtr.	Quarter
RA	Remedial Action
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	RCRA Facility Agreement
RI	Remedial Investigation
RMIS	Restoration Management Information System
SI	Site Investigation
SWMU	Solid Waste Management Unit
TNRCC	Texas Natural Resource Conservation Commission
TNT	Trinitrotoluene
TWC	Texas Water Commission
UEP	Unlined Evaporation Pond
U.S.	United States
UST	Underground Storage Tank

**RESTORATION MANAGEMENT INFORMATION SYSTEM SUMMARY
FOR
LONGHORN ARMY AMMUNITION PLANT**

I. INSTALLATION INFORMATION

A. LOCALE

Longhorn Army Ammunition Plant (LHAAP) is located in central east Texas in the northeast corner of Harrison County, approximately 14 miles northeast of Marshall, Texas, and approximately 40 miles west of Shreveport, Louisiana. The installation occupies 8,493 acres between State Highway 43 and the western shore of Caddo Lake. Approximately 1,700 to 2,000 personnel are employed at LHAAP. The area surrounding LHAAP is primarily rural and consists of forest lands; the small town of Karnack, Texas; Caddo Lake; and Caddo Lake State Park.

B. COMMAND ORGANIZATION

- - Major Command: U.S. Army Material Command, Environmental Quality Division
- - Subcommand: U.S. Army Armament, Munitions, and Chemical Command, Environmental Quality Directorate
- - Installation: LHAAP, Environmental Office

C. INSTALLATION RESTORATION PROGRAM (IRP) EXECUTING AGENCY

- - Investigation Phase Executing Agency: U.S. Army Corps of Engineers, Tulsa District
- - Remedial Design/Action Phase Executing Agency: U.S. Army Corps of Engineers, Tulsa District and Fort Worth District

D. REGULATOR PARTICIPATION

- - Federal: U.S. Environmental Protection Agency, Region VI
- - State: Texas Natural Resource Conservation Commission

E. REGULATORY STATUS

- - National Priorities List Installation with Interagency Agreement (IAG)
- - Technical Review Committee, March 1992
- - Interagency Agreement, December 1991
- - Federal Facility Agreement, 1991

II. INSTALLATION DESCRIPTION

A. CURRENT ACTIVITY

LHAAP is an active government-owned, contractor operated (GOCO) U.S. Army Armament, Munitions, and Chemical Command Facility. The primary mission of LHAAP is to load, assemble, and pack (LAP) pyrotechnic and illuminating/signal ammunition and solid propellant rocket motors. The Longhorn Division of Thiokol Corporation is the current operating contractor. Thiokol signed a Facilities Contract with the U.S. Army to operate LHAAP beginning 1 October 1993.

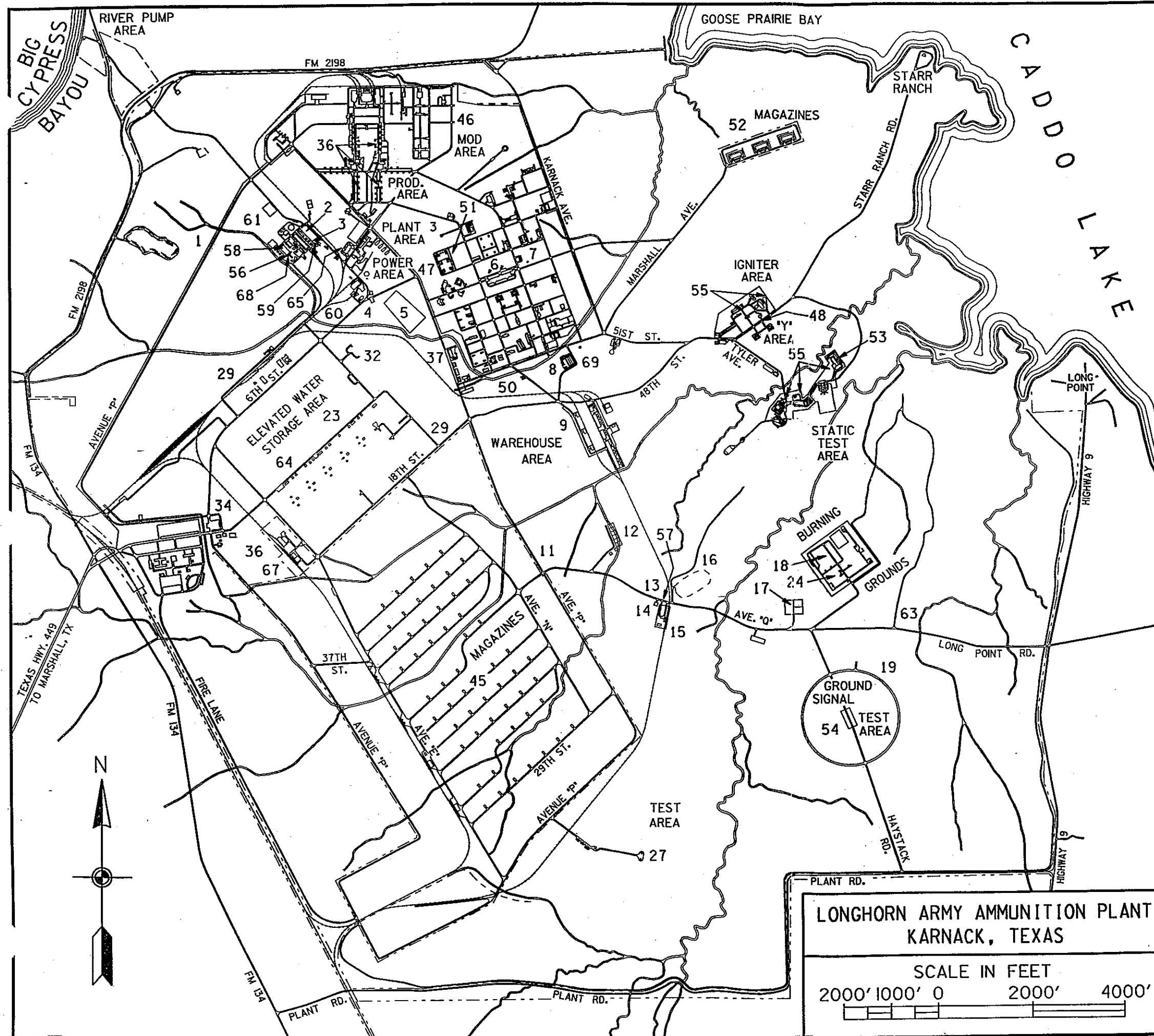
B. HISTORIC ACTIVITY

LHAAP was established in October 1942 with the primary mission of producing 2,4,6-trinitrotoluene (2,4,6-TNT) flake. Monsanto Chemical Company was the first contract operator of the plant. Production of 2,4,6-TNT continued through World War II until August 1945 when the plant went on standby status until February 1952. From 1952 until 1956, Universal Match Corporation was the contracting operator, producing such pyrotechnic ammunition as photoflash bombs, simulators, hand signals, and tracers for 40 mm. Thiokol assumed this responsibility with the departure of Universal Match Corporation in 1956. Production of rocket motors continued to be the primary mission of LHAAP until 1965 when the production of pyrotechnic and illuminating ammunition was re-established.

Current operations consist of compounding pyrotechnic and propellant mixtures, LAP activities, accommodating receipt and shipment of containerized cargo, and maintenance and/or layaway of standby facilities and equipment as they apply to mobilization planning. The installation has also been responsible for static firing and elimination of Pershing I and II rocket motors in compliance with the Intermediate-Range Nuclear Force (INF) Treaty in effect between the United States and the former USSR.

C. REGULATORY STATUS

LHAAP was placed on the National Priorities List (NPL) on August 30, 1990, as a result of a contaminant release to the environment at the installation. After being listed on the NPL, the LHAAP, the U.S. Environmental Protection Agency (EPA), and the Texas Water Commission (TWC) (now called the Texas Natural Resource Conservation Commission [TNRCC]) entered into a Comprehensive Environmental, Response, Compensation and Liability Act (CERCLA) Section 120 Agreement for remedial activities at LHAAP. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective December 30, 1991.



RMIS LHAAP #

1	Inert Burning Ground.	00047941
2	Vacuum Truck Overnight Parking Lot.	
3	Building 722 - Paint Shop.	
4	Pilot Waste Water Treatment Plant.	
5	Power House Boiler Pond.	
6	Building 54F Solvent.	
7	Building 50G Drum Processing.	
8	Sewage Treatment Plant.	
9	Building 31W Drum Storage.	
11	Suspected TNT Burial Site at P&Q Ave.	
12	Active Landfill.	
13	Suspected TNT Burial Between Active and Old Landfill.	
14	Area 54W Burial Site.	
15	Area 49W Drum Storage.	
16	Old Landfill.	
17	No. 2 Flashing Area Burning Ground.	
18	a) Burning Ground #3, b) 24X Holding Area, c) Air Curtain Destructor, d) Building 41X, e) Building 43X, f) 25X Washout Pad, g) Open Burning Cage, h) Open Burning Pan.	
19	Construction Materials Landfill.	
23	Building 707 - Storage Area PCB's.	
24	Former Unlined Evaporation Pond.	
27	South Test Area / Bomb Test Area.	
29	a) Former TNT Production Area, b) TNT Red Water Pipeline, c) Former Acid Plant.	
32	Former TNT Waste Disposal Plant.	
34	Building 701 - PCP Storage.	
35	Various Sumps (Located Throughout Facility).	
36	Explosive Waste Pads.	
37	Quality Assurance Laboratory Building 29A.	
45	Magazine Area (Other-Than Plant 1).	
46	Plant 2 / Pyrotechnic Operation.	
47	Plant 3 / Produces Hand Signal Assemblies.	
48	Y Area / Produces Hand Signal Assemblies.	
50	Former Waste Disposal Facility.	
51	Photographic Laboratory Building 60B.	
52	Magazine Area (Plant 1).	
53	Static Test Area.	
54	Ground Signal Test Area.	
55	Septic Tank.	
56	Vehicle Wash Rack & Oil/Water Separator.	
57	Rubble Burial Site.	
58	Maintenance Complex.	
59	Storage Building 725.	
60	Former Storage Building 411 and 714.	
61	Water Treatment Plant.	
63	Burial Pits.	
64	Transformer Storage.	
65	Building 209.	
66	Transformers (Located Throughout Facility).	
67	Above Ground Storage Tank.	
68	Mobile Storage Tank.	
69	Underground Storage Tank.	

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT

LHRCN7-1.DGN - 06FEB1995 RBP

In addition to the site listing of the FFA, an Installation Assessment by the Army in February 1980, and the RFA in April 1988 identified additional potential sites of concern. The DERPMS identified 59 sites in the 1992 list. The RMIS has been updated to remove duplicate sites, sites contained within other sites, sites that are not a part of the restoration program, and sites that never existed. As a result, 9 sites were identified as sites that were contained within other sites. The RMIS has identified 50 sites. Below is a DERPMS/RMIS cross reference table.

TABLE 1 DERPMS/RMIS CROSS REFERENCE TABLE

SITE DESCRIPTION	DERPMS LHAAP#	RMIS LHAAP#	STATUS
Inert Burning Ground	001	1*	RI/FS
Vacuum Truck Overnight Parking Lot	002 *	2	ACTIVE
Building 722 - Paint Shop	003	3	ACTIVE
Pilot Waste Water Treatment Plant	004	4	ACTIVE
Power House Boiler Pond	005	5	ACTIVE
Building 54F Solvent	006	6	ACTIVE
Building 50G Drum Processing	007	7	ACTIVE
Sewage Treatment Plant	008	8	ACTIVE
Building 31-W Drum Storage	009	9	ACTIVE
Suspected TNT Burial Site at P&Q Avenue	010	11*	RI/FS
Active Landfill	011	12*	RI/FS
Suspected TNT Burial Between Active and Old Landfill	012	13*	RI/FS
Area 54W Burial Site	013	14*	RI/FS
Area 49W Drum Storage	014	15	ACTIVE
Old Landfill	015	16*	RI/FS
No. 2 Flashing Area Burning Ground	016	17*	RI/FS
Burning Ground/Rocket Motor Washout Pond	017	18*	RI/FS
Construction Materials Landfill	018	19	ACTIVE
South Test Area/Bomb Test Area	019	27*	RI/FS
Former TNT Production Area	021	29*	RI/FS

TNT Red Water Pipeline	022	29	RI/FS
Building 707 Storage Area PCBs	023	23	NFA
Former TNT Waste Disposal Plant	024	32*	RI/FS
Building 701 PCB Storage	034	34	NFA
Sumps Various	035	35	RI/FS
Explosive Waste Pads	036	36	NFA
Quality Assurance Laboratory Building 29-A	037	37	ACTIVE
24X Holding Area	038	18	IRA
25X Washout Pad	039	18	IRA
Air Curtain Destructor	040	18	IRA
Open Burning Cage	041	18	IRA
Open Burning Pan	041	18	IRA
Former Unlined Evaporation Pond	043	24*	IRA
Building 41-X	044	18	IRA
Magazine Area	045	45	ACTIVE
Plant 2/Pyrotechnic Operation	046	46	NFA
Plant 3/Produces Hand Signal Assemblies	047	47	NFA
Y Area/Produces Hand Signal Assemblies	048	48	NFA
Former Acid Plant	049	29	RI/FS
Former Waste Disposal Facility	050	50	SI
Photographic Laboratory Building 60B	051	51	NFA
Magazine Area	052	52	SI
Static Test Area	053	53	NFA
Ground Signal Test Area	054	54*	RI/FS
Septic Tank	055	55	NFA
Vehicle Wash Rack & Oil/Water Separator	056	56	RI/FS
Rubble Burial Site	057	57	NFA
Maintenance Complex	058	58	NFA

Storage Building #725	059	59	RI/FS
Former Storage Building \$411 and #714	060	60	SI
Water Treatment Plant	061	61	NFA
Building #43X	062	18	IRA
Burial Pits	063	63	SI
Transformer Storage	064	64	NFA
Building #209	065	65	RI/FS
Transformers	066	66	NFA
Above Ground Storage Tank	067	67	NFA
Mobile Storage Tank	068	68	NFA
Underground Storage Tank	069	69	NFA

(*) FFA Sites.

III. CONTAMINATION ASSESSMENT

A. ASSESSMENT OVERVIEW

In February 1980, the U.S. Army Environmental Center (AEC), formerly the U.S. Army Toxic and Hazardous Materials Agency, conducted an on-site installation assessment to determine the presence of any toxic or hazardous materials and to assess the potential for off-post migration. The assessment identified major areas of potential contamination as burial sites, testing areas, the TNT production area, the LAP areas, and the burning grounds. The major contaminants suspected included pyrotechnic ingredients, TNT scrap, red water, and explosive contamination scrap. The assessment identified the most likely route of any potential off-post migration as groundwater flow and surface runoff into the bayou which feed Caddo Lake.

Numerous studies followed this preliminary assessment to investigate waste management, groundwater and soil contamination. The most extensive studies were conducted at the burning ground and landfill areas. Attachment I provides a list of all studies conducted to date at LHAAP. The reports generally concluded that the groundwater is the major media of concern.

Groundwater at LHAAP generally occurs under unconfined conditions in alluvial or Wilcox materials and can be encountered within one foot to 20-30 feet or more below the ground surface. Perched and locally confined conditions frequently occur within the Wilcox due to its highly variable stratigraphy, with frequent clay lenses. Recharge is primarily by precipitation infiltration

from the surface and can effect the groundwater elevation as much as two feet in a six-month period. The contamination exists in the groundwater. The main contaminants of concern are methylene chloride, trichloroethylene (TCE), explosives, and metals.

LHAAP is currently under Remedial Investigation/Feasibility Study (RI/FS) phases on 13 sites listed in the FFA and the installation-wide sumps. The current investigations have been divided into five groups. The sites are identified by group number under the individual site descriptions in Section III B of this report. Group 1 includes sites that have historically showed little contamination or little potential for contamination. Group 2 sites are considered to be more contaminated than the Group 1 sites. Group 3 sites include two sites where no contamination has been found and will proceed to a no action record of decision. Group 4 sites are the installation-wide sumps. The Group 5 sites have been identified as potential sites of concern in a recent re-evaluation of previous reports and will undergo a site investigation in FY 95.

Early Interim Remedial Action (IRA) have been initiated to extract contaminated groundwater underneath Burning Ground No. 3 and the former Unlined Evaporation Pond and to construct landfill caps at the former cells of the Active Landfill and the Old Landfill. High concentrations of TCE and methylene chloride were detected in the shallow groundwater underneath these sites.

B. SITE DESCRIPTIONS

LHAAP currently has 50 sites in the RMIS. A summary of all 50 sites listed in the RMIS is given below and provided in the site summary chart.

LHAAP-1 INERT BURNING GROUNDS

This site is used for the burning of trash, ashes, scrap lumber, and waste from burned TNT. Universal Match Corporation used this site during the 1950's for burning photoflash powder and other discarded materials. In 1982, investigations at this site included completion and sampling of one groundwater well and three surface soil samples. Contamination by metals, chloride, sulfate, and two explosive compounds was detected. Very low-level explosive contamination was detected here in a downgradient well in 1988. This site is included in the FFA.

Contaminant of concern: Explosive chemicals/inert materials
Media of concern: Soil/Groundwater
Completed IRP Phase: Preliminary Assessment Site
Investigation (PA/SI)
Current IRP Phase: RI/FS -- Group #1
Future IRP Phase: Remedial Design/Remedial Action (RD/RA)

LHAAP-2 VACUUM TRUCK OVERNIGHT PARKING LOT

This site is a vacuum truck overnight parking lot. Tanker trucks containing industrial wastewater are sometimes left at this location overnight. This parking lot is located next to Building 704D. This site was identified as a Solid Waste Management Unit (SWMU) in the RFA, and the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Unknown (industrial wastewaters)
 Media of concern: Surface Water/Groundwater
 Completed IRP Phase: PA
 Current IRP Phase: None
 Future IRP Phase: Active Site

LHAAP-3 BUILDING 722 - PAINT SHOP

This site is used for collection of waste produce from the paint shop. Wastes may include paint thinner, paints, and kerosene. The site consists of one 55-gallon drum set on a gravel pad in an open-sided shed, with a galvanized metal roof. Waste is put into a 55-gallon drum until the drum is full. The drum is then taken to Building 31-W. This site has been active since the early 1970's and is active today. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Paint and solvents
 Media of concern: Soil/Groundwater/Surface Water
 Completed IRP Phase: PA
 Current IRP Phase: None
 Future IRP Phase: Active Site

LHAAP-4 PILOT WASTEWATER TREATMENT PLANT

This plant receives all the wastewater from all sumps on the installation. After settlement, the wastewater is transferred to one of two storage tanks and then pumped through a heat exchanger to an evaporation tower. Solids are shipped off site, and sludges from the settling tank are blown down and drummed on a weekly basis and burned at Burning Ground No. 3. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Ordnance Comp./Industrial Wastewater
 Media of concern: Groundwater/Surface Water/Air
 Completed IRP Phase: PA
 Current IRP Phase: None
 Future IRP Phase: Active Site

LHAAP-5 POWER HOUSE BOILER POND

This site has been in operation since 1978. It consists of a 4-foot-deep earthen lagoon lined with a polyvinyl chloride (PVC) liner. The lagoon receives approximately 3,000 gallons per day of backwash water from zeolite treatment units at the Building 401 Powerhouse. Water is either evaporated from the lagoon or discharged to the sewage treatment plant. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Unknown (backwash from zeolite treatment)
 Media of concern: Groundwater/Surface Water
 Completed IRP Phase: PA
 Current IRP Phase: None
 Future IRP Phase: Active Site

LHAAP-6 BUILDING 54F

This site serves as a collection point for waste solvents from production processes. The site consists of a single 55-gallon drum stored in a three-sided shed, approximately 8 by 10 feet in size, with fiberglass siding and a roof of galvanized metal and fiberglass. The shed is set on a curbless concrete pad. Full drums are taken to Building 31-W. This site has been in operation since mid-1985 and is currently active. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Acid
 Media of concern: Soil/Groundwater
 Completed IRP Phase: PA
 Current IRP Phase: None
 Future IRP Phase: Active Site

LHAAP-7 BUILDING 50G - DRUM PROCESSING

This site is a washdown area for empty drums used in production. The site consists of a wooden frame building 30 by

100 feet in size, set on concrete and having transite walls. Main washdown takes place in a separate bay, 20 by 30 feet in size. All washdown water drains to a 3,000-gallon sump outside Sump No. 70. Empty drums are either reused or flashed at the Air Curtain Destructor and sent to Building 49-W for disposal as scrap. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Petroleum/Oil Lubricants
Media of concern: Soil/Groundwater
Completed IRP Phase: PA
Current IRP Phase: None
Future IRP Phase: Active Site

LHAAP-8 SEWAGE TREATMENT PLANT

This site is a sewage treatment plant consisting of an Imhoff tank, a sand filter, and three sludge beds. Sludge is dried on sand beds then shipped to the active landfill. This site has been active from 1942 to the present. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Residues from production material
Media of concern: Groundwater/Soil/Air
Completed IRP Phase: PA
Current IRP Phase: None
Future IRP Phase: Active Site

LHAAP-9 BUILDING 31-W - DRUM STORAGE

Building 31-W is a storage area for containers of liquid hazardous waste. The building consists of two adjoining areas. The original area is a 100 by 50 foot structure with transite siding. The building has been in existence since at least the 1950's. The newer area consists of a structure approximately 80 by 50 feet in size, enclosed with galvanized metal siding that was completed in April 1987. Within the older area are three concrete troughs, 6 feet by 31 feet with 6-inch curbs, that were used for polychlorinated biphenyls (PCB) storage. No PCB is presently being stored there, but the area is used for various chemicals held in the lab pack for disposal. The newer area consists of eight concrete pads enclosed by 6-inch concrete curbs, 20 feet 1 inch by 25 feet 10 inches in size. Drums on pallets are stored on the pads. This site was used for liquid waste storage during the early 1950's and has been used for hazardous waste storage since 1984. Although this site was

identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Petroleum/Oil/Lubricants and
Unknown
Media of concern: Soil/Groundwater
Completed IRP Phase: PA
Current IRP Phase: None
Future IRP Phase: Active Site

LHAAP-11 SUSPECTED TNT BURIAL SITE AT AVENUES P AND Q

Burial of contaminated wastes occurred in the general area just north of Avenue Q, bounded by Avenue P on the west and the explosive burning ground on the east. An area near the intersection of Avenues Q and P was identified as a possible TNT disposal site in use during the 1940's. A concrete block was discovered in this area during an assessment conducted in 1980, but its purpose is unknown. There is an area a few hectare in size located just west of the intersection of track 3-A and Avenue Q. This area was used during the late 1940's and early 1950's for the disposal of acids, building rubble, and other trash. Surface and subsurface soil samples were collected in 1984 and 1988. Low levels of explosive contamination were detected in both soil sampling events. This site is included in the FFA. Site investigations conducted in 1993 concluded that further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Unknown (TNT residues)
Media of concern: Soil/Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #1
Future IRP Phase: RD/RA

LHAAP-12 ACTIVE LANDFILL

The Active Landfill is currently used for disposal of non-hazardous industrial waste. The landfill has been used intermittently since 1963. Continuous use of the landfill began in approximately 1978. Four groundwater wells were installed in 1980 and two in 1982. Groundwater analyses showed some metals, chlorides, and an explosive compound were present. In 1991, surface water and sediment samples were collected from one location near the landfill. These samples contained elevated levels of metals and trace amounts of some explosive and volatile organic compounds. This site is included in the FFA. Site investigations conducted in 1993 concluded that an Early Interim Remedial Action (Landfill Cap) is necessary to reduce further

contamination to the groundwater. Additional field investigation (Phase II, RI/FS) is also required at this site.

Contaminant of concern: Asbestos/Refuse without Hazardous Waste/Unknown
Media of concern: Soil/Groundwater/Surface Water
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #2
Future IRP Phase: IRA and RD/RA

LHAAP-13 SUSPECTED TNT BURIAL BETWEEN ACTIVE LANDFILL AND OLD LANDFILL

The Suspected TNT Burial Site/Acid Dump is an undocumented location where it is suspected that TNT or waste acids may have been disposed sometime during the history of the installation. Other than this suspected one-time disposal, no other activities have taken place at this site. Evidence of possible TNT burial or acid waste disposal at the site consists of several areas of little or no vegetation which is consistent with the suspicion that some form of waste disposal has occurred at this location. Examination of aerial photographs dated 1963 show these same locations stripped of vegetation with some type of activity being performed at the site. These locations are not evident in 1954 photos, and most of the area appears to be revegetated and inactive in 1970 photos. This site is included in the FFA. Completion of a remedial investigation conducted in 1993 concluded that no further investigation is needed at this site.

Contaminant of concern: TNT/Waste Acid
Media of concern: Soil/Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #3
Future IRP Phase: NFA

LHAAP-14 AREA 54 - BURIAL GROUND

The Area 54 Burial Ground is an undocumented location where it is suspected that demolition debris, building rubble, explosives, and acidic wastes were disposed during the 1940's and early 1950's. The disposal site is reportedly beneath the asphalt parking area adjacent to Building 49-W. Other than this period of operation, no other waste activities have taken place at the site. This site is included in the FFA. Site investigations conducted in 1993 concluded that no further investigation is needed at this site.

Contaminant of concern: Acid/Ordinance Components
Media of concern: Soil/Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #3
Future IRP Phase: NFA

LHAAP-15 AREA 49W - DRUM STORAGE

This site is a drummed waste storage shed containing solid and hazardous waste. It consists of a metal building 50 feet by 100 feet by 10/16 feet (sloped), with a concrete floor. Drums are stacked three high on pallets and held for shipment to the Defense Reutilization and Marketing Service (DRMS). This site has been in operation since 1984 and is still active today. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active unit therefore it is not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Unknown/Brine/Oil/Ash
 Media of concern: Soil/Groundwater
 Completed IRP Phase: PA
 Current IRP Phase: None
 Future IRP Phase: Active Site

LHAAP-16 OLD LANDFILL

The Old Landfill was originally used for disposal of products generated from the TNT Waste Disposal Plant. However, a variety of waste was disposed of in the landfill until the 1980's. Burned rocket motor casings, substandard TNT, barrels of chemicals, oil, paint, scrap iron, and wood may have been disposed of in the Old Landfill. Contamination from explosives, solvents, and metals is suspected in the soil, surface water, and groundwater around the Old Landfill.

Investigations were conducted at this site in 1980, 1982, and 1988. Five monitoring wells were installed in 1980. One well installation, well sampling, sediment and surface water sampling, and soil sampling were conducted in 1982. In 1988, wells were sampled and additional soil sampling was conducted. Explosive contamination was detected in the groundwater, sediments, and soil samples. Vinyl chloride was also detected in one monitoring well. This site is no longer in operation and is included in the FFA. Site investigations conducted in 1993 concluded that an Early IRA (Landfill Cap) is necessary to reduce further contamination to the groundwater. Additional field investigation (Phase II, RI/FS) is also required at this site.

Contaminant of concern: Ordnance Components and Unknown
 Media of concern: Soil/Groundwater
 Completed IRP Phase: PA/SI
 Current IRP Phase: RI/FS -- Group #2
 Future IRP Phase: IRA and RD/RA

LHAAP-17 NO. 2 FLASHING AREA/BURNING GROUND

This site was used for burning bulk TNT, photoflash powder, and reject material from Universal Match Corporation's production processes. The site was operated as a burning ground from 1959 until 1980. There is evidence of bulk burial of TNT prior to 1954. Two burning pads are enclosed in a 2-acre fenced area surrounded by a flat grass area. Burning Ground No. 2 is situated approximately 400-500 feet southwest of Burning Ground No. 3, on adjoining property. Waste residues were removed in 1984 and the area grassed over. This site is no longer active and is included in the FFA. This site was investigated in 1984, 1986, and 1988. Contamination of the groundwater was found in the first two sampling events, and explosive compounds were detected in the soil sampling event in 1988. Site investigations conducted in 1993 concluded that further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Explosives and Unknown
 Media of concern: Soil/Groundwater
 Completed IRP Phase: PA/SI
 Current IRP Phase: RI/FS -- Group #2
 Future IRP Phase: RD/RA

LHAAP-18 & 24 BURNING GROUND/WASHOUT POND & UNLINED EVAPORATION POND

Burning Ground No. 3 has been in operation since 1955. It has been used for the treatment, storage, and disposal of solid and liquid explosives, pyrotechnics, and combustible solvent wastes by open burning, incineration, evaporation, and burial. The Unlined Evaporation Pond (UEP) was constructed in 1963 in Burning Ground No. 3. Various types of waste have been disposed of in the UEP since 1963. Explosive waste, solvents, metallic materials, and nitrogen and phosphorous compounds are the suspected contaminants. In 1986, waste from the UEP was removed and the UEP capped. Burning of waste is still conducted in the Burning Ground No. 3 area.

Several investigations have been conducted at this site. In 1980, 13 monitoring wells were completed. In 1984, samples were collected to characterize the waste in portions of the site. Nine additional wells were installed in 1982. Explosives, metals, and organic solvents contamination was detected in groundwater at the site. In 1984, eight additional wells were installed around the UEP. To further characterize the UEP, 10 additional wells were installed around the area. In 1987, a soil gas survey, soil sampling, installation and sampling of 15 new groundwater wells, and sampling of 10 existing wells were conducted to identify additional contamination sources in the area. Contamination by volatile organic compounds, metals,

chlorides, nitrates, and some explosives was found in the area. In 1989, additional wells were completed, along with soil and surface water sampling to determine the extent of groundwater contamination. Quarterly monitoring has been conducted at the site since closure of the UEP. This site is included in the FFA.

Based on the results of the latest round of water sampling which indicated the zone of contaminated groundwater is expanding, a Proposed Plan of an Early IRA was issued to the public in September 1994. The purpose of this IRA is to extract, treat, and contain contaminated groundwater underneath this site. Additional field investigation (Phase II, RI/FS) is also required at this site.

Contaminant of concern: Petroleum/Oil/Lubricants/Unknown
Solvents and Heavy Metals
Media of concern: Soil/Groundwater/Surface Water
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #2
Future IRP Phase: IRA and RD/RA

LHAAP-19 CONSTRUCTION MATERIALS LANDFILL

This site is used as a landfill. It is a fenced area 400 by 800 feet in size. Operation is trench and burial. This site has been in operation from 1985 until the present. Although this site has been identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. Disposal at the site is construction material only. There is no apparent contamination. This is an active site and therefore not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Refuse without hazardous waste
Media of concern: Soil/Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: None
Future IRP Phase: Active Site

LHAAP-22 TNT RED WATER PIPELINE

This site is being investigated under LHAAP 29 and 32 which are under RI/FS phases.

Contaminant of concern: Ordnance Components
Media of concern: Soil/Groundwater/Surface Water/Sediment
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #2
Future IRP Phase: RD/RA

LHAAP-23 BUILDING 707 - STORAGE AREA FOR PCBs

This site consists of a wooden storage building 30 by 150 feet in size, with shingle siding and a concrete floor. Drums or transformers containing PCB-contaminated oil were stored in galvanized steel cattle watering troughs inside the building. The building was empty except for the used cattle troughs. This site was in operation from 1980 until March 1986. Although this site was identified as an SWMU in the RFA, the TNRC determined that there were no additional investigations required at this site. A Preliminary Assessment was conducted by the Army in March 1996, and there was no visible evidence of contamination at the site. Therefore, the Army has placed this site in a No Further Action Category.

Contaminant of concern: Unknown
 Media of concern: Contamination of Building
 Completed IRP Phase: PA
 Current IRP Phase: NFA
 Future IRP Phase: NFA

LHAAP-27 SOUTH TEST AREA

The South Test Area was constructed in 1954 for testing of photoflash bombs. During the late 1950's, illuminating signal devices were also demilitarized within pits at the site. In the early 1980's, photoflash cartridges were demilitarized in the area. In 1982, investigations included installation and sampling of two wells and three shallow soil samples. Metals above background levels, explosives, and chloride and sulfate were detected above background levels in the groundwater. This site is no longer in operation and is included in the FFA. Site investigations conducted in 1993 concluded that further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Ordnance Components
 Media of concern: Soil/Groundwater
 Completed IRP Phase: PA/SI
 Current IRP Phase: RI/FS -- Group #1
 Future IRP Phase: RD/RA

LHAAP-29 FORMER TNT PRODUCTION AREA

The Former TNT Production Area was in operation from April 1943 to August 1945 as a six-line plant with a supporting acid plant. The plant produced 180 million kilograms of TNT throughout the period of operation. A bulk toluene storage area servicing the TNT Production Area was located adjacent to the production area. TNT wastewater (red water) from the production of the TNT was sent through wooden pipelines to a storage tank and pump house, and then to the TNT Disposal Plant. Cooling water (blue water) from the production area ran through main lines and

into an open ditch. Acidic waste were neutralized and discharged into a drainage ditch. The entire site, except for the foundations, was demolished and removed in 1959.

Six groundwater wells were completed and sampled in 1984 along with surface water/sediment samples from four locations. In 1988, the 6 wells, additional surface water, and 35 soil borings were sampled. Explosive contamination was detected in soil and surface water/sediment samples. This site is no longer in operation and is included in the FFA. Site investigations conducted in 1993 concluded that further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Ordnance Components
Media of concern: Soil/Groundwater/Surface Water/Sediment
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #2
Future IRP Phase: RD/RA

LHAAP-32 FORMER TNT WASTE DISPOSAL PLANT

The TNT Waste Disposal Plant was constructed in 1942 to treat and dispose of wastewaters generated at the TNT Production Area. The plant was in operation from April 1943 until August 1945. In 1959, most of the facilities at the Disposal Plant were removed. The suspected contaminants are explosive compounds and metals contained in explosive manufacturing residues.

One groundwater well was completed and sampled in 1982. Surface water and sediment samples were also collected in the area. One explosive compound was detected along with some elevated levels of metals. A surface water sample was collected in 1991, and the analyses detected low levels of explosive compounds. This site is no longer active and is included in the FFA. Site investigations conducted in 1993 concluded that further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Ordnance Components
Media of concern: Groundwater/Surface Water/Sediment
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #2
Future IRP Phase: RD/RA

LHAAP-34 BUILDING 701 - PCB STORAGE

This site consists of a building formerly used for storage of PCB-contaminated material from the cleanup of transformer spills in 30- and 55-gallon drums. The site consists of a wooden framed building with shingles and a concrete floor, approximately 25 by 110 feet in dimension. Only the north half of the building was used for storage. This site was in operation from 1980 until 1984. Although this site was identified as an SWMU in the RFA,

the TNRCC determined that there were no additional investigations required at this site. Based on this determination, historical information, and finding no visible evidence of contamination the Army has placed this site into a No Further Action category.

Contaminant of concern: Polychlorinated Biphenyls
 Media of concern: Contamination of Building
 Completed IRP Phase: PA/SI
 Current IRP Phase: NFA
 Future IRP Phase: NFA

LHAAP-35 PROCESS WASTEWATER SUMPS - VARIOUS

This site consists of 24 industrial wastewater sumps. These sumps are located in different locations within LHAAP. Site investigations conducted in 1993 concluded that further field investigations is needed at this site to complete the site characterization report.

Contaminant of concern: Heavy Metals
 Media of concern: Groundwater
 Completed IRP Phase: PA/SI
 Current IRP Phase: RI/FS -- Group #4
 Future IRP Phase: RD/RA

LHAAP-36 EXPLOSIVE WASTE PADS

This site is a compilation of approximately 20 waste pads. These waste pads consist of a galvanized metal roof set over a concrete 4- by 8-foot pad with a 6-inch curb. The waste pads are drained by concrete troughs into sumps. Explosive waste is desensitized with diesel fuel and placed in 5-gallon, galvanized, lidded, metal garbage pails with plastic bag liners. Full garbage pails are stored in a metal rack approximately 1.5 feet above the ground. The site has been in operation from 1985 until the present. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. Based on a Preliminary Assessment conducted by the Army in March 1996, historical information, and finding no visual evidence of contamination the Army has placed this site into a No Further Action category.

LHAAP-37 QUALITY ASSURANCE LABORATORY - BUILDING 29A

This site serves as a collection point for spent solvents from the Quality Assurance Laboratory. The site consists of one 55-gallon, plastic, DOT-approved drum set on a concrete pad. Each full drum is sent to Building 31-W. This site has been in operation from 1985 until the present. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active site and therefore not eligible for DERA funding. If

any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Solvent
Media of concern: Soil/Groundwater/Surface Water/Air
Completed IRP Phase: PA
Current IRP Phase: None
Future IRP Phase: Active Site

LHAAP-38 24X HOLDING AREA, LHAAP-39 25X WASHOUT PAD,
LHAAP-40 AIR CURTAIN DESTRUCTOR, LHAAP-41 OPEN BURNING CAGE,
LHAAP-42 OPEN BURNING PAN, LHAAP-43 FORMER UNLINED EVAPORATION
POND, LHAAP-44 BUILDING 41X

These sites are located within LHAAP 18 and LHAAP- 24 which is under IRA and RI/FS phases.

Contaminant of concern: Petroleum/Oil/Lubricants/Unknown
Solvents and Heavy Metals
Media of concern: Soil/Groundwater/Surface Water
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #2
Future IRP Phase: IRA and RD/RA

LHAAP-45 MAGAZINE AREA

This site has been used for the storage of munitions. The total enclosed area is over 800 acres. Located within this area are 58 bunkers and 2 buildings. Each bunker consists of three concrete walls and a concrete-floored structure 26 by 60 by 10 feet in size, with a wooden roof and doors. If stored munitions are designated for disposal, they are taken to Building 811-1 where they are processed out. In operation since 1942, this site is still active. Although this site was identified as an SWMU in the RFA, the TNRCC determined that there were no additional investigations required at this site. This is an active site and therefore not eligible for DERA funding. If any future actions are found necessary they will be addressed under RCRA.

Contaminant of concern: Unexploded Ordnance
Media of concern: Soil/Building
Completed IRP Phase: PA
Current IRP Phase: None
Future IRP Phase: Active Site

LHAAP-46 PLANT 2/PYROTECHNIC OPERATION - SUMPS

Plant 2 is the main site of pyrotechnic operations. The plant operated from June 1952 to 1956 and from April 1963 until the present. Wastewater from washdown activities is collected in 44 waste sumps and transferred to the pilot wastewater treatment plant. Site investigations conducted in 1993 concluded that

further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Heavy Metals
Media of concern: Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #4
Future IRP Phase: RD/RA

LHAAP-47 PLANT 3/PRODUCES MOTOR ASSEMBLIES - SUMPS

This site exists for the production of simulator and illuminating motor assemblies. Polysulfide polymer solid propellant rocket motors have been produced in the Plant 3 Area since 1955. Operations integral to this activity are vapor degreasing, grit blasting, particle size reduction, mixing and blending, teflon coating, and vacuum and pressure casting of solid fuel rocket motors. Wastewater from washdown activities is collected in the 48 waste sumps and transferred to the pilot wastewater treatment plant. Site investigations conducted in 1993 concluded that further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Heavy Metals
Media of concern: Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #4
Future IRP Phase: RD/RA

LHAAP-48 Y AREA/PRODUCES HAND SIGNAL ASSEMBLIES - SUMPS

This site is a former rocket motor igniter facility. Wastewater is collected in nine waste sumps and transferred to the pilot wastewater treatment plant. Site investigations conducted in 1993 concluded that further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Heavy Metals
Media of concern: Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #4
Future IRP Phase: RD/RA

LHAAP-49 FORMER ACID PLANT

This site is being investigated under LHAAP 29 and 32 which are under RI/FS phases.

Contaminant of concern: Ordnance Components
Media of concern: Soil/Groundwater/Surface Water/Sediment
Completed IRP Phase: PA/SI

Current IRP Phase: RI/FS -- Group #2
 Future IRP Phase: RD/RA

LHAAP-50 FORMER WASTE DISPOSAL FACILITY

This site has received wastewaters from several sumps at Plants 3 and 2 during periods of sufficient flow from 1955 to the early 1970's. Washout of ammonium perchlorate containers was performed on site. Findings from the Army's preliminary assessment and recent re-evaluation concluded that an SI will be initiated in FY 95.

Contaminant of concern: Industrial Liquid Waste/Heavy
 Metals/Chlorinated Solvents

Media of concern: Soil/Groundwater

Completed IRP Phase: PA

Current IRP Phase: SI -- Group #5

Future IRP Phase: RI/FS

LHAAP-51 PHOTOGRAPHIC LABORATORY/BUILDING 60B

Building 60B is the location for processing of x-ray film. The building has a concrete floor without a floor drain. Spent developing waste is drummed and transferred to Building 31-W. Findings from the Army's preliminary assessment concluded that no further action is necessary at this time.

Contaminant of concern: Acid/Base

Media of concern: Soil/Building

Completed IRP Phase: PA

Current IRP Phase: NFA

Future IRP Phase: NFA

LHAAP-52 MAGAZINE AREA

The Plant 1 Magazine Area contains 58 Richmond-type magazines and two aboveground magazines, all of which had been used for the storage of TNT. A standpipe near the intersection of Avenue E and 19th Street was used to wash out trucks used for the transport of TNT. Waste waters from this operation may have flowed onto the ground. Findings from the Army's preliminary assessment and recent re-evaluation concluded that an SI will be initiated in FY 95.

Contaminant of concern: Explosive Chemicals

Media of concern: Soil

Completed IRP Phase: PA

Current IRP Phase: SI -- Group #5

Future IRP Phase: RI/FS

LHAAP-53 STATIC TEST AREA

This static test area also has a candle test area. The site was formerly used for rocket motor, red phosphorus smoke wedge,

and illuminating candle testing. The current activity of this site is demilitarization by ignition of Pershing rocket motors performed on test stands. Findings from the Army's preliminary assessment concluded that no further action is necessary at this site.

Contaminant of concern: Propellant/Explosive Chemicals
Media of concern: Soil/Groundwater
Completed IRP Phase: PA
Current IRP Phase: NFA
Future IRP Phase: NFA

LHAAP-54 GROUND SIGNAL TEST AREA

The Ground Signal Test Area is currently used for aerial and on-ground testing of pyrotechnic, illuminators, and signal devices manufactured at the facility. Since 1988, burnout of Pershing missiles has been conducted at this site in accordance with the Intermediate-Range Nuclear Forces Treaty. The site has been used intermittently since 1963 for various types of testing and destruction of many explosive devices. In 1982, investigations included installation and sampling of two groundwater wells and three surface samples. Elevated levels of some metals were detected in the soil and groundwater. Elevated levels of chloride and sulfate were detected in the groundwater. This site is included in the FFA. Site investigations conducted in 1993 concluded that further field investigation is needed at this site to complete the site characterization report.

Contaminant of concern: Propellant/Explosive Chemicals
Media of concern: Soil/Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #1
Future IRP Phase: RD/RA

LHAAP-55 SEPTIC TANK

This site contains ten septic tanks which serve outlying areas, with outfalls to ditches. The effluent is chlorinated prior to discharge. Contents of septic tanks are pumped out and transferred to the sewage treatment plant as needed. There is no history of industrial waste being put into these septic tanks. Findings from the Army's preliminary assessment concluded that no further action is necessary at this site.

Contaminant of concern: Refuse without hazardous waste
Media of concern: Soil/Groundwater
Completed IRP Phase: PA
Current IRP Phase: NFA
Future IRP Phase: NFA

LHAAP-56 VEHICLE WASH RACK & OIL SEPARATOR

This site consists of a concrete wash rack sloped to drain, connected to an oil/water separator. The site does have permitted discharge to a drainage ditch. The extent of separator maintenance is unknown. Although this site will require further investigations, response is complete under DERA since the site is still active. The sumps on this site is being investigated under LHAAP #35.

Contaminant of concern: Heavy Metals
Media of concern: Groundwater
Completed IRP Phase: PA/SI
Current IRP Phase: RI/FS -- Group #4
Future IRP Phase: RD/RA

LHAAP-57 RUBBLE BURIAL SITE

This site is used for burial of inert materials that were cleared from property after acquisition. Findings from the Army's preliminary assessment concluded that no further action is necessary at this site.

Contaminant of concern: Unknown
Media of concern: Soil
Completed IRP Phase: PA
Current IRP Phase: NFA
Future IRP Phase: NFA

LHAAP-58 MAINTENANCE COMPLEX

This site is a maintenance complex with concrete floors and no curbs at the doorways. Floor drains are connected to the sanitary sewer. Lubricants are stored on drum racks outside over a gravel surface. No curbing or other containment is present. Waste oil and solvents are transferred to Building 31-W. Findings from the Army's preliminary assessment concluded that no further action is necessary at this site.

Contaminant of concern: Petroleum/Oil/Lubricants/Solvents
Media of concern: Soil
Completed IRP Phase: PA
Current IRP Phase: NFA
Future IRP Phase: NFA

LHAAP-59 STORAGE BUILDING NO. 725

This site is a building used for storage of pesticides and herbicides. Building 725 has a concrete floor that slopes to floor drains discharging to a nearby sump. Contents of the sump are pumped out as required and transferred to the pilot wastewater treatment system via vacuum truck. This site is still

active. The sumps on this site are being investigated under LHAAP #35.

Contaminant of concern: Heavy Metals
 Media of concern: Groundwater
 Completed IRP Phase: PA/SI
 Current IRP Phase: RI/FS -- Group #4
 Future IRP Phase: RD/RA

LHAAP-60 FORMER STORAGE BUILDING 411 AND 714

This site is comprised of two buildings formerly used for storage of pesticides and herbicides (Building 411 and 714). Pesticides were originally stored in Building 714. In 1970, the stock was moved to Building 411. Both buildings have concrete floors with no curbs present at the doorways. Findings from the Army's preliminary assessment and recent re-evaluation concluded that an SI will be initiated in FY 95.

Contaminant of concern: Pesticides
 Media of concern: Soil
 Completed IRP Phase: PA
 Current IRP Phase: SI -- Group #5
 Future IRP Phase: RI

LHAAP-61 WATER TREATMENT PLANT EFFLUENT SETTLING POND

This facility consists of two adjacent ponds each 0.1 hectare by 1.5 meters deep. The ponds are located just north of the shops area. Synthetic waterproof sheeting with soil cover constitutes the pond liner. The purpose of the facility is to settle out solids from backwashing water treatment sand filters. Drainage is to Goose Prairie Bayou. Findings from the Army's preliminary assessment concluded that no further action is necessary at this site.

Contaminant of concern: Industrial Sludge
 Media of concern: Soil/Groundwater
 Completed IRP Phase: PA
 Current IRP Phase: NFA
 Future IRP Phase: NFA

LHAAP-62 BUILDING 43X

This site, known as Building 43X, is a shed used for storage of materials prior to incineration. The shed has a concrete floor, but has no curb or other containment. This site is located within LHAAP 18 which is under IRA and RI/FS phases.

Contaminant of concern: Petroleum/Oil/Lubricants/Unknown
 Solvents and Heavy Metals
 Media of concern: Soil/Groundwater/Surface Water
 Completed IRP Phase: PA/SI

Current IRP Phase: RI/FS -- Group #2
 Future IRP Phase: IRA and RD/RA

LHAAP-63 BURIAL PITS

Pits are located along Bobby Jones Road (location 14) approximately 30 meters north of Long Point Road and east of the explosive burning ground. These pits were used in the late 1950's for the detonation of Plant 3 reject materials of unknown composition. Findings from the Army's preliminary assessment and recent re-evaluation concluded that an SI will be initiated in FY 95.

Contaminant of concern: Explosives
 Media of concern: Soil/Groundwater
 Completed IRP Phase: PA
 Current IRP Phase: SI -- Group #5
 Future IRP Phase: RI/FS

LHAAP-64 TRANSFORMER STORAGE

This site was used for storage of transformer oil. Approximately 20 out-of-service non-PCB transformers are stored on pallets outside, with no curb or other containment. Site investigation is being planned. This site is still active. Findings from the Army's preliminary assessment concluded that no further action is necessary at this site.

Contaminant of concern: Petroleum/Oil/Lubricants/
 Polychlorinated Biphenyls
 Media of concern: Soil/Groundwater
 Completed IRP Phase: PA
 Current IRP Phase: NFA
 Future IRP Phase: NFA

LHAAP-65 BUILDING NO. 209

Building 209 is used for chemical storage for items such as paint and solvents. This building has a concrete floor with floor drains connected to sumps. The sumps on this site are being investigated under LHAAP #35.

Contaminant of concern: Heavy Metals
 Media of concern: Groundwater
 Completed IRP Phase: PA/SI
 Current IRP Phase: RI/FS -- Group #4
 Future IRP Phase: RD/RA

LHAAP-66 TRANSFORMER AT BUILDING 401

A transformer at Building 401 dripped oil continuously for approximately 1 year. The transformer did not contain any polychlorinated biphenyls. Findings from the Army's preliminary

assessment concluded that no further action is necessary at this site.

Contaminant of concern: Oil
Media of concern: Soil
Completed IRP Phase: PA
Current IRP Phase: NFA
Future IRP Phase: NFA

LHAAP-67 ABOVEGROUND STORAGE TANK

This site consists of seven aboveground storage tanks containing Number 2 fuel oil and kerosene. Tanks have earthen dikes sufficient to contain potential spill. Motor fuel tanks are registered with the state. There is no history of spills at this location. Findings from the Army's preliminary assessment concluded that no further action is necessary at this site.

Contaminant of concern: Petroleum/Oil Lubricants/Other
Media of concern: Soil
Completed IRP Phase: PA
Current IRP Phase: NFA
Future IRP Phase: NFA

LHAAP-68 MOBILE STORAGE TANK PARKING AREA

This site contains two mobile storage tank (600 gallon) compartments on a tank truck. These vehicles are used throughout the facility and are parked on the asphalt surface at the maintenance complex. No curb or other containment is present at the parking facility. Mobile storage tanks contain Number 2 diesel and gasoline. Findings from the Army's preliminary assessment concluded that no further action is necessary at this site.

Contaminant of concern: Petroleum/Oil Lubricants
Media of concern: Soil
Completed IRP Phase: PA
Current IRP Phase: NFA
Future IRP Phase: NFA

LHAAP-69 SERVICE STATION UNDERGROUND STORAGE TANKS

This site has six leaking underground storage tanks (USTs) that were leak tested in 1989. These tanks contained gasoline. The tanks were replaced in 1993, and the site has been remediated. No further action is needed at this site.

Contaminant of concern: Petroleum/Oil/Lubricants
Media of concern: Soil/Groundwater
Completed IRP Phase: RD/RA
Current IRP Phase: NFA
Future IRP Phase: NFA

IV. RMIS SITE SUMMARY CHART

An RMIS Site Summary Chart showing the status of each site is provided on the following pages.

TABLE 2

LONGHORN ARMY AMMUNITION PLANT
RESTORATION MANAGEMENT INFORMATION SYSTEM
SITE SUMMARY CHART

RMIS SITE NO.	CHEMICALS OF CONCERN	PHASE OF INVESTIGATION			COMPLETED IRA/RA
		COMPLETED	CURRENT	FUTURE	
LHAAP-001	INERT MATERIALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-002	EXPLOSIVE CHEMICALS				
	UNKNOWN (INDUSTRIAL WASTEWATER)	PA	NONE	ACTIVE	NONE
LHAAP-003	PAINT/SOLVENT	PA	NONE	ACTIVE	NONE
LHAAP-004	ORDNANCE COMP/INDUSTRIAL WASTEWATERS	PA	NONE	ACTIVE	NONE
LHAAP-005	UNKNOWN (BACKWASH FROM ZEOLITE TREATMENT	PA	NONE	ACTIVE	NONE
LHAAP-006	ACID	PA	NONE	ACTIVE	NONE
LHAAP-007	PETROLEUM/OIL/LUBRICANTS	PA	NONE	ACTIVE	NONE
LHAAP-008	RESIDUES FROM PRODUCTION MATERIALS	PA	NONE	ACTIVE	NONE
LHAAP-009	PETROLEUM/OIL/LUBRICANTS UNKNOWN	PA	NONE	ACTIVE	NONE
LHAAP-011	UNKNOWN (TNT RESIDUES)	PA/SI	RI/FS	RD/RA	NONE
LHAAP-012	ASBESTOS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-013	REFUSE w/o HAZARDOUS WASTE				
	TNT/WASTE ACID	PA/SI	RI/FS	NFA	NONE
LHAAP-014	ACID/ORDNANCE COMP	PA/SI	RI/FS	NFA	NONE
LHAAP-015	UNKNOWN/BRINE/OIL/ASH	PA	NONE	ACTIVE	NONE
LHAAP-016	ORDNANCE COMPONENTS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-017	EXPLOSIVES AND UNKNOWN	PA/SI	RI/FS	RD/RA	NONE
LHAAP-018	PETROLEUM/SOLVENTS/HEAVY METALS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-019	REFUSE w/o HAZARDOUS WASTE	PA/SI	NONE	ACTIVE	NONE
LHAAP-022	ORDNANCE COMP	PA/SI	RI/FS	RD/RA	NONE
LHAAP-023	UNKNOWN	PA/SI	NFA	NFA	NONE
LHAAP-024	PETROLEUM/SOLVENTS/HEAVY METALS	PA/SI	RI/FS	IRA, RD/RA	CAPPED
LHAAP-027	ORDNANCE COMP	PA/SI	RI/FS	RD/RA	NONE
LHAAP-029	ORDNANCE COMP	PA/SI	RI/FS	RD/RA	NONE

TABLE 2 (Continued)

LONGHORN ARMY AMMUNITION PLANT

RESTORATION MANAGEMENT INFORMATION SYSTEM
SITE SUMMARY CHART

RMIS SITE NO.	CHEMICALS OF CONCERN	PHASE OF INVESTIGATION			COMPLETED IRA/RA
		COMPLETED	CURRENT	FUTURE	
LHAAP-032	ORDNANCE COMP	PA/SI	RI/FS	RD/RA	NONE
LHAAP-034	POLYCHLORINATED BIPHENYLS	PA/SI	NFA	NFA	NONE
LHAAP-035	HEAVY METALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-036	POLYCHLORINATED BIPHENYLS	PA/SI	NFA	NFA	NONE
LHAAP-037	SOLVENT	PA	NONE	ACTIVE	NONE
LHAAP-038	PETROLEUM/SOLVENTS/HEAVY METALS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-039	PETROLEUM/SOLVENTS/HEAVY METALS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-040	PETROLEUM/SOLVENTS/HEAVY METALS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-041	PETROLEUM/SOLVENTS/HEAVY METALS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-042	PETROLEUM/SOLVENTS/HEAVY METALS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-044	PETROLEUM/SOLVENTS/HEAVY METALS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-045	UNEXPLODED ORDNANCE	PA	NONE	ACTIVE	NONE
LHAAP-046	HEAVY METALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-047	HEAVY METALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-048	HEAVY METALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-049	ORDNANCE COMPONENTS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-050	INDUSTRIAL LIQUID WASTE/HEAVY METALS/CHLORINATED SOLVENTS	PA	SI	RI/FS	NONE
LHAAP-051	ACID/BASE	PA	NFA	NFA	NONE
LHAAP-052	EXPLOSIVE CHEMICALS	PA	NFA	NFA	NONE
LHAAP-053	PROPELLANT EXPLOSIVE CHEMICALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-054	PROPELLANT EXPLOSIVE CHEMICALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-055	REFUSE w/o HAZARDOUS WASTE	PA	NFA	NFA	NONE
LHAAP-056	HEAVY METALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-057	UNKNOWN	PA	NFA	NFA	NONE

TABLE 2 (Continued)

LONGHORN ARMY AMMUNITION PLANT
RESTORATION MANAGEMENT INFORMATION SYSTEM
SITE SUMMARY CHART

RMIS SITE NO.	CHEMICALS OF CONCERN	PHASE OF INVESTIGATION			COMPLETED IRA/RA
		COMPLETED	CURRENT	FUTURE	
LHAAP-058	PETROLEUM/LUBRICANTS/SOLVENTS	PA	NFA	NFA	NONE
LHAAP-059	HEAVY METALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-060	PESTICIDES	PA	SI	RI/FS	NONE
LHAAP-061	INDUSTRIAL SLUDGE	PA	NFA	NFA	NONE
LHAAP-062	PETROLEUM/OIL/LUBRICANTS	PA/SI	RI/FS	IRA, RD/RA	NONE
LHAAP-063	EXPLOSIVES	PA	SI	RI/FS	NONE
LHAAP-064	PETROLEUM/OIL/LUBRICANTS	PA	NFA	NFA	NONE
LHAAP-065	HEAVY METALS	PA/SI	RI/FS	RD/RA	NONE
LHAAP-066	POLYCHLORINATED BIPHENYLS	PA	NFA	NFA	NONE
LHAAP-067	PETROLEUM/OIL/LUBRICANTS	PA	NFA	NFA	NONE
LHAAP-068	PETROLEUM/OIL/LUBRICANTS	PA	NFA	NFA	NONE
LHAAP-069	PETROLEUM/OIL/LUBRICANTS	PA	NFA	NFA	NONE

V. SCHEDULE

Various environmental investigations, studies, and reports have been conducted since 1980 to address possible contamination at LHAAP. LHAAP was progressing towards a RCRA permit when the installation was listed on the NPL. An FFA was signed in December 1991, and the RCRA permit was signed in February 1992. A summary of the current project milestones for the remedial activities is given below.

A. PAST PHASE COMPLETION MILESTONES

<u>IRP Phase</u>	<u>Completion Date</u>
Interim Remedial Action (Soil Removal and Capping LHAAP-24)	1986
RFA Installation	April 1988
Groundwater Monitoring System installed at LHAAP 18 & 24	1989
IRP PA Initiation	May 1992
RI/FS Initiated (Group #1 and other sites)	1993
IRA at LHAAP 18 & 24 Initiated	August 1994

B. PROJECTED MILESTONES BY PHASE

RI/FS Completed (Group #1)	January 1996
RI/FS Completed (Group #2)	August 1996
RI/FS Completed (Group #3)	March 1995
RI/FS Completed (Group #4)	May 1996
SI Initiated (Group #5)	January 1995
SI Completed (Group #5)	September 1995
RI Initiated (Group #5)	August 1995
ROD (Group #1)	June 1998
ROD (Group #2)	August 1998
ROD (Group #3)	September 1995
ROD (Group #4)	June 1998
ROD (IRA LHAAP 18 & 24)	March 1995
ROD (IRA LHAAP 12 & 16)	July 1995

VI. REMOVAL/INTERIM REMEDIAL ACTION/REMEDIAL ACTION/LONG-TERM MONITORING

A. PAST REM/IRA/RA/LTM

- ★ LHAAP 18 & 24 - Burning Ground No. 3 and Unlined Evaporation Pond, Long-Term Monitoring (LTM) System installed in 1989.
- ★ LHAAP 18 & 24 - Burning Ground No. 3 and Unlined Evaporation Pond, Interim Remedial Action, Waste Removal and Capping accomplished in 1986.

B. CURRENT REM/IRA/LTM

- ★ LHAAP 18 & 24 - Burning Ground No. 3 and Unlined Evaporation Pond, Long-Term Monitoring System installed in 1989. An IRA was initiated in August 1994 to install a groundwater and soil treatment system. IRA construction is pending the final approval of the ROD. Projects are still in RI/FS phases.
- ★ LHAAP 12 & 16 - Old and Active Landfills, landfill caps are planned to mitigate groundwater contamination from landfill leachate. A Proposed Plan and Public Meeting are scheduled in March 1995.

C. FUTURE REM/IRA/LTM POSSIBLE OPPORTUNITIES

Removal Action is planned for Group #4 (Sumps) and TNT Pipelines. Interim Action is possible at LHAAP 17 (Burning Ground No. 2).

VII. PREVIOUS STUDIES AT LONGHORN ARMY AMMUNITION PLANT

1. The Robert H. Balter Co., 1 April 1979, Assessment of Contaminant Migration, Longhorn Army Ammunition Plant, Harrison County, Texas.
2. The U.S. Army Toxic and Hazardous Materials Agency, February 1980, Installation Assessment of Longhorn Army Ammunition Plant Report No. 150.
3. The U.S. Army Environmental Hygiene Agency (USAEHA), Aberdeen Proving Ground, February 1980, Land Disposal No. 38-26-0104-81, Longhorn Army Ammunition Plant.
4. USAEHA, 26 May 1980, Land Disposal Study No. 38-26-0104-81, Longhorn Army Ammunition Plant, Marshall, Texas, 23 January - 8 February 1980.
5. USAEHA, Regional Div., South, September 1981, Wastewater Engineering Special Study No. 32-62-0182-82.
6. USAEHA, 2-6 November 1981, Hazardous Waste Management Survey No. 37-26-0172-82, Longhorn Army Ammunition Plant, Marshall, Texas.
7. USAEHA, Aberdeen Proving Ground, MD, November 1982, Hazardous Waste Special Study No. 39-26-0215-83.
8. Larry M. Jacobs and Associates, Inc., 27 August 1982, Geotechnical Interim Report for Longhorn Army Ammunition Plant, Marshall, Texas.

35. U.S. Army Corps of Engineers, Tulsa District, April 1994, Final Work Plan Phase II (Pilot Study) for IRA at Burning Ground No. 3.
36. U.S. Army Corps of Engineers, Tulsa District, May 1994, Draft Final Field Summary Report for Area 1A.
37. U.S. Army Corps of Engineers, Tulsa District, June 1994, Draft Final Work Plan and Chemical Data Acquisition Plan Addendum for Phase II of Group #1.
38. U.S. Army Corps of Engineers, Tulsa District, June 1994, Draft Final Phase Work Plan Addendum for Soil and Groundwater Background Concentration Report.
39. U.S. Army Corps of Engineers, Tulsa District, July 1994, Draft Final Phase II Work Plan of 125 Waste Process Sumps and 20 Waste Rack Sumps.
40. U.S. Army Corps of Engineers, Tulsa District, August 1994, Draft Final Remedial Investigation/Feasibility Study Report for LHAAP #13 & 14.
41. U.S. Army Corps of Engineers, Tulsa District, September 1994, Proposed Plan for the Early IRA at Burning Ground No. 3.
42. U.S. Army Corps of Engineers, Tulsa District, December 1994, Final Phase II Group #2 Work Plan.
43. U.S. Army Corps of Engineers, Tulsa District, January 1995, Draft Final Hydrogeological Assessment.

1. INTRODUCTION

The Army property waste site summary reports included in this document were developed by Roy F. Weston, Inc. (WESTON) under contract DAAA15-88-D-0007 Task Order 2 for the United States Army Toxic and Hazardous Materials Agency (USATHAMA). The primary objective was to establish baseline data reflecting potential waste sites at Army properties. Waste sites for the purposes of this survey were defined broadly to include any location at a facility from which hazardous constituents might be released into the environment, regardless of whether the material in that location is defined as a solid or hazardous waste.

A brief report for each property was compiled with data collected between October 1988 and February 1989. Data was collected through questionnaires distributed to Army personnel familiar with the properties. WESTON conducted a brief (1-day or less) site visit and/or telephone follow-up with the Army personnel completing the questionnaires (and some local water and electric companies) to supplement information obtained in the questionnaires. WESTON did not collect additional independent data, but relied entirely on information from those sources.

These reports will be used as references for all future Installation Restoration Program (IRP) communication. Additionally, they will be the basis for the allocation of funding and resources in support of the IRP. As remediation activities are completed and/or additional information becomes available, updates will be performed.

2. USER GUIDE

2.1 Sample Report

The first page of each property report (see Figure 1) provides general information about the property and its environmental coordinator. Base population estimates contained in general information use the higher of weekday or weekend populations present on base. A summary listing of the total number of waste sites, maximum Installation Scoring Model (ISM) score, and the confidence factor associated with the report is provided at the bottom of the page. Where the Army leases properties from other entities, only Army activities or areas of Army responsibility were evaluated. Where the Army leases parts of a property to another entity (such as the US Navy) waste sites generated by that entity (e.g. Navy activities) were not evaluated. The letters "NPL" appear in the summary listing if the property (or a site on the property) is listed on the National Priority List (NPL). The symbol "*NPL" in the summary listing indicates that the property is part of a site listed on the NPL. The symbol "*"

next to a Maximum Score indicates that a waste site with a higher score may exist on the property, but information to accurately assess that site is currently unavailable. That possible waste site is either listed as an unscored waste site in the property's waste site reports, or referenced in the comment section of the property report, depending on the amount of information available.

The subsequent page(s) of each property report (see Figure 2) are used to list and to provide details of each waste site on the property. The site numbers and names are matched, when possible, to site numbers and names as listed in available published reports. The Waste Site Characterization section is used to list specific types of wastes (or a description of the process generating the waste), amount of waste, analytical data, and applicable permits. Underground storage tank registration information is included under permits. Where no permits or registrations are either reported or required, "None" is entered under "Permit".

For properties with multiple sites, a minimum of two waste sites per property were scored, unless scores were not justified by the Installation Scoring Model used (see Section 2.2). The sites with the highest potential scores were scored first, and scoring continued for other sites until significant decreases were noted in the totals. The initial decision as to potential scoring was based both on observations made during inspections of the installations and on documentation supplied to WESTON by the facility or the environmental coordinator, and focused on obvious factors such as degree of containment or constituents of concern.

The comments section is used as needed to further explain processes, to detail releases of contaminants, to list additional analytical data, or to note any special facts. The final section denotes the IRP status by phase as related to each waste site. The phases are: PA = preliminary assessment, SI = site investigation, RI = remedial investigation, FS = feasibility study, and RD = remedial design. Codes used to reflect status include: N = no/none, I = initiated, U = unknown, and C = complete. These phases are filled in as complete only if the formal (CERCLA) PA/SI or RI/FS documentation has been generated. Accordingly informal or internal remediation strategies may be ongoing even if these codes are all "N". Such activities are noted in the comment section.

The following information can be assumed in reading waste site reports. Underground storage tanks are of steel construction without any corrosion protection unless otherwise noted in the comment. Transformers are only listed as a waste site if they contain PCBs (or are likely to contain PCBs due to their age and

lack of additional information). Asbestos areas are only listed as a waste site if particularly high hazards are present (such as quarantined areas or buildings, or areas with ripped or shredding asbestos material). Otherwise, any information obtained as to asbestos removal activities is noted in the property report under the comments section. Radon contamination has not been assessed.

2.2 Installation Scoring Model (ISM) and Confidence Factors

The Installation Scoring Model (ISM) used for the study is based on the Environmental Protection Agency (EPA) Hazard Ranking System (HRS). ISM scores are intended to reflect the level of environmental concern posed by a particular waste site and are not to be considered equivalent to an HRS score. Only waste sites determined to be a potential environmental concern were scored.

Each waste site scored was evaluated with respect to containment of the hazardous substance(s), route by which substance(s) could be released, characteristics and amount of harmful substances, and the likely targets. Four scores are reported per waste site: surface water score, groundwater score, air quality score, and total score. The ISM does not at this time include an evaluation for exposure in the work place. Localized contact with potentially hazardous materials is thus not assigned a score. Air quality scores may only be assigned if a specific release of contaminants significantly above background has been documented. Accordingly, no scores for potential air releases are given. No scores are given for any containment releases that are occurring under existing regulatory permits. The ISM scores reflect a minimum waste quantity of approximately 2000 gallons. Many of the sites ranked contain less than that amount of wastes, however.

Reliable scores require considerable information about the property, its surroundings, the hazardous substances present, and the geological character of the area down to the aquifers that may be at risk. As an indicator of reliability, a confidence factor scoring system was developed to provide the user of this document with a measure of the applicable and available information used to characterize and compute the ISM scores for each waste site. The criteria used for development of these confidence factors are displayed in Table 1. It should be noted that Table 1 does not list all possible combinations of information sources, but it does cover the range of available information. As such, it is used as a guideline.

TABLE 1
CONFIDENCE FACTOR DEFINITIONS

Confidence Factor	Site Visit	RI Report Available	Installation Assess. or Equivalent Information*	Questionnaire Completed
A	1	1	1	1
B	1	1+	1	--
C	--	0	1	1
D	--	0	0	1
E	0	0	0	0

* Equivalent information refers to small properties where a site visit or telephone contact may yield as much data as an installation assessment.

+ If an RI is not applicable to circumstances at the property, a B Confidence Factor score may still be assigned.

1 Information available.

0 Information not available or not submitted.

-- This component not a critical value for this specific Confidence Factor Score.

Figure 1USATHAMA Property Report

Date of Printing: 03/06/89
Last Update: 01/01/89

Property Number: 99999
FFIS Number : ZZ-123456789

Name : FORT EXAMPLE
Address: ONE U.S. ARMY AVENUE
ATTN: #UTZ-EC
COMBAT CITY
ZZ 99999-1111

Coord.: 99DEG 99MIN N 99DEG 99MIN W

Nearest Town : COMBAT CITY, ZZ
Population : 100
Base Population : 100
Command : MACOM

EPA Region : #
Support Facility: SUPPORT FACILITY NAME

Environmental Coordinator Name : JOHN F DOE
Environmental Coordinator Address: FORT EXAMPLE
ONE U.S. ARMY AVENUE
P. O. BOX 99999
ATTN: #UTS-EC-2
COMBAT CITY
ZZ 99999-1111

Environmental Coordinator Phone : (999)999-9999

Date of Form Response : 12/25/88

Name of Respondee : JOHN L. DOE
Title : ENVIRONMENTAL ENGINEER
Time Associated : 1 YEAR

Surface Water Uses: DESCRIBE SURFACE WATER USE

Ground Water Uses : DESCRIBE GROUND WATER USE

Comments : GENERAL COMMENTS RELEVANT TO THE
IDENTIFICATION AND/OR CHARACTERIZATION
OF THE PROPERTY WASTE SITES.

Number of Waste Sites: # NPL

Maximum Score : # *

Confidence Factor : A - F

Longhorn Army Ammunition Plant

- 1 - Inert Burning Grounds
- 2 - Vacuum Trucks (location varies)
- 3 - Paint Shop
- 4 - IMTP
- 5 - 4018 L-Operation Pond
- 6 - Building 54-F
- 7 - Drum Processing Area
- 8 - Quality Assurance Laboratory
- 9 - Sewage Treatment Plant
- 10 - Building 31-W
- 11 - Suspected TNT Burial Site
- 12 - Active Landfill
- 13 - Suspected TNT Burial Ground
- 14 - Area 548 Burial Grounds
- 15 - 48-W
- 16 - Former Landfill
- 17 - Former Burning Ground/Flashing Area
- 18 - Active Burning Ground
- 19 - 244 Holding Area
- 20 - 253 Washout Pad
- 21 - Air Curtain Destructor
- 22 - Open Burning Cage
- 23 - Open Burning Pan
- 24 - Former Unlined Evaporation Pond
- 25 - Building 41-X
- 26 - Construction Materials Landfill
- 27 - South Test Area
- 28 - Magazine Area
- 29 - Former TNT Production Area
- 30 - TNT Red Water Pileup
- 31 - Building 101-C
- 32 - Former TNT Waste Disposal Plant
- 33 - Building 701
- 34 - Sumo Hot Show, Located Throughout Facility
- 35 - Explosive Waste Pads
- 36 - Plant 2
- 37 - Plant 3

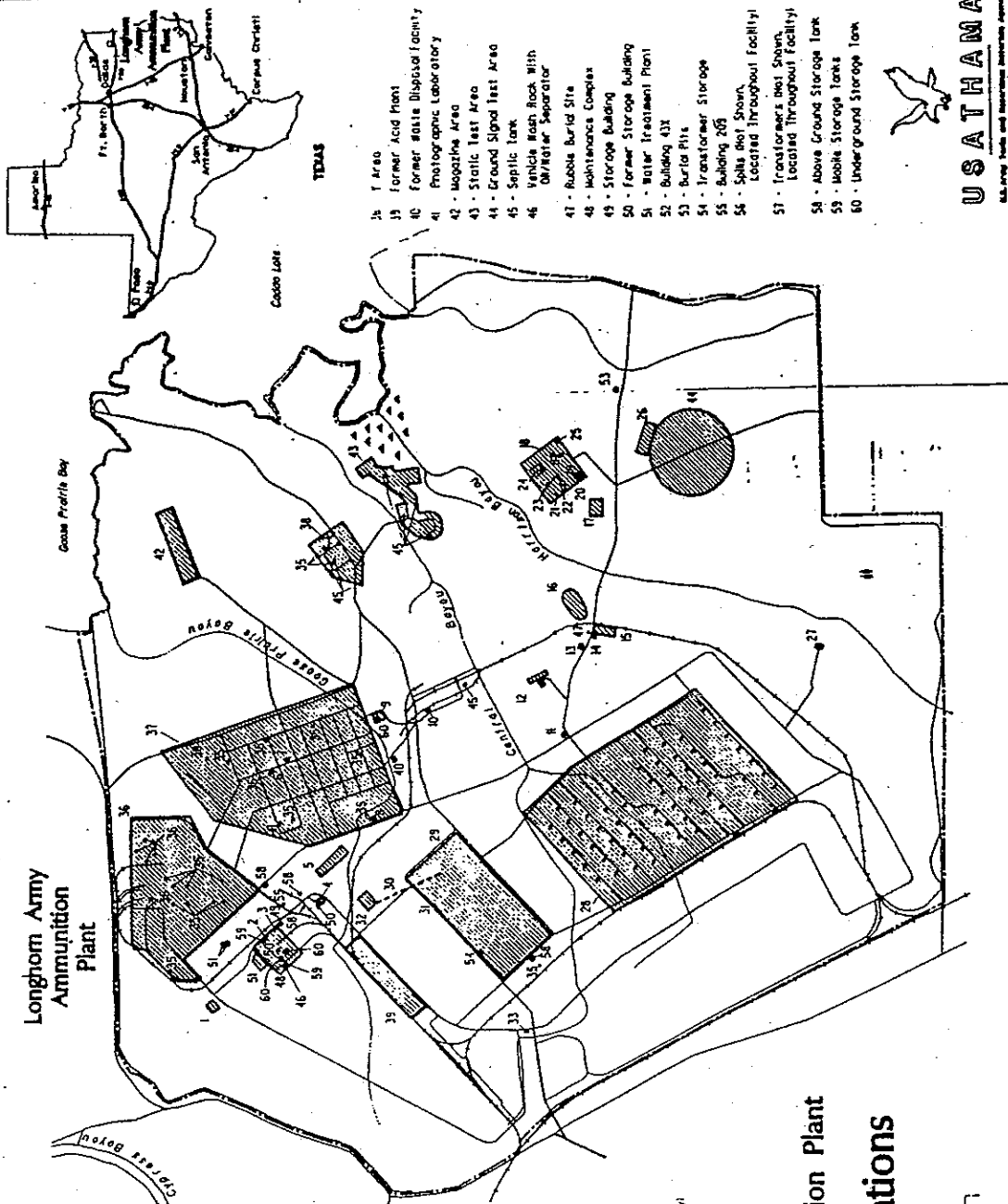
Longhorn Army Ammunition Plant Marshall, TX

Waste Site Locations



20-July-1990

4000 Feet



USATHAMA

U.S. Army Toxic and Hazardous Materials Agency

Figure 2

USAHAMA Waste Site Report

Date of Printing: 03/06/89
Last Update: 03/03/89

Property Number: 99999 Property Name: Ft. EXAMPLE

<u>Site Number</u>	<u>Site Name</u>	<u>Waste Site Characterization</u>	<u>ISM Scores</u>	<u>Comments</u>	<u>IRP Status</u>
1	WASTE SITE IDENTIFICATION NAME	Type: DESCRIBE THE TYPES OF WASTE WHICH ARE PRESENT OR PROCESSES	Ground Water : # Surface Water: # Air Quality : # Total Score : #	INCLUDES RELEVANT INFORMATION AS TO THE CONTAMINATION, POTENTIAL CONTAMINATION, WASTE SITE HISTORY, PROCESSES, ANALYSIS DATA, REMEDIATION, ECT.	PA : C SI : I RI : U FS : N RD : N

Qty: (IF KNOWN)

Permit: NPDES #1223432-PA, RCRA,
OTHER

USATHAMA Property Report

Property Number: 48315 Name : LONGHORN ARMY AMMUNITION PLANT Date of Printing: 08/07/90
FFIS Number : TX-213820738 Address: Last Update: 08/07/90

MARSHALL
TX 75670-1059

Coord.: 32DEG 40MIN N 94DEG 07MIN W

Nearest Town : MARSHALL Base Population : 938
Population : 24,900 Command : AMCCOM

EPA Region : 6 Support Facility:

Environmental Coordinator Name : DORIS HAYES
Environmental Coordinator Address: LONGHORN ARMY AMMUNITION PLANT

MARSHALL
TX 75670-1059

Environmental Coordinator Phone : (214)679-2804

Date of Form Response : 04/02/90

Name of Respondee : DON MALEY
Title : CHIEF ENGINEER
Time Associated : 10 YEARS

Surface Water Uses: RECREATION: CADDO LAKE BORDERS FACILITY "

Ground Water Uses : DRINKING: MUNICIPAL WELLS < 1 MILE

Comments : 8490-AC GOCO FAC PERFORMS LOAD, ASSEMBLY & PACK OF PYROTECHNICS & PERSHING ROCKET
MOTOR DEMIL. PAST ACTIVITIES INCL TNT & ROCKET MOTOR PROD. TEN SITES IN RCRA
PART B APPL REQ RFI WORK. PROPOSED NPL: BURNING GROUND&POSS OTHER SWMUS.

Number of Waste Sites: 60

Maximum Score : 28.4

Confidence Factor : C

00047979

Date of Printing: 08/07/90
Last Update: 08/07/90

Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

4. 14791

**type: WASTEWATER CONTAINING
HALOGENATED ORGANIC SOL-
VENTS, -HEAVY METALS AND
EXPLOSIVES**

Qty: 4200 GALLONS EACH

Permit: TEXAS WATER COMMISSION
PERMIT NO. 02713

Ground Water :13.5
Surface Water: 0.0
Air Quality : 0.0
Total Score : 7.8

WATER FROM PUMPS (SITE #34) TRANSFERRED BY VACUUM TRUCK (SITE #2) & STORED IN (2) 42000-GALLON CAP TANKS PRIOR TO EVAPORATION. BRINE WATER/SLUDGE HELD IN 8000-GALLON FRP TANK, DUMPED, TRUCKED TO BLDG #49-W (SITE #15). SETTLING TANK SLUDGE DUMPED, TRUCKED TO ACTIVE BURNING GRND (SITE #18). AREA HAS EARTHEN BERMS.

PA	SI	RI	FS	RD
C	N	N	N	N

5 401B EVAPORATION POND

Type: WATER CONTAINING CALCIUM,
MAGNESIUM AND SODIUM
CHLORIDE

Qty: 3000 GALLONS/DAY

Permit: NONE

Ground Water : 3.1
Surface Water: 0.0
Air Quality : 0.0
Total Score : 1.8

5.5-ACRE EARTHEN LAGOON IS 4' DEEP WITH SINGLE PVC LINER. LAGOON RECEIVES BACKWASH WATER FROM ZEOLITE TREATMENT UNITS AT BUILDING #401 POWERHOUSE. WATER IS EITHER EVAPORATED OR DISCHARGED BY PIPELINE TO SEWAGE TREATMENT PLANT (SITE#9).

PA : C
SI : H
RI : H
FS : H
RD : H

6 BUILDING #54-F

type: WASTE ACIDS AND SOLVENTS

QTY: NONE CURRENTLY GENERATED

Permit: NONE

Ground Water : 7.6
Surface Water: 1.5
Air Quality : 0.0
Total Score : 4.5

MMX PRODUCTION FACILITY INACTIVE SINCE 6/6/88. WASTE SOLVENTS FROM PRODUCTION PROCESSES WERE COLLECTED IN A 55-GALLON DRUM AND PLACED ON AN UNCURED CONCRETE PAD UNDER OPEN SHED. FULL DRUMS WERE TRANSFERRED TO BUILDING #31-W (SITE#10). SCORE BASED ON PAST ACTIVITIES.

PA : C
SI : M
RI : M
FS : M
RD : M

USATHAMA Waste Site Report

Date of Printing: 08/07/90
Last Update: 08/07/90

Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

<u>Site Number</u>	<u>Site Name</u>	<u>Waste Site Characterization</u>	<u>ISM Scores</u>	<u>Comments</u>	<u>IRP Status</u>
1	INERT BURNING GROUNDS	Type: RESIDUES FROM BURNING OF TRASH, ASHES, SCRAP LUMBER, TNT AND PHOTO FLASH POWDER Qty: 2 ACRES Permit: NONE	Ground Water : 48.7 Surface Water: 5.8 Air Quality : 0.0 Total Score : 28.4	1-2 ACRE AREA USED FOR BURNING OF INERT MATERIALS FROM 1942 TO THE EARLY 1950'S IS HEAVILY WOODED AT PRESENT. BULK TNT ALSO REPORTED TO HAVE BEEN BURNED ON SITE. DOWNGRADIENT MONITOR WELL INDICATES GROUNDWATER CONTAMINATION WITH TNT BREAKDOWN PRODUCTS.	PA : C SI : I RI : N FS : N RD : N

2	VACUUM TRUCKS	Type: WASTEWATER CONTAINING HALOGENATED ORGANIC SOLVENTS, HEAVY METALS AND EXPLOSIVES Qty: 5500-GALLONS/TRUCK Permit: NONE	Ground Water : 12.2 Surface Water: 1.8 Air Quality : 0.0 Total Score : 7.2	(2) 5500-GALLON CAPACITY TANK TRUCKS USED TO TRANSFER LIQUID WASTES FROM VARIOUS SURFS (SITE #34) TO INTX (SITE #4) ARE PARKED OVERNIGHT ON ASPHALT SURFACE. TRUCKS OCCASIONALLY ARE PARKED OVERNIGHT IN FULL CONDITION PRIOR TO TRANSFER TO WASTE IN MORNING. NO CURB OR OTHER CONTAINMENT.	PA : C SI : N RI : N FS : N RD : N
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3	PAINT SHOP	Type: PAINT THINNER AND PAINT RESIDUES Qty: (2) 55-GALLON DRUMS Permit: NONE	Ground Water : 8.0 Surface Water: 1.2 Air Quality : 0.0 Total Score : 4.7	BUILDING #722-P. (2) 55-GALLON DRUMS ON GRAVEL PAD IN OPEN SHED ARE TRANSFERRED TO BUILDING #31 (SITE #10) WHEN FULL. NO CURB OR OTHER CONTAINMENT.	PA : C SI : N RI : N FS : N RD : N
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USATHAMA Waste Site Report

Date of Printing: 08/07/90
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Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

7 DRUM PROCESSING AREA Type: HALOGENATED ORGANIC SOLVENTS, OIL AND HEAVY METALS Ground Water : 9.0
Surface Water: 1.8
Air Quality : 0.0
Total Score : 5.3
Qty: RESIDUAL IN DRUMS
Permit: NONE
PA : C
SI : N
RI : N
FS : N
RD : N
WASHDOWN OF EMPTY DRUMS AT BLDG #50-G IS PERFORMED IN A 20'X 30' BAY WHICH DRAINS TO A 3000-GALLON SUMP (SITE #34) LOCATED OUTSIDE BUILDING. WASHED, EMPTY DRUMS ARE REUSED OR FLASHED AT THE AIR CURTAIN DESTRUCTOR (SITE #21) AND TRANSFERRED TO BLDG #49-W FOR DISPOSAL AS SCRAP. SCORE BASED ON RESIDUAL MATERIAL IN DRUMS.

8 QUALITY ASSURANCE LABORATORY Type: SPENT SOLVENTS Ground Water : 8.0
Surface Water: 1.5
Air Quality : 0.0
Total Score : 4.7
Qty: (2) 55-GALLON DRUMS
Permit: NONE
PA : C
SI : N
RI : N
FS : N
RD : N
BUILDING #29-A. DRUMS ON AN UNCURED CONCRETE PAD RECEIVE SPENT SOLVENTS FROM QUALITY ASSURANCE LABORATORY. FULL DRUMS ARE TRANSFERRED TO BUILDING #31-W (SITE #10) FOR DISPOSAL.

9 SEWAGE TREATMENT PLANT Type: SANITARY SEWAGE AND STORMWATER INFILTRATION Ground Water : 7.6
Surface Water: 0.0
Air Quality : 0.0
Total Score : 4.4
Qty: 0.87 MGD CAPACITY
Permit: NPDES TX 0000035
PA : C
SI : N
RI : N
FS : N
RD : N
PLANT CONSISTS OF INHOFF TANK, SAND FILTER, AND (3) SLUDGE DRYING BEDS. EFFLUENT IS DISCHARGED TO CENTER BAYOU. DRIED SLUDGE IS TRANSFERRED TO THE ACTIVE LANDFILL (SITE #12) FOR DISPOSAL. OCCASIONAL UPSETS DUE TO STORMWATER INFILTRATION REPORTED. SCORE BASED ON POTENTIAL FOR LEAKAGE OF LARGEST TANK.

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Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

10 BUILDING #31-W Type: BATTERIES, PCBs & LIQUID WASTES INCLUDING OILS, HALOGENATED SOLVENTS, ACIDS AND HEAVY METALS Qty: 88000-GALLON CAPACITY Permit: HW-50195 DRAFT PART B

Ground Water : 0.0
Surface Water: 0.0
Air Quality : 0.0
Total Score : 0.0

50'X 100' BLDG CA 1950 INCL (3) 6'X 31' CONC TROUGHS W/6" CURBS USED FOR STOR OF PCB TRANSFORMERS & VARIOUS CHEMICALS IN LAB PACK. 80'X 50' ADDITION CA 1987 HAS (6) APPROX 20'X 26' CONC PADS W/6" CURBS FOR STORAGE OF 55-GAL DRUMS ON PALLETS. MATERIALS DISPOSED VIA DRMO TEXARKANA. SCORE BASED ON CONT OF POTENTIAL SPILL.

PA : C
SI : M
RI : M
FS : M
RD : M

11 SUSPECTED TNT BURIAL SITE Type: POTENTIAL FOR BURIED TNT Qty: UNKNOWN Permit: NONE

Ground Water : 27.8
Surface Water: 6.4
Air Quality : 0.0
Total Score : 16.5

APPROXIMATE 1-1.5-ACRE SITE REPORTEDLY USED FOR BURIAL OF TNT IN 1940'S. AREA IS CURRENTLY REVEGETATED WITH GRASSES AND TREES. LOW LEVELS OF EXPLOSIVES CONTAMINATION OF SOIL DETECTED. EXACT LOCATION AND QUANTITY OF BURIED MATERIAL UNCERTAIN.

PA : C
SI : I
RI : M
FS : M
RD : M

12 ACTIVE LANDFILL Type: TRASH, GARBAGE, ASH AND ASBESTOS Qty: 20 CUBIC YARDS/MONTH Permit: TEXAS WATER COMMISSION PERMIT NO. 30990

Ground Water : 42.9
Surface Water: 7.3
Air Quality : 0.0
Total Score : 25.1

APPROX 5-ACRE UNLINED LNDFL OPERATED BY TRENCH FILL METHOD FROM CA 1970 TO PRESENT. TRENCHES ARE DUG THE APPROX SIZE OF ONE DAY'S WASTE (10'X 20'X 10') AND COVERED WITH SOIL DAILY. SITE INCLUDES AEMA SNAU #12A ASBESTOS LNDFL. MANGANESE, CADMIUM, DICHLOROMETHANE, PENTANE AND DINITROBENZENE DETECTED IN GROUNDWATER.

PA : C
SI : I
RI : M
FS : M
RD : M

USATHAMA Waste Site Report

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Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

13 SUSPECTED TNT BURIAL SITE

Type: POTENTIAL FOR BURIED TNT

Ground Water :24.2
Surface Water: 4.5
Air Quality : 0.0
Total Score :14.2

50'X 50' GRASSY AREA BETWEEN OLD AND
ACTIVE LANDFILLS (SITES #16 AND 12).
PREVIOUS SURVEY BY AEMA CONCLUDED LACK
OF VEGETATIVE COVER INDICATED POTENTIAL
FOR BURIED TNT.

PA : C
SI : I
RI : M
FS : M
RD : M

Qty: APPROX 2500 SQUARE FEET

Permit: NONE

14 AREA 54W BURIAL GROUND

Type: ACIDS, BUILDING RUBBLE
AND EXPLOSIVES

Ground Water :26.7
Surface Water: 0.0
Air Quality : 0.0
Total Score :15.4

10'X 20' AREA BENEATH PAVED PARKING LOT
USED AS BURIAL SITE FROM CA 1940 TO
EARLY 1950'S. CHROMIUM AND 1,3,5-
TRINITROBENZENE CONTAMINATION OF GROUND-
WATER DETECTED IN DOWNGRADIENT WELL.

PA : C
SI : I
RI : M
FS : M
RD : M

Qty: EST < 50 CUBIC YARDS

Permit: NONE

15 49-W

Type: BRINE SLUDGE, OIL, CON-
TAMINATED MATERIALS,
BATTERIES, MERCURY AND
ASH

Ground Water : 6.8
Surface Water: 1.6
Air Quality : 0.0
Total Score : 4.0

50'X 100' METAL BLDG W/CONC FLR. DRUMMED
SOLID WASTE HELD FOR SHPMT TO DRMO
TEXARKANA. SCRAP METAL COMPACTED & STOR
ON ADJACENT GRND SURFACE PRIOR TO PUBLIC
SALE. DRUMMED ASH FROM ACTIVE BURNING
GROUND (SITE #18) STORED PENDING EP TOX
RESULTS AND SHIPMENT TO ACTIVE LANDFILL
(SITE #12). LARGEST CONTAINER 55 GAL.

PA : C
SI : M
RI : M
FS : M
RD : M

Qty: 72500-GALLON CAPACITY

Permit: HW-50195 DRAFT PART B

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Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

16 FORMER LANDFILL
Type: TNT, TNT REDWATER ASH,
DRUMMED CHEMICALS, OIL,
PAINT, SCRAP IRON, RUBBLE
AND ROCKET MOTOR CASINGS

Ground Water : 34.7
Surface Water: 14.5
Air Quality : 0.0
Total Score : 21.7

PA : C
SI : I
RI : N
FS : M
RD : N

Qty: 20 ACRES

Permit: NONE

APPROXIMATELY 20-ACRE UNLINED LANDFILL
OPERATED FROM 1942 TO 1985. SITE HAS
PARTIALLY VEGETATED SOIL COVER. AREA
INCLUDES FORMER ARTIFICIAL LAKE USED AS
DUMPING SITE. 2,6 DINITROTOLUENE, CHROM-
IUM, LEAD AND MANGANESE DETECTED IN
DOWNGRADIENT MONITORING WELLS AND SUR-
FACE WATER.

17 FORMER BURNING GRND/FLASHING AREA

Type: BURN RESIDUE FROM TNT,
PHOTOFLASH POWDER AND
REJECT MATERIAL FROM
PRODUCTION PROCESSES

Ground Water : 6.1
Surface Water: 8.7
Air Quality : 0.0
Total Score : 6.2

PA : C
SI : I
RI : N
FS : N
RD : N

Qty: 4 ACRES

Permit: NONE

4-ACRE SITE USED AS BURNING GROUND AND
FLASHING AREA FOR DECONTAMINATION OF
EXPLOSIVES CONTAMINATED EQUIPMENT FROM
1959 TO 1980. WASTE RESIDUES WERE RE-
MOVED IN 1984 AND AREA GRASSED OVER.
BULK BURIAL OF TNT PRIOR TO 1954 REPORT-
ED. BARIUM, LEAD, STRONTIUM, MANGANESE
AND CHLOROFORM DETECTED IN GROUNDWATER.

18 ACTIVE BURNING GROUND

Type: PRODUCTION AND LAB WASTE
BURN RESIDUE AND BURIED
METHYLENE CHLORIDE
IMPREGNATED SANDUST

Ground Water : 5.9
Surface Water: 10.3
Air Quality : 0.0
Total Score : 6.8

PA : C
SI : I
RI : N
FS : N
RD : N

Qty: EST < 2500 CUBIC YARDS

Permit: HW-50195 DRAFT PART B

34.5-ACRE AREA ACTIVE SINCE 1950'S INCL
SITES #19-25. (18) 10'X 10'X 1' & SEV-
ERAL 100'X 15'X 4' DEEP OPEN BURNING
PITS AND METHYLENE CHLORIDE IMPREGNATED
SANDUST PILES & DISPOSAL PITS. METHYLENE
CHLORIDE, TCE, CADMIUM, BARIUM, CHROMIUM,
MERCURY AND LEAD DETECTED IN GW. SCORE
BASED ON REMAINING BURIED SANDUST PILES.

USAIHAMA Waste Site Report

Date of Printing: 08/07/90
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Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

19 24X HOLDING AREA Type: EXPLOSIVE WASTE, EXPLOSIVE
CONTAMINATED WASTE, ASH
AND SCRAP METAL Ground Water : 2.7
Surface Water: 6.5
Air Quality : 0.0
Total Score : 4.1
Qty: EST < 60 CUBIC YARDS
Permit: NONE
75'X 100' ASPHALT PAD USED FOR SORTING
MATERIAL TO BE BURNED AND ASH AND SCRAP
METAL FROM BURNING AT OPEN BURNING PADS
(SITE #23), CAGES (SITE #22) AND AIR
CURTAIN DESTRUCTOR (SITE #21). NO CURB
OR OTHER CONTAINMENT.
PA : C
SI : N
RI : N
FS : N
RD : N

20 25X WASHOUT PAD Type: RESIDUES OF EXPLOSIVE
WASTE DEACTIVATED WITH
FUEL OIL AND EXPLOSIVE
CONTAMINATED WASTE Ground Water :
Surface Water:
Air Quality :
Total Score :
Qty: EST < 10 GALLONS
Permit: NONE
SEMI-ENCLOSED METAL SHED OVER CONCRETE
PAD WITH 6" HIGH CURB. 5-GALLON PAILS
AND 30-GALLON DRUMS FROM EXPLOSIVE WASTE
PADS (SITE #35) ARE WASHED DOWN. WASH-
WATER DRAINS TO SUMP (SITE #34). SITE
NOT SCORED BECAUSE WASTE INCLUDED IN
SUMPS (SITE #34).
PA : C
SI : N
RI : N
FS : N
RD : N

21 AIR CURTAIN DESTRUCTOR Type: WOOD, PAPER AND EXPLOSIVE
CONTAMINATED INERT AND
FLAMMABLE WASTE Ground Water : 3.6
Surface Water: 8.5
Air Quality : 0.0
Total Score : 5.3
Qty: EST 100 TONS/YR PROCESSED
Permit: TEXAS AIR CONTROL BOARD
NO. R-6356
REFRACTORY LINED BURNING CHAMBER IN-
STALL 1980 OPERATES IN BATCH FASHION.
BURN RESIDUE IS REMOVED, SAMPLED, DRUM-
MED AND SHIPPED TO BUILDING #49-W (SITE
#15). RUNOFF FROM SITE IS COLLECTED IN
ADJACENT SUMP. ASH IS NOT CONTAINED
WITHIN AREA DRAINING TO SUMP.
PA : C
SI : N
RI : N
FS : N
RD : N

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22 OPEN BURNING CAGE Type: EXPLOSIVE WASTES AND
PERSHING ROCKET MOTORS

Ground Water : 3.6 PA : C
Surface Water: 8.5 SI : N
Air Quality : 0.0 RI : N
FS : N
RD : N

Total Score : 5.3

Qty: EST 400 TONS/YR PROCESSED

Permit: TEXAS AIR CONTROL BOARD
NO. R-6356

(3) 12'X 12'X 12' STEEL FRAMED CAGES IN-
STALLED 1984 WITH 1" GRATING ON SIDE-
WALLS. 4' CLAY LINED PAN OVER GRAVEL
SURFACE WITH PLASTIC LINER. TOP OF
CAGE IS 6" DEEP STEEL TANK FILLED WITH
WATER. WASTES PLACED IN CAGES & IGNITED
WITH SAFETY FUSE. SCORE BASED ON INSUFFICIENT
CONTAINMENT OF WINDBLOWN ASH.

23 OPEN BURNING PAN Type: EXPLOSIVE WASTES

Ground Water : 3.6 PA : C
Surface Water: 8.5 SI : N
Air Quality : 0.0 RI : N
FS : N
RD : N

Total Score : 5.3

Qty: EST 150 TONS/YR PROCESSED

Permit: TEXAS AIR CONTROL BOARD
NO. R-6356

(2) 2'X 8'X 16' STEEL FRAMED BOXES IN-
STALLED 1984 WITH GALVANIZED STEEL LIDS.
PANS ARE CLAY LINED AND SET ON GRAVEL
PADS OVER PLASTIC LINER. STEEL SHEETS
PLACED IN FRONT OF PAN TO CATCH ASHES.
WASTES PLACED INSIDE PAN & IGNITED WITH
SAFETY FUSE. SCORE BASED ON INSUFFICIENT
CONTAINMENT OF WINDBLOWN ASH.

24 FORMER UNLINED EVAPORATION POND Type: HEAVY METALS, HALOGENATED
SOLVENTS FROM SUMP WASTE-
WATER AND ROCKET MOTOR
WASHOUT

Ground Water : 6.1 PA : C
Surface Water: 0.0 SI : I
Air Quality : 0.0 RI : N
FS : N
RD : N

Total Score : 3.5

Qty: GROUNDWATER PLUME

Permit: HU-50195 DRAFT PART B
POST CLOSURE CARE

FORMER 1.55-AC, 7 MILLION-GAL CAP LAGOON
CERTIFIED CLEAN CLOSED 1985 BY TWC. WTR
REMOVED & DISPOSED BY OFF-SITE DEEP WELL
INJECTION. CONTAMINATED SOIL & SLUDGE
DISPOSED IN OFF-SITE APPROVED HAZARDOUS
WASTE LANDFILL. LAGOON FILLED, MOUND &
CAPPED W/4' CLAY, 1'SAND & 1'SOODDED TOP-
SOIL. GW CONTAM PLUME MONITORED QTRLY.

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USATHAMA Waste Site Report

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Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

25 BUILDING #41-X Type: EXPLOSIVE WASTES Ground Water : 1.3
Surface Water: 3.1
Air Quality : 0.0
Total Score : 1.9
Qty: EST < 5000 POUNDS
Permit: NONE
8'X 10' STORAGE SHED ON CONCRETE PAD
USED TO STORE EXPLOSIVES PRIOR TO INCIN-
ERATION IN OPEN BURNING CAGES OR PANS
(SITE #22 & 23). NO CURBING OR OTHER
CONTAINMENT.
PA : C
SI : N
RI : N
FS : N
RD : N

26 CONSTRUCTION MATERIALS LANDFILL Type: CLASS 3 DEMOLITION WASTE Ground Water : 2.2
Surface Water: 2.8
Air Quality : 0.0
Total Score : 2.1
Qty: 350-400 CUBIC YARDS/MONTH
Permit: NONE
LANDFILL OPERATED BY TRENCH FILL METHOD
FROM 1985 TO PRESENT. 400'X 800' FENCED
AREA WITH APPROXIMATELY 400'X 100' AREA
IN USE. TRENCHES ARE SIZED TO ACCOMMO-
DATE ONE WEEK'S WASTE AND COVERED AT
WEEK END.
PA : C
SI : N
RI : N
FS : N
RD : N

27 SOUTH TEST AREA Type: PHOTOFLASH, BUTTON BOMB,
ILLUMINATING DEVICE REST-
DUE, BURIED LEAKING PRO-
DUCTION ITEMS Ground Water : 33.4
Surface Water: 7.7
Air Quality : 0.0
Total Score : 19.8
Qty: 0.5 ACRE
Permit: NONE
APPROXIMATELY 1/2 ACRE SITE OPERATED
FROM 1942 TO 1953 FOR DEMILITARIZATION
AND BURIAL OF MATERIALS. AREA IS CUR-
RENTLY GRASSED OVER. EXPLOSIVES IN SOIL
SAMPLES AND ORGANIC SOLVENT CONTAMIN-
ATION OF GROUNDWATER REPORTED.
PA : C
SI : N
RI : N
FS : N
RD : N

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28 MAGAZINE AREA Type: MUNITIONS PRODUCTS

Ground Water : 7.7
Surface Water: 1.8
Air Quality : 0.0
Total Score : 4.5

APPROX 800-ACRE FENCED SITE INCL (58)
26'X 60'X 10' MAGAZINES WITH CONC FLRS &
WALLS & (2) 150'X75'X 20' STEEL BLDGS W/
CONCRETE FLRS. UNSUITABLE PRODUCT LOTS
DETERMINED BY TESTING OR SHELF LIFE ARE
STORED AT MAGAZINE 811-1 PRIOR TO REMAN-
UFACTURING OR BURNING AT OPEN BURNING
CAGES OR PANS (SITE #22 AND 23).

PA : C
SI : N
RI : N
FS : N
RD : N

Qty: 500000-POUND CAPACITY EA

Permit: HW-50195 DRAFT PART B
MAGAZINE 811-1

29 FORMER TNT PRODUCTION AREA

Type: TNT AND INDUSTRIAL WASTE
FROM TNT MANUFACTURING

Ground Water : 42.2
Surface Water: 9.7
Air Quality : 0.0
Total Score : 25.0

APPROX 85-ACRE SITE OF FORMER SIX-LINE
TNT PLANT OPERATED FROM 1943-1945. TNT
REDWATER TRANSFERRED VIA TNT PIPELINE
(SITE #30) TO FORMER TNT WASTE DISPOSAL PLANT
(SITE #32). PLANT RAZED 1959. MATLS &
EQUIPMENT WERE BURNED OR FLASHED AT THE
OLD BURNING GROUNDS (SITE #17). EXPLVS
DETECTED IN SW, SOIL & SEDIMENT SAMPLES.

PA : C
SI : 1
RI : N
FS : N
RD : N

Qty: 85 ACRES

Permit: NONE

30 TNT REDWATER PIPELINE

Type: TNT REDWATER

Ground Water : 29.4
Surface Water: 0.0
Air Quality : 0.0
Total Score : 17.0

APPROX 4200' LONG WOODEN UNDERGROUND
PIPELINE OF UNKNOWN DIAMETER ABANDONED
IN PLACE IN 1946. PIPELINE WAS USED TO
TRANSFER REDWATER FROM FORMER TNT PRO-
DUCTION AREA (SITE #29) TO WOODEN TANK
6188 AND PUMPHOUSE 6188 THEN TO FORMER
TNT WASTE DISPOSAL PLANT (SITE #32).
PIPELINE WAS CLEAR-FLUSHED IN 1946.

PA : C
SI : N
RI : N
FS : N
RD : N

Qty: POTENTIAL RESIDUAL

Permit: NONE

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Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

31 BUILDING 707C Type: PCB CONTAMINATED OIL Ground Water : 0.0
Surface Water: 0.0
Air Quality : 0.0
Total Score : 0.0
Qty: NONE CURRENTLY GENERATED
Permit: NONE
PA : C
SI : N
RI : N
FS : N
RD : N
30'X 150' WOODEN BUILDING WITH CONCRETE FLOOR WAS USED TO STORE TRANSFORMERS, DRUMS OF PCB CONTAMINATED OILS AND OTHER WASTE MATERIALS FROM 1980 TO 1986. CONTAINERS PLACED IN GALVANIZED STEEL TROUGHS PRIOR TO DISPOSAL VIA DRMO TEXARKANA. SCORE BASED ON CONTAINMENT OF POTENTIAL SPILL DURING PERIOD OF ACTIV.

32 FORMER TNT WASTE DISPOSAL PLNT Type: TNT REDWATER AND INDUSTRIAL WASTE FROM TNT PRODUCTION Ground Water :31.2
Surface Water: 5.7
Air Quality : 0.0
Total Score :18.3
Qty: 2 ACRES
Permit: NONE
PA : C
SI : I
RI : N
FS : N
RD : N
PLANT ON 2-ACRE SITE OPERATED 1943-1946 & RAZED IN 1959. TNT REDWATER TREATED IN STEEL & LEAKING WOODEN SETTLING, HOLDING, EQUALIZATION AND EVAPORATION TANKS & AN INCINERATION FACILITY. ASH DISPOSED IN OLD LANDFILL (SITE #16) OR SLURRIED W/CONDENSATE FROM PLANT & DISCHARGED BY DITCH TO GOOSE PRAIRIE BAYOU.

33 BUILDING #701 Type: PCB CONTAMINATED MATERIAL FROM PCB SPILL CLEANUP Ground Water :11.6
Surface Water: 2.1
Air Quality : 0.0
Total Score #6.8
Qty: POTENTIAL RESIDUAL
Permit: NONE
PA : C
SI : N
RI : N
FS : N
RD : N
APPROX 25'X 110' WOOD BUILDING WITH CONCRETE FLOOR USED FROM 1980 TO 1984 FOR STORAGE OF PCB CONTAMINATED MATERIAL (MOSTLY SOIL FROM SITE #56) IN 30 AND 55-GALLON DRUMS. MATERIAL DISPOSED VIA DRMO TEXARKANA. SCORE BASED ON PAST ACTIVITY.

Property Number: 48315

Property Name: LONGHORN ARMY AMMUNITION PLANT

USATHAMA Waste Site Report

34 SUMPS

Type: WASTEWATER CONTAINING
HALOGENATED ORGANIC
SOLVENTS, HEAVY METALS
AND EXPLOSIVES

Qty: 11000 GALLONS EA (MAX)

Permit: NONE

Ground Water :36.7
Surface Water: 9.7
Air Quality : 0.0
Total Score :22.0

(124) CONC SUMPS LOCATED THROUGHOUT IN-
STALLATION OF 19 TO 11000-GALLON CAPAC-
ITIES. VACUUM TRUCK (SITE #2) TRANSFERS
CONTENTS TO IHTP (SITE #4) ON SCHEDULED
BASIS OR UPON DEMAND OF PRODUCTION FORE-
MAN. SOME SUMPS HAVE BEEN INACTIVATED
BY CLEANING AND BACKFILLING WITH SOIL.
OVERFLOW OF SUMPS REPORTED PRIOR 1976.

PA : C
SI : M
RI : M
FS : M
RD : M

35 EXPLOSIVE WASTE PAD

Type: EXPLOSIVE WASTE

Qty: EST < 20 GALLONS EACH

Permit: NONE

Ground Water : 0.0
Surface Water: 0.0
Air Quality : 0.0
Total Score : 0.0

(27) 4'X 8' CONC PADS WITH 6" CURBS AND
METAL ROOFS LOCATED THROUGHOUT FAC. EX-
PLOSIVE WASTE DESENSITIZED W/DIESEL FUEL
IN 5-GAL GALVANIZED METAL PAILS W/LIDS &
PLASTIC BAG LINERS AND PLACED ON METAL
RACK. PAILS TRANSF TO ACTIVE BURNING
GROUND (SITE #18). SCORE BASED ON CON-
TAINMENT OF POTNL SPILL W/I CURBED AREA.

PA : C
SI : M
RI : M
FS : M
RD : M

36 PLANT 2

Type: HALOGENATED SOLVENTS AND
HEAVY METALS

Qty: EST < (100) 55-GAL DRUMS

Permit: NONE

Ground Water :11.6
Surface Water: 1.8
Air Quality : 0.0
Total Score : 6.8

PLNT 2 IS MAIN SITE OF PYROTECHNIC OPER.
CONC FLRS. NO CURBS AT DOORWAYS. WASTE-
WATER FROM WASHDOWN COLLECTED IN SUMPS
(SITE #34) AND TRANSFERRED TO IHTP (SITE
#4). EXPLOSIVE WASTES ARE DESENSITIZED
W/DIESEL FUEL AND PLACED AT EXPLOSIVE
WASTE PAD (SITE #35). SCORE BASED ON
LIQUIDS STORED ON SITE IN 55-GAL DRUMS.

PA : C
SI : M
RI : M
FS : M
RD : M

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Date of Printing: 08/07/90
Last Update: 08/07/90

Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

37 PLANT 3

Type: PROPELLANT, OXIDIZERS,
HALOGENATED ORGANICS,
CHROMIC ACID AND PAINT

QTY: EST < (100) 55-GAL DRUMS

Permit: NONE

Ground Water : 11.6
Surface Water: 2.1
Air Quality : 0.0
Total Score : 6.8

PROOF OF SIMULATOR AND ILLUMINATING MOTOR ASSEMBLIES. CONCRETE FLOORS. NO CURBS AT DOORWAYS. WASTEWATER IS COLLECTED IN SINKS (SITE #34) AND TRANSFERRED TO ITP (SITE #4). EXPLOSIVE WASTES ARE DESIGNATED W/DIESEL FUEL & PLACED AT EXISTING WASTE PAD (SITE #35). SCORE BASED ON LIQUIDS STORED IN 55-GAL DRUMS.

PA : C
SI : M
RI : M
FS : M
RD : M

38 Y AREA

Type: HALOGENATED SOLVENTS AND
HEAVY METALS

Qty: EST < (50) 55-GAL DRUMS

Permit: NONE

Ground Water : 9.0
Surface Water: 3.5
Air Quality : 0.0
Total Score : 5.6

PPHMR ROCKET MOTOR IGNITER FAC CURRENTLY
PRODUCES HAND SIGNAL ASSEMBLIES. CONC
FLRS. NO CURBS AT DOORWAYS. W/ IS COL-
LECTED IN SUMPS (SITE #34) & TRANSFERRED
TO IWP (SITE #4). EXPLOSIVE WASTES
DESENSITIZED W/DIESEL AND PLACED AT EX-
PLOSIVE WASTE PAD (SITE #35). SCORE
BASED ON LIQUIDS STORED IN 55-GAL DRUMS.

PA : C
SI : M
RI : M
FS : M
RD : M

39. FORMER ACID PLANT

Type: ACID :

Qty: UNKNOWN

Permit: NONE

Ground Water :
Surface Water:
Air Quality :
Total Score #:

FORMER ACID PLANT OPERATED IN 1940'S IN
SUPPORT OF FORMER TNT PRODUCTION AREA
(SITE #29). PLANT RAZED 1959. SITE NOT
SCORED BECAUSE NO OTHER INFORMATION
AVAILABLE.

PA : C
SI : N
RI : N
FS : N
RD : N

USATHAMA Waste Site Report

Date of Printing: 08/07/90
Last Update: 08/07/90

Property Number: 48315

Property Name: LONGHORN ARMY AMMUNITION PLANT

40	FORMER WASTE DISPOSAL FACILITY	Type: HEAVY METALS AND ORGANIC SOLVENTS IN WASTEWATER AND AMMONIUM PERCHLORATE	Ground Water : 10.4 Surface Water: 7.4 Air Quality : 0.0 Total Score : 7.4	WASTEWATERS FROM SUMPS (SITE #34) AT PLANT 3 (SITE #37) & PLANT 2 (SITE #36) WERE DISCHARGED FROM 35000-GAL TANK TO GOOSE PRAIRIE BAYOU DURING PERIODS OF SUFFICIENT FLOW FROM 1955 TO EARLY 1970'S. WASHOUT OF AMMONIUM PERCHLORATE CONTAINERS PERFORMED ON SITE. SCORE BASED ON PAST ACTIVITY.	PA : C SI : M RI : M FS : M RD : M
		Qty: NONE CURRENTLY GENERATED Permit: NONE			
41	PHOTOGRAPHIC-LABORATORY	Type: WASTE DEVELOPER AND FIXER	Ground Water : 11.6 Surface Water: 1.8 Air Quality : 0.0 Total Score : 6.8	BUILDING #608 PROCESSES X-RAY FILM. CON- CRETE FLOOR, NO FLOOR DRAIN & NO CURB AT DOOR. SPENT DEVELOPER DRUMMED & TRANS- FERRED TO BUILDING #31-W (SITE #10). LARGEST CONTAINER IS 5 GALLONS.	PA : C SI : M RI : M FS : M RD : M
		Qty: EST < 50 GALLONS Permit: NONE			
42	MAGAZINE AREA	Type: MUNITIONS PRODUCTS	Ground Water : 7.7 Surface Water: 1.8 Air Quality : 0.0 Total Score : 4.5	(3) MAGAZINES WITH CONCRETE FLOORS. NO CURBS AT DOORWAYS.	PA : C SI : M RI : M FS : M RD : M
		Qty: 500000-POUND CAPACITY EA Permit: NONE			

USATHAMA Waste Site Report

Date of Printing: 08/07/90
Last Update: 08/07/90

Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

43	STATIC TEST AREA	Type: BURN RESIDUE FROM ROCKET MOTOR AND ILLUMINATING CANDLE TESTING	Ground Water :21.2 Surface Water:13.3 Air Quality : 0.0 Total Score :14.5	STATIC TEST AREA INCLUDES CANDLE TEST AREA. SITE FORMERLY USED FOR ROCKET MOTOR, RED PHOSPHORUS SMOKE WEDGE AND ILLUMINATING CANDLE TESTING. CURRENT ACTIVITY IS DEMILITARIZATION BY IGNITION OF PERSHING ROCKET MOTORS PERFORMED ON (2) TEST STANDS.	PA : C SI : M RI : M FS : M RD : M
		Qty: UNKNOWN			
		Permit: NONE			
44	GROUND SIGNAL TEST AREA	Type: BURN RESIDUE FROM MUNITION AND ILLUMINANT TESTING	Ground Water : 4.9 Surface Water: 6.5 Air Quality : 0.0 Total Score : 4.7	80-ACRE AREA FORMERLY USED FOR RED PHOSPHORUS SMOKE WEDGES, ILLUMINATING SHELLS AND MUNITIONS TESTING AND DEMILITARIZATION OF LEAKING WHITE PHOSPHORUS ITEMS. SITE CURRENTLY USED FOR ILLUMINANT TESTING AND DEMILITARIZATION OF PERSHING ROCKET MOTORS BY IGNITION ON (2) TEST STANDS.	PA : C SI : M RI : M FS : M RD : M
		Qty: UNKNOWN			
		Permit: NONE			
45	SEPTIC TANK	Type: SEWAGE AND SANITARY WASTEWATER	Ground Water : 4.8 Surface Water: 0.0 Air Quality : 0.0 Total Score # 2.8	(10) SEPTIC TANKS SERVE OUTLYING AREAS WITH OUTFALLS TO DITCHES. EFFLUENT IS CHLORINATED PRIOR TO DISCHARGE. CONTENTS OF SEPTIC TANKS PUMPED OUT AND TRANSFERRED TO SEWAGE TREATMENT PLANT (SITE #9) AS NEEDED. SCORE BASED ON LARGEST TANK.	PA : C SI : M RI : M FS : M RD : M
		Qty: EST < 5000 GALS EA (MAX)			
		Permit: NPDES TX 0000035			

Date of Printing: 08/07/90
Last Update: 08/07/90

00047995

USATHAMA Waste Site Report

Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

46 VEHICLE WASH RACK & O/W SEP. Type: OIL AND GREASE FROM
VEHICLE WASHWATER

Qty: 10 VEHICLES/WEK

Permit: NPDES TX 0000035

CONCRETE WASH RACK SLOPES TO DRAIN CON-
NECTED TO OIL/WATER SEPARATOR. SITE NOT
SCORED DUE TO PERMITTED DISCHARGE TO
DRAINAGE DITCH. EXTENT OF SEPARATOR
MAINTENANCE UNKNOWN.

Ground Water :
Surface Water:
Air Quality :
Total Score :

PA : C
SI : N
RI : N
FS : N
RD : N

47 RUBBLE BURIAL SITE

Type: BARBED WIRE, FENCE POSTS
AND OTHER INERT MATERIAL

Qty: EST. < 10 CUBIC YARDS

Permit: NONE

SITE USED FOR BURIAL OF INERT MATERIALS
THAT WERE CLEARED FROM PROPERTY AFTER
ACQUISITION.

Ground Water : 3.9
Surface Water: 0.9
Air Quality : 0.0

Total Score : 2.3

PA : C
SI : N
RI : N
FS : N
RD : N

48 MAINTENANCE COMPLEX

Type: OIL, GREASE, ANTIFREEZE
AND SOLVENTS

Qty: EST (50) 55-GAL DRUMS

Permit: NONE

CONCRETE FLOORS. NO CURBS AT DOORWAYS.
FLOOR DRAINS CONNECTED TO SANITARY SEW-
ER. LUBRICANTS STORED ON DRUM RACKS
OUTSIDE OVER GRAVEL SURFACE. NO CURBING
OR OTHER CONTAINMENT. WASTE OIL AND
SOLVENTS TRANSFERRED TO BUILDING #31-W
(SITE #10). SCORE BASED ON EXTERIOR
DRUM STORAGE.

Ground Water : 8.0
Surface Water: 1.5
Air Quality : 0.0
Total Score : 4.7

PA : C
SI : N
RI : N
FS : N
RD : N

USATHAMA Waste Site Report

Date of Printing: 08/07/90
Last Update: 08/07/90

Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

49 STORAGE BUILDING

Type: PESTICIDES AND HERBICIDES

Qty: 400 GAL LIQ, 1000 LB SOLID

Permit: NONE

Ground Water : 11.6
Surface Water: 2.1
Air Quality : 0.0

Total Score : 6.8

MATERIAL STORED IN BUILDING #725. CON-
CRETE FLOOR SLOPES TO FLOOR DRAIN DIS-
CHARGING TO SUMP (SITE #34). NO CURB AT
DOOR. CONTENTS OF SUMP PUMPED OUT AS
REQUIRED AND TRANSFERRED TO PILOT WASTE-
WATER TREATMENT SYSTEM (SITE #4) VIA
VACUUM TRUCK (SITE #2). LARGEST CON-
TAINER IS 55-GALLON DRUM.

PA : C
SI : M
RI : M
FS : M
RD : M

50 FORMER STORAGE BUILDING

Type: PESTICIDES AND HERBICIDES

Qty: POTENTIAL RESIDUAL

Permit: NONE

Ground Water : 11.6
Surface Water: 2.1
Air Quality : 0.0

Total Score : 6.8

PESTICIDES FORMERLY STORED IN BUILDINGS
#411 AND 716. CONCRETE FLOOR. NO CURB
AT DOOR. SCORE BASED ON PAST ACTIVITY.

PA : C
SI : M
RI : M
FS : M
RD : M

51 WATER TREATMENT PLANT

Type: ALUM AND LIME SLUDGE,
FILTER BACKWASH EFFLUENT

Qty: 216000 GALLONS EACH

Permit: NONE

Ground Water : 11.0
Surface Water: 1.0
Air Quality : 0.0

Total Score : 6.4

WATER TREATMENT PLANT PUMPS SLUDGE AND
FILTER BACKWASH EFFLUENT TO (2) 216000-
GAL CAPACITY POLYETHYLENE LINED EARTHEN
PONDS. DRIED SLUDGE IS REMOVED & SPREAD
ON FACILITY GROUNDS AS FERTILIZER. SCORE
BASED ON LARGEST VOLUME. ~~NO INFORMATION
AVAILABLE ON PRESENT STATUS OF HAZARDOUS
CONSTITUENTS IN SLUDGE.~~

PA : C
SI : M
RI : M
FS : M
RD : M

USATHAMA Waste Site Report

Date of Printing: 08/07/90
Last Update: 08/07/90

Property Name: LONGHORN ARMY AMMUNITION PLANT

Property Number: 48315

52 BUILDING #43X Type: EXPLOSIVES

Ground Water : 0.9
Surface Water: 2.0
Air Quality : 0.0

Total Score : 1.3

Qty: EST. < 5000 POUNDS

Permit:

PA : C
SI : M
RI : M
FS : M
RD : M

SHED USED FOR STORAGE OF MATERIALS PRIOR
TO INCINERATION. CONCRETE FLOOR. NO
CURB OR OTHER CONTAINMENT.

53 BURIAL PITTS

Type: REJECT MATERIAL OF
UNKNOWN COMPOSITION

Ground Water :
Surface Water:
Air Quality :
Total Score :

Qty: UNKNOWN

Permit: NONE

PA : C
SI : M
RI : M
FS : M
RD : M

PITS USED IN LATE 1950'S FOR DETONATION
AND BURIAL OF REJECT MATERIAL FROM PLANT
3 (SITE #37). NO OTHER INFORMATION
AVAILABLE, SO SITE NOT SCORED.

54 TRANSFORMER STORAGE

Type: TRANSFORMER OIL

Ground Water : 8.0
Surface Water: 1.2
Air Quality : 0.0
Total Score : 4.7

Qty: EST < 150 GALLONS EACH

Permit: NONE

PA : C
SI : M
RI : M
FS : M
RD : M

APPROXIMATELY (20) OUT-OF-SERVICE NON-
PCB TRANSFORMERS STORED ON PALLETS OUT-
SIDE. NO CURB OR OTHER CONTAINMENT.
SCORE APPLIED TO EACH UNIT.

USATHAMA Waste Site Report

Date of Printing: 08/07/90
Last Update: 08/07/90

Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

55	BUILDING #209	Type: CHEMICALS, PAINT AND SOLVENTS	Ground Water : Surface Water: Air Quality : Total Score :	BUILDING #209 IS A CHEMICAL STORAGE AREA WITH CONCRETE FLOOR. FLOOR DRAINS CONNECTED TO SUMPS (SITE #34). MATERIALS STORED IN CURBED AREA. LARGEST CONTAINER IS 55-GALLON DRUM. SITE NOT SCORED. POTENTIAL SPILL WOULD DRAIN TO SUMPS (SITE #34).	PA : C SI : M RI : M FS : M RD : M
		Qty: EST < (100) 55-GAL DRUMS			
		Permit: NONE			
56	SPILLS	Type: ACID, LIQUID POLYSULFIDE POLYMER, TNT, OIL AND PCB OIL	Ground Water : Surface Water: Air Quality : Total Score :	NUMEROUS SPILLS, FIRES AND EXPLOSIONS OF VARIOUS MAGNITUDES HAVE OCCURRED THROUGHOUT INSTALLATION FROM 1940'S TO PRESENT. LARGEST REPORTED WAS 2900 GALS POLYSULFIDE POLYMER IN EARLY 1960'S. SPILLS NOT SCORED BECAUSE NO INFORMATION ON CLEANUP ACTIVITIES AVAILABLE.	PA : C SI : M RI : M FS : M RD : M
		Qty: 2900 GALLONS			
		Permit: NONE			
57	TRANSFORMERS	Type: PCBs IN TRANSFORMER OIL	Ground Water :11.6 Surface Water: 2.3 Air Quality : 0.0 Total Score #: 6.9	(201) ARMY-OWNED TRANSFORMERS IN SERVICE THROUGHOUT FAC. CAPACITIES RANGE FROM 3 TO 220 GALS EA. (7) TRANSFORMERS TESTED > 500 PPM. (194) UNITS TESTED BETWEEN 50 PPM AND 500 PPM. TRANSFORMERS TO BE REPLACED ARE TRANSFERRED TO BLDG #31-W (SITE #10) PRIOR TO DISPOSAL VIA DRMO TEXARKANA. SCORE APPLIED TO EACH UNIT.	PA : C SI : M RI : M FS : M RD : M
		Qty: 220 GALLONS EACH (MAX)			
		Permit: NONE			

USATHAMA Waste Site Report

Date of Printing: 08/07/90
Last Update: 08/07/90

Property Number: 48315 Property Name: LONGHORN ARMY AMMUNITION PLANT

58 ABOVE GROUND STORAGE TANK Type: #2 FUEL OIL, KEROSENE AND ASPHALT Qty: 500000 GALLONS (MAXIMUM)

Ground Water : 11.6 (1) 50000-GALLON, (2) 10000-GALLON, PA : C
Surface Water: 0.0 (3) 1500-GALLON AND (1) 750-GALLON TANKS SI : M
Air Quality : 0.0 WITH EARTHEN DIKES SUFFICIENT TO CONTAIN RI : M
Total Score : 6.7 POTENTIAL SPILL. MOTOR FUEL TANKS REGI- FS : M
STERED WITH STATE. SCORE BASED ON LRGT RD : M
TANK AND APPLIED TO EACH TANK.

Permit: NONE

59 MOBILE STORAGE TANKS Type: #2 DIESEL AND GASOLINE Qty: 600 GALLONS EACH

Ground Water : 8.0 (2) 600-GALLON CAPACITY COMPARTMENTS ON PA : C
Surface Water: 1.5 TANK TRUCK. VEHICLE USED THROUGHOUT SI : M
Air Quality : 0.0 FACILITY AND PARKED ON ASPHALT SURFACE RI : M
Total Score : 4.7 AT MAINTENANCE COMPLEX IN FULL CONDI- FS : M
TION. NO CURB OR OTHER CONTAINMENT. RD : M
SCORE APPLIED TO EACH TANK

Permit: NONE

60 UNDERGROUND STORAGE TANKS Type: GASOLINE Qty: 17000 GALLONS (MAXIMUM)

Ground Water : 9.2 (1) 17000-GALLON, (1) 12000-GALLON, (1) PA : C
Surface Water: 0.0 10000-GALLON, (2) 1000-GALLON AND (1) SI : M
Air Quality : 0.0 280-GALLON TANKS. LEAK TESTED 1989. RI : M
Total Score : 5.3 NO LEAKS DETECTED. FS : M
RD : M

Permit: NONE

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APPENDIX C
RESOURCE CONSERVATION & RECOVERY ACT
FACILITY ASSESSMENT

Longhorn Army Ammunition Plant
Karnack, Tx
APRIL 25-426 & MAY 2-5 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. ISW 30990UNIT IDENTIFICATION: LHAAP-2 TANK TRUCK PARKING LOT

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

Asphalt Parking Area 150' x 120' ±, which is
isolated by a metal railing and a drainage ditch.

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

Industrial wastewater as depicted in the Preliminary
Review.

- C. Visual/Physical Inspection of Unit

1. ~~Conditions of drums~~ CONDITION OF TANKERS

The tankers were functional, free of leaks, and
in good condition. The parking lot was
without ~~any~~ substantial cracking or holes.

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

No controls for run-on or runoff. The parking lot drains into the drainage ditch.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There was no evidence of any spillage or leakage attributable to this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known

D. Other Areas of Concern

E. Summary/General Comments

[REDACTED]

*This unit is governed by the Regulations published
in 40 CFR PART 265 SUBPART I*

*Because this is a well-managed unit, and
because there is no evidence of past mis-management,
no further RFA action is recommended.*

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25 → 28 & MAY 2 → 5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990UNIT IDENTIFICATION: LHAAP-3 Paint Shop Container Accumulation

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted on the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted on the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

Good Condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A modest sheet metal roof covers the drum.
The drum is elevated above base grade by
a wooden pallet.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest
mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this
unit would contribute to any significant
groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C-1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

Longhorn Army Ammunition 1 of 3
Karnack, TX

April 25-28 & May 2-5, 1968

Pilot Wastewater Treatment Plant

PART II - UNIT EVALUATION

TWC Regis. No. _____

WASTE MANAGEMENT UNIT

PHAAP-4

Regis. Facility No. ISW 30990

- A. Verification and description of Physical Construction and Operation
(dimensions, years of service, containment features, e.g. concrete pads,
dikes, indoor)

As depicted in the Preliminary Review.

This evaporative unit is the terminus of the wastewater industrial
wastewater treatment system.

- B. Characterization of Waste Materials (facility records, sample results,
process description, constituents of concern, documentation)

Industrial wastewater having traces of (1) spent organic
solvents, (2) metallic salts, and (3) inert debris.

- C. Visual/Physical Inspection of Unit

1. Conditions unit and support apparatus

Upon visual inspection, it appears that this
unit is functioning well.

2. Rainfall controls (run-on/run-off controls, stormwater collection and disposal, analyses)

The unit and support apparatus occupy a concrete slab which is open to the elements.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There is no evidence of any spills or leaks attributable to this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection it seems unlikely that this unit would ~~also~~ contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

none known.

D. Other Areas of Concern**E. - Summary/General Comments**

Under Title 40 CFR Part 264-1 g. (6) this unit is exempt from permitting requirements -

Because this unit is well managed and gives no evidence of past mismanagement, no further RFA action is recommended.

Longhorn Army Ammunition Plant
Karnack, Texas
April 25-28 and May 2-5, 1968

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PART II - UNIT EVALUATION
SURFACE IMPOUNDMENTS

TWC Regis. No. _____
Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: LHAAP-5 Salt Evaporation Pond

- A. Verification of physical construction and operation
(dimensions, years of service, materials of construction)

As depicted in the Preliminary Review

- B. Characterization of waste materials (Facility records, sample results, process description, constituents of concern, documentation)

a mild concentration of Brine

- C. Visual/physical inspection of unit:

1. Description of dike structure, height and freeboard:

4:1 sideslope, 3 feet of freeboard
Clayey, compacted soil over a PVC liner

2. Evidence of discharges from impoundment (spill history, bypassing, inadequate run-on/run-off controls, flood prone area):

There is no evidence of the dike being
breached.

3. Evidence of actual or potential groundwater contamination (samples from mon. wells, knowledge of shallow water table, liner integrity, active seeps, leak detection records, operating practices)

Upon inspection it is unlikely that this
unit would introduce any significant contamination
into the groundwater.

4. Air quality concerns (TACB complaints, odors, air sampling records)

None known.

- D. Other areas of concern:

E. Summary/General Comments:

This unit does not manage hazardous waste, or
waste having hazardous constituents.

Because this is a well-managed unit, no
further RFA action is recommended.

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Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. TSW 30990

UNIT IDENTIFICATION: LHAAP-6 - Bldg 54 F, Collection Point

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

Waste acids and solvents

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

Good Condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

Protected on 3 sides and the roof -

There is little exposure to the elements

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
1, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

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Loughm Army Ammunition Plant

Karnack, Texas

April 25 → 28 & May 2 → 5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: LHAAP-7 Drum Processing Area

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

The building houses a concrete, above-grade
vault where (1) empty drums are rinsed with
hot water and (2) spent H_2SO_4 is neutralized in
limestone.

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the preliminary review.

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

Empty as defined in Title 40 CFR PART 261.7

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

The elementary neutralization unit is within
the confines of a weather-proof building.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There is no evidence that suggests any spillage or
leakage attributable to this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit
would contribute to any significant groundwater
contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Inasmuch as this unit serves to (1) neutralize H_2SO_4 and (2) rinse empty containers, it is exempt from permitting requirements (Ref. 40 CFR 261.7, 260.10, 265.2 c 10).

Because this unit exhibits no evidence of mismanagement, no further RFA action is recommended.

00048019

Longhorn Army Ammunition Plant
Karneck, Texas

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APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: LHAAP-8 Q.A. Lab Collection Point

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

Waste containers in outstanding condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

Sheet Metal Roof -

Waste containers above grade

There is little exposure to direct rainfall or runoff.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest
mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this
unit would contribute to any significant
groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

Longhorn Army Ammunition Plant
Karnack Texas

April 25-28 & May 2-5, 1988

PART II - UNIT EVALUATION
SURFACE IMPOUNDMENTS

TWC Regis. No.
Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: Sewage Treatment Plant LHAAP-9

- A. Verification of physical construction and operation
(dimensions, years of service, materials of construction)

Concrete Tanks as depicted in the
Preliminary Review

- B. Characterization of waste materials (Facility records, sample results, process description, constituents of concern, documentation)

Sanitary Sewage and Infiltration - Inflow

- C. Visual/physical inspection of unit:

1. Description of dike structure, height and freeboard:

Concrete Tanks with $1\frac{1}{2}$ - 2' Freeboard

2. Evidence of discharges from impoundment (spill history, bypassing, inadequate run-on/run-off controls, flood prone area):

There is no evidence of any uncontrolled
releases from this unit.

3. Evidence of actual or potential groundwater contamination (samples from mon. wells, knowledge of shallow water table, liner integrity, active seeps, leak detection records, operating practices)

Upon inspection it seems unlikely that this treatment facility would introduce any hazardous waste or waste with hazardous constituents into the groundwater.

4. Air quality concerns (TACB complaints, odors, air sampling records)

None known

D. Other areas of concern:

E. Summary/General Comments:

Under Title 40 CFR Part 264.1 g (6),
this unit is exempt from permitting requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & May 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: LHAAP-10 Drum Storage Bldg 31W

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As Depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review.

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

Drums are in good condition - everything is
arranged in an orderly manner.

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

All of the segregated drum storage bags are within the confines of this metal building.

--- No exposure to rainfall, runoff or runoff ---

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There is no manifestation of spillage or leakage attributable to this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it appears unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known

D. Other Areas of Concern

E. Summary/General Comments

Because this is a well-managed unit, and because there is no evidence that suggests past micromanagement, no further RFA action is recommended.

00048028

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Longhorn Army Ammunition Plant
Karnack, Texas

April 25-28 & May 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: LHAAP-15 Containerized Waste

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted on the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted on the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

Good Condition, neat and orderly.

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

Metal Sides and Roof. Concrete Slab above grade. No exposure to rainfall or runoff.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There is no evidence of spillage or leakage attributable to this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it is unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known

D. Other Areas of Concern

E. Summary/General Comments

Because this is a well-managed unit, no further RFA action is recommended.

Longhorn Army Ammunition Plant
Karnack, Texas

00048031

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April 25-28 and May 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: LHAAP-19 24X HOLDING AREA

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

Portable bins in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

Portables Bins are sheltered from direct
precipitation by a corrugated metal roof
No other run-on/runoff controls are present.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There is no evidence of spillage or leakage
attributable to this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection it appears unlikely that
this unit contributed to any significant
groundwater contamination

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known

D. Other Areas of Concern

E. Summary/General Comments

This unit is governed by the regulations that appear in 40 CFR Part 265, Subpart I.

Because this is a well-managed unit, no further RFA action is recommended.

00048034/138

Longhorn Army Ammunition Plant
Karnach, Texas

April 25-28 & May 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE *LHAAP-20*

Regis. Facility No. *JSW 30990*

UNIT IDENTIFICATION: *BLDG 25X, WASHOUT PAD*

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

*Historically, rinsate from the cleaning process
employed at this unit has not been
hazardous either by characteristic or by
listed constituent.*

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

Empty as defined in 40 CFR Part 261.7

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

The open area of the unit is concrete curbed and
sloped. ~~THE OPEN AREA~~ The housed portion
is protected from direct rainfall by a building
having 3 walls and a roof.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There is no evidence that suggests any past
spills or leaks attributable to the unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection it seems unlikely that this
unit would contribute to any significant groundwater
contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known

D. Other Areas of Concern

E. Summary/General Comments

At this Particular Unit, Empty containers (as defined in 40 CFR Part 261.7) are rinsed and allowed to air dry. Therefore, this unit is exempt from permitting requirements.

Because this is a well-managed unit, and because this unit exhibits no manifestation of past mismanagement, no further RFA action is recommended.

Longhorn Army Ammunition Post
Karnack, TX 183
April 25-28 and May 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: LHAAP-28, BLDG. 811-1

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

A Bunker as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

Expired Munitions as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

None Present

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

Waste materials managed within the confines of a weather-proof building.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage from this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known

D. Other Areas of Concern

E. Summary/General Comments

Because there is no evidence of mis management,
no further RFA action is recommended for the unit.

Longhorn Army Ammunition Plant
Karnack, Texas

April 25-28 & May 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE (TSCA UNIT)

Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: LHAAP-31

BLDG 707 C

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as depicted in the ~~original~~ Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

The building is empty

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

This unit is a completely-enclosed building.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There was no evidence of any spillage or leakage attributable to this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it appears unlikely that this unit would have contributed to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

none known

D. Other Areas of Concern

E. Summary/General Comments

The building was closed in 1987, with all of the remaining PCB-containing waste being transferred to building 31-W. No further RFA action is recommended.

Biu

Longhorn Army Ammunition Plant 211
Karnack, Texas
April 25-28 & May 2-5 1988

00048043

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE TSCA UNIT

Regis. Facility No. ISW 30990

UNIT IDENTIFICATION: SHARP-33, Bldg 701

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted on the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted on the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums

No longer any ~~waste~~ drums present

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

This unit was within the confines of a
weather-proof building.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

There is no evidence of spillage or leakage
attributable to this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this
unit would have contributed to any significant
groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known

D. Other Areas of Concern

E. Summary/General Comments

Because this unit shows no manifestations of past mismanagement, no further RFA action is recommended.

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: LHAAP-35 PAD X-1

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

Explosive-Contaminated Waste as depicted in the
Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ Containers

all in excellent shape

605

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A roof shelters containers from direct precipitation

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

no evidence of spillage or leakage that would suggest mismanagement of this unit

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

00048048

Longhorn Army Ammunition Plant
Karneck, Texas 607

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. TSW 30990

UNIT IDENTIFICATION: LHAAP-35 X-2

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

Excellent

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

Sheltered from direct precipitation by a metal
roof

Containers are elevated above grade.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest
mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this
unit would contribute to any significant
groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
I, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

611

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

*A roof protects waste containers from direct rainfall
Waste containers are elevated above grade*

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

*No evidence of spillage or leakage that would suggest
mismanagement of this unit.*

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

*Upon inspection, it seems unlikely that this
unit would contribute to any significant
groundwater contamination.*

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

NONE KNOWN.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
1, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

000480533

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. TSW 30990

UNIT IDENTIFICATION: LHAAP-35 PAD X-4

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

all in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A metal roof shelters the drums from direct rainfall

Containers elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest
mismanagement of this unit:

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this
unit would contribute to any significant
groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

0004805616

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25 → 28 & MAY 2 → 5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: LHAPP-35 X-5

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review.

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ containers

all in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A roof over protects containers from direct precipitation

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
I, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C-
I, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A roof shelter contains from direct precipitation

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.
I, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

00048061

625

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25 → 28 & MAY 2 → 5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990UNIT IDENTIFICATION: LHARP - 35X-B

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

An 8' x 8' concrete Pad, no curb,
no roof; operating practices as depicted in the
Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ containers

None Present

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

This unit is unsheltered from direct precipitation.
However, this unit is sloped to drain well.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.).

No evidence of spillage or leakage that would suggest
mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this
unit would contribute to any significant
groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C-1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

00048064

Longhorn Army Ammunition Plant
Karneck, Texas 628

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: LHAAP-35

X-9

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as Depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as Depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

all in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A roof shelters the containers from direct precipitation

The containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

Longhorn Army Ammunition Plant
Karneck, Texas 631

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION:

LHAAP-35X-10

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ containers

All in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A metal roof protects containers from direct precipitation

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern**E. Summary/General Comments**

Under Title 40 CFR Part 262, Subpart C Paragraph C
1, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

00048069

Longhorn Army Ammunition Plant
Karneck, Texas 634

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. ISW 30990

UNIT IDENTIFICATION:

LHAAP-35X-11

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Condition of ~~drums~~ containers

All in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A roof shelters the containers from direct precipitation

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.1,
this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25-28 & MAY 2-5, 1968

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990UNIT IDENTIFICATION: LHAAP-35 X-12

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

all in excellent condition.

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

a roof shelters the drums from direct precipitation

~~Drums~~ Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

00048075 640

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION:

LHAAP-35

X 13

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ containers

all ~~drums~~ in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A roof protects containers from direct rainfall

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence; dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
1, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

64300048078

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25-28 & MAY 2-5, 1988

RT II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION:

SHAAP-35

PAD X-14

Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

Visual/Physical Inspection of Unit

1. Conditions of drums containers

All in excellent condition

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

000480896

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25 → 28 & MAY 2 → 5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. TSW 30990

UNIT IDENTIFICATION: LHAAP-35 X-15

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

All containers in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A roof shelters the containers from direct precipitation

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

00046083

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25 → 28 & MAY 2 → 5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: PHAAP-35 X-16

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Condition of drums containers

All containers in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A metal roof shelter contains from direct rainfall

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.
I, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

00048086

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & MAY 2-5, 1988 652

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION:

LHAAP-35

X-17

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

all containers in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

Unit has a roof to shelter containers from direct precipitation.

Containers elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

654

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
1, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25-28 & MAY 2-5, 1988 655

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION:

LHAAP-35X-18

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

all containers in excellent condition

656

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A metal roof shelters containers from direct precipitation.

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

657

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

00048992
6582

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION:

LHAAP-35

X-19

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

all containers in excellent condition

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A metal roof shelter contains from direct precipitation -

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

660

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
I, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

00048095

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & MAY 2-5, 1988 661

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: LHAAP-35 WASTE PAD X-20

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

As depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

As depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums container

Containers all in excellent condition

662

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

A roof shelters the containers from direct rainfall.

Containers are elevated above grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

663

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25-28 & MAY 2-5, 1988 664

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990UNIT IDENTIFICATION: LHAAP-35 WASTE PAD @ P116

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

An unsheltered metal rack which elevates 5-gallon
galvanized pails above bare grade; operating
practices as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

Explosive-contaminated waste as depicted in
the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

Containers have lids - containers in
excellent condition

665

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

No shelter from direct precipitation

Containers are elevated above bare grade

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

666

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
1, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

00048101

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & MAY 2-5, 1988 667

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: LHAAP-35 WASTE PAD AT BLDG. 25 I

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

4'x8' ± Concrete Pad ; operating practices as
depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ containers

Containers have lids. Containers are in
excellent condition

668

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

There are no rainfall controls of any description.

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

669

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
1, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & MAY 2-5, 1988

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION:

LHAAP-35 WASTE PAD @ BLDG 54 G

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

A 4' x 12' ± concrete slab with no other appurtenances;
operating practices are as depicted in the Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

AS DEPICTED IN THE PRELIMINARY REVIEW

- C. Visual/Physical Inspection of Unit

1. Conditions of drums containers

Containers are in excellent condition - containers have
lids

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

There are no rainfall controls of any description

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

672

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C
1, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25-28 & MAY 2-5, 1988

673

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: LHAAP-35 WASTE Pad @ Bldg 54 F

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

A 50 Ft², Pie shaped concrete pad with no curb,
rack, or roof - Operating practices are as depicted in
the Preliminary Review -

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

Waste material as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ containers

Containers have lids, and are in excellent
condition

675

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C.
I, this unit is exempt from permitting and certain
interim status requirements.

Because this is a well-managed unit, no further
RFA action is recommended.

Longhorn Army Ammunition Plant
Karneck, Texas

APRIL 25-28 & MAY 2-5, 1988 676

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990UNIT IDENTIFICATION: LHAAP-35 WASTE PAD @ 26 E

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

A 4'x8' CONCRETE PAD WITHOUT METAL RACK, concrete
curbing, on metal roof. Operating practices are
as depicted in the Preliminary Review--

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ containers

Waste containers in good condition

677

2. Rainfall controls (run-on/runoff controls, stormwater collection and disposal, analyses)

No rainfall controls of any description at this unit

3. Evidence of spillage/leakage (visual and olfactory evidence, dead vegetation, etc.)

No evidence of spillage or leakage that would suggest mismanagement of this unit.

4. Evidence of actual or potential groundwater contamination (samples from monitor wells, knowledge of shallow water tables, operating practices)

Upon inspection, it seems unlikely that this unit would contribute to any significant groundwater contamination.

5. Air quality concerns (TACB complaints, odors, particulate dispersal, sampling records)

None known.

678

D. Other Areas of Concern

E. Summary/General Comments

Under Title 40 CFR Part 262, Subpart C Paragraph C-1, this unit is exempt from permitting and certain interim status requirements.

Because this is a well-managed unit, no further RFA action is recommended.

Longhorn Army Ammunition Plant
Karnack, Texas

APRIL 25-28 & MAY 2-5, 1988

679

PART II - UNIT EVALUATION

TWC Regis. No. _____

CONTAINER STORAGE

Regis. Facility No. JSW 30990

UNIT IDENTIFICATION: LHAAP-35 WASTE PAD @ P-3

- A. Verification of Physical Construction and Operation
(dimensions, years of service, containment features eg.
concrete pads, dikes, indoor)

~~XXXXXXXXXXXXXXXXXXXX~~ A 6' x 12' concrete

Slab having no roof or concrete curbing

Operating Practices are as depicted in the
Preliminary Review

- B. Characterization of Waste Materials (facility records, sample
results, process description, constituents of concern,
documentation)

as depicted in the Preliminary Review

- C. Visual/Physical Inspection of Unit

1. Conditions of ~~drums~~ containers

Drums and containers in excellent condition



LONGHORN ARMY AMMUNITION PLANT
 RESTORATION ADVISORY BOARD
 Karnack, Texas
 (479) 635-0110

DRAFT FINAL AGENDA

DATE:	Tuesday, December 12, 2006
TIME:	6:30 – 7:30 PM
PLACE:	Karnack Community Center, Karnack, Texas

- | | |
|--------------|--|
| 06:30 | Welcome {RMZ & PF} |
| 06:35 | Open items {RMZ}
RAB Co-Chair Election |
| 06:45 | Defense Environmental Restoration Program (DERP) PBC Update {Shaw}
Groundwater Treatment Plant (GWTP) Update
Ecological Risk Assessment Status
Documents Status/ Environmental Sites
Perimeter Well Monitoring |
| 07:05 | DERP Total Environmental Restoration Contract Update {Shaw}
Documents Status/ Environmental Sites |
| 07:10 | DERP Corps of Engineers Update {MCM} |
| 07:15 | Military Munitions Response Program (MMRP) Update {RPS} |
| 07:20 | Transfer Update {RMZ} |
| 07:25 | Other Interest {RMZ & PF} |
| 07:30 | Adjourn {RMZ} |



**Subject: Draft Final Minutes, Quarterly Restoration Advisory Board (RAB)
Meeting, Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: Karnack Community Center, Karnack, Texas

Date of Meeting: December 12, 2006, 6:30 – 8:20 PM

Meeting Participants:

BRAC:	Rose M. Zeiler (RMZ), Tom Lederle (TL)
USACE-Tulsa:	Cliff Murray (CM), Rick Smith (RPS)
GSA – Fort Worth	John Robinson
USAEC	Jeff Armstrong (JA)
USFWS:	Mark Williams (MW), Barry Forsythe
Shaw Environmental:	Praveen Srivastav (PS), Kay Everett
USEPA Region 6:	Chris Villarreal, Scott Harris, Stephen Tzhone
RAB:	Paul Fortune (PF) (Co-Chair), Shirley Shivers, Nigel Shivers, Tom Walker (TW), Judith Johnson (JJ), Tony Novak (TN)
Community:	Jay Webb (JW), John Fortune, Paul Miliotis, Doug Parker, Judith Parker, Richard Anderson (RA), Phyllis Bailey

An agenda for the meeting was distributed prior to the meeting

Welcome and Introductions – Rose Zeiler and Paul Fortune

RMZ thanked the community for the festive pot-luck dinner, welcomed the attendees and brought the 2006 third quarter Restoration Activity Board meeting to order (approximately 7:15 PM). The draft final minutes from the September 2006 meeting were previously distributed. RMZ asked if there were comments or changes to the minutes from the September 2006 RAB meeting. No changes were indicated.

RMZ mentioned that Tom Lederle from BRAC Headquarters was in attendance.

Open Items – Rose Zeiler

Elections for the RAB co-chair were conducted by distributing a list of the current RAB members. Nominated were Judith Johnson and Paul Fortune. John Robinson collected the ballots. The new two-year RAB Co-Chair will be named at the next RAB meeting.

Defense Environmental Restoration Program (DERP) (PBC) Update– Shaw

Document Status/Environmental Sites

Shaw's PS indicated that Shaw field teams were currently at LHAAP completing sampling tasks at various sites.

Groundwater Treatment Plant (GWTP) Update

The GWTP's CatOx unit is currently being repaired. RMZ explained that water from the GWTP is not discharged to the creek until treated, tested and verified to be within specific parameters. It is only discharged into running water within the creek, that is, treated water is not discharged into the creek bed if it is dry. The pond is almost full and received a couple inches of rain during the week. The water in the pond was tested due to an excursion of perchlorate in the treated water a few weeks ago. A discussion ensued on when water from the pond can be discharged, since there is now running water in the creek due to recent rains. Repeat samples of the pond water would be collected to confirm that the pond water is acceptable for discharge.

The Baseline Ecological Risk Assessment (BERA) is close to completion and Volume I: Step 3 Report is due out for Army review in December 2006. RMZ reiterated that this document is extremely important and that Records of Decision (RODs) for many sites are contingent on this document.

Groundwater Perimeter Wells

Sampling of perimeter wells was conducted in September 2006 and results were reported to the regulators. Creek sampling cannot be conducted until creeks have water in them.

DERP Total Environmental Restoration Contract Update – Shaw

Document Status/Environmental Sites

PS noted that several documents were in review and that several sites were in the proposed plan stage. Sites LHAAP-08, -32, -48, -53, -37 and -67 are at a point where proposed plans will have to wait until the BERA is done. These sites are in the middle of the base and can be transferred to USFWS when RODs are approved.

DERP Corps of Engineers Update

Military Munitions Response Program (MMRP) Update – Rick Smith

The Engineering Evaluation/Cost Analysis (EE/CA) report was delayed; however, the Army now has the draft report and it is under review. At LHAAP-53 (the Static Test Area), the document indicates that nothing further needs to be done. The South Bomb Test and Signal Test Areas results presented in the draft report indicate a moderate density of MEC close to surface, to within 6 inches of the surface. The geophysical survey went to 3 feet below ground surface. The next phase of operation is to look at available options.

Questions from the community: What kinds of tests were done? RPS said that transects with 100 foot spacings were performed using metal detectors. This amounted to coverage of 3% of the area. When anomalous readings were found the team went back and excavated those areas.

Question from the community: Is this tied to preexisting sites or random areas? RMZ indicated some locations were biased (based on historical documentation) and some were unbiased.

Question from the community: Do the components found at the site include spent shell casings? Answer was that yes, it was spent casings, but no fused items were found. RMZ said that the type of MEC scrap found was minor.

Question from the community: Is there a comfort level of whatever munitions that may be remaining? RPS explained that in the MMRP response process, 3% of an area is statistically looked at, but that in the 97% remaining area, there is a low to moderate probability of finding something hazardous. RMZ said that the document they are reviewing is a report that records what was found and ends with a recommendation. The report states that a mortar test area with heavy fragments was found. Evaluation of removal action alternatives will be presented in the EE/CA with selection based on 5 criteria including cost, implementability, long- and short-term effectiveness, and acceptance would be made. This will result in the most appropriate alternatives for the sites.

JA indicated that the Army has money set aside to complete the MEC cleanup at the Longhorn MMRP sites.

TN reiterated that the community was anxious and wanted to get out on the installation. He wanted to know when that would happen. TL indicated that months of work on many environmental sites has already been conducted. Regarding MMRP work the EECA is being prepared now with a cleanup to be completed in about a year. RMZ said LHAAP was one of the first installations to be funded for MMRP work and indicated that LHAAP is a high priority for Army Environmental Command (AEC) who will be funding this work.

RA thanked Tom Lederle for being here, and commented that he didn't want them to rush, but to resolve this issue of site access in a reasonable time frame. TL suggested that a target date be set for the end of cleanup and having a target date and schedule would be well received.

JA said that their goal is to complete transfer as quickly as they can, but that cleanups have to be done correctly.

TN said there is a lot of interest in visiting the refuge and the public is getting restless. He stressed that the time it is taking to open the refuge should be accelerated.

Transfer Update – Tom Lederle

TL said an organizational change occurred within BRAC recently. It has caused some of the slow down on the permit. Originally BRAC Division had 3 field offices – these were all consolidated at DA. A lot of personnel did not make the move to DC and now TL is trying to do it all himself while these positions are being filled. There are 600 acres in ECOP IV that will be ready for transfer this fiscal year and another 100+ acres in the Production Area Parcel already available to USFWS from ECOP III.

The congressional hold also produced a slowdown in the transfer of management of areas and also impacted progress on the “permit”. The “permit” is now in final form and Army legal has reviewed with minor changes. After TL finishes his review in January 2007, it will be sent to USFWS. By the end of summer 2007, it is anticipated that USFWS will be operating the entire installation as the refuge. There will remain restricted areas but there may be some degree of access by car tours, etc. TL said the last thing they’d ever want is to allow someone to be exposed to a hazard. Even after the final transfer, there will still be some areas with restricted access. It is planned to put a contract in place to have pits and sump hazards filled in probably beginning of March 2007. There will need to be some public education about certain hazards and restricted areas before opening the base.

JJ asked if the green area (as depicted in the transfer map) has already been transferred, why access is limited to these sites now. TL said there is limited access, but that USFWS is managing that. MW said that when the Army is satisfied with signs, fencing, and gates restricting access in certain areas still under cleanup, the USFWS will put up their signs and informational posters before opening up the refuge. He said they are planning car tours with maps and brochures and informational pamphlets regarding certain dangers the public may encounter at the installation. They are currently making the plans to have guided tours with limited access with the help of community volunteers. In the fall, they hope to open it up for deer hunting, and in the spring, they hope to open up more areas.

JW expressed the importance of tourism in the area now. RA concurred and stated that in regards to eco-tourism, a timeline should be melded within this economic model.

TW inquired why a drive through tour could not be conducted next week. JW said that Marshall has an initiative for tourism and they need to put Caddo Lake Refuge on the map. TL said we can probably open the production area for tours next week. Some signs may have to be put up so there may be some delay. Regarding comments on the “permit” TL said that a question on water rights has since been discussed and the issues resolved.

TN wanted the group to know that the community is excited about the refuge opening and appreciates their commitment to making this happen.

JW thanked Judge Anderson (RA) for his involvement and asked if the Army would be or could be using local contractors to complete the pit and sump work and/or MEC removal work being planned. TL stated that the main contractor is not local and that the work is being contracted though the Fort Worth District of the Corps of Engineers using government approved contractors. Sump and pit work would require sampling and other environmental

issues, and not encompass only fill work. He invited any questions be directed to himself or RMZ.

Next RAB Meeting

Rose Zeiler suggested that the next RAB meeting be held on March 6, 2007 at 6:30 PM. Announcement of the new Co-Chair will be made at that time.

Adjourn**December Meeting Attachments and Handouts:**

September Meeting Agenda; September 2006 RAB Meeting Minutes; September Attendees Signup Sheet; USACE Status of Technical Documents TERC; Status of Technical Documents MARC



Shaw Environmental, Inc.

Longhorn Army Ammunition Plant Restoration Advisory Board Meeting



Location	Karnack Community Center, Karnack, Texas	
Date	12-Dec-2006	6:30 PM

Please sign in the space provided or add your name and address information if your name does not appear below.

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Ken Shaw				kens@shreve.net

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Tom LEDERLE *Tom Lederle* US ARMY BRAC 703 602 2854 *thomas.lederle@US.ARMY.mil*

[illegible]



LONGHORN ARMY AMMUNITION PLANT
 RESTORATION ADVISORY BOARD
 Karnack, Texas
 (479) 635-0110

DRAFT AGENDA

DATE: Tuesday, March 13, 2007
TIME: 6:30 – 7:30 PM
PLACE: Karnack Community Center, Karnack, Texas

- 06:30** Welcome {RMZ & PF}
- 06:30** **Begin ECOP IV Public Meeting**
- 06:45** Open items {RMZ}
 RAB Co-Chair Election Results
- 06:50** Defense Environmental Restoration Program (DERP) PBC Update {Shaw}
 Groundwater Treatment Plant (GWTP) Update
 Ecological Risk Assessment Status
 Documents Status/ Environmental Sites
 Perimeter Well Monitoring
- 07:05** DERP Total Environmental Restoration Contract Update {Shaw}
 Documents Status/ Environmental Sites
- 07:10** DERP Corps of Engineers Update {MCM}
- 07:15** Military Munitions Response Program (MMRP) Update {RPS}
- 07:20** Transfer Update {RMZ}
- 07:25** Other Interest {RMZ }
- 07:30** Adjourn {RMZ}



**Subject: Draft Final Minutes, Quarterly Restoration Advisory Board (RAB)
Meeting, Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: Karnack Community Center, Karnack, Texas

Date of Meeting: March 13, 2007, 6:45 – 08:45 PM

Meeting Participants:

BRAC:	Rose M. Zeiler
USACE-Tulsa:	Cliff Murray, Rick Smith, John R. Lambert, Susan Trussell
USFWS:	Paul Bruckwicki
Shaw Environmental:	Dave Cobb, Praveen Srivastav, John Elliott Kay Everett
USEPA Region 6:	Stephen Tzhone, Raji Josiam
TCEQ:	Fay Duke
Community:	RAB: Paul Fortune (Co-Chair), Tony Novak, Shirley Shivers, Nigel Shivers, Tom Walker, Judith Johnson Others: Jay Webb, Patti Webb, Ben Grant, Donny Lynch, Lucille Lynch, Paul Miliotis, Doug Parker, Judith Parker, Jack Sanders, Mary Jane Sanders, Debbie Shaw, Carl Turner, Diane Turner, Bridgette Alton

An agenda for the meeting was distributed prior to the meeting

Welcome – Rose Zeiler and Paul Fortune

Paul Fortune opened the meeting, welcomed everyone in attendance, and brought the 2007 first quarter Restoration Activity Board meeting to order (at approximately 6:45 PM).

John R. Lambert, USACE, introduced himself to the group and mentioned that he would be replacing Rick Smith who has been reassigned to other projects. Susan Trussell, USACE, said she was present for ECOP IV and that the public comment period was underway. Jay Webb, with the Caddo Lake Friend's Volunteer Group, introduced Carl Turner and his wife Diane, who are members of the Caddo Lake Board. John Elliott with Shaw will be involved in the management of the remaining TERC sites.

The meeting was turned over to co-chair Rose M. Zeiler. Rose welcomed the group, including Bridgette Alton of the Marshall News Messenger newspaper. Rose informed the meeting participants that Stephen Tzhone would be taking on Chris Villarreal's role as EPA lead for Longhorn AAP.

The draft final minutes from the December 2006 meeting were distributed before the meeting. Rose asked if there were any comments or changes to the minutes from the December 2006 RAB meeting and to forward them to her.

Begin ECOP IV Public Meeting

Open Items – Rose Zeiler

Rose Zeiler announced that Paul Fortune was reelected as RAB Co-Chair for another 2-year term.

Defense Environmental Restoration Program (DERP) (PBC) Update–Dave Cobb/Praveen Srivastav

Groundwater Treatment Plant (GWTP) Update

Dave Cobb indicated that operations at the GWTP were normal for the past quarter. Approximately 800,000 gallons of groundwater were extracted during the months of January and February. Since there has been flow in the Harrison Bayou, wastewater from the GWTP was discharged to the bayou during normal operating hours and to the INF pond over weekends. The water from the INF pond was discharged to Harrison Bayou during the following week.

Ecological Risk Assessment Status

The draft final Baseline Ecological Risk Assessment (BERA) (Volumes I and II) has been submitted to the regulators. A number of documents are on hold until the BERA is finalized. Once the regulators' reviews are completed, comments resolved, and the document finalized, many of the sites on hold pending this assessment will progress to the next stage.

Document Status/Environmental Sites

Praveen Srivastav presented an overview of the status of the remaining sites at Longhorn. Praveen discussed the schedule designations [remedy-in-place (RIP), operating properly and successfully (OPS), long term management (LTM), remedy complete (RC)] and their meaning in association with the remaining Longhorn sites. Praveen also discussed that several sites are currently being managed under the old TERC contract and that once these sites reach RIP, the sites would be switched to the PBC-based contracting side.

Paul Fortune asked when the sites would be considered complete. Praveen said that sites such as GWTP or Burning Ground (LHAAP-18/24) and LHAAP-16 would be considered "complete" when they reach the OPS stage which indicates that the remedies are working as designed in response to site contamination and the Army can transfer the site to USFWS at that point.

Rose Zeiler said that sections of Plant Production Areas 2 and 3 (LHAAP-46 and 47) are in the ECOP IV transfer parcel. USFWS has identified about 700 acres inside these sites that pose no environmental impact, based on sampling by USFWS, and could be transferred to USFWS. Praveen Srivastav completed his presentation by discussing short term schedule goals. (A copy of the slide presentation was available to meeting participants.)

Perimeter Well Monitoring

Perimeter well sampling for perchlorate occurred in October 2006 with the results being below action levels. There were low levels of perchlorate found in wells 133 and 134, but the concentrations were below action levels. Perchlorate was nondetect in other perimeter wells. A request to reduce the frequency of sampling was considered by regulators who have suggested that the frequency be reduced from quarterly to annually for all wells except for wells 133 and 134. Regulators have requested that these wells be sampled semi-annually because they have had low detections (below action level) of perchlorate.

Shirley Shivers asked when the creek sampling had occurred. Praveen Srivastav replied that the sampling occurred on December 19, 2006, but only Harrison Bayou was sampled. Goose Prairie Creek was scheduled for sampling, but it was dry during this sampling event.

John Lambert asked Shaw to clarify what Long Term Management (LTM) and Response Complete (RC) meant using LHAAP-08 and LHAAP-12 as examples. Praveen Srivastav elaborated that these sites would undergo a period of remedial action operation (RAO) until response complete is achieved. RC is a point beyond which only LTM is necessary. LTM includes activities such as maintenance of the cap at LHAAP-12, 5-year reviews, and sampling of compliance wells to ensure that groundwater contamination does not leave the site.

A question was asked about any actions taken on sites that are being monitored. Rose Zeiler said that additional actions are taken but that action is dependent on the site itself. John Lambert said that at some sites, proposed soil removals or groundwater treatment were planned. In some cases, no action is needed.

Ben Grant asked about any ongoing groundwater treatment. Cliff Murray said that there is an existing groundwater treatment plant that extracts the groundwater and treats it. The effluent and influent are sampled. There is a stripping process that removes volatile organic compounds in the groundwater. Metals are dropped out by precipitation into sludge that is then removed from the site and disposed at an appropriate landfill. Perchlorate is treated through the Fluidized Bed Reactor (FBR) that consists of “bugs” that feed on perchlorate. Water is either discharged to Harrison Bayou or discharged to the INF pond for temporary storage, if water is not flowing in the creek, until treated groundwater can be discharged into the creek.

DERP Total Environmental Restoration Contract Update – Praveen Srivastav/John Elliott

Praveen Srivastav mentioned that John Elliott has been helping him in managing the work under TERC. He handed over the presentation of site status to John Elliott.

Document Status/Environmental Sites

John Elliott discussed the document status table briefly. John indicated that proposed plans for LHAAP-08 and LHAAP-32 are ready to go final once the BERA is finalized. He also indicated LHAAP-48/53 Evaluation Report will be finalized and submitted in early April 2007 along with the Draft Final Proposed Plan for these sites. The Final Data Gaps Report and the final report on Use of Perimeter Well Data as Groundwater Background will be submitted by April 2007 as well.

DERP Corps of Engineers Update – USACE***Military Munitions Response Program (MMRP) Update – Rick P. Smith***

The responses to comments on the draft report were recently received, but these were not acceptable to the Army. The USACE has submitted a second set of comments to the MMRP contractor CAPE. Once these comments have been resolved and the report revised, then the report can be submitted to the regulators. The Army is eager to finalize the EE/CA as soon as possible in order to receive FY07 funding for follow on work this year.

Ben Grant asked about any remaining ammunition at the MMRP sites. Rick Smith indicated that any munitions found at the surface would be removed. Rose Zeiler said that no fused items or live items were found and that the munitions found were rated low. The munitions produced at Longhorn were predominantly pyrotechnics, illuminants, and flares. Rick said that some munitions were found were in piles, obviously being readied for disposal, but the piles were never removed. The Army hopes to be in the field in the fall.

Ben Grant asked if the government's fiscal year ends in September. Rose Zeiler confirmed that it did.

Transfer Update – Rose M. Zeiler

Several transfer issues were discussed by the group.

Next RAB Meeting

Rose Zeiler suggested that the next RAB meeting be held on June 12, 2007 at 6:30 PM. Everyone present agreed.

Adjourn**March Meeting Attachments and Handouts:**

December 2006 RAB Meeting Minutes; December Attendees Signup Sheet; USACE Status of Technical Documents TERC; Status of Technical Documents MARC PBC; Site Status Presentation



Shaw Environmental, Inc.

Longhorn Army Ammunition Plant Restoration Advisory Board Meeting



Location	Karnack Community Center, Karnack, Texas		
Date	13-Mar-2007	6:30 PM	page 1 of 2

Please sign in the space provided or add your name and address on next page if your name does not appear below.

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more spaces on next page				
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Longhorn Army Ammunition Plant Restoration Advisory Board Meeting



ATTENDEES

[illegible]



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
March 06, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
ERA									
1	Draft Step 3 report (Vol I of BERA)	1/16/07		x	2/15/07		Under regulatory review		As discussed, report will be issued in two parts to expedite review. BERA (Volume 2) will follow later due to sampling analysis durations.
2	Draft BERA (Vol II of BERA)	1/31/07	x		2/16/07	In progress	Army comments received, resolution in progress		
ENVIRONMENTAL									
3	Draft Final SI/Evaluation Report, LHAAP-02	3/30/06		x			Comments rec'd from TCEQ 8/29/06. EPA comments rec'd 5/12/06.	x	Final will be issued when ERA information available.
4	Draft Final Proposed Plan, LHAAP-60	7/7/06		x			Comments rec'd from TCEQ 8/1/06. EPA comments rec'd 8/21/06.	x	Final to be submitted when ERA information available.
5	LHAAP-18/24 GWTP Sampling Optimization Memo	11/15/06		x	12/16/06		Under Stakeholders review	x	Comments pending from both TCEQ and EPA
6	Draft Final TCRA Memo – LHAAP-04, -49, -50, and Pistol Range	12/6/06	x				Under Army review		Currently undergoing resolution
7	Perimeter Well Sampling Optimization Memo	12/28/07		x	1/27/07		Comments received 2/6/07		Under Shaw review.
8	Draft Feasibility Study, LHAAP-58	TBD					On hold pending BERA		Draft versions 80% complete. Can not be finalized until eco issues resolved/ ERA further along.



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
March 06, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
9	Draft Feasibility Study, LHAAP-17	TBD					On hold pending BERA		Draft versions 80% complete. Can not be finalized until eco issues resolved/ ERA further along.
10	Draft Feasibility Study, LHAAP-16	11/30/06	x		12/18/06 (Army)		Complete		
10	Draft Final Feasibility Study, LHAAP-16	TBD					On hold pending review of MNA evaluation proposal		Can not be finalized until eco issues resolved/ ERA further along.
11	Draft Final SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68 (combined)	1/11/07		x	2/10/07		In regulatory review	x	
12	Draft SI Report for LHAAP-35/36	3/15/07 (Army)					In preparation		Report that summarizes sampling data for sumps
13	Quarterly GWTP Report	1/31/07 (Army)	x	X			Complete		
14	Draft LHAAP-16 MNA Evaluation Proposal	2/21/07 (Army)	x				Complete		In Army review

Technical Document Status Table
TERC Task Order NO. 0109
Longhorn Army Ammunition Plant

00048130

No.	Site	Documents in Progress	Draft Document				Draft Final Document									Final Document
			Draft Submittal Date	Army Comments	Shaw RTC	Comment Resolution	Draft Final Submittal Date	AEC Comments	EPA Comments	TCEQ Comments	Shaw RTC	Army Comments	Comment Resolution	Army forward RTC to TCEQ & EPA	Comment Resolution	Final Submittal Date
1	LHAAP-12	Remedial Design Addendum, Rev 03, LHAAP-12	07/14/06	08/11/06			08/17/06	None Required	09/05/06							
2	LHAAP-12	Well Abandonment and Installation Report, LHAAP-12					06/07/06	None Required	07/17/06	09/27/06	10/19/06	10/31/06	11/07/06	11/20/06	TCEQ _____ EPA _____	
3	LHAAP-12	Results of Modeling for Natural Attenuation of TCE, LHAAP-12					05/15/06	None Required								
4	LHAAP-32	Proposed Plan, LHAAP-32					07/21/06	08/25/06	09/05/06	09/12/06	09/19/06			11/21/06	TCEQ 12/07/06 EPA 01/26/07	
5		Evaluation of Perimeter Well Data for use as Groundwater Background					03/07/06	None Required	04/19/06	10/24/06	11/07/06	RMZ 11/07/2006 USACE 11/20/06	11/20/06	11/21/06	TCEQ 12/07/06 EPA 02/21/07	
6		Data Gaps Investigation Report					05/18/05	None Required	05/17/06	10/24/06	11/07/06	RMZ 11/09/2006 USACE 11/20/06	11/28/06	11/29/06	TCEQ 02/28/07 EPA 12/06/06	
7	LHAAP-48/53	Site Evaluation Report, LHAAP-48/53					03/10/06	None Required	04/20/06	07/06/06	10/27/06	10/31/06	10/31/06	11/02/06	EPA concur 11/03/06 TCEQ comments 11/13/06	
8	LHAAP-48/53	Revised Proposed Plan, LHAAP-48/53	09/25/06	10/31/06	11/14/06	01/12/07										
9	LHAAP-37/67	Proposed Plan, LHAAP-37/67	05/02/06	05/24/06	06/06/06	06/22/06	07/18/06	08/25/06	09/05/06	09/20/06	10/19/06	10/31/06	11/07/06	11/21/06	TCEQ _____ EPA 02/21/07	
10	LHAAP-37/67	Natural Attenuation Modeling Report, LHAAP-37/67	09/22/06	10/13/06	10/27/06	10/31/06	11/14/06									
11	LHAAP-08	Proposed Plan, LHAAP-08	05/01/06	05/24/06			07/07/06	08/25/06	08/21/06	09/20/06	09/29/06			11/21/06	TCEQ 12/07/06 EPA 02/21/07	
12	LHAAP-59	Site Investigation Report, LHAAP-59	11/02/06	11/07/06	11/09/06	11/15/06	11/21/06	None Required		01/11/07						
13	LHAAP-12/37/67	Natural Attenuation Evaluation, LHAAP-12/37/67	10/31/06	11/30/06	12/08/06	12/08/06	12/15/06	None Required								
14	LHAAP-12/37/67	Memorandum regarding MNA Evaluation, LHAAP-12, 37, & 67	02/15/07	02/16/07	02/16/07	02/16/07	02/16/07									
15		Final Modeling Report (Revision 1)														02/09/07

Shaw Forecasted Submittal Date

Shaw Action Item

Army Action Item

EPA & TCEQ Action Item



LONGHORN ARMY AMMUNITION PLANT
 RESTORATION ADVISORY BOARD
 Karnack, Texas
 (479) 635-0110

AGENDA

DATE: Tuesday, June 12, 2007
TIME: 6:30 – 7:30 PM
PLACE: Karnack Community Center, Karnack, Texas

- 06:30** Welcome {RMZ & PF}
- 06:35** Open items {RMZ}
- 06:40** Defense Environmental Restoration Program (DERP) PBC Update {Shaw}
 Groundwater Treatment Plant (GWTP) Update
 Ecological Risk Assessment Status
 Documents Status/ Environmental Sites
 Perimeter Well Monitoring
- 06:50** DERP Total Environmental Restoration Contract Update {Shaw}
 Documents Status/ Environmental Sites
 Draft Final Proposed Plans for 8, 32, 37, 48, 53, & 67
 Site 59 SI Report
- 07:00** Military Munitions Response Program (MMRP) Update {JRL}
- 07:10** GIS Database for Longhorn AAP (EPA, USGS) {ST}
- 07:25** Other Environmental Restoration Issues/Concerns {RMZ }
 Demolition Landfill Closure
 Installation Action Plan (IAP) Website
<http://aec.army.mil/usaec/cleanup/aic00.html>
 Scroll down to the Map, Click on Texas and Select Longhorn
 (To access from this document, click on URL while pressing Ctrl key)
- 07:30** Adjourn {RMZ}



**Subject: Draft Final Minutes, Quarterly Restoration Advisory Board (RAB)
Meeting, Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: Karnack Community Center, Karnack, Texas

Date of Meeting: June 12, 2007, 6:30 – 07:45 PM

Meeting Participants:

BRAC:	Rose M. Zeiler
USAEC:	Jeff Armstrong
USACE-Tulsa:	Cliff Murray, John R. Lambert
USFWS:	Mark Williams
Shaw Environmental:	Dave Cobb, Praveen Srivastav, John Elliott, Kay Everett
USEPA Region 6:	Stephen Tzhone, Scott Harris
TCEQ:	Fay Duke
USGS:	Kent Becher, Daniel Pearson, Sachin Shah
CAPE:	Elliot Adler, Amanda Easley
Community:	RAB: Nigel Shivers, Tony Novak, Tom Walker, Judith Johnson
	Others: Lucille Lynch, Donny Lynch, Jay Webb, Michael Turner, Susan Turner, R. LeTourneau, Jack Saunders, Mary Jane Sanders

An agenda for the meeting was distributed prior to the meeting

Welcome – Rose Zeiler

Rose Zeiler opened the meeting, welcomed everyone in attendance, and brought the second quarter 2007 Restoration Activity Board meeting to order.

The draft final minutes from the March 2007 meeting were distributed before the meeting. No comments or changes were made to the March 2007 minutes.

Open Items – Rose Zeiler

Rose Zeiler introduced CAPE and USGS representatives present and mentioned that they would each be making presentations later in the meeting.

Defense Environmental Restoration Program (DERP) Performance Based Contract (PBC) Update–Dave Cobb/Praveen Srivastav

Groundwater Treatment Plant (GWTP) Update

Dave Cobb indicated that operations at the GWTP were normal for the past quarter. It is currently shut down for maintenance this week and should be back up by next Monday.

Ecological Risk Assessment Status

The draft final Baseline Ecological Risk Assessment (BERA) (Volumes I and II) is close to completion. A number of documents are on hold until the BERA is finalized. Once the regulators' comments are resolved and the document finalized, many of the sites on hold pending this assessment will progress to the next stage.

Document Status/Environmental Sites

A document status table was provided.

Perimeter Well Monitoring

Perimeter well sampling was completed in May 2007. Currently waiting on data from the lab.

DERP Total Environmental Restoration Contract (TERC) Update –John Elliott

John Elliott reviewed the document status table for the TERC contract. He indicated that most of the outstanding documents were coming to an end. The Remedial Design for LHAAP-12 will be submitted as final next Thursday. There are two proposed plans (LHAAP-08 and 32) that are waiting on BERA to finalize. The proposed plan for LHAAP-48/53 has recently received comments and is currently being finalized. Site Investigation Report for LHAAP-59 and the Monitored Natural Attenuation (MNA) report for LHAAP-12, 37, and 67 are also being finalized.

Rose Zeiler indicated that LHAAP-12 is a landfill and that the Remedial Design for this site incorporates Land Use Controls (LUCs). After the Environmental Condition of Property (ECOP) V is finalized, the Army should be able to offer this tract of land to USFWS for transfer by the end of this fiscal year. Deed recordation of the LUC, which are for groundwater restrictions and cap maintenance, is currently being done for this site.

DERP Corps of Engineers Update – USACE

Military Munitions Response Program (MMRP) Update – John Lambert

John Lambert informed the group that the EE/CA report has been submitted to the TCEQ and EPA for review. The public review notice is expected in July 2007 after regulatory comments are resolved. John Lambert introduced Elliot Adler with CAPE, Inc. to provide more information of what was done under the MMRP program.

Mr. Adler indicated that there were three sites, identified as LHAAP-53 (Static Test Area), LHAAP-54 (Ground Signal Test Area), and LHAAP-27 (South Test Area), studied under the EE/CA and introduced Amanda Easley as the principal author of the document. Mr. Adler began his talk by describing what and how their testing was conducted using geophysical equipment and methods. Approximately 3% of the total acreage (189 acres) was sampled.

This statistical coverage was obtained by using grids or transects of the areas. A geophysicist identified anomalies by interpreting the results using digitally recorded data. These anomalies were investigated further and were identified as either cultural debris or ordnance. Approximately 5% of the time, anomalies were found to be ordnance related.

Site LHAAP-27 had the fewest MEC items found. No MEC items were found at LHAAP-53. At LHAAP-54, only 13 items were found. It is always difficult to tell if ordnance is inert or live so it is always treated as hazardous and subsequently the items are blown up. Soil samples were collected at all sites and analyzed for Munitions Constituents (MC) and white phosphorous (WP). No WP was identified above detectable concentrations, and no MC was present above the MDL.

Since no munitions were found at LHAAP-53 and concentrations of MC and WP in the soil were found to be at acceptable levels, the site was classified as no risk. No further action is required. At LHAAP-27 and LHAAP-54 response alternatives were discussed.

A summary of the field activities was presented. A total of 77, 808 linear feet of transects were investigated. In that, 2,960 anomalies were selected by the geophysicist for further investigation. Of that 3,320 anomalies were excavated and inspected. Mr. Adler explained that the number of anomalies gets higher because when you dig for one anomaly, you may find other items. A total of 1,470 pounds of scrap and munitions debris were removed. There were 35 suspect munitions items destroyed.

No high hazard types of munitions were found. (A high hazard would include anti-tank rockets, landmines, detonators, fuses, etc.) However the most common item found were 60 mm illuminator rounds. Illuminators were manufactured to provide light source and not to kill. Although when fully loaded, fully fused, they would still need a heat source to “go off.” It could cause severe injury if a person stands right in front of it and ignites it.

Field activities are complete and a final EE/CA review is nearing completion. A final report is to be issued in July 2007.

GIS Database for Longhorn AAP (EPA, USGS) – Steve Tzhone

Steve Tzhone with the EPA, who took over for Chris Villarreal as the EPA project manager within the last several months, introduced Daniel Pearson with the USGS to the group. The USGS is developing a relational geodatabase for the Longhorn installation. Mr. Pearson, a geographer, using data from the USACE and Shaw, made a presentation showing how this database may benefit users. The database is still in draft form and is described as a “relational” database, data that is directly tied to x,y locations. This database will be very valuable to the EPA to allow them to “see” what data exists at a given location. A secondary effort will involve extracting necessary data points from the database to generate 3-D models of the surface and subsurface of given areas.

Other Environmental Restoration Issues/Concerns - Rose Zeiler***Demolition Landfill Closure***

The demolition landfill is in the process of being closed. It is due for an inspection on June 22.

Installation Action Plan (IAP) Website

Rose Zeiler mentioned that Shirley Shivers had expressed an interest in learning more about environmental restoration at Longhorn. Rose Zeiler indicated that she has provided the website address for the LHAAP IAP in the agenda. The IAP will give the community basic information about the environmental program at LHAAP.

ECOP V

ECOP V is in BRAC legal review

Next RAB Meeting

The next RAB meeting will be held on September 11, 2007 at 6:30 PM.

Adjourn**March Meeting Attachments and Handouts:**

March 2007 RAB Meeting Minutes; March Attendees Signup Sheet; USACE Status of Technical Documents TERC; Status of Technical Documents MARC PBC



Shaw Environmental, Inc.

Longhorn Army Ammunition Plant Restoration Advisory Board Meeting



Location	Karnack Community Center, Karnack, Texas		
Date	12-Jun-2007	6:30 PM	page 1 of 2

Please sign in the space provided or add your name and address on next page if your name does not appear below.

ATTENDEES

Name (printed)	Signature	Organization	Phone	E-mail
RAB Members				
Paul Fortune				plfortune@hotmail.com
Robert Speight				r.speightjr@att.net
Larry McCathran				MMCattle@yahoo.com
Nigel R. Shivers	<i>Nigel R. Shivers</i>	RAB		2shivers@gower.net
Shirley Shivers				2shivers@gower.net
Tom Walker	<i>Tom Walker</i>	self	903-665-8279	twalkercaddolake@gmail.com
Tony Novak	<i>Tony Novak</i>			paldog@earthlink.net
Judith Johnson	<i>Judith Johnson</i>	RAB	903-679-3130	judithjohnson@webtv.net
Ken Shaw				kens@shreve.net
more spaces on next page				
Longhorn Team Members and Community				
Rose M. Zeiler	<i>Rose M. Zeiler</i>	Longhorn AAP	(479) 635-0110	rose.zeiler@us.army.mil
Jeff Armstrong	<i>Jeff Armstrong</i>	USAEC	(410) 436-1516	jeffrey.armstrong@us.army.mil
Cliff Murray	<i>Cliff Murray</i>	USACE, Tulsa	(918) 669-7573	cliff.murray@SWT03.usace.army.mil
John Lambert	<i>John Lambert</i>	USACE, Tulsa		john.r.lambert@SWT03.usace.army.mil
Steve Tzhone	<i>Steve Tzhone</i>	USEPA, Dallas	(214) 665-8409	tzhone.steve@epa.gov
Raji Josiam	<i>Raji Josiam</i>	USEPA, Dallas		josiam.raji@epa.gov
Scott Harris	<i>Scott Harris</i>	USEPA, Dallas	(214) 665-7114	harris.scott@epa.gov
Fay Duke	<i>Fay Duke</i>	TCEQ, Austin	(512) 239-2443	fduke@tceq.state.tx.us
Dale Vodak		TCEQ	(903) 535-5142	dvodak@tceq.state.tx.us
Paul Bruckwicki		USFSW	(903) 679-4536	paul_bruckwicki@fws.gov
Barry Forsythe		USFSW	(214) 665-8467	forsythe.barry@epa.gov
Mark Williams	<i>Mark Williams</i>	USFSW	(903) 679-9144	mark_williams@fws.gov
Praveen Srivastav	<i>Praveen Srivastav</i>	SHAW	(713) 996-4588	praveen.srivastav@shawgrp.com
David Cobb	<i>David Cobb</i>	SHAW	(617) 589-5561	david.cobb@shawgrp.com
John Elliott	<i>John Elliott</i>	SHAW	(713) 996-4517	john.elliott@shawgrp.com
Kay Everett	<i>Kay Everett</i>	SHAW	(713) 996-4421	kay.everett@shawgrp.com

continued on next page



Shaw Environmental, Inc.

Longhorn Army Ammunition Plant Restoration Advisory Board Meeting



Location	Karnack Community Center, Karnack, Texas		
Date	12-Jun-2007	6:30 PM	page 2 of 2

Please provide your address for future mailings or information.

ATTENDEES

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**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
June 12, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
ERA									
1	Draft Final Step 3 report (Vol I of BERA)	1/16/07	x		6/12/07		Under regulatory review. Regulator not issuing comments until sees Vol. 2.	x	TCEQ comments received 5/3/07. EPA comments received 5/18/07
2	Draft Final BERA (Vol II of BERA)	3/6/07	x		6/12/07		Responses under Army's review	x	TCEQ comments received 5/3/07. EPA comments received 5/18/07.
ENVIRONMENTAL									
4	Draft Final SI/Evaluation Report, LHAAP-02	3/30/06		x			Comments rec'd from TCEQ 8/29/06. EPA comments rec'd 5/12/06.	x	Final will be issued when BERA information available.
5	Draft Final Proposed Plan, LHAAP-60	7/7/06		x			Comments rec'd from TCEQ 8/1/06. EPA comments rec'd 8/21/06.	x	Final to be submitted when BERA information available.
7	Draft Final TCRA Memo – LHAAP-04, -49, -50, and Pistol Range	12/6/06	x				On hold. Currently undergoing contractual resolution between Army and Shaw.		
9	Draft Feasibility Study, LHAAP-58	6/1/07	x		6/18/07				No eco risk expected at the site based on Draft Final BERA. Draft FS submitted to the Army. Draft Final to be submitted to the regulators after BERA is finalized.
10	Draft Feasibility Study, LHAAP-17	TBD					On hold pending BERA		Draft versions 80% complete. Draft will be issued when BERA information available.
12	Draft Final Feasibility Study, LHAAP-16	TBD					On hold pending BERA		Decision made to hold DF document until BERA information available based on EPA comments regarding CERCLA process.



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
June 12, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
13	Draft Final SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68 (combined)	1/11/07		x	2/10/07		In revision	x	EPA comments received 3/8/07. TCEQ comments received 3/23/07 (transmitted to Shaw on 5/16/07 by Army). Document to be revised to reflect changes in standards for comparison and inclusion of SPLP data. Revised version expected to be issued late June 2007.
14	Draft SI Report for LHAAP-35/36	6/30/07 (Army)					In preparation		
17	Draft Final LHAAP-16 MNA Evaluation Proposal	3/2/07		x	4/2/07	EPA comments rec'd 3/28/07, TCEQ comments pending.	In regulatory review	x	TCEQ expressed concerns during several conference calls over the use of dilution factors based on modeling. No formal comments received, although the proposal was discussed during several phone calls.
18	Draft SI Report for LHAAP-03	6/30/07 (Army)	x				In preparation		Will be incorporated into FINAL SI report for sites -06, -07, -51, -55, -64, -66, -68. Revised version expected to be issued late May 2007.
19	Optimization Plan, GWTP	5/31/07		x				x	The plan provided to the regulators for information. No review required.

No.	Site	Documents in Progress	Draft Document				Draft Final Document									Final Document	
			Draft Submittal Date	Army Comments	Shaw RTC	Comment Resolution	Draft Final Submittal Date	AEC Comments	EPA Comments	TCEQ Comments	Shaw RTC	Army Comments	Comment Resolution	Army forward RTC to TCEQ & EPA	Comment Resolution	Final Submittal Date	
1	LHAAP-12	Remedial Design Addendum, Rev 03, LHAAP-12	07/14/06	08/11/06			08/17/06	None Required	09/05/06	03/15/07	04/12/07	RMZ 04/23/07 USACE 04/23/07	04/23/07	05/03/07	TCEQ 05/21/07 EPA 05/11/07	06/21/07	
3	LHAAP-12	Results of Modeling for Natural Attenuation of TCE, LHAAP-12					05/02/06	None Required	03/27/07	3/12/2007 & 03/26/07	04/19/07	RMZ 04/23/07 USACE 04/23/07 RMZ 05/02/07 Army 05/10/07 RMZ 05/18/07	05/18/07	05/18/07	TCEQ 05/21/07 EPA 05/21/07	06/07/07	
4	LHAAP-32	Proposed Plan, LHAAP-32					07/21/06	08/25/06	09/05/06	09/12/06	09/19/06			11/21/06	TCEQ 12/07/06 EPA 01/26/07		
5		Evaluation of Perimeter Well Data for use as Groundwater Background					03/07/06	None Required	04/19/06	10/24/06	11/07/06	RMZ 11/07/2006 USACE 11/20/06	11/20/06	11/21/06	TCEQ 12/07/06 EPA 02/21/07	06/14/07	
8	LHAAP-48/53	Revised Proposed Plan, LHAAP-48/53	09/25/06	10/31/06	11/14/06	01/12/07	04/09/07	USACHPPM 04/25/07 OC 05/15/07	6/12/07 via USACE	04/27/07	06/27/07						
9	LHAAP-37/67	Proposed Plan, LHAAP-37/67	05/02/06	05/24/06	06/06/06	06/22/06	07/18/06	08/25/06	09/05/06	09/20/06	10/19/06	10/31/06	11/07/06	11/21/06	TCEQ 04/27/07 EPA 02/21/07	07/03/07	
10	LHAAP-37/67	Natural Attenuation Modeling Report, LHAAP-37/67	09/22/06	10/13/06	10/27/06	10/31/06	11/14/06		05/01/07	04/27/07	05/17/07	05/18/07	05/18/07	05/18/07	TCEQ 06/12/07 EPA 05/1/07	07/12/07	
11	LHAAP-08	Proposed Plan, LHAAP-08	05/01/06	05/24/06			07/07/06	08/25/06	08/21/06	09/20/06	09/29/06			11/21/06	TCEQ 12/07/06 EPA 02/21/07		
12	LHAAP-59	Site Investigation Report, LHAAP-59	11/02/06	11/07/06	11/09/06	11/15/06	11/21/06	None Required	03/20/07	01/11/2007, 03/20/07, & 03/22/07	04/02/07	RMZ 04/12/07 USACE 04/11/07	04/12/07	04/25/07	TCEQ _____ EPA 04/30/07		
13	LHAAP-12/37/67	Natural Attenuation Evaluation, LHAAP-12/37/67	10/31/06	11/30/06	12/08/06	12/08/06	12/15/06	None Required	04/09/07	04/27/07	05/14/07	05/17/07	05/18/07	05/18/07	TCEQ 05/21/07 EPA 05/21/07	06/19/07	
14	LHAAP-12/37/67	Memorandum regarding MNA Evaluation, LHAAP-12, 37, & 67	02/15/07	02/16/07	02/16/07	02/16/07	02/16/07		03/26/07	04/27/07	05/14/07	05/17/07	05/18/07	05/18/07	TCEQ 05/21/07 EPA 05/21/07		
Shaw Forecasted Submittal Date			Shaw Action Item				Army Action Item				EPA & TCEQ Action Item				Current Action item		



Longhorn Army Ammunition Plant Restoration Advisory Board

The U.S. Army Invites You To . . . the Restoration Advisory Board Meeting (RAB)

The RAB was formed to ensure that community input was factored into the Army's environmental cleanup decisions at the Longhorn Army Ammunition Plant. All board meetings are open to the public. Please join us this week and participate in this process.

Date: Tuesday, June 12, 2007

Place: Karnack Community Center

Time: 6:30 – 7:30 PM

For more information, please call:
903-679-3949 or
479-635-0110

June
12



Longhorn RAB Meeting

Kathleen Hartnett White, *Chairman*
Larry R. Soward, *Commissioner*
H. S. Buddy Garcia, *Commissioner*
Glenn Shankle, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 5, 2007

Ms. Rose Zeiler
Department of the Army
Longhorn Army Ammunition Plant
Post Office Box 220
Ratcliff, AR 72951

Re: Authorization and Registration of Class V Aquifer Remediation Injection Wells
TCEQ Authorization No. 5X2600464; WWC12121358; CN600696025/RN101264505
Longhorn Army Ammunition Plant
Karnack
Harrison County

Dear Ms. Zeiler:

The Underground Injection Control (UIC) staff has completed review of the request from Shaw Environmental & Infrastructure received May 9, 2007 requesting approval for the re-injection of treated groundwater at the above site. Our consideration of this proposed project for injection has included coordination with the commission's Remediation Division. Based on our review, approval is hereby given for construction and operation of the injection wells according to the submitted plans and specifications.

In order to maintain authorization by rule for the injection operations, the project must meet all requirements set by the Remediation Division and the UIC rules provided by 30 Texas Administrative Code (TAC), Chapter 331. Requirements for the injection include:

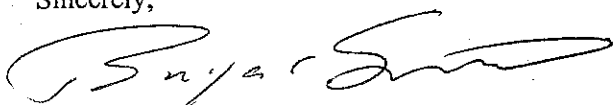
1. All injection wells are to be constructed to meet the standards provided in 30 TAC Section (§) 331.132 and completed well logs or construction diagrams submitted to the UIC Permits Team, Industrial and Hazardous Waste Permits Section, at mail code MC-130 upon completion;
2. Operational and status changes shall be reported to and approved by the UIC Permits Team;
3. Closure (plugging) of injection wells shall comply with standards provided in 30 TAC §331.133. Closure reports including plugging reports and injection well monitoring data (injection volumes, pressures, and results) shall be submitted to the UIC Permits Team, Industrial and Hazardous Waste Permits Section, at mail code MC-130 within 60 days of completion of injection or plugging activities; and

Ms. Rose Zeiler
Page 2
July 5, 2007

4. Injection volumes, pressures, and concentrations of contaminants (including pH and total dissolved solids) in the treated groundwater shall be sampled monthly at the point of reinjection and submitted to the UIC Permits Team, Industrial and Hazardous Waste Permits Section, at mail code MC-130 on a quarterly basis. The concentration of contaminants in the treated effluent shall not exceed the concentration of contaminants prior to treatment.

If you have any questions regarding this matter, please contact me at (512) 239-5711. If you will be corresponding by mail, please use mail code MC-130.

Sincerely,



Bryan Smith, P.G.
Industrial and Hazardous Waste Permits Section
Waste Permits Division
Texas Commission on Environmental Quality

BSS/ff

cc: ✓ Mr. Praveen Srivastav, Shaw Environmental & Infrastructure, Houston



A World of **Solutions**™

July 12, 2007

Shaw/TERC 07-047

Mr. Cliff Murray
U.S. Army Corps of Engineers – Tulsa District
1645 South 101st – East Avenue
Tulsa, Oklahoma 74128-4629

Re: **Task Order No. 109**
Total Environmental Restoration Contract (TERC)
Contract No. DACA56-94-D-0020
Environmental Investigation and Remediation at
Longhorn Army Ammunition Plant, Karnack, Texas
***Final Results of Modeling for Natural Attenuation of Chlorinated
Solvents in Groundwater at LHAAP-35B(37) and LHAAP-67
Longhorn Army Ammunition Plant, Karnack, Texas***

Dear Mr. Murray:

Shaw Environmental, Inc. is pleased to submit the attached *Final Results of Modeling for Natural Attenuation of Chlorinated Solvents in Groundwater at LHAAP-35B(37) and LHAAP-67*. We are also sending copies of the document directly to individuals on the attached project document distribution list.

Please contact me if you have any questions or require additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Elliott", is written over a horizontal line.

John C. Elliott, PMP
Project Manager

JCE/jt
Attachments

Longhorn Distribution List

Member	Agency	Address	Phone No. e-mail address	No. of Copies
Cliff Murray Tulsa District	U.S. Army Corp of Engineers	US Army Corp of Engineers 1645 South 101 st – East Avenue Tulsa, Oklahoma 74128-4529	Office: 918-669-7573 Cliff.Murray@SWT03.usace.army.mil	2
Dr. Rose Zeiler	BRAC; Longhorn Site Manager	P.O. Box 220 Ratcliff, AR 72951 727 South Brooklyn Rd Ratcliff, AR 72951	Office: 479-635-0110 rose.zeiler@us.army.mil	1
Jeff Armstrong	Army Environmental Center	Commander USAEC SFIM-AEC-ERA (Attn: Jeff Armstrong) Beal Road Bldg E-4880 APG, MD 21010-5401	Office: 410-436-1516 jeffrey.armstrong@us.army.mil	1
Stephen Tzhone	US Environmental Protection Agency	US Environmental Protection Agency Superfund Division (6SF-AT) 1445 Ross Avenue Dallas, TX 75202-2733	Office: 214-665-8409 tzhone.stephen@epamail.epa.gov	2
Fay Duke	Texas Commission of Environmental Quality	Texas Commission on Environmental Quality TCEQ Environmental Cleanup Section II, Team 2 (MC-221) 12100 Park 35 Circle, Bldg D Austin, TX 78753	Office: 512-239-2443 fduke@tceq.state.tx.us	2 - most 4-eco
Dale Vodak	Texas Commission of Environmental Quality	Texas Commission on Environmental Quality 2916 Teague Drive Tyler, TX 75701	Office: 903-535-5147 dvodak@tceq.state.tx.us	1
Paul Bruckwicki	US Fish and Wildlife Service	US Fish and Wildlife Service PO Box 230 Karnack, TX 75661 (<i>mailing only</i>) <hr/> Caddo Lake NWR Hwy 134 & Spur 449 Karnack, TX 75661	Office: 903-679-4536 Cell: 903-407-0852 paul_bruckwicki@fws.gov	1
Barry Forsythe	US Fish & Wildlife Service EPA Liaison (6SF-LT)	US Fish & Wildlife Service EPA Liaison (6SF-LT) 1445 Ross Avenue, Suite 1200 Dallas, TX 75202	Office: 214-665-8467 forsythe.barry@epa.gov	1-eco

Total external distribution for routine final (non eco) reports = 10



00048146

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

July 12, 2007

DAIM-BD-LO

Mr. Steve Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Results of Modeling for Natural Attenuation of Chlorinated Solvents in
Groundwater at LHAAP-35B(37) and LHAAP-67, Longhorn Army Ammunition Plant,
Karnack, Texas, July 2007

Dear Mr. Tzhone,

The above-referenced document is transmitted to you for your files.

Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by
email at rose.zeiler@us.army.mil.

Sincerely,

A handwritten signature in cursive script, reading "Rose M. Zeiler", is positioned below the word "Sincerely,".

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
Fay Duke, TCEQ, Austin, TX
Paul Bruckwicki, Caddo Lake NWR, TX
Cliff Murray, COE – Tulsa District, OK
John R. Lambert, COE – Tulsa District, OK
P. Srivastav, Shaw, Houston, TX (for project file)



00048147

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

July 12, 2007

DAIM-BD-LO

Ms. Fay Duke
Texas Commission on Environmental Quality
Environmental Cleanup Section II (MC-221)
12100 Park 35 Circle
Austin, TX 78753

Re: Final Results of Modeling for Natural Attenuation of Chlorinated Solvents in
Groundwater at LHAAP-35B(37) and LHAAP-67, Longhorn Army Ammunition Plant,
Karnack, Texas, July 2007

Dear Ms. Duke,

The above-referenced document is transmitted to you for your files.

Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by
email at rose.zeiler@us.army.mil.

Sincerely,

A handwritten signature in cursive script, reading "Rose M. Zeiler", is positioned below the word "Sincerely,".

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
Stephen Tzhone, USEPA Region 6, Dallas, TX
Paul Bruckwicki, Caddo Lake NWR, TX
Cliff Murray, COE – Tulsa District, OK
John R. Lambert, COE – Tulsa District, OK
P. Srivastav, Shaw, Houston, TX (for project file)

Comments on
Draft Final Results of Modeling For Natural Attenuation of Chlorinated Solvents in Groundwater at LHAAP-35B(37) and LHAAP-67
Longhorn Army Ammunition Plant Dated November 2006

Submitted to Army on May 18, 2007

Reviewer: Fay Duke, TC EQ (Email Response Received on April 27, 2007)
 Per 05/01/07 conference call, EPA has no additional comments to TCEQ's 04/27/07 comments.
Respondents: Shaw Environmental and Infrastructure

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commenter Agrees (A) with response, or Does not Agree (D) with response.

Comment No.	Page	Section/ Paragraph	Comment	C, D ¹ , E or X	Response	A or D ²
Fay Duke, TCEQ						
1	2-1	Section 2.0 Degradation Rates	Three degradation rates were used in the model to evaluate the time it takes for each COC to attenuate to its MCL. The degradation selected were no degradation, chemical half-life and 10 times the half life. We have several concerns regarding the use of chemical half-life as the attenuation rate. It is stated that at LHAAP-35B(37), the presence of TCE and 1,1-DCE, indicate dechlorination of PCE and TCE. We disagree that the presence of these compounds alone is an indication that attenuation is occurring. We also question whether 1,1-DCE could be considered a daughter compound for PCE or TCE. We note that the discussion of degradation rate is limited to certain COCs. Please expand the discussions of degradation to include all COCs including the daughter compounds at each of the sites. Justifications as to the appropriateness in using the literature-based half-life as the rate of degradation for TCE, 1,1-DCE and other daughter compounds at these sites should be provided.	C/D	<p>There is evidence of reductive dechlorination at LHAAP-35B(37). Please note that both PCE and 1,1,1-TCA are present at this site. The presence of TCE, a daughter product of PCE, and 1,1-DCE, a daughter product of 1,1,1-TCA at this site indicates PCE and 1,1,1-TCA are degrading. At LHAAP-67, 1,1-DCE and 1,2-DCA are the daughter products of 1,1,1-TCA and 1,1,2-TCA, respectively.</p> <p>Additionally, based on subsequent sampling events and MNA evaluations, the following text supporting natural attenuation at LHAAP-35(B)37 will be included in the Final Natural Attenuation Evaluation, LHAAP-12, 35B(37), & 67:</p> <p>Primary Lines of Evidence (PLOE): The historical VOC trends indicate the occurrence of biodegradation via anaerobic reductive dechlorination as evidenced by the presence of two of the three daughter products of TCE, including low levels (J qualified values) of 1,1-DCE and cis-1,2-DCE. Although there is no evidence of VC production via the reductive dechlorination of cis-1,2-DCE, the VC reporting limit is elevated (10 µg/L) and exceeds VC concentrations that may be produced by reductive dechlorination based on the current concentrations of TCE and cis-1,2-DCE. Nevertheless, ethene, the product of VC reductive dechlorination, was detected during the December 2006 sampling event in wells 35BWW03, 35BWW04, 35BWW05, and 35BWW06, indicating</p>	A

Comments on
Draft Final Results of Modeling For Natural Attenuation of Chlorinated Solvents in Groundwater at LHAAP-35B(37) and LHAAP-67
Longhorn Army Ammunition Plant Dated November 2006

Submitted to Army on May 18, 2007

Reviewer: Fay Duke, TC EQ (Email Response Received on April 27, 2007)
 Per 05/01/07 conference call, EPA has no additional comments to TCEQ's 04/27/07 comments.
Respondents: Shaw Environmental and Infrastructure

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commenter Agrees (A) with response, or Does not Agree (D) with response.

Comment No.	Page	Section/ Paragraph	Comment	C, D ¹ , E or X	Response	A or D ²
					<p>that complete reductive dechlorination is occurring. The groundwater data collected from well LHSMW58 and LHSMW59 indicate a decrease in PCE and TCE concentrations from their historical high values over the entire monitoring period. Among the three wells newly installed to delineate the plume, wells 35BWW04 and 35BWW05 demonstrated TCE exceeding the MCL, with a J qualified detection of cis-1,2-DCE in well 35BWW04, and the detection of ethene in all three wells, suggesting the occurrence of complete reductive dechlorination. The evaluation of the PLOE indicates that reductive dechlorination is occurring at the site. Furthermore, other alternative biodegradation pathways such as cometabolic or oxidative dechlorination may also contribute to the reduction of COCs.</p> <p>Secondary Lines of Evidence (SLOE): The qualitative assessment of geochemical indicators in the shallow groundwater zone at LHAAP-35B(37) presents evidence that current geochemical conditions are not favorable for complete dechlorination in some of the wells. The elevated DO, ORP, and sulfate concentrations indicate that the aquifer is primarily under aerobic oxidative conditions with the exception of 35BWW05 and 35BWW06, where anaerobic reducing conditions were observed, and there is evidence of complete dechlorination.</p> <p>Evaluation of the PLOE and SLOE demonstrates that natural attenuation mechanisms including reductive biodegradation, dilution, dispersion, sorption, and volatilization, may all be contributing</p>	

Comments on
Draft Final Results of Modeling For Natural Attenuation of Chlorinated Solvents in Groundwater at LHAAP-35B(37) and LHAAP-67
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Comment No.	Page	Section/ Paragraph	Comment	C, D ¹ , E or X	Response	A or D ²
					<p>to the observed reduction in COC concentrations at LHAAP-35B(37).</p> <p>Note: The above COC degradation information will also be included in the Final Results of Modeling For Natural Attenuation of Chlorinated Solvents in Groundwater at LHAAP-35B(37) and LHAAP-67.</p> <p>Based on the site information, a range of degradation rates were included in the current model: from no degradation to a degradation rate corresponding to literature values. Please note that literature values were used only to show a possibility. A degradation rate corresponding to 10 times the half-life of the literature value was also used to reflect the possibility of such occurrence with less degradation. Even though a literature value was used, the use of a no degradation scenario provided a conservative upper limit to the estimate of time to MCL.</p>	
2	Page 2-2	Section 2.0	<p>It is stated that "since a decreasing trend of the COC concentration is not clearly evident, the model was conducted using literature-based half-life values and 10-times these values to obtain a more conservative estimate." Please explain why the use of literature-based half-life and 10 times these values would yield a more conservative estimate? Additionally, if decreasing trend is not evident what would be the other overriding factors that can be used to determine that MNA is an appropriate remedy at these sites?</p>	C	<p>This sentence will be re-phrased as "since a decreasing trend of the COC concentration was not clearly evident at the time of modeling, degradation rates of literature-based half-life values, 10-times these values, and no degradation at all were used to obtain a conservative estimate."</p> <p>Combined with the evidence of degradation provided in the response to Comment No. 1 this approach covers a wide range of possibilities. The word "conservative" used here is substantiated not only by the use of the "no degradation" option but also with the literature values. All the literature</p>	A

Comments on
Draft Final Results of Modeling For Natural Attenuation of Chlorinated Solvents in Groundwater at LHAAP-35B(37) and LHAAP-67
Longhorn Army Ammunition Plant Dated November 2006

Submitted to Army on May 18, 2007

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Comment No.	Page	Section/ Paragraph	Comment	C, D ¹ , E or X	Response	A or D ²
					values used in the model were the longest half-lives cited. Please see response to Comment No. 1 regarding decreasing trends and additional factors contributing to natural attenuation.	
3		Section 4.0, Table 2 and Table 3	It is stated in the last sentence of the section that "assuming 10-time literature-based half-life values and assuming an instantaneous source, it is very likely that the time it takes to reach the MCL is 2-years for TCE, 8 years for 1,1-DCE, 4.4 years for 1,2-DCE, 7.1 years for 1,1,1-TCA and 5.8 years for 1,1,2-TCA." Please explain when does the attenuation period begins and ends. It appears that most of the COC maximum concentrations used to model LHAAP 67 were based on the December 1998 COC concentrations in 67WW001. So, does this mean, for the scenario referenced above, all COCs should have attenuated to the MCLs to date?	C	Since it is not a realistic assumption, the last sentence in Section 4.0 will be deleted. By using different degradation rates, including the most conservative approach of no degradation, the time to MCL is expected to be within the range of values presented in the document.	A

FINAL
**RESULTS OF MODELING FOR NATURAL ATTENUATION OF
CHLORINATED SOLVENTS IN GROUNDWATER
AT LHAAP-35B(37) AND LHAAP-67
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**



Prepared for
U.S. Army Corps of Engineers
Tulsa District
1645 South 101st Avenue
Tulsa, Oklahoma

Prepared by
Shaw Environmental, Inc.
3010 Briarpark Drive, Suite 400
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Contract Number DACA56-94-D-0020
Task Order No. 0109

July 2007

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Acronyms and Abbreviations

µg/L	micrograms per liter
1,1,1-TCA	1,1,1-trichloroethane
1,1,2-TCA	1,1,2-trichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
COC	chemicals of concern
foc	fraction of organic carbon
K	hydraulic conductivity
Kd	distribution coefficient
Koc	carbon-water sorption coefficient
LHAAP	Longhorn Army Ammunition Plant
MCL	maximum contaminant level
PCE	tetrachloroethene
Shaw	Shaw Environmental, Inc.
TCE	trichloroethene
TO	task order

1.0 Introduction

The U.S. Army Corps of Engineers, Tulsa District, contracted Shaw Environmental, Inc. (Shaw), under Total Environmental Restoration Contract, No. DACA94-D-0020, Task Order (TO) No. 0109, to conduct environmental restoration at Longhorn Army Ammunition Plant (LHAAP). This report discusses the modeling used to estimate the time for natural attenuation of contaminants to concentrations that are at or below their maximum contaminant level (MCL) in groundwater at LHAAP-35B(37) and LHAAP-67, and presents the results of that modeling.

LHAAP-35B(37) is located on the north-central portion of LHAAP. LHAAP-35B(37) was a chemical laboratory used to support production activities at the facility. LHAAP-67 is located approximately at the center of LHAAP, with LHAAP-12 to the south and LHAAP-8 to the northwest. The site was referred to as the aboveground storage tank area where seven aboveground tanks stored fuel oil, kerosene, and solvents.

Chlorinated solvents were found at concentrations that exceeded their MCL at both sites and were identified as chemicals of concern (COC) in the groundwater. The COCs in groundwater at LHAAP-35B(37) are tetrachloroethene (PCE), trichloroethene (TCE), and 1,1-dichloroethene (1,1,-DCE). The COCs at LHAAP-67 in groundwater are TCE, 1,1-DCE, 1,2-dichloroethane (1,2-DCA), 1,1,1-trichloroethane (1,1,1-TCA), and 1,1,2-trichloroethane (1,1,2-TCA). The maximum concentration of each COC was used in the model to calculate the time required for the COCs to attenuate naturally.

2.0 Input Parameters

Groundwater modeling input was based on the following assumptions and considerations:

- **Natural attenuation goal.** The MCL was selected as the concentration to attain using natural attenuation. The MCLs for COCs are shown in **Table 1**.
- **Maximum contaminant concentration.** The maximum concentration of each COC detected in the groundwater (Shaw, 2007a) was used in the model to calculate the time required for the COCs to attenuate naturally, as shown in **Table 1**. When more than one zone is represented at a site and there is not a clear distinction between zones, the maximum concentration of a COC from either zone was used, which will yield more conservative results.
- **Contaminant source.** Since it is not known if the source of contamination is instantaneous (e.g., a plume of contaminated groundwater with no remaining source) or continuous (e.g., contaminated soil continuously acting as a source), both scenarios were modeled.
- **Aquifer parameters.** The aquifer parameters including hydraulic conductivity, effective porosity, and hydraulic gradient at LHAAP-35B(37) and LHAAP-67 were taken from the *Final Modeling Report – Derivation of Soil and Groundwater Concentrations Protective of Surface Water and Sediment, Longhorn Army Ammunition Plant, Revision 1* (Shaw, 2007a). These values are:

Estimated average hydraulic conductivities (K):

6.13×10^{-4} centimeter per second (634.2 feet per year) for LHAAP-35B(37) and
 5.21×10^{-3} centimeter per second (5,390.5 feet per year) for LHAAP-67.

Hydraulic gradient: 0.007 feet/feet for LHAAP-35B(37) and
0.0033 feet/feet for LHAAP-67.

Effective porosity: Assumed at 0.25 for both sites.

Shallow water-bearing zone thickness: 13.5 feet for both sites.

- **Chemical properties.** The distribution coefficient, K_d, is the partition coefficient for a chemical to be distributed to soil and groundwater, which is calculated using the carbon-water sorption coefficient (K_{oc}) and the fraction of organic carbon (f_{oc}) (K_d = K_{oc} × f_{oc}). The K_{oc} for each COC was obtained from literature values (Montgomery, 2000) and are shown in **Table 1**. The f_{oc} is assumed to be 0.1 percent (Shaw, 2007a). The K_d value is used to calculate the retardation factor.
- **Degradation rates.** Three degradation rates were used to evaluate the time it takes for each COC to attenuate to its MCL. The rates used in the model were no degradation, half-life, and 10 times the half-life. No degradation is the most conservative scenario representing no chemical attenuation (e.g., no dechlorination). At LHAAP-35B(37), attenuation is indicated by the presence of TCE and 1,1-DCE, which indicate

dechlorination of PCE and TCE. Historical volatile organic trends indicate the occurrence of complete reductive dechlorination by the presence of 1,1-DCE, cis-1,2-DCE, and ethene. Evaluation of the primary and secondary lines of evidence demonstrates that natural attenuation mechanisms including reductive biodegradation, dilution, dispersion, sorption, and volatilization, may all be contributing to the observed reduction in COC concentrations at LHAAP-35B(37) (Shaw, 2007b). The presence of 1,1-DCE and 1,2-DCA at LHAAP-67 indicates that some degree of dechlorination has occurred from 1,1,1-TCA and 1,1,2-TCA, respectively. Therefore, it is reasonable to assume a degradation rate. Since a degradation rate for the COCs could not be calculated at the time of modeling, degradation rates of literature-based half-life values, 10 times these values, and no degradation at all were used to obtain a more conservative estimate. The literature-based half-life degradation rates shown in **Table 1** are based on Howard, et al., (1991).

3.0 *Computer Code and Model*

The computer program, AT123D (an acronym for Analytical Transient One-, Two-, Three-, Dimensional Simulation of Waste Transport in the Aquifer System [Yeh, 1987]), was used to calculate the time it takes for each COC to naturally attenuate to its respective MCL. In the model a pseudo three-dimensional grid was constructed. The horizontal longitudinal axis extends to the potential receptor or to some distance downgradient, which is long enough to capture the migration of the plume from the source. The horizontal transverse axis extends 60 feet on both sides of the longitudinal axis. The vertical axis extends to 13.5 feet, which is the thickness of the shallow water-bearing zone for both sites. The origin of the grid is located 100 feet upgradient from the contaminant source. This allows the change of concentration over time at the source to be recorded.

The modeling results for LHAAP-35B(37) are presented in **Table 2** and the modeling results for LHAAP-67 are presented in **Table 3**.

4.0 Discussion and Modeling Results

The factors that influence the time it takes for each COC to attenuate to its respective MCL are (1) type of the contaminant source (instantaneous or continuous) and (2) the degradation rate of the COC.

At LHAAP-35B(37), with no degradation assumed, the time for the PCE concentration of 34 µg/L, the TCE concentration of 330 µg/L, and the 1,1-DCE concentration of 58 µg/L to attenuate to their MCL assuming an instantaneous source is 26.4, 32.6, and 20.4 years, respectively; whereas, it takes 32, 39, and 27 years assuming a continuous source. As can be seen from **Table 2**, the time it takes for each COC at LHAAP-35B(37) to attenuate to its MCL is reduced by 41 percent to 90 percent assuming an instantaneous source and 34 percent to 62 percent assuming a continuous source when both cases are simulated using literature-based half-lives (Howard et al., 1991). As evidenced by the presence of daughter products, there is complete reductive dechlorination occurring at the source (Shaw, 2007b). Therefore, assuming 10 times the literature-based half-life values and assuming an instantaneous source, it is concluded that the time it takes to attenuate to PCE, TCE, 1,1-DCE in groundwater at LHAAP-35B(37) is 22 years, 30 years, and 12 years, respectively.

At LHAAP-67, the time it takes for the TCE concentration of 6.3 µg/L (Shaw, 2007a) to be reduced to its MCL is from 1.6 years to 2.1 years (no degradation) assuming an instantaneous source. Assuming a continuous source, the time it takes for TCE to attenuate to its MCL is from 11.4 to 13.8 years. Assuming an instantaneous source and no degradation, the time it takes for other COCs to be reduced to their MCL is 15 years for 1,1-DCE, 5.3 years for 1,2-DCA, 8.4 years for 1,1,1-TCA, and 6.4 years for 1,1,2-TCA. Assuming an instantaneous source with literature-based degradation values, the time it takes for each COC to attenuate to the MCL is reduced by 50 percent for 1,1,2-TCA and 87 percent 1,1-DCE. Assuming a continuous source with no degradation, the time needed to reduce these COCs (excluding TCE) to the MCL ranges from 19 years (1,2-DCA) to 34 years (1,1-DCE). Assuming a continuous source half-life degradation rate, all the COCs attenuate to their respective MCLs within 11.3 to 13.1 years. There is some evidence of degradation at LHAAP-67.

5.0 *Summary*

At LHAAP-35B(37), the maximum estimated time it would take for each COC in either zone to attenuate to its MCL would be 39 years assuming no degradation (based on TCE). However, since complete reductive dechlorination is occurring, the estimated time for natural attenuation is less than 39 years.

At LHAAP-67, the maximum estimated time it would take for each COC to attenuate to its MCL would be 34 years (based on 1,1-DCE). Since 1,1-DCE is a daughter product of 1,1,1-TCA, it is evident that degradation is occurring and, therefore, the estimated time for natural attenuation would be less than 34 years.

6.0 References

Howard, P.H., R.S. Boethling, W.F. Jarvis, W.M., Meylan, and E.M. Michalenko, 1991, *Environmental Degradation Rates*, Lewis Publishers, Inc.

Jacobs Engineering Group, 2002, *Final Remedial Investigation Report for the Group 4 Sites, Sites 35A, 35B, 35C, 46, 47, 48, 50, and Goose Prairie Creek, Longhorn Army Ammunition Plant, Karnack, Texas*, January.

Montgomery, J.H., 2000, *Groundwater Chemicals Desk Reference*, 3rd Edition, Lewis Publisher.

Shaw Environmental, Inc. (Shaw), 2007a, *Final Modeling Report – Derivation of Soil and Groundwater Concentrations Protective of Surface Water and Sediment, Longhorn Army Ammunition Plant, Karnack, Texas, Revision 1*, Houston, Texas, September.

Shaw, 2007b, *Final Attenuation Evaluation, LHAAP-12, LHAAP-35B(37), and LHAAP-67, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, June.

Yeh, G.T., 1987, *Analytical Transient One-, Two-, and Three-Dimensional Simulation of Waste Transport in the Aquifer System*, Pennsylvania State University.

Tables

Table 1
Chemicals of Concern Data

Chemical of Concern	Maximum Contaminant Level (MCL) (micrograms per liter)	LHAAP-35B(37) Maximum Concentrations ^a (micrograms per liter)	LHAAP-67 Maximum Concentrations ^a (micrograms per liter)	Koc (cubic centimeters per gram)	Degradation half-life (years)
PCE	5	34	--	155	2
TCE	5	330 ^b	6.3	100	4.5
1,1-DCE	7	58	380	61.7	0.362
1,2-DCA	5	ND	27	31.6	1
1,1,1-TCA	200	37 ^c	1800	125.9	1.5
1,1,2-TCA	5	ND	33	70.8	2

Notes and Abbreviations:^a Data from Final Modeling Report (Shaw, 2007a) used in the model unless noted.^b Data from well LHSMW59.^c Data from Final Remedial Investigation Report (Jacobs, 2002) and the concentration was below the MCL and was not used in the model.

ND Chemical not detected above the reporting limit.

PCE tetrachloroethene

TCE trichloroethene

1,2-DCA 1,2-dichloroethane

1,1-DCE 1,1-dichloroethene

1,1,1-TCA 1,1,1-trichloroethane

1,1,2-TCA 1,1,2-trichloroethane

Table 2
Estimated Time for PCE, TCE, and 1,1-DCE Concentrations at the Source to be Reduced to MCLs
by Natural Attenuation at LHAAP-35B(37)

	Maximum Concentration at the Source (µg/L)	Attenuation Period Assuming an Instantaneous Source (years)	Attenuation Period Assuming a Continuous Source for 10 years (years)
	Tetrachloroethene (PCE), MCL = 5.0 µg/L		
No degradation	34	26.4	32
10 x half-life = 20 years		22.2	27.6
Half-life = 2 years		8.5	14.5
	Trichloroethene (TCE), MCL = 5.0 µg/L		
No degradation	330	32.6	39
10 x half-life = 45 years		30.5	37
Half-life = 4.5 years		19.3	25.6
	1,1-Dichloroethene (1,1-DCE), MCL = 7.0 µg/L		
No degradation	58	20.4	27
10 x half-life = 3.62 years		11.8	18
Half-life = 0.362 years		2	10.2

Abbreviations:

µg/L micrograms per liter
MCL maximum contaminant level

Table 3
Estimated Time for TCE, 1,1-DCE, 1,2-DCA, 1,1,1-TCA, and 1,1,2-TCA Concentrations at the Source
to be Reduced to MCLs by Natural Attenuation at LHAAP-67

	Maximum Concentration at the Source (µg/L)	Attenuation Period Assuming an Instantaneous Source (years)	Attenuation Period Assuming a Continuous Source for 10 years (years)
	Trichloroethene (TCE), MCL = 5.0 µg/L		
No degradation	6.3	2.1	13.8
10 x half-life = 45 years		1.97	13.3
Half-life = 4.5 years		1.6	11.4
	1,1-Dichloroethene (1,1-DCE), MCL = 7.0 µg/L		
No degradation	380	15	34
10 x half-life = 3.62 years		8.2	20.1
Half-life = 0.362 years		2	11.3
	1,2-Dichloroethane (1,2-DCA), MCL = 5.0 µg/L		
No degradation	27	5.3	19
10 x Half-life =10 years		4.4	16.3
Half-life = 1 year		2.1	11.4
	1,1,1-Trichloroethane (1,1,1-TCA), MCL = 200 µg/L		
No degradation	1800	8.4	26.9
10 x half-life = 15 years		7.1	22
Half-life = 1.5 years		3.2	12.9
	1,1,2-Trichloroethane (1,1,2-TCA), MCL = 5 µg/L		
No degradation	33	6.4	22
10 x half-life = 20 years		5.8	19.6
Half-life = 2 years		3.2	13.1

Abbreviations:

µg/L micrograms per liter

MCL maximum contaminant level

Kathleen Hartnett White, *Chairman*
Larry R. Soward, *Commissioner*
H. S. Buddy Garcia, *Commissioner*
Glenn Shankle, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution
July 13, 2007

Ms. Rose Zeiler
Army / BRAC Site Manager
Longhorn Army Ammunition Plant
Post Office Box 220
Ratcliff, AR 72951

Re: Baseline Risk Assessment Surface Water Sampling Plan for
Goose Prairie Creek
Longhorn Army Ammunition Plant (LHAAP)

Dear Ms. Zeiler:

The Texas Commission on Environmental Quality (TCEQ) has completed review of the Baseline Risk Assessment Surface Water Sampling Plan for Goose Prairie Creek (Shaw, July 2007). Listed below are our review comments.

1. We are concerned that the analytical method selected does not appear to provide the sensitivity needed. Based on input by QA/QC staff here, we recommend the following approaches:
 - The project can use EPA SW-846 Method 6020 with a reporting limit of 1.0 ug/L for lead if each analytical batch containing project samples includes a successful low-level laboratory control sample (LCS) and duplicate spiked at a concentration below the 0.5 ug/L regulatory limit for lead in surface water. For quality control, the acceptance criteria for recovery and precision from the low-level LCSs should be within 70 to 130% and <30%, respectively. If this approach is used, the 0.5 ug/L remains the regulatory limit.
 - A better approach may be to use a certified, drinking-water laboratory running EPA Method 200.8 or have the current laboratory use that method instead. If the laboratory's reporting limit for 200.8 is greater than the 0.5 ug/L, the low-level LCSs described above will be required, but the 200.8 method allows for direct injection of the sample and 6020 requires digestion of the sample. If 6020 is used, that required digestion may introduce interferences at concentrations near 0.5 ug/L, and those interferences could cause the required low-level LCSs to fail the acceptance criteria specified above.
2. The work plan states that "because the concentrations of interest for this study are extremely low, special care will be used during sample collection and handling to avoid cross contamination among samples." The sampling procedure is too general and vague. The TCEQ recommends that surface water sample collection be conducted in accordance with the TCEQ guidance document, Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment and Tissue available on the internet at http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/rg/rg-415/rg-415.html. In particular, the discussion regarding the "dirty hands/clean hands" procedures on pages 5-5 and 5-6 of the

Ms. Rosen Zeiler

Page 2

guidance could be relevant.

3. Finally, please ensure that metals grade preservatives are used and 0.45 micron filters be used for samples to be analyzed for dissolved metals.

If you have any questions or need additional information, please feel free to contact me at (512) 239-2443.

Sincerely,

A handwritten signature in black ink, appearing to read 'Fay Duke', with a long horizontal flourish extending to the right.

Fay Duke, Project Manager
Team 2, Environmental Cleanup Section II
Remediation Division
Texas Commission on Environmental Quality

FD/

cc: Mr. Stephen L. Tzhone, U. S. Environmental Protection Agency Region 6, Dallas, TX
Mr. Cliff Murray, U.S. Army Corps of Engineers, Tulsa, OK
Dr. Barry Forsythe, U.S. Fish and Wildlife Service, Dallas, TX
Mr. Paul Bruckwicki, U.S. Fish and Wildlife Service, Karnack, TX

BERA SW Sampling Plan.txt

From: Tzhone.Stephen@epamail.epa.gov
Sent: Tuesday, July 17, 2007 9:41 AM
To: rose.zeiler@us.army.mil; Srivastav, Praveen; Cobb, Dave
Cc: Forsythe.Barry@epamail.epa.gov; Charles.Wood@tpwd.state.tx.us;
Murray, Cliff SWT; Fay Duke; Lambert, John R SWT;
Rauscher.Jon@epamail.epa.gov; Lindberg, Jonathan;
Greenberg.Marc@epamail.epa.gov; Weisberg, Mark; paul_bruckwicki@fws.gov;
Roddy.Susan@epamail.epa.gov; Vickie Reat
Subject: BERA SW Sampling Plan

Hi Rose,

The EPA has reviewed the Baseline Ecological Risk Assessment Surface Water Sampling Plan For Goose Prairie Creek, Rev 01, July 2007, and have no comments. Please proceed with implementation of the Sampling Plan, thanks.

Stephen L. Tzhone
Superfund Remedial Project Manager
USEPA Region 6 (6SF-RA)
214.665.8409
tzhone.stephen@epa.gov

From: Fay Duke [FDUKE@tceq.state.tx.us]
Sent: Thursday, July 19, 2007 6:23 PM
To: Tzhone.Stephen@epamail.epa.gov; Srivastav, Praveen
Cc: Roddy.Susan@epamail.epa.gov; Willmore, Allen; Cobb, Dave; Lindberg, Jonathan; Everett, Kay; Weisberg, Mark; Cliff SWT Murray; John R SWT Lambert; Vickie Reat; rose.zeiler@us.army.mil
Subject: Re: FW: BERA WP RTCs
Rose/Praveen,

The TCEQ has no additional comments.

>>> "Srivastav, Praveen" <Praveen.Srivastav@shawgrp.com> 7/19/2007 5:14 PM >>>
Steve/Fay:

Please see attached responses to EPA/TCEQ comments on the BERA Surface Water Sampling work plan. This is just a confirmation of what I relayed earlier, that we concur with your comments and will implement procedures as suggested in the comments.

Let me know if there are any questions.

Thanks

Praveen Srivastav, Ph.D., PG, PMP
Project Manager
Shaw Environmental & Infrastructure
3010 Briarpark Drive, Suite 4N
Houston, TX 77042
713-996-4588 direct
281-639-8743 cell
713-996-4436 fax
www.shawgrp.com

From: Lindberg, Jonathan
Sent: Thursday, July 19, 2007 3:55 PM
To: Srivastav, Praveen; Weisberg, Mark
Subject: RE: BERA WP RTCs

Revised.

Jon

From: Srivastav, Praveen
Sent: Thursday, July 19, 2007 4:32 PM
To: Lindberg, Jonathan; Weisberg, Mark
Subject: RE: BERA WP RTCs

Looks good. Just add EPA's comments to it for documentation purposes to show that they didn't have any.

Thanks

Praveen Srivastav, Ph.D., PG, PMP
Project Manager
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From: Lindberg, Jonathan
Sent: Thursday, July 19, 2007 3:21 PM
To: Weisberg, Mark
Cc: Srivastav, Praveen
Subject: BERA WP RTCs

See how these look.

Jon

Jon Lindberg
Risk Assessor
Shaw Environmental & Infrastructure
312 Directors Drive
Knoxville, TN 37923
865.692.3647 direct
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<http://www.shawgrp.com>

Response to Comments
Baseline Ecological Risk Assessment Surface Water Sampling Plan for Goose Prairie Creek, Rev 01 (dated July 2007)
Longhorn Army Ammunition Plant, Karnack, Texas

July 2007

Reviewers: Stephen Tzhone, USEPA Region 6; Vickie Reat, TCEQ

Respondents: Shaw Environmental, Inc.

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commenter Agrees (A) with response, or Does not Agree (D) with response.

Comment #	Page	Section/ Paragraph	Comment	C, D, E or X ¹	Response	A or D ²
USEPA Region 6 Comments						
1			The EPA has reviewed the Baseline Ecological Risk Assessment Surface Water Sampling Plan For Goose Prairie Creek, Rev 01, July 2007, and have no comments. Please proceed with implementation of the Sampling Plan, thanks.	C	No response necessary.	
TCEQ Comments						
1			<p>I am concerned that the analytical method selected does not appear to provide the sensitivity needed. Based on input by QA/QC staff here, please consider the following suggestions.</p> <p>The project can use 6020 with a reporting limit of 1.0 ug/L for lead if the each analytical batch containing project samples includes a successful low-level laboratory control sample (LCS) and duplicate spiked at a concentration below the 0.5 ug/L regulatory limit for lead in surface water. For quality control, the acceptance criteria for recovery and precision from the low-level LCSs should be within 70 to 130% and <30%, respectively. If this approach is used, the 0.5 ug/L remains the regulatory limit.</p> <p>A better approach may be to use a certified drinking water laboratory running EPA Method 200.8 or have the current laboratory use that method instead. If the laboratory's reporting limit for 200.8 is greater than the 0.5 ug/L, the low-level LCSs described above will be required, but the 200.8 method allows for direct injection of the sample and 6020 requires digestion of the sample. If 6020 is used, that required digestion may introduce interferences at concentrations near 0.5 ug/L, and those interferences could cause the required low-level LCSs to fail the acceptance criteria specified above.</p>	C	<p>The laboratory has confirmed that the 0.5 ug/L regulatory limit can be met by using the 6020 method. It is also anticipated that the control limits specified in the comment will be met.</p> <p>Although not specified in the work plan, a field duplicate and MS/MSD sample will also be collected. Additionally, an equipment blank will be collected at the analytical laboratory using the same type of tubing and filter used in the field.</p>	

Response to Comments
Baseline Ecological Risk Assessment Surface Water Sampling Plan for Goose Prairie Creek, Rev 01 (dated July 2007)
Longhorn Army Ammunition Plant, Karnack, Texas

July 2007

Reviewers: Stephen Tzhone, USEPA Region 6; Vickie Reat, TCEQ

Respondents: Shaw Environmental, Inc.

1. Respondent Concur (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commenter Agrees (A) with response, or Does not Agree (D) with response.

Comment #	Page	Section/ Paragraph	Comment	C, D, E or X ¹	Response	A or D ²
2			The work plan states that "because the concentrations of interest for this study are extremely low, special care will be used during sample collection and handling to avoid cross contamination among samples." I would think there needs to be more specificity here. In particular the discussion could refer to the "dirty hands/clean hands" guidance (or equivalent) on pages 5-5 and 5-6 of the TCEQ's Surface Water Quality Monitoring Procedures, Volume I (available at: http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/rg/rg-415/rg-415.html).	C	Shaw has reviewed the TCEQ methodology and concurs. Every effort will be made to comply with the methodology to reduce the possibility of cross-contamination.	
3			Also, Longhorn should ensure that metals grade preservatives are used. Further, TCEQ monitoring programs use 0.45 micron filters for samples to be analyzed for dissolved metals.	C	Metals grade preservatives and 0.45 micron filters will be used.	

**BASELINE ECOLOGICAL RISK ASSESSMENT SURFACE WATER
SAMPLING PLAN FOR GOOSE PRAIRIE CREEK
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**



**Prepared for
U.S. Army Corps of Engineers
Tulsa District
1645 South 101st Avenue
Tulsa, Oklahoma**

Rev 01

**Prepared by
Shaw Environmental, Inc.
3010 Briarpark Suite 400
Houston, Texas 77042**

**Contract No. W912QR-04-D-0027, Task Order No. DS02
Shaw Project No. 117591**

July 2007

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Table 2	Sample List for Supplemental Surface Water Study for Goose Prairie Creek

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Figure 2	BERA Background Surface Water Sample Locations Proposed for Resampling

Acronyms and Abbreviations

COPEC	chemicals of potential concern
LHAAP	Longhorn Army Ammunition Plant
ORP	oxidation reduction potential
Shaw	Shaw Environmental, Inc.
Step 3/BERA	Step 3/baseline ecological risk assessment
UPL	upper prediction limit
UTL	upper tolerance limit

1.0 Introduction

This sampling plan describes the methodology and approach for field work to be conducted as part of the Installation-Wide combined Step 3/Baseline Ecological Risk Assessment (Step 3/BERA) at the former Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas (Shaw, 2007). The Step 3/BERA is being performed to address potential impacts of chemicals of potential ecological concern (COPEC) on biota at the installation. The Step 3/BERA identified potential direct contact hazards for aquatic receptors associated with lead in surface water in the Goose Prairie Creek Watershed at LHAAP associated with lead. This surface water sampling plan will collect data to address whether lead in surface water in Goose Prairie Creek is likely to be naturally occurring (i.e., background) and whether detected concentrations are a potential ecological concern.

The current estimated exposure point concentration of total lead in surface water of Goose Prairie Creek is 7.76 µg/L, with an estimated dissolved concentration of 1.4 µg/L (Shaw, 2007a). This estimated dissolved concentration is above the chronic water quality criteria of 0.5 µg/L, based on a site-specific hardness of 28 mg/L. While information presented in Shaw (2007) and Army Response to Comments discusses why it is believed lead concentrations are related to background, it was decided at the June 22, 2007 Response to Comment Meeting in Austin, Texas that a Surface Water Sampling Study would be conducted to resolve the issue.

Therefore, based on stakeholder review comments received on the Step 3/BERA for LHAAP (Shaw, 2007), additional surface water sampling is proposed in order to determine if lead in surface water of Goose Prairie Creek is (1) a direct contact hazard for aquatic life; and/or (2) related to background. This will be accomplished by collecting eight surface water samples within the on-site Goose Prairie Creek Watershed and also collecting eight background samples upgradient of areas of impact at the Installation.

2.0 Sampling Approach, Analyses, and Proposed Use of Data

Eight on-site surface water samples will be collected at the locations shown in **Figure 1**. Eight samples is the minimum sample size recommended in Texas Risk Reduction Program guidance for a background study in which a statistic (e.g., upper tolerance limit) is calculated as the representative concentration. The sample locations for this exercise were selected from among historical surface water sampling locations where metals were analyzed. These samples are listed in **Table 1**. In order to obtain adequate spatial coverage of the watershed, the samples were selected from various portions of Goose Prairie Creek that pass through or near the environmental sites and near Caddo Lake (**Table 1, Figure 1**). In general, the samples selected to represent the environmental sites were chosen by reviewing the historical surface water data available for the Site and selecting a sample location that had an elevated lead concentration. This resulted in the selection of seven samples near environmental sites and one near Caddo Lake (**Figure 1, Table 1**). :

It should be noted that two of these sample locations include the highest and second highest detected lead concentrations in Goose Prairie Creek watershed in the historical surface water samples. This subset of samples also includes the only sample that was identified by the Step 3/BERA geochemical analysis to have anomalously high lead concentrations in comparison to reference elements (i.e., 32SW-19) (Shaw, 2007).

In addition to these eight on-site surface water samples, eight background surface water samples will be collected from previously sampled background locations (Shaw, 2006). These include two samples each from upgradient areas of Goose Prairie Creek, Harrison Bayou, Central Creek, and Saunders Branch Watersheds, listed as follows and shown on **Figure 2**.

Background Sample Location	Watershed
Bkg-SW01	Goose Prairie Creek
Bkg-SW04	Goose Prairie Creek
Bkg-SW05	Saunders Branch
Bkg-SW07	Saunders Branch
Bkg-SW08	Harrison Bayou
Bkg-SW09	Harrison Bayou
Bkg-SW011	Central Creek
Bkg-SW014	Central Creek

These 16 on- and off-site samples will be analyzed for the following constituents, including both total and dissolved concentrations for the metals:

- Lead (Method 6020; ICP-MS method with a method detection limit of 0.11 µg/L and a reporting limit of 1 µg/L). Based on this method, estimated values (J-qualified) down to at least 0.5 µg/L are achievable.
- Aluminum, iron, and manganese, (also Method 6020). These additional metals are necessary so that the geochemical background evaluation may be performed, as was used in Shaw (2007).
- Hardness (measured as CaCO₃)

During the field collection event, the following information will also be collected, to aid in interpretation of the analytical results:

- Oxidation reduction potential (ORP)
- Dissolved oxygen
- pH
- Turbidity
- Temperature

The full list of samples to be collected for this supplemental surface water study at Goose Prairie Creek is presented in **Table 2**.

Sample collection methodology will follow protocols described in previous Longhorn Work Plans (see Shaw, 2004). Because the concentrations of interest for this study are extremely low (e.g., the lead water quality criteria is 0.5 µg/L), special care will be used during sample collection and handling to avoid cross contamination among samples.

Besides the geochemical background evaluation technique referenced previously, additional background evaluation techniques will include the following, as employed in the Step 3/BERA report (2007):

- Wilcoxon Rank Sum Test (or possibly Student's T-test, depending on the distribution of the data)
- Box and Whisker Plot
- "Bright Line" test, comparing the upper tolerance limit (UTL) and/or upper prediction limit (UPL) of the background data set to the on-site data.

All evaluation techniques will be performed on both total and dissolved lead, and used to make a determination, based on professional judgment, as to whether lead is background related. If on-site concentrations are determined to be background related, no further evaluation will be performed. However, if lead is not determined to be background related, the on-site dissolved lead concentrations will be compared with the site-specific hardness dependent dissolved chronic

water quality criterion of approximately 0.5 µg/L. The hardness dependent dissolved chronic water quality criterion may be recalculated using the 15th percentile hardness concentration of the available LHAAP surface water data, including the data collected as part of this sampling plan.

Results of this surface water study will be incorporated into the Final Installation-Wide combined Step 3/baseline ecological risk assessment (Step 3/BERA) for LHAAP.

3.0 References

Shaw Environmental, Inc. (Shaw), 2004, *Final Installation-Wide Background Study Work Plan, Longhorn Army Ammunition Plant, Karnack, Texas*, submitted to U.S. Army Corps of Engineers, Tulsa District, January.

Shaw, 2006, *Final Background Surface Water and Sediment Study Report, Longhorn Army Ammunition Plant, Karnack, Texas*, July.

Shaw, 2007, *Installation-Wide Baseline Ecological Risk Assessment, Longhorn Army Ammunition Plant, Karnack, Texas*, Volumes I and II Draft Final, March.

Tables

Table 1
Proposed 2007 Sample Locations for Surface Water
Goose Prairie Creek

Sample No.	Sample ID	Near Site(s)	Previous Sample Date	Proposed Sample Location?	Historical Lead Result (mg/L)	Rationale
29SW12	29SW12	29	05/12/93		0.002	
29SW13	29SW13	29	05/03/93		0.015	
29SW14	29SW14	29	05/25/93		0.004	
29SW15	29SW15	29	05/03/93		0.002	
29SW16	29SW16	29	05/13/93		0.006	
29SW17	29SW17	29	05/04/93		0.009	
29SW22	29SW22	49	10/07/98	Yes	0.011	Selected sample near Site 49
29SW27	29SW27	32	10/08/98	Yes	0.009	Selected sample near Site 32 and 47
29SW29	29SW29	29	10/06/98		0.003	
29SW30	29SW30	29	10/07/98		0.013	
29SW31	29SW31	37	10/07/98		0.011	
32SW01	32SW01-930525	32	05/25/93		0.002	
32SW02	32SW02-930506	32	05/06/93		0.002	
32SW03	32SW03-930512	32	05/12/93		0.007	
32SW08	32SW08(WATER)	32	04/12/95		0.006	
32SW09	32SW09(WATER)	32	04/12/95		0.002	
32SW10	32SW10(WATER)	32	02/20/95		0.002	
32SW14	32SW14(WATER)	49	02/19/95		0.002	
32SW15	32SW15(WATER)	5, 32	02/19/95		0.003	
32SW16	32SW16(WATER)	5, 32	02/19/95		0.002	
32SW19	32SW19-981008	29	10/08/98	Yes	0.024	Selected sample near Site 29
35ASW01	35ASW01-981109	cluster	11/09/98	Yes	0.004	Selected sample near site cluster north of Site 45
35ASW02	35ASW02-981109	cluster	11/09/98		0.003	
46SW03	46SW03-981110	46	11/10/98		0.003	
46SW04	46SW04-981110	46	11/10/98		0.008	
46SW07	46SW07-981110	46	11/10/98	Yes	0.005	Selected sample near Site 46
46SW08	46SW08-981110	46	11/10/98		0.004	
50SW03	50SW03-981112	50	11/12/98	Yes	0.069	Selected sample near Site 50
50SW04	50SW04-981111	50	11/11/98		0.005	
50SW05	50SW05-981111	50	11/11/98		0.005	
50SW06	50SW06-981110	50	11/10/98		0.003	
50SW07	50SW07-981111	50	11/11/98		0.006	
50SW08	50SW08-981111	50	11/11/98		0.004	
GPCSW01	GPCSW01-981118	DG	11/18/98		0.004	
GPCSW02	GPCSW02-981118	DG	11/18/98		0.005	
GPCSW03	GPCSW03-981117	DG	11/17/98		0.005	
GPCSW04	GPCSW04-981116	DG	11/16/98		0.003	
GPCSW05	GPCSW05-981116	46	11/16/98		0.005	
GPCSW06	GPCSW06-981116	8	11/16/98	Yes	0.004	Selected sample near Site 8 and 47
GPCSW07	GPCSW07-981116	5, 32	11/16/98		0.006	
GPCSW08	GPCSW08-981111	32, 49	11/11/98		0.005	
GPCSW10	GPCSW10-981111	37	11/11/98		0.003	
GPWSW01	GPWSW01-981119	DG	11/19/98		0.005	
GPWSW02	GPWSW02-981201	DG	12/01/98	Yes	0.004	Selected sample near Caddo Lake
GPWSW03	GPWSW03-981201	DG	12/01/98		0.007	
GPWSW04	GPWSW04-981120	DG	11/20/98		0.003	
LHS-GPC-01	LHS-GPC-01	50	01/11/95		0.002	
LHS-GPC-03	LHS-GPC-03	37	01/12/95		0.002	
LHS-GPC-05	LHS-GPC-05	29, 37	01/12/95		0.002	
LHS-GPC-07	LHS-GPC-07	46	01/12/95		0.003	
IWSW03	IWSW03	DG	September-04		0.004	
IWSW04	IWSW04	DG	September-04		0.005	

Notes:

Previous locations sampled for metals, without QA samples listed.

DG = downgradient sample.

Table 2
Sample List for Supplemental Surface Water Study for
Goose Prairie Creek

Location	Sample Number ^a	Analyses
On-Site Samples		
29SW22	29SW22-YYMMDD	Metals ^b , Hardness, Field Param ^c
29SW27	29SW27-YYMMDD	Metals ^b , Hardness, Field Param ^c
32SW19	32SW19-YYMMDD	Metals ^b , Hardness, Field Param ^c
35ASW01	35ASW01-YYMMDD	Metals ^b , Hardness, Field Param ^c
46SW07	46SW07-YYMMDD	Metals ^b , Hardness, Field Param ^c
50SW03	50SW03-YYMMDD	Metals ^b , Hardness, Field Param ^c
GPCSW06	GPCSW06-YYMMDD	Metals ^b , Hardness, Field Param ^c
GPWSW02	GPWSW02-YYMMDD	Metals ^b , Hardness, Field Param ^c
Off-Site (Background) Samples		
BKG-SW01	BKG-SW01-YYMMDD	Metals ^b , Hardness, Field Param ^c
BKG-SW04	BKG-SW04-YYMMDD	Metals ^b , Hardness, Field Param ^c
BKG-SW05	BKG-SW05-YYMMDD	Metals ^b , Hardness, Field Param ^c
BKG-SW07	BKG-SW07-YYMMDD	Metals ^b , Hardness, Field Param ^c
BKG-SW08	BKG-SW08-YYMMDD	Metals ^b , Hardness, Field Param ^c
BKG-SW09	BKG-SW09-YYMMDD	Metals ^b , Hardness, Field Param ^c
BKG-SW11	BKG-SW11-YYMMDD	Metals ^b , Hardness, Field Param ^c
BKG-SW14	BKG-SW14-YYMMDD	Metals ^b , Hardness, Field Param ^c

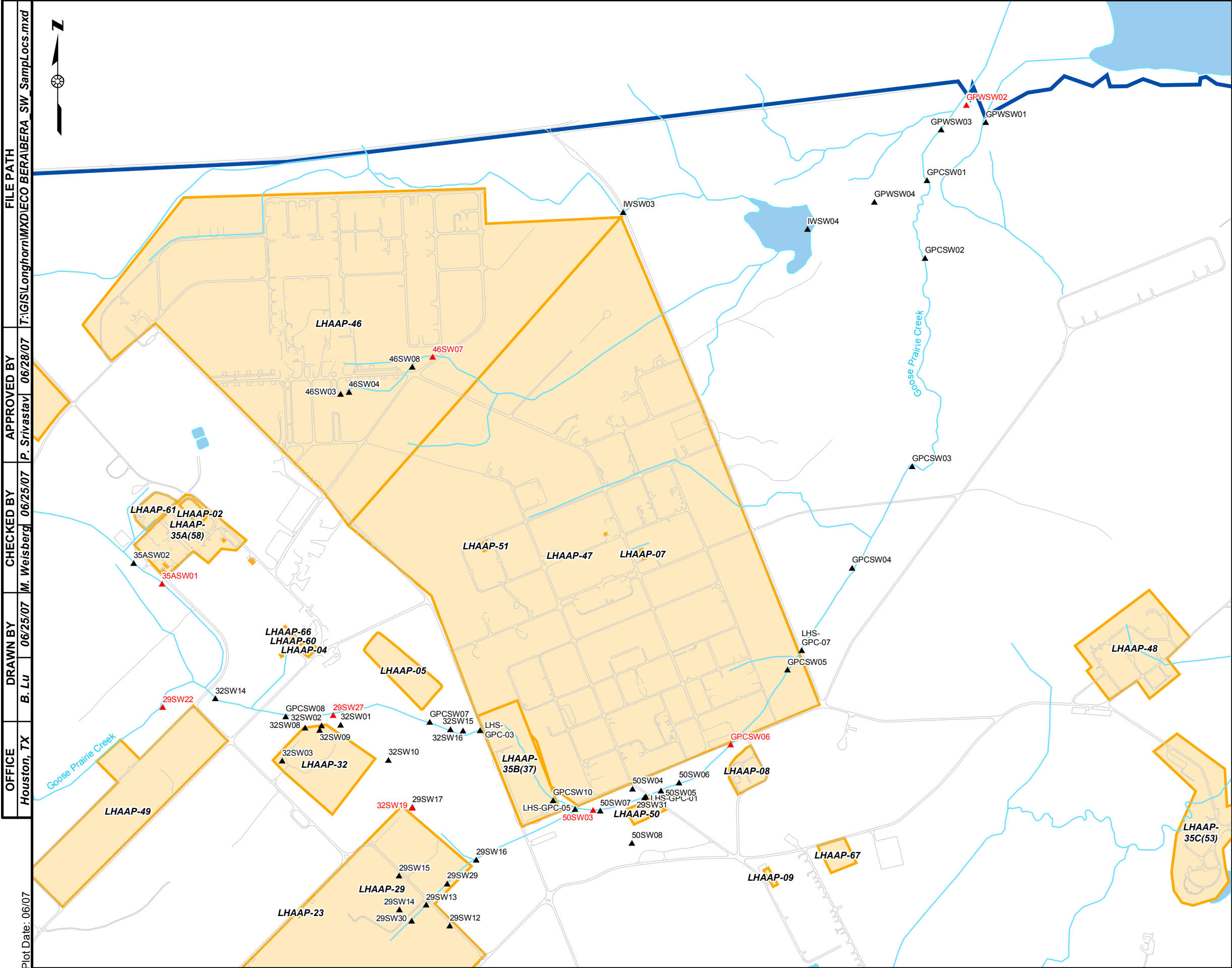
Notes:

^a "YYMMDD" will be replaced with the appropriate year, month, and date of the sampling event.

^b Filtered and unfiltered samples will be collected for each sample. Metals analysis includes analysis for lead, aluminum, iron, and manganese.

^c Field parameters (Field Param) includes oxidation/reduction potential, dissolved oxygen, pH, turbidity, and temperature.

Figures



FILE PATH T:\GIS\Longhorn\MXD\ECO BERA\BERA_SW_SampLocs.mxd

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY
Houston, TX	B. Lu	M. Weisberg	P. Srivastav

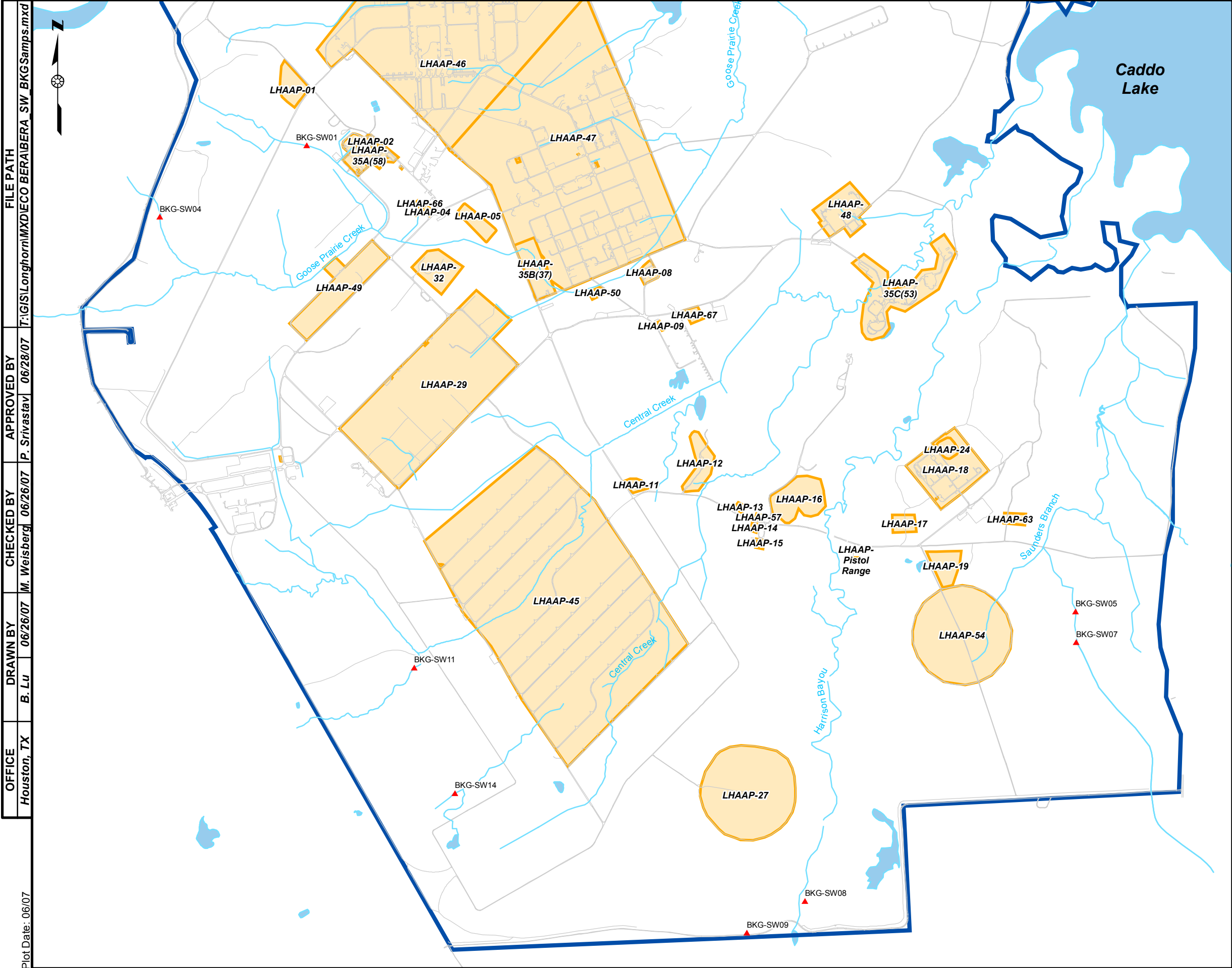
Plot Date: 06/07

0 500 1,000 2,000 Feet



U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA


FIGURE 1
BERA SURFACE WATER SAMPLE
LOCATIONS IN GOOSE PRAIRIE CREEK
PROPOSED FOR RESAMPLING
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



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OFFICE	DRAWN BY	CHECKED BY	APPROVED BY
Houston, TX	B. Lu	M. Weisberg	P. Srivastav

Plot Date: 06/07



U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 2

BERA BACKGROUND SURFACE WATER
SAMPLE LOCATIONS
PROPOSED FOR RESAMPLING
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

LONGHORN ARMY AMMUNITION PLANT,

00048187

Karnack, Texas

MONTHLY MANAGERS' MEETING

AGENDA

DATE: Tuesday, 17 July 2007
TIME: 1:00 p.m.
PLACE: Teleconference Toll-Free Number: 866-797-9304, Passcode: 4155734

Welcome **RMZ**

Review of June 2007 Meeting Minutes and Action Items **RMZ**

Shaw

- Shaw to provide BERA response to comments to regulators by Friday, June 15 (completed)
- Shaw to provide regulators a schedule for 5-year review (completed)
- Shaw to provide regulators a link to Oak Ridge National Lab's website for perchlorate action levels (completed)
- Shaw to provide perimeter well sampling results (completed)

TCEQ

- Fay Duke has addressed this. Fay will check with TCEQ's Chuck Stone for a model or calculation that can be used to project time to MCL for sites with MNA as a remedy
- **Army** Provide MMRP action memorandum to regulators by end of June 2007

Defense Environmental Restoration Program (DERP) PBC Update **DC/PS**

- Document Status/Environmental Sites (Table)
- BERA RTC and Redline Review
- BERA Surface Water Sampling
- LHAAP-18/24 Injection testing/permit
- GWTP Quarterly Report RTC
- 5-Year Review
- RTC for LHAAP-06, 07, 51, 55, 66, 68, 68 SI Report (SPLP Sampling)
- GWTP Operations Update
- Perimeter wells sampling (wells 133/134) results

DERP Total Environmental Restoration Contract Update **PS/JE**

- Documents Status/Environmental Sites (Table)
- Fieldwork: Well Abandonment and installation, SPLP for Site 59
- Schedule for OPS on LHAAP-12

MMRP Update **JRL**

- Action Memorandum
- Revised MMRP EE/CA
- Public Notice of MMRP EE/CA available for Review

- PWS and Site Walkover

Transfer Update

RMZ

- ECOPs IV and V
- Pits and Hazards Abatement
- Utility Easement
- Power House Demolition



**Subject: Draft Final Minutes, Monthly Managers Meeting,
Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: Conference Call

Date of Meeting: July 17, 2007; 1:00 PM – 2:15 PM

Meeting Participants:

BRAC:	Rose M. Zeiler
USACE-Tulsa:	Cliff Murray
USAEC	Jeff Armstrong
Shaw Environmental:	Dave Cobb, Praveen Srivastav, John Elliott, Van Vangala, Greg Jones, Kay Everett
USEPA Region 6:	Steve Tzhone
TCEQ:	Fay Duke, Dale Vodak

Welcome

Rose Zeiler welcomed everyone to the meeting and began a brief review of the June 12, 2007 monthly meeting minutes and asked if there are any changes to these minutes to let her know. The changes would be incorporated and the result broadcast to stakeholders. She mentioned that an excursion had occurred for perchlorate in the groundwater treatment plant (GWTP) effluent on June 20, 2007. More details will be presented later in the meeting.

Rose Zeiler requested Shaw to present perimeter well sampling results at the next RAB meeting.

Action Items from June 2007 Manager's Meeting

Shaw

- **Shaw to provide BERA response to comments to regulators by Friday, June 15 – Completed**
- **Shaw to provide regulators a schedule for 5-year review– Completed**
- **Shaw to provide regulators a link to Oak Ridge national lab's website for perchlorate action levels– Completed**
- **Shaw to provide perimeter well sampling results– Completed**

TCEQ

- **Fay Duke will check with TCEQ's Chuck Stone for a model or calculation that can be used to project time to MCL for sites with MNA as a remedy.** Fay indicated that Chuck Stone's recommendation is to follow the Texas guidance.

Army

- **Army to provide MMRP action memorandum to regulators by end of June 2007 –**
The document is expected out soon.

Defense Environmental Restoration Program (DERP) PBC Update (Dave Cobb/Praveen Srivastav)

Dave Cobb briefly went over the highlights on the document status table.

BERA RTC and Redline Review. Dave Cobb indicated that revised “response to comments” (RTC) have been submitted to the stakeholders. Shaw received comments yesterday on the BERA surface water sampling work plan. The comments would be incorporated directly into the draft final document and implemented in the field. The “dirty hand/clean hand” protocol will be utilized during the sampling effort as previously discussed. EPA had no comments on the BERA work plan for conducting additional surface water and background sampling. Praveen Srivastav informed the team that the surface water sampling may not begin on July 18 as originally planned because of a field staff falling sick. The sampling would be conducted as soon as a replacement is found and may occur during the week of July 23. The BERA was very close to being issued as final. The redline document is scheduled for mid-August. It was suggested that Shaw notify Rose Zeiler when the surface water sampling results go out so Rose can coordinate with Larry Tannenbaum of USACHPPM in order to schedule his time to review the responses and data results.

LHAAP-18/24. Amar Bumb with Shaw was on site conducting injection tests on the ICTs. Van Vangala was in touch with Amar Bumb and informed the stakeholders that the ICTs were taking a lot of water, approximately 17 gallons per minute. Praveen Srivastav informed everyone that the test should be completed by the end of the week.

GWTP Quarterly Report RTC. EPA/USGS had issued comments on previous quarterly reports. Shaw planned to respond to these comments by incorporating them into future reports. EPA agreed. Shaw should have another quarterly report ready by the end of the month. Shaw had prepared draft responses to EPA/USGS comments that were in Army's review.

5-Year Review. The inspections were conducted at sites LHAAP-12, LHAAP-16, and LHAAP-18/24 on July 11, 2007 for the 5-year review. Chris Villarreal(EPA) and Dale Vodak (TCEQ) were on site for the inspection.

RTC for LHAAP-06, -07, -51, -55, -64, -66, -68 SI Report (SPLP Sampling). The RTCs for the SI report incorporated the SPLP sampling results and were submitted to the Army last week via email from Greg Jones on July 11, 2007. Rose will look for it and will submit her comments to Shaw.

GWTP Operations Update. Van Vangala discussed the June 20, 2007 excursion for perchlorate in the GWTP effluent. The weekly and bi-weekly effluent sample results for perchlorate during the week of 18 June were received on 16 July. The sample collected on 19 June was non-detect and where as the sample collected on 20 June showed a concentration of 50 ppb exceeding the daily average of 6 ppb. The third sample collected on 21 June is above daily average but below daily maximum (13 ppb). Treated water during these periods was discharged to Harrison Bayou as there was enough flow that meets the discharge criteria. The concentration above the discharge criteria may be due to surge of perchlorate concentration in the influent due to heavy rain fall resulting in moving contaminants within the formation towards the ICTs. The other reason may be due to one of the feed pumps not pumping enough nutrients or electron donors. Shaw is looking at other options to monitor the influent concentration on a regular basis so that the dosages can be altered accordingly. Van indicated some possible solutions include the installation of a probe that could better monitor conditions in order to adjust the fluidized bed reactor (FBR) treatment process. Another option will be to conduct real-time analysis of samples for perchlorate at the plant. This would required upgrade of instrumentation already at the site. Some maintenance on the plant was completed, including some replacement piping and an actuator on the CATOX unit. Shaw also replaced some nozzles on the FBR and installed a new sump pump.

Perimeter wells sampling (wells 133 and 134) results. The data have been submitted to the team. The results were non-detect at sampled wells 133 and 134. All wells will be sampled at the next scheduled sampling event in September 2007.

LHAAP-35/36 Report. Praveen Srivastav mentioned that the report for LHAAP-35/36 didn't make it on the agenda, but wanted stakeholders to be aware that the draft report went out the day before (July 17) to the Army. He indicated to the regulators that they will probably be getting it in a couple weeks.

Defense Environmental Restoration Program (DERP) TERC Update (John Elliott)

John Elliott discussed the highlights of the Document Status Table for the TERC contract. Table was cleaned up a bit by removing some documents that have been completed and added RODs for several sites with no associated dates for the time being in order to have them listed for future consideration. Also added several proposed plans (PP) for LHAAP-08, 32, 37 and 67, and 48 and 53. PP for LHAAP-08 and 32 are on hold until the BERA is finalized. PP for 37/67 is due out on August 16. An "operating properly and successfully" (OPS) document for LHAAP-12 is due out to the Army by the following Wednesday, July 25, 2007. The PP for LHAAP48/53 is undergoing the final comment resolution. The Site Investigation report for LHAAP-59 should go final on August 2. There had been some discussions between Shaw's Frank Eidson and TCEQ regarding LHAAP-59 response to comments (RTC). Fay will follow up with Anne Strahl to see if she is currently reviewing the final RTC. Upcoming field work has not been scheduled as the focus is on the OPS document. The SPLP results indicated no exceedances.

MMRP Update

Cliff Murray informed the team that the Army met with four contractors for the MMRP removal action and showed them each of the sites and the magazines. They have the rest of the week to look at them and feel comfortable with them before placing their bids. The contract will be performance based, fixed price. The award is expected probably late August or early September 2007. The MMRP EE/CA RTCs are in review with TCEQ and EPA. TCEQ's Fay Duke expects to get comments back from their contractor who is reviewing the MMRP document by the end of the week. Jeff Armstrong said when they get a successful bidder, the work will be funded.

Transfer Update

ECOP IV and ECOP V. Rose Zeiler indicated that USFWS Albuquerque Region 2 has asked for maps and coverage which indicates they are close to acceptance of the transfer of acreage from ECOP IV. ECOP IV encompasses approximately 639 acres in the production area. The draft final ECOP V went out as electronic file to stakeholders and hardcopy to follow today. ECOP V addresses the Landfill 12 Area Parcel.

Pits and Hazards. This work is part of a demolition contract handled out of the Fort Worth District Corps office. The contractors will mobilize the week of July 30 to begin mitigating pits and other safety hazards at previously identified locations throughout Longhorn. The contractor activity schedule is not known at this time. Initial sampling of the pit water has been conducted with detections of metals, VOCs and perchlorate. As a result of perchlorate detections in excess of 6 ppb, treatment will be required for a large amount of pit water. Fort Worth will know more about what will need to be done after they receive the results of additional rounds of sampling.

Utility Easement. Rose Zeiler indicated that the easement is being worked out by the Army with SWEPCO and USFWS.

Powerhouse Demolition. Fort Worth plans to conduct sampling of the powerhouse as soon as possible in order to reduce the uncertainty (and therefore initial estimates) associated with the project.

The construction and debris landfill (LHAAP_19) was discussed. During a state inspection it was noted there were holes in the landfill cap. Dale Vodak made a recommendation to the contractor to use sugar sand to fill in any void spaces. He said that before plug is placed it might be beneficial to fill in holes first.

Next Meeting

Next monthly manager's meeting is scheduled for August 7 or 14, 2007 at 1:00 or 2 PM at the Longhorn trailer. Actual date and time is forthcoming.

Meeting Adjourned

Action Items:**Shaw**

- Shaw to provide BERA surface water sampling results by mid-August.
- Shaw to provide regulators a 5-year review report by early August.
- Shaw to provide perimeter well results at the next RAB meeting.
- Shaw to provide creek sampling results

TCEQ

- Fay Duke will follow up with Anne Strahl on comments to SI to LHAAP-59 report.

Army

- Provide MMRP action memorandum to regulators by end of July 2007 or early August.

LONGHORN ARMY AMMUNITION PLANT MONTHLY MANAGERS' MEETING

Location	Teleconference		
Date	17-Jul-2007	Time	1:00 PM

ATTENDEES

[illegible]

**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
July 17, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
ERA									
1	Draft Final Step 3 report (Vol I of BERA)	1/16/07		x	6/12/07	Meeting held 6/22/07.	Revised RTC based on meeting issued xx/xx/07	x	TCEQ comments received 5/3/07. EPA comments received 5/18/07
2	Draft Final BERA (Vol II of BERA)	3/6/07		x	6/12/07	Meeting held 6/22/07.		x	TCEQ comments received 5/3/07. EPA comments received 5/18/07.
3	BERA RTCs (revised)	6/28/07		x	As soon as possible		Responses to revised redline RTC rec'd from EPA and TCEQ on 7/6/07.		Plan is to incorporate these comments and subsequent responses directly into DF document and issue BERA as final. Surface water sampling data will also be included in final.
4	BERA Surface Water Sampling Plan	7/9/07		x	As soon as possible		Comments rec'd from TCEQ 7/13. EPA comments pending.		Shaw addressing TCEQ comments. Schedule is to be in field 7/18/07.
ENVIRONMENTAL									
5	Draft Final SI/Evaluation Report, LHAAP-02	3/30/06		x			Comments rec'd from TCEQ 8/29/06. EPA comments rec'd 5/12/06.	x	Final will be issued when BERA information available.
6	Draft Final Proposed Plan, LHAAP-60	7/7/06		x			Comments rec'd from TCEQ 8/1/06. EPA comments rec'd 8/21/06.	x	Final to be submitted when BERA information available.
7	Draft Final TCRA Memo – LHAAP-04, -49, -50, and Pistol Range	12/6/06	x				TCRA Memos will not be used. Alternative path to closure being pursued.		Expected Paths Forward are: <ul style="list-style-type: none"> • 04 = EE/CA, NTCRA, etc. • 49 = NFA Eval Report • 50 = FS/PP/ROD, etc • Pistol Range = EE/CA, NTCRA, etc.



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
July 17, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
8	Draft Feasibility Study, LHAAP-58	6/1/07	x		6/18/07		Comments not rec'd from Army		No eco risk expected at the site based on Draft Final BERA. Draft FS submitted to the Army. Draft Final to be submitted to the regulators after BERA is finalized.
9	Draft Feasibility Study, LHAAP-17	TBD					On hold pending BERA		Draft versions 80% complete. Draft will be issued when BERA information available.
10	Draft Final Feasibility Study, LHAAP-16	TBD					On hold pending BERA		Decision made to hold DF document until BERA information available based on EPA comments regarding CERCLA process.
11	Draft Final SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68 (combined)	1/11/07		x	2/10/07		Complete	x	Final will be issued based on resolution of RTC for DF (Item 11)
12	Revised RTC on DF SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68	7/11/07	x		7/21/07		Under Army review		
13	Draft SI Report for LHAAP-35/36	7/16/07 (Army)	x		8/2/07		Under Army review		
14	Draft Final LHAAP-16 MNA Evaluation Proposal	3/2/07		x		EPA comments rec'd 3/28/07, TCEQ has provided verbal comments – no formal written comments rec'd.	Final being revised to reflect recent discussions once open issues resolved.	x	<ul style="list-style-type: none"> No formal comments received from TCEQ. Perchlorate standard for stream still needs to be resolved.
15	Draft SI Report for LHAAP-03	7/24/07 (Army)					In preparation		Will be incorporated into FINAL SI report for sites -06, -07, -51, -55, -64, -66, -68. Revised version expected to be issued late July 2007.



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
July 17, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
16	Draft EE/CA for LHAAP-04	8/10/07 (Army)					In preparation		On hold pending resolution of BERA issues.

**Technical Document Status Table
TERC Task Order NO. 0109
Longhorn Army Ammunition Plant**

Site	Documents in Progress	Draft Document				Draft Final Document									Final
		Draft Submittal Date	Army Comments	Shaw RTC	Comment Resolution	Draft Final Submittal Date	AEC Comments	EPA Comments	TCEQ Comments	Shaw RTC	Army Comments	Comment Resolution	Army forward RTC to TCEQ & EPA	Comment Resolution	Final Submittal Date
08	Proposed Plan, LHAAP-08	05/01/06	05/24/06			07/07/06	08/25/06	08/21/06	09/20/06	09/29/06			11/21/06	TCEQ 12/07/06 EPA 02/21/07	
08	Record of Decision, LHAAP-08														
12	Operating Properly and Successfully Demonstration Report, LHAAP-12	07/25/07													
32	Proposed Plan, LHAAP-32					07/21/06	08/25/06	09/05/06	09/12/06	09/19/06			11/21/06	TCEQ 12/07/06 EPA 01/26/07	
32	Record of Decision, LHAAP-32														
37/67	Proposed Plan, LHAAP-37/67	05/02/06	05/24/06	06/06/06	06/22/06	07/18/06	08/25/06	09/05/06	09/20/06	10/19/06	10/31/06	11/07/06	11/21/06	TCEQ 04/27/07 EPA 02/21/07	08/16/07
37/67	Record of Decision, LHAAP-37/67														
48/53	Revised Proposed Plan, LHAAP-48/53	09/25/06	10/31/06	11/14/06	01/12/07	04/09/07	USACHPPM 04/25/07 OC 05/15/07	6/12/07 via USACE	04/27/07	06/27/07	07/12/07 07/13/07	07/19/07			
48/53	Record of Decision, LHAAP-48/53														
59	Site Investigation Report, LHAAP-59	11/02/06	11/07/06	11/09/06	11/15/06	11/21/06	None Required	03/20/07	01/11/2007, 03/20/07, & 03/22/07	04/02/07	RMZ 04/12/07 USACE 04/11/07	04/12/07	04/25/07	TCEQ 06/15/07 EPA 04/30/07	08/02/07
59	Record of Decision, LHAAP-59														

Shaw Forecasted Submittal Date

Shaw Action Item

Army Action Item

EPA & TCEQ Action Item

Current Action item

Date: July 19, 2007

Project No.: 117591.0005B000

TRANSMITTAL LETTER:

To: Mr. Cliff Murray

Address: US Army Corps of Engineers - Tulsa

CESWT-PP-M

1645 South 101st East Ave

Tulsa, Oklahoma 74128

Re: Sampling and Analysis Plan, Groundwater Treatment Plant and Well Fields - LHAAP

Contract No. W912QR-04-D-0027/DS02

For: Review ☐ As Requested ☐ Approval ☐ Corrections ☐ Submittal ☐ Other ☐ **Information**

<i>Item No:</i>	<i>No. of Copies</i>	<i>Date:</i>	<i>Document Title</i>
1	1	July 2007	Sampling and Analysis Plan, GWTP and Well Fields, LHAAP, Karnack Texas

Sincerely:



Dave Cobb
Project Manager

CC: Distribution List:

Ms. Rose Zeiler – BRAC-LHAAP

**SAMPLING AND ANALYSIS PLAN
GROUNDWATER TREATMENT PLANT AND WELL FIELDS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**



**Prepared for
U.S. Army Corps of Engineers
Tulsa District
1645 South 101st Avenue
Tulsa, Oklahoma**

**Prepared by
Shaw Environmental, Inc.
3010 Briarpark Suite 400
Houston, Texas 77042**

**Contract Number W912QR-04-D-0027, Task Order No. DS02
Shaw Project No. 117591**

**Revision 1
July 2007**

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Appendix A	Related Documents
	1. Table 2 from Record of Decision
	2. Letter: Monitoring and Reporting Requirements for Plant Discharges
	3. June 21, 2000, Memorandum: Longhorn Army Ammunition Plant - Decrease in Sampling Frequency
	4. July 19, 2000, Memorandum: Longhorn Army Ammunition Plant - Decrease in Sampling Frequency
	5. July 26, 2000, Letter: Decrease in Sampling Frequency, Longhorn Army Ammunition Plant Superfund Site
	6. October 24, 2006, Memorandum: Sampling Modifications for LHAAP-18/24 (text and tables, only)
Appendix B	Sampling and Analysis Requirements
	1. Table B-1 – Sample Containers, Preservation, and Preparation for Water Samples
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	3. Table B-3 – Quantitation Limits for Volatile Analyses in Soil and Water by Method 8260 and 8010
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	5. Table B-5 – Required Quantitation Limits for Other Analyses in Soil and Water

Acronyms and Abbreviations

CES	Complete Environmental Services
CFR	Code of Federal Regulations
COC	chain-of-custody
DQO	data quality objectives
GAC	granular activated carbon
GWTP	groundwater treatment plant
ICT	interceptor collection trench
LHAAP	Longhorn Army Ammunition Plant
MARC	Multiple Award Remediation Contract
NAPL	non-aqueous phase liquid
ORP	oxidation-reduction potential
PPE	personal protective equipment
QA	quality assurance
QC	quality control
QCM	Quality Control Manager
RPD	relative percent difference
Shaw	Shaw Environmental, Inc.
TCEQ	Texas Commission on Environmental Quality
TO	Task Order
UEP	unlined evaporation pond
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VEW	vertical extraction well

1.0 Purpose

Shaw Environmental, Inc. (Shaw) was contracted by the U.S. Army Corps of Engineers (USACE) to perform remediation activities associated with Site Closure of Multiple Sites at the Longhorn Army Ammunition Plant (LHAAP) under the Multiple Award Remediation Contract (MARC) No. W912QR-04-D-0027 issued by the Louisville District. Management of work performed under this contract is performed by the Tulsa District of USACE. Work by Shaw at the Longhorn facility is performed under Task Order (TO) No. DS02 of the above-referenced contract. As part of the remediation activities, Shaw has been tasked with continued monitoring of the Groundwater Treatment Plant and the well fields at LHAAP-18/24 and LHAAP-16.

The purpose of this document is to provide a written sampling and analysis plan for monitoring of the groundwater treatment plant (GWTP) in accordance with the approved Record of Decision (USACE, 1995) and groundwater monitoring as required under Federal Regulation 40 Code of Federal Regulations (CFR) Part 265, Subpart F, Section 265.92. The procedures herein are required to ensure that data obtained from sampling are of acceptable quality. This plan serves as a reference document for Shaw personnel, regulatory agencies, and contract laboratories involved with groundwater monitoring.

Quality assurance (QA) is the activity required to assure desired and verifiable levels of quality in a sampling and testing program. Quality control (QC) is the functional mechanism to achieve quality data. The QA program will ensure that the QC program will result in high quality data. This document will describe the QA/QC procedures for each aspect of the confirmation sampling activities, which will meet the data quality objectives of this project. Procedures in this Plan were referenced from *Chemical Quality Data Management for Hazardous Waste Remedial Activities*, ER-1110-1-263 (USACE, 1990), a USACE regulation, with additional guidance from *Development of an RFI Work Plan for RCRA Facility Investigations*, SW-87-001 (U.S. Environmental Protection Agency [USEPA], 1987), *Minimum Chemistry Data Reporting Requirements*, (USACE, 1989), *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, 1989), and the *RCRA Groundwater Monitoring Enforcement Guidance Document* (USEPA, 1986a).

1.1 Site Description and Background

LHAAP is located in the northeast corner of Harrison County, Texas, approximately 3.6 miles from the Louisiana border. LHAAP is bordered by Caddo Lake, Caddo Lake State Park, and the small town of Karnack. The plant is located approximately 30 miles west of Shreveport, Louisiana, with the nearest major city being Marshall, Texas, 15 miles to the southwest. The

installation has a total area of approximately 8,493 acres. State Highways 43 and 134 access the installation.

1.2 LHAAP 18 & 24 – Active Burning Ground & Unlined Evaporation Pond

LHAAP 18 – Burning Ground No. 3 and LHAAP 24 Unlined Evaporation Pond/Rocket Motor Washout Facility are located within a secured area of 34.5 acres. The area has been used for the treatment, storage, and disposal of solid and liquid explosive, pyrotechnic, and combustible solvent waste by open burning/open detonation, incineration, evaporation, and burial.

Burning Ground No. 3 has been in operation since 1955, and historical waste management units include open burn pits, an unlined evaporation pond (UEP), stockpiles of solvent-soaked sawdust, and suspected waste burial pits. The UEP was constructed at the burning ground in 1963 as a holding pond to store explosive wastes resulting from the washout of rocket motor casings. In 1973, the pond also began receiving wash water containing solvent residues and solids collected from operations involving pyrotechnic material preparation and mixing commonly containing the metallic cations aluminum, arsenic, barium, cadmium, chromium, iron, lead, magnesium, sodium, strontium, and zinc. The nonmetallic anions nitrate, nitrate, and phosphate. Also, the organic solvents acetone, trichloroethane, ethyl alcohol, methyl ethyl ketone, methylene chloride, and toluene. An Air Curtain Destructor was built in 1979 for the purpose of disposing of explosive and explosive-contaminated wastes by burning.

Use of burn pits and trenches were reportedly discontinued in 1984, and the use of the UEP was discontinued in 1984 when it was discovered that the pond was contaminating groundwater beneath the site. The UEP was closed as a RCRA interim status surface impoundment in 1986 by removing all waste and capping the impoundment. The last burning cage was removed in 1998.

1.3 LHAAP-16 – Old Landfill

The Old Landfill encompasses approximately 20 acres in the south-central portion of LHAAP. This site was originally used from 1942 to 1944 for the disposal of TNT red water ash. The central section of the site was reportedly used as an all-purpose junkyard for disposal of such materials as substandard TNT, barrels of chemicals, oil, paint, scrap iron, and wood. In the mid to late 1950s, rocket motor casings were reportedly burned and possibly buried at the site. Burn pits, waste storage, and landfill operations continued as waste disposal and treatment activities until sometime in the 1980s. The site is no longer active.

2.0 *Sampling and Analysis Requirements*

Sampling will be performed at the GWTP, LHAAP-18/24, and LHAAP-16 to meet the requirements of the Record of Decision (USACE, 1995) and the long-term monitoring requirements. **Table 2-1** illustrates the current approved monitoring requirements, and **Table 2-2** provides a plan for additional testing to support operation of the fluidized bed reactor at the GWTP. The monitoring frequencies and analytical parameters have most recently been revised to match those proposed in the October 2006 memorandum on *Sampling Modifications for LHAAP-18/24* (Shaw, 2006b). The text of that memorandum is included in **Appendix A**, and the locations of the monitoring wells at LHAAP-18/24 are shown in **Figure 2-1**.

Extracted groundwater collected at the GWTP is treated to the levels established by the Texas Commission on Environmental Quality (TCEQ) and EPA. Table 2 from the Interim Record of Decision (provided in **Appendix A**) lists all groundwater chemicals of concern and their associated effluent discharge limits as set by the TCEQ.

The treated water will be discharged to Harrison Bayou and/or Central Creek or sprayed on Burning Ground No. 3 (within LHAAP-18) as irrigation water. The precipitated metals will be taken off-site for disposal at an approved/licensed facility. Relevant sampling will therefore occur at the GWTP effluent stream before discharge and to a lesser degree at the influent stream after equalization.

During the implementation of the groundwater treatment process, the effectiveness of the groundwater extraction system shall be evaluated by monitoring groundwater levels and water quality in the shallow aquifer at LHAAP-18/24 and LHAAP-16.

2.1 *GWTP Influent & Effluent Monitoring*

GWTP samples are obtained both before and after treatment. The pumped groundwater is collected in an equalization tank to smooth any fluctuations in the streams from the vertical extraction wells (VEWs) and/or sumps at the interceptor collection trenches (ICTs) and to provide a continuous feed to the GWTP. The samples are collected from dedicated sampling valves installed on the line between the equalization tank and treatment plant and on the treated effluent discharge line.

Sampling of the GWTP influent and effluent (as appropriate) will occur at the same time as that for the daily monitoring. Sampling will not occur until the pH, temperature, and the specific conductance of the water have stabilized. These parameters will be considered to be stabilized within approximately 10 percent over at least two measurements. The minimum volume of water removed between measurement sets is 20 gallons.

Table 2-1
Sampling and Analysis of Groundwater

Location	Sampling Frequency	Drivers	Parameters	Test Method
GWTP Air Emissions	Continuous	Record of Decision, Site 18/24, page 24. Ref. 30 TAC 116. General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.4, page 2-19. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24.	1. Total Hydrocarbons	1. Model 51 FID (Thermo Environmental Instruments, Inc.) or equivalent
GWTP Air Emissions	Quarterly	Record of Decision Site 18/24, page 24. Ref. 30 TAC 116. General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.4, page 2-19. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24.	1. Volatile Organics	1. TO-14 (EPA/625/R-96/010b)
GWTP Influent	Annual Flow-weighted composite sample for all except volatiles	General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24. Monthly sampling for certain constituents left in place due to compliance violations per letter from TCEQ dated July 26, 2000.	1. Record of Decision Table 2 Volatiles 2. Record of Decision Metals 3. Chemical Oxygen Demand 4. Chloride 5. Sulfate 6. Perchlorate	1. 8260B ^a 2. 6010B ^a , 7000 ^a , 7421 ^a 3. 410.4 ^b 4. 325.3 ^b /9056 ^a 5. 375.4 ^b /9056 ^a 6. 9058 ^a /314 ^b (IC)
GWTP Effluent	Continuous	Record of Decision for Site 18/24. Table 2, page 25. General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24.	1. pH 2. Flow	1. pH probes and transmitter 2. Endress Hauser electromagnetic flow meter
GWTP Effluent	Daily (on site)	Record of Decision Site 18/24. Table 2, page 25. In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for GWTP Onsite Remediation System Operations Plan for Site 18/24.	1. Chloride 2. Sulfate	1. 325.3 ^b /9056 ^a 2. 375.4 ^b /9056 ^a
GWTP Effluent	Biweekly (every other week); Grab sample & flow-weighted composite for all except volatiles	Record of Decision Site 18/24. Table 2, page 25. In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.3, page 2-17. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24. Frequency changed to biweekly per approval from TCEQ March 19, 1999 & EPA March 24, 1999.	1. Record of Decision Table 2 Volatiles 2. Lead (total) 3. Chloride 4. Sulfate 5. Perchlorate 6. Chromium (hexavalent)	1. 8260B ^a 2. 6010B ^a 3. 325.3 ^b /9056 ^a 4. 375.4 ^b /9056 ^a 5. 9058 ^a /314 ^b (IC) 6. Hach Test Kit or equivalent

Table 2-1 (continued)
Sampling and Analysis of Groundwater

Location	Sampling Frequency	Drivers	Parameters	Test Method
GWTP Effluent	Quarterly Grab sample & flow-weighted composite for all except volatiles	Record of Decision Site 18/24. Table 2, page 25. In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24. Approval received for quarterly sampling from TCEQ per letter dated July 26, 2000	1. Record of Decision Table 2 Volatiles 2. Record of Decision Table 2 Metals 3. Oil & Grease 4. Chemical Oxygen Demand 5. Chloride 6. Sulfate 7. Perchlorate	1. 8260B ^a 2. 6010B ^a , 7000 ^a , 7421 ^a 3. 9070 ^a /1664 (EPA-821-B-94-004b) 4. 410.4 ^b 5. 325.3 ^b /9056 ^a 6. 375.4 ^b /9056 ^a 7. 9058 ^a /314 ^b (IC)
Site 16 Extraction Wells	Annual 8 vertical extraction wells (or more as needed by Shaw to monitor performance of remedy)	Two wells installed as part of a pilot study and another six installed under the Accelerated Remedial Investigation, June 1997. No specific guidance for sampling frequency found other than 40 CFR 264.	1. Volatiles 2. Chloride 3. Perchlorate	1. 8260B ^a 2. 9253 ^a 3. 9058 ^a /314 ^b (IC)
Site 18/24 Interceptor Collection Trenches	Annual from each Interceptor collection trench sump (up to 28)	General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.5, page 2-33. Sampling originally quarterly sampling in IRA Work Plan. Sampling changed to semi-annual in 2000 in Onsite Remediation Operations Plan for Site 18/24. Work Plan revised in 3/99 to remove quarterly sampling frequency requirement (undocumented)	1. Volatiles 2. Perchlorate 3. Chloride	1. 8260B ^a 2. 9058 ^a /314 ^b 3. 325.3 ^b /2253 ^a
Site 18/24 Monitoring Wells	Semi-Annual 15 monitoring wells (see Figure 2-1 for well locations)	In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.5, page 2-33. Sampling changed to semi-annual in 2000 in Onsite Remediation Operations Plan for Site 18/24. Work Plan revised in 3/99 to remove six month sampling frequency requirement (undocumented)	1. Record of Decision Table 2 Volatiles 2. Arsenic (total), Barium (total), Cadmium (total), Chromium (total), Lead (total), Silver (total), Selenium (total), Zinc (total), Nickel (total) 3. Perchlorate 4. Chloride	1. 8260B ^a 2. 6010B ^a , 7000 ^a , 7421 ^a 3. 9058 ^a /314 ^b (IC) 4. 9253 ^a

Notes and Abbreviations:

^a U.S. Environmental Protection Agency (USEPA), 1986

^b USEPA, 1983

FID flame ionization detector

IC ion chromatography

Table 2-2
Testing Plan for Fluidized Bed Reactor

Parameter	Laboratory Location	Analytical Method	Frequency (startup)	Frequency (normal operation)	Sample Location	Reason for Monitoring Parameter
Oxidation-Reduction Potential (ORP)	Field	Probe	Daily (5 × week)	Daily (5 × week) ORP is monitored Online	FBR Recycle	Used to determine acetic acid dosage. Measurement in negative region is usually good. Carbon donor (acetic acid) directly affects ORP readings.
Ammonia-N	Off-site Laboratory	Hach Method 8038 (Nessler)*	Daily (5 × week)	2 × week	FBR Recycle	Used to determine if adequate nutrients are available. .2 mg/L or 0 if some TKN residual is present.
Ortho-Phosphate	Off-site Laboratory	Hach Method 8048 (ascorbic acid)*	Daily (5 × week)	2 × week	FBR Recycle	Used to determine if adequate nutrients are available. Measurement greater than 2 mg/L is usually good.
Carbon Bed Height	Field	Sounding Device	Daily (5 × week)	Daily	FBR Reactor	Used to determine FBR bed height.
Total Phosphorous (TP)	Off-site Laboratory	Hach Method 8190 (digestion, persulfate, ascorbic acid)*	(3 × week)	2 × week	FBR Influent & Recycle	Used to determine if adequate nutrients are available.
Total Kjeldahl Nitrogen (TKN)	Off-site Laboratory	Hach Method (digestion, Nessler)	(3 × week)	2 × month	FBR Effluent	Used to determine if sufficient nutrients are available. Usually not lower than 1.6 is good.
pH	Field	Probe	3 × week	pH is Monitored Online	FBR Influent, Recycle, & Effluent	Used to determine if on-line pH probe is out of calibration.
Perchlorate	Off-site Laboratory	IC-EPA 314.0	2 × week	1 x month 2 x week	FBR Influent FBR Effluent	Influent analyses used to set acetic acid addition rate. Objective of FBR operation is to remove perchlorate to < 4.00 ppb.
Total Organic Carbon (TOC)	Off-site Laboratory	Hach Method (digestion, persulfate, sulfuric acid)	2 × week	2 × week	FBR Influent and Recycle	Used to confirm reactor operation. Slight residual TOC expected from "old" cell debris.
Chloride	On-site Laboratory	Hach Method 951	As required	As required	FBR Effluent	
Sulfate	On-site Laboratory	IC, Hach Method	As required	As required	FBR Influent & FBR Effluent	Effluent should not be more than ½ ppm lower than influent or reaction is going too far and converting SO ₄ to H ₂ S.
Alkalinity	Off-site Laboratory	EPA 310.1	Quarterly	Quarterly	FBR Effluent	
Total Hardness	Off-site Laboratory	EPA 130.2	Quarterly	Quarterly	FBR Effluent	
Total Dissolved Solids (TDS)	Off-site Laboratory	EPA 160.1	Quarterly	Quarterly	FBR Effluent	
Cations	Off-site Laboratory	EPA 300.0	Quarterly	Quarterly	FBR Effluent	Na ⁺ , Mg ⁺² , Ca ⁺² , K ⁺

Sample containers will be filled directly from the dedicated sampling valves. A common container will not be used to fill sample bottles. Samples for chemical analysis will be collected in the following order:

- Field parameters (pH, conductivity, flow rate)
- Volatile organics
- Oil and grease
- Metals
- Sulfate
- Chloride
- Perchlorate

Table B-1 (**Appendix B**) lists container, preservation, and handling requirements for each parameter and Table B-2 (**Appendix B**) lists holding times.

2.1.1 Flow Weighted Composite Sample

To obtain a 24-hour composite for continuous discharges, equal portions are collected over a 24-hour period. For effluent that discharges only part of the day, collect a minimum of four portions over the operational day.

Rinse the sample container with effluent before collecting the sample. Collect the sample, apply a completed label, enter the sampling information on the chain-of-custody form and place the sample on ice.

Before delivery to the analytical lab, measure the temperature of a small portion of one of the samples. Enter the shipping temperature on the chain-of-custody form. The storage and shipping temperature should be less than 5 degrees Celsius.

2.2 GWTP Air Monitoring

The testing plan for air emissions at the GWTP is presented in **Table 2-3**. Air monitoring samples are collected quarterly as required in the scope of work to meet TCEQ Ambient Air Quality Regulations in accordance with the approved Air Monitoring Plan (Complete Environmental Services [CES], 2000).

Air samples are collected in SUMMA[®] passivated containers. No cleaning of these containers will be performed on site.

2.3 Sites 18 & 24 ICT Monitoring

Groundwater from the ICT sumps is fed directly into an equalization tank prior to treatment. Sampling of the groundwater after equalization but before treatment is performed in accordance

with **Section 2.1**. GWTP influent sampling is also performed at the extraction points to identify the contributions of the constituents of concern from individual ICT sumps.

Table 2-3
Groundwater Treatment Plant Testing Plan for Air

Frequency Of Testing	Parameters	Test Method
Continuous GWTP Air Emissions	Total Hydrocarbons	Model 51 FID (Thermo Environmental Instruments, Inc.) or equivalent
Quarterly GWTP Air Emissions	Volatile Organics	TO-14 (EPA/625/R-96/010b)

Abbreviations:

FID flame ionization detector
GWTP groundwater treatment plant

Groundwater is collected from dedicated sampling valves installed on the line between the pump and the equalization tank, and at the pump location. The groundwater pumping is expected to be continuous and therefore the groundwater samples will be taken at approximately the same time each sampling event.

If the pumping is discontinued for any reason (i.e., the sump shuts down due to low water levels), the samples will not be taken until after at least two hours of pumping. Also, sampling will not occur until pH, temperature, and conductivity of water have stabilized. These parameters will be considered to be stabilized within approximately 10 percent over at least two measurements. The minimum volume of water removed between measurement sets is 20 gallons.

All sample containers will be filled directly from the dedicated sampling valve. A common container will not be used to fill sampling bottles. Sampling equipment and containers will be kept from ground contact, but may be placed on the concrete slab on the ground.

Samples of groundwater from the extraction wells obtained for chemical analysis are taken in the following order:

- Field parameters (pH, conductivity, temperature, flow rate, and volume)
- Volatile organics
- Chloride
- Heavy metals
- Perchlorate

Table B-1 (**Appendix B**) lists container, preservation, and handling requirements for each parameter and Table B-2 (**Appendix B**) lists holding times.

2.4 LHAAP-16 Extraction Well Monitoring

Groundwater from the VEWs is fed directly into an equalization tank prior to treatment. Sampling of the groundwater after equalization but before treatment is performed in accordance with **Section 2.1**. GWTP influent sampling is also performed at the extraction points to identify the contributions of the constituents of concern from individual VEWs.

The groundwater is collected from dedicated sampling valves installed on the line in the LHAAP-16 pumphouse. The dedicated valves are between the pump and the equalization tank. The groundwater pumping is expected to be continuous and therefore the groundwater samples will be taken at approximately the same time each sampling event.

If the pumping is discontinued for any reason (i.e., the pump shuts down due to low water levels), the samples will not be taken until after at least two hours of pumping. Also, sampling will not occur until pH, temperature, and conductivity of water have stabilized. These parameters will be considered to be stabilized within approximately 10 percent over at least two consecutive measurements. The minimum volume of water removed between measurement sets is 20 gallons.

Sample containers will be filled directly from the dedicated sampling valve. A common container will not be used to fill sampling bottles. Sampling equipment and containers will be kept from contact with the floor or other materials that may have had contact with contaminants.

Samples of groundwater from the extraction units obtained for chemical analysis are taken in the following order:

- Field parameters (pH, conductivity, temperature, flow rate, and volume)
- Volatile organics
- Chloride
- Perchlorate

Table B-1 (**Appendix B**) lists container, preservation, and handling requirements for each parameter and Table B-2 (**Appendix B**) lists holding times.

2.5 Monitoring Well Monitoring

Open wells are monitoring wells that will not be fitted with dedicated purging and sampling equipment. They will be purged with a dedicated or disposable bailer or portable purging system. They will be sampled with disposable, Teflon[®] bailers or stainless steel dedicated

bailers. The portable system typically consists of a submersible or purge pump and a discharge pipe. The purge pump will be operated by a portable generator. After purging is completed, the equipment will be removed from the well and cleaned thoroughly. Cleaning is to include decontamination in three separate consecutive cleaning tubs as follows:

1. The equipment will be washed with a phosphate-free detergent and nylon brush in distilled water in the first tub.
2. The equipment will be washed with distilled water and a nylon brush in the second tub.
3. Step two will be repeated.

For the purging pump and associated tubing, water from the above tubs will be pumped through these pieces of equipment and into waste drums prior to cleaning in the subsequent tubs. The bailers will be disposed of in a drum and will be treated as solid waste to be stored on site and the spent cleaning/purge water will be sent to the GWTP. Clean plastic sheeting is to be placed beneath all field sampling equipment in order to alleviate any contamination from the soil. The used sheeting will be disposed of in the same manner as personal protective equipment (PPE). Several monitoring wells have dedicated Well Wizard pumps and sampling equipment (i.e., sampling ports). In these cases, samples are obtained directly from the sampling ports after the required purging is completed and stabilization has been verified. Any non-dedicated equipment will be cleaned as discussed above.

2.5.1 Monitoring Well Inspection

Upon arrival at the wellhead during a sampling event, the Groundwater Monitoring Well Inspection Form (**Figure 2-2**) should be filled out completely for each well. The completed form should be returned to the GWTP office. The inspection forms will be reviewed to determine if the wells need maintenance. Shaw staff will perform routine maintenance of the well. If it is determined that the well needs significant repairs, the information will be reviewed with the CERCLA Army Project Manager to determine whether Shaw should take action to repair/replace the well.

Each groundwater monitoring well will be inspected as often as it is sampled and not less than once a year. The completed inspection forms will be on file at the GWTP office.

2.5.2 Measurement of Static Water Level Elevations in Monitoring Wells & Piezometers

Groundwater-monitoring wells at LHAAP have steel protective covers, which are secured with padlocks.

Before well evacuation and sampling is performed, the depth of the well and the static water level of the well are measured. Measurements are made from the notch in the top of the well

casing and recorded in the field journal and other appropriate forms. This measurement, with the date and time, is recorded to 0.01 foot on the field data log sheet. Some historically contaminated wells require measurement of non-aqueous phase liquid (NAPL), or “floaters” and “sinkers.” For these wells, the dedicated bailers must be removed from the well and packed securely in a non-permeable bag to prevent the bailer from being contaminated. The well should be sampled for NAPLs prior to evacuation for conventional sampling.

A portable static water level meter is used to measure water levels. If the electronic device is not operable, a second standby electronic measuring device is used. Both devices are identical and are capable of measurement with a reliability of 0.01 foot. The probe will be rinsed in Type II reagent grade water immediately before being lowered into the well and immediately after removing it from the well. If the well/piezometer is heavily contaminated, additional cleaning of the probe may be required. Cleaning should be done in accordance with manufacturer’s instructions and decontamination procedures described in Attachment 9 of Appendix D of the Installation-Wide Work Plan (Shaw, 2006a).

An electronic KECK Model KIR-89 portable NAPL meter or similar meter will be used to detect and measure the layers of free product and water in the wells. Water level measurements are then used to calculate the volume of groundwater in the well. The measuring device is decontaminated between uses in separate wells to prevent cross-contamination of wells. Decontamination will be performed in accordance with Attachment 9 of Appendix D of the Installation-Wide Work Plan (Shaw, 2006a).

2.5.3 Monitoring Well Evacuation Procedures

Prior to sampling, the stagnant water within the well (three casing volumes) will be removed so that fresh formation water can enter. If after removing three volumes of water, the pH, temperature, and conductivity have not stabilized, then additional volumes will be removed. These parameters will be considered to be stabilized within approximately 10 percent over at least two consecutive measurements. As a guide, measurements should be taken at the end of purging each casing volume. In the case where the well runs dry before three well casings can be removed, then the sampling will take place as soon as the well has recharged (i.e., there is no need to remove any more casing volumes). The purged water will be sent to the GWTP for processing as described in the Waste Management Plan. The wells will be sampled as soon as possible after purging, but not before they achieve 85 percent recovery.

If full recovery time exceeds two hours, sampling will take place as soon as sufficient volume is available to retrieve samples for each required parameter. If the recharge rate is high for a well, the purge water is removed at a slower rate to prevent agitation of the recharge water. For slowly recharging wells, sampling will take place as soon as sufficient recharge has occurred to fill sampling containers. In all cases, sampling will take place within 24 hours of purging. The

sampling crew will record the recharge rate, the date, time, and rate of purging, and any unusual conditions noted with this operation. Non-dedicated purging equipment will be thoroughly cleaned as described in decontamination procedures.

The well casing volume is first determined by using the well depth and water level measurements. A sampling pump or a dedicated sampling bailer (if the well does not have a pump) is then used to remove three volumes of water from the well.

Volumes for the well being purged are determined using the following formula:

Three Casing Volumes =

$$([T-W]) \times \frac{D^2}{4} \times 7.48 \times 3 = \text{Minimum Purge Amount (gallons)}$$

Where:

T = Total depth of well in feet
W = depth to static water level in feet
= 3.1412
D = diameter of the well pipe in feet

Five Casing Volumes =

$$([T-W]) \times \frac{D^2}{4} \times 7.48 \times 5 = \text{Minimum Purge Amount (gallons)}$$

Where:

T = Total depth of well in feet
W = Depth to static water level in feet
= 3.1412
D = Diameter of the well pipe in feet

For each well diameter size, a factor may be calculated to simplify the formula.

2-inch well: $(T-W) \times 0.49 = 3.0$ casing volumes

4-inch well: $(T-W) \times 1.96 = 3.0$ casing volumes

2-inch well: $(T-W) \times 0.82 = 5$ casing volumes

4-inch well: $(T-W) \times 3.26 = 5$ casing volumes

If the well does not yield the three volumes, it will be evacuated to dryness once. When the well recovers sufficiently, in situ or field analyses are done on water samples to measure pH, temperature, and specific conductance. As soon as the well has recovered sufficiently, samples should then be collected and containerized in the order of parameters' volatilization sensitivity. The well should be retested for pH, temperature, and specific conductance after sampling as a measure of purging efficiency. Four replicate measurements for field analyses on each well are taken and recorded on the Groundwater Sampling Log Form (see Attachment 2 of Appendix D of the Final Installation-Wide Work Plan) (Shaw, 2006).

The pH and conductivity meters are calibrated each morning before purging and sampling, and the calibration is checked in the field several times throughout the day. Meters will be checked to more than one standard to ensure accuracy. Calibration data is recorded in the calibration logbook, which is kept at the GWTP office.

2.5.4 Monitoring Well Sampling and Testing

Open wells will be sampled with a dedicated, disposable, Teflon[®] bailer, which will be slowly lowered into the well. Each sample container will be filled directly from the bailer. A common container will not be used to fill sample bottles. Closed wells will be sampled directly from the dedicated sampling ports into the individual sample containers. Sampling equipment and containers will be kept from ground contact, and may be laid on plastic sheets on the ground. Upgradient wells will be sampled before downgradient wells.

Samples of groundwater for chemical analysis are taken in the following order:

1. Field parameters (pH, conductivity, temperature, water levels, and water volumes)
2. Volatile organics
3. Total organic carbon
4. Extractable organics (including explosives)
5. Total metals
6. Dissolved metals
7. Sulfate and chloride
8. Perchlorate

Dedicated positive displacement bladder pumps are used to retrieve samples from MW-1 through MW-15. The pumps are made entirely of stainless steel and Teflon[®], and sample tubing is Teflon[®]-lined.

Dedicated stainless steel and PVC bailers are used in all other wells to collect sample water. The sample from each well is collected with as little agitation as possible to prevent the loss of volatile contaminants by gently lowering the bailer into the water column.

Care must be taken to minimize sample agitation and contact with the atmosphere, especially for samples taken for organic analyses. The sampling pump is used to minimize agitation as well as the dedicated bailer is used while retrieving samples for organic analysis. During sample collection, the flow rate of water is not to exceed 100 milliliters per minute. These samples are put into clean glass containers, which have Teflon[®]-lined lids or septa. To assure that no headspace is present the container is turned upside-down and checked for the presence of air bubbles.

Table B-1 (**Appendix B**) lists container, preservation, and handling requirements for each parameter and Table B-2 (**Appendix B**) lists holding times.

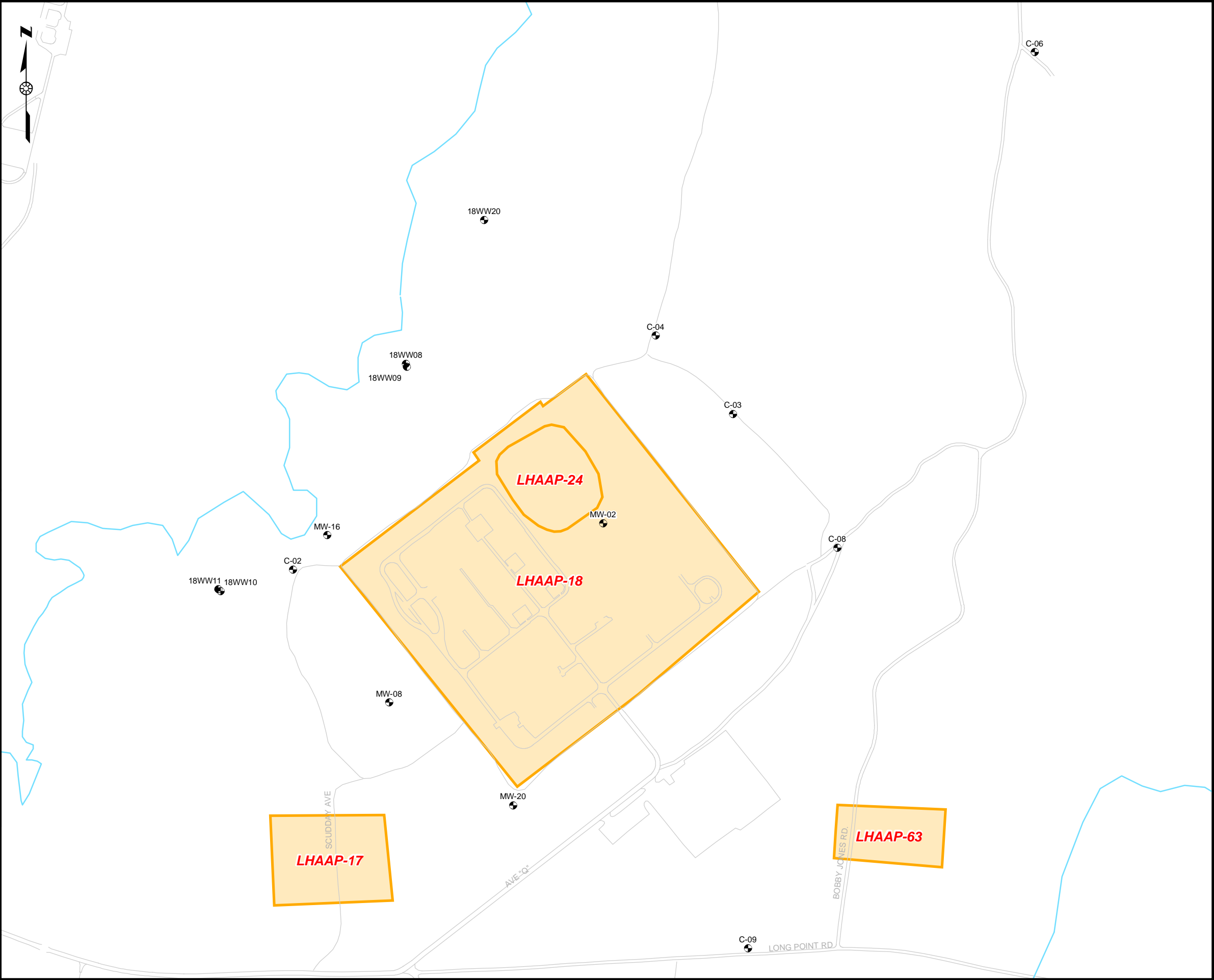
The sequence of operations for groundwater sampling is as follows:

- Purge slow recharging wells at the outset of the sampling day
- Purge and sample other wells
- Sample slow rechargers, if possible
- Preserve the samples
- Package and ship the samples to the laboratory

2.5.4.1 Immiscible Layers in Monitoring Wells

Immiscible liquid layers may be encountered in some of the monitoring wells. If immiscible liquid layers are encountered, the following procedures will be followed:

- The level of the immiscible layer surface and water interface will be determined with an electronic probe. The apparent thickness of the immiscible layer is defined as the difference between the liquid level and the interface level.
- A sample will be collected, using a transparent Teflon[®] bailer. Presence of the immiscible layer will be confirmed visually.



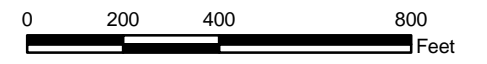
- ☒ Shallow Monitoring Well
- ☐ Intermediate Monitoring Well

Stream

_____ Road

 Lake/Pond

Site



U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 2-1

MONITORING WELL LOCATION MAP
LHAAP-18/24

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

MONITORING WELL INSPECTION CHECKLIST**INSPECTION FREQUENCY REQUIRED: Each Sampling Event****DATE:** _____**TIME:** _____**WELL No.:** _____

This inspection is required in accordance with the LHAAP RCRA Part B Hazardous Waste Permit Number 50195.

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
OUTER CASING		
INNER CASING		
SLAB		
BUMPER POLES		
PAINT ON OUTER CASING		
WELL NUMBER LEGIBLE		
LOCKING CAP		
INNER CASING COVER CAP		
LOCK OR SEAL		
VEGETATION		
EROSION		
DEBRIS		
FIREANTS		

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE: _____

Figure 2-2
Groundwater Monitoring Well Inspection Form

3.0 *Training and Staffing Requirements for Sampling*

Field operations will be conducted by the on-site Shaw team. Personnel collecting groundwater samples at LHAAP will have completed First Responder operations level training IAW 29 CFR 1910.120.

PPE will vary according to which site is to be monitored. Various areas at LHAAP are known to have high concentrations of metals and solvents in the groundwater.

Most metals are carcinogenic, and most are toxic by ingestion, inhalation, and/or skin absorption. Wearing personal protective clothing and maintaining good work practices will minimize the possibility of exposure to metals. Exposure to metals through skin contact will be controlled through proper PPE. Exposure to metals via inhalation is expected to be minimal as little dust is generated from groundwater sampling. If high winds are present during a sampling event it is to be postponed until a later time.

Solvents identified in the groundwater at LHAAP sites include methylene chloride, trichloroethene, vinyl chloride, etc. The primary route of exposure to solvents is through the respiratory system, although other routes of exposure may be by skin absorption and/or ingestion. Most of these solvents have been identified to be carcinogens. Due to the unconfined spaces at the sampling site and the rapid volatility of these compounds, the possibility of exposure through inhalation is low. Air monitoring at the most contaminated wells will be conducted to determine when an air respirator will be required. PPE will control the possibility of exposure through skin contact.

In order to minimize contact with potentially hazardous materials the following personal protective equipment will be worn:

- Cotton or Tyvek[®] full body coveralls
- Chemical resistant gloves
- Steel toe rubber safety work boots
- Hard hat (if overhead hazards are present)
- Safety glasses

Personnel involved in groundwater monitoring will have access to a NIOSH approved air purifying respirator (full-face). Appropriate cartridges will be made available to the field personnel as necessary. Respirators will be added to the personnel protective equipment as determined by the on-site safety officer.

4.0 *Decontamination of Sampling Equipment*

The sampling equipment will be transported in sealed, clean containers, and care will be taken to avoid contamination. Cleaning is to include decontamination in three separate consecutive cleaning tubs as follows:

1. The equipment will be washed with a phosphate free detergent. Fully immerse hose, measuring tape, and other equipment and brush clean.
2. The equipment will be washed with distilled water and a nylon brush in the second tub.
3. Step two will be repeated.
4. Spray equipment with hexane.
5. Allow sampling equipment to dry thoroughly.

Sampling equipment will then be rinsed with hexane and allowed to air dry and are sealed back into clean containers. The spent cleaning water will be sent to the GWTP for processing. A cleaning seal will accompany each bailer with the following information: equipment identification number, date and time cleaned, and signature of the person who cleaned the equipment. The inclusion of the cleaning seal and numbering of the equipment allows for the tracking of any cleaning or cross contamination problems between samples. Each member of the sampling crew will don a new pair of gloves at each sampling location. The person collecting samples will wear disposable plastic gloves and will change them between each sampling interval for each sampling site.

5.0 *Field Quality Assurance/Quality Control*

5.1 *Quality Control Personnel*

Program personnel are responsible for monitoring and reviewing procedures used in each stage of the work to assure that data generated during the execution of this Sampling and Analysis Plan is accurate, complete, precise and representative of site conditions. The lead operator for the GWTP is designated as the Quality Control Manager (QCM) and will be responsible for the proper execution of the field QC.

5.2 *Chemical Samples*

QC samples for groundwater, soil, and vapor will be used to verify that the sampling and analytical techniques are being performed properly. QC samples will be taken in the field and analyzed with the field samples by the same off-site laboratory. QC samples required for groundwater, soil, and vapor sampling include travel blanks, equipment blanks, and replicates. QA/QC samples are described below. Air monitoring QA/QC samples are described in the Air Monitoring Plan (CES, 2000).

Travel Blanks

Travel blanks consist of ASTM International Type II reagent water sealed into a sample vial in the field laboratory. The blank is not opened again until it is received in the laboratory. One travel blank will be prepared for each shipment of water samples containing two or more samples for volatiles that are shipped in the same ice chest to the lab each day. Travel blanks measure cross contamination during shipment and contamination sources contacted during shipment. They are only analyzed for volatiles.

Equipment/Field Blanks

Equipment blanks for soil and/or water samples will consist of ASTM International Type II water which has been poured over or through non-dedicated sampling equipment such as augers, knives, spoons, or split spoon samplers. They will be shipped in the ice chest with the associated samples from the site. Equipment blanks will be prepared and preserved in the same manner as a water sample. Equipment blanks measure the effectiveness of equipment decontamination. Equipment blanks are taken at a rate of 1 for every 20 samples and are analyzed for the same constituents as the associated soil or water samples.

Replicate Samples

Replicate samples or splits are extra samples as identical as possible to the original. They may consist of a composite, or as a series of grab samples from the same source. Every tenth sample is taken in duplicate. The two samples will be sent to the analytical lab as a field sample and a QC sample, each with a unique sample number.

Field Calibration

All field testing equipment is calibrated in the laboratory each day before field use. The calibration is checked in the field several times during the day. Readings are recorded in the calibration logbook.

6.0 *Sample Handling and Testing*

6.1 *Sample Numbering System*

Sample numbers are assigned by the project manager and are unique to each site. Sample numbers identify the site, sample location, and type of blank or replicate. Sample numbers are assigned as follows:

LHss-hhhh-aaaa-bb

LHss refers to the site being investigated at Longhorn Army Ammunition Plant (LH18/24), hhhh is the well, boring number, sampling port/valve, or air monitoring location

aaaa is the sample number

bb is a QC modifier, when needed, where:

QC = a QC sample (split for contract lab)

TB = travel blank

EB = equipment blank

GRAB = grab sample

COMP = composite sample

For example, the effluent sample (SP650) taken as a grab from LHAAP-18/24 is sample number 6813 and would be identified as:

LH 18/24-SP650-6813-GRAB

6.2 *Sample Containers and Preservatives*

The type of sample container used for each parameter, the required preservatives, and the maximum holding times are listed in Tables B-1 and B-2 (**Appendix B**). New containers are used for sample collection, which precludes container cleaning. However, each container is rinsed once with the water being sampled prior to filling the container.

6.3 *Shipment of Samples*

Field samples are collected in appropriately labeled, pre-cleaned sample containers, and enclosed within a Ziploc[™] bag. All ice utilized inside the cooler will be containerized within two plastic freezer bags of 1 quart or larger size. The ice chest is filled with ice and the chain-of-custody (COC) form and field data form are placed inside in a sealable plastic bag placed on top of the ice. The ice chest is wrapped with strapping and a seal is placed on the strapping. The samples are then delivered to the shipper. Samples are shipped on the day they are sampled if possible.

Air monitoring samples are prepared and shipped as described in Air Monitoring Plan (CES, 2000).

6.4 Sample Receipt at Laboratory

After the ice chests are received at the subcontract laboratory, the samples are logged in, the COC is signed, and a cooler receipt form is filled out. This form documents the condition of the samples as received. The samples are checked for breakage or leakage and the temperature of the ice bath is checked. If the temperature exceeds 4°C or if any other problems are noted, this information is recorded on the COC and QCM is notified of the problem.

Preservation of samples is performed in the field. Samples collected in the field are placed on ice and delivered or shipped to the off-site laboratory that same day.

7.0 *Data Quality Objectives*

The data quality objectives (DQOs) of this project have been chosen to meet the goals of the interim remedial action. DQOs are qualitative and quantitative statements that specify the quality of data required to support decisions made during remedial response activities. These DQOs will be used throughout the interim remedial action process. Data developed during this phase of work will be used to operate the groundwater treatment plant systems and to confirm remediation goals. The minimum internal data reporting requirements (USACE, 1989) which will be required of all analytical laboratories includes the following:

- Sample identification numbers cross-referenced with laboratory IDs and QC sample numbers.
- Problems with arriving samples noted on an appropriate form (not applicable to on-site testing).
- Each analyte reported as an actual value or less than a specified quantitation limit as listed in Tables B-3 to B-5 (**Appendix B**), or in the Air Monitoring Plan (CES, 2000).
- Dilution factors, extraction dates, and analysis dates also reported.
- QC samples to be included as laboratory blanks, surrogate spikes, matrix spikes, laboratory duplicates, field duplicates, and field blanks.

The data developed from the scope of work described in this plan will meet the objectives discussed below with respect to precision, representativeness, accuracy, completeness, and comparability. The majority of this data will be developed in the laboratory from the analysis of field samples and the remainder will be measured in the field.

7.1 *Accuracy*

Accuracy is the degree to which a measurement agrees with the actual value, i.e., and the amount of measurement bias. Accuracy is expressed as a percent recovery of a known concentration of reference material. The accuracy of an analytical procedure is determined by the addition of a known amount of material (matrix spike) to a field sample matrix or a standard matrix. A standard matrix is made up of distilled water or sterile, clean soil with approximately the same physical properties (porosity, permeability, plasticity, grain size, etc.) as the field sample. The field sample matrix is described as all components of the sample mixture except the analyte (the compound being analyzed). The lab will be required to perform matrix spiking on 5 percent of field samples, as well as on 5 to 10 percent of standard matrix samples. Field sample matrix and standard matrix sample spiking show how the sample matrix-analyte chemical interactions affect the analytical results. The matrix behavior of the spiked field sample will be comparable to that

of the matrix of the original sample. After analysis for the spike is completed, the accuracy of the procedure is expressed as a percent recovery as shown by the following equation:

$$\text{Percent Recovery} = \frac{(C_2 - C_1)}{C_0} \times 100 \text{ percent}$$

where C_0 = amount of analyte added to the sample matrix
 C_1 = amount of analyte present in the unspiked sample matrix (equal to zero for the standard matrix)
 C_2 = amount of spiked material recovered in the analysis

Typically, the amount of a reference analyte spiked into a field sample matrix is specified by the laboratory quality control program, or 3 to 5 times the background concentration of the analyte in the sample matrix. Samples cannot be spiked for all organic compounds which could possibly exist in the field sample matrix; however, a set of surrogate compounds, each of whose physical and chemical properties is similar to a class of organic compounds, is used as surrogate matrix spikes, or surrogates. Acceptable recovery ranges for each class of organic compounds are discussed in the analytical methods for each parameter.

7.2 Precision

Precision is a measure of the degree of reproducibility of an analytical value and is used as a check on the quality of the sampling and analytical procedures. Precision is determined by analyzing replicate samples. The significance of a precision measurement depends on whether the sample is a field replicate, lab replicate, or a matrix spike replicate. Field replicates are taken at the rate of 10 percent or one per batch (each daily shipment of samples from a site whichever is greater. Precision of the analytical method, at each stage, is determined by calculation of a relative percent difference [RPD] between duplicate analytical results of a sample component, relative to the average of those results:),

$$\text{RPD} = \frac{|C_2 - C_1|}{(C_2 + C_1)/2} \times 100 \text{ percent}$$

where C_1 = analyte concentration in the sample
 C_2 = analyte concentration in the sample replicate

and $| \quad |$ = an absolute value (it is customary to express RPD as a positive number)

These calculations are usually performed on matrix spikes and matrix spike duplicates.

7.3 *Completeness*

Field completeness will be assessed by comparing the number of samples collected to the number of samples planned. Analytical completeness will be assessed by comparing the total number of samples with valid analytical results to the number of samples collected. The overall project completeness is, therefore, a comparison between the total number of valid samples to the number of samples planned. The results will be calculated following data validation and reduction. Completeness is determined by:

$$C = \frac{P_1}{P_0} \times 100 \text{ percent}$$

where P_0 = total number of samples planned
and P_1 = number of valid data points

A value of 90 percent or higher is the goal. For values less than 90 percent, problems in the sampling or analytical procedures will be examined and possible solutions explored.

7.4 *Representativeness*

Representativeness expresses the degree to which sample data accurately and precisely represent actual site conditions. The determination of the representativeness of the data will be performed by:

- Comparing actual sampling and chain of custody procedures to those described in this Sampling and Analysis Plan
- Identifying and eliminating nonrepresentative data
- Evaluating holding times and condition of samples on arrival at the laboratory (not applicable to on site testing)
- Examining blanks for cross contamination

Representativeness is a qualitative determination. The representativeness objective of this plan is to eliminate all non-representative data.

7.5 *Comparability*

Comparability is a qualitative measure of the confidence with which one data set can be compared to another. These data sets include data generated by different laboratories performing work under this plan, data generated by laboratories in previous investigative phases, data generated by the same laboratory over a period of several years, or data obtained using differing sampling techniques or analytical protocols. The comparability objectives of this plan are (1) to

generate consistent data using standard test methods; and (2) to salvage as much previously generated data as possible.

7.6 *Sensitivity*

Sensitivity is a general term that refers to the calibration sensitivity and the analytical sensitivity of a piece of equipment. The calibration sensitivity is the slope of the calibration curve evaluated in the concentration range of interest. The analytical sensitivity is the ratio of the calibration sensitivity to the standard deviation of the analytical signal at a given analyte concentration. The detection limit, which is based on the sensitivity of the analysis, is the smallest reported concentration in a sample within a specified level of confidence. Quantitation limits represent the sum of all of the uncertainties in the analytical procedure plus a safety factor. The detection limit is a part of the quantitation limit. Quantitation limits are given in Tables B-3 to B-5 (**Appendix B**).

7.7 *Field Measurements*

Field measurements will be performed to Level I standards. These will include measurements of pH, conductivity, and temperature on groundwater samples. Precision on field measurements will be assessed by four replicate measurements to determine reproducibility. These consecutive readings should be $\pm 1^\circ$ for temperature, ± 0.02 units for pH, and ± 10 percent for conductivity. In addition, the percent moisture of pretreated soil will be determined as an operational parameter. It will not be necessary to perform replicate analyses for this test.

8.0 Laboratory QA/QC Requirements

The laboratory will be able to perform analyses by the applicable test methods described in *Test methods for Evaluation of Solids Waste, Physical/Chemical Methods* (USEPA, 1986b), and *Methods for Chemical Analyses of Water and Wastes* (USEPA, 1983). A listing of the specific test methods can be found in **Appendix B**.

The laboratory uses as a guide and reference the “Handbook for Analytical Quality Control in Water and Wastewater Laboratories,” U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory EPA-600/4-79-019, March 1979, Cincinnati, OH 45268.

The laboratory follows good laboratory practices for laboratory cleanliness as applied to glassware, apparatus, reagent preparation, solvent and/or gas usage, and facilities in general. Required quantitation limits for each parameter are provided in **Appendix B**.

8.1 General Laboratory QA/QC Requirements for Inorganic Parameters

General Laboratory QA/QC requirements for inorganic parameters are as follows:

1. Initial Calibration Curve

The initial calibration curve is checked by analyzing EPA Reference Standard Solutions or other suitable reference solutions. If these measurements differ statistically from the accepted value, the standard stock solution is prepared again or adjusted until analysis of the reference solution provides acceptable measurements.

Fresh stock of calibrating solutions for each analyte is prepared at least monthly or before each set of existing calibration standards is depleted. Analysis of each new set of calibration solutions must agree statistically with the old set before use.

2. Blank Analysis

A calibration blank must be analyzed each time an instrument is calibrated.

3. Duplicate Sample Analysis

Duplicate sample analysis is run at least once for each group of samples, and in most cases for each individual sample. The RPD is calculated and reported on a QC report form. If the duplicate results fail to meet the precision requirements, the following steps are taken until the requirements are met; checking of data for calculation or transcription errors, preparation of new standards, recalibration of instrument, and reanalysis of duplicate samples.

4. Spiked Sample Analysis

Spiked samples are used to provide information about the effect of the sample matrix on the analytical methodology. A spiked sample is analyzed at least once for each set

of samples. The results of the spiked sample analysis are recorded on the QC report form. If the spiked sample results fail to meet accuracy requirements, the following steps will be taken until the requirements are met; checking of data for calculation or transcription errors, preparation of new standards, recalibration of instruments, and reanalysis of spiked samples.

8.2 General Laboratory QA/QC Requirements for Organic Analytes

General Laboratory QA/QC requirements for organic analytes are as follows:

1. Instrument Calibration

Instrument calibration is performed following guidelines given in Section 7 of EPA Methods SW-846 (USEPA, 1986b).

2. Blank Analysis

A reagent blank analysis is performed at least once for each set of samples. A reagent blank is a volume of distilled water carried through the entire analytical procedure. The volume of the blank is approximately equal to the sample volume. The reagent blank is used to determine if measurements of samples reflect contamination.

3. Matrix Spiked Duplicate Analysis

Matrix spiked duplicate analysis is performed on at least one sample from each batch or five percent of all samples, whichever is larger. To accomplish this, three additional duplicate samples will be collected and designated for matrix spiked duplicate analysis. The matrix spike will consist of a standard mix of specific organic compounds. The recoveries of the compounds in the mix will provide information about the matrix effect of the sample on the analytical methodology. Results of the spiked sample analyses are recorded on the QC report form.

Recoveries for individual components of the matrix spike as well as the relative percent differences for each component are calculated and recorded. If the recovery or relative percent difference of the spiking matrix does not meet the requirements for accuracy and precision, the following steps are taken until the requirements are met: 1) checking for errors in calculation or transcription, 2) recalibration of instrumentation, 3) re-analysis of matrix spike duplicate, and 4) re-analysis of all samples analyzed with matrix spike.

Analytical methods from these sources are given in Table B-2 (**Appendix B**).

Quantitation limits are given in Tables B-3 through B-5 (**Appendix B**). Quantitation limits, however, are dependent on the concentration of the components in the matrix to be analyzed.

8.3 Laboratory Logbook

The laboratory analyzing groundwater samples for LHAAP maintains a logbook detailing such information as sample preparation techniques, experimental conditions, instrument reading, and sample and QA/QC results.

9.0 *Sample Integrity*

The quality of analytical data is suspect if the integrity of the sample cannot be ensured. Integrity includes the procedures and written records which, when taken together, verify that the sample is as represented.

9.1 *Security*

Security involves procedures that ensure sample integrity. Security is required until final disposal of the sample after laboratory analysis is complete. Aspects of sample security are discussed below.

9.1.1 *Security of the Well and Samples in the Field*

Each well will have a locking cap and keys will be given out only to those who need them. Samples, once taken, will be in the possession of the sampling crew or locked in the field laboratory. QA and QC samples will be taken, which, when analyzed, will also document the integrity of the sample.

9.1.2 *Security of the Sample in the Laboratory*

Samples will be stored in a secure area in the laboratory with limited access to authorized laboratory personnel. Upon receipt of the ice chests, laboratory personnel will check the temperature of the ice bath, the condition of the samples, and the accuracy of the accompanying paper work.

9.2 *Custody*

Custody consists of formal records that document integrity. These records are described below.

9.2.1 *Chain-of-Custody Form*

The COC is a record that describes the sample, the date and method of sampling, the analyses required, and also contains the following information:

A COC record contains the following information:

- Sample and well identification number
- Signature or collector
- Date and time of collection
- Number of containers
- Parameters requested for analysis
- Signature of person accepting samples at the lab
- Dates samples changed possession

- Internal temperature of shipping container when sealed for shipment
- Internal temperature of shipping container upon receipt by lab
- Laboratory-assigned sample number

It has spaces for signatures of those receiving and relinquishing the samples. The form is normally signed by the sampler, the individual preparing the samples for shipment, and the receiving individual at the laboratory. The individual preparing the samples for shipment maintains a copy. The original COC is incorporated into the hard copy laboratory report, where it is placed on file. An example of this form is given in **Figure 9-1**.

9.2.2 Bill of Lading

A bill of lading (airbill) documents receipt of the samples by the carrier. It is not possible for the carrier's representative to sign the COC since it is sealed in the ice chest. Bills of lading are kept on file in the GWTP Office.

9.2.3 Cooler Receipt Form

The cooler receipt form is completed by the laboratory and documents the condition of the samples as received by the lab. This form is available in the hard copy laboratory report.

9.3 Sample Tracking and Identification

Other than the items listed in **Section 6.2**, there is additional documentation discussed below that demonstrate sample integrity.

9.3.1 Field Logbook

The field logbook is a bound record, kept by the sampling crew, in which sampling information is recorded. It is taken to the field to record all items of interest. It is used in the field lab to record preservation and preparation procedures for shipment. It is also used to record equipment calibration and decontamination of sampling equipment. In case of concurrent operations, sampling information will be transferred to the field logbook in the field lab. The information for the COC and field data form comes from the field logbook.

9.3.2 Field Data Form

The sample collectors complete a field log sheet for each well sampled. Field measurements such as pH, conductivity, and water levels as well as problems with the location or the sample are noted on this form. Field data forms are taken for all sampling events.

The log sheet contains the following information:

- Well identification number
- Depth of well

- Date and time well was purged
- Static water level
- Minimum amount purged
- Total amount purged
- Name of collector
- Well identification number
- Date and time samples are collected
- Four replicate of pH
- Four replicate of specific conductivity/temperature
- Preservatives used
- Climatic conditions w/ambient air temperature
- Name of collector

Field log sheets are kept on file in the GWTP office. An example of a field collection report for groundwater sampling is provided in Attachment 2 of Appendix D of the Installation-Wide Work Plan (Shaw, 2006a).

9.3.3 Sample Labels

Labels on each jar or air monitoring container include the location (well number, boring number, valve/port, or sample location), the sample number, the date and time of collection, preservation (if any), parameters requested, and the initials of the sampler. An example label is provided in **Figure 9-2**.

9.3.4 Custody Seals

Custody seals are narrow strips of adhesive paper or glass fiber used to demonstrate that no tampering of the sample cooler has occurred. The custody seal will be signed and dated by the Sample Technician and placed across the opening of the lid and body of the sample transport container (e.g., cooler) on one side and the front (cover the custody seal with wide, clear tape). A custody seal should also be placed from one side, across the top (lid), and to the other side of the sample container. A sample custody seal is shown on **Figure 9-3**.



Shaw® Shaw Environmental, Inc.

3010 Briarpark Drive, Suite 4N
Houston, TX 77042 (713) 996-4400

CHAIN-OF-CUSTODY

No. 10510

Laboratory Name:				Address:				Contact:			
Project Name		Project Location		Project Telephone No.		Analysis and Method Desired (Indicate separate containers)		Remarks			
Project No.	Project Contact	Project Manager/Supervisor	Matrix	Grab	Comp	Date	Time	Sample Number	Sample Description, Location		
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
Transfers Relinquished By (Signature)				Date/Time		Transfers Accepted By (Signature)		Date/Time			
TAT: _____ Standard _____ Rush Due: _____				Seals Intact? _____ Y _____ N		Received Good Condition _____ Y _____ N		Cold			
Laboratory				Laboratory		FedEx Airbill No.:		Sampler's Signature			

White - Lab Copy Canary - Field Copy Pink - File Copy

Figure 9-1
Chain-of-Custody

PROJECT NAME/#:	<u>LHAAP/117591</u>	SAMPLE NO:	<u>LH18/24-MW18-7123-GRAB</u>
LOCATION:	<u>MW 18</u>	DATE:	<u>17-FEB-2007</u>
SAMPLER:	<u>RBW</u>	TIME:	<u>1415</u>
PRESERVATIVE:	<u>ICE</u>	ANALYSIS:	<u>SW8260B</u>

Figure 9-2
Sample Label

CUSTODY SEAL	
PERSON COLLECTING SAMPLE	<u>RBW</u>
DATE COLLECTED	<u>17-FEB-2007</u>

Figure 9-3
Sample Custody Seal

10.0 Data Reduction, Validation, and Reporting

10.1 Field Data

Field data reduction will be performed by Shaw. Data validation in the field is determined primarily by making several readings (QC checks for reproducibility). Periodic QA oversight is also a part of the validation process. The field data is sent to the GWTP onsite office on the field data form.

10.2 Laboratory Data

Laboratory data are reduced at the contract lab, which generates a laboratory report containing the analytical data, field and quality control duplicate data comparisons, and lab quality control data. Laboratory deliverables include the following:

- Results of field samples, laboratory blanks, surrogate spikes, surrogate recoveries, matrix spikes, laboratory control samples, laboratory duplicates, matrix spike duplicates, relative percent differences, field duplicates, and field blanks
- Table(s) that cross-reference field samples with associated method blanks, matrix spikes, and matrix spike duplicate samples
- Legible copies of the fully executed chain-of-custody forms and cooler receipt forms on which the laboratory has documented the condition of the samples on arrival
- Actual sample results, sample quantitation limits, and practical quantitation limits reported in a tabular format. Each analyte will be reported as an actual value or less than a specified quantitation limit. Data qualifiers will be used to address sample/analytical anomalies associated with an analyte.
- Soil samples will be reported on a dry weight basis with moisture content. Sampling dates, dilution factors, extraction dates, and analysis dates will also be reported.
- Laboratory data will be provided as a hard copy and an electronic data deliverable which will be loaded into the ShawView data base. A Shaw chemist will review the laboratory reports according to TCEQ TRRP-13 guidelines and add validation qualifiers to the data base. The TRRP-13 data review checklist generated by the Shaw chemist will be placed in the project file.
- Calibration and internal standards information, raw data (which includes equipment/analyst worksheets/logbooks, mass spectra, gas chromatograph/mass spectrophotometer tuning calibrations, chromatograms, sample extraction volumes, etc.), and all instrumentation graphs and traces will be available from the laboratory, if needed.

10.3 Technical Data

Technical data refers to data of several types, such as groundwater flow calculations, stratigraphic maps generated from geologic and geophysical field data, isopleth profiles of contaminants, and groundwater models. Technical data will be reduced, validated, and reported by the project staff.

10.4 Reports to EPA and TCEQ

A monthly summary report will be provided in accordance with contractual requirements.

11.0 Corrective Action

11.1 Field Data

Corrective action for poor field data quality (as determined by replicate measurements or prior expectation) consists of remeasurement until successive readings agree within reasonable limits. Examples of frequently made measurements and limits to which they should agree include:

- pH – measurements should agree within 0.02 pH unit.
- Conductivity – measurements should agree within two numbers of the last significant digit.
- Depth and water level measurements – readings should agree within 0.01 foot.

If remeasurement is not successful, then instrument calibration and operation and the user's technique will be evaluated.

11.2 Laboratory

Laboratory corrective action is described in the analytical method for that analysis.

11.3 Implementing and Reporting

Corrective action should be initiated at the lowest level possible. Corrective action, which involves correcting a mistake for little potential of repetition, need not be reported as long as the error was not reported. For example, an erroneous water level measurement, such as 40 feet in a 30-foot well, would be corrected by making several additional readings that agreed with each other and looked reasonable. It would not be necessary to report this error. Corrective action involving a potentially repetitive error or one that had been reported should be documented in writing. For example, an erroneous water level measurement due to a low battery in the water level indicator should be documented because previous suspect water levels may need to be flagged and/or checked. The corrective action report would state the nature of the problem and the potential ramifications, as well as the types of actions taken. In this case, it would be necessary to replace the battery and check the last several days of readings of the indicator. This report will be sent to the project manager.

12.0 References

American Public Health Association, 1989, *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., APHA, Washington, DC.

Complete Environmental Services, 2000, *Air Monitoring Plan, Longhorn Army Ammunition Plant, Groundwater Treatment Plant, Site 18/24 and 16, Karnack, Texas*, June.

Shaw Environmental, Inc. (Shaw), 2006a, *Final Installation-Wide Work Plan, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, January.

Shaw, 2006b, *Memorandum: Sampling Modifications for LHAAP-18/24, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, October.

Texas Commission on Environmental Quality (TCEQ), 2002, *TCEQ Regulatory Guidance, Review and Reporting of COC Concentration Data, RG-366/TRRP-13*, December 2002.

U.S. Army Corps of Engineers (USACE), 1989, *Minimum Chemistry Data Reporting Requirements for DERP and Superfund HTW Projects*, CEMRD-ED-GC Memorandum, August.

USACE, 1990, *Chemical Data Quality Management for Hazardous Waste Remedial Activities*, ER-1110-1-263, January.

USACE, 1995, *Record of Decision for Early Interim Remedial Action at Burning Ground No. 3, Longhorn Army Ammunition Plant, Karnack, Texas*, May.

U.S. Environmental Protection Agency (USEPA), March, 1983, *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020.

USEPA, 1986a, *RCRA Groundwater Monitoring Technical Enforcement Guidance Document*, September.

USEPA, 1986b, *Test Methods for Evaluating Solid Waste*, SW 846, 3rd Ed, November.

USEPA, 1987, *Development of an RFI Work Plan and General Considerations for RCRA Facility Investigations*, SW-87-001.

Appendix A
Related Documents

A-1

Table 2 from Record of Decision

012711

TABLE 2
Effluent Limitations for the Discharge of Remediated Groundwater

Pollutants	Units are (µg/l)		
	Daily Average	Daily Maximum	MAL
Methylene Chloride (Dichloromethane)	803	1699	20
Trichloroethylene	85	181	10
1,1-Dichloroethane	6633	14032	10
1,1-Dichloroethene (1,1-Dichloroethylene)	119	253	-
1,2-Dichloroethane	85	181	10
Vinyl Chloride	34	72	10
Acetone	1132	2395	-
Chloroform	1708	3615	10
Tetrachloroethene (Tetrachloroethylene)	85.4	180.7	10
Ethylbenzene	26954	57025	10
Styrene	2829	5987	-
Toluene	1980	4189	10
Benzene	85	181	10
Xylene	39.5	83.6	-
Carbon Tetrachloride	85	181	10
1,1,1 Trichloroethane	3417	7230	10
1,1,2 Trichloroethane	102.5	216.9	10
Aluminum	777	1644	20
Arsenic (Total)	365	772	10
Barium (Total)	1000	2000	10
Cadmium (Total)	1.6	3.4	1
Chromium (Total)	355	752	5
Chromium (3+)	297	628	10
Chromium (6+)	58	124	10
Cobalt*	5433	11495	-
Iron*	1132	2395	-
Lead (Total)	2.2	4.6	5

012712

TABLE 2
(Continued)

Pollutants	Units are (µg/l)		
	Daily Average	Daily Maximum	MAL
Nickel (Total)	87	184	10
Manganese*	7323	15494	-
Silver (total Equivalent)	1.4	3	2
Selenium (Total)	5.7	12	5
Vanadium*	1698	3592	-
Zinc	146	310	5
Chlorobenzene	22300	47180	50
Hexachlorobenzene	0.22	0.47	10
Oil and Grease	N/A	15	-
Chemical Oxygen Demand	N/A	200	-
Chloride	See Note Below	N/A	-
Sulfate	See Note Below	N/A	-

*Assumes 100% dissolved

Note: Discharge limits for Chloride and sulfate are to be based on discharge rates using the following formula:

$$C_C \geq \frac{Q_S C_A + Q_E C_E}{Q_E + Q_S}$$

where:

Q_S = Flow rate in the receiving stream, Harrison Bayou and/or Central Creek, in cubic feet per second (cfs). This flow rate shall be measured at a constant location no less than 100 feet upstream from the point of discharge of treated groundwater. Measurements will be taken daily in Harrison Bayou and Central Creek in accordance with TNRCC's Water Quality Monitoring Manual, August, 1994.

C_A = Chloride/Sulfate (ambient), 10,000 microgram/per liter (µg/l) (from State of Texas Water Quality Inventory)

C_C = Chloride/Sulfate criteria, 100,000 µg/l for Chloride and 50,000 ug/l for Sulfate (from State of Texas Water Quality Inventory)

Q_E = Treated Groundwater Discharge Rate in cfs. The groundwater pumping and treatment rate shall be adjusted as necessary in order to meet the required effluent concentration C_E .

C_E = Effluent Concentration (discharge limit) in µg/l.

012713

TABLE 2
(Continued)

Example: For a discharge rate of 250,000 gallons per day or 0.39 cfs, and a flow rate in the receiving stream of 4 cfs, the discharge limit for chloride would be:

$$100,000 = \frac{(4.0)(10,000) + (0.39)(C_E)}{0.39 + 4.0}$$

$$C_E = 1,023,000 \mu\text{g/l}$$

DEFINITIONS

Daily average concentration - the arithmetic average of all effluent samples, composite or grab as required by this permit within a period of one calendar month, consisting of at least four separate representative measurements. When four samples are not available in a calendar month, the arithmetic average (weighted by flow) of all values taken during the month shall be utilized as the daily average concentration.

Daily maximum concentration - the maximum concentration measured on a single day, by composite sample, unless otherwise specified elsewhere in the permit.

TAC reference - most of the limitations are based upon water quality standards found at TAC 307 for the protection of human health and aquatic life. The limit for Barium is from TAC 319 - Subchapter B.

MAL - the minimum analytical level. All testing must be completed utilizing EPA approved methods which can detect the pollutant to the referenced MAL.

N/A - Not Applicable.

A-2

**Letter: Monitoring and Reporting Requirements for Plant
Discharges**

Barry R. McBee, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Dan Pearson, *Executive Director*

AD 016340

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

December 13, 1995

David Tolbert, Project Manager
Longhorn Army Ammunition Plant
Attn: SIOLH-OR
Marshall, Texas 75671-1059

**CERTIFIED MAIL
P 836 901 073
RETURN RECEIPT REQUESTED**

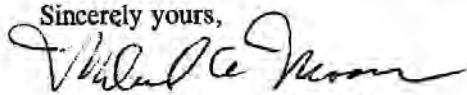
Re: Longhorn Army Ammunition Plant
Interim Remedial Action - Burning Ground No.3
Phase III Work Plan, Volumes 1 through 5
Monitoring and Reporting Requirements for Plant Discharges

Dear Mr. Tolbert:

Please find the attached comments in response to the discussions held on November 30, 1995 between the staff of the Texas Natural Resource Conservation Commission (TNRCC), DOW Environmental, and the U. S. Army Corps of Engineers, regarding monitoring and reporting requirements for the above referenced project. Also attached, please find a copy of TNRCC's standard permit provisions, which are based on 30 TAC Chapter 305, which has previously been identified as Applicable or Relevant and Appropriate Requirements (ARARs), which support these comments.

In response to the your request made during the Project Manager's Meeting held on November 30, 1995, regarding the format for the Quarterly Ground-Water Monitoring Report, a letter report will be acceptable. According to our Industrial and Hazardous Waste staff, the following information is to be included in the letter report: dates of period being reported, analytical results tables (no raw data), potentiometric maps, potentiometric data tables, well location maps, analytical concentration data maps (if available), and any additional information applicable, such as well functioning problems. If you have any questions or comments, please contact me at (512) 239-2483.

Sincerely yours,



Michael A. Moore (MC 143)
RI/FS II Unit
Superfund Investigation Section
Pollution Cleanup Division

Enclosures

cc: Jonna Polk, COE Tulsa District (CESWT-PP-EA)
Lisa Price, EPA Region 6 (6SF-AT)

P.O. Box 13087 • Austin, Texas 78711-3087 • 512/239-1000

Superfund Engineering Section's Comments (Alvie Nichols)

No.	Section/page	TNRCC Comments to LHAAP response
8	Monitoring of Groundwater Quality	When on-site results show water has passed cleanup requirements and off-site results show failure and water has already been discharged then the USACE must notify the TNRCC in accordance with the attached: Paragraph 7, Noncompliance Notification, Monitoring and Reporting Requirements, DEFINITIONS AND STANDARD PERMIT CONDITIONS. Notifications shall be made to the Project Manager in lieu of Enforcement Section of the Watershed Management Division.
13	Monitoring of Groundwater Quality and Soils and Source Material treatment	<p>The USACE shall maintain records of groundwater treatment monitoring activities in accordance with the attached: Items a and c of Paragraph 3, Records of Results, Monitoring and Reporting Requirements, DEFINITIONS AND STANDARD PERMIT CONDITIONS. Records shall be maintained at the facility site and/or shall be readily available for review by the TNRCC for a period of 3 years from the date of the record of sample, measurement, report or certification. The USACE shall also provide a monthly report to the TNRCC Project Manager. Report shall include at a minimum: total volume discharged for that month, total volume discharged to date, and list of noncompliance(s), if applicable.</p> <p>The USACE shall also maintain records of soils and source material treatment in accordance with the same as above. The USACE shall also provide a monthly report to the TNRCC Project Manager. Report shall include volume treated and transported for that month, and total volume treated and transported to date.</p>

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DEFINITIONS AND STANDARD PERMIT CONDITIONS

As required by Title 30 Texas Administrative Code (TAC) Chapter 305, certain regulations appear as standard conditions in waste discharge permits. 30 TAC §§305.121-305.129, Subchapter F, "Permit Characteristics and Conditions" as promulgated under the Texas Water Code, §§5.103 and 5.105, and §§361.017 and 361.024(a) of the Texas Solid Waste Disposal Act establish the characteristics and standards for waste discharge permits, including sewage sludge. The following text includes these conditions and incorporates them into this permit. All definitions contained in Section 26.001 of the Texas Water Code shall apply to this permit and are incorporated herein by reference. Additional definitions of words or phrases used in this permit are as follows:

1. Flow Measurements

- a. Daily average flow - the arithmetic average of all determinations of the daily discharge within a period of one calendar month. The daily average flow determination shall consist of determinations made on at least four separate days. If instantaneous measurements are used to determine the daily discharge, the determination shall be the arithmetic average of all instantaneous measurements taken during that month. Daily average flow determination for intermittent discharges shall consist of a minimum of three flow determinations on days of discharge.
- b. Instantaneous flow - the measured flow during the minimum time required to interpret the flow measuring device.
- c. 2-hour peak (domestic wastewater treatment plants) - the maximum flow sustained for a two-hour period during the period of daily discharge. Multiple measurements of instantaneous maximum flow within a two-hour period may be compared to the permitted 2-hour peak flow.
- d. Daily maximum flow - the highest total flow for any 24-hour period in a calendar month.

2. Concentration Measurements

- a. Daily average concentration - the arithmetic average of all effluent samples, composite or grab as required by this permit within a period of one calendar month, consisting of at least four separate representative measurements. When four samples are not available in a calendar month, the arithmetic average of the four most recent measurements or the arithmetic average (weighted by flow) of all values taken during the month shall be utilized as the daily average concentration.
- b. 7-day average concentration - the arithmetic average of all effluent samples, composite or grab, within a period of one calendar week, Sunday through Saturday, consisting of at least three separate measurements.
- c. Daily maximum concentration - the maximum concentration measured on a single day, by composite sample, unless otherwise specified elsewhere in this permit.
- d. Fecal Coliform bacteria - the number of colonies per 100 milliliters effluent.

3. Sample Type

- a. Composite sample - a sample made up of a minimum of three effluent portions collected in a continuous 24-hour period or during the period of daily discharge if less than 24 hours, and combined in volumes proportional to flow collected no closer than two hours for domestic sewage. For industrial wastewater a composite sample is a sample made up of a minimum of three effluent portions collected in a continuous 24-hour period or during the period of daily discharge if less than 24 hours, and combined in volumes proportional to flow collected no closer than one hour.
 - b. Grab sample - an individual sample collected in less than 15 minutes.
4. Treatment Facility (facility) - wastewater facilities used in the conveyance, storage, treatment, recycling, reclamation and/or disposal of domestic sewage, industrial wastes, agricultural wastes, recreational wastes, or other wastes including sludge handling or disposal facilities under the jurisdiction of the Commission.

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5. The term "sewage sludge" is defined as solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in 30 TAC Chapter 312. This includes the solids separated from wastewater by unit processes which have not been classified as hazardous waste.

MONITORING AND REPORTING REQUIREMENTS

1. Self-Reporting

Monitoring results shall be provided at the intervals specified in the permit. Unless otherwise specified in this permit or otherwise ordered by the Commission, the permittee shall conduct effluent sampling and reporting in accordance with 30 TAC §§319.4 - 319.12. Unless otherwise specified, a monthly effluent report shall be submitted each month by the 20th day of the following month for each discharge which is described by this permit whether or not a discharge is made for that month.

As provided by State Law, the permittee is subject to administrative, civil and criminal penalties, as applicable, for negligently or knowingly violating the Clean Water Act, the Texas Water Code, Chapters 26, 27, and 28, and Texas Health and Safety Code, Chapter 361, including but not limited to knowingly making any false statement on any report or document, falsifying, tampering with or knowingly rendering inaccurate any monitoring device or method required by this permit or violating any other requirement imposed by state or federal regulations.

2. Test Procedures

Unless otherwise specified in this permit, test procedures for the analysis of pollutants shall comply with procedures specified in 30 TAC §§319.11 - 319.12. Measurements, tests and calculations shall be accurately accomplished in a representative manner.

3. Records of Results

- a. Monitoring samples and measurements shall be taken at times and in a manner so as to be representative of the monitored activity.
- b. Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), monitoring and reporting records, including strip charts and records of calibration and maintenance, copies of all records required by this permit, and the certification required by 40 Code of Federal Regulations §264.73(b)(9) shall be retained at the facility site and/or shall be readily available for review by a TNRCC representative for a period of three years from the date of the record or sample, measurement, report or certification. This period may be extended at the request of the Executive Director.
- c. Records of monitoring activities shall include the following:
 - i. date, time and place of sample or measurement;
 - ii. identity of individual who collected the sample or made the measurement.
 - iii. date and time of analysis;
 - iv. identity of the individual and laboratory who performed the analysis;
 - v. the technique or method of analysis; and
 - vi. the results of the analysis or measurement and quality assurance/quality control records.

The period during which records are required to be kept shall be automatically extended to and through the final disposition of any administrative or judicial enforcement action that maybe instituted against the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit using approved analytical methods as specified above, all results of such monitoring shall be included in the calculation and reporting of the values submitted on the required monthly effluent report. Increased frequency of sampling shall be indicated on the monthly effluent report.

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5. Calibration of Instruments

All automatic flow measuring and/or recording devices and/or totalizing meters required by the permit for measuring permit limited flows shall be accurately calibrated by a trained person at plant start-up and as often thereafter as necessary to ensure accuracy, but not less often than annually unless authorized by the Executive Director for a longer period. Such person shall verify in writing that the device is operating properly and giving accurate results. Copies of the verification shall be kept at the plant site for at least three years.

6. Compliance Schedule Reports

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date to the appropriate Regional Office and the Watershed Management Division enforcement staff.

7. Noncompliance Notification

- a. Unless specified otherwise, any noncompliance which may endanger human health or safety, or the environment shall be reported to the TNRCC. Report of such information shall be provided orally or by facsimile transmission (FAX) to the Regional Office within 24 hours of becoming aware of the noncompliance. A written submission of such information shall also be provided to the Regional Office and to the Enforcement Section of the Watershed Management Division within five working days of becoming aware of the noncompliance. The written submission shall contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.
- b. Unauthorized discharges as defined in Permit Condition 2(g) of this permit shall be reported under Part a of this noncompliance notification provision.
- c. Notwithstanding any of the above, any effluent violation which deviates from the permitted effluent limitation by more than 40% shall be reported in writing to the Regional Office and the Enforcement Section of the Watershed Management Division within 5 working days of becoming aware of the noncompliance.
- d. Any noncompliance other than that specified in this section, or any required information not submitted or submitted incorrectly, shall be reported to the Enforcement Section of the Watershed Management Division as promptly as possible. This requirement means to report these types of noncompliance on the monthly self-report form.

8. Signatories to Reports

All reports and other information requested by the Executive Director shall be signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).

PERMIT CONDITIONS

1. General

- a. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in an application or in any report to the Executive Director, it shall promptly submit such facts or information.
- b. This permit is granted on the basis of the information supplied and representations made by the permittee during the application process, relying upon the accuracy and completeness of that information and those representations. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked, in whole or in part in accordance with 30 TAC 305.61 - 305.62, during its term for cause including but not limited to, the following:

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- i. Violation of any terms or conditions of this permit;
- ii. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
- iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

- c. The permittee shall furnish to the Executive Director, upon request and within a reasonable time, any information to determine whether cause exists for amending, revoking, suspending or terminating the permit. The permittee shall also furnish to the Executive Director, upon request, copies of records required by the permit.

2. Compliance

- a. Acceptance of the permit by the person to whom it is issued constitutes acknowledgement and agreement that such person will comply with all the terms and conditions embodied in the permit, and the rules and other orders of the Commission.
- b. The permittee has a duty to comply with all conditions of the permit. Failure to comply with any permit condition constitutes a violation of the permit and the Texas Water Code or the Texas Solid Waste Disposal Act, and is grounds for enforcement action, for permit amendment, revocation or suspension, or for denial of a permit renewal application or of an application for a permit for another facility.
- c. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.
- d. The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal or other permit violation which has a reasonable likelihood of adversely affecting human health or the environment.
- e. Authorization from the Commission is required before beginning any change in the permitted facility or activity that may result in noncompliance with any permit requirements.
- f. A permit may be amended, suspended and reissued, or revoked for cause. The filing of a request by the permittee for a permit amendment, suspension and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- g. There shall be no unauthorized discharge of wastewater or any other waste. For the purpose of this permit, an unauthorized discharge is considered to be any discharge of wastewater into or adjacent to waters in the state at any location not permitted as an outfall or otherwise defined in the Other Requirements of this permit.
- h. A temporary diversion of wastewater around a unit or units to a permitted outfall for the purposes of maintenance or repair is not a violation of this permit as long as the wastewater complies with all other standards, terms and conditions of this permit. Notice shall be provided to the Regional Office at least 24 hours in advance of any temporary diversion, where practical. Where prior notice for a temporary diversion is not practical, notice shall be provided to the Regional Office as soon as possible but at least within 24 hours after beginning the temporary diversion. Notwithstanding any of the above, the Commission may require that an application be submitted for formal authorization.

3. Inspections and Entry

- a. Inspection and entry shall be allowed as prescribed in the Texas Water Code, Chapters 26, 27, and 28, and Texas Health and Safety Code, Chapter 361.
- b. The members of the Commission and employees and agents of the Commission are entitled to enter any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to the quality of water in the state. Members, employees, or agents acting under this authority who enter

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private property shall observe the establishment's rules and regulations concerning safety, internal security, and fire protection, and if the property has management in residence, shall notify management or the person then in charge of his or her presence and shall exhibit proper credentials. If any member, employee, or agent is refused the right to enter in or on public or private property under this authority, the Executive Director may invoke the remedies authorized in Texas Water Code Section 26.123.

4. Permit Amendment

- a. The permittee shall give notice to the Executive Director prior to physical alterations or additions to the permitted facility if such alterations or additions would require a permit amendment or result in a violation of permit requirements.
- b. Prior to any facility modifications, additions and/or expansions of a permitted facility that will increase the plant capacity beyond the permitted flow, the permittee must apply for and obtain proper authorization from the Commission before commencing construction.
- c. The permittee must apply for an amendment or renewal at least 180 days prior to expiration of the existing permit in order to continue a permitted activity after the expiration date of the permit. Authorization to continue such activity will terminate upon the effective denial of said application.
- d. Prior to accepting wastes which are not described in the permit application or which would result in a significant change in the quantity or quality of the existing discharge, the permittee must report the proposed changes to the Commission. The permittee must apply for a permit amendment reflecting any necessary changes in permit conditions, including effluent limitations for pollutants not identified and limited by this permit.
- e. Texas Water Code §26.029(b) After a public hearing, notice of which shall be given to the permittee, the Commission may require the permittee, from time to time, for good cause, to conform to new or additional conditions. The Commission shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Commission may grant additional time.

5. Permit Transfer

- a. Prior to any transfer of this permit, Commission approval must be obtained. The Commission shall be notified, in writing, of any change in control or ownership of facilities authorized by this permit. Such notification should be sent to the Permit Application Team in the Watershed Management Division.
- b. A permit may be transferred only according to the provisions of 30 TAC §305.64 (relating to Transfer of Permits) and 30 TAC 305.97 (relating to Action on Application for Transfer).

6. Relationship to Hazardous Waste Activities

This permit does not authorize any activity of hazardous waste or solid waste storage, processing or disposal which requires a permit or other authorization pursuant to the Texas Health and Safety Code.

7. Relationship to Water Rights

Disposal of treated effluent by any means other than discharge directly to the waters in the state must be specifically authorized in this permit and may require a permit pursuant to Chapter 11 of the Texas Water Code.

8. Property Rights

A permit does not convey any property rights of any sort, or any exclusive privilege.

9. Permit Enforceability

The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

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OPERATIONAL REQUIREMENTS

1. The permittee shall at all times ensure that the facility and all its systems of collection, treatment, and disposal are properly operated. This includes the regular, periodic examination of wastewater solids within the treatment plant by the operator in order to maintain an appropriate quantity and quality of solids inventory as described in the various operator training manuals and according to accepted industry standards for process control such as the Commission's "Recommendations for Minimum Process Control Tests for Domestic Wastewater Treatment Facilities." Process control records shall be retained at the facility site and/or shall be readily available for review by a TNRCC representative for a period of three years.
2. Upon request of the Executive Director, the permittee shall take appropriate samples and provide proper analysis in order to demonstrate compliance with Commission rules. Unless otherwise specified in this permit or otherwise ordered by the Commission, the permittee shall comply with all provisions of 30 TAC §312.1-§312.13 concerning sewage sludge use and disposal and §§319.21 - 319.29 concerning the discharge of certain hazardous metals.
3. Domestic wastewater treatment facilities shall comply with the following provisions:
 - a. The permittee shall notify the Executive Director in care of the Permitting Section, Watershed Management Division, in writing of any closure activity or facility expansion at least 90 days prior to conducting such activity.
 - b. Closure activities include those associated with any pit, tank, pond, lagoon, or surface impoundment regulated by this permit.
 - c. As part of the notification, the permittee shall submit to the Municipal Permits Team in Austin, a closure plan which has been developed in accordance with the "Closure Guidance Documents" available through Record System Services for the Office of Waste Management & Pollution Cleanup.
4. The permittee is responsible for installing prior to plant start-up, and subsequently maintaining, adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failures by means of alternate power sources, standby generators, and/or retention of inadequately treated wastewater.
5. Unless otherwise specified, the permittee shall provide a readily accessible sampling point and, where applicable, an effluent flow measuring device or other acceptable means by which effluent flow may be determined.
6. The permittee shall remit an annual waste treatment fee to the Commission as required by 30 TAC 305 (Subchapter M) and an annual water quality assessment fee to the Commission as required by 30 TAC 320. Failure to pay either fee may result in revocation of this permit.
7. Documentation

For all written notifications to the Commission required of the permittee by this permit, the permittee shall keep and make available a copy of each such notification, upon the same basis as self-monitoring data are required to be kept and made available.
8. Facilities which generate domestic wastewater shall comply with these provisions; domestic wastewater treatment facilities at permitted industrial sites are excluded.
 - a. Whenever flow measurements for any domestic sewage treatment facility reach 75 percent of the permitted average daily flow for three consecutive months, the permittee must initiate engineering and financial planning for expansion and/or upgrading of the domestic wastewater treatment and/or collection facilities. Whenever the average daily flow reaches 90 percent of the permitted average daily flow for three consecutive months, the permittee shall obtain necessary authorization from the Commission to commence construction of the necessary additional treatment and/or collection facilities. In the case of a domestic wastewater treatment facility which reaches 75 percent of the permitted daily average flow for three consecutive months, and the planned population to be served or the quantity of waste produced is not expected to exceed the design limitations of the treatment facility, the permittee shall submit an engineering report supporting this claim to the Executive Director of the Commission. If in the judgement of the Executive Director the population to be served will not cause

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- permit noncompliance, then the requirement of this section may be waived. To be effective, any waiver must be in writing and signed by the director of the Watershed Management Division of the Commission or an authorized agent, and such waiver of these requirements will be reviewed upon expiration of the existing permit; however, any such waiver shall not be interpreted as condoning or excusing any violation of any permit parameter.
- b. The plans and specifications for domestic sewage collection and treatment works associated with any domestic permit must be approved by the Commission, and failure to secure approval before commencing construction of such works or making a discharge is a violation of this permit and each day is an additional violation until approval has been secured.
 - c. Permits for domestic wastewater treatment plants are granted subject to the policy of the Commission to encourage the development of area-wide waste collection, treatment and disposal systems. The Commission reserves the right to amend any domestic wastewater permit in accordance with applicable procedural requirements to require the system covered by this permit to be integrated into an area-wide system, should such be developed; to require the delivery of the wastes authorized to be collected in, treated by or discharged from said system, to such area-wide system; or to amend this permit in any other particular to effectuate the Commission's policy. Such amendments may be made when the changes required are advisable for water quality control purposes and are feasible on the basis of waste treatment technology, engineering, financial, and related considerations existing at the time the changes are required, exclusive of the loss of investment in or revenues from any then existing or proposed waste collection, treatment or disposal system.
9. Domestic wastewater treatment plants shall be operated and maintained by sewage plant operators holding a valid certificate of competency at the required level as defined in 30 TAC Chapter 325.
10. Facilities which generate industrial solid waste as defined in 30 Texas Administrative Code (TAC) §335.1 shall comply with these provisions:
- a. Any solid waste generated by the permittee during the management and treatment of wastewater, as defined in 30 Texas Administrative Code (TAC) §335.1 (including but not limited to such wastes as garbage, refuse, sludge from a waste treatment, water supply treatment plant or air pollution control facility, discarded materials, discarded materials to be recycled, whether the waste is solid, liquid, or semisolid) must be managed in accordance with all applicable provisions of 30 TAC Chapter 335, relating to Industrial Solid Waste Management.
 - b. Industrial wastewater that is being collected, accumulated, stored, or processed before discharge through any final discharge outfall, specified by this permit, is considered to be industrial solid waste until the wastewater passes through the actual point source discharge and must be managed in accordance with all applicable provisions of 30 TAC Chapter 335.
 - c. The permittee shall provide written notification, pursuant to the requirements of 30 TAC §335.6(g), to the Corrective Action Section of the Commission's Industrial and Hazardous Waste Division informing the Commission of any closure activity involving an Industrial Solid Waste Management Unit, at least 90 days prior to conducting such an activity.
 - d. Construction of any industrial solid waste management unit requires the prior written notification of the proposed activity to the Waste Evaluation Section of the Commission's Industrial and Hazardous Waste Division. No person shall dispose of industrial solid waste, including sludge or other solids from wastewater treatment processes, prior to fulfilling the deed recordation requirements of 30 TAC §335.5.
 - e. The term "industrial solid waste management unit" means a landfill, surface impoundment, waste-pile, industrial furnace, incinerator, cement kiln, injection well, container, drum, salt dome waste containment cavern, or any other structure vessel, appurtenance, or other improvement on land used to manage industrial solid waste.
 - f. The permittee shall keep management records for all sludge (or other waste) removed from any wastewater treatment process. These records shall fulfill all applicable requirements of 30 TAC Chapter 335 and must include the following, as it pertains to wastewater treatment and discharge:

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- i. Volume of waste and date(s) generated from treatment process;
- ii. Volume of waste disposed of on-site or shipped off-site;
- iii. Date(s) of disposal;
- iv. Identity of hauler or transporter;
- v. Location of disposal site; and
- vi. Method of final disposal.

The above records shall be maintained on a monthly basis and be available at the plant site for inspection by authorized representatives of the Texas Natural Resource Conservation Commission for at least five years.

11. For facilities to which the requirements of 30 Texas Administrative Code (TAC) Chapter 335 do not apply, sludge and solid wastes, including tank cleaning and contaminated solids for disposal, shall be disposed of in accordance with Chapter 361 of the Health and Safety Code of Texas.

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**June 21, 2000, Memorandum:
Longhorn Army Ammunition Plant – Decrease in Sampling Frequency**

08/01/00 TUE 15:11 FAX 512 2392440


TNRCC-SIS

006

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

To: Chris Linendol, Team Leader
Industrial Permits Team, Wastewater Permits Section,
Water Permits and Resource Management Division
Date: June 21, 2000

Thru:  James Sher, Project Manager, Superfund Cleanup Section, Remediation Division
Wade Stone, Team Leader, Superfund Cleanup Section, Remediation Division

From: RC - Robert Castro, Assistant Project Manager, Superfund Cleanup Section,
Remediation Division

Subject: Longhorn Army Ammunition Plant - Decrease in Sampling Frequency

The Longhorn Army Ammunition Plant (LHAAP) currently samples the effluent of the groundwater treatment plant (GWTP) for chloride, sulfate, barium, lead, methylene chloride, trichloroethylene, and perchlorate, biweekly (every other week). Perchlorate was added to the biweekly sampling list in January 2000. The LHAAP will be required to meet discharge criteria for perchlorate before December 1, 2002. Additionally, the LHAAP must sample the influent and effluent for the parameters listed on table 2, in enclosure A, monthly. The LHAAP would like for the Texas Natural Resource Conservation Commission (TNRCC) to consider changing the sampling frequency of the influent and effluent for the parameters listed on table 2, in enclosure A from monthly to quarterly, while maintaining the biweekly sampling of the effluent.

Please see the enclosed documents for your review

1. Enclosure A: Table 2, TNRCC Effluent Limitations
2. Enclosure B: Monthly GWTP Chemical Data Summary Sheets
3/99 - 3/00
3. Enclosure C: Summary of Biweekly Analysis
3/99 - 3/00
4. Enclosure D: Historical Influent Data
1/99-4/00

If you have any questions or need additional information please call me at (512) 239-6887 or James Sher at (512) 239-2444.

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**July 19, 2000, Memorandum:
Longhorn Army Ammunition Plant – Decrease in Sampling Frequency**

08/01/00 TUE 15:11 FAX 512 2392449

TNRCC-SIS

005

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

TO : Robert Castro, Assistant Project Manager
Superfund Cleanup Section, Remediation Division

DATE: July 19, 2000

FROM : Chris Linendoll, E.I.T., Team Leader *CL 7/19/00*
Industrial Permits Team, Wastewater Permitting Section (MC-148)

SUBJECT: Longhorn Army Ammunition Plant - Decrease in Sampling Frequency

This memorandum is in response to the request to decrease sampling frequencies at the Longhorn Army Ammunition Plant outlined in your memorandum of June 21, 2000. I have reviewed the request and supporting documentation and approve the reduction in monitoring frequencies for influent and effluent parameters from once per month to once per quarter, with the exception of monitoring reduction for hexavalent chromium, total selenium, and total silver. As outlined in your memorandum, biweekly sampling of the effluent will continue for chloride, sulfate, total barium, total lead, methylene chloride, trichloroethylene, and perchlorate.

The reduction in monitoring frequency cannot be supported for hexavalent chromium, total selenium, and total silver based on analytical results which indicated a violation of the calculated daily average effluent limitation on at least one occasion for each of these parameters. The dates and concentrations which show violations of the calculated daily average effluent limitation are outlined below:

<u>Parameter</u>	<u>Daily Avg. Limitation</u>	<u>Sampling Results</u>	<u>Date</u>
Total Lead	2.2 µg/l	4 µg/l	4/7/99
Total Silver	1.4 µg/l	4 µg/l	4/7/99
Hexavalent Chromium	58 µg/l	80 µg/l	8/17/99
Total Silver	2.2 µg/l	6 µg/l	9/7/99
Total Selenium	5.7 µg/l	17 µg/l	1/11/00
Total Selenium	5.7 µg/l	18 µg/l	2/14/00

It should be further noted that the supporting documentation (Enclosure B) submitted with your memorandum indicated that sampling results were compliant with the limitations for each of the events outlined above. This discrepancy could be explained based on the effluent limitations in the table being expressed in µg/l and the reported analytical results being expressed in mg/l.

Should additional information be provided which indicate the analytical results were compliant with the calculated daily average effluent limitations, reduction in monitoring frequencies for these parameters would be supported.

Should you require any additional assistance please contact me at extension 4515.

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**July 26, 2000, Letter:
Decrease in Sampling Frequency – Longhorn Army Ammunition
Plant Superfund Site**

08/01/00 TUE 15:09 FAX 512 2392449

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Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
John M. Baker, *Commissioner*
Jeffrey A. Saitas, *Executive Director*



TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

July 26, 2000

VIA FAX AND OVERNIGHT MAIL

Mr. David Tolbert, Commander's Representative
Department of the Army
Longhorn/Louisiana Army Ammunition Plants
P.O. Box 6558
Dodyline, Louisiana 71023-0658

Re: Decrease In Sampling Frequency
Longhorn Army Ammunition Plant Superfund Site

The Texas Natural Resource Conservation Commission (TNRCC) has reviewed the request to decrease sampling frequencies at the Longhorn Army Ammunition Plant. The TNRCC has approved the reduction in monitoring frequencies for the influent and effluent parameters in the table below from once per month to once per quarter with the exception of ~~hexavalent chromium, total selenium and total silver~~. Enclosed is an interoffice memorandum from Chris Linendoll of the TNRCC Wastewater Permit Section in response to the request and an Interoffice Memorandum from Robert Castro of the TNRCC Superfund Cleanup section submitting the request.

Parameter	Previous Sampling Frequency	Approved Sampling Frequency
Methylene Chloride	Monthly	Quarterly
Trichloro ethylene	Monthly	Quarterly
1,1 - Dichloroethane	Monthly	Quarterly
1,1 - Dichloroethene	Monthly	Quarterly
1,2 - Dichloroethane	Monthly	Quarterly
Vinyl Chloride	Monthly	Quarterly
Acetone	Monthly	Quarterly
Chloroform	Monthly	Quarterly
Tetrachloroethene	Monthly	Quarterly

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Mr. David Tolbert, Commander's Representative
July 26, 2000
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Parameter	Frequency	Sampling Frequency
Ethyl Benzene	Monthly	Quarterly
Styrene	Monthly	Quarterly
Toluene	Monthly	Quarterly
Benzene	Monthly	Quarterly
Xylene	Monthly	Quarterly
Carbon Tetrachloride	Monthly	Quarterly
1,1,1 - Trichlorethane	Monthly	Quarterly
1,1,2 - Trichloroethane	Monthly	Quarterly
Chlorobenzene	Monthly	Quarterly
Hexachlorobenzene	Monthly	Quarterly
Aluminum	Monthly	Quarterly
Arsenic (Total)	Monthly	Quarterly
Barium (Total)	Monthly	Quarterly
Cadmium (Total)	Monthly	Quarterly
Chromium (Total)	Monthly	Quarterly
Chromium (3+)	Monthly	Quarterly
Chromium (6+)	Monthly	Monthly
Cobalt	Monthly	Quarterly
Iron	Monthly	Quarterly
Lead (Total)	Monthly	Quarterly
Nickel (Total)	Monthly	Quarterly
Manganese	Monthly	Quarterly
Silver (Total Equivalent)	Monthly	Monthly
Selenium (Total)	Monthly	Monthly
Vanadium	Monthly	Quarterly

08/01/00 TUE 15:10 FAX 512 2392448

TNRCC-SIS

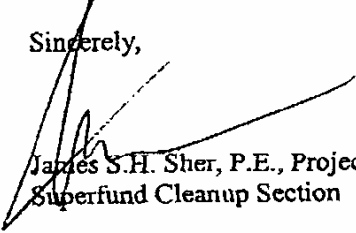
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Mr. David Tolbert, Commander's Representative
July 26, 2000
Page 3

	Frequency	Frequency
Zinc	Monthly	Quarterly
Oil and Grease	Monthly	Quarterly
Chemical Oxygen Demand	Monthly	Quarterly
Chloride	Monthly	Quarterly
Sulfate	Monthly	Quarterly

If you have any questions, please call me at (512) 239-2444.

Sincerely,


James S.H. Sher, P.E., Project Manager
Superfund Cleanup Section

JS/mmww

cc: Chris Villarreal, EPA Region 6 (6SF-AP)

A-6

**October 24, 2006, Memorandum:
Sampling Modifications for LHAAP-18/24 (text and tables, only)**



Shaw Environmental, Inc.

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Houston, Texas 77042
713.996.4400
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MEMORANDUM

Date: 24 October 2006

To: Rick Smith/USACE-Tulsa

From: David Cobb/Shaw Environmental, Inc.

RE: Sampling Modifications for LHAAP-18/24

This memo provides Shaw Environmental, Inc. (Shaw)'s planned changes to sampling at the Burning Ground No. 3/Unlined Evaporation Pond area at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. The Burning Ground No. 3 (SWMU 18) and the former Unlined Evaporation Pond (SMWU 24) are currently designated as site LHAAP-18/24. Based on previous investigation work, groundwater at the site is known to be contaminated with trichloroethene (TCE), methylene chloride, and perchlorate. The existing remediation system includes the groundwater treatment plant (GWTP), interceptor collection trenches (ICTs) with extraction wells, and both shallow and intermediate monitoring wells. The intended changes are the result of a review of current sampling frequencies and system operations.

Sampling Modifications

Several factors were considered during the review of the sampling scheme. Those factors included the following:

- redundancy of samples
- requirements of the Record of Decision (ROD)
- ultimate use of the sample results
- historical trends

Table 1 presents the sampling changes for the GWTP and monitoring well system. **Table 1** includes the existing sampling frequency, documents that drive the sampling, revised sampling frequency, reasons for the proposed changes in the sampling requirement, and the suite of analyses. The planned changes to the sampling frequency and analysis will not affect the overall system monitoring parameters.

The most significant of the changes included in **Table 1** is the reduction in the number of monitoring wells (see last row of table). **Table 2** provides additional detail on the monitoring wells. **Figure 1** presents the locations of the current monitoring wells and highlights the fifteen monitoring wells that are intended to be retained for sampling. **Figures 2 through 7**

provide the results for two key parameters (TCE and perchlorate) for May 2006, May 2004, and May 2002. As can be seen in those figures, the fifteen wells that are planned for future monitoring are sufficient to monitor the boundary of the site, potential migration toward the creek to the northwest of the site, and the hot spot in the interior of the site.

Table 1
Groundwater Treatment Plant and Well Fields
Sampling and Analysis of Groundwater

Location	Current Sampling Frequency	Drivers	Proposed Sampling Frequency	Explanation for Change	Parameters	Test Method
GWTP Air Emissions	Continuous	Record of Decision, Site 18/24, page 24. Ref. 30 TAC 116. General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.4, page 2-19. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24.	No change	Not Applicable	1. Total Hydrocarbons	1. Model 51 FID
GWTP Air Emissions	Quarterly	Record of Decision Site 18/24, page 24. Ref. 30 TAC 116. General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.4, page 2-19. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24.	No change	Not Applicable	1. Volatile Organics	1. TO-14
GWTP Influent	Monthly flow-weighted composite sample	General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24. Monthly sampling for certain constituents left in place due to compliance violations per letter from TNRC dated July 26, 2000.	Remove requirement	Not a compliance sample. Samples will be collected with annual Influent Sample.	1. Chromium (hexavalent), Silver (Total Equivalent), Selenium (Total), Lead (Total)	1. 6010B

MARC No. W912QR-04-D-0027, TO No. DS02
Longhorn Army Ammunition Plant, Karnack, Texas

Table 1 (continued)
Groundwater Treatment Plant and Well Fields
Sampling and Analysis of Groundwater

Location	Current Sampling Frequency	Drivers	Proposed Sampling Frequency	Explanation for Change	Parameters	Test Method
GWTP Influent	Quarterly flow-weighted composite sample for all except volatiles	General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24. Monthly sampling for certain constituents left in place due to compliance violations per letter from TNRCC dated July 26, 2000.	Change to annual. Remove hexachlorobenzene and oil & grease from sampling requirements	Not a compliance sample. An annual sample will be collected for information to estimate mass removal from site. Historically, there have not been detected results for hexachlorobenzene and oil & grease.	1. Record of Decision Table 2 Volatiles 2. Hexachlorobenzene (proposed to be dropped) 3. Record of Decision Metals 4. Oil & Grease (proposed to be dropped) 5. Chemical Oxygen Demand 6. Chloride 7. Sulfate 8. Perchlorate	1. 8260B 2. 8270B 3. 6010B, 7000, 7421 4. 9070/1664 5. 410.4 6. 325.3/9056 7. 375.4/9056 8. 9058/314 (IC)
GWTP Effluent	Continuous	Record of Decision for Site 18/24, Table 2, page 25. General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24.	No change	Not Applicable	1. pH 2. Flow	1. pH probes and transmitter 2. Endress Hauser electromagnetic flow meter
GWTP Effluent	Daily (on site)	Record of Decision Site 18/24, Table 2, page 25. In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for GWTP Onsite Remediation System Operations Plan for Site 18/24.	No change	Not Applicable	1. Chloride 2. Sulfate	1. 325.3/9056 2. 375.4/9056

MARC No. W912QR-04-D-0027, TO No. DS02
Longhorn Army Ammunition Plant, Karnack, Texas

Table 1 (continued)
Groundwater Treatment Plant and Well Fields
Sampling and Analysis of Groundwater

Location	Current Sampling Frequency	Drivers	Proposed Sampling Frequency	Explanation for Change	Parameters	Test Method
GWTP Effluent	Biweekly (Every Other Week); Grab Sample & Flow-weighted composite for all except volatiles	Record of Decision Site 18/24, Table 2, page 25. In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.3, page 2-17. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24. Frequency changed to biweekly per approval from TNRCC March 19, 1999 & EPA March 24, 1999.	Drop sampling requirement for Barium. Add Hexavalent Chromium (analyzed on site due to 15 minute holding time)	Barium has never been near permit limits due to low concentrations in the influent.	1. Record of Decision Table 2 Volatiles 2. Barium (Total) 3. Lead (Total) 4. Chloride 5. Sulfate 6. Perchlorate	1. 8260B 2. 6010B 3. 6010B 4. 325.3/9056 5. 375.4/9056 6. 9058/314 (IC)
GWTP Effluent	Weekly (2-samples per week)	Record of Decision Site 18/24, Table 2, page 25. Requirement added September 3, 1999 per TNRCC letter. Also agreed to by Army in Dec. 1999 Dispute Resolution for biweekly sampling of GWTP effluent.	Combine with other biweekly sampling and eliminate any redundant analyses.	Adequate FBR monitoring procedures and alarms are in place to ensure perchlorate treatment.	1. Perchlorate	1. 9058/314 (IC)
GWTP Effluent	Monthly grab and flow-weighted composite	Record of Decision Site 18/24, Table 2, page 25. In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24. Monthly sampling for certain constituents left in place due to compliance violations per letter from TNRCC dated July 26, 2000.	Drop monthly sampling requirement. Absorb analysis for Chromium into biweekly samples.	Monthly sample events should be combined with the Biweekly sample events. Chromium will be added to Biweekly and analyzed on site. Lead is already analyzed Biweekly. Silver and selenium do not pose hazard due to low concentrations in influent.	1. Chromium (hexavalent), Silver (Total Equivalent), Selenium (Total), Lead (Total)	2. 6010B

MARC No. W912QR-04-D-0027, TO No. DS02
Longhorn Army Ammunition Plant, Karnack, Texas

Table 1 (continued)
Groundwater Treatment Plant and Well Fields
Sampling and Analysis of Groundwater

Location	Current Sampling Frequency	Drivers	Proposed Sampling Frequency	Explanation for Change	Parameters	Test Method
GWTP Effluent	Quarterly Grab Sample & Flow-weighted composite for all except volatiles	Record of Decision Site 18/24, Table 2, page 25. In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.2, page 2-16. Incorporated into the Sampling & Analysis Plan for the GWTP Onsite Remediation System Operations Plan for Site 18/24, Approval received for quarterly sampling from TNRCC per letter dated July 26, 2000	Drop sampling requirement for Hexachlorobenzene.	Hexachlorobenzene has never been detected in the influent and is not introduced into the process.	1. Record of Decision Table 2 Volatiles 2. Hexachlorobenzene (proposed to be dropped) 3. Record of Decision Table 2 Metals 4. Oil & Grease 5. Chemical Oxygen Demand 6. Chloride 7. Sulfate 8. Perchlorate	1. 8260B 2. 8270B 3. 6010B, 7000, 7421 4. 9070/1664 5. 410.4 6. 325.3/9056 7. 375.4/9056 8. 9058/314 (IC)
Site 16 Extraction Wells	Quarterly 8-each Vertical Extraction Wells	Two wells installed as part of a pilot study and another six installed under the Accelerated Remedial Investigation, June 1997. No specific guidance for sampling frequency found other than 40 CFR 264.	annual or as needed for performance monitoring of remedy.	Sample event will be combined with the semi-annual sample event.	1. Perchlorate	1. 9058/314 (IC)
Site 16 Extraction Wells	Semi-Annual 8-each Vertical Extraction Wells	Two wells installed as part of a pilot study and another six installed under the Accelerated Remedial Investigation, June 1997. No specific guidance for sampling frequency found other than 40 CFR 264.	annual or as needed for performance monitoring of remedy.	Perchlorate was previously collected during quarterly sample event.	1. Volatiles 2. Chloride	1. 8260B 2. 9253

MARC No. W912QR-04-D-0027, TO No. D302
Longhorn Army Ammunition Plant, Karnack, Texas

Table 1 (continued)
Groundwater Treatment Plant and Well Fields
Sampling and Analysis of Groundwater

Location	Current Sampling Frequency	Drivers	Proposed Sampling Frequency	Explanation for Change	Parameters	Test Method
Site 18/24 Interceptor Collection Trenches	Semi-Annual 28-each Interceptor Collection Trench Sumps	General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.5, page 2-33. Sampling originally quarterly sampling in IRA Work Plan. Sampling changed to semi-annual in 2000 in Onsite Remediation Operations Plan for Site 18/24. Work Plan revised in 3/99 to remove quarterly sampling frequency requirement (undocumented)	Change to annual.	Data used for mass removal calculations. Data from annual influent samples can provide mass removal amount, but not by individual ICTs.	1. Volatiles 2. Perchlorate 3. Chloride	1. 8260B 2. 9058/314 3. 325.3/2253
Site 18/24 Monitoring Wells	Semi-Annual 47-each monitoring wells	In General Work Plan for Interim Remedial Action for BG-3, Dec. 1995, Table 2.5, page 2-33. Sampling changed to semi-annual in 2000 in Onsite Remediation Operations Plan for Site 18/24. Work Plan revised in 3/99 to remove six month sampling frequency requirement (undocumented)	Change to remove some wells. Approximately 15 wells to monitor source areas and upgradient & downgradient areas (please refer to Table 2).	Site can be monitored with fewer wells. Wells may be added or removed as required during remediation.	1. Record of Decision Table 2 Volatiles Arsenic (Total), Barium (Total), Cadmium (Total), Chromium (Total), Lead (Total), Silver (Total), Selenium (Total), Zinc (Total), Nickel (Total) 3. Perchlorate 4. Chloride	1. 8260B 2. 6010B, 7000, 7421 3. 9058/314 (IC) 4. 9253

Notes and Abbreviations:

Bold text indicates a proposed change in sampling or analysis.

BG-3

Burning Ground No. 3

FBR

Fluidized bed reactor

TAC

Texas Administrative Code

MARC No. W9120R-04-D-0027, TO No. DS02
Longhorn Army Ammunition Plant, Karnack, Texas

Table 2
Proposed Monitoring Well Sampling

Well ID	Approximate Location	Well depth	Analytical schedule ¹			Explanation
			VOC	MNA	CIO ₄	
18WW01	northern edge of LHAAP-54	deep				Located far south of site and plume; screened deeper than contamination
18WW02	west, plume edge	deep				Adjacent to 18WW-06; screened deeper than -06, below contamination flow paths
18WW03	east, plume edge	deep				Screened below contamination flow paths
18WW04	1,100 ft north of site	deep				Screened deeper than contamination
18WW05	3,000 ft north of site	deep				Located far north of site; screened deeper than contamination
18WW06	west, plume edge	deep				Screened below contamination flow paths
18WW07*	north, plume edge	shallow				Redundant due to 18WW08 and 18WW20.
18WW08*	north, plume edge	shallow	1	1	1	Shallow well between 18/24 site and Harrison Bayou
18WW09*	north, plume edge	intermediate	1	1	1	Intermediate well between 18/24 site and Harrison Bayou
18WW10*	west, plume edge	intermediate	1	1	1	Intermediate well between 18/24 site and Harrison Bayou
18WW11*	west, plume edge	shallow	1	1	1	Shallow well between site 18/24 and Harrison bayou
18WW14	south west, plume edge	intermediate				Located southwest of site; may be applicable for site 17
18WW15	south west, plume edge	shallow				Located southwest of site; may be applicable for site 17
18WW16	northern edge of LHAAP-54	shallow				Far south of site; perhaps applicable to other sites.
18WW17*	east, plume edge	shallow				Will be converted to extraction well; samples will be collected per the GWTP influent monitoring.
18WW18*	east, plume edge	intermediate				No longer relevant; below well 18WW17 which will be used for extraction
18WW19*	north, outside plume	intermediate				Unnecessary; screened below 18WW20, neither 19 nor 20 screened in the sand/silt
18WW20*	north, outside plume	shallow	1	1	1	Shallow well between 18/24 site and Harrison Bayou
101	east	shallow				Within or next to CT perimeter; likely redundant to CT sampling
102	south	shallow				Within or next to CT perimeter; likely redundant to CT sampling
109	north east	shallow				Within or next to CT perimeter; likely redundant to CT sampling

Table 2 (continued)
Proposed Monitoring Well Sampling

Well ID	Approximate Location	Well depth	Analytical schedule ¹			Explanation
			VOC	MNA	CIO ₄	
123	north along CT	shallow				Within or next to CT perimeter; likely redundant to CT sampling
124	north along CT	shallow				Within or next to CT perimeter; likely redundant to CT sampling
125	northeast	shallow				Screened in shallow zone, but too close to system trenches.
126	South , plume edge	shallow				~90% of Screen is across clay layer - Limited applicability if necessary, prefer using C-09
129	west, along CT	shallow				Within or next to CT perimeter; likely redundant to CT sampling
AWD-1	west along CT	shallow				Within or next to CT perimeter; likely redundant to CT sampling
AWD-2	inside CT perimeter	shallow				within or next to CT perimeter, Likely redundant to CT sampling
AWD-3	inside CT perimeter	shallow				Within or next to CT perimeter; likely redundant to CT sampling
AWD-4	north	shallow				Close to CT trenches, may be consider in future as plume pulls back from 18WW wells to north
E-01	inside CT perimeter	shallow				Near MW-02, will consider as injection point in future for optimization if necessary
C-01	south , plume edge	intermediate				Well has 20-foot screen; may be applicable to site 17
C-02*	northwest , plume edge	shallow	1	1	1	Shallow well between 18/24 site and Harrison bayou
C-03	East, plume edge	shallow	1	1	1	Replacement well for 18WW17
C-04A	northeast, plume edge	intermediate				Screened below C-04
C-04*	northeast, plume edge	intermediate	1	1	1	Screened more in intermediate zone; may not be ideal, but in best location for monitoring northeast.
C-05	3,000 ft north of site, near 18WW04	shallow				Located far to the northeast of the site. Provides limited information in comparison to Wells C-03 and C-04.
C-06	2,100 ft north of site	shallow	1	1	1	Located far to the northeast of the site, but will be kept as a compliance point.
C-07	1,200 feet south of site, just south of Long Point Road	shallow				Located southwest of site; perhaps applicable for site 17
C-08*	east	shallow	1	1	1	Best location south of 18WW17/18 well pair
C-09	south, plume edge	shallow	1	1	1	Provides additional monitoring coverage on southern side of site
C-10	south, plume edge	intermediate				Screened below Monitoring well C-09

Table 2 (continued)
Proposed Monitoring Well Sampling

Well ID	Approximate Location	Well depth	Analytical schedule ¹			Explanation
			VOC	MNA	CIO ₄	
MW-01	inside CT perimeter	shallow				Within or next to CT perimeter; Likely redundant to CT sampling
MW-02	inside CT perimeter	shallow	1	1	1	Well most influenced by DNAPL; analysis of samples may be limited due to DNAPL
MW-03 thru MW-07	Inside CT perimeter	shallow				Within or next to CT perimeter; likely redundant to CT sampling
MW-08*	east of site	shallow	1	1	1	Good spacing from CT and has historical value, may also be applicable to site 17
MW-09	inside CT perimeter	shallow				Within or next to CT perimeter; likely redundant to CT sampling
MW-10	west	shallow				Redundant to monitoring well C-02
MW-11	west northwest	shallow				Within or next to CT perimeter; likely redundant to CT sampling
MW-12	west northwest	shallow				Within or next to CT perimeter; likely redundant to CT sampling
MW-13	west	shallow				Redundant to monitoring well C-02
MW-14	inside CT perimeter	shallow				Within or next to CT perimeter; likely redundant to CT sampling
MW-15	inside CT perimeter	shallow				Within or next to CT perimeter; likely redundant to CT sampling
MW-16	west northwest	shallow	1	1	1	Appears to be the shallow well in along the bayou closest to the CT system.
MW-17*	west	shallow				Appears redundant with wells C-02 & or 18WW10/11 pair
MW-18	west	shallow				Good spacing between sites 18/24 and 17, more applicable to site 17
MW-19	southwest	shallow				Good spacing between sites 18/24 and 17, more applicable to site 17
MW-20*	south	shallow	1	1	1	South; may also serve as a monitoring point for site 17
MW-21	inside CT perimeter	shallow				Within or next to CT perimeter; Likely redundant to CT sampling
MW-22	inside CT perimeter	shallow				Within or next to CT perimeter; likely redundant to CT sampling
MW-23	inside CT perimeter	shallow				Within or next to CT perimeter; likely redundant to CT sampling
Totals			15	15	15	

Notes and Abbreviations:

* in previous sampling plan

¹ 1 indicates that analysis is proposed for the given well.

CT collection trench

DNAPL dense non-aqueous phase liquid

CIO₄ perchlorate

MNA parameters for monitored natural attenuation

VOC volatile organic compounds

Appendix B

Sampling and Analysis Requirements

Table B-1
Sample Containers, Preservation, and Preparation for Water Samples

Parameter	Size and Type of Container	# of Containers	Ice	Method of Preservation
pH	½ pint glass	1	N	field test
Conductivity	½ pint glass	1	N	field test
Temperature	½ pint glass	1	N	field test
Metals	liter plastic	1	Y	nitric acid to pH < 2
Volatiles	40 mL glass vial	3	Y	no head space, air bubbles or agitation
Semivolatiles	liter amber glass	2	Y	
Anions	liter glass	1	Y	
Herbicides	liter amber glass	1	Y	
Total organic carbon	liter amber glass	1	Y	sulfuric acid to pH <2
Chemical oxygen demand	liter amber glass	1	Y	sulfuric acid to pH <2
Flash point	liter amber glass	1	Y	
TCLP (See note 1) volatiles semivolatiles pesticides herbicides metals				
Alkalinity	250 mL plastic	1	Y	cool to 4°C
Hardness	250 mL plastic	1	Y	sulfuric acid to pH <2
Perchlorate	500 mL plastic	1	Y	none
Total dissolved solids (TDS)	250 mL plastic	1	Y	cool to 4°C
Total suspended solids (TSS)	250 mL plastic	1	Y	cool to 4°C
Ammonia	1 liter plastic	1	Y	sulfuric acid to pH <2
Oil and grease	liter amber glass	2	Y	sulfuric acid to pH <2
Total petroleum hydrocarbons	liter amber glass	1	Y	sulfuric acid to pH <2

Notes:

- ¹ Sample containers for aqueous samples to be analyzed for TCLP are identical to the sample containers for the corresponding total analysis.

Table B-2
Maximum Holding Times and Analytical Methods in Soil and Water

Analytical Method Parameter	Holding Time		Reference	Method
	Extraction	Analysis		
Field tests				
pH	—	immediate		
conductivity	—	immediate		
temperature	—	immediate		
Metals				
antimony	—	6 months	SW-846 ^a	6010 B or 6020
arsenic	—	6 months	SW-846	6010 B or 6020
selenium	—	6 months	SW-846	6010 B or 6020
lead	—	6 months	SW-846	6010 B or 6020
mercury in water	—	28 days	SW-846	7470
mercury in soil	—	28 days	SW-846	7471
thallium	—	6 months	SW-846	6010 B or 6020
others	—	6 months	SW-846	6010
Volatiles by GC/MS	—	14 days	SW-846	8260 B
Semivolatiles			SW-846	8270 C
chloride	7 days	40 days		
sulfate	14 days	40 days		
Anions			EPA-600 ^b	300.0
in water	—	28 days		
in soil	—	28 days		
Herbicides				
in water	7 days	40 days	SW-846	8151
in soil	14 days	40 days	SW-846	8151
Total organic carbon		28 days	SW-846	9060 or 415.1
Chemical oxygen demand		28 days	EPA-600	410.4
Flash point		14 days	SW-846	1010
TCLP				
volatiles	14 days	14 days	SW-846	1311/8260 B
semivolatiles	7 days ^c	40 days	SW-846	1311/8270 C
metals (except mercury)	6 months	6 months	SW-846	1311/various
mercury	28 days	28 days	SW-846	1311/7470
Alkalinity	—	14 days	EPA-600	310
Hardness	—	6 months	EPA-600	130
Perchlorate	28 days	7 days	EPA-600	314.0
Total dissolved solids (TDS)	—	7 days	EPA-600	160.1
Total suspended solids (TSS)	—	7 days	EPA-600	160.2
Ammonia	—	28 days	EPA-600	350
Oil and grease	—	28 days	SW-846/EPA-600	9070/413

Notes:

- ^a SW-846: USEPA, 1986, *Test Methods for Evaluating Solid Waste*, SW-846, 3rd Edition, November.
^b EPA-600: USEPA, 1983, *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020, March.
^c There is a holding time of 7 days from field collection to TCLP extraction, 7 days from TCLP extraction to preparative extraction and 40 days from preparative extraction to determinative analysis for a total elapsed time of 54 days.

Table B-3
Quantitation Limits for Volatile Analyses in Soil and Water
by Method 8240 and 8010

Parameter Method 8260B	Water (µg/L)	Low Level Soil/Sediment (µg/kg)
1,1,1-trichloroethane	5	5
1,1,2,2-tetrachloroethane	5	5
1,1,2-trichloroethane	5	5
1,1-dichloroethane	5	5
1,1-dichloroethene	1	5
1,2,3-trichloropropane	5	5
1,2-dichloroethane	5	5
1,2-dichloropropane	5	5
1,4-dichloro-2-butene	10	10
2-butanone (MEK)	10	10
2-hexanone	10	10
4-methyl-2-pentanone	10	10
Acetone	10	10
Acrolein	5	5
Acrylonitrile	10	10
Benzene	5	5
Bromodichloromethane	5	5
Bromomethane	10	10
Carbon disulfide	5	5
Carbon tetrachloride	5	5
Chlorobenzene	5	5
Chloroethane	10	10
chloroform	5	5
Chloromethane	10	10
cis-1,2-dichloroethene	1	5
Dibromochloromethane	5	5
Dibromomethane	5	5
Dichlorodifluoromethane	5	5
Dichloromethane	5	5
Ethyl methacrylate	5	5
Ethylbenzene	5	5
Iodomethane	10	10
Methylene chloride	2	5
Styrene	5	5
Tetrachloroethene	1	5
Toluene	5	5
trans-1,2-dichloroethene	1	5
Trans-1,3-dichloropropene	5	5
Trichloroethene	1	5
Trichlorofluoromethane	5	5
Vinyl acetate	10	5
Vinyl chloride	1	10
Xylenes (total)	5	5

Table B-4
Quantitation Limits for Semivolatile Analyses in Soil and Water by Method 8270C

Parameter	Water (µg/L)	Soil/Sediment (µg/kg)
1,2,4-trichlorobenzene	10	330
1,2-dichlorobenzene	10	330
1,2-diphenylhydrazine	50	1600
1,3-dichlorobenzene	10	330
1,4-dichlorobenzene	10	330
1-chloroanaphthalene	10	660
2,4,5-trichlorophenol	50	1600
2,4,6-trichlorophenol	10	330
2,4-dichlorophenol	10	330
2,4-dimethylphenol	10	330
2,4-dinitrophenol	50	1600
2,4-dinitrotoluene	10	330
2,6-dinitrotoluene	10	330
2-chloronaphthalene	10	330
2-chlorophenol	10	330
2-methylnaphthalene	10	330
2-methylphenol	10	330
2-nitroaniline	50	1600
2-nitrophenol	10	330
3,3'-dichlorobenzidine	20	660
3-methylphenol	10	330
3-nitroaniline	50	1600
4,6-dinitro-2-methylphenol	50	1600
4-bromophenyl phenyl ether	10	330
4-chloro-3-methylphenol	10	330
4-chloroaniline	10	330
4-chlorophenyl phenyl ether	10	330
4-methylphenol	10	330
4-nitroaniline	50	1600
4-nitrophenol	50	1600
Acenaphthene	10	330
Acenaphthylene	10	330
Anthracene	10	330
Benzo(a)anthracene	10	330
Benzo(a)pyrene	10	330
Benzo(b)fluoranthene	10	330
Benzo(g,h,i)perylene	10	330
Benzo(k)fluoranthene	10	330
Benzoic acid	50	1600
Benzyl alcohol	10	330
Bis(2-chloroethoxy) methane	10	330
Bis(2-chloroethyl) ether	10	330
Bis(2-chloroisopropyl) ether	10	330
Bis(2-ethylhexyl)phthalate	10	330
Butyl benzyl phthalate	10	330

Table B-4 (continued)
Quantitation Limits for Semivolatile Analyses in Soil and Water by Method 8270C

Parameter	Water (µg/L)	Soil/Sediment (µg/kg)
Chrysene	10	330
Dibenz(a,h)anthracene	10	330
Dibenzofuran	10	330
Diethyl phthalate	10	330
Dimethyl phthalate	10	330
di-n-butyl phthalate	10	330
di-n-octyl phthalate	10	330
Diphenylamine	20	1000
Fluoranthene	10	330
Fluorene	10	330
Hexachloro-1,3-butadiene	10	330
Hexachlorobenzene	10	330
Hexachlorocyclopentadiene	10	330
Hexachloroethane	10	330
Indeno(1,2,3-cd)pyrene	10	330
Isophorone	10	330
Naphthalene	10	330
Nitrobenzene	10	330
n-nitrosodi-n-propylamine	50	1600
N-nitrosodiphenylamine	10	330
Pentachlorophenol	50	1600
Phenanthrene	10	330
Phenol	10	330
Pyrene	10	330

Notes:

Medium soil/sediment quantitation limits are 60 times the low soil/sediment quantitation limits.

Table B-5
Quantitation Limits for Other Analyses in Soil and Water

Parameter	Water (mg/L)	Low-Level Soil/Sediment (mg/kg)
Metals		
Antimony	0.03	1.0
Arsenic	0.01	1.0
Barium	0.02	10.0
Cadmium	0.005	1.0
Calcium	5	500
Chromium	0.01	1.0
Lead	0.002	1.0
Magnesium	5	500
Mercury	0.002	0.1
Nickel	0.05	1.0
Potassium	5	500
Selenium	0.01	1.0
Silver	0.07	1.0
Sodium	5	500
Thallium	0.01	1.0
Anions		
Chloride	2.0	—
Nitrite	0.01	—
Ortho-Phosphorous (as P)	0.010	—
Perchlorate	0.002	—
Sulfate	2.0	—
Miscellaneous		
Alkalinity (as CaCO ₃)	4	
Hardness (as CaCO ₃)	10	
Total dissolved solids (TDS)	4	
Total suspended solids (TSS)	4	
Silica	2	
Ammonia (as N)	0.05	
Oil and grease	5	
Total petroleum hydrocarbons	1	
Total organic carbon	1.0	

Notes:

CaCO₃ calcium carbonate

N nitrogen

P phosphorus



DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

July 23, 2007

DAIM-BD-LO

Texas Department of Licensing and Regulation
Post Office Box 12157
Austin, TX 78711

ATTN: Water Well Drillers and Pump Installers

Re: Prohibition of Water Well Installation on the Landfill 12 Parcel at the Former Longhorn Army Ammunition Plant, located in Harrison County, Texas, near the town of Karnack

With this correspondence notification is given that a prohibition against water well installation is in effect at the above referenced site. The U.S. Army has performed an environmental remediation of the 50.541 acre Landfill 12 Parcel, a tract of land located in Harrison County, Texas at the Former Longhorn Army Ammunition Plant (LHAAP). As a National Priority List (NPL) site, LHAAP is being environmentally restored in accordance with the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120. The groundwater in and around Landfill 12 is contaminated with trichloroethene (TCE) and other volatile organic compounds. Land use controls (LUCs), including a groundwater restriction, were implemented at the Landfill 12 Parcel as part of the final environmental remedy. As a result of the restriction, the groundwater may not be accessed or used for any purpose other than environmental monitoring and testing without the prior written approval of the U.S. Army, the US Environmental Protection Agency (USEPA) and the Texas Commission on Environmental Quality (TCEQ). This includes water well drilling and installation. This restriction is long-term and will remain in place until the above agencies agree to its termination.

Pursuant to the Rules of the TCEQ pertaining to Industrial Solid Waste Management, a recordation of the LUCs for this tract of land were filed in the Public Records of Harrison County, Texas. A copy of the recordation including a legal description and map is enclosed for your information.

Point of contact for this action is the undersigned. If you have any questions or require further information, I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "Rose M. Zeiler", is written over a horizontal line.

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

One Enclosure

Copies furnished:

Fay Duke, TCEQ, Austin, TX

Steve Tzhone, USEPA Region 6, Dallas, TX

Paul Bruckwicki, Caddo Lake NWR, TX

Cliff Murray, COE – Tulsa District, OK

John R. Lambert, COE – Tulsa District, OK

✓ P. Srivastav, Shaw, Houston, TX (for project file)

00048286

7009064 OR 3640 1

FILED FOR RECORD

07 JUN 13 AM 10:09

STATE OF TEXAS

FATSY COX
CO CLERK, HARRISON CO

HARRISON COUNTY

BY CEJ DEPUTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROLS AT LHAAP-12

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The remediation site is a capped landfill located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-12. The site is included in TCEQ Notice of Registration No. 30990 as Unit Number 001. LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-12 were performed in accordance with the FFA requirements.

The landfill was used intermittently for the disposal of industrial solid waste, possibly containing small quantities of hazardous constituents generated at LHAAP. A Record of Decision (ROD) for LHAAP-12 was signed by USEPA in 1995 establishing the construction of a cap as an interim remedial action for the site to mitigate potential risks posed by the burial of landfill waste. Construction of the landfill cap was completed in 1998. The final remedy consists of land use controls (LUCs) in conjunction with monitored natural attenuation as documented in the Final ROD signed by USEPA on July 24, 2006. The site was not remediated to levels suitable for unrestricted use. LUCs at LHAAP-12 are required to ensure the integrity of the landfill cap and cover system and prevent human exposure to contaminated groundwater. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the

Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-12 parcel is a 50.541 acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A. Within the LHAAP-12 parcel are designated LUC boundaries including a 9.429 acre tract, more or less, and a 45.939 acre tract, more or less, as described in Exhibit A. The LUC boundaries are also presented in the attached Figure 1.


Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. The United States Department of the Army has undertaken careful environmental study of the LHAAP-12 site and concluded that the LUCs set forth below are required to ensure protection of human health and the environment.

- (1) **Landfill Restriction.** A closed non-hazardous landfill (LHAAP-12) of approximately 7 acres is located within the 9.429 acre tract. The landfill restriction boundary consists of the 7-acre capped landfill and an area extending to the surrounding fence. LUCs have been established to protect the integrity of the remedy. No activity shall be conducted or permitted that would damage the integrity of the landfill cover (i.e. digging or disturbing the existing cover or contents of the landfill). The LUCs will remain in place for perpetuity unless otherwise removed by the U.S. Army per agreement with the USEPA and TCEQ.
- (2) **Residential Use Restriction.** The residential use restriction boundary consists of the 9.429 acre-tract, more or less, and includes the 7-acre capped landfill and an area extending to the surrounding fence. This tract shall be used solely for the purpose of a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.
- (3) **Groundwater Restriction.** The groundwater use restriction boundary consists of the 45.939 acre tract, more or less, and extends beyond the landfill

boundary. Groundwater underlying this land is contaminated with trichloroethene (TCE) and other volatile organic compounds and shall not be accessed or used for any purpose without the prior written approval of U.S. Army, the USEPA and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army will notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA and the TCEQ. The LUC will remain in place until applicable or relevant and appropriate requirements (ARARs) as established in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulation 300) are met. Due to the potential for TCE-contaminated groundwater to migrate, monitored natural attenuation will be implemented to assure that TCE-contaminated groundwater will not migrate to nearby surface water at levels that may present an unacceptable risk to human health and the environment. The monitoring and reporting associated with this remedy will continue until ARARs are achieved.

The owner of the site is the Department of the Army, and its address where more specific information may be obtained from is as follows:

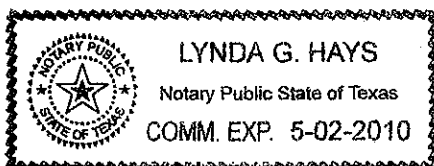
ATTN: DAIM-BD-LO (R. Zeiler)
Post Office Box 220
Ratcliff, AR 72951



Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 13th day of June, 2007.

BEFORE ME, on this the 13th day of June, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 13 day of June, 2007.




Notary Public in and for the State of Texas,
County of Harrison

00048289

Doc	Bk	Vol	Pg
7009064	OR	3640	4

EXHIBIT A

NOTE

ALL BEARINGS, DISTANCES (UNLESS LABELED OTHERWISE), & COORDINATES ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE, CODE 4202, HAD 1983 (92). THE SCALE FACTOR APPLIED EQUALS 0.999918513 & IS BASED ON SURFACE TRAVERSE BETWEEN STATIONS 2-95 & 3-95. THE COMPUTED LAND AREA IS BASED ON SURFACE DISTANCES

"D" NORTHMOST CORNER OF 50.541 ACRE TRACT

00048290

I, Tom A. Fidler, registered professional land surveyor, No. 3940, do hereby certify that this plat reflects the location of the corners on the tract herein described, as surveyed on the ground and under my supervision in April and May 2006.

Witness my hand and seal this the 9th day of June, 2006.



Tom A. Fidler

Tom A. Fidler, Registered Professional Land Surveyor, No. 3940

LHAAP-12
PARCEL
50.541 ACRES

NORTHWEST CORNER OF BOTH 50.541 ACRE TRACT AND 45.939 ACRE TRACT

NORTHMOST CORNER OF 45.939 ACRE TRACT

N 35°09'39"E 32.94'

EASTMOST CORNER OF 45.939 ACRE TRACT

EASTMOST CORNER OF 50.541 ACRE TRACT

P.O.B. OF AND SOUTHWEST CORNER OF BOTH 50.541 ACRE TRACT AND 45.939 ACRE TRACT

P.O.B. OF 9.429 ACRE TRACT

SOUTHEAST CORNER OF BOTH 50.541 ACRE TRACT AND 45.939 ACRE TRACT

AVENUE "O" (ASPHALT ROAD)

STATION 2-95
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6853300.265 FEET
E=3311219.080 FEET

N 84°21'15"W 528.56'

SURFACE TRAVERSE USING ELECTRONIC TOTAL STATION INDICATES 3050.038' (BEARING SOURCE)

SCALE 1"=200'



COORDINATE TABLE

POINT	NORTH	EAST
A	6853300.000	3311087.000
B	6855038.000	3310886.000
C	6855445.333	3311755.144
D	6855578.000	3312005.000
E	6854317.000	3312366.000
F	6854290.070	3312347.030
G	6853248.000	3311613.000

STATION 3-95
STATE OF TEXAS
NORTH CENTRAL ZONE
N=6852411.298 FEET
E=3314136.438 FEET

LINE TABLE

COURSE	BEARING	DISTANCE
L1	S 89°52'35"W	132.09'
L2	N 58°35'33"E	31.72'
L3	N 23°52'43"W	96.81'
L4	N 37°07'57"E	537.87'
L5	N 15°28'17"W	618.92'
L6	N 26°16'28"E	90.81'
L7	N 54°00'30"E	50.67'
L8	S 81°02'29"E	96.24'
L9	S 34°25'01"E	596.16'
L10	S 12°11'35"W	370.18'
L11	S 36°09'00"W	434.64'
L12	S 87°15'04"W	286.47'
L13	N 57°18'20"W	15.33'

NOTES:

- O INDICATES 12" DIAMETER WOODEN FENCE CORNER POST (FOUND)
- INDICATES 10" DIAMETER WOODEN FENCE CORNER POST (FOUND)
- X INDICATES TYPE "G" CORPS OF ENGINEERS MONUMENT (FOUND)
- Δ INDICATES 1/2" IRON REBAR WITH ORANGE PLASTIC CAP ENGRAVED "TIDLER" & "APLS 3840" (SET IN CONCRETE)
- — — — — INDICATES BARBED WIRE FENCE AND PERIMETER OF 9.429 ACRE TRACT
- — — — — INDICATES PERIMETER OF 50.541 ACRE TRACT ONLY
- — — — — INDICATES PERIMETER OF 45.939 ACRE TRACT ONLY
- — — — — INDICATES PERIMETER OF BOTH 50.541 ACRE TRACT AND 45.939 ACRE TRACT

LANDMARK CONSULTANTS, INC.
PROFESSIONAL LAND SURVEYORS
P.O. BOX 606 LONGVIEW, TEXAS 75606
PHONE (803) 236-3377 FAX (903) 236-3530
E-MAIL landmark@earthlink.com

SHEET 1 OF 4		
50.541 ACRES 45.939 ACRES 9.429 ACRES LONGHORN ARMY AMMUNITION PLANT HARRISON COUNTY, TEXAS		
JOB #040708B	040708B.CRD	0605063A.DWG
06/09/2005	0605063.CRD	DRAWN BY JJJ

SHEET 2 OF 4

FIELD NOTES DESCRIPTION OF
"LHAAP-12 PARCEL"
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Parcel" being 50.541 acres of land out of the Longhorn Ordnance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-12 Parcel" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95" (N=6953300.285 feet & E=3311219.090 feet) and "3-95" (N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE S 89deg52'35"W 132.09' to an I.R.O.P.C. set in concrete for the S.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 03deg15'37"W 1740.82' along the W.B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northwest corner,

THENCE N 62deg01'58"E 1151.47' along the N.W. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northmost corner,

THENCE S 15deg58'31"E 1311.66' along the N.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Eastmost corner,

THENCE S 35deg09'39"W 1307.58' along the S.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Southeast corner,

THENCE N 84deg21'15"W 528.56' along the S.B.L. of this tract to this POINT OF BEGINNING, containing 50.541 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

SHEET 3 OF 4

FIELD NOTES DESCRIPTION OF
"LHAAP-12 LAND USE CONTROL AREA"
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Land Use Control Area" being 45.939 acres of land out of the Longhorn Ordnance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said "LHAAP-12 Land Use Control Area" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95" (N=6953300.285 feet & E=3311219.090 feet) and "3-95" (N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE S 89deg52'35"W 132.09' to an I.R.O.P.C. set in concrete for the S.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 03deg15'37"W 1740.82' along the W.B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northwest corner,

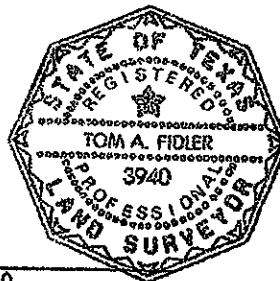
THENCE N 62deg01'58"E 868.58' along the N.W. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northmost corner,

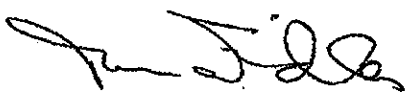
THENCE S 27deg07'40"E 1298.06' along the N.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Eastmost corner,

THENCE S 35deg09'39"W 1274.64' along the S.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Southeast corner,

THENCE N 84deg21'15"W 528.56' along the S.B.L. of this tract to this POINT OF BEGINNING, containing 45.939 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.




Tom A. Fidler, R.P.L.S. Number 3940

SHEET 4a OF 4

FIELD NOTES DESCRIPTION OF
"LHAAP-12 LANDFILL AREA"
CADD O LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Landfill Area" being 9.429 acres of land out of the Longhorn Ordnance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said "LHAAP-12 Landfill Area" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95" (N=6953300.285 feet & E=3311219.090 feet) and "3-95" (N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE N 58deg35'33"E 31.72' to a 12" diameter wooden fence corner post found for a Southwest corner of this tract and this POINT OF BEGINNING,

THENCE generally along a barbed wire fence the following eleven courses,

N 23deg52'43"W 96.81' to a 10" diameter wooden fence corner post found for the Westmost corner of this tract,

N 37deg07'57"E 537.87' to a 10" diameter wooden fence corner post,

N 15deg28'17"W 618.92' to a 12" diameter wooden fence corner post,

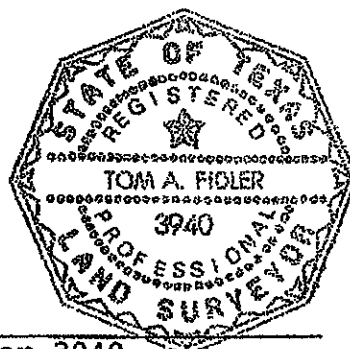
N 26deg16'28"E 90.81' to a 12" diameter wooden fence corner post,

N 54deg00'30"E 50.67' to a 12" diameter wooden fence corner post found for the Northmost corner of this tract,

SHEET 4b OF 4

S 81deg02'29"E 96.24' to a 12" diameter wooden fence corner post,
S 34deg25'01"E 596.16' to a 12" diameter wooden fence corner post
found for the Eastmost corner of this tract,
S 12deg11'35"W 370.18' to a 10" diameter wooden fence corner post,
S 36deg09'00"W 434.64' to a 12" diameter wooden fence corner post,
S 87deg15'04"W 286.47' to a 12" diameter wooden fence corner post,
N 57deg18'20"W 15.33' to this POINT OF BEGINNING, containing 9.429
acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in
the State of Texas, do hereby certify that this field notes
description is the result of a survey made on the ground and under
my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00048295

Doc	Bk	Vol	Pa
7009064	OR	3640	10

FIGURE 1

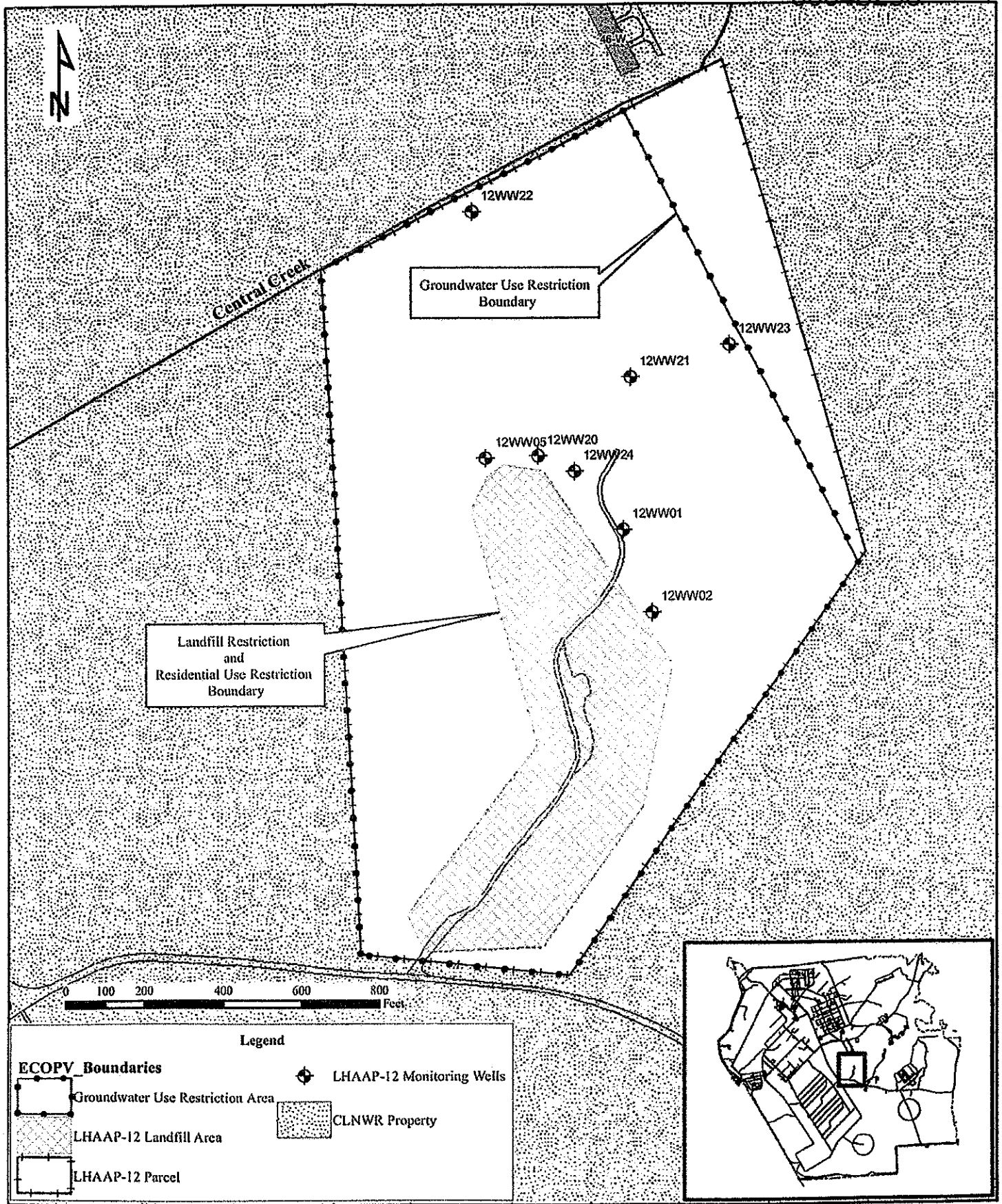


FIGURE 1

Land Use Control Boundaries

STATE OF TEXAS

COUNTY OF HARRISON

I hereby certify that this instrument was
filed on the date and time stamped hereon by me
and was duly recorded in the volume and page
of the named records of:

Harrison County
as stamped hereon by me.

Jun 13, 2007
HONORABLE PATSY COX, COUNTY CLERK
Harrison County



Shaw Environmental & Infrastructure, Inc.

A World of **Solutions**™

August 2, 2007

Shaw/TERC 07-052

Mr. Cliff Murray
U.S. Army Corps of Engineers – Tulsa District
1645 South 101st - East Avenue
Tulsa, Oklahoma 74128-4629

RE: **Task Order No. 109**
Total Environmental Restoration Contract (TERC)
Contract No. DACA56-94-D-0020
Environmental Investigation and Remediation at
Longhorn Army Ammunition Plant, Karnack, Texas
*Final Site Investigation Report LHAAP-59, Longhorn Army Ammunition
Plant, Karnack, Texas*

Dear Mr. Murray:

Shaw Environmental, Inc. is pleased to submit the attached *Final Site Investigation Report LHAAP-59*. We are also sending copies of the document directly to individuals on the attached project document distribution list.

Please contact me if you have any questions or require additional information.

Sincerely,

John Elliott, PMP
Project Manager

Longhorn Distribution List

Member	Agency	Address	Phone No. e-mail address	No. of Copies
Cliff Murray Tulsa District	U.S. Army Corp of Engineers	US Army Corp of Engineers 1645 South 101 st - East Avenue Tulsa, Oklahoma 74128-4529	Office: 918-669-7573 Cliff.Murray@SWT03.usace.army.mil	2
Dr. Rose Zeiler	BRAC; Longhorn Site Manager	P.O. Box 220 Ratcliff, AR 72951 727 South Brooklyn Rd Ratcliff, AR 72951	Office: 479-635-0110 rose.zeiler@us.army.mil	1
Jeff Armstrong	Army Environmental Center	Commander USAEC SFIM-AEC-ERA (Attn: Jeff Armstrong) Beal Road Bldg E-4880 APG, MD 21010-5401	Office: 410-436-1516 jeffrey.armstrong@us.army.mil	1
Stephen Tzhone	US Environmental Protection Agency	US Environmental Protection Agency Superfund Division (6SF-AT) 1445 Ross Avenue Dallas, TX 75202-2733	Office: 214-665-8409 tzhone.stephen@epamail.epa.gov	2
Fay Duke	Texas Commission of Environmental Quality	Texas Commission on Environmental Quality TCEQ Environmental Cleanup Section II, Team 2 (MC-221) 12100 Park 35 Circle, Bldg D Austin, TX 78753	Office: 512-239-2443 fduke@tceq.state.tx.us	2 - most 4-eco
Dale Vodak	Texas Commission of Environmental Quality	Texas Commission on Environmental Quality 2916 Teague Drive Tyler, TX 75701	Office: 903-535-5147 dvodak@tceq.state.tx.us	1
Paul Bruckwicki	US Fish and Wildlife Service	US Fish and Wildlife Service PO Box 230 Karnack, TX 75661 (<i>mailing only</i>) <hr/> Caddo Lake NWR Hwy 134 & Spur 449 Karnack, TX 75661	Office: 903-679-4536 Cell: 903-407-0852 paul_bruckwicki@fws.gov	1
Barry Forsythe	US Fish & Wildlife Service EPA Liaison (6SF-LT)	US Fish & Wildlife Service EPA Liaison (6SF-LT) 1445 Ross Avenue, Suite 1200 Dallas, TX 75202	Office: 214-665-8467 forsythe.barry@epa.gov	1-eco

Total external distribution for routine final (non eco) reports = 10



00048300

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

August 2, 2007

DAIM-BD-LO

Mr. Steve Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Site Investigation Report LHAAP-59, Longhorn Army Ammunition Plant,
Karnack, Texas, August 2007

Dear Mr. Tzhone,

The above-referenced document is transmitted to you for your files.

Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

A handwritten signature in black ink, reading "Rose M. Zeiler".

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:

Fay Duke, TCEQ, Austin, TX
Paul Bruckwicki, Caddo Lake NWR, TX
Cliff Murray, COE – Tulsa District, OK
John R. Lambert, COE – Tulsa District, OK
John Elliott, Shaw, Houston, TX
Praveen Srivastav, Shaw, Houston, TX
Kay Everett, Shaw, Houston, TX



00048301

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

August 2, 2007

DAIM-BD-LO

Ms. Fay Duke
Texas Commission on Environmental Quality
Environmental Cleanup Section II (MC-221)
12100 Park 35 Circle
Austin, TX 78753

Re: Final Site Investigation Report LHAAP-59, Longhorn Army Ammunition Plant,
Karnack, Texas, August 2007

Dear Ms. Duke,

The above-referenced document is transmitted to you for your files.

Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

A handwritten signature in black ink, reading "Rose M. Zeiler".

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

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Stephen Tzhone, USEPA Region 6, Dallas, TX
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John R. Lambert, COE – Tulsa District, OK
John Elliott, Shaw, Houston, TX
Praveen Srivastav, Shaw, Houston, TX
Kay Everett, Shaw, Houston, TX

**Comments on Draft Final Site Investigation Report, LHAAP-59
Longhorn Army Ammunition Plant**

00048302

November 2006

Submitted to Army on April 2, 2007

Reviewer: Fay Duke, TCEQ; Scott Harris, EPA Region 6

Respondents: Shaw Environmental, Inc.

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commentor Agrees (A) with response, or Does not Agree (D) with response.

Comment #	Page	Section/ Paragraph	Comment	C, D ¹ , E or X	Response	A or D ²
TCEQ Review Comments						
1		Section 3.1.1	<p>a. It is stated that the TCEQ Consistency Memorandum defines the PQL as the sample quantitation limit (SQL), which is the MQL for the analytical method as adjusted by the laboratory to account for the individual sample matrix characteristics, or other analytical adjustment. This is incorrect. The Consistency Memorandum defines the PQL as the lowest non-zero standard in the calibration curve for the most sensitive standard available method. This definition is analogous to the Method Quantitation Limit (MQL) as defined in SW846 Method 8000B. Please correct.</p> <p>b. It is stated that the average MQL used for screening represents the average of MQL values reported by the laboratory. Please verify that the MQL value used represents the lowest non-zero standard in the laboratory's initial calibration curve as defined in SW846 Method 8000B.</p> <p>c. It is noted that several compounds have elevated detection limits. Explanations</p>	C	<p>a. & b. The referenced text in Section 3.1.1 will be corrected to read: <i>"The practical quantitation limit (PQL) as used in this report, is the lowest non-zero standard in the laboratory's initial calibration curve, as defined in the Attachment B.1.1.4 of the Consistency Memorandum (TCEQ, 1998), and is analogous to the MQL currently defined in SW-846 (USEPA, 1997)."</i></p> <p>A Laboratory Review Checklist (LRC) is included with each data package. The LRC asks "do the MQLs correspond to the concentration of the lowest non-zero calibration standard?" The laboratory checked that they utilize this definition. The values used in the calibration curves are included in the QA/QC section of each data package. Data that form the basis of this report (and all Shaw reports for the LHAAP) have been validated according to SW846 methods 8081 and 8151 and National Functional Guidelines for organic analysis or for inorganic analysis provided by the EPA.</p> <p>The Consistency Memorandum (Section B.1.1.6) provides for adjustment of MQL values, "to reflect sample-specific action(s) performed by the laboratory that are necessary but not prescribed in the method." The report text in Section 3.1.1 will be revised to read: <i>The "Result" values reported by the laboratory and used in this report represent the sample quantitation limit (SQL), which is defined as the method quantitation limit (MQL) adjusted for sample specific factors such as moisture content and dilution (Consistency Memorandum, Attachment B.1.1.6). LHAAP uses the SQLs to report the results for nondetected chemicals analyzed in an environmental sample. When a chemical is not detected in the sample, the SQL calculated for the chemical is reported flagged with a "U" qualifier, as required in the Consistency Memorandum (Section II.4.2), to advise the data user the chemical is not detected in the sample. See definitions in Section 3.0.</i></p> <p>c. Section 3.1.1 of the draft report describes the dilution of several</p>	A

**Comments on Draft Final Site Investigation Report, LHAAP-59
Longhorn Army Ammunition Plant**

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			should be provided in the report as to why lower detection limits could not be achieved.		samples to quantitate chlordane concentrations, and the resulting elevation of detection limits. Because there are other reasons why detection limits might be elevated, the text will be revised to read: <i>"Some samples required dilution to quantitate a chemical present in the sample at high concentrations. Dilution of a sample causes the SQLs for chemicals not detected to be elevated. For some chemicals the effect of dilution on the SQL will result in SQLs greater than the screening or regulatory levels. The laboratory determined dilutions were necessary when the matrix interfered with the analysis of the sample."</i>	
2		Test Report and Analytical Tables.	We noted that there are two quantitation limits reported by the laboratory in their test report: PQL and SQL. The PQL values appear to be used in the table to represent detection limit. Shouldn't the SQL be used instead? Because there are many definitions of PQL, please clarify what each of these reporting limits represent.	C	<p>The laboratory reports two quantitation limits and provides their definitions routinely in analytical reports. The laboratory's PQL is analogous to the TCEQ's SQL, i.e., the MQL adjusted for soil moisture content and dilutions, as defined in the Consistency Memorandum (Section B.1.1.6). Therefore, in Tables 3-1, 3-3, and 3-4 of the final site investigation report, the laboratory's PQL flagged with a "U" and is used in the "Results" column to report the results for a chemical analyzed, but not detected, in environmental samples. Additionally, the column headed "Results" in those tables will be annotated by a footnote to document the results reported for chemicals not detected in the sample are flagged with a "U" and are the PQLs reported and defined by the laboratory as the MQL adjusted for sample-specific factors, such as soil moisture and dilution.</p> <p>The full value of the SQL is used in the data screening process, as described in the Consistency Memorandum (Section III.4) and as provided for assessments according to Risk Reduction Standard 3.</p> <p>The footnotes b and U to tables in Section 3 were revised to read: <i>b = Value is the lowest non-zero calibration standard in the laboratory's initial calibration curve adjusted for the laboratory matrix and the amount of standard used.</i> <i>U = Compound validated as not detected above the SQL reported. The</i></p>	A

**Comments on Draft Final Site Investigation Report, LHAAP-59
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					<p><i>SQL corresponds to the SQL as defined in TCEQ guidance (TCEQ 1998 Consistency Memorandum).</i></p> <p>For some chemicals, the unmodified MQL serves as the Standards 2 and 3 MSC cleanup level as described in the Consistency Memorandum (Section VI.2). When SQL values for soil are developed from analytical data, a correction for moisture content is required and other corrections for sample-specific actions by the laboratory are made (Consistency Memorandum Section B.1.1.6). In such cases, the Consistency Memorandum leads to an inconsistency in which the MSC cleanup standard can not be achieved in practice.</p> <p>Note that an SQL value for a soil sample that is based on an MQL corrected for soil moisture content (which involves dividing the MQL by the dry weight fraction) can never be less than the uncorrected MQL value, and can only equal the MQL if the soil sample is anhydrous, which is extremely unlikely in practice. Thus, when the MQL becomes the MSC cleanup value for a chemical, soil having concentrations at or below the SQL values still will exceed the cleanup standard. Further, any subsequent samples taken to confirm a cleanup action can never meet the cleanup standard for the same reasons.</p> <p>This inconsistency would not exist if the sample-specific value were based on a modified MDL as provided in other TCEQ guidance documents, the Texas Risk Reduction Program (30TAC§350 and the Quality Assurance Project Plan for the Superfund Program (Document Control Number 200919.4, April 2006.)</p> <p>This question was discussed with Fay Duke at a meeting on April 4, 2007. It was confirmed by the TCEQ in an April 9 e-mail that the laboratory MQL value is not corrected for moisture content. The importance of this question was discussed with Ann Strahl at the TCEQ by telephone on April 12 and in a telephone conference on May 17,</p>	

Comments on Draft Final Site Investigation Report, LHAAP-59
Longhorn Army Ammunition Plant

November 2006

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					<p>2007.</p> <p>Based on these conversations, the following text was inserted in Section 3.0 of the revised document to define terms:</p> <p>"Terms used in this report to describe concentrations at or near the detection limit are defined as follows:</p> <p>Practical quantitation limit (PQL) is the concentration of the lowest non-zero standard in the laboratory's calibration curve adjusted for laboratory reagent matrix type and sample size. The PQL is analogous to the method quantitation limit (MQL) reported by the laboratory and described in Section 7 of SW846-Method 8000B in U.S. Environmental Protection Agency's (USEPA) Test Methods for Evaluating Solid Waste (SW-846), (USEPA, 1997). The PQL is used under the 30 TAC 335 rule to evaluate the capability of the analytical method used by the laboratory to quantitate the chemicals at concentrations below the regulatory level, e.g., the medium specific concentrations (MSCs).</p> <p>When the PQL of the most sensitive standard available method is greater than the regulatory level, the PQL from that method is used as the regulatory limit in lieu of the MSC as allowed in 30 TAC 335. Upon TCEQ concurrence, that PQL remains the MSC for the life of the work related to the site being investigated if no extenuating circumstance arises and warrants investigating the chemical to lower levels. An example of an extenuating circumstance warranting a change to the PQL used as the MSC and relative to LHAAP would be a substantial change in circumstances that would result in increased risk to human health or the environment.</p> <p>Sample quantitation limit (SQL) is the PQL adjusted for sample-specific factors affecting the quantitation of the chemical measured in an environmental sample, such as dilution or moisture content, and flagged with a "U" qualifier to indicate the chemical was not detected in the</p>	

Comments on Draft Final Site Investigation Report, LHAAP-59
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					<p>sample.</p> <p>Method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from the analysis of a sample in a given matrix type containing the analyte ad defined in the Consistency Memorandum, Appendix B.1.1.2 (TCEQ, 1998).</p> <p>The laboratory establishes the MDL for the chemical and verifies the value on at least a quarterly basis using a detectability check sample (DCS) to demonstrate that the laboratory can detect the chemical at that MDL. The DCS is a laboratory reagent grade matrix sample spiked with the chemical at or within two times the laboratory's MDL and carried through the entire sample preparation and analysis procedures.</p> <p>Sample detection limit (SDL) is the laboratory's MDL for the chemical adjusted for sample-specific factors affecting the detection of the chemical measured in an environmental sample, such as dilution or percent moisture, and flagged or qualified with a "U" or "<" to indicate the chemical was not detected in the sample.</p> <p>As agreed upon between the TCEQ and LHAAP during a May 17, 2007 telephone conference, the SDL is used in this document to report nondetected results for chemicals only when the PQL is being used as the regulatory limit in lieu of the MSC for the chemical.</p> <p>Note: The analytical data test reports received from the laboratory use similar terms but define the terms differently. The following terms used by the Kemron laboratory are defined relative to the PQL, SQL, and SDL listed above:</p> <ul style="list-style-type: none"> • The Kemron laboratory's MQL is as defined in the 	

Comments on Draft Final Site Investigation Report, LHAAP-59
Longhorn Army Ammunition Plant

November 2006

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Reviewer: Fay Duke, TCEQ; Scott Harris, EPA Region 6

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					<p>Consistency Memorandum (Section B.1.1.3). MQL values for chemicals at LHAAP-59 are provided in Appendix B of this report.</p> <ul style="list-style-type: none"> • The Kemron laboratory's MDL is as defined in the Consistency Memorandum (Section B.1.1.3). • The Kemron laboratory's "PQL" is analogous to the SQL defined in Section 3.0 of this report. • The Kemron laboratory's "SQL" is analogous to the SDL defined in Section 3.0 of this report." 	
3		Section 3.1.2	<p>We note that several compounds were detected at concentrations above GWP-Ind, but not above their SAI-Ind values. It is further stated in this report that because there is no intention to access groundwater at LHAAP, the SAI-Ind concentrations are the more applicable medium specific concentrations. Unless a land use control is implemented for this area the presumption that there is no intention to access groundwater should not be used as the rationale for dismissing the GWP-Ind values. Please revise.</p> <p><i>TCEQ Comment (Fay Duke, from email dated March 20, 2007): I must revise my comments relating to Section 3.1.2 (TCEQ comment No. 3). Unlike RRR Std 3, there is limited flexibility in determining cleanup levels. In other words,</i></p>	C	The report will be revised to address the GWP-Ind MSC values.	A

Comments on Draft Final Site Investigation Report, LHAAP-59
Longhorn Army Ammunition Plant

November 2006

Submitted to Army on April 2, 2007

Reviewer: Fay Duke, TCEQ; Scott Harris, EPA Region 6

Respondents: Shaw Environmental, Inc.

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			<p>one cannot modify or chose not to comply with GWP-Ind MSC just because there is no intention to access groundwater. I have included the citation below:</p> <p>http://info.sos.state.tx.us/pls/pub/readtac\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=335&rl=559</p>			
4		Section 3.1.3	<p>We note that in the screening process for samples collected in the previous study the data was evaluated against the ecological screening value. Please explain why this process was not conducted for the samples collected in 2006. Are the additional data collected in 2006 being incorporated into the installation-wide risk assessment?</p>	C	<p>The ecological screening of historic data was done for information purposes only. The 2006 data were not screened for ecological evaluations because they are included in the site-wide ecological risk assessment.</p> <p>Yes, they have been included in the site-wide ecological risk assessment.</p>	A
5			<p>I completed my review of the SI report for LHAAP-06, 07...68. The comment letter is currently under review by management. However, I wanted to point out another major concern that I have regarding the data evaluation being conducted under TCEQ Risk Reduction Standard 2 medium specific concentrations (MSC). In this</p>	C	<p>Longhorn AAP sites can be evaluated according to Risk Standard 3 as provided in TCEQ correspondence dated April 2, 2000. However, at this time, the Army intends to screen the data under Standard 2. The screen against RBSV will be deleted from the document.</p>	A

**Comments on Draft Final Site Investigation Report, LHAAP-59
Longhorn Army Ammunition Plant**

November 2006

Submitted to Army on April 2, 2007

Reviewer: Fay Duke, TCEQ; Scott Harris, EPA Region 6

Respondents: Shaw Environmental, Inc.

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			report and likely in the SI report for LHAAP-59, a screening process was conducted to eliminate chemical with concentration that are equal or below the TCEQ risk based screening value (RSBV) from further evaluation against the Std 2 MSC. Please note that the screening chemical against the TCEQ RBSV is only to be use to be used under RRR std 3 for the purpose of eliminating chemical from the baseline risk assessment; the RBSV are not to be use compliance with RRR standard 2. Under RRR Standard 2, the sample results must be compared to the lower of the SAI-Ind and the GWP-Ind MSC unless the PQL or background is lower than the applicable MSC.			
EPA Review Comments						
1		Section 3.1.2	Section 3.1.2 indicates that under the TCEQ RRS, the future use of LHAAP as wildlife refuge corresponds to commercial/industrial land use regulations, rather than residential regulations. Thus the use of commercial/industrial criteria. Please verify and document that this is an	C	<p>Shaw concurs with the following TCEQ comment from Fay Duke:</p> <p><i>TCEQ Comment (Fay Duke, from email dated March 20, 2007): I went back to look at the rule and my comments regarding Scott's comment and wanted to clarify the issue regarding land use scenarios.</i></p> <p><i>First of all, the land use concept really only applies to RRR Std 3 in developing site specific baseline risk assessment. Under RRR Std 2, all facility are subject to residential soil requirements unless one of the three conditions are satisfied. The situation at Longhorn appears to satisfy the</i></p>	A

**Comments on Draft Final Site Investigation Report, LHAAP-59
Longhorn Army Ammunition Plant**

November 2006

Submitted to Army on April 2, 2007

Reviewer: Fay Duke, TCEQ; Scott Harris, EPA Region 6

Respondents: Shaw Environmental, Inc.

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			<p>accurate interpretation. I found an apparently conflicting interpretation at:</p> <p>http://www.tceq.state.tx.us/assets/public/remediation/trrp/update033104.pdf</p> <p>This document seems to indicate that such a land use would be considered residential.</p>		<p><i>conditions under 335.557(3), which states that for government owned property which have nonresidential activities, as long as access are restricted such that exposure assumptions remain valid for the duration of government control and therefore, can be subject to nonresidential requirements. The citation for 30 TAC 335.557 is included below:</i></p> <p><i>http://info.sos.state.tx.us/pls/pub/readtac\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=335&rl=557</i></p>	
2		Section 3.1.2	<p>Section 3.1.2 indicates that GWP-Ind standards will not be considered since there is no intent to access GW. Verify whether this is a sufficient rationale to disregard those standards, absent any type of land use restrictions.</p>	C	<p>The report will be revised to address the GWP-Ind MSC values.</p>	A

FINAL
SITE INVESTIGATION REPORT
LHAAP-59
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



Prepared for
U.S. Army Corps of Engineers
Tulsa District
1645 South 101st Avenue
Tulsa, Oklahoma

Prepared by
Shaw Environmental, Inc.
3010 Briarpark Drive, Suite 400
Houston, Texas 77042

Contract Number DACA56-94-D-0020, Task Order No. 109
Shaw Project No. 845714

August 2007

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Figure 1-2	Sample Location Map, LHAAP-59

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Appendix A	Soil Boring Logs
Appendix B	Analytical Data Reports (on compact disk)

Acronyms and Abbreviations

BERA	baseline ecological risk assessment
bgs	below ground surface
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
DCS	detectability check sample
DDE	dichloro-diphenyl ethylene
GWP-Ind	Groundwater Protection Standard for Industrial Use
ID	Identifier
Jacobs	Jacobs Engineering Group
LHAAP	Longhorn Army Ammunition Plant
MCL	maximum contaminant level
MCP	2-(4-chloro-2-methylphenoxy) propanoic acid
MDL	method detection limit
mg/kg	milligrams per kilogram
MQL	method quantitation limit
MSC	medium specific concentration
PQL	practical quantitation limit
QC	quality control
RRS	Risk Reduction Standard
SAI-Ind	Soil Ingestion, Inhalation, and Dermal Contact for Industrial Use
SDL	sample detection limit
Shaw	Shaw Environmental, Inc.
SI	site investigation
SQL	sample quantitation limit
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TERC	Total Environmental Restoration Contract
TO	Task Order
UPL	upper prediction limit
USEPA	U.S. Environmental Protection Agency

1.0 Introduction

The U.S. Army Corps of Engineers, Tulsa District, contracted Shaw Environmental, Inc. (Shaw), under Total Environmental Restoration Contract (TERC) Number DACA56-94-D-0020, Task Order (TO) No. 109, to conduct a site investigation (SI) at site LHAAP-59 at Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. The site is a former pesticide storage building (Building 725) located near LHAAP-35A(58). The location of LHAAP-59 is shown on **Figure 1-1**. This SI report presents results of soil sampling activities at LHAAP-59 conducted by Shaw in August 2006 and June 2007, and an evaluation of the results to support future action for the site.

1.1 Project Objectives

The objective of the field investigation at LHAAP-59 was to collect soil samples from the area around Building 725 to confirm the presence or absence of pesticide compounds that may have been released in the vicinity of Building 725 during their storage.

1.2 Site Description and History

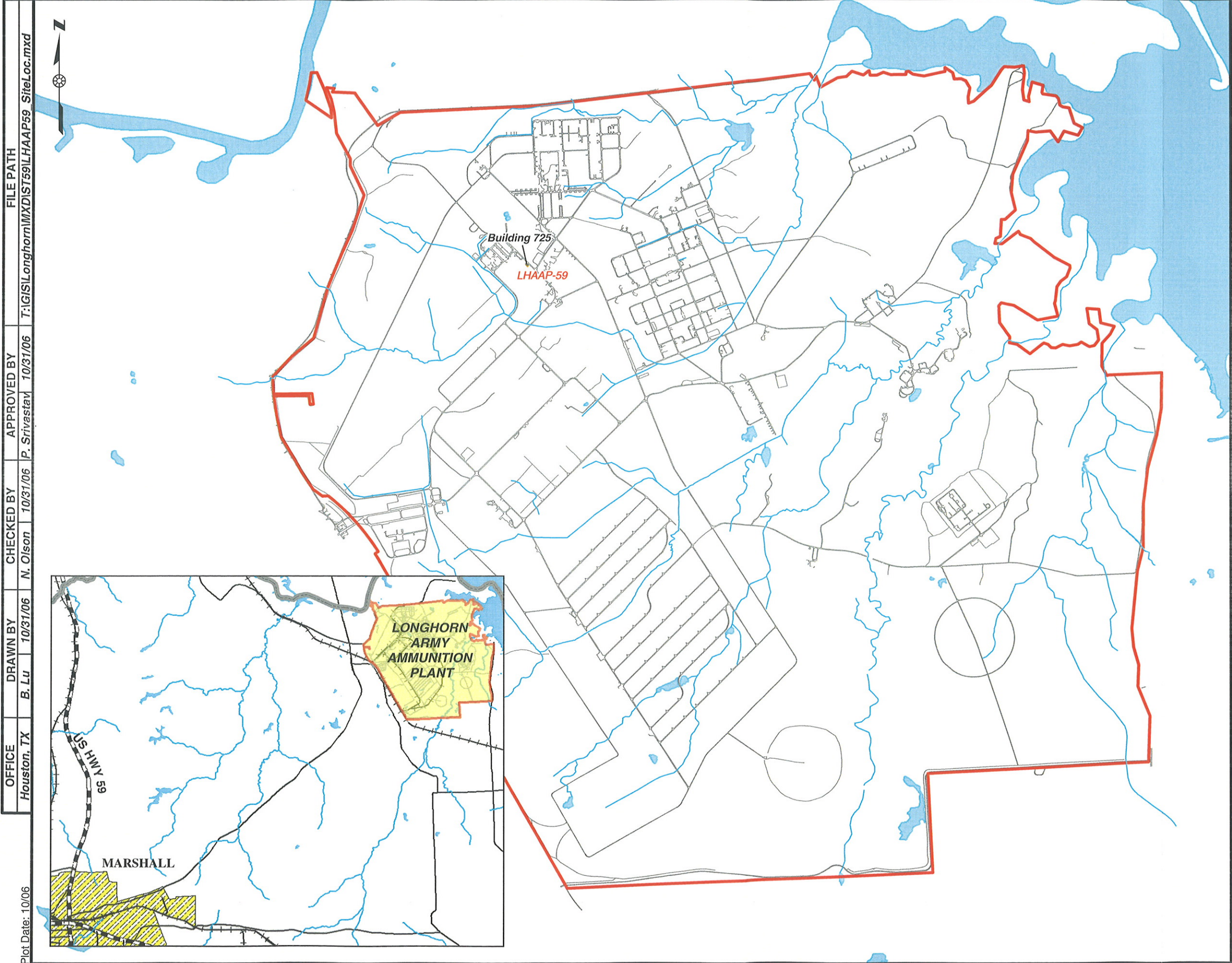
LHAAP is a former Army installation that occupied nearly 8,500 acres between State Highway 43 in Karnack, Texas, and the southwestern shore of Caddo Lake. The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the southeast. Caddo Lake, a large freshwater lake situated on the Texas-Louisiana border, bounds LHAAP to the north and east.

LHAAP-59 is described as a former pesticide storage building built in 1984, containing a concrete floor with floor drains. The drains discharged to two nearby sumps (SUMP119 and SUMP120). These sumps were previously filled with concrete (U.S. Army Corps of Engineers, 1993). The building has since been removed leaving a concrete slab measuring approximately 25 by 50 feet. The history and use of the slab adjacent to Building 725 is not described in available documents: Jacobs Engineering Group (Jacobs), 2002, and Plexus Scientific, 2005 (see **Figure 1-2**).

1.2.1 Previous Investigations

Between 1993 and 1998 a remedial investigation for the Group 4 sites included the collection of soil samples in areas located near Building 725 (Jacobs, 2002). A total of 8 soil samples from four locations were collected in the vicinity of LHAAP-59. Samples were analyzed for metals, volatile organic compounds, semivolatile organic compounds, and dioxins and furans (Jacobs, 2002). The samples were not analyzed for pesticides/herbicides, which are the site-related chemicals.

In the Environmental Site Assessment Phase I and II Report (Plexus Scientific, 2005), Building 725 is described as a former pesticide storage building where numerous chemicals were stored, including pyrethrum, FICAM[®]W, ZP[®] rodent bait, Sevin[®] Dust, Vaponite[®], Dursban[®], Velpar[®], Rodeo[®], Oust[®], Arsenal[®], Roundup[™], diazinon, Wasp Freeze[®], rodent cake, rat sorb, Gold Crest, 2,4-dichlorophenoxyacetic acid, USMA arsenic, UROX-G 4% Bromocil, AVITROL[®], pyrid, Safrocin, and Garlon[™].



Legend

- Stream
- Road
- Former Building 725
- Site
- Lake
- LHAAP Boundary

0 1,250 2,500 5,000 Feet



U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-1

SITE LOCATION MAP
LHAAP-59

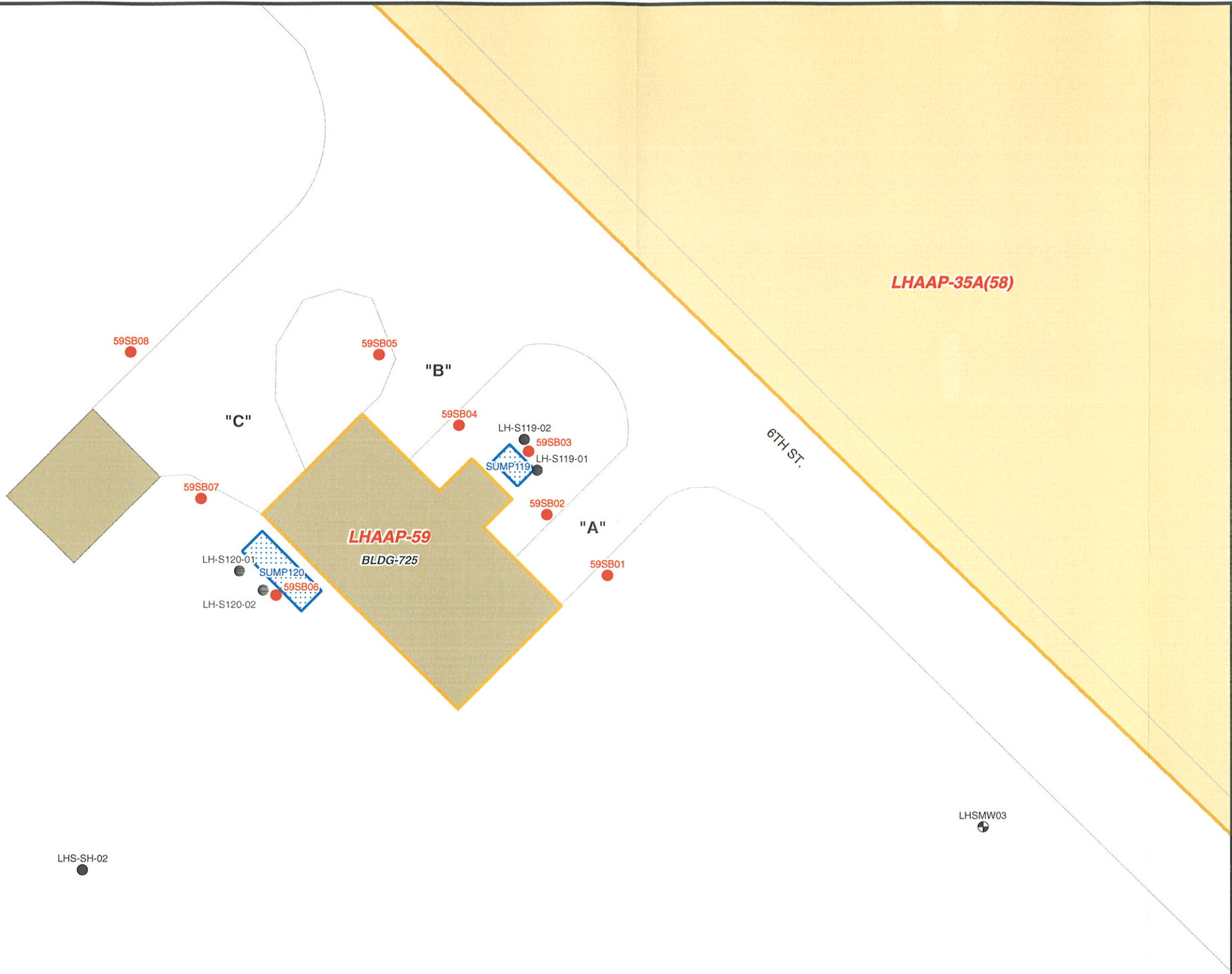
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

OFFICE Houston, TX
DRAWN BY B. Lu
CHECKED BY N. Olson
APPROVED BY P. Srivastav
FILE PATH T:\GIS\Longhorn\MXD\IST59\LHAAP59_SiteLoc.mxd

Plot Date: 10/06

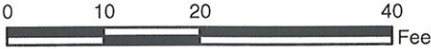
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Houston, TX	B. Lu	N. Olson	P. Srivastav	T:\GIS\LHAAP\MXD\IST59\LHAAP59_SampLocs_InvesPlan.mxd

Plot Date: 10/06



Legend

- Soil Boring (Shaw, August 2006)
- Shallow Monitoring Well
- Soil Boring (Previous Investigation, Jacobs, 2002)
- Road
- Sump
- Former Building or Concrete Slab
- Site
- "A" Drive Area Identification



U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

FIGURE 1-2

SAMPLE LOCATION MAP
LHAAP-59

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

2.0 *Field Investigation at LHAAP-59*

This section identifies the specific locations that were sampled by Shaw at LHAAP-59 during the August 2006 sampling event. The sample identifiers (IDs), as presented in this report, differ somewhat from the nomenclature presented in the Work Plan (Shaw, 2004a). The IDs presented here were selected to continue the numbering sequences that are currently in use at this site.

2.1 *Soil Sampling and Analytical Methods*

At LHAAP-59, Shaw collected the following samples (excluding quality control [QC] samples) for pesticide and herbicide analysis. Soil samples were collected next to the building foundation-slab drive areas where pesticides would typically be loaded and unloaded, and near the two sumps formerly located in the vicinity of Building 725.

- A sample pair on each side of the driveway designated “A” and facing 6th Street (59SB01 and 59SB02)
- A sample near the former SUMP119 (59SB03)
- A sample pair each side of the driveway designated “B” on and facing 6th Street to the northeast (59SB04 and 59SB05)
- One sample to the southwest of Building 725 adjacent to former SUMP120 (59SB06)
- One sample southwest of drive “C” (59SB07)
- One sample approximately 35 feet to the northwest of Building 725 and drive “C” (59SB08)

Table 2-1 provides a listing of soil samples. The sample locations are shown in **Figure 1-2**.

Boring locations were marked with a stake, where practical, and location coordinates were determined using a global positioning system device. Borings were advanced to approximately 4 feet using a hand auger. Two soil samples were collected from each location. One sample was from the surface interval, 0 to 1 foot below ground surface (bgs) and one sample from 3 to 4 feet bgs. Soil samples were screened using a photoionization detector, and headspace readings were taken and entered on the drilling log. **Appendix A** contains the soil boring logs. The analytical results with detection limits and data validation are in **Appendix B** on compact disk.

Table 2-1
LHAAP-59 Soil Sampling Locations

Sample ID	Location	Depth (feet bgs)	Analytes
59SB01-001	Approximately 10 feet from southeast corner of Building 725	0 - 1	pesticides/herbicides
59SB01-002		3 - 4	pesticides/herbicides
59SB02-001	Approximately 10 feet from east side of Building 725	0 - 1	pesticides/herbicides
59SB02-002		3 - 4	pesticides/herbicides
59SB03-001	Approximately 10 feet from east side of Building 725 adjacent to former "Sump119"	0 - 1	pesticides/herbicides
59SB03-002		3 - 4	pesticides/herbicides
59SB04-001	Approximately 10 feet from northeast side of Building 725	0 - 1	pesticides/herbicides
59SB04-002		3 - 4	pesticides/herbicides
59SB05-001	Approximately 10 feet from northeast corner of Building 725	0 - 1	pesticides/herbicides
59SB05-002		3 - 4	pesticides/herbicides
59SB06-001	Approximately 10 feet from west side of Building 725 near former "Sump120"	0 - 1	pesticides/herbicides
59SB06-002		3 - 4	pesticides/herbicides
59SB07-001	Approximately 10 feet from northwest corner of Building 725	0 - 1	pesticides/herbicides
59SB07-002		3 - 4	pesticides/herbicides
59SB08-001	Approximately 35 feet from north side of Building 725	0 - 1	pesticides/herbicides
59SB08-002		3 - 4	pesticides/herbicides

Abbreviation:

bgs below ground surface

3.0 *Summary and Interpretation of Analytical Results*

Soil samples collected in previous investigations (**Section 1.0**), samples collected and analyzed in August 2006 (**Section 2.0**), and samples collected in June 2007 (**Section 3.1.2**) were evaluated to support future regulatory decisions on LHAAP-59.

Decisions related to further action at the LHAAP-59 site will be made according to the requirements of the Risk Reduction Standards (RRSs) as described in Chapter 335 of Title 30 of the Texas Administrative Code (TAC) (30TAC§335) as updated by the Texas Commission on Environmental Quality (TCEQ) (TCEQ, 1998).

Analytical results of the samples were evaluated to identify chemicals of potential concern (COPCs) for human health and to compare the concentrations of COPCs to risk-based concentrations provided by the TCEQ.

Terms used in this report to describe concentrations at or near the detection limit are defined as follows:

- **Practical quantitation limit (PQL)** is the concentration of the lowest non-zero standard in the laboratory's calibration curve adjusted for laboratory reagent matrix type and sample size. The PQL is analogous to the method quantitation limit (MQL) reported by the laboratory and described in Section 7 of SW846-Method 8000B in U.S. Environmental Protection Agency's (USEPA) Test Methods for Evaluating Solid Waste (SW-846) (USEPA, 1997). The PQL is used under the 30 TAC §335 rule to evaluate the capability of the analytical method used by the laboratory to quantitate the chemicals at concentrations below the regulatory level, e.g., the medium specific concentrations (MSCs).

When the PQL of the most sensitive standard available method is greater than the regulatory level, the PQL from that method is used as the regulatory limit in lieu of the MSC as allowed in 30 TAC §335. Upon TCEQ concurrence, that PQL remains the MSC for the life of the work related to the site being investigated if no extenuating circumstance arises and warrants investigating the chemical to lower levels. An example of an extenuating circumstance warranting a change to the PQL used as the MSC and relative to LHAAP would be a substantial change in circumstances that would result in increased risk to human health or the environment.

- **Sample quantitation limit (SQL)** is the PQL adjusted for sample-specific factors affecting the quantitation of the chemical measured in an environmental sample, such as dilution or moisture content, and flagged with a "U" qualifier to indicate the chemical was not detected in the sample.
- **Method detection limit (MDL)** is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is

greater than zero and is determined from the analysis of a sample in a given matrix type containing the analyte as defined in the Consistency Memorandum, Appendix B.1.1.2 (TCEQ, 1998).

The laboratory establishes the MDL for the chemical and verifies the value on at least a quarterly basis using a detectability check sample (DCS) to demonstrate that the laboratory can detect the chemical at that MDL. The DCS is a laboratory reagent grade matrix sample spiked with the chemical at or within two times the laboratory's MDL and carried through the entire sample preparation and analysis procedures.

- **Sample detection limit (SDL)** is the laboratory's MDL for the chemical adjusted for sample-specific factors affecting the detection of the chemical measured in an environmental sample, such as dilution or percent moisture, and flagged or qualified with a "U" or "<" to indicate the chemical was not detected in the sample.

As agreed upon between the TCEQ and LHAAP during a May 17, 2007 telephone conference, the SDL is used in this document to report nondetected results for chemicals only when the PQL is being used as the regulatory limit in lieu of the MSC for the chemical.

Note: The analytical data test reports received from the laboratory use similar terms but define the terms differently. The following terms used by the Kemron laboratory are defined relative to the PQL, SQL, and SDL listed above:

- The Kemron laboratory's MQL is as defined in the Consistency Memorandum (Section B.1.1.3). MQL values for chemicals at LHAAP-59 are provided in Appendix B of this report.
- The Kemron laboratory's MDL is as defined in the Consistency Memorandum (Section B.1.1.3).
- The Kemron laboratory's "PQL" is analogous to the SQL defined in Section 3.0 of this report.
- The Kemron laboratory's "SQL" is analogous to the SDL defined in Section 3.0 of this report."

3.1 Identification of Chemicals of Potential Concern

Concentrations of chemicals analyzed in soil samples described in **Section 2.0** are provided in **Table 3-1**.

Analytical data were evaluated as follows:

- "U" – qualified data indicate undetected concentrations, with the method detection limit (MDL) shown.

- “J” – qualified data indicate estimated concentrations detected with concentrations measured between the MDL and the MQL value shown.
- “E” – qualified data indicate measurements exceeding the upper calibration limit, therefore, the concentration is estimated.
- “P” – qualified data indicate samples that were analyzed using two different chromatography columns, in which the difference between the two results exceeded QC limits. These results are included in the data screening values as estimated (J-qualified) values.
- Samples with any of the above qualifiers were included in the evaluation. Samples with an “R” qualifier were rejected from the data set.

The first step in the data evaluation was the selection of COPCs. The COPCs are chemicals that are detected in site media at concentrations that fail one or more criteria designed to eliminate chemicals from further evaluation that are unlikely to cause adverse human health effects. The COPCs for the LHAAP-59 evaluation were identified using the following criteria:

Essential Nutrients. Calcium, chloride, iron, magnesium, phosphorus, potassium, and sodium are considered as essential nutrients and were eliminated as COPCs (TCEQ, 2001, 2003).

Risk-Based Screening. A risk-based screening step was used to identify chemicals that would contribute significantly to human health risk. Chemicals with detected concentrations equal to or below risk-based screening concentrations in all samples were eliminated from further consideration. The TCEQ MSC value for a chemical in soil that is protective of groundwater for each chemical according to the commercial/industrial land use scenario, is termed the Groundwater Protection Standard for Industrial Use (GWP-Ind) MSC (TCEQ, 1998, 2006). The GWP-Ind MSC for a chemical is its concentration in soil that is protective of a groundwater resource that might be used as a drinking water source. The value is protective of human health from ingestion exposure to chemicals in water at a 1E-06 target risk level for carcinogens and a target hazard quotient of 1 for noncarcinogens. For chemicals having a maximum contaminant level (MCL) value established in the Safe Drinking Water Act, the GWP-Ind expressed as milligrams per kilogram (mg/kg) equals 100 X the MCL value (30 TAC §335). In cases where chemicals have both carcinogenic and noncancer toxicity factors, the applicable MSC represents the lower (more conservative) value.

Background. For metals, a comparison to site-specific background concentrations was used to determine whether detected concentrations might be related to LHAAP operations or naturally occurring background levels. The LHAAP-specific background concentrations for soil were developed using data that represent background concentrations for surface (0 to 0.5 feet bgs) and subsurface (1.5 to 2.5 feet bgs) soil (Shaw, 2004b). Because the samples collected at LHAAP-59 (see **Sections 1.0** and **2.0**) were taken at 0 to 1 feet bgs and 3 to 4 feet bgs, the depth interval of

surface and subsurface samples for LHAAP-59 and background soil data do not correspond exactly. Therefore, the LHAAP-59 concentrations were compared to the lower of surface and subsurface background concentrations. This approach provides a more conservative evaluation.

Based on TCEQ recommendations, 95 percent upper prediction limits (UPLs) of the background data sets (Shaw, 2004b) were calculated and used in this evaluation (**Table 3-2**). The 95 percent UPL value represents the concentration that will be above the next single measurement with 95 percent confidence as calculated below.

The distributions of background concentrations are shown in the original soil background document (Shaw, 2004b) and are repeated in **Table 3-2**. If the background data have either the normal or lognormal distribution, then the 95 percent UPL was calculated according to the equation (USEPA, 1992):

$$UPL_{0.95} = X + t_{n-1,0.95} \times S \times (1+1/n)^{1/2} \quad \text{Equation 1}$$

where:

$UPL_{0.95}$	=	the 95 percent UPL
X	=	mean background concentration
$t_{n-1,0.95}$	=	Student's t value for n-1 degrees of freedom and 95 percent confidence
S	=	standard deviation of the mean
n	=	number of samples

If the data were lognormally distributed, then the 95 percent UPL value used (**Table 3-2**) is the antilogarithm of the value calculated by Equation 1.

Nonparametric methods were used if the data did not have either the normal or lognormal distribution. The 95 percent UPL concentration was determined by ranking the data from highest to lowest and calculating the 95th percentile rank according to the equation:

$$UPL_{0.95} = 95^{\text{th}} \text{ percentile} = 0.95(n+1) \quad \text{Equation 2}$$

where:

$UPL_{0.95}$	=	concentration occupying the 95 th percentile rank
95 th percentile	=	the 95 th percentile rank of the data set
n	=	number of samples

This 95th percentile is the same as the 95 percent UPL according to the assumptions made in Equation 1. **Table 3-2** summarizes the 95 percent UPL concentrations as applied in **Table 3-1**.

3.1.1 *Screening of Samples Collected in August 2006*

Table 3-1 illustrates the COPC screening process for the soil samples collected in August 2006. The applicable GWP-Ind MSCs used for screening are risk-based levels given in TCEQ (1998) guidance and in current tables (TCEQ, 2006). As provided in the RRS, the cleanup level for a chemical is the higher of the PQL or the background concentration for all RRSs, as described in Title 30, TAC§335.554(d) for Risk Standard 1, and §335.555(d) for Risk Standard 2. The PQL as used in this report, is the lowest non-zero standard in the laboratory's initial calibration curve, as defined in the Attachment B.1.1.4 of the Consistency Memorandum (TCEQ, 1998), and is analogous to the MQL currently defined in SW-846 (USEPA, 1997).

The "Result" values reported by the laboratory and used in this report represent the SQL, which is defined as the MQL adjusted for sample specific factors such as moisture content and dilution (Consistency Memorandum, Attachment B.1.1.6). LHAAP uses the SQLs to report the results for nondetected chemicals analyzed in an environmental sample. When a chemical is not detected in the sample, the SQL calculated for the chemical is reported flagged with a "U" qualifier, as required in the Consistency Memorandum (Section II.4.2), to advise the data user the chemical is not detected in the sample. See definitions in **Section 3.0**.

Some samples required dilution to quantitate a chemical present in the sample at high concentrations. Dilution of a sample causes the SQLs for chemicals not detected to be elevated. For some chemicals the effect of dilution on the SQL will result in SQLs greater than the screening or regulatory levels. The laboratory determined dilutions were necessary when the matrix interfered with the analysis of the sample.

The applicable screening value (**Table 3-1**) represents the greater of the GWP-Ind value, background, and the MQL in accordance with TCEQ guidance. All chemicals analyzed in the 2006 samples were nondetect except for 2-(4-chloro-2-methylphenoxy) propanoic acid (MCP), 4,4'-dichloro-diphenyl ethylene (DDE), alpha-chlordane, gamma-chlordane, heptachlor, heptachlor epoxide, and pentachlorophenol, and can be removed from further consideration at LHAAP-59 (**Table 3-1**).

3.1.2 *Comparison of COPCs to Medium Specific Concentrations*

Under the TCEQ RRS, future use of LHAAP as a game refuge corresponds to commercial/industrial land-use regulations, rather than residential regulations. The TCEQ Soil Ingestion, Inhalation, and Dermal Contact for Industrial Use (SAI-Ind) MSC values are risk-based soil concentrations developed to protect human health from exposure via ingestion, inhalation, and dermal absorption pathways under commercial/industrial land-use assumptions.

The TCEQ GWP-Ind MSC values were developed to protect groundwater from the leaching of chemicals from soil, and correspond to potential use of groundwater under commercial/industrial land use assumptions.

The GWP-Ind MSC values are used in the evaluation of LHAAP-59 soil data (TCEQ, 2006). The values are protective at a target risk level of 1E-06 for carcinogens and a target hazard quotient of 1 for noncarcinogens. In cases where contaminants have both carcinogenic factors and no cancer toxicity factors, the MSC represents the lower (more conservative) value.

As provided in the original RRS 30TAC§335.559[g], the applicable MSC for a chemical in soil under RRS 2 is the lower of the SAI-Ind and the GWP-Ind. If the MQL is greater than the lower MSC value, the MQL is the applicable MSC, as described above.

Table 3-1 illustrates the comparison of soil concentrations to the applicable TCEQ MSCs. Concentrations of MCP, 4,4'-DDE, and heptachlor are below the applicable MSC in all samples.

Pentachlorophenol was detected in one sample (59SB-05-01) at a concentration below the applicable MSC. Pentachlorophenol was not detected in samples 59SB02-01, 59SB03-01, 59SB04-01, and 59SB06-01, 59SB06-01-FD, and 59SB07-01, but the SDL was elevated above the applicable MSC as a result of sample dilution (**Table 3-1**). Because the SDL was elevated by dilution, it is uncertain whether pentachlorophenol is present at a concentration slightly below the elevated SDL, or is not present in the sample at all.

These diluted samples were taken from the upper 1 foot of soil. The samples taken at the same locations at 3 to 4 feet bgs did not require dilution, and did not contain detectable pentachlorophenol. The uncertainty associated with dilution of the 0 to 1 foot sample is best explained by concluding that the diluted samples actually did not contain detectable pentachlorophenol.

If the diluted samples from the upper 1 foot contained pentachlorophenol at a concentration above the applicable GWP-Ind, the data show that any pentachlorophenol is not transportable to soil at 3 to 4 feet bgs in detectable concentrations. Therefore, pentachlorophenol concentrations in these samples, if any, are protective of groundwater.

Because pesticide concentrations above applicable MSC concentrations were measured in soil at the 59SB01 and 59SB02 locations, additional samples were collected for analysis by SW-846 Method 1312, the Synthetic Precipitation Leachate Procedure (SPLP), as provided in 30TAC§335.559(g)(2)(B). The samples were collected according to the approved work plan (Shaw, 2004a) on June 21, 2007 and assigned identifiers 59SB01A-0-1FT and 59SB02A-0-1FT (**Table 3-3a** and **3-3b**).

Results of the SPLP analysis indicate that alpha-chlordane, gamma-chlordane, and heptachlor epoxide in SPLP leachate were detected at concentrations below the MSC for groundwater (GWP-Ind) (**Table 3-3a**). Because these leachate concentrations are below GWP-Ind MSCs, the results demonstrate that these chemicals in soil do not pose the potential for a future release of leachate in excess of the groundwater concentration and are considered to be protective for nonresidential worker exposure, as specified in 30TAC§335.559(g)(2)(B).

Analytical results for alpha-chlordane, gamma-chlordane, and heptachlor epoxide in the soil samples subjected to the leaching test (**Table 3-3b**) indicate that samples 59SB01A-0-1FT and 59SB02A-0-1FT contained lower concentrations than the samples collected from the same locations in 2006 (59SB01-01 and 59SB02-01, **Table 3-1**). Thus, the resampling event of June 21, 2007, did not confirm the observations of August 2, 2006.

All chemicals analyzed in the August 2006 sampling effort are either undetected in all samples, below applicable MSC (GWP-Ind) or were found to be protective of groundwater by the SPLP leaching test. Therefore, the chemicals in soil samples collected in August 2006 meet requirements for closure of LHAAP-59, under the RRSs.

3.1.3 Screening of Samples Collected in Previous Studies

Table 3-4 illustrates the COPC screening process for the soil samples collected at LHAAP-59 in previous studies (**Section 2.0**). The applicable MSC used for screening is the TCEQ (2006) GWP-Ind value, unless the minimum MQL is greater, or the minimum 95 percent UPL background concentration is greater if the chemical is a metal.

Aluminum was detected above the applicable MSC in one sample (LH-S120-02_2), which was collected from 4 to 5 ft bgs (**Table 3-4**). Arsenic was detected in sample LH-S119-01 QC, which was collected from 0.5 to 2 ft bgs, and is a field duplicate sample of sample LH-S119-01_1 that did not contain arsenic above the MSC. Arsenic was detected at a concentration of 5.2 mg/kg in sample LH-S120-02_2 that was collected at 4 to 5 ft bgs. This concentration is above the applicable MSC value, but below the background concentration of soil at 1.5 to 2.5 ft bgs.

Lead was detected above the applicable MSC in one sample (LH-S119-01_2), which was collected from 5 to 7 ft bgs (**Table 3-4**). The lead concentration (21.3 mg/kg) is within the background concentration range for surface and subsurface soil (11.41 mg/kg to 22.59 mg/kg, **Table 3-4**).

Zinc was detected above the applicable MSC in samples LH-S119-01 QC, though not confirmed by the duplicate sample LH-S119-01_1, and in samples LH-S119-01_2, LH-S119-02_2, and LH-S120-02_2, which were collected between 4 and 7 ft bgs. The zinc concentrations detected

above the MSC (24 mg/kg , 30 mg/kg, 26 mg/kg, and 23 mg/kg) are all within the range of background concentrations of zinc (20.20 mg/kg to 61.60 mg/kg) (**Table 3-4**).

Table 3-4 includes the ecological screening values for the chemicals of potential ecological concern (COPECs) at LHAAP (Shaw, 2006). The risk to ecological receptors at LHAAP is being assessed on an installation-wide basis under the baseline ecological risk assessment (BERA). The BERA is currently in progress and its results are expected to identify areas and contaminants within the installation that would require a remedial response. Because any ecological risk for LHAAP-59 will be addressed when the BERA is complete, the ecological screening values are provided only for information purposes in the screening evaluation. Samples with COPECs at concentrations above the ecological screening values are indicated by shading in **Table 3-4**.

Aluminum, arsenic, barium, chromium, cobalt, copper, lead, manganese, strontium, zinc, and bis-(2-ethylhexyl)phthalate were detected in at least one sample. All other chemicals analyzed were undetected in all samples (**Table 3-4**). All metals except aluminum, arsenic, lead, zinc, and bis-(2-ethylhexyl)phthalate were detected at concentrations below the applicable MSC concentration and, therefore, are not of further concern at LHAAP-59.

Bis-(2-ethylhexyl)phthalate was detected at concentrations slightly above the MQL in two samples, LH-S120-02_1 and LH-S120-02_2 (**Table 3-4**). Bis-(2-ethylhexyl)phthalate is used widely in the manufacture of plastics and polymers, and is not associated with the explosives manufacturing operations at LHAAP. It is ubiquitous in the environment at concentrations near the detection limit as observed at LHAAP-59 (**Table 3-4**), and is not of further concern at LHAAP-59.

The aluminum concentration exceeded applicable MSC concentrations only at one location in historic samples, and at a concentration consistent with background levels (**Table 3-4**), and is not of further concern at LHAAP-59.

Because concentrations of arsenic detected above the MSC were near background concentrations, or did not exceed applicable MSCs in duplicate samples, or in samples from the same boring, arsenic is not of further concern at LHAAP-59.

Lead and zinc concentrations in historic samples exceeded applicable MSCs, as represented by the lower of background concentrations for surface and subsurface soil at LHAAP. However, the detected concentrations are within the range of background observed in these metals in LHAAP soil and lead and zinc are not of further consideration at LHAAP-59.

Table 3-1
Comparison of Chemical Concentrations in Soil to Groundwater-Protective Commercial/Industrial Medium Specific Concentrations
LHAAP-59

LOCATION_CODE						35SUMP119-SB01	35SUMP119-SB02	35SUMP120-SB01	35SUMP120-SB02
SAMPLE_NO						35-SMP119-SB01-02	35-SMP119-SB02-02	35-SMP120-SB01-02	35-SMP120-SB02-02
SAMPLE_DATE						26-Sep-06	26-Sep-06	26-Sep-06	26-Sep-06
SAMPLE_DEPTH						6 - 6 Ft	6 - 6 Ft	6 - 6 Ft	6 - 6 Ft
SAMPLE_PURPOSE						REG	REG	REG	REG
Test Group	Parameter (Units = mg/kg)	TCEQ Medium-Specific Concentration (MSC)	Method Detection	Method Quantitation	Applicable TCEQ Risk-Based MSC ^b	Result ^c Qual ValQual DIL	Result ^c Qual ValQual DIL	Result ^c Qual ValQual DIL	Result ^c Qual ValQual DIL
GEN CHEMISTRY	Percent Solids	NA	NA	NA	--	86.6	88.1	85.8	86.8
HERBICIDES	2,2-Dichloropropanoic Acid (Dalapon)	2.0E+01	5.00E-02	1.00E-01	2.0E+01				
HERBICIDES	2,4,5-T	1.0E+02	2.00E-03	4.00E-03	1.0E+02				
HERBICIDES	2,4,5-TP (Silvex)	5.0E+00	1.50E-03	3.00E-03	5.0E+00				
HERBICIDES	2,4-D	7.0E+00	2.00E-02	4.00E-02	7.0E+00				
HERBICIDES	2,4-DB	8.2E+01	2.00E-02	4.00E-02	8.2E+01				
HERBICIDES	Dicamba	3.1E+02	2.00E-03	4.00E-03	3.1E+02				
HERBICIDES	Dichloroprop	1.0E+02	2.00E-02	4.00E-02	1.0E+02				
HERBICIDES	Dinoseb	7.0E-01	1.00E-02	2.00E-02	7.0E-01				
HERBICIDES	MCPA	5.1E+00	2.00E+00	4.00E+00	5.1E+00				
HERBICIDES	MCPP	1.0E+01	2.00E+00	4.00E+00	1.0E+01				
PESTICIDES	4,4'-DDD	1.2E-01	3.30E-04	1.65E-03	1.2E-01	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	4,4'-DDE	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	4,4'-DDT	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Aldrin	1.7E-03	3.30E-04	1.65E-03	1.7E-03	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	alpha-BHC	4.5E-03	3.30E-04	1.65E-03	4.5E-03	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	alpha-Chlordane	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.00219 P J	0.00187 U U	0.03410 P J	0.00189 U U
PESTICIDES	beta-BHC	1.6E-01	3.30E-04	1.65E-03	1.6E-01	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	delta-BHC	1.6E-02	3.30E-04	1.65E-03	1.6E-02	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Dieldrin	1.8E-03	3.30E-04	1.65E-03	1.8E-03	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Endosulfan I	2.0E+01	3.30E-04	1.65E-03	2.0E+01	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Endosulfan II	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Endosulfan Sulfate	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Endrin	2.0E-01	3.30E-04	1.65E-03	2.0E-01	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Endrin aldehyde	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Endrin ketone	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00189 U UJ	0.00187 U UJ	0.00192 U UJ	0.00189 U UJ
PESTICIDES	gamma-BHC (Lindane)	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	gamma-CHLORDANE	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.00104 J J	0.00187 U U	0.00801	0.00189 U U
PESTICIDES	Heptachlor	4.0E-02	3.30E-04	1.65E-03	4.0E-02	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Heptachlor epoxide	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00189 U U	0.00187 U U	0.00851	0.00189 U U
PESTICIDES	METHOXYCHLOR	4.0E+00	3.30E-04	1.65E-03	4.0E+00	0.00189 U U	0.00187 U U	0.00192 U U	0.00189 U U
PESTICIDES	Toxaphene	3.0E-01	1.67E-02	3.30E-02	3.0E-01	0.03790 U U	0.03730 U U	0.03840 U U	0.03780 U U
SEMIVOLATILES	Pentachlorophenol	1.0E-01	3.30E-01	8.25E-01	8.3E-01				

Notes and Abbreviations:

Blank entry indicates sample was not analyzed for the chemical.

Shading indicates the Applicable Risk-Based MSC = the MQL for the chemical.

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

b Value is the lowest non-zero calibration standard in the laboratory's initial calibration curve adjusted for the laboratory matrix and the amount of standard used.

c Results flagged with a "U" are the PQLs reported and defined by the laboratory as the MQL adjusted for sample-specific factors such as soil moisture and dilution.

DIL: Dilution factor

FD: Field duplicate sample

J: Estimated value. Chemical was detected above the method detection limit but below the MQL.

NA: Not applicable

P: Sample was analyzed using two different chromatography columns in which the difference between the two results exceeded quality control limits.

REG: Regular sample

U: Compound validated as not detected above SQL reported. The SQL corresponds to the SQL as defined in TCEQ guidance (TCEQ, 1998).

Concentration exceeds Applicable MSC concentration.

Table 3-1
Comparison of Chemical Concentrations in Soil to Groundwater-Protective Commercial/Industrial Medium Specific Concentrations
LHAAP-59

LOCATION_CODE						59SB01			59SB01			59SB02							
SAMPLE_NO						59SB01-01			59SB01-02			59SB02-01							
SAMPLE_DATE	TCEQ				Applicable TCEQ Risk-Based	2-Aug-06			2-Aug-06			2-Aug-06							
SAMPLE_DEPTH	Medium-Specific Concentration (MSC)		Method Detection	Method Quantitation		0 - 1 ft			3 - 4 ft			0 - 1 ft							
SAMPLE_PURPOSE						REG			REG			REG							
Test Group	Parameter (Units = mg/kg)	GWP-Ind ^a	Limit (MDL)	Limit (MQL)		MSC ^b			Result ^c	Qual	Val/Qual	DIL	Result ^c	Qual	Val/Qual	DIL	Result ^c	Qual	Val/Qual
GEN CHEMISTRY	Percent Solids	NA	NA	NA	--	93.1	Qual	Val/Qual	DIL	93.1	Qual	Val/Qual	DIL	93.1	Qual	Val/Qual	DIL		
HERBICIDES	2,2-Dicloropropanoic Acid (Dalapon)	2.0E+01	5.00E-02	1.00E-01	2.0E+01	0.10700	U	U	1	0.11300	U	U	1	1.05000	U	U	10		
HERBICIDES	2,4,5-T	1.0E+02	2.00E-03	4.00E-03	1.0E+02	0.00429	U	U	1	0.00454	U	U	1	0.04200	U	U	10		
HERBICIDES	2,4,5-TP (Silvex)	5.0E+00	1.50E-03	3.00E-03	5.0E+00	0.00322	U	U	1	0.00340	U	U	1	0.03150	U	U	10		
HERBICIDES	2,4-D	7.0E+00	2.00E-02	4.00E-02	7.0E+00	0.04290	U	U	1	0.04540	U	U	1	0.42000	U	U	10		
HERBICIDES	2,4-DB	8.2E+01	2.00E-02	4.00E-02	8.2E+01	0.04290	U	U	1	0.04540	U	U	1	0.42000	U	U	10		
HERBICIDES	Dicamba	3.1E+02	2.00E-03	4.00E-03	3.1E+02	0.00429	U	U	1	0.00454	U	U	1	0.04200	U	U	10		
HERBICIDES	Dichloroprop	1.0E+02	2.00E-02	4.00E-02	1.0E+02	0.04290	U	U	1	0.04540	U	U	1	0.42000	U	U	10		
HERBICIDES	Dinoseb	7.0E-01	1.00E-02	2.00E-02	7.0E-01	0.02150	U	U	1	0.02270	U	U	1	0.21000	U	U	10		
HERBICIDES	MCPA	5.1E+00	2.00E+00	4.00E+00	5.1E+00	4.29	U	U	1	4.54	U	U	1	42.00	U	U	10		
HERBICIDES	MCPP	1.0E+01	2.00E+00	4.00E+00	1.0E+01	4.29	U	U	1	4.54	U	U	1	42.00	U	U	10		
PESTICIDES	4,4'-DDD	1.2E-01	3.30E-04	1.65E-03	1.2E-01	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	4,4'-DDE	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	4,4'-DDT	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Aldrin	1.7E-03	3.30E-04	1.65E-03	1.7E-03	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	alpha-BHC	4.5E-03	3.30E-04	1.65E-03	4.5E-03	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	alpha-Chlordane	8.2E-02	3.30E-04	1.65E-03	8.2E-02	2.11	P	J	500	0.01310	P	J	1	0.661	P	J	10		
PESTICIDES	beta-BHC	1.6E-01	3.30E-04	1.65E-03	1.6E-01	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	delta-BHC	1.6E-02	3.30E-04	1.65E-03	1.6E-02	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Dieldrin	1.8E-03	3.30E-04	1.65E-03	1.8E-03	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Endosulfan I	2.0E+01	3.30E-04	1.65E-03	2.0E+01	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Endosulfan II	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Endosulfan Sulfate	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Endrin	2.0E-01	3.30E-04	1.65E-03	2.0E-01	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Endrin aldehyde	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Endrin ketone	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	gamma-BHC (Lindane)	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	gamma-CHLORDANE	8.2E-02	3.30E-04	1.65E-03	8.2E-02	2.43		500		0.01570			1	0.677	P	J	10		
PESTICIDES	Heptachlor	4.0E-02	3.30E-04	1.65E-03	4.0E-02	0.00548		1		0.00185	U	U	1	0.01070	J	J	10		
PESTICIDES	Heptachlor epoxide	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00176	U	U	1	0.00262	P	J	1	0.165	P	J	10		
PESTICIDES	METHOXYCHLOR	4.0E+00	3.30E-04	1.65E-03	4.0E+00	0.00176	U	U	1	0.00185	U	U	1	0.01730	U	U	10		
PESTICIDES	Toxaphene	3.0E-01	1.67E-02	3.30E-02	3.0E-01	0.03530	U	U	1	0.03710	U	U	1	0.34700	U	U	10		
SEMIVOLATILES	Pentachlorophenol	1.0E-01	3.30E-01	8.25E-01	8.3E-01	0.35446	U	U	1	0.35446	U	U	1	3.54458	U	U	10		

Notes and Abbreviations:

Blank entry indicates sample was not analyzed for the chemical.

Shading indicates the Applicable Risk-Based MSC = the MQL for the chemical.

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

b Value is the lowest non-zero calibration standard in the laboratory's initial calibration curve adjusted for the laboratory matrix and the amount of standard used.

c Results flagged with a "U" are the PQLs reported and defined by the laboratory as the MQL adjusted for sample-specific factors such as soil moisture and dilution.

DIL: Dilution factor

FD: Field duplicate sample

J: Estimated value. Chemical was detected above the method detection limit but below the MQL.

NA: Not applicable

P: Sample was analyzed using two different chromatography columns in which the difference between the two results exceeded quality control limits.

REG: Regular sample

U: Compound validated as not detected above SQL reported. The SQL corresponds to the SQL as defined in TCEQ guidance (TCEQ, 1998).

Concentration exceeds Applicable MSC concentration.

Table 3-1
Comparison of Chemical Concentrations in Soil to Groundwater-Protective Commercial/Industrial Medium Specific Concentrations
LHAAP-59

LOCATION_CODE						59SB02	59SB03	59SB03
SAMPLE_NO						59SB02-02	59SB03-01	59SB03-02
SAMPLE_DATE						2-Aug-06	2-Aug-06	2-Aug-06
SAMPLE_DEPTH	TCEQ	Method	Method	Applicable		3 - 4 ft	0 - 1 ft	3 - 4 ft
SAMPLE_PURPOSE	Medium-Specific Concentration (MSC)	Detection	Quantitation	Risk-Based		REG	REG	REG
Test Group	Parameter (Units = mg/kg)	GWP-Ind ^a	Limit (MDL)	Limit (MQL)	MSC ^b	Result ^c Qual ValQual DIL	Result ^c Qual ValQual DIL	Result ^c Qual ValQual DIL
GEN CHEMISTRY	Percent Solids	NA	NA	NA		93.1 1	93.1 1	93.1 1
HERBICIDES	2,2-Dichloropropanoic Acid (Dalapon)	2.0E+01	5.00E-02	1.00E-01	2.0E+01	0.11100 U U 1	0.55900 U U 5	0.11100 U U 1
HERBICIDES	2,4,5-T	1.0E+02	2.00E-03	4.00E-03	1.0E+02	0.00443 U U 1	0.02240 U U 5	0.00445 U U 1
HERBICIDES	2,4,5-TP (Silvex)	5.0E+00	1.50E-03	3.00E-03	5.0E+00	0.00332 U U 1	0.01680 U U 5	0.00334 U U 1
HERBICIDES	2,4-D	7.0E+00	2.00E-02	4.00E-02	7.0E+00	0.04430 U U 1	0.22400 U U 5	0.04450 U U 1
HERBICIDES	2,4-DB	8.2E+01	2.00E-02	4.00E-02	8.2E+01	0.04430 U U 1	0.22400 U U 5	0.04450 U U 1
HERBICIDES	Dicamba	3.1E+02	2.00E-03	4.00E-03	3.1E+02	0.00443 U U 1	0.02240 U U 5	0.00445 U U 1
HERBICIDES	Dichloroprop	1.0E+02	2.00E-02	4.00E-02	1.0E+02	0.04430 U U 1	0.22400 U U 5	0.04450 U U 1
HERBICIDES	Dinoseb	7.0E-01	1.00E-02	2.00E-02	7.0E-01	0.02220 U U 1	0.11200 U U 5	0.02230 U U 1
HERBICIDES	MCPA	5.1E+00	2.00E+00	4.00E+00	5.1E+00	4.43 U U 1	22.40 U U 5	4.45 U U 1
HERBICIDES	MCPP	1.0E+01	2.00E+00	4.00E+00	1.0E+01	4.43 U U 1	22.40 U U 5	4.45 U U 1
PESTICIDES	4,4'-DDD	1.2E-01	3.30E-04	1.65E-03	1.2E-01	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	4,4'-DDE	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	4,4'-DDT	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Aldrin	1.7E-03	3.30E-04	1.65E-03	1.7E-03	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	alpha-BHC	4.5E-03	3.30E-04	1.65E-03	4.5E-03	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	alpha-Chlordane	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.01650 P J 1	0.00602 J J 5	0.00184 U U 1
PESTICIDES	beta-BHC	1.6E-01	3.30E-04	1.65E-03	1.6E-01	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	delta-BHC	1.6E-02	3.30E-04	1.65E-03	1.6E-02	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Dieldrin	1.8E-03	3.30E-04	1.65E-03	1.8E-03	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Endosulfan I	2.0E+01	3.30E-04	1.65E-03	2.0E+01	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Endosulfan II	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Endosulfan Sulfate	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Endrin	2.0E-01	3.30E-04	1.65E-03	2.0E-01	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Endrin aldehyde	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Endrin ketone	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	gamma-BHC (Lindane)	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	gamma-CHLORDANE	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.02030 1	0.00696 J J 5	0.00184 U U 1
PESTICIDES	Heptachlor	4.0E-02	3.30E-04	1.65E-03	4.0E-02	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Heptachlor epoxide	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00339 P J 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	METHOXYCHLOR	4.0E+00	3.30E-04	1.65E-03	4.0E+00	0.00181 U U 1	0.00900 U U 5	0.00184 U U 1
PESTICIDES	Toxaphene	3.0E-01	1.67E-02	3.30E-02	3.0E-01	0.03620 U U 1	0.18000 U U 5	0.03670 U U 1
SEMIVOLATILES	Pentachlorophenol	1.0E-01	3.30E-01	8.25E-01	8.3E-01	0.35446 U U 1	1.77229 U U 5	0.35446 U U 1

Notes and Abbreviations:

Blank entry indicates sample was not analyzed for the chemical.

Shading indicates the Applicable Risk-Based MSC = the MQL for the chemical.

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

b Value is the lowest non-zero calibration standard in the laboratory's initial calibration curve adjusted for the laboratory matrix and the amount of standard used.

c Results flagged with a "U" are the PQLs reported and defined by the laboratory as the MQL adjusted for sample-specific factors such as soil moisture and dilution.

DIL: Dilution factor

FD: Field duplicate sample

J: Estimated value. Chemical was detected above the method detection limit but below the MQL.

NA: Not applicable

P: Sample was analyzed using two different chromatography columns in which the difference between the two results exceeded quality control limits.

REG: Regular sample

U: Compound validated as not detected above SQL reported. The SQL corresponds to the SQL as defined in TCEQ guidance (TCEQ, 1998).

Concentration exceeds Applicable MSC concentration.

Table 3-1
Comparison of Chemical Concentrations in Soil to Groundwater-Protective Commercial/Industrial Medium Specific Concentrations
LHAAP-59

LOCATION_CODE						59SB04			59SB04			59SB04					
SAMPLE_NO						59SB04-01			59SB04-02			59SB04-02-FD					
SAMPLE_DATE		TCEQ			Applicable	2-Aug-06			2-Aug-06			2-Aug-06					
SAMPLE_DEPTH		Medium-Specific	Method	Method	TCEQ	0 - 1 ft			3 - 4 ft			3 - 4 ft					
SAMPLE_PURPOSE		Concentration (MSC)	Detection	Quantitation	Risk-Based	REG			REG			FD					
Test Group	Parameter (Units = mg/kg)	GWP-Ind ^a	Limit (MDL)	Limit (MQL)	MSC ^b	Result ^c	Qual	ValQual	DIL	Result ^c	Qual	ValQual	DIL	Result ^c	Qual	ValQual	DIL
GEN CHEMISTRY	Percent Solids	NA	NA	NA	--	93.1			1	93.1			1	93.1			1
HERBICIDES	2,2-Dichloropropanoic Acid (Dalapon)	2.0E+01	5.00E-02	1.00E-01	2.0E+01	0.52900	U	U	5	0.11000	U	U	1	0.11000	U	U	1
HERBICIDES	2,4,5-T	1.0E+02	2.00E-03	4.00E-03	1.0E+02	0.02120	U	U	5	0.00441	U	U	1	0.00441	U	U	1
HERBICIDES	2,4,5-TP (Silvex)	5.0E+00	1.50E-03	3.00E-03	5.0E+00	0.01590	U	U	5	0.00331	U	U	1	0.00331	U	U	1
HERBICIDES	2,4-D	7.0E+00	2.00E-02	4.00E-02	7.0E+00	0.21200	U	U	5	0.04410	U	U	1	0.04410	U	U	1
HERBICIDES	2,4-DB	8.2E+01	2.00E-02	4.00E-02	8.2E+01	0.21200	U	U	5	0.04410	U	U	1	0.04410	U	U	1
HERBICIDES	Dicamba	3.1E+02	2.00E-03	4.00E-03	3.1E+02	0.02120	U	U	5	0.00441	U	U	1	0.00441	U	U	1
HERBICIDES	Dichloroprop	1.0E+02	2.00E-02	4.00E-02	1.0E+02	0.21200	U	U	5	0.04410	U	U	1	0.04410	U	U	1
HERBICIDES	Dinoseb	7.0E-01	1.00E-02	2.00E-02	7.0E-01	0.10600	U	U	5	0.02200	U	U	1	0.02210	U	U	1
HERBICIDES	MCPA	5.1E+00	2.00E+00	4.00E+00	5.1E+00	21.20	U	U	5	4.41	U	U	1	4.41	U	U	1
HERBICIDES	MCPP	1.0E+01	2.00E+00	4.00E+00	1.0E+01	21.20	U	U	5	4.41	U	U	1	4.41	U	U	1
PESTICIDES	4,4'-DDD	1.2E-01	3.30E-04	1.65E-03	1.2E-01	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	4,4'-DDE	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	4,4'-DDT	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Aldrin	1.7E-03	3.30E-04	1.65E-03	1.7E-03	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	alpha-BHC	4.5E-03	3.30E-04	1.65E-03	4.5E-03	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	alpha-Chlordane	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.05860	P	J	1	0.00627	P	J	1	0.00590	P	J	1
PESTICIDES	beta-BHC	1.6E-01	3.30E-04	1.65E-03	1.6E-01	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	delta-BHC	1.6E-02	3.30E-04	1.65E-03	1.6E-02	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Dieldrin	1.8E-03	3.30E-04	1.65E-03	1.8E-03	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Endosulfan I	2.0E+01	3.30E-04	1.65E-03	2.0E+01	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Endosulfan II	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Endosulfan Sulfate	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Endrin	2.0E-01	3.30E-04	1.65E-03	2.0E-01	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Endrin aldehyde	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Endrin ketone	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	gamma-BHC (Lindane)	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	gamma-CHLORDANE	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.06870			1	0.00740			1	0.00692			1
PESTICIDES	Heptachlor	4.0E-02	3.30E-04	1.65E-03	4.0E-02	0.00137	J		1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Heptachlor epoxide	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.01540	P	J	1	0.00152	J	J	1	0.00132	J	J	1
PESTICIDES	METHOXYCHLOR	4.0E+00	3.30E-04	1.65E-03	4.0E+00	0.00171	U	U	1	0.00181	U	U	1	0.00178	U	U	1
PESTICIDES	Toxaphene	3.0E-01	1.67E-02	3.30E-02	3.0E-01	0.03430	U	U	1	0.03630	U	U	1	0.03570	U	U	1
SEMIVOLATILES	Pentachlorophenol	1.0E-01	3.30E-01	8.25E-01	8.3E-01	1.77229	U	U	5	0.35446	U	U	1	0.35446	U	U	1

Notes and Abbreviations:

Blank entry indicates sample was not analyzed for the chemical.

Shading indicates the Applicable Risk-Based MSC = the MQL for the chemical.

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

b Value is the lowest non-zero calibration standard in the laboratory's initial calibration curve adjusted for the laboratory matrix and the amount of standard used.

c Results flagged with a "U" are the PQLs reported and defined by the laboratory as the MQL adjusted for sample-specific factors such as soil moisture and dilution.

DIL: Dilution factor

FD: Field duplicate sample

J: Estimated value. Chemical was detected above the method detection limit but below the MQL.

NA: Not applicable

P: Sample was analyzed using two different chromatography columns in which the difference between the two results exceeded quality control limits.

REG: Regular sample

U: Compound validated as not detected above SQL reported. The SQL corresponds to the SQL as defined in TCEQ guidance (TCEQ, 1998).

Concentration exceeds Applicable MSC concentration.

Table 3-1
Comparison of Chemical Concentrations in Soil to Groundwater-Protective Commercial/Industrial Medium Specific Concentrations
LHAAP-59

LOCATION_CODE						59SB05			59SB05			59SB06					
SAMPLE_NO						59SB05-01			59SB05-02			59SB06-01					
SAMPLE_DATE		TCEQ			Applicable	3-Aug-06			3-Aug-06			3-Aug-06					
SAMPLE_DEPTH		Medium-Specific	Method	Method	TCEQ	0 - 1 ft			3 - 4 ft			0 - 1 ft					
SAMPLE_PURPOSE		Concentration (MSC)	Detection	Quantitation	Risk-Based	REG			REG			REG					
Test Group	Parameter (Units = mg/kg)	GWP-Ind ^a	Limit (MDL)	Limit (MQL)	MSC ^b	Result ^c	Qual	ValQual	DIL	Result ^c	Qual	ValQual	DIL	Result ^c	Qual	ValQual	DIL
GEN CHEMISTRY	Percent Solids	NA	NA	NA	--	93.1			1	93.1			1	93.1			1
HERBICIDES	2,2-Dichloropropanoic Acid (Dalapon)	2.0E+01	5.00E-02	1.00E-01	2.0E+01	0.10400	U	U	1	0.11000	U	U	1	0.54600	U	U	5
HERBICIDES	2,4,5-T	1.0E+02	2.00E-03	4.00E-03	1.0E+02	0.00418	U	U	1	0.00439	U	U	1	0.02180	U	U	5
HERBICIDES	2,4,5-TP (Silvex)	5.0E+00	1.50E-03	3.00E-03	5.0E+00	0.00313	U	U	1	0.00329	U	U	1	0.01640	U	U	5
HERBICIDES	2,4-D	7.0E+00	2.00E-02	4.00E-02	7.0E+00	0.04180	U	U	1	0.04390	U	U	1	0.21800	U	U	5
HERBICIDES	2,4-DB	8.2E+01	2.00E-02	4.00E-02	8.2E+01	0.04180	U	U	1	0.04390	U	U	1	0.21800	U	U	5
HERBICIDES	Dicamba	3.1E+02	2.00E-03	4.00E-03	3.1E+02	0.00418	U	U	1	0.00439	U	U	1	0.02180	U	U	5
HERBICIDES	Dichloroprop	1.0E+02	2.00E-02	4.00E-02	1.0E+02	0.04180	U	U	1	0.04390	U	U	1	0.21800	U	U	5
HERBICIDES	Dinoseb	7.0E-01	1.00E-02	2.00E-02	7.0E-01	0.02090	U	U	1	0.02190	U	U	1	0.10900	U	U	5
HERBICIDES	MCPA	5.1E+00	2.00E+00	4.00E+00	5.1E+00	4.18	U	U	1	4.39	U	U	1	21.80	U	U	5
HERBICIDES	MCPP	1.0E+01	2.00E+00	4.00E+00	1.0E+01	4.18	U	U	1	4.39	U	U	1	21.80	U	U	5
PESTICIDES	4,4'-DDD	1.2E-01	3.30E-04	1.65E-03	1.2E-01	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	4,4'-DDE	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	4,4'-DDT	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Aldrin	1.7E-03	3.30E-04	1.65E-03	1.7E-03	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	alpha-BHC	4.5E-03	3.30E-04	1.65E-03	4.5E-03	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	alpha-Chlordane	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.00453	P	J	1	0.00636	P	J	1	0.04920	P	J	1
PESTICIDES	beta-BHC	1.6E-01	3.30E-04	1.65E-03	1.6E-01	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	delta-BHC	1.6E-02	3.30E-04	1.65E-03	1.6E-02	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Dieldrin	1.8E-03	3.30E-04	1.65E-03	1.8E-03	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Endosulfan I	2.0E+01	3.30E-04	1.65E-03	2.0E+01	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Endosulfan II	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Endosulfan Sulfate	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Endrin	2.0E-01	3.30E-04	1.65E-03	2.0E-01	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Endrin aldehyde	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Endrin ketone	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	gamma-BHC (Lindane)	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	gamma-CHLORDANE	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.00547			1	0.00847			1	0.05850			1
PESTICIDES	Heptachlor	4.0E-02	3.30E-04	1.65E-03	4.0E-02	0.00172	U	U	1	0.00178	U	U	1	0.00160	J		1
PESTICIDES	Heptachlor epoxide	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00172	U	U	1	0.00156	J	J	1	0.00958	P	J	1
PESTICIDES	METHOXYCHLOR	4.0E+00	3.30E-04	1.65E-03	4.0E+00	0.00172	U	U	1	0.00178	U	U	1	0.00179	U	U	1
PESTICIDES	Toxaphene	3.0E-01	1.67E-02	3.30E-02	3.0E-01	0.03440	U	U	1	0.03570	U	U	1	0.03580	U	U	1
SEMIVOLATILES	Pentachlorophenol	1.0E-01	3.30E-01	8.25E-01	8.3E-01	0.00277	J	J	1	0.35446	U	U	1	1.77229	U	U	5

Notes and Abbreviations:

Blank entry indicates sample was not analyzed for the chemical.

Shading indicates the Applicable Risk-Based MSC = the MQL for the chemical.

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

b Value is the lowest non-zero calibration standard in the laboratory's initial calibration curve adjusted for the laboratory matrix and the amount of standard used.

c Results flagged with a "U" are the PQLs reported and defined by the laboratory as the MQL adjusted for sample-specific factors such as soil moisture and dilution.

DIL: Dilution factor

FD: Field duplicate sample

J: Estimated value. Chemical was detected above the method detection limit but below the MQL.

NA: Not applicable

P: Sample was analyzed using two different chromatography columns in which the difference between the two results exceeded quality control limits.

REG: Regular sample

U: Compound validated as not detected above SQL reported. The SQL corresponds to the SQL as defined in TCEQ guidance (TCEQ, 1998).

Concentration exceeds Applicable MSC concentration.

Table 3-1
Comparison of Chemical Concentrations in Soil to Groundwater-Protective Commercial/Industrial Medium Specific Concentrations
LHAAP-59

LOCATION_CODE						59SB06	59SB06	59SB07
SAMPLE_NO						59SB06-01-FD	59SB06-02	59SB07-01
SAMPLE_DATE						3-Aug-06	3-Aug-06	3-Aug-06
SAMPLE_DEPTH						0 - 1 ft	3 - 4 ft	0 - 1 ft
SAMPLE_PURPOSE						FD	REG	REG
Test Group	Parameter (Units = mg/kg)	Medium-Specific Concentration (MSC)	Method Detection	Method Quantitation	Applicable Risk-Based MSC ^b	Result ^c Qual ValQual DIL	Result ^c Qual ValQual DIL	Result ^c Qual ValQual DIL
GEN CHEMISTRY	Percent Solids	NA	NA	NA	NA	93.1	93.1	93.1
HERBICIDES	2,2-Dichloropropanoic Acid (Dalapon)	2.0E+01	5.00E-02	1.00E-01	2.0E+01	0.54000 U U 5	0.10700 U U 1	0.55100 U U 5
HERBICIDES	2,4,5-T	1.0E+02	2.00E-03	4.00E-03	1.0E+02	0.02160 U U 5	0.00427 U U 1	0.02200 U U 5
HERBICIDES	2,4,5-TP (Silvex)	5.0E+00	1.50E-03	3.00E-03	5.0E+00	0.01620 U U 5	0.00320 U U 1	0.01650 U U 5
HERBICIDES	2,4-D	7.0E+00	2.00E-02	4.00E-02	7.0E+00	0.21600 U U 5	0.04270 U U 1	0.22000 U U 5
HERBICIDES	2,4-DB	8.2E+01	2.00E-02	4.00E-02	8.2E+01	0.21600 U U 5	0.04270 U U 1	0.22000 U U 5
HERBICIDES	Dicamba	3.1E+02	2.00E-03	4.00E-03	3.1E+02	0.02160 U U 5	0.00427 U U 1	0.02200 U U 5
HERBICIDES	Dichloroprop	1.0E+02	2.00E-02	4.00E-02	1.0E+02	0.21600 U U 5	0.04270 U U 1	0.22000 U U 5
HERBICIDES	Dinoseb	7.0E-01	1.00E-02	2.00E-02	7.0E-01	0.10800 U U 5	0.02130 U U 1	0.11000 U U 5
HERBICIDES	MCPA	5.1E+00	2.00E+00	4.00E+00	5.1E+00	21.60 U U 5	4.27 U U 1	22.00 U U 5
HERBICIDES	MCPP	1.0E+01	2.00E+00	4.00E+00	1.0E+01	21.60 U U 5	4.27 U U 1	22.00 U U 5
PESTICIDES	4,4'-DDD	1.2E-01	3.30E-04	1.65E-03	1.2E-01	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	4,4'-DDE	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00180 U U 1	0.00174 U U 1	0.00148 J U 1
PESTICIDES	4,4'-DDT	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Aldrin	1.7E-03	3.30E-04	1.65E-03	1.7E-03	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	alpha-BHC	4.5E-03	3.30E-04	1.65E-03	4.5E-03	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	alpha-Chlordane	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.04790 P J 1	0.02950 P J 1	0.00081 J J 1
PESTICIDES	beta-BHC	1.6E-01	3.30E-04	1.65E-03	1.6E-01	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	delta-BHC	1.6E-02	3.30E-04	1.65E-03	1.6E-02	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Dieldrin	1.8E-03	3.30E-04	1.65E-03	1.8E-03	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Endosulfan I	2.0E+01	3.30E-04	1.65E-03	2.0E+01	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Endosulfan II	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Endosulfan Sulfate	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Endrin	2.0E-01	3.30E-04	1.65E-03	2.0E-01	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Endrin aldehyde	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Endrin ketone	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	gamma-BHC (Lindane)	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	gamma-CHLORDANE	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.05800 U U 1	0.04270 U U 1	0.00193 U U 1
PESTICIDES	Heptachlor	4.0E-02	3.30E-04	1.65E-03	4.0E-02	0.00139 J U 1	0.00176 U U 1	0.00182 U U 1
PESTICIDES	Heptachlor epoxide	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00883 P J 1	0.00951 P J 1	0.00040 J J 1
PESTICIDES	METHOXYCHLOR	4.0E+00	3.30E-04	1.65E-03	4.0E+00	0.00180 U U 1	0.00174 U U 1	0.00182 U U 1
PESTICIDES	Toxaphene	3.0E-01	1.67E-02	3.30E-02	3.0E-01	0.03600 U U 1	0.03490 U U 1	0.03640 U U 1
SEMIVOLATILES	Pentachlorophenol	1.0E-01	3.30E-01	8.25E-01	8.3E-01	1.77229 U U 5	0.35446 U U 1	1.77229 U U 5

Notes and Abbreviations:

Blank entry indicates sample was not analyzed for the chemical.

Shading indicates the Applicable Risk-Based MSC = the MQL for the chemical.

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

b Value is the lowest non-zero calibration standard in the laboratory's initial calibration curve adjusted for the laboratory matrix and the amount of standard used.

c Results flagged with a "U" are the PQLs reported and defined by the laboratory as the MQL adjusted for sample-specific factors such as soil moisture and dilution.

DIL: Dilution factor

FD: Field duplicate sample

J: Estimated value. Chemical was detected above the method detection limit but below the MQL.

NA: Not applicable

P: Sample was analyzed using two different chromatography columns in which the difference between the two results exceeded quality control limits.

REG: Regular sample

U: Compound validated as not detected above SQL reported. The SQL corresponds to the SQL as defined in TCEQ guidance (TCEQ, 1998).

Concentration exceeds Applicable MSC concentration.

Table 3-1
Comparison of Chemical Concentrations in Soil to Groundwater-Protective Commercial/Industrial Medium Specific Concentrations
LHAAP-59

LOCATION_CODE						59SB07	59SB08	59SB08
SAMPLE_NO						59SB07-02	59SB08-01	59SB08-02
SAMPLE_DATE						3-Aug-06	3-Aug-06	3-Aug-06
SAMPLE_DEPTH						3 - 4 ft	0 - 1 ft	3 - 4 ft
SAMPLE_PURPOSE						REG	REG	REG
Test Group	Parameter (Units = mg/kg)	TCEQ Medium-Specific Concentration (MSC)	Method Detection	Method Quantitation	Applicable TCEQ Risk-Based MSC ^b	Result ^c Qual	Result ^c Qual	Result ^c Qual
GEN CHEMISTRY	Percent Solids	NA	NA	NA	~	93.1	93.1	93.1
HERBICIDES	2,2-Dichloropropanoic Acid (Dalapon)	2.0E+01	5.00E-02	1.00E-01	2.0E+01	0.11600 U	0.11300 U	0.12000 U
HERBICIDES	2,4,5-T	1.0E+02	2.00E-03	4.00E-03	1.0E+02	0.00462 U	0.00454 U	0.00479 U
HERBICIDES	2,4,5-TP (Silvex)	5.0E+00	1.50E-03	3.00E-03	5.0E+00	0.00347 U	0.00340 U	0.00360 U
HERBICIDES	2,4-D	7.0E+00	2.00E-02	4.00E-02	7.0E+00	0.04620 U	0.04540 U	0.04790 U
HERBICIDES	2,4-DB	8.2E+01	2.00E-02	4.00E-02	8.2E+01	0.04620 U	0.04540 U	0.04790 U
HERBICIDES	Dicamba	3.1E+02	2.00E-03	4.00E-03	3.1E+02	0.00462 U	0.00454 U	0.00479 U
HERBICIDES	Dichloroprop	1.0E+02	2.00E-02	4.00E-02	1.0E+02	0.04620 U	0.04540 U	0.04790 U
HERBICIDES	Dinoseb	7.0E-01	1.00E-02	2.00E-02	7.0E-01	0.02310 U	0.02270 U	0.02400 U
HERBICIDES	MCPA	5.1E+00	2.00E+00	4.00E+00	5.1E+00	4.62 U	4.54 U	4.79 U
HERBICIDES	MCPP	1.0E+01	2.00E+00	4.00E+00	1.0E+01	4.62 U	5.30 P	4.79 U
PESTICIDES	4,4'-DDD	1.2E-01	3.30E-04	1.65E-03	1.2E-01	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	4,4'-DDE	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	4,4'-DDT	8.4E-02	3.30E-04	1.65E-03	8.4E-02	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Aldrin	1.7E-03	3.30E-04	1.65E-03	1.7E-03	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	alpha-BHC	4.5E-03	3.30E-04	1.65E-03	4.5E-03	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	alpha-Chlordane	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	beta-BHC	1.6E-01	3.30E-04	1.65E-03	1.6E-01	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	delta-BHC	1.6E-02	3.30E-04	1.65E-03	1.6E-02	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Dieldrin	1.8E-03	3.30E-04	1.65E-03	1.8E-03	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Endosulfan I	2.0E+01	3.30E-04	1.65E-03	2.0E+01	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Endosulfan II	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Endosulfan Sulfate	6.1E+01	3.30E-04	1.65E-03	6.1E+01	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Endrin	2.0E-01	3.30E-04	1.65E-03	2.0E-01	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Endrin aldehyde	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Endrin ketone	3.1E+00	3.30E-04	1.65E-03	3.1E+00	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	gamma-BHC (Lindane)	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	gamma-CHLORDANE	8.2E-02	3.30E-04	1.65E-03	8.2E-02	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Heptachlor	4.0E-02	3.30E-04	1.65E-03	4.0E-02	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Heptachlor epoxide	2.0E-02	3.30E-04	1.65E-03	2.0E-02	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	METHOXYCHLOR	4.0E+00	3.30E-04	1.65E-03	4.0E+00	0.00189 U	0.00186 U	0.00195 U
PESTICIDES	Toxaphene	3.0E-01	1.67E-02	3.30E-02	3.0E-01	0.03780 U	0.03720 U	0.03890 U
SEMIVOLATILES	Pentachlorophenol	1.0E-01	3.30E-01	8.25E-01	8.3E-01	0.35446 U	0.35446 U	0.35446 U

Notes and Abbreviations:

Blank entry indicates sample was not analyzed for the chemical.

Shading indicates the Applicable Risk-Based MSC = the MQL for the chemical.

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

b Value is the lowest non-zero calibration standard in the laboratory's initial calibration curve adjusted for the laboratory matrix and the amount of standard used.

c Results flagged with a "U" are the PQLs reported and defined by the laboratory as the MQL adjusted for sample-specific factors such as soil moisture and dilution.

DIL: Dilution factor

FD: Field duplicate sample

J: Estimated value. Chemical was detected above the method detection limit but below the MQL.

NA: Not applicable

P: Sample was analyzed using two different chromatography columns in which the difference between the two results exceeded quality control limits.

REG: Regular sample

U: Compound validated as not detected above SQL reported. The SQL corresponds to the SQL as defined in TCEQ guidance (TCEQ, 1998).

Concentration exceeds Applicable MSC concentration.

Table 3-2
Upper Prediction Limits
for Soil Background Data

Metal	Surface Soil (0 - 0.5 Feet bgs)		Subsurface Soil (1.5 - 2.5 Feet bgs)	
	Distribution Type	95% UPL Concentration (mg/kg)	Distribution Type	95% UPL Concentration (mg/kg)
Aluminum	Nonparametric	16300.00	Lognormal	20767.06
Antimony	Nonparametric	0.94	Nonparametric	1.60
Arsenic	Lognormal	4.81	Normal	5.54
Barium	Lognormal	151.83	Lognormal	85.45
Cadmium	Nonparametric	1.40	Nonparametric	0.40
Chromium	Lognormal	26.56	Lognormal	30.06
Cobalt	Normal	7.23	Lognormal	5.61
Copper	Lognormal	5.55	Lognormal	9.25
Lead	Lognormal	22.59	Lognormal	11.41
Manganese	Lognormal	1249.70	Lognormal	201.11
Mercury	Lognormal	0.08	Nonparametric	0.36
Selenium	Lognormal	3.48	Normal	5.56
Silver	Nonparametric	0.31	Nonparametric	0.37
Strontium	Lognormal	19.83	Lognormal	29.05
Zinc	Nonparametric	61.60	Lognormal	20.20

Notes and Abbreviations:

95% UPL The concentration that will be above the next single measurement with 95 percent confidence.

bgs below ground surface

mg/kg milligrams per kilogram

Table 3-3a
Concentrations of Chemicals in Leachate from Synthetic Precipitation Leaching Procedure (SPLP) (SW-846 Method 1312)
Conducted on Soil Samples from LHAAP-59
Longhorn Army Ammunition Plant
Karnack, Texas

LOCATION_CODE SAMPLE_NO SAMPLE_DATE			Method Quantitation	Method Quantitation	TCEQ Risk-Based MSC	Applicable TCEQ Risk-Based MSC	59SB01A 59SB01A-0-1FT 21-Jun-07			59SB02A 59SB02A-0-1FT 21-Jun-07		
Test Group	Parameter	Units	Limit (MDL)	Limit (MQL)	GW-Ind ^a	Industrial	Result	DIL	Qual	Result	DIL	Qual
PESTICIDES	alpha-Chlordane	ug/L	0.01000	0.0500	8.2E-01	8.2E-01	0.0292	1	J	NA		
PESTICIDES	gamma-CHLORDANE	ug/L	0.01000	0.0500	8.2E-01	8.2E-01	0.0185	1	J	NA		
PESTICIDES	Heptachlor epoxide	ug/L	0.01000	0.0500	2.0E-01	2.0E-01	NA			0.0665		1

Notes and Abbreviations:

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

J estimated value. Chemical was detected above the method detection limit but below the MQL.

MDL method detection limit

MQL method quantitation limit

NA Sample not analyzed for this chemical

µg/L micrograms per liter

Table 3-3b
Concentrations of Chemicals in Soil Samples Used in the Synthetic Precipitation Leaching Procedure (SPLP) (SW-846 Method 1312)
Longhorn Army Ammunition Plant
Karnack, Texas

LOCATION_CODE SAMPLE_NO SAMPLE_DATE			Method Quantitation	Method Quantitation	TCEQ Risk-Based MSC	Applicable TCEQ Risk-Based MSC	59SB01A 59SB01A-0-1FT 21-Jun-07			59SB02A 59SB02A-0-1FT 21-Jun-07		
Test Group	Parameter	Units	Limit (MDL)	Limit (MQL)	GWP-Ind ^a	Industrial	Result	DIL	Qual	Result	DIL	Qual
PESTICIDES	alpha-Chlordane	ug/kg	0.33000	1.6500	8.2E+01	8.2E+01	15.70	1	J	NA		
PESTICIDES	gamma-CHLORDANE	ug/kg	0.33000	1.6500	8.2E+01	8.2E+01	6.26	1	J	NA		
PESTICIDES	Heptachlor epoxide	ug/kg	0.33000	1.6500	2.0E+01	2.0E+01	NA			33.60		1

Notes and Abbreviations:

Concentration exceeds Applicable MSC concentration.

a Value provided by the Texas Commission on Environmental Quality (TCEQ) as updated through March 2006 available on the TCEQ website at <http://www.tceq.state.tx.us/remediation/rrr.html>.

J estimated value. Chemical was detected above the method detection limit but below the MQL.

MDL method detection limit

MQL method quantitation limit

NA Sample not analyzed for this chemical

µg/L micrograms per liter

Table 3-4
Comparison of Chemicals Analyzed in Soil to Groundwater-Protective Medium Specific Concentrations
LHAAP-59 Historical Samples

Location Code						Background		Applicable TCEQ Risk-Based MSC ^e	LH-S119-01	LH-S119-01	LH-S119-01	LH-S119-02	LH-S119-02	LH-S120-01	LH-S120-01	LH-S120-02	LH-S120-02		
Sample No						Concentrations in Soil (95% UPL, mg/kg) ^d			LH-S119-01_1	LH-S119-01 QC	LH-S119-01_2	LH-S119-02_1	LH-S119-02_2	LH-S120-01_1	LH-S120-01_2	LH-S120-02_1	LH-S120-02_2		
Sample Date	TCEQ								4-Aug-93	4-Aug-93	4-Aug-93	4-Aug-93	4-Aug-93	4-Aug-93	4-Aug-93	4-Aug-93	4-Aug-93		
FK Depth	Medium-Specific Concentration					Ecological Screening Value ^b			Method Quantitation Limit (MQL) ^c		Surface		Subsurface		0 - 0.5 Ft		1.5 - 2.5 Ft		
Sample Purpose											REG		REG		REG		REG		
Test Group	Parameter, Units = mg/kg	(MSC, GWP-Ind) ^a								Result ^f	Qual	ValQual	Result ^f	Qual	ValQual	Result ^f	Qual	ValQual	
Metals	Aluminum	1.0E+04	NVR		16300	20767	1.6E+04	9030			12500			14400			7210		
Metals	Antimony	6.0E-01	NVR	3	0.94	1.60	3.0E+00	3	<	U	3	<	U	3	<	U	3	<	U
Metals	Arsenic	1.0E+00	NVR		4.81	5.54	4.8E+00	2			8.2			4.4			2.1		5.2
Metals	Barium	2.0E+02	330		151.83	85.45	2.0E+02	96			57			128			79		69
Metals	Cadmium	5.0E-01	0.36	1	1.40	0.40	1.0E+00	1	<	U	1	<	U	1	<	U	1	<	U
Metals	Calcium ^g	NVR	NVR	NVR	NVR	NVR	NVR	2520			1320			2070			886		909
Metals	Chromium	1.0E+01	0.40		26.56	30.06	2.7E+01	15			19			21			11		25
Metals	Cobalt	6.1E+02	NVR		7.23	5.61	6.1E+02	8			3			19			11		3
Metals	Copper	1.3E+02	NVR		5.55	9.25	1.3E+02	3			3			3			3		3
Metals	Iron ^g	NVR	NVR	NVR	NVR	NVR	NVR	13800			15700			19100			13500		7810
Metals	Lead	1.5E+00	11.00		22.59	11.41	1.1E+01	6.8			6.9			21.3			5.9		4.1
Metals	Magnesium ^g	NVR	NVR	NVR	NVR	NVR	NVR	1080			1020			1050			491		4.1
Metals	Manganese	1.4E+03	NVR		1249.70	201.11	1.4E+03	529			175			593			229		759
Metals	Mercury	2.0E-01	0.10	0.1	0.08	0.36	2.0E-01	0.1	<	U	0.1	<	U	0.1	<	U	0.1	<	0.1
Metals	Potassium ^g	NVR	NVR	NVR	NVR	NVR	NVR	582			796			758			673		930
Metals	Selenium	5.0E+00	1.00	1	3.48	5.56	5.0E+00	1	<	U	1	<	U	1	<	U	1	<	1
Metals	Silver	5.1E+01	2	1	0.31	0.37	5.1E+01	1	<	U	1	<	U	1	<	U	1	<	1
Metals	Strontium	6.1E+03	NVR		19.83	29.05	6.1E+03	8			7			11			9		6
Metals	Zinc	3.1E+00	120		61.60	20.20	2.0E+01	14			24			30			17		26
Semivolatiles	1,2,4-Trichlorobenzene	7.0E+00	NVR	0.33	NVA	NVA	7.0E+00	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	1,2-Dichlorobenzene	6.0E+01	NVR	0.33	NVA	NVA	6.0E+01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	1,3-Dichlorobenzene	3.1E+02	NVR	0.33	NVA	NVA	3.1E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	1,4-Dichlorobenzene	7.5E+00	NVR	0.33	NVA	NVA	7.5E+00	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2,4,5-Trichlorophenol	1.0E+03	NVR	1.65	NVA	NVA	1.0E+03	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	1.65
Semivolatiles	2,4,6-Trichlorophenol	2.6E+00	NVR	0.33	NVA	NVA	2.6E+00	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2,4-Dichlorophenol	3.1E+01	NVR	0.33	NVA	NVA	3.1E+01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2,4-Dimethylphenol	2.0E+02	NVR	0.33	NVA	NVA	2.0E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2,4-Dinitrophenol	2.0E+01	NVR	1.65	NVA	NVA	2.0E+01	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	1.65
Semivolatiles	2,4-Dinitrotoluene	4.2E-02	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2,6-Dinitrotoluene	4.2E-02	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2-Chloronaphthalene	8.2E+02	NVR	0.33	NVA	NVA	8.2E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2-Chlorophenol	5.1E+01	NVR	0.33	NVA	NVA	5.1E+01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2-Methylnaphthalene	4.1E+01	NVR	0.33	NVA	NVA	4.1E+01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2-Methylphenol	5.1E+02	NVR	0.33	NVA	NVA	5.1E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	2-Nitroaniline	3.1E+00	NVR	1.65	NVA	NVA	3.1E+00	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	1.65
Semivolatiles	2-Nitrophenol	3.1E+00	NVR	0.33	NVA	NVA	3.1E+00	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	3,3'-Dichlorobenzidine	6.4E-02	NVR	0.65	NVA	NVA	6.5E-01	0.65	<	U	0.65	<	U	0.65	<	U	0.65	<	0.65
Semivolatiles	3-Nitroaniline	3.1E+00	NVR	1.65	NVA	NVA	3.1E+00	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	1.65
Semivolatiles	4,6-Dinitro-2-methylphenol	2.0E+01	NVR	1.65	NVA	NVA	2.0E+01	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	1.65
Semivolatiles	4-Bromophenyl phenyl ether	1.9E-02	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	4-Chloro-3-methylphenol	5.1E+01	NVR	0.65	NVA	NVA	5.1E+01	0.65	<	U	0.65	<	U	0.65	<	U	0.65	<	0.65
Semivolatiles	4-Chloroaniline	4.1E+01	NVR	0.65	NVA	NVA	4.1E+01	0.65	<	U	0.65	<	U	0.65	<	U	0.65	<	0.65
Semivolatiles	4-Chlorophenyl phenyl ether	1.9E-02	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	4-Methylphenol	5.1E+01	NVR	0.33	NVA	NVA	5.1E+01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	4-Nitroaniline	7.5E+00	NVR	1.65	NVA	NVA	7.5E+00	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	1.65
Semivolatiles	4-Nitrophenol	2.0E+01	NVR	1.65	NVA	NVA	2.0E+01	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	1.65
Semivolatiles	Acenaphthene	6.1E+02	NVR	0.33	NVA	NVA	6.1E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	Acenaphthylene	6.1E+02	NVR	0.33	NVA	NVA	6.1E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	Anthracene	3.1E+03	NVR	0.33	NVA	NVA	3.1E+03	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	Benzo(a)anthracene	3.9E-02	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	Benzo(a)pyrene	2.0E-02	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	Benzo(b)fluoranthene	3.9E-02	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	0.33
Semivolatiles	Benzo(ghi)perylene	3.1E+02	NVR	0.33	NVA	NVA	3.1E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33		

Notes are provided on the last page of this table

Table 3-4
Comparison of Chemicals Analyzed in Soil to Groundwater-Protective Medium Specific Concentrations
LHAAP-59 Historical Samples

Location Code								LH-S119-01		LH-S119-01		LH-S119-01		LH-S119-02		LH-S119-02		LH-S120-01		LH-S120-01		LH-S120-02		LH-S120-02	
Sample No	Sample Date	TCEQ		Background		Applicable TCEQ Risk-Based MSC ^a	LH-S119-01_1		LH-S119-01 QC		LH-S119-01_2		LH-S119-02_1		LH-S119-02_2		LH-S120-01_1		LH-S120-01_2		LH-S120-02_1		LH-S120-02_2		
FK Depth		Medium-Specific Concentration	Ecological Screening Value ^b	Method Quantitation Limit (MQL)	Concentrations in Soil (95% UPL, mg/kg) ^c		4-Aug-93 5 - 2 Ft		4-Aug-93 .5 - 2 Ft		4-Aug-93 5 - 7 Ft		4-Aug-93 .5 - 2 Ft		4-Aug-93 5 - 7 Ft		4-Aug-93 .5 - 2 Ft		4-Aug-93 4 - 6 Ft		4-Aug-93 .5 - 2 Ft		4-Aug-93 4 - 5 Ft		
Sample Purpose	Test Group	(MSC, GWP-Ind) ^a			Surface 0 - 0.5 Ft		Subsurface 1.5 - 2.5 Ft	REG	FD	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	REG	
	Parameter, Units = mg/kg						Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	
Semivolatiles	Hexachlorobenzene	1.0E-01	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Hexachlorobutadiene	2.0E+00	NVR	0.33	NVA	NVA	2.0E+00	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Hexachlorocyclopentadiene	5.0E+00	NVR	0.33	NVA	NVA	5.0E+00	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Hexachloroethane	1.0E+01	NVR	0.33	NVA	NVA	1.0E+01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Indeno(1,2,3-cd)pyrene	3.9E-02	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Isophorone	3.0E+02	NVR	0.33	NVA	NVA	3.0E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Naphthalene	2.0E+02	NVR	0.33	NVA	NVA	2.0E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Nitrobenzene	5.1E+00	NVR	0.33	NVA	NVA	5.1E+00	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	n-Nitroso-di-n-propylamine	4.1E-03	NVR	0.33	NVA	NVA	3.3E-01	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	n-Nitrosodiphenylamine	5.8E+00	NVR	0.33	NVA	NVA	5.8E+00	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Pentachlorophenol	1.0E-01	NVR	1.65	NVA	NVA	1.7E+00	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	U	1.65	<	U
Semivolatiles	Phenanthrene	3.1E+02	NVR	0.33	NVA	NVA	3.1E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Phenol	3.1E+03	NVR	0.33	NVA	NVA	3.1E+03	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Semivolatiles	Pyrene	3.1E+02	NVR	0.33	NVA	NVA	3.1E+02	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U	0.33	<	U
Volatiles	1,1,1-Trichloroethane	2.0E+01	NVR	0.01	NVA	NVA	2.0E+01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	1,1,2,2-Tetrachloroethane	1.1E+01	NVR	0.01	NVA	NVA	1.1E+01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	1,1,2-Trichloroethane	5.0E-01	NVR	0.01	NVA	NVA	5.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	1,1-Dichloroethane	1.0E+03	NVR	0.01	NVA	NVA	1.0E+03	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	1,1-Dichloroethene	7.0E-01	NVR	0.01	NVA	NVA	7.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	1,2-Dichloroethane	5.0E-01	NVR	0.01	NVA	NVA	5.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	1,2-Dichloroethene	1.0E+01	NVR	0.01	NVA	NVA	1.0E+01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	1,2-Dichloropropane	5.0E-01	NVR	0.01	NVA	NVA	5.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	2-Butanone	6.1E+03	NVR	0.05	NVA	NVA	6.1E+03	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U
Volatiles	2-Chloroethyl vinyl ether	2.6E-01	NVR	0.01	NVA	NVA	2.6E-01	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U
Volatiles	2-Hexanone	6.1E+02	NVR	0.05	NVA	NVA	6.1E+02	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U
Volatiles	Acetone	9.2E+03	NVR	0.10	NVA	NVA	9.2E+03	0.1	<	U	0.1	<	U	0.1	<	U	0.1	<	U	0.1	<	U	0.1	<	U
Volatiles	Benzene	5.0E-01	NVR	0.01	NVA	NVA	5.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Bromodichloromethane	4.6E-01	NVR	0.01	NVA	NVA	4.6E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Bromoform	3.6E+00	NVR	0.01	NVA	NVA	3.6E+00	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Bromomethane	1.4E+01	NVR	0.01	NVA	NVA	1.4E+01	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U
Volatiles	Carbon disulfide	1.0E+03	NVR	0.01	NVA	NVA	1.0E+03	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Carbon tetrachloride	5.0E-01	NVR	0.01	NVA	NVA	5.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Chlorobenzene	1.0E+01	NVR	0.01	NVA	NVA	1.0E+01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Chloroethane	4.1E+03	NVR	0.01	NVA	NVA	4.1E+03	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U
Volatiles	Chloroform	1.0E+02	NVR	0.01	NVA	NVA	1.0E+02	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Chloromethane	2.2E+01	NVR	0.01	NVA	NVA	2.2E+01	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U	0.01	<	U
Volatiles	cis-1,3-Dichloropropene	5.3E-01	NVR	0.01	NVA	NVA	5.3E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Dibromochloromethane	3.4E+00	NVR	0.01	NVA	NVA	3.4E+00	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Ethylbenzene	7.0E+01	NVR	0.01	NVA	NVA	7.0E+01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Methyl isobutyl ketone	8.2E+02	NVR	0.05	NVA	NVA	8.2E+02	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U	0.05	<	U
Volatiles	Methylene chloride	5.0E-01	NVR	0.01	NVA	NVA	5.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Styrene	1.0E+01	NVR	0.01	NVA	NVA	1.0E+01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Tetrachloroethene	5.0E-01	NVR	0.01	NVA	NVA	5.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Toluene	1.0E+02	NVR	0.01	NVA	NVA	1.0E+02	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	trans-1,3-Dichloropropene	2.9E+00	NVR	0.01	NVA	NVA	2.9E+00	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U	0.005	<	U
Volatiles	Trichloroethene	5.0E-01	NVR	0.01	NVA	NVA	5.0E-01	0.005	<	U	0.005	<	U	0.005	<	U	0.005</								

4.0 *Summary and Conclusions*

Concentrations of chemicals analyzed in soil samples were screened to identify COPCs according to TCEQ (2006) guidance. These data were not evaluated for unrestricted use. The groundwater-protective MSC for commercial/industrial land use assumptions (GWP-Ind) was applied as the screening value unless the minimum MQL is greater, or the minimum 95 percent UPL background concentration is greater if the chemical is a metal. Ecological screening values for the COPECs at LHAAP are provided for information only, but were not applied because ecological risk for LHAAP-59, if any, will be addressed when the BERA is completed.

All chemicals analyzed in samples from the 2006 and 2007 sampling efforts at LHAAP-59, and previous sampling efforts, either have concentrations below groundwater-protective MSC values, or exceedances that were not confirmed in duplicate samples or in samples from the same boring. Other chemicals with concentrations above applicable MSC values have concentrations within the range of background levels, or are not associated with LHAAP operations. Therefore, the residual concentrations of chemicals in soil at LHAAP-59 meet requirements for closure according to TCEQ RRSs. No further action is required for LHAAP-59.

5.0 References

Jacobs Engineering Group, Inc., 2002, *Remedial Investigation Volume 1: Report for the Group 4 Sites, Site 35A, 35B, 35C, 46, 47, 48, 50, 60, & Goose Prairie Creek*, Final, Oak Ridge, Tennessee, January.

Plexus Scientific, 2005, *Environmental Site Assessment Phase I and II Report, Production Areas, Longhorn Army Ammunition Plant, Karnack, Texas*, Final, Columbia, Maryland, February.

Shaw Environmental, Inc. (Shaw), 2004a, *Final Work Plan Groundwater Data Gaps Investigation Groups 2 and 4, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, February.

Shaw, 2004b, *Final Background Soil Study Report, Longhorn Army Ammunition Plant, Karnack Texas*, Houston, Texas, July.

Shaw, 2006, *Final Baseline Ecological Risk Assessment Field Sampling Work Plan, Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, September.

Texas Commission on Environmental Quality (TCEQ), 1998, Interoffice Memorandum from Ronald R. Pedde (TNRCC) to Remediation Division Staff, "Implementation of the existing risk reduction rules," (also known as. the Consistency Memorandum), 23 July, and updated through March 2006.

TCEQ, 2001, Interoffice Memorandum from Joseph T. Haney, Jr., to Camarie Perry, Office of Permitting, Remediation & Registration, entitled "Evaluation of the Potential Health Impacts of Exposure to Iron, Calcium, Magnesium, Potassium, Sodium, and Phosphorus through Soil Ingestion," October.

TCEQ, 2003, Interoffice Memorandum, entitled "Compounds for which Calculation of a Human Health MSC is Not Required," <<http://www.tnrcc.state.tx.us.htm>> (November 2006), October.

TCEQ, 2006, Texas Risk Reduction Rules (30TAC§335) as updated through March 2006.

U.S. Army Corps of Engineers, 1993, *Waste Sump Inventory, Longhorn Army Ammunition Plant, Karnack, Texas*, Tulsa, Oklahoma, April.

U.S. Environmental Protection Agency (USEPA), 1992, *Guidance for Data Usability in Risk Assessment (Part A)*, EPA Publication 9285.7-09A, PB92-973356, Office of Emergency and Remedial Response, April.

USEPA, 1997, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-845), Update III*, Office of Solid Waste and Emergency Response, Washington, D.C.

Appendix A
Soil Boring Logs

00048343
HOLE NO. 595B01

DRILLING LOG		DIVISION	INSTALLATION	SHEET (
1. PROJECT		TERC	LONGHORN AAP	OF 1 SHEETS			
2. LOCATION (Coordinates or Station)		LARNACK, TEXAS	10. SIZE AND TYPE OF BIT	3.5" Auger			
3. DRILLING AGENCY		SHAW E+I	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL			
4. HOLE NO. (As shown on drawing title and file number)		595B01	12. MANUFACTURER'S DESIGNATION OF DRILL	STAINLESS STEEL HAND AUGER			
5. NAME OF DRILLER		DIEGO CASTANEDA	13. OVERBURDEN SAMPLES	DISTURBED	UNDISTURBED		
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED 0° DEG. FROM VERT.	14. TOTAL NUMBER CORE BOXES	NA			
7. THICKNESS OF OVERBURDEN		NA	15. ELEVATION GROUND WATER	NA			
8. DEPTH DRILLED INTO ROCK		NA	16. DATE HOLE	STARTED 8/2/06	COMPLETED 8/2/06		
9. TOTAL DEPTH OF HOLE		4'	17. ELEVATION TOP OF HOLE	NA			
			18. TOTAL CORE RECOVERY FOR BORING	NA %			
			ALLEN WILLMORE INSPECTOR				
ELEVATION ft	DEPTH ft	LEGEND	CLASSIFICATION OF MATERIALS (Description)		% CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	1	SC	TOPSOIL SAND, clayey, medium-sorted, fine to medium grained, dry, no odor.		100%		1315-Sampled 595B01-01
0.0	2			100%		1335-Sampled 595B01-02	
0.0	3						
0.0	4						
			END OF BORING				

00048344

HOLE NO. 59SB02

DRILLING LOG		DIVISION TERC	INSTALLATION LONGHORN AAP	SHEET 1
1. PROJECT LHAAP		10. SIZE AND TYPE OF BIT 3.5" Auger		
2. LOCATION (Coordinates or Station) KARNACK, TEXAS		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL		
3. DRILLING AGENCY SHAW EIT		12. MANUFACTURER'S DESIGNATION OF DRILL STAINLESS STEEL HAND AUGER		
4. HOLE NO. (As shown on drawing title and file number) 59SB02		13. OVERBURDEN SAMPLES	DISTURBED V	UNDISTURBED --
5. NAME OF DRILLER DIEGO CASTAÑEDA		14. TOTAL NUMBER CORE BOXES NA		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED 0° DEG. FROM VERT.		15. ELEVATION GROUND WATER NA		
7. THICKNESS OF OVERBURDEN NA		16. DATE HOLE STARTED 8/2/06 COMPLETED 8/2/06		
8. DEPTH DRILLED INTO ROCK NA		17. ELEVATION TOP OF HOLE NA		
9. TOTAL DEPTH OF HOLE 4'		18. TOTAL CORE RECOVERY FOR BORING NA X		
		INSPECTOR ALLEN WILLMORE		

ELEVATION PID a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
0.0	1	SC	TOPSOIL, ROOTINGS, GRASS SAND	100%	X	SAMPLED 01 @ 13:50
0.0	2		SAND, CLAYEY, MEDIUM-SORTED, FINE TO MEDIUM-GRAINED, DRY, NO ODOR	100%		
0.0	3			100%	X	SAMPLED 02 @ 1400
0.0	4			100%		
			END OF BORING			

00048345

HOLE NO. 595803

DRILLING LOG		DIVISION TERC	INSTALLATION LONGHORN AAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP			10. SIZE AND TYPE OF BIT 3.5" Auger	
2. LOCATION (Coordinates or Station) KARNALL, TEXAS			11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY SHAW E.I.I.			12. MANUFACTURER'S DESIGNATION OF DRILL STAINLESS STEEL HAND AUGER	
4. HOLE NO. (As shown on drawing title and file number) 595803			13. OVERBURDEN SAMPLES	DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input type="checkbox"/>
5. NAME OF DRILLER DIEGO CASTAÑEDA			14. TOTAL NUMBER CORE BOXES NA	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ ° DEG. FROM VERT.			15. ELEVATION GROUND WATER NA	
7. THICKNESS OF OVERBURDEN NA			16. DATE HOLE STARTED 8/2/06 COMPLETED 8/2/06	
8. DEPTH DRILLED INTO ROCK NA			17. ELEVATION TOP OF HOLE NA	
9. TOTAL DEPTH OF HOLE 4'			18. TOTAL CORE RECOVERY FOR BORING NA %	
			ALLEN WILLMORE INSPECTOR	

ELEVATION PID a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
0.0	1	SC	TOPSOIL, ROOTINGS, GRASS SAND	100%	X	1415 - SAMPLED 01
0.0	2		SAND, CLAYEY, MEDIUM-SORTED, FINE TO MEDIUM-GRAINED, DRY, NO ODOR	100%		
0.0	3			100%	X	1430 - SAMPLED 02
0.0	4			100%		
			END OF BORING			

00048346
HOLE NO. 59SB04

DRILLING LOG		DIVISION TERC	INSTALLATION LONGHORN AAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP			10. SIZE AND TYPE OF BIT 3.5"	
2. LOCATION (Coordinates or Station) KARNACK, TEXAS			11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY SHAW E.I.			12. MANUFACTURER'S DESIGNATION OF DRILL STAINLESS STEEL HAND AUGER	
4. HOLE NO. (As shown on drawing title and file number) 59SB04			13. OVERBURDEN SAMPLES	DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input type="checkbox"/>
5. NAME OF DRILLER DIEGO CASTAÑEDA			14. TOTAL NUMBER CORE BOXES NA	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED 0° DEG. FROM VERT.			15. ELEVATION GROUND WATER NA	
7. THICKNESS OF OVERBURDEN NA			16. DATE HOLE STARTED 8/2/06 COMPLETED 8/2/06	
8. DEPTH DRILLED INTO ROCK NA			17. ELEVATION TOP OF HOLE NA	
9. TOTAL DEPTH OF HOLE 4'			18. TOTAL CORE RECOVERY FOR BORING NA %	
			ALLEN WILLMORE INSPECTOR	

ELEVATION ft a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
0.0	1	SC	TOPSOIL, ROOTING, GRASS SAND	100%		1440 - SAMPLED 01
0.0	2		SAND, CLAYEY, MEDIUM-SORTED, FINE TO MEDIUM-GRAINED, DRY, NO ODOR	100%		
0.0	3					
0.0	4			100%		
			END OF BORING			1450 - SAMPLED 02 (COC SAMPLE TAKEN)

00048347

HOLE NO. 59SB05

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		TERC		LONGHORN AAP		1 OF 1 SHEETS	
2. LOCATION (Coordinates or Station)		KARNACK, TEXAS		10. SIZE AND TYPE OF BIT		3.5" Auger	
3. DRILLING AGENCY		SHAW E.I.		11. DATUM FOR ELEVATION SHOWN (TBM & MSL)		MSL	
4. HOLE NO. (As shown on drawing title and file number)		59SB05		12. MANUFACTURER'S DESIGNATION OF DRILL		STAINLESS STEEL HAND AUGER	
5. NAME OF DRILLER		DIEGO CASTAÑEDA		13. OVERBURDEN SAMPLES		DISTURBED UNDISTURBED	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ ° DEG. FROM VERT.		0°		14. TOTAL NUMBER CORE BOXES		NA	
7. THICKNESS OF OVERBURDEN		NA		15. ELEVATION GROUND WATER		NA	
8. DEPTH DRILLED INTO ROCK		NA		16. DATE HOLE		STARTED 8/3/06 COMPLETED 8/3/06	
9. TOTAL DEPTH OF HOLE		4'		17. ELEVATION TOP OF HOLE		NA	
				18. TOTAL CORE RECOVERY FOR BORING		NA %	
				ALLEN WILLMORE		INSPECTOR	
ELEVATION ft	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
0.0	1		TOPSOIL, ROOTING, GRASS SAND	100%		0810 - SAMPLED 01	
0.0	2		SAND, CLAYEY, MEDIUM-SORTED, FINE TO MEDIUM-GRAINED, DRY, NO ODOR	100%			
0.0	3			100%			
0.0	4			100%		0820 - SAMPLED 02	
			END OF BORING				

00048348

HOLE NO. 59SB06

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		TERC		LONGHORN AAP		SHEET 1 OF 1 SHEETS	
2. LOCATION (Coordinates or Station)		KARNACK, TEXAS		10. SIZE AND TYPE OF BIT		3.5" Auger	
3. DRILLING AGENCY		SHAW E.I.		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		MSL	
4. HOLE NO. (As shown on drawing title and file number)		59SB06		12. MANUFACTURER'S DESIGNATION OF DRILL		STAINLESS STEEL HAND AUGER	
5. NAME OF DRILLER		DIEGO CASTAÑEDA		13. OVERBURDEN SAMPLES		DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input type="checkbox"/>	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED <input type="checkbox"/> DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES		NA	
7. THICKNESS OF OVERBURDEN		NA		15. ELEVATION GROUND WATER		NA	
8. DEPTH DRILLED INTO ROCK		NA		16. DATE HOLE		STARTED 8/3/06 COMPLETED 8/3/06	
9. TOTAL DEPTH OF HOLE		4'		17. ELEVATION TOP OF HOLE		NA	
				18. TOTAL CORE RECOVERY FOR BORING		NA	
				ALLEN WILLMORE		INSPECTOR	
ELEVATION PID	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
a	b	c	d	e	f	g	
0.0	1		TOPSOIL, ROOTING, GRASS SAND	100%		0955 - SAMPLED 01 (LOC SAMPLE TAKEN)	
0.0	2		SAND, CLAYEY, MEDIUM-SORTED, FINE TO MEDIUM-GRAINED, DRY, NO ODOR	100%			
0.0	3			100%			
0.0	4			100%		1010 - SAMPLED 02	
			END OF BORING				

00048349
HOLE NO. 59SB07

DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 1 SHEETS	
1. PROJECT LHAAP				10. SIZE AND TYPE OF BIT 3.5" Auger			
2. LOCATION (Coordinates or Station) KARNACK, TEXAS				11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL			
3. DRILLING AGENCY SHAW E.I.				12. MANUFACTURER'S DESIGNATION OF DRILL STAINLESS STEEL HAND AUGER			
4. HOLE NO. (As shown on drawing title and file number) 59SB07				13. OVERBURDEN SAMPLES DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input type="checkbox"/>			
5. NAME OF DRILLER DIEGO CASTAÑEDA				14. TOTAL NUMBER CORE BOXES NA			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED 0° DEG. FROM VERT.				15. ELEVATION GROUND WATER NA			
7. THICKNESS OF OVERBURDEN NA				16. DATE HOLE STARTED 8/3/06 COMPLETED 8/3/06			
8. DEPTH DRILLED INTO ROCK NA				17. ELEVATION TOP OF HOLE NA			
9. TOTAL DEPTH OF HOLE 4'				18. TOTAL CORE RECOVERY FOR BORING NA %			
				ALLEN WILLMORE INSPECTOR			
ELEVATION PID a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
0.0	1	SC	TOPSOIL, ROOTING, GRASS SAND	100%	X	0905-59SB07-01	
0.0	2		SAND, CLAYEY, MEDIUM-SORTED, FINE TO MEDIUM-GRAINED, DRY, NO ODOR	100%			
0.0	3						
0.0	4				100%	X	0920-SAMPLED 02
			END OF BORING				

00048350

HOLE NO. 595B08

DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 1 SHEETS	
1. PROJECT LHAAP				10. SIZE AND TYPE OF BIT 3"			
2. LOCATION (Coordinates or Station) KARNACK, TEXAS				11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL			
3. DRILLING AGENCY SHAW E.I.				12. MANUFACTURER'S DESIGNATION OF DRILL STAINLESS STEEL HAND AUGER			
4. HOLE NO. (As shown on drawing title and file number) 595B08				13. OVERBURDEN SAMPLES		DISTURBED Y	
5. NAME OF DRILLER DIEGO CASTAÑEDA				14. TOTAL NUMBER CORE BOXES NA		UNDISTURBED --	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED 0° DEG. FROM VERT.				15. ELEVATION GROUND WATER NA		16. DATE HOLE STARTED 8/3/06	
7. THICKNESS OF OVERBURDEN NA				17. ELEVATION TOP OF HOLE NA		COMPLETED 8/3/06	
8. DEPTH DRILLED INTO ROCK NA				18. TOTAL CORE RECOVERY FOR BORING NA			
9. TOTAL DEPTH OF HOLE 4'				INSPECTOR ALLEN WILLMORE			
ELEVATION PID a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
0.0	1	SL	TOPSOIL, ROOTING, GRASS SAND	100%	X	0835 - Sampled 01	
0.0	2		SAND, CLAYEY, MEDIUM-SORTED, FINE TO MEDIUM-GRAINED, DRY, NO ODOR	100%			
0.0	3			100%			
0.0	4			100%		0845 - Sampled 02	
			END OF BORING				

Appendix B

***Analytical Data Reports
(on compact disk)***

**DATA EVALUATION REPORT
OF KEMRON REPORT NUMBERS L0608140 and L0608182
LONGHORN ARMY AMMUNITION PLANT
SITE 59
KARNACK, TEXAS**

SHAW PROJECT NUMBER 845714

Prepared by

**Shaw Environmental, Inc.
3010 Briarpark Drive, Suite 4N
Houston, Texas 77042**

August 25, 2006

DATA EVALUATION REPORT
KEMRON REPORT NUMBERS L0608140 and L0608182
SITE 59
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

August 25, 2006

Approved by: *Diane Meyer*
Diane Meyer, Program Chemist

Date: 8/25/06

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Acronyms and Abbreviations

COC	chain of custody
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LHAAP	Longhorn Army Ammunition Plant
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
TERC	Total Environmental Restoration Contract
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

1.0 Introduction

Shaw Environmental, Inc. has performed a review of the laboratory data associated with sampling at Site 12 at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. **Table 1-1** provides a list of the samples collected, a sample identification number and laboratory sample number cross-references, sample matrix, chain of custody (COC) number, date collected, sample location, and analytical method performed for each sample.

The work was performed under the Total Environmental Restoration Contract (TERC), Number DACA56-94-D-0020, and Task Order 109. This Data Evaluation Report is a summary of the analytical data generated by Kemron Environmental Services, Marietta, Ohio.

The purpose of the analytical data review is to assess the effect of the overall analytical process on the usability of the data. The review involved comparing the analytical data summary forms, as submitted by the laboratory, to method requirements set forth in methods found in SW-846, 3rd Edition, Update III, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA, 1997) and project-imposed requirements specified in the task order. Additionally, surrogate spike recoveries, if applicable, matrix spike recoveries, and duplicate sample results were reviewed to determine any matrix interference. The data packages were reviewed by the Project Chemist using the process outlined in Standard Operating Procedure 1141, Analytical Data Quality Evaluation and Reporting (Shaw, revised 2002).

This data evaluation report discusses accuracy, precision, and representativeness for each type of analysis. **Sections 2.0** and **Section 3.0** contain a discussion of precision, accuracy, and representativeness for each method. **Section 4.0** of this report is a technical summary of the data review for the data group as a whole, including completeness. **Section 5.0** lists references.

Data qualifiers were added to the applicable results in the data package. A list of validation qualifiers is shown in **Table 4-1**.

00048357

Table 1-1
Chain-of-Custody Summary

Sample I.D.	Lab Sample Number	Matrix	Chain of Custody Number	Date Collected	Methods SW-846 ¹
59-SB-01-01	L0608140-01	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-01-02	L0608140-02	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-02-01	L0608140-03	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-02-02	L0608140-04	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-03-01	L0608140-05	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-03-02	L0608140-06	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-04-01	L0608140-07	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-04-02	L0608140-08	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-04-02QC	L0608140-09	Soil	63090	8/02/06	Pesticides- 8081A; herbicides- 8151A
59-SB-05-01	L0608140-10	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A
59-SB-05-02	L0608140-11	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A
59-SB-08-01	L0608140-12	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A
59-SB-07-01	L0608140-13	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A
59-SB-08-02	L0608140-14	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A
59-SB-07-02	L0608140-15	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A
59-SB-06-01	L0608140-16	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A
59-SB-06-01QC	L0608140-17	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A
59-SB-01-02	L0608140-18	Soil	63090	8/03/06	Pesticides- 8081A; herbicides- 8151A

Table 1-2
Chain-of-Custody Summary (continued)

Sample I.D.	Lab Sample Number	Matrix	Chain of Custody Number	Date Collected	Methods SW-846 ¹
Equipment Rinse HA	L0608182-01	Water	62298	8/06/06	Pesticides- 8081A

Notes and Abbreviations:

- 1 United States Environmental Protection Agency (USEPA), 1997, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Update III, Washington, D.C.

2.0 Pesticides

The soil samples and equipment rinsate blank were collected and analyzed for chlorinated pesticides by SW-846 Method 8081A.

2.1 Initial and Continuing Calibration

The initial and continuing calibration met all quality control criteria except as follows:

- Endosulfan I exceeded 15% deviation for the continuing calibration on the confirmation column associated with samples L0608140-09 through 18. Sample results for endosulfan I were reported from the primary column and the data were not qualified.
- Toxaphene for SDG L0608182, associated with the equipment blank, exceeded the 15% deviation criterion and this result was qualified UJ with validation code 05B.

2.2 Accuracy

The laboratory control sample (LCS), laboratory control sample duplicate (LCSD), and surrogates were within quality control limits, except as noted below. No matrix spike (MS) and matrix spike duplicate (MSD) was analyzed from this site. Instead a LCS/LCSD was analyzed.

2.2.1 Surrogate Recoveries

The following surrogate was outside quality control limits.

Table 2-1
Surrogate Recoveries

Sample I.D.	Surrogate	% Recovery	Control Limits (%)
L0608140-01 (1X-primary column)	Tetrachloro-m-xylene	146	39 - 130

No detected analyte was reported from this analysis and no qualifiers were added.

2.3 Precision

The LCS/LCSD relative percent (RPD) values were within quality control limits.

2.4 Representativeness

The method blank and equipment rinsate blank were free of contamination. Several samples had high concentrations of target analytes and were analyzed at two dilutions. Any detected analyte was confirmed by second column. The percent difference between primary and secondary column exceed the QC criterion of 40% for several samples. This data was qualified "J" with

validation code 18. Sample L0608140-03 was qualified J18 for gamma chlordane. Samples L0608140-02, 03, 04, and 07 were qualified J18 for heptachlor epoxide. The analyte alpha chlordane co-eluted with another non-target compound and the result is reported from the confirmation column. All detected alpha chlordane results were qualified J with code 18 as the results between the two columns differed by more than 40%.

Two QC replicate samples were submitted. The results had a RPD \leq 35% or a difference \leq 2 SQL (sample quantitation limit) for all analytes. The soil samples were extracted within 14 days and analyzed within 40 days and the aqueous sample was extracted within 7 days and analyzed within 40 days.

3.0 Herbicides

The soil samples were collected and analyzed for herbicides by SW-846 Method 8151A.

3.1 Initial and Continuing Calibration

The initial and continuing calibration met all quality control criteria.

3.2 Accuracy

The LCS, LCSD, and surrogates were within quality control limits. No MS and MSD was analyzed from this site. Instead a LCS/LCSD was analyzed.

3.3 Precision

The LCS/LCSD RPD values were within quality control limits.

3.4 Representativeness

The method blank was free of contamination. Any detected analyte was confirmed by second column. The percent difference between primary and secondary column exceed the QC criterion of 40% MCPP in sample L0608140-12. This data was qualified "J" with validation code 18.

Two QC replicate samples were submitted. The results were non-detects for all analytes. The samples were extracted within 14 days and analyzed within 40 days.

4.0 Technical Summary

The following summarizes the data review for the sampling at LHAAP.

4.1 Documentation

The COC were complete and contained the required information. The actual methods used for sample analysis were based upon the COC submitted with the samples. Upon receipt at the laboratory, cooler receipt forms were completed and are included as part of the laboratory data package. All holding times for extraction and analyses were met.

4.2 Completeness

The 100% completeness goal was met as set forth in the USACE Engineering Manual 200-1-3 (February, 2001). None of the data was rejected.

- Data reported between the MDL and reporting limit (RL) were "J" flagged (quantitation estimated).

4.3 Conclusion

An overall review of the samples collected indicates that the chain of custody procedures and laboratory analyses have been conducted in an acceptable manner according to the USEPA Contract Laboratory Program, National Functional Guidelines for Organic Data Review, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C. (October 1999). Table 4-1 lists qualifier definitions applied to the samples.

Table 4-1
Data Validation Qualifier Definitions

Qualifier	Definitions
U	Not detected: The analyte was analyzed for, but was not detected above the level of the associated value. The associated value is the sample quantitation limit (SQL).
J	Estimated: The analyte was detected and positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ	Not detected, SQL is estimated: The analyte was analyzed for, but was not detected above the reported SQL. However, the reported SQL is an estimate and may be inaccurate or imprecise.
R	Rejected: The data are unusable. (Note: The presence or absence of the analyte cannot be confirmed.)
B	Analyte was detected in method blank at concentration within 5X/10X sample concentration. Sample result is likely a non-detect.

5.0 References

Shaw Environmental, Inc. (revised 2002), *Standard Operating Procedure Manual*, Houston, Texas.

United States Environmental Protection Agency (USEPA), 1997, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Update III*, Washington, D.C.

Department of the Army, U.S. Army Corps of Engineers, Requirements for the Preparation of Sampling and Analysis Plans USACE Engineering Manual 200-1-3 (February 2001).

USEPA Contract Laboratory Program, National Functional Guidelines for Organic Data Review, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C., October 1999.

VALIDATION REASON CODE DEFINITIONS

Reason Code	Description
01	Sample received outside of 4 +/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance outside criteria
03A	BFB tune for GC/MS volatiles
03B	DFTPP tune for GC/MS semivolatiles
03C	DDT and/or endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient < 0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % deviation QC criteria not met
06	Result qualified as a result of the 5X/10X blank correction
06A	Method or preparation blank
06B	Initial calibration blank (ICB) or continuing calibration blank (CCB)
06C	Equipment rinse
06D	Trip blank
06E	Field blank
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified control limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgment was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

SHAW ENVIRONMENTAL, INC.
ANALYTICAL DATA EVALUATION

The Project Chemist reviewed the attached Data Package. Detailed comments concerning specific analyses (i.e. GC/MS Semivolatiles) are provided in the attached review sheets. Any additional comments concerning the data package as a whole are listed below

Site/Location: Longhorn
 Project No.: 845714
 Laboratory: Kemtron
 Report No.: 10608140

COMMENTS:

equipment blank in SDG 10608182
Per Kemtron GC analyst - the alpha chlorodane has a co-elution peak on
the front column & the lower peak column results should be used
For all other compds the highest result should be reported

DATA COMPLETENESS			
REQUIREMENTS: Cooler receipt	Y	N	NA
Cooler receipt form present?	✓		
Documentation of broken bottles, bubbles in VOA vials, missing labels, seals, etc.?	✓		
Was the cooler temperature upon receipt at the laboratory between 2° and 6° C?	✓		
Was the pH of the sample acceptable?			✓
Original chain of custody/analytical request form present and complete?	✓		
Comparison of the reported parameters to the request on the chain of custody?	✓		
Each sample number transcribed by the laboratory and correct sample date?	✓		
Cross reference of field sample number, laboratory number and analytical batch?	✓		
Date of preparation / extraction and analysis for each sample?	✓		
Detection / Quantitation limits reported as specified?	✓		
Results reported for method blanks?	✓		
Results reported for trip blanks (VOCs only)?			✓
Matrix Spike (MS) /Matrix Spike Duplicates (MSD) % recoveries and RPDs reported?	✓		
Laboratory Control Samples (LCS) / LCSD % recoveries and RPDs reported?	✓		
Surrogate values provided (organic samples only)?	✓		

Data Reviewed by: Diane Meyer Date: 8/22/06
 Diane Meyer, Project Chemist

TIER 1 DATA REVIEW – ORGANIC ANALYSIS

ANALYSIS: <u>Herbicides</u>		MATRIX: LIQUID	
EPA METHOD: <u>8151A</u>		SOLID/SOIL <u>X</u>	TCLP
BY: <u>GC</u> OR HPLC		HOLD TIMES MET? <u>yes</u>	

REQUIREMENTS		Y	N	NA
<u>2 batches</u>	Every Batch or 20 Samples	✓		
Method Blank	All Compounds <MDL	✓		
<u>no equip blank for herb.</u>				
Matrix Spike % Recovery Values	Within those set by Lab			✓
Matrix Spike Dup % Recovery Values	Within those set by Lab			✓
MS/MSD RPD	<Lab QC Limits			✓
% LCS Recovery Value	Within those set by Lab	✓		
% LCSD Recovery Values	Within those set by Lab	✓		
LCS/LCSD RPD	<Lab QC Limits	✓		
% Surrogate Recovery Limits	Within those set by Lab	✓		
① <u>595B04-02 + QC</u> <u>ND</u> <u>ND</u> <u>ND</u>	Ratio < 2.0 for water			✓
Field Duplicate Evaluation				
② <u>595B06-01 + QC</u>	Ratio < 5.0 for soil	✓		
<u>ND</u> <u>ND</u> <u>ND</u>				

If "NO," List all samples below:

Blank Information

Run		Date Extracted	Blank ID	Compound	Conc. Units	Associated Samples
Date	Time					

Matrix Spike / Matrix Spike Duplicate Results and Field Duplicate

Sample Type	Sample ID	Analyte	MS Recovery	MSD Recovery	Result - 1	Result - 2	RPD %

Any runs with one (1) or more recoveries outside limits for each fraction?

Run Date	Surrogate Compound	Analyte	Original % Recovery	Re-Run Recovery	Comments

Laboratory Control Sample

Sample Type	Sample ID	Compound	LCS %	LCSD %	Comments

no Quals for herbicides

TIER 2 DATA REVIEW - ORGANIC ANALYSIS

ANALYSIS: Herbicides

MATRIX: LIQUID _____

EPA METHOD: 8151ASOLID/SOIL X

TCLP _____

BY: GC OR HPLC

REQUIREMENT		Y	N	NA
Initial Calibration <u>HP15</u>	% RSD <OR = 30%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuing Calibration	% DIFF <OR = 15%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All sample/blank internal standard (IS) retention times	Within those set by lab	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All sample/blank IS retention times	Within 30 sec. of Standard IS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

alternate source < 250% ✓

If "NO," list all samples below

Initial Calibration

Calibration		Instrument ID	Matrix	Correlation Coefficient	% RSD	Compound	Associated Samples
Date	Time						

Continuing Calibration

Calibration		Instrument ID	Matrix	% Diff.	Compound	Associated Samples
Date	Time					

Internal Standard Performance

Sample Number	Compound	Internal Standard Area/RT	Limits

secondary column difference > 40% for MCP in 10608140-12
Qualify J18

TIER 1 DATA REVIEW – ORGANIC ANALYSIS

ANALYSIS: <u>pesticides</u>		MATRIX: LIQUID	
EPA METHOD: <u>8081A</u>		SOLID/SOIL <u>X</u>	TCLP
BY: <u>GC</u> OR HPLC		HOLD TIMES MET?	

REQUIREMENTS	Y	N	NA
Method Blank <i>Equip blank 506-182 is all ND</i> <i>2 batches</i>	Every Batch or 20 Samples	<input checked="" type="checkbox"/>	
	All Compounds <MDL	<input checked="" type="checkbox"/>	
Matrix Spike % Recovery Values	Within those set by Lab		<input checked="" type="checkbox"/>
Matrix Spike Dup % Recovery Values	Within those set by Lab		<input checked="" type="checkbox"/>
MS/MSD RPD	<Lab QC Limits		<input checked="" type="checkbox"/>
% LCS Recovery Value	Within those set by Lab	<input checked="" type="checkbox"/>	
% LCSD Recovery Values	Within those set by Lab	<input checked="" type="checkbox"/>	
LCS/LCSD RPD	<Lab QC Limits	<input checked="" type="checkbox"/>	
% Surrogate Recovery Limits	Within those set by Lab	<input checked="" type="checkbox"/>	
① 595804-02 + QC - ok	Ratio < 2.0 for water		<input checked="" type="checkbox"/>
Field Duplicate Evaluation			
② 595806-01 + QC - ok	Ratio < 5.0 for soil	<input checked="" type="checkbox"/>	

If "NO," List all samples below:

Blank Information

Run		Date Extracted	Blank ID	Compound	Conc. Units	Associated Samples
Date	Time					

Matrix Spike / Matrix Spike Duplicate Results and Field Duplicate

Sample Type	Sample ID	Analyte	MS Recovery	MSD Recovery	Result - 1	Result - 2	RPD %

Any runs with one (1) or more recoveries outside limits for each fraction?

Run Date	Surrogate Compound	Analyte	Original % Recovery	Re-Run Recovery	Comments
10/6/08	140-01	tetrachloro-m-xylene	146 (primary)	81.9 (CF01)	39-130

Laboratory Control Sample

Sample Type	Sample ID	Compound	LCS %	LCSD %	Comments

TIER 2 DATA REVIEW – ORGANIC ANALYSIS

ANALYSIS: <u>pesticides</u>		MATRIX: LIQUID _____	
EPA METHOD: <u>8081A</u>		SOLID/SOIL <u>X</u> TCLP _____	
BY: <u>GC</u> OR HPLC			
REQUIREMENT	Y	N	NA
Initial Calibration <u>HP10</u>	% RSD <OR = 30%	✓	
Continuing Calibration	% DIFF <OR = 15%		✓
All sample/blank internal standard (IS) retention times	Within those set by lab		—
All sample/blank IS retention times	Within 30 sec. of Standard IS		—

alternate source - ok (250k)

If "NO," list all samples below

Initial Calibration

Calibration		Instrument ID	Matrix	Correlation Coefficient	% RSD	Compound	Associated Samples
Date	Time						

Continuing Calibration

Calibration		Instrument ID	Matrix	% Diff.	Compound	Associated Samples
Date	Time					
8/11/06	07:49	HP15 R	(Front col - is ok) Soil	17	Endosulfan I	SX 09-18
8/11/06	13:58	R	Front OK	16.1	↓	SX 09-18
8/14/06	23:00	F				
	23:28	R				

data reported on previous column

NO TOX reported from this run.

Internal Standard Performance

Sample Number	Compound	Internal Standard Area/RT	Limits
			Code 18
Greater than	40% difference between columns 1 & 2 for		
	alpha chlordane - SX 0101, 02, 03		
	Gamma chlordane SX 03		
heptachlor	epoxide SX 02, 03, 04, 07		

FIELD DUPLICATES

$$RPD = \frac{[orig-dup]}{orig + dup/2} \times 100$$

Total

Are original/field duplicate pairs identifiable? YES

(If "yes" then list:)

[illegible]

SHAW ENVIRONMENTAL, INC.
ANALYTICAL DATA EVALUATION

The Project Chemist reviewed the attached Data Package. Detailed comments concerning specific analyses (i.e. GC/MS Semivolatiles) are provided in the attached review sheets. Any additional comments concerning the data package as a whole are listed below

Site/Location: Longhorn
 Project No.: 845414
 Laboratory: Kemkon
 Report No.: 10608182

COMMENTS:

DATA COMPLETENESS				
	REQUIREMENTS: Cooler receipt	Y	N	NA
	Cooler receipt form present?	✓		
	Documentation of broken bottles, bubbles in VOA vials, missing labels, seals, etc.?	✓		
	Was the cooler temperature upon receipt at the laboratory between 2° and 6° C?	✓		
	Was the pH of the sample acceptable?	✓		
	Original chain of custody/analytical request form present and complete?	✓		
	Comparison of the reported parameters to the request on the chain of custody?	✓		
	Each sample number transcribed by the laboratory and correct sample date?	✓		
	Cross reference of field sample number, laboratory number and analytical batch?	✓		
	Date of preparation / extraction and analysis for each sample?	✓		
	Detection / Quantitation limits reported as specified?	✓		
	Results reported for method blanks?	✓		
	Results reported for trip blanks (VOCs only)?			✓
	Matrix Spike (MS) /Matrix Spike Duplicates (MSD) % recoveries and RPDs reported?			✓
	Laboratory Control Samples (LCS) / LCSD % recoveries and RPDs reported?	✓		
	Surrogate values provided (organic samples only)?	✓		

Data Reviewed by:

Diane Meyer
 Diane Meyer, Project Chemist

Date:

8/25/06

TIER 1 DATA REVIEW – ORGANIC ANALYSIS

ANALYSIS: <u>pesticides</u>		MATRIX: LIQUID <u>X</u>		
EPA METHOD: <u>8081A</u>		SOLID/SOIL _____	TCLP _____	
BY: <u>GC</u> OR HPLC		HOLD TIMES MET?		
REQUIREMENTS		Y	N	NA
Method Blank	Every Batch or 20 Samples	✓		
	All Compounds <MDL	✓		
Matrix Spike % Recovery Values	Within those set by Lab			✓
Matrix Spike Dup % Recovery Values	Within those set by Lab			✓
MS/MSD RPD	<Lab QC Limits			✓
% LCS Recovery Value	Within those set by Lab	✓		
% LCSD Recovery Values	Within those set by Lab	✓		
LCS/LCSD RPD	<Lab QC Limits	✓		
% Surrogate Recovery Limits	Within those set by Lab	✓		
Field Duplicate Evaluation	Ratio < 2.0 for water			✓
	Ratio < 5.0 for soil			✓

If "NO," List all samples below:

Blank Information

Run		Date Extracted	Blank ID	Compound	Conc. Units	Associated Samples
Date	Time					

Matrix Spike / Matrix Spike Duplicate Results and Field Duplicate

Sample Type	Sample ID	Analyte	MS Recovery	MSD Recovery	Result - 1	Result - 2	RPD %

Any runs with one (1) or more recoveries outside limits for each fraction?

Run Date	Surrogate Compound	Analyte	Original % Recovery	Re-Run Recovery	Comments

Laboratory Control Sample

Sample Type	Sample ID	Compound	LCS %	LCSD %	Comments
Initial calibration ok; alternate source ok (125%)					
Continuing calibration for toxaphene 715% - Qualify VJ056					
All other CAL <15%					

The equipment blank, only sample in SDG is non-detected for all analytes.

156 Starlite Drive
Marietta, OH 45750

Phone: 740-373-4071

Fax: 740-373-4835



CHAIN-OF-CUSTODY RECORD

[illegible]

***Homogenize all composite samples prior to analysis**

00048374

SAMPLE RECEIPT FORM

Date: 8-4-06 Client: Shaw E & I156 STARLITE DRIVE
MARIETTA, OH
45750
(740) 373-4071Shipped By: () Fed-Ex () UPS () DHL () KEMRON () Client () Other 10:00Opened By: JSDLogged By: WAD Login # L06 8-140IR Temp Gun: () D YAG

COOLER INFORMATION

Number	Cooler ID	Temp °C	Airbill#	COC#	Other
1	<u>2109</u>	<u>3</u>	<u>2194563 2021</u>	<u>63090</u>	
2					
3					
4					
5					
6					

Were all coolers sealed? (Y) N N/A
 Were custody seals used on all coolers? (Y) N N/A
 Were custody seals intact? (Y) N N/A
 Was visible ice present? (Y) N N/A
 Were all coolers in the temperature range of 2-6C? (>6C*) (Y) N N/A
 Were the samples frozen?* Y (N) N/A
 Were COC papers provided? (Y) N N/A
 Were all sample containers intact?* (Y) N N/A
 Were all sample labels intact? (Y) N N/A
 Were all sample labels legible?* (Y) N N/A
 Did all sample labels match the COC?* (Y) N N/A
 Was the label information complete?* (Y) N N/A
 Were the correct containers used?* (Y) N N/A
 Were the correct preservatives added to water samples?* Y N (N/A)
 Was the pH tested on preserved water samples? Y N (N/A)
 Were pH ranges acceptable?* Y N (N/A)
 Was sufficient amount of sample provided?* (Y) N N/A
 Were bubbles present in VOA samples?* Y N (N/A)
 Were COC's signed and dated? (Y) N N/A
 Did samples arrive before hold time expired?* (Y) N N/A
 Are discrepancy forms attached? Y N (N/A)
 *Requires a discrepancy form

Comments: _____

CRF #1
Revised 8/22/03



156 Starlite Drive, Marietta, OH 45750 • TEL 740-373-4071 • FAX 740-373-4835 • <http://www.kemron.com>

Laboratory Report Number: L0608140

Please find enclosed the analytical results for the samples you submitted to KEMRON Environmental Services.

Review and compilation of your report was completed by KEMRON's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box below at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

Debra Elliott - Team Leader

delliott@kemron-lab.com

Amanda Fickiesen - Client Services Specialist

afickiesen@kemron-lab.com

Cheryl Koelsch - Team Chemist/Data Specialist

ckoelsch@kemron-lab.com

Annie Bock - Client Services Specialist

abock@kemron-lab.com

Stephanie Mossburg - Team Chemist/Data Specialist

smossburg@kemron-lab.com

Kathy Albertson - Team Chemist/Data Specialist

kalbertson@kemron-lab.com

This report was reviewed on August 15, 2006.

A handwritten signature in cursive script that reads "Stephanie Mossburg".

STEPHANIE MOSSBURG - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the NELAP standards and other applicable contract terms and conditions. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of KEMRON Environmental Services.

This report was certified on August 15, 2006.

A handwritten signature in cursive script that reads "David E. Vandenberg".

David Vandenberg - Vice President

FL DOH NELAP ID: E8755

This report contains a total of 162 pages.

Protecting Our Environmental Future

LABORATORY REPORT

00048376

L0608140

08/15/06 12:07

Submitted By

KEMRON Environmental Services

156 Starlite Drive

Marietta, OH 45750

(740) 373-4071

For

Account Name: Shaw E & I. Inc.

ABB Lummus Building

3010 Briarpark

Houston, TX 77042

Attention: Diane Meyer

Account Number: 2773

Work ID: LONGHORN AAP

P.O. Number: 200328

Sample Summary

Client ID	Lab ID	Date Collected	Date Received
59-SB-01-01	L0608140-01	02-AUG-06	04-AUG-06
59-SB-01-02	L0608140-02	02-AUG-06	04-AUG-06
59-SB-02-01	L0608140-03	02-AUG-06	04-AUG-06
59-SB-02-02	L0608140-04	02-AUG-06	04-AUG-06
59-SB-03-01	L0608140-05	02-AUG-06	04-AUG-06
59-SB-03-02	L0608140-06	02-AUG-06	04-AUG-06
59-SB-04-01	L0608140-07	02-AUG-06	04-AUG-06
59-SB-04-02	L0608140-08	02-AUG-06	04-AUG-06
59-SB-04-02QC	L0608140-09	02-AUG-06	04-AUG-06
59-SB-05-01	L0608140-10	03-AUG-06	04-AUG-06
59-SB-05-02	L0608140-11	03-AUG-06	04-AUG-06
59-SB-08-01	L0608140-12	03-AUG-06	04-AUG-06
59-SB-07-01	L0608140-13	03-AUG-06	04-AUG-06
59-SB-08-02	L0608140-14	03-AUG-06	04-AUG-06
59-SB-07-02	L0608140-15	03-AUG-06	04-AUG-06
59-SB-06-01	L0608140-16	03-AUG-06	04-AUG-06
59-SB-06-01QC	L0608140-17	03-AUG-06	04-AUG-06
59-SB-06-02	L0608140-18	03-AUG-06	04-AUG-06

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

KEMRON Login No.: L0608140

CHAIN OF CUSTODY: The chain of custody number was 63090.

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 3 degrees C.

SAMPLE MANAGEMENT: All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Approved: 10-AUG-06

Stephanie Mordung

KEMRON ENVIRONMENTAL SERVICES
GC PESTICIDES

KEMRON Login No.: L0608140

METHOD

Preparation: SW- 846 3550B(Soils) 3510C(Waters)

Analysis: SW-846 8081

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: For all compounds which yielded a %RSD greater than 20 %, linear or higher order equations were applied. All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Continuing Calibration: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: There were no MS/MSD results associated with this sample delivery group, due to insufficient volume of sample. The laboratory included an LCS and LCS duplicate in the preparation batch in lieu of the NELAC prescribed MS/MSD. KEMRON recommends site specific MS/MSD samples to avoid possible data qualification.

SAMPLES

Surrogates: Sample 01 yielded a % recovery for decachlorobiphenyl that was above the acceptance limit. All other acceptance criteria were met.

Endrin/DDT Breakdown: All acceptance criteria were met.

Samples: For all samples which yielded results with an RPD of greater than 40% between the primary and confirmation column the appropriate flag was applied. All acceptance criteria were met.

Manual Integration Reason Codes

KEMRON laboratory management has identified four general cases with valid reasons supporting the use of manual integration techniques.

Reason #1: Data System Fails to Select Correct Peak

In some cases the chromatography system selects and integrates the "wrong peak". In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.

This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

Reason #3: Improperly Integrated Isomers and/or coeluting compounds.

This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline

There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

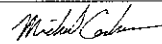
Reason #5: Miscellaneous

Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Laboratory Director or the QA/QC Supervisor will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Analyst: ECL

Approved: 15-AUG-06



Laboratory Data Package Cover Page

00048380

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

- a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for analytical duplicates.


R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: ☐ This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

DEANNA I. HESSON		Conventional Lab Supervisor	August 8, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608140
 Project Name: 798-LONGHORN
 Method: PCTSOLIDS
 Prep Batch Number(s): WG219325, WG219326
 Reviewer Name: DEANNA I. HESSON
 LRC Date: August 08, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?			✓		
Were blanks analyzed at the appropriate frequency?			✓		
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?			✓		
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?			✓		
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?			✓		
Were LCSs analyzed at the required frequency?			✓		
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?			✓		
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA	NA(2)	NA(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?			✓		
Has the initial calibration curve been verified using an appropriate second source standard?			✓		
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?			✓		
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?			✓		
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

Description	Yes	No	NA(1)	NR(2)	EN(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?			✓		
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?			✓		
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0608140
Project Name:	798-LONGHORN
Method:	PCTSOLIDS
Prep Batch Number(s):	WG219325, WG219326
Reviewer Name:	DEANNA I. HESSON
LRC Date:	August 08, 2006

EXCEPTIONS REPORT**ER# - Description**

Footnotes:

- (1) NA = Not applicable to method or project
- (2) NR = Not reviewed
- (3) ER# = Exception report number

Laboratory Data Package Cover Page

00048385

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

- a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: ☐ This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MICHAEL D. COCHRAN



Semivolatiles Lab Supervisor

August 9, 2006

Name (Printed)

Signature

Official Title (printed)

DATE

RG-366/TRRP-13 December 2002

AI

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608140
 Project Name: 798-LONGHORN
 Method: 8151
 Prep Batch Number(s): WG219236
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 09, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	✓				
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

00048387

Description	Yes	No	NA(1)	NR(2)	LR(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608140
 Project Name: 798-LONGHORN
 Method: 8151
 Prep Batch Number(s): WG219236
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 09, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?			✓		
Was applicable and available technology used to lower the SQL minimize the matrix interference effects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608140
 Project Name: 798-LONGHORN
 Method: 8151
 Prep Batch Number(s): WG219236
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 09, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?	✓				
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0608140
Project Name:	798-LONGHORN
Method:	8151
Prep Batch Number(s):	WG219236
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	August 09, 2006

EXCEPTIONS REPORT**ER# - Description**

Footnotes:

- (1) NA = Not applicable to method or project
- (2) NR = Not reviewed
- (3) ER# = Exception report number

Laboratory Data Package Cover Page

00048391

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

- a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for analytical duplicates.


R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: ☐ This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MICHAEL D. COCHRAN		Semivolatiles Lab Supervisor	August 15, 2006
Name (Printed)	Signature	Official Title (printed)	DATE

RG-366/TRRP-13 December 2002

A1

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608140
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG219235
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 15, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?		✓			I
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

00048393

Description	Yes	No	NA(1)	NR(2)	EN(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608140
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG219235
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 15, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?			✓		
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608140
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG219235
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 15, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0608140
Project Name:	798-LONGHORN
Method:	8081
Prep Batch Number(s):	WG219235
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	August 15, 2006

EXCEPTIONS REPORT**ER# - Description**

1. Sample 01 yielded a

Footnotes:

(1) NA = Not applicable to method or project

(2) NR = Not reviewed

(3) ER# = Exception report number

KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

00048397

Report Date : August 15, 2006

Sample Number: L0608140-01
 Client ID: 59-SB-01-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:15
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:02
 File ID: 15G6186.R
 Percent Solid: 93.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.76	0.353
beta-BHC	319-85-7		U	1.76	0.353
delta-BHC	319-86-8		U	1.76	0.353
gamma-BHC (Lindane)	58-89-9		U	1.76	0.353
Heptachlor	76-44-8	5.48		1.76	0.353
Aldrin	309-00-2		U	1.76	0.353
Heptachlor epoxide	1024-57-3		U	1.76	0.353
Endosulfan I	959-98-8		U	1.76	0.353
Dieldrin	60-57-1		U	1.76	0.353
4,4'-DDE	72-55-9		U	1.76	0.353
Endrin	72-20-8		U	1.76	0.353
Endosulfan II	33213-65-9		U	1.76	0.353
4,4'-DDD	72-54-8		U	1.76	0.353
Endosulfan sulfate	1031-07-8		U	1.76	0.353
4,4'-DDT	50-29-3		U	1.76	0.353
Methoxychlor	72-43-5		U	1.76	0.353
Endrin ketone	53494-70-5		U	1.76	0.353
Endrin aldehyde	7421-93-4		U	1.76	0.353
alpha Chlordane	5103-71-9	673	I	1.76	0.353
gamma Chlordane	5103-74-2	742	I	1.76	0.353
Toxaphene	8001-35-2		U	35.3	17.8
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	68.4	39	130		
Decachlorobiphenyl	81.9	33	143		

I Semiquantitative result (out of instrument calibration range)

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-01
 Client ID: 59-SB-01-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:15
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 03:34
 File ID: 15G6186.F
 Percent Solid: 93.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.76	0.353
beta-BHC	319-85-7		U	1.76	0.353
delta-BHC	319-86-8		U	1.76	0.353
gamma-BHC (Lindane)	58-89-9		U	1.76	0.353
Heptachlor	76-44-8	5.07		1.76	0.353
Aldrin	309-00-2		U	1.76	0.353
Heptachlor epoxide	1024-57-3		U	1.76	0.353
Endosulfan I	959-98-8		U	1.76	0.353
Dieldrin	60-57-1		U	1.76	0.353
4,4'-DDE	72-55-9		U	1.76	0.353
Endrin	72-20-8		U	1.76	0.353
Endosulfan II	33213-65-9		U	1.76	0.353
4,4'-DDD	72-54-8		U	1.76	0.353

1 of 40

 DM
 8/22/06

Report Number: L0608140

00048398

Report Date : August 15, 2006

Sample Number: L0608140-01
 Client ID: 59-SB-01-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:15
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 03:34
 File ID: 15G6186.F
 Percent Solid: 93.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan sulfate	1031-07-8		U	1.76	0.353
4,4'-DDT	50-29-3		U	1.76	0.353
Methoxychlor	72-43-5		U	1.76	0.353
Endrin ketone	53494-70-5		U	1.76	0.353
Endrin aldehyde	7421-93-4		U	1.76	0.353
alpha Chlordane	5103-71-9	1550	I	1.76	0.353
gamma Chlordane	5103-74-2	1230	I	1.76	0.353
Toxaphene	8001-35-2		U	35.3	17.8
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	73.2	39	130		
Decachlorobiphenyl	146	33	143	*	

* Surrogate or spike compound out of range
 I Semiquantitative result (out of instrument calibration range)
 U Not detected at or above adjusted sample detection limit

R16
↓

Sample Number: L0608140-01
 Client ID: 59-SB-01-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:15
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 500
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/14/2006 19:13
 Run Date: 08/14/2006 19:42
 File ID: 15G6255.F
 Percent Solid: 93.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	882	176
beta-BHC	319-85-7		U	882	176
delta-BHC	319-86-8		U	882	176
gamma-BHC (Lindane)	58-89-9		U	882	176
Heptachlor	76-44-8		U	882	176
Aldrin	309-00-2		U	882	176
Heptachlor epoxide	1024-57-3		U	882	176
Endosulfan I	959-98-8		U	882	176
Dieldrin	60-57-1		U	882	176
4,4'-DDE	72-55-9		U	882	176
Endrin	72-20-8		U	882	176
Endosulfan II	33213-65-9		U	882	176
4,4'-DDD	72-54-8		U	882	176
Endosulfan sulfate	1031-07-8		U	882	176
4,4'-DDT	50-29-3		U	882	176
Methoxychlor	72-43-5		U	882	176
Endrin ketone	53494-70-5		U	882	176
Endrin aldehyde	7421-93-4		U	882	176
alpha Chlordane	5103-71-9	4660	P	882	176
gamma Chlordane	5103-74-2	2430		882	176
Toxaphene	8001-35-2		U	17600	8920
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene		39	130	DL	
Decachlorobiphenyl		33	143	DL	

R16
↓

DL Surrogate or spike compound was diluted out
 P Concentrations >40% difference between the two GC columns

2 of 40

DM
8/22/06

Report Number: L0608140

00048399

Report Date : August 15, 2006

Sample Number: L0608140-01
 Client ID: 59-SB-01-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:15
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 500
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/14/2006 19:13
 Run Date: 08/14/2006 19:42
 File ID: 15G6255.F
 Percent Solid: 93.1

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-01
 Client ID: 59-SB-01-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:15
 Sample Tag: CFDL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 500
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/14/2006 19:13
 Run Date: 08/14/2006 20:10
 File ID: 15G6255.R
 Percent Solid: 93.1

Analyte	CAS. Number	Result	Qual	PQL	SOL
alpha-BHC	319-84-6		U	882	176
beta-BHC	319-85-7		U	882	176
delta-BHC	319-86-8		U	882	176
gamma-BHC (Lindane)	58-89-9		U	882	176
Heptachlor	76-44-8		U	882	176
Aldrin	309-00-2		U	882	176
Heptachlor epoxide	1024-57-3		U	882	176
Endosulfan I	959-98-8		U	882	176
Dieldrin	60-57-1		U	882	176
4,4'-DDE	72-55-9		U	882	176
Endrin	72-20-8		U	882	176
Endosulfan II	33213-65-9		U	882	176
4,4'-DDD	72-54-8		U	882	176
Endosulfan sulfate	1031-07-8		U	882	176
4,4'-DDT	50-29-3		U	882	176
Methoxychlor	72-43-5		U	882	176
Endrin ketone	53494-70-5		U	882	176
Endrin aldehyde	7421-93-4		U	882	176
alpha Chlordane	5103-71-9	2110	P	882	176
gamma Chlordane	5103-74-2	2260		882	176
Toxaphene	8001-35-2		U	17600	8920
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene		39	130	DL	
Decachlorobiphenyl		33	143	DL	

R16

J18
R16

DL Surrogate or spike compound was diluted out
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

DM
8/22/06

Report Number: L0608140

00048400

Report Date : August 15, 2006

Sample Number: L0608140-01
 Client ID: 59-SB-01-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 13:15
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 00:15
 File ID: 15G6134.F
 Percent Solid: 93.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	42.9	21.5
2,4-DB	94-82-6		U	42.9	21.5
2,4,5-T	93-76-5		U	4.29	2.15
2,4,5-TP (Silvex)	93-72-1		U	3.22	1.61
Dalapon	75-99-0		U	107	53.7
Dicamba	1918-00-9		U	4.29	2.15
Dichloroprop	120-36-5		U	42.9	21.5
Dinoseb	88-85-7		U	21.5	10.7
MCPA	94-74-6		U	4290	2150
MCPP	93-65-2		U	4290	2150
Pentachlorophenol	87-86-5		U	4.29	2.15
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	34.2	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-01
 Client ID: 59-SB-01-01
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 13:15

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-11

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	93.1		1.00	1.00

Sample Number: L0608140-02
 Client ID: 59-SB-01-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:35
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:30
 File ID: 15G6187.R
 Percent Solid: 87.9

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.85	0.371
beta-BHC	319-85-7		U	1.85	0.371
delta-BHC	319-86-8		U	1.85	0.371
gamma-BHC (Lindane)	58-89-9		U	1.85	0.371
Heptachlor	76-44-8		U	1.85	0.371
Aldrin	309-00-2		U	1.85	0.371
Heptachlor epoxide	1024-57-3	0.532	J	1.85	0.371
Endosulfan I	959-98-8		U	1.85	0.371
Dieldrin	60-57-1		U	1.85	0.371
4,4'-DDE	72-55-9		U	1.85	0.371
Endrin	72-20-8		U	1.85	0.371

R16

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Am
8/22/06

Report Number: L0608140

00048401

Report Date : August 15, 2006

Sample Number: L0608140-02
 Client ID: 59-SB-01-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:35
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:30
 File ID: 15G6187.R
 Percent Solid: 87.9

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan II	33213-65-9		U	1.85	0.371
4,4'-DDD	72-54-8		U	1.85	0.371
Endosulfan sulfate	1031-07-8		U	1.85	0.371
4,4'-DDT	50-29-3		U	1.85	0.371
Methoxychlor	72-43-5		U	1.85	0.371
Endrin ketone	53494-70-5		U	1.85	0.371
Endrin aldehyde	7421-93-4		U	1.85	0.371
alpha Chlordane	5103-71-9	13.1	P	1.85	0.371
gamma Chlordane	5103-74-2	12.3		1.85	0.371
Toxaphene	8001-35-2		U	37.1	18.8
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	84.0	39	130		
Decachlorobiphenyl	91.8	33	143		

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

R16
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 J18
 R16
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Sample Number: L0608140-02
 Client ID: 59-SB-01-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:35
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:02
 File ID: 15G6187.F
 Percent Solid: 87.9

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.85	0.371
beta-BHC	319-85-7		U	1.85	0.371
delta-BHC	319-86-8		U	1.85	0.371
gamma-BHC (Lindane)	58-89-9		U	1.85	0.371
Heptachlor	76-44-8		U	1.85	0.371
Aldrin	309-00-2		U	1.85	0.371
Heptachlor epoxide	1024-57-3	2.62	P	1.85	0.371
Endosulfan I	959-98-8		U	1.85	0.371
Dieldrin	60-57-1		U	1.85	0.371
4,4'-DDE	72-55-9		U	1.85	0.371
Endrin	72-20-8		U	1.85	0.371
Endosulfan II	33213-65-9		U	1.85	0.371
4,4'-DDD	72-54-8		U	1.85	0.371
Endosulfan sulfate	1031-07-8		U	1.85	0.371
4,4'-DDT	50-29-3		U	1.85	0.371
Methoxychlor	72-43-5		U	1.85	0.371
Endrin ketone	53494-70-5		U	1.85	0.371
Endrin aldehyde	7421-93-4		U	1.85	0.371
alpha Chlordane	5103-71-9	43.8	P	1.85	0.371
gamma Chlordane	5103-74-2	15.7		1.85	0.371
Toxaphene	8001-35-2		U	37.1	18.8

J18

R16

DM
 8/22/06

Report Number: L0608140

00048402

Report Date : August 15, 2006

Sample Number: L0608140-02
 Client ID: 59-SB-01-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:35
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:02
 File ID: 15G6187.F
 Percent Solid: 87.9

Surrogate	% Recovery	Lower	Upper	Qual
2,4,5,6-Tetrachloro-m-xylene	80.3	39	130	
Decachlorobiphenyl	88.8	33	143	

P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-02
 Client ID: 59-SB-01-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 13:35
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 00:42
 File ID: 15G6135.F
 Percent Solid: 87.9

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	45.4	22.7
2,4-DB	94-82-6		U	45.4	22.7
2,4,5-T	93-76-5		U	4.54	2.27
2,4,5-TP (Silvex)	93-72-1		U	3.40	1.70
Dalapon	75-99-0		U	113	56.7
Dicamba	1918-00-9		U	4.54	2.27
Dichloroprop	120-36-5		U	45.4	22.7
Dinoseb	88-85-7		U	22.7	11.3
MCPA	94-74-6		U	4540	2270
MCP	93-65-2		U	4540	2270
Pentachlorophenol	87-86-5		U	4.54	2.27
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	52.1	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-02
 Client ID: 59-SB-01-02
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 13:35

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-12

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	87.9		1.00	1.00

DM
8/23/06

Report Number: L0608140

00048403

Report Date : August 15, 2006

Sample Number: L0608140-03
 Client ID: 59-SB-02-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:50
 Sample Tag: CDFL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 10
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:59
 File ID: 15G6188.R
 Percent Solid: 95.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	17.3	3.47
beta-BHC	319-85-7		U	17.3	3.47
delta-BHC	319-86-8		U	17.3	3.47
gamma-BHC (Lindane)	58-89-9		U	17.3	3.47
Heptachlor	76-44-8	10.7	J	17.3	3.47
Aldrin	309-00-2		U	17.3	3.47
Heptachlor epoxide	1024-57-3	55.4	P	17.3	3.47
Endosulfan I	959-98-8		U	17.3	3.47
Dieldrin	60-57-1		U	17.3	3.47
4,4'-DDE	72-55-9		U	17.3	3.47
Endrin	72-20-8		U	17.3	3.47
Endosulfan II	33213-65-9		U	17.3	3.47
4,4'-DDD	72-54-8		U	17.3	3.47
Endosulfan sulfate	1031-07-8		U	17.3	3.47
4,4'-DDT	50-29-3		U	17.3	3.47
Methoxychlor	72-43-5		U	17.3	3.47
Endrin ketone	53494-70-5		U	17.3	3.47
Endrin aldehyde	7421-93-4		U	17.3	3.47
alpha Chlordane	5103-71-9	661	P	17.3	3.47
gamma Chlordane	5103-74-2	677	P	17.3	3.47
Toxaphene	8001-35-2		U	347	175
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	80.6	39	130		
Decachlorobiphenyl	86.1	33	143		

J15
 R16

J18
 J18

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-03
 Client ID: 59-SB-02-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:50
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 10
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:30
 File ID: 15G6188.F
 Percent Solid: 95.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	17.3	3.47
beta-BHC	319-85-7		U	17.3	3.47
delta-BHC	319-86-8		U	17.3	3.47
gamma-BHC (Lindane)	58-89-9		U	17.3	3.47
Heptachlor	76-44-8	9.70	J	17.3	3.47
Aldrin	309-00-2		U	17.3	3.47
Heptachlor epoxide	1024-57-3	165	P	17.3	3.47
Endosulfan I	959-98-8		U	17.3	3.47
Dieldrin	60-57-1		U	17.3	3.47
4,4'-DDE	72-55-9		U	17.3	3.47
Endrin	72-20-8		U	17.3	3.47
Endosulfan II	33213-65-9		U	17.3	3.47
4,4'-DDD	72-54-8		U	17.3	3.47

R16

J18
 R16

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DM
 8/23/06

Report Number: L0608140

00048404

Report Date : August 15, 2006

Sample Number: L0608140-03
 Client ID: 59-SB-02-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 13:50
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 10
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:30
 File ID: 15G6188.F
 Percent Solid: 95.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan sulfate	1031-07-8		U	17.3	3.47
4,4'-DDT	50-29-3		U	17.3	3.47
Methoxychlor	72-43-5		U	17.3	3.47
Endrin ketone	53494-70-5		U	17.3	3.47
Endrin aldehyde	7421-93-4		U	17.3	3.47
alpha Chlordane	5103-71-9	1710	I	17.3	3.47
gamma Chlordane	5103-74-2	817	I	17.3	3.47
Toxaphene	8001-35-2		U	347	175
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	83.1	39	130		
Decachlorobiphenyl	124	33	143		

I Semiquantitative result (out of instrument calibration range)

J The analyte was positively identified, but the quantitation was below the RL

P Concentrations >40% difference between the two GC columns

U Not detected at or above adjusted sample detection limit

R16
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 R16
 R16

Sample Number: L0608140-03
 Client ID: 59-SB-02-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 13:50
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 10
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 01:08
 File ID: 15G6136.F
 Percent Solid: 95.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	420	210
2,4-DB	94-82-6		U	420	210
2,4,5-T	93-76-5		U	42.0	21.0
2,4,5-TP (Silvex)	93-72-1		U	31.5	15.7
Dalapon	75-99-0		U	1050	525
Dicamba	1918-00-9		U	42.0	21.0
Dichloroprop	120-36-5		U	420	210
Dinoseb	88-85-7		U	210	105
MCPA	94-74-6		U	42000	21000
MCPP	93-65-2		U	42000	21000
Pentachlorophenol	87-86-5		U	42.0	21.0
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	70.7	25	110		

U Not detected at or above adjusted sample detection limit

DM
 8/23/06

KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

00048405

Report Date : August 15, 2006

Sample Number: L0608140-03
 Client ID: 59-SB-02-01
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 13:50

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-13

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	95.1		1.00	1.00

Sample Number: L0608140-04
 Client ID: 59-SB-02-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:00
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 04:59
 File ID: 15G6189.F
 Percent Solid: 89.9

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.81	0.362
beta-BHC	319-85-7		U	1.81	0.362
delta-BHC	319-86-8		U	1.81	0.362
gamma-BHC (Lindane)	58-89-9		U	1.81	0.362
Heptachlor	76-44-8		U	1.81	0.362
Aldrin	309-00-2		U	1.81	0.362
Heptachlor epoxide	1024-57-3	3.39	P	1.81	0.362
Endosulfan I	959-98-8		U	1.81	0.362
Dieldrin	60-57-1		U	1.81	0.362
4,4'-DDE	72-55-9		U	1.81	0.362
Endrin	72-20-8		U	1.81	0.362
Endosulfan II	33213-65-9		U	1.81	0.362
4,4'-DDD	72-54-8		U	1.81	0.362
Endosulfan sulfate	1031-07-8		U	1.81	0.362
4,4'-DDT	50-29-3		U	1.81	0.362
Methoxychlor	72-43-5		U	1.81	0.362
Endrin ketone	53494-70-5		U	1.81	0.362
Endrin aldehyde	7421-93-4		U	1.81	0.362
alpha Chlordane	5103-71-9	43.3	P	1.81	0.362
gamma Chlordane	5103-74-2	20.3		1.81	0.362
Toxaphene	8001-35-2		U	36.2	18.3
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	87.3	39	130		
Decachlorobiphenyl	96.4	33	143		

P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

DM
8/23/06

Report Number: L0608140

00048406

Report Date : August 15, 2006

Sample Number: L0608140-04
 Client ID: 59-SB-02-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:00
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 05:27
 File ID: 15G6189.R
 Percent Solid: 89.9

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.81	0.362
beta-BHC	319-85-7		U	1.81	0.362
delta-BHC	319-86-8		U	1.81	0.362
gamma-BHC (Lindane)	58-89-9		U	1.81	0.362
Heptachlor	76-44-8		U	1.81	0.362
Aldrin	309-00-2		U	1.81	0.362
Heptachlor epoxide	1024-57-3	1.25	J	1.81	0.362
Endosulfan I	959-98-8		U	1.81	0.362
Dieldrin	60-57-1		U	1.81	0.362
4,4'-DDE	72-55-9		U	1.81	0.362
Endrin	72-20-8		U	1.81	0.362
Endosulfan II	33213-65-9		U	1.81	0.362
4,4'-DDD	72-54-8		U	1.81	0.362
Endosulfan sulfate	1031-07-8		U	1.81	0.362
4,4'-DDT	50-29-3		U	1.81	0.362
Methoxychlor	72-43-5		U	1.81	0.362
Endrin ketone	53494-70-5		U	1.81	0.362
Endrin aldehyde	7421-93-4		U	1.81	0.362
alpha Chlordane	5103-71-9	16.5	P	1.81	0.362
gamma Chlordane	5103-74-2	17.6		1.81	0.362
Toxaphene	8001-35-2		U	36.2	18.3
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	82.9	39	130		
Decachlorobiphenyl	95.3	33	143		

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-04
 Client ID: 59-SB-02-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 14:00
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 01:34
 File ID: 15G6137.F
 Percent Solid: 89.9

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	44.3	22.2
2,4-DB	94-82-6		U	44.3	22.2
2,4,5-T	93-76-5		U	4.43	2.22
2,4,5-TP (Silvex)	93-72-1		U	3.32	1.66
Dalapon	75-99-0		U	111	55.4
Dicamba	1918-00-9		U	4.43	2.22
Dichloroprop	120-36-5		U	44.3	22.2
Dinoseb	88-85-7		U	22.2	11.1
MCPA	94-74-6		U	4430	2220
MCPP	93-65-2		U	4430	2220
Pentachlorophenol	87-86-5		U	4.43	2.22

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DM
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Report Number: L0608140

Report Date : August 15, 2006

00048407

Sample Number: L0608140-04
 Client ID: 59-SB-02-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 14:00
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 01:34
 File ID: 15G6137.F
 Percent Solid: 89.9

Surrogate	% Recovery	Lower	Upper	Qual
2,4-Dichlorophenylacetic acid	35.1	25	110	

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-04
 Client ID: 59-SB-02-02
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 14:00

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-14

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	89.9		1.00	1.00

Sample Number: L0608140-05
 Client ID: 59-SB-03-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:15
 Sample Tag: CFDL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 05:55
 File ID: 15G6190.R
 Percent Solid: 89.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	9.00	1.80
beta-BHC	319-85-7		U	9.00	1.80
delta-BHC	319-86-8		U	9.00	1.80
gamma-BHC (Lindane)	58-89-9		U	9.00	1.80
Heptachlor	76-44-8		U	9.00	1.80
Aldrin	309-00-2		U	9.00	1.80
Heptachlor epoxide	1024-57-3		U	9.00	1.80
Endosulfan I	959-98-8		U	9.00	1.80
Dieldrin	60-57-1		U	9.00	1.80
4,4'-DDE	72-55-9		U	9.00	1.80
Endrin	72-20-8		U	9.00	1.80
Endosulfan II	33213-65-9		U	9.00	1.80
4,4'-DDD	72-54-8		U	9.00	1.80
Endosulfan sulfate	1031-07-8		U	9.00	1.80
4,4'-DDT	50-29-3		U	9.00	1.80
Methoxychlor	72-43-5		U	9.00	1.80
Endrin ketone	53494-70-5		U	9.00	1.80
Endrin aldehyde	7421-93-4		U	9.00	1.80
alpha Chlordane	5103-71-9	6.02	J	9.00	1.80
gamma Chlordane	5103-74-2	7.73	J	9.00	1.80
Toxaphene	8001-35-2		U	180	91.1

J15, 18
J15

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AM
8/22/06

Report Number: L0608140

00048408

Report Date : August 15, 2006

Sample Number: L0608140-05
 Client ID: 59-SB-03-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:15
 Sample Tag: CFDL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 05:55
 File ID: 15G6190.R
 Percent Solid: 89.1

Surrogate	% Recovery	Lower	Upper	Qual
2,4,5,6-Tetrachloro-m-xylene	81.4	39	130	
Decachlorobiphenyl	105	33	143	

J The analyte was positively identified, but the quantitation was below the RL
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-05
 Client ID: 59-SB-03-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:15
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 05:27
 File ID: 15G6190.F
 Percent Solid: 89.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	9.00	1.80
beta-BHC	319-85-7		U	9.00	1.80
delta-BHC	319-86-8		U	9.00	1.80
gamma-BHC (Lindane)	58-89-9		U	9.00	1.80
Heptachlor	76-44-8		U	9.00	1.80
Aldrin	309-00-2		U	9.00	1.80
Heptachlor epoxide	1024-57-3		U	9.00	1.80
Endosulfan I	959-98-8		U	9.00	1.80
Dieldrin	60-57-1		U	9.00	1.80
4,4'-DDE	72-55-9		U	9.00	1.80
Endrin	72-20-8		U	9.00	1.80
Endosulfan II	33213-65-9		U	9.00	1.80
4,4'-DDD	72-54-8		U	9.00	1.80
Endosulfan sulfate	1031-07-8		U	9.00	1.80
4,4'-DDT	50-29-3		U	9.00	1.80
Methoxychlor	72-43-5		U	9.00	1.80
Endrin ketone	53494-70-5		U	9.00	1.80
Endrin aldehyde	7421-93-4		U	9.00	1.80
alpha Chlordane	5103-71-9	29.7	P	9.00	1.80
gamma Chlordane	5103-74-2	6.96	J	9.00	1.80
Toxaphene	8001-35-2		U	180	91.1
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	78.5	39	130		
Decachlorobiphenyl	86.1	33	143		

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

AM
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Report Number: L0608140

Report Date : August 15, 2006

Sample Number: L0608140-05
 Client ID: 59-SB-03-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 14:15
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 02:28
 File ID: 15G6139.F
 Percent Solid: 89.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	224	112
2,4-DB	94-82-6		U	224	112
2,4,5-T	93-76-5		U	22.4	11.2
2,4,5-TP (Silvex)	93-72-1		U	16.8	8.39
Dalapon	75-99-0		U	559	280
Dicamba	1918-00-9		U	22.4	11.2
Dichloroprop	120-36-5		U	224	112
Dinoseb	88-85-7		U	112	55.9
MCPA	94-74-6		U	22400	11200
MCPD	93-65-2		U	22400	11200
Pentachlorophenol	87-86-5		U	22.4	11.2
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	53.7	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-05
 Client ID: 59-SB-03-01
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 14:15

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-15

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	89.1		1.00	1.00

Sample Number: L0608140-06
 Client ID: 59-SB-03-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:30
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 05:55
 File ID: 15G6191.F
 Percent Solid: 88.7

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.84	0.367
beta-BHC	319-85-7		U	1.84	0.367
delta-BHC	319-86-8		U	1.84	0.367
gamma-BHC (Lindane)	58-89-9		U	1.84	0.367
Heptachlor	76-44-8		U	1.84	0.367
Aldrin	309-00-2		U	1.84	0.367
Heptachlor epoxide	1024-57-3		U	1.84	0.367
Endosulfan I	959-98-8		U	1.84	0.367
Dieldrin	60-57-1		U	1.84	0.367
4,4'-DDE	72-55-9		U	1.84	0.367
Endrin	72-20-8		U	1.84	0.367

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DM
8/23/06

Report Number: L0608140

00048410

Report Date : August 15, 2006

Sample Number: L0608140-06
 Client ID: 59-SB-03-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:30
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 05:55
 File ID: 15G6191.F
 Percent Solid: 88.7

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan II	33213-65-9		U	1.84	0.367
4,4'-DDD	72-54-8		U	1.84	0.367
Endosulfan sulfate	1031-07-8		U	1.84	0.367
4,4'-DDT	50-29-3		U	1.84	0.367
Methoxychlor	72-43-5		U	1.84	0.367
Endrin ketone	53494-70-5		U	1.84	0.367
Endrin aldehyde	7421-93-4		U	1.84	0.367
alpha Chlordane	5103-71-9		U	1.84	0.367
gamma Chlordane	5103-74-2		U	1.84	0.367
Toxaphene	8001-35-2		U	36.7	18.6
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	71.8	39	130		
Decachlorobiphenyl	76.9	33	143		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-06
 Client ID: 59-SB-03-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 14:30
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 02:55
 File ID: 15G6140.F
 Percent Solid: 88.7

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	44.5	22.3
2,4-DE	94-82-6		U	44.5	22.3
2,4,5-T	93-76-5		U	4.45	2.23
2,4,5-TP (Silvex)	93-72-1		U	3.34	1.67
Dalapon	75-99-0		U	111	55.7
Dicamba	1918-00-9		U	4.45	2.23
Dichloroprop	120-36-5		U	44.5	22.3
Dinoseb	88-85-7		U	22.3	11.1
MCPA	94-74-6		U	4450	2230
MCPFP	93-65-2		U	4450	2230
Pentachlorophenol	87-86-5		U	4.45	2.23
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	52.0	25	110		

U Not detected at or above adjusted sample detection limit

DM
8/23/06

Report Number: L0608140

00048411

Report Date : August 15, 2006

Sample Number: L0608140-06
 Client ID: 59-SB-03-02
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 14:30

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-16

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	88.7		1.00	1.00

Sample Number: L0608140-07
 Client ID: 59-SB-04-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:40
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 06:24
 File ID: 15G6192.F
 Percent Solid: 94.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.71	0.343
beta-BHC	319-85-7		U	1.71	0.343
delta-BHC	319-86-8		U	1.71	0.343
gamma-BHC (Lindane)	58-89-9		U	1.71	0.343
Heptachlor	76-44-8	1.37	J	1.71	0.343
Aldrin	309-00-2		U	1.71	0.343
Heptachlor epoxide	1024-57-3	15.4	P	1.71	0.343
Endosulfan I	959-98-8		U	1.71	0.343
Dieldrin	60-57-1		U	1.71	0.343
4,4'-DDE	72-55-9		U	1.71	0.343
Endrin	72-20-8		U	1.71	0.343
Endosulfan II	33213-65-9		U	1.71	0.343
4,4'-DDD	72-54-8		U	1.71	0.343
Endosulfan sulfate	1031-07-8		U	1.71	0.343
4,4'-DDT	50-29-3		U	1.71	0.343
Methoxychlor	72-43-5		U	1.71	0.343
Endrin ketone	53494-70-5		U	1.71	0.343
Endrin aldehyde	7421-93-4		U	1.71	0.343
alpha Chlordane	5103-71-9	150	I	1.71	0.343
gamma Chlordane	5103-74-2	68.7		1.71	0.343
Toxaphene	8001-35-2		U	34.3	17.3
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	78.8	39	130		
Decachlorobiphenyl	86.8	33	143		

J15

J18

R16

I Semiquantitative result (out of instrument calibration range)
 J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

DM
8/23/06

KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

00048412

Report Date : August 15, 2006

Sample Number: L0608140-07
 Client ID: 59-SB-04-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:40
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 06:52
 File ID: 15G6192.R
 Percent Solid: 94.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.71	0.343
beta-BHC	319-85-7		U	1.71	0.343
delta-BHC	319-86-8		U	1.71	0.343
gamma-BHC (Lindane)	58-89-9		U	1.71	0.343
Heptachlor	76-44-8	1.47	J	1.71	0.343
Aldrin	309-00-2		U	1.71	0.343
Heptachlor epoxide	1024-57-3	5.98	P	1.71	0.343
Endosulfan I	959-98-8		U	1.71	0.343
Dieldrin	60-57-1		U	1.71	0.343
4,4'-DDE	72-55-9		U	1.71	0.343
Endrin	72-20-8		U	1.71	0.343
Endosulfan II	33213-65-9		U	1.71	0.343
4,4'-DDD	72-54-8		U	1.71	0.343
Endosulfan sulfate	1031-07-8		U	1.71	0.343
4,4'-DDT	50-29-3		U	1.71	0.343
Methoxychlor	72-43-5		U	1.71	0.343
Endrin ketone	53494-70-5		U	1.71	0.343
Endrin aldehyde	7421-93-4		U	1.71	0.343
alpha Chlordane	5103-71-9	58.6	P	1.71	0.343
gamma Chlordane	5103-74-2	58.5		1.71	0.343
Toxaphene	8001-35-2		U	34.3	17.3
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	74.4	39	130		
Decachlorobiphenyl	85.3	33	143		

R16

J18
R16

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-07
 Client ID: 59-SB-04-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 14:40
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 03:22
 File ID: 15G6141.F
 Percent Solid: 94.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	212	106
2,4-DB	94-82-6		U	212	106
2,4,5-T	93-76-5		U	21.2	10.6
2,4,5-TP (Silvex)	93-72-1		U	15.9	7.94
Dalapon	75-99-0		U	529	265
Dicamba	1918-00-9		U	21.2	10.6
Dichloroprop	120-36-5		U	212	106
Dinoseb	88-85-7		U	106	52.9
MCPA	94-74-6		U	21200	10600
MCPP	93-65-2		U	21200	10600
Pentachlorophenol	87-86-5		U	21.2	10.6

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Report Number: L0608140

Report Date : August 15, 2006

00048413

Sample Number: L0608140-07
 Client ID: 59-SB-04-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 14:40
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 03:22
 File ID: 15G6141.F
 Percent Solid: 94.1

Surrogate	% Recovery	Lower	Upper	Qual
2,4-Dichlorophenylacetic acid	27.8	25	110	

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-07
 Client ID: 59-SB-04-01
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 14:40

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-17

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	94.1		1.00	1.00

Sample Number: L0608140-08
 Client ID: 59-SB-04-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:50
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 06:52
 File ID: 15G6193.F
 Percent Solid: 90.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.81	0.363
beta-BHC	319-85-7		U	1.81	0.363
delta-BHC	319-86-8		U	1.81	0.363
gamma-BHC (Lindane)	58-89-9		U	1.81	0.363
Heptachlor	76-44-8		U	1.81	0.363
Aldrin	309-00-2		U	1.81	0.363
Heptachlor epoxide	1024-57-3	1.52	J	1.81	0.363
Endosulfan I	959-98-8		U	1.81	0.363
Dieldrin	60-57-1		U	1.81	0.363
4,4'-DDE	72-55-9		U	1.81	0.363
Endrin	72-20-8		U	1.81	0.363
Endosulfan II	33213-65-9		U	1.81	0.363
4,4'-DDD	72-54-8		U	1.81	0.363
Endosulfan sulfate	1031-07-8		U	1.81	0.363
4,4'-DDT	50-29-3		U	1.81	0.363
Methoxychlor	72-43-5		U	1.81	0.363
Endrin ketone	53494-70-5		U	1.81	0.363
Endrin aldehyde	7421-93-4		U	1.81	0.363
alpha Chlordane	5103-71-9	16.2	P	1.81	0.363
gamma Chlordane	5103-74-2	7.40		1.81	0.363
Toxaphene	8001-35-2		U	36.3	18.4

315

R16

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Am
8/22/06

Report Number: L0608140

00048414

Report Date : August 15, 2006

Sample Number: L0608140-08
 Client ID: 59-SB-04-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:50
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 06:52
 File ID: 15G6193.F
 Percent Solid: 90.1

Surrogate	% Recovery	Lower	Upper	Qual
2,4,5,6-Tetrachloro-m-xylene	65.7	39	130	
Decachlorobiphenyl	87.1	33	143	

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-08
 Client ID: 59-SB-04-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:50
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 07:20
 File ID: 15G6193.R
 Percent Solid: 90.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.81	0.363
beta-BHC	319-85-7		U	1.81	0.363
delta-BHC	319-86-8		U	1.81	0.363
gamma-BHC (Lindane)	58-89-9		U	1.81	0.363
Heptachlor	76-44-8		U	1.81	0.363
Aldrin	309-00-2		U	1.81	0.363
Heptachlor epoxide	1024-57-3	0.572	J	1.81	0.363
Endosulfan I	959-98-8		U	1.81	0.363
Dieldrin	60-57-1		U	1.81	0.363
4,4'-DDE	72-55-9		U	1.81	0.363
Endrin	72-20-8		U	1.81	0.363
Endosulfan II	33213-65-9		U	1.81	0.363
4,4'-DDD	72-54-8		U	1.81	0.363
Endosulfan sulfate	1031-07-8		U	1.81	0.363
4,4'-DDT	50-29-3		U	1.81	0.363
Methoxychlor	72-43-5		U	1.81	0.363
Endrin ketone	53494-70-5		U	1.81	0.363
Endrin aldehyde	7421-93-4		U	1.81	0.363
alpha Chlordane	5103-71-9	6.27	P	1.81	0.363
gamma Chlordane	5103-74-2	6.09		1.81	0.363
Toxaphene	8001-35-2		U	36.3	18.4
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	61.5	39	130		
Decachlorobiphenyl	79.3	33	143		

R16
 J18
 R16

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

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 8/23/06

Report Number: L0608140

00048415

Report Date : August 15, 2006

Sample Number: L0608140-08
 Client ID: 59-SB-04-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 14:50
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 03:48
 File ID: 15G6142.F
 Percent Solid: 90.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	44.1	22.0
2,4-DB	94-82-6		U	44.1	22.0
2,4,5-T	93-76-5		U	4.41	2.20
2,4,5-TP (Silvex)	93-72-1		U	3.31	1.65
Dalapon	75-99-0		U	110	55.1
Dicamba	1918-00-9		U	4.41	2.20
Dichloroprop	120-36-5		U	44.1	22.0
Dinoseb	88-85-7		U	22.0	11.0
MCPA	94-74-6		U	4410	2200
MCPP	93-65-2		U	4410	2200
Pentachlorophenol	87-86-5		U	4.41	2.20
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	47.6	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-08
 Client ID: 59-SB-04-02
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 14:50

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: QVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-18

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	90.1		1.00	1.00

Sample Number: L0608140-09
 Client ID: 59-SB-04-02QC
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:50
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 08:17
 File ID: 15G6196.F
 Percent Solid: 90.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.78	0.357
beta-BHC	319-85-7		U	1.78	0.357
delta-BHC	319-86-8		U	1.78	0.357
gamma-BHC (Lindane)	58-89-9		U	1.78	0.357
Heptachlor	76-44-8		U	1.78	0.357
Aldrin	309-00-2		U	1.78	0.357
Heptachlor epoxide	1024-57-3	1.32	J	1.78	0.357
Endosulfan I	959-98-8		U	1.78	0.357
Dieldrin	60-57-1		U	1.78	0.357
4,4'-DDE	72-55-9		U	1.78	0.357
Endrin	72-20-8		U	1.78	0.357

J15

DM
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Report Number: L0608140

00048416

Report Date : August 15, 2006

Sample Number: L0608140-09

Client ID: 59-SB-04-02QC

Matrix: Soil

Workgroup Number: WG219418

Collect Date: 08/02/2006 14:50

Sample Tag: 01

PrePrep Method: NONE

Prep Method: 3550B

Analytical Method: 8081A

Analyst: ECL

Dilution: 1

Units: ug/kg

Instrument: HP15

Prep Date: 08/07/2006 07:30

Cal Date: 08/10/2006 20:29

Run Date: 08/11/2006 08:17

File ID: 15G6196.F

Percent Solid: 90.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan II	33213-65-9		U	1.78	0.357
4,4'-DDD	72-54-8		U	1.78	0.357
Endosulfan sulfate	1031-07-8		U	1.78	0.357
4,4'-DDT	50-29-3		U	1.78	0.357
Methoxychlor	72-43-5		U	1.78	0.357
Endrin ketone	53494-70-5		U	1.78	0.357
Endrin aldehyde	7421-93-4		U	1.78	0.357
alpha Chlordane	5103-71-9	14.6	P	1.78	0.357
gamma Chlordane	5103-74-2	6.92		1.78	0.357
Toxaphene	8001-35-2		U	35.7	18.1
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	65.0	39	130		
Decachlorobiphenyl	75.6	33	143		

J The analyte was positively identified, but the quantitation was below the RL

P Concentrations >40% difference between the two GC columns

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-09

Client ID: 59-SB-04-02QC

Matrix: Soil

Workgroup Number: WG219418

Collect Date: 08/02/2006 14:50

Sample Tag: CF01

PrePrep Method: NONE

Prep Method: 3550B

Analytical Method: 8081A

Analyst: ECL

Dilution: 1

Units: ug/kg

Instrument: HP15

Prep Date: 08/07/2006 07:30

Cal Date: 08/10/2006 20:29

Run Date: 08/11/2006 08:45

File ID: 15G6196.R

Percent Solid: 90.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.78	0.357
beta-BHC	319-85-7		U	1.78	0.357
delta-BHC	319-86-8		U	1.78	0.357
gamma-BHC (Lindane)	58-89-9		U	1.78	0.357
Heptachlor	76-44-8		U	1.78	0.357
Aldrin	309-00-2		U	1.78	0.357
Heptachlor epoxide	1024-57-3	0.526	J	1.78	0.357
Endosulfan I	959-98-8		U	1.78	0.357
Dieldrin	60-57-1		U	1.78	0.357
4,4'-DDE	72-55-9		U	1.78	0.357
Endrin	72-20-8		U	1.78	0.357
Endosulfan II	33213-65-9		U	1.78	0.357
4,4'-DDD	72-54-8		U	1.78	0.357
Endosulfan sulfate	1031-07-8		U	1.78	0.357
4,4'-DDT	50-29-3		U	1.78	0.357
Methoxychlor	72-43-5		U	1.78	0.357
Endrin ketone	53494-70-5		U	1.78	0.357
Endrin aldehyde	7421-93-4		U	1.78	0.357
alpha Chlordane	5103-71-9	5.90	P	1.78	0.357
gamma Chlordane	5103-74-2	5.86		1.78	0.357
Toxaphene	8001-35-2		U	35.7	18.1

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Report Number: L0608140

00048417

Report Date : August 15, 2006

Sample Number: L0608140-09
 Client ID: 59-SB-04-02QC
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/02/2006 14:50
 Sample Tag: CP01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 08:45
 File ID: 15G6196.R
 Percent Solid: 90.1

Surrogate	% Recovery	Lower	Upper	Qual
2,4,5,6-Tetrachloro-m-xylene	60.9	39	130	
Decachlorobiphenyl	78.2	33	143	

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-09
 Client ID: 59-SB-04-02QC
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/02/2006 14:50
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 04:14
 File ID: 15G6143.F
 Percent Solid: 90.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	44.1	22.1
2,4-DE	94-82-6		U	44.1	22.1
2,4,5-T	93-76-5		U	4.41	2.21
2,4,5-TP (Silvex)	93-72-1		U	3.31	1.66
Dalapon	75-99-0		U	110	55.2
Dicamba	1918-00-9		U	4.41	2.21
Dichloroprop	120-36-5		U	44.1	22.1
Dinoseb	88-85-7		U	22.1	11.0
MCPA	94-74-6		U	4410	2210
MCPP	93-65-2		U	4410	2210
Pentachlorophenol	87-86-5		U	4.41	2.21
Surrogate	% Recovery	Lower	Upper	Qual	Qual
2,4-Dichlorophenylacetic acid	57.0	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-09
 Client ID: 59-SB-04-02QC
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/02/2006 14:50

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-19

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	90.1		1.00	1.00

DM
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KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

00048418

Report Date : August 15, 2006

Sample Number: L0608140-10
 Client ID: 59-SB-05-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:10
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 09:14
 File ID: 15G6197.R
 Percent Solid: 94.6

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.72	0.344
beta-BHC	319-85-7		U	1.72	0.344
delta-BHC	319-86-8		U	1.72	0.344
gamma-BHC (Lindane)	58-89-9		U	1.72	0.344
Heptachlor	76-44-8		U	1.72	0.344
Aldrin	309-00-2		U	1.72	0.344
Heptachlor epoxide	1024-57-3		U	1.72	0.344
Endosulfan I	959-98-8		U	1.72	0.344
Dieldrin	60-57-1		U	1.72	0.344
4,4'-DDE	72-55-9		U	1.72	0.344
Endrin	72-20-8		U	1.72	0.344
Endosulfan II	33213-65-9		U	1.72	0.344
4,4'-DDD	72-54-8		U	1.72	0.344
Endosulfan sulfate	1031-07-8		U	1.72	0.344
4,4'-DDT	50-29-3		U	1.72	0.344
Methoxychlor	72-43-5		U	1.72	0.344
Endrin ketone	53494-70-5		U	1.72	0.344
Endrin aldehyde	7421-93-4		U	1.72	0.344
alpha Chlordane	5103-71-9	4.53	P	1.72	0.344
gamma Chlordane	5103-74-2	4.62		1.72	0.344
Toxaphene	8001-35-2		U	34.4	17.4
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	59.6	39	130		
Decachlorobiphenyl	87.4	33	143		

P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

R16

J18

R16

↓

Sample Number: L0608140-10
 Client ID: 59-SB-05-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:10
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 08:45
 File ID: 15G6197.F
 Percent Solid: 94.6

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.72	0.344
beta-BHC	319-85-7		U	1.72	0.344
delta-BHC	319-86-8		U	1.72	0.344
gamma-BHC (Lindane)	58-89-9		U	1.72	0.344
Heptachlor	76-44-8		U	1.72	0.344
Aldrin	309-00-2		U	1.72	0.344
Heptachlor epoxide	1024-57-3		U	1.72	0.344
Endosulfan I	959-98-8		U	1.72	0.344
Dieldrin	60-57-1		U	1.72	0.344
4,4'-DDE	72-55-9		U	1.72	0.344
Endrin	72-20-8		U	1.72	0.344
Endosulfan II	33213-65-9		U	1.72	0.344
4,4'-DDD	72-54-8		U	1.72	0.344

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KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

00048419

Report Date : August 15, 2006

Sample Number: L0608140-10
 Client ID: 59-SB-05-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:10
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 08:45
 File ID: 15G6197.F
 Percent Solid: 94.6

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan sulfate	1031-07-8		U	1.72	0.344
4,4'-DDT	50-29-3		U	1.72	0.344
Methoxychlor	72-43-5		U	1.72	0.344
Endrin ketone	53494-70-5		U	1.72	0.344
Endrin aldehyde	7421-93-4		U	1.72	0.344
alpha Chlordane	5103-71-9	12.9	P	1.72	0.344
gamma Chlordane	5103-74-2	5.47		1.72	0.344
Toxaphene	8001-35-2		U	34.4	17.4
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	73.1	39	130		
Decachlorobiphenyl	86.7	33	143		

P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

RIG

Sample Number: L0608140-10
 Client ID: 59-SB-05-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 08:10
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 04:41
 File ID: 15G6144.F
 Percent Solid: 94.6

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	41.8	20.9
2,4-DB	94-82-6		U	41.8	20.9
2,4,5-T	93-76-5		U	4.18	2.09
2,4,5-TP (Silvex)	93-72-1		U	3.13	1.57
Dalapon	75-99-0		U	104	52.2
Dicamba	1918-00-9		U	4.18	2.09
Dichloroprop	120-36-5		U	41.8	20.9
Dinoseb	88-85-7		U	20.9	10.4
MCPA	94-74-6		U	4180	2090
MCPP	93-65-2		U	4180	2090
Pentachlorophenol	87-86-5	2.77	J	4.18	2.09
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	45.3	25	110		

J The analyte was positively identified, but the quantitation was below the RL
 U Not detected at or above adjusted sample detection limit

DM
8/23/06

Report Number: L0608140

00048420

Report Date : August 15, 2006

Sample Number: L0608140-10
 Client ID: 59-SB-05-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 08:10
 Sample Tag: CFI

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg
 Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 05:08
 File ID: 15G6144.R
 Percent Solid: 94.6

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	41.8	20.9
2,4-DB	94-82-6		U	41.8	20.9
2,4,5-T	93-76-5		U	4.18	2.09
2,4,5-TP (Silvex)	93-72-1		U	3.13	1.57
Dalapon	75-99-0		U	104	52.2
Dicamba	1918-00-9		U	4.18	2.09
Dichloroprop	120-36-5		U	41.8	20.9
Dinoseb	88-85-7		U	20.9	10.4
MCPA	94-74-6		U	4180	2090
MCPP	93-65-2		U	4180	2090
Pentachlorophenol	87-86-5	2.36	J	4.18	2.09
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	47.9	25	110		

J15

J The analyte was positively identified, but the quantitation was below the RL
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-10
 Client ID: 59-SB-05-01
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/03/2006 08:10

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %
 Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-20

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	94.6		1.00	1.00

Sample Number: L0608140-11
 Client ID: 59-SB-05-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:20
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg
 Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 09:14
 File ID: 15G6198.F
 Percent Solid: 90.8

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.78	0.357
beta-BHC	319-85-7		U	1.78	0.357
delta-BHC	319-86-8		U	1.78	0.357
gamma-BHC (Lindane)	58-89-9		U	1.78	0.357
Heptachlor	76-44-8		U	1.78	0.357
Aldrin	309-00-2		U	1.78	0.357
Heptachlor epoxide	1024-57-3	1.56	J	1.78	0.357
Endosulfan I	959-98-8		U	1.78	0.357
Dieldrin	60-57-1		U	1.78	0.357
4,4'-DDE	72-55-9		U	1.78	0.357

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RM
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Report Number: L0608140

00048421

Report Date : August 15, 2006

Sample Number: L0608140-11
 Client ID: 59-SB-05-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:20
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 09:14
 File ID: 15G6198.F
 Percent Solid: 90.8

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endrin	72-20-8		U	1.78	0.357
Endosulfan II	33213-65-9		U	1.78	0.357
4,4'-DDD	72-54-8		U	1.78	0.357
Endosulfan sulfate	1031-07-8		U	1.78	0.357
4,4'-DDT	50-29-3		U	1.78	0.357
Methoxychlor	72-43-5		U	1.78	0.357
Endrin ketone	53494-70-5		U	1.78	0.357
Endrin aldehyde	7421-93-4		U	1.78	0.357
alpha Chlordane	5103-71-9	19.4	P	1.78	0.357
gamma Chlordane	5103-74-2	8.47		1.78	0.357
Toxaphene	8001-35-2		U	35.7	18.1
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	83.1	39	130		
Decachlorobiphenyl	91.9	33	143		

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-11
 Client ID: 59-SB-05-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:20
 Sample Tag: CP01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 09:42
 File ID: 15G6198.R
 Percent Solid: 90.8

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.78	0.357
beta-BHC	319-85-7		U	1.78	0.357
delta-BHC	319-86-8		U	1.78	0.357
gamma-BHC (Lindane)	58-89-9		U	1.78	0.357
Heptachlor	76-44-8		U	1.78	0.357
Aldrin	309-00-2		U	1.78	0.357
Heptachlor epoxide	1024-57-3	0.598	J	1.78	0.357
Endosulfan I	959-98-8		U	1.78	0.357
Dieldrin	60-57-1		U	1.78	0.357
4,4'-DDE	72-55-9		U	1.78	0.357
Endrin	72-20-8		U	1.78	0.357
Endosulfan II	33213-65-9		U	1.78	0.357
4,4'-DDD	72-54-8		U	1.78	0.357
Endosulfan sulfate	1031-07-8		U	1.78	0.357
4,4'-DDT	50-29-3		U	1.78	0.357
Methoxychlor	72-43-5		U	1.78	0.357
Endrin ketone	53494-70-5		U	1.78	0.357
Endrin aldehyde	7421-93-4		U	1.78	0.357
alpha Chlordane	5103-71-9	6.36	P	1.78	0.357
gamma Chlordane	5103-74-2	6.01		1.78	0.357
Toxaphene	8001-35-2		U	35.7	18.1

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DM
8/23/06

Report Number: L0608140

00048422

Report Date : August 15, 2006

Sample Number: L0608140-11
 Client ID: 59-SB-05-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:20
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 09:42
 File ID: 15G6198.R
 Percent Solid: 90.8

Surrogate	% Recovery	Lower	Upper	Qual
2,4,5,6-Tetrachloro-m-xylene	72.8	39	130	
Decachlorobiphenyl	91.2	33	143	

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-11
 Client ID: 59-SB-05-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 08:20
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 05:08
 File ID: 15G6145.F
 Percent Solid: 90.8

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	43.9	21.9
2,4-DB	94-82-6		U	43.9	21.9
2,4,5-T	93-76-5		U	4.39	2.19
2,4,5-TP (Silvex)	93-72-1		U	3.29	1.65
Dalapon	75-99-0		U	110	54.8
Dicamba	1918-00-9		U	4.39	2.19
Dichloroprop	120-36-5		U	43.9	21.9
Dinoseb	88-85-7		U	21.9	11.0
MCPA	94-74-6		U	4390	2190
MCPB	93-65-2		U	4390	2190
Pentachlorophenol	87-86-5		U	4.39	2.19
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	50.4	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-11
 Client ID: 59-SB-05-02
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/03/2006 08:20

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-21

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	90.8		1.00	1.00

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Report Number: L0608140

00048423

Report Date : August 15, 2006

Sample Number: L0608140-12
 Client ID: 59-SB-08-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:35
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 09:42
 File ID: 15G6199.F
 Percent Solid: 86.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.86	0.372
beta-BHC	319-85-7		U	1.86	0.372
delta-BHC	319-86-8		U	1.86	0.372
gamma-BHC (Lindane)	58-89-9		U	1.86	0.372
Heptachlor	76-44-8		U	1.86	0.372
Aldrin	309-00-2		U	1.86	0.372
Heptachlor epoxide	1024-57-3		U	1.86	0.372
Endosulfan I	959-98-8		U	1.86	0.372
Dieldrin	60-57-1		U	1.86	0.372
4,4'-DDE	72-55-9		U	1.86	0.372
Endrin	72-20-8		U	1.86	0.372
Endosulfan II	33213-65-9		U	1.86	0.372
4,4'-DDD	72-54-8		U	1.86	0.372
Endosulfan sulfate	1031-07-8		U	1.86	0.372
4,4'-DDT	50-29-3		U	1.86	0.372
Methoxychlor	72-43-5		U	1.86	0.372
Endrin ketone	53494-70-5		U	1.86	0.372
Endrin aldehyde	7421-93-4		U	1.86	0.372
alpha Chlordane	5103-71-9		U	1.86	0.372
gamma Chlordane	5103-74-2		U	1.86	0.372
Toxaphene	8001-35-2		U	37.2	18.8
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	86.6	39	130		
Decachlorobiphenyl	97.7	33	143		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-12
 Client ID: 59-SB-08-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 08:35
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 05:34
 File ID: 15G6146.F
 Percent Solid: 86.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	45.4	22.7
2,4-DB	94-82-6		U	45.4	22.7
2,4,5-T	93-76-5		U	4.54	2.27
2,4,5-TP (Silvex)	93-72-1		U	3.40	1.70
Dalapon	75-99-0		U	113	56.7
Dicamba	1918-00-9		U	4.54	2.27
Dichloroprop	120-36-5		U	45.4	22.7
Dinoseb	88-85-7		U	22.7	11.3
MCPA	94-74-6		U	4540	2270
MCPP	93-65-2	5300	P	4540	2270
Pentachlorophenol	87-86-5		U	4.54	2.27
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	91.6	25	110		

P Concentrations >40% difference between the two GC columns

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Report Number: L0608140

00048424

Report Date : August 15, 2006

Sample Number: L0608140-12
 Client ID: 59-SB-08-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 08:35
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 05:34
 File ID: 15G6146.F
 Percent Solid: 86.5

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-12
 Client ID: 59-SB-08-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 08:35
 Sample Tag: CF1

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 06:01
 File ID: 15G6146.R
 Percent Solid: 86.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	45.4	22.7
2,4-DB	94-82-6		U	45.4	22.7
2,4,5-T	93-76-5		U	4.54	2.27
2,4,5-TP (Silvex)	93-72-1		U	3.40	1.70
Dalapon	75-99-0		U	113	56.7
Dicamba	1918-00-9		U	4.54	2.27
Dichloroprop	120-36-5		U	45.4	22.7
Dinoseb	88-85-7		U	22.7	11.3
MCPA	94-74-6		U	4540	2270
MCPB	93-65-2	4440	J	4540	2270
Pentachlorophenol	87-86-5		U	4.54	2.27
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	50.0	25	110		

RL
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J The analyte was positively identified, but the quantitation was below the RL
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-12
 Client ID: 59-SB-08-01
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/03/2006 08:35

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-22

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	86.5		1.00	1.00

BM
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KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

00048425

Report Date : August 15, 2006

Sample Number: L0608140-13
 Client ID: 59-SB-07-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:05
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 10:11
 File ID: 15G6200.F
 Percent Solid: 89.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.82	0.364
beta-BHC	319-85-7		U	1.82	0.364
delta-BHC	319-86-8		U	1.82	0.364
gamma-BHC (Lindane)	58-89-9		U	1.82	0.364
Heptachlor	76-44-8		U	1.82	0.364
Aldrin	309-00-2		U	1.82	0.364
Heptachlor epoxide	1024-57-3	0.397	J	1.82	0.364
Endosulfan I	959-98-8		U	1.82	0.364
Dieldrin	60-57-1		U	1.82	0.364
4,4'-DDE	72-55-9	1.48	J	1.82	0.364
Endrin	72-20-8		U	1.82	0.364
Endosulfan II	33213-65-9		U	1.82	0.364
4,4'-DDD	72-54-8		U	1.82	0.364
Endosulfan sulfate	1031-07-8		U	1.82	0.364
4,4'-DDT	50-29-3		U	1.82	0.364
Methoxychlor	72-43-5		U	1.82	0.364
Endrin ketone	53494-70-5		U	1.82	0.364
Endrin aldehyde	7421-93-4		U	1.82	0.364
alpha Chlordane	5103-71-9	11.4	P	1.82	0.364
gamma Chlordane	5103-74-2	1.93		1.82	0.364
Toxaphene	8001-35-2		U	36.4	18.4
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	86.5	39	130		
Decachlorobiphenyl	105	33	143		

J15

J15

R16

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-13
 Client ID: 59-SB-07-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:05
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 10:40
 File ID: 15G6200.R
 Percent Solid: 89.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.82	0.364
beta-BHC	319-85-7		U	1.82	0.364
delta-BHC	319-86-8		U	1.82	0.364
gamma-BHC (Lindane)	58-89-9		U	1.82	0.364
Heptachlor	76-44-8		U	1.82	0.364
Aldrin	309-00-2		U	1.82	0.364
Heptachlor epoxide	1024-57-3	0.832	J	1.82	0.364
Endosulfan I	959-98-8		U	1.82	0.364
Dieldrin	60-57-1		U	1.82	0.364
4,4'-DDE	72-55-9	0.570	J	1.82	0.364
Endrin	72-20-8		U	1.82	0.364
Endosulfan II	33213-65-9		U	1.82	0.364
4,4'-DDD	72-54-8		U	1.82	0.364

R16

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DM
8/15/06

Report Number: L0608140

00048426

Report Date : August 15, 2006

Sample Number: L0608140-13
 Client ID: 59-SB-07-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:05
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 10:40
 File ID: 1506200.R
 Percent Solid: 89.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan sulfate	1031-07-8		U	1.82	0.364
4,4'-DDT	50-29-3		U	1.82	0.364
Methoxychlor	72-43-5		U	1.82	0.364
Endrin ketone	53494-70-5		U	1.82	0.364
Endrin aldehyde	7421-93-4		U	1.82	0.364
alpha Chlordane	5103-71-9	0.813	J	1.82	0.364
gamma Chlordane	5103-74-2	1.85		1.82	0.364
Toxaphene	8001-35-2		U	36.4	18.4
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	86.6	39	130		
Decachlorobiphenyl	111	33	143		

J The analyte was positively identified, but the quantitation was below the RL
 U Not detected at or above adjusted sample detection limit

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 RL

Sample Number: L0608140-13
 Client ID: 59-SB-07-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 09:05
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 06:01
 File ID: 1506147.F
 Percent Solid: 89.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	220	110
2,4-DB	94-82-6		U	220	110
2,4,5-T	93-76-5		U	22.0	11.0
2,4,5-TP (Silvex)	93-72-1		U	16.5	8.26
Dalapon	75-99-0		U	551	275
Dicamba	1918-00-9		U	22.0	11.0
Dichloroprop	120-36-5		U	220	110
Dinoseb	88-85-7		U	110	55.1
MCPA	94-74-6		U	22000	11000
MCP	93-65-2		U	22000	11000
Pentachlorophenol	87-86-5		U	22.0	11.0
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	80.9	25	110		

U Not detected at or above adjusted sample detection limit

DM
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KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

00048427

Report Date : August 15, 2006

Sample Number: L0608140-13
 Client ID: 59-SB-07-01
 Matrix: Soil
 Workgroup Number: WG219325
 Collect Date: 08/03/2006 09:05

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:10
 Cal Date:
 Run Date: 08/07/2006 15:10
 File ID: OV.0608071510-23

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	89.5		1.00	1.00

Sample Number: L0608140-14
 Client ID: 59-SB-08-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 08:45
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 10:40
 File ID: 15G6201.F
 Percent Solid: 82.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.95	0.389
beta-BHC	319-85-7		U	1.95	0.389
delta-BHC	319-86-8		U	1.95	0.389
gamma-BHC (Lindane)	58-89-9		U	1.95	0.389
Heptachlor	76-44-8		U	1.95	0.389
Aldrin	309-00-2		U	1.95	0.389
Heptachlor epoxide	1024-57-3		U	1.95	0.389
Endosulfan I	959-98-8		U	1.95	0.389
Dieldrin	60-57-1		U	1.95	0.389
4,4'-DDE	72-55-9		U	1.95	0.389
Endrin	72-20-8		U	1.95	0.389
Endosulfan II	33213-65-9		U	1.95	0.389
4,4'-DDD	72-54-8		U	1.95	0.389
Endosulfan sulfate	1031-07-8		U	1.95	0.389
4,4'-DDT	50-29-3		U	1.95	0.389
Methoxychlor	72-43-5		U	1.95	0.389
Endrin ketone	53494-70-5		U	1.95	0.389
Endrin aldehyde	7421-93-4		U	1.95	0.389
alpha Chlordane	5103-71-9		U	1.95	0.389
gamma Chlordane	5103-74-2		U	1.95	0.389
Toxaphene	8001-35-2		U	38.9	19.7
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	85.5	39	130		
Decachlorobiphenyl	96.1	33	143		

U Not detected at or above adjusted sample detection limit

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Report Number: L0608140

00048428

Report Date : August 15, 2006

Sample Number: L0608140-14
 Client ID: 59-SB-08-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 08:45
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 06:27
 File ID: 15G6148.F
 Percent Solid: 82.5

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	47.9	24.0
2,4-DB	94-82-6		U	47.9	24.0
2,4,5-T	93-76-5		U	4.79	2.40
2,4,5-TP (Silvex)	93-72-1		U	3.60	1.80
Dalapon	75-99-0		U	120	59.9
Dicamba	1918-00-9		U	4.79	2.40
Dichloroprop	120-36-5		U	47.9	24.0
Dinoseb	88-85-7		U	24.0	12.0
MCPA	94-74-6		U	4790	2400
MCP	93-65-2		U	4790	2400
Pentachlorophenol	87-86-5		U	4.79	2.40
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	42.9	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-14
 Client ID: 59-SB-08-02
 Matrix: Soil
 Workgroup Number: WG219326
 Collect Date: 08/03/2006 08:45

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:30
 Cal Date:
 Run Date: 08/07/2006 15:30
 File ID: OV_0608071530-01

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	82.5		1.00	1.00

Sample Number: L0608140-15
 Client ID: 59-SB-07-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:20
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 11:08
 File ID: 15G6202.F
 Percent Solid: 86.3

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.89	0.378
beta-BHC	319-85-7		U	1.89	0.378
delta-BHC	319-86-8		U	1.89	0.378
gamma-BHC (Lindane)	58-89-9		U	1.89	0.378
Heptachlor	76-44-8		U	1.89	0.378
Aldrin	309-00-2		U	1.89	0.378
Heptachlor epoxide	1024-57-3		U	1.89	0.378
Endosulfan I	959-98-8		U	1.89	0.378
Dieldrin	60-57-1		U	1.89	0.378
4,4'-DDE	72-55-9		U	1.89	0.378
Endrin	72-20-8		U	1.89	0.378

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Report Number: L0608140

00048429

Report Date : August 15, 2006

Sample Number: L0608140-15
 Client ID: 59-SB-07-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:20
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 11:08
 File ID: 15G6202.F
 Percent Solid: 86.3

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan II	33213-65-9		U	1.89	0.378
4,4'-DDD	72-54-8		U	1.89	0.378
Endosulfan sulfate	1031-07-8		U	1.89	0.378
4,4'-DDT	50-29-3		U	1.89	0.378
Methoxychlor	72-43-5		U	1.89	0.378
Endrin ketone	53494-70-5		U	1.89	0.378
Endrin aldehyde	7421-93-4		U	1.89	0.378
alpha Chlordane	5103-71-9		U	1.89	0.378
gamma Chlordane	5103-74-2		U	1.89	0.378
Toxaphene	8001-35-2		U	37.8	19.1
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	82.5	39	130		
Decachlorobiphenyl	92.6	33	143		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-15
 Client ID: 59-SB-07-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 09:20
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 07:21
 File ID: 15G6150.F
 Percent Solid: 86.3

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	46.2	23.1
2,4-DB	94-82-6		U	46.2	23.1
2,4,5-T	93-76-5		U	4.62	2.31
2,4,5-TP (Silvex)	93-72-1		U	3.47	1.73
Dalapon	75-99-0		U	116	57.8
Dicamba	1918-00-9		U	4.62	2.31
Dichloroprop	120-36-5		U	46.2	23.1
Dinoseb	88-85-7		U	23.1	11.6
MCPA	94-74-6		U	4620	2310
MCPP	93-65-2		U	4620	2310
Pentachlorophenol	87-86-5		U	4.62	2.31
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	58.6	25	110		

U Not detected at or above adjusted sample detection limit

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8/23/06

KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

Report Date : August 15, 2006

00048430

Sample Number: L0608140-15
 Client ID: 59-SB-07-02
 Matrix: Soil
 Workgroup Number: WG219326
 Collect Date: 08/03/2006 09:20

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:30
 Cal Date:
 Run Date: 08/07/2006 15:30
 File ID: OV.0608071530-02

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	86.3		1.00	1.00

Sample Number: L0608140-16
 Client ID: 59-SB-06-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:55
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 12:05
 File ID: 1506203.R
 Percent Solid: 91.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.79	0.358
beta-BHC	319-85-7		U	1.79	0.358
delta-BHC	319-86-8		U	1.79	0.358
gamma-BHC (Lindane)	58-89-9		U	1.79	0.358
Heptachlor	76-44-8	1.69	J	1.79	0.358
Aldrin	309-00-2		U	1.79	0.358
Heptachlor epoxide	1024-57-3	2.40	P	1.79	0.358
Endosulfan I	959-98-8		U	1.79	0.358
Dieldrin	60-57-1		U	1.79	0.358
4,4'-DDE	72-55-9		U	1.79	0.358
Endrin	72-20-8		U	1.79	0.358
Endosulfan II	33213-65-9		U	1.79	0.358
4,4'-DDD	72-54-8		U	1.79	0.358
Endosulfan sulfate	1031-07-8		U	1.79	0.358
4,4'-DDT	50-29-3		U	1.79	0.358
Methoxychlor	72-43-5		U	1.79	0.358
Endrin ketone	53494-70-5		U	1.79	0.358
Endrin aldehyde	7421-93-4		U	1.79	0.358
alpha Chlordane	5103-71-9	49.2	P	1.79	0.358
gamma Chlordane	5103-74-2	53.1		1.79	0.358
Toxaphene	8001-35-2		U	35.8	18.1
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	82.8	39	130		
Decachlorobiphenyl	125	33	143		

R16

J18
R16
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J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608140

00048431

Report Date : August 15, 2006

Sample Number: L0608140-16
 Client ID: 59-SB-06-01
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:55
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 11:36
 File ID: 15G6203.F
 Percent Solid: 91.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.79	0.358
beta-BHC	319-85-7		U	1.79	0.358
delta-BHC	319-86-8		U	1.79	0.358
gamma-BHC (Lindane)	58-89-9		U	1.79	0.358
Heptachlor	76-44-8	1.60	J	1.79	0.358
Aldrin	309-00-2		U	1.79	0.358
Heptachlor epoxide	1024-57-3	9.58	P	1.79	0.358
Endosulfan I	959-98-8		U	1.79	0.358
Dieldrin	60-57-1		U	1.79	0.358
4,4'-DDE	72-55-9		U	1.79	0.358
Endrin	72-20-8		U	1.79	0.358
Endosulfan II	33213-65-9		U	1.79	0.358
4,4'-DDD	72-54-8		U	1.79	0.358
Endosulfan sulfate	1031-07-8		U	1.79	0.358
4,4'-DDT	50-29-3		U	1.79	0.358
Methoxychlor	72-43-5		U	1.79	0.358
Endrin ketone	53494-70-5		U	1.79	0.358
Endrin aldehyde	7421-93-4		U	1.79	0.358
alpha Chlordane	5103-71-9	121	I	1.79	0.358
gamma Chlordane	5103-74-2	58.5		1.79	0.358
Toxaphene	8001-35-2		U	35.8	18.1
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	85.9	39	130		
Decachlorobiphenyl	96.7	33	143		

J15

R16

I Semiquantitative result (out of instrument calibration range)
 J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-16
 Client ID: 59-SB-06-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 09:55
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 07:47
 File ID: 15G6151.F
 Percent Solid: 91.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	218	109
2,4-DB	94-82-6		U	218	109
2,4,5-T	93-76-5		U	21.8	10.9
2,4,5-TP (Silvex)	93-72-1		U	16.4	8.19
Dalapon	75-99-0		U	546	273
Dicamba	1918-00-9		U	21.8	10.9
Dichloroprop	120-36-5		U	218	109
Dinoseb	88-85-7		U	109	54.6
MCPA	94-74-6		U	21800	10900
MCPP	93-65-2		U	21800	10900
Pentachlorophenol	87-86-5		U	21.8	10.9

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DM
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Report Number: L0608140

00048432

Report Date : August 15, 2006

Sample Number: L0608140-16
 Client ID: 59-SB-06-01
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 09:55
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 07:47
 File ID: 15G6151.F
 Percent Solid: 91.1

Surrogate	% Recovery	Lower	Upper	Qual
2,4-Dichlorophenylacetic acid	60.5	25	110	

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-16
 Client ID: 59-SB-06-01
 Matrix: Soil
 Workgroup Number: WG219326
 Collect Date: 08/03/2006 09:55

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:30
 Cal Date:
 Run Date: 08/07/2006 15:30
 File ID: OV.0608071530-03

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	91.1		1.00	1.00

Sample Number: L0608140-17
 Client ID: 59-SB-06-01QC
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:55
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 12:05
 File ID: 15G6204.F
 Percent Solid: 91.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.80	0.360
beta-BHC	319-85-7		U	1.80	0.360
delta-BHC	319-86-8		U	1.80	0.360
gamma-BHC (Lindane)	58-89-9		U	1.80	0.360
Heptachlor	76-44-8	1.39	J	1.80	0.360
Aldrin	309-00-2		U	1.80	0.360
Heptachlor epoxide	1024-57-3	8.83	P	1.80	0.360
Endosulfan I	959-98-8		U	1.80	0.360
Dieldrin	60-57-1		U	1.80	0.360
4,4'-DDE	72-55-9		U	1.80	0.360
Endrin	72-20-8		U	1.80	0.360
Endosulfan II	33213-65-9		U	1.80	0.360
4,4'-DDD	72-54-8		U	1.80	0.360
Endosulfan sulfate	1031-07-8		U	1.80	0.360
4,4'-DDT	50-29-3		U	1.80	0.360
Methoxychlor	72-43-5		U	1.80	0.360
Endrin ketone	53494-70-5		U	1.80	0.360
Endrin aldehyde	7421-93-4		U	1.80	0.360
alpha Chlordane	5103-71-9	119	I	1.80	0.360
gamma Chlordane	5103-74-2	58.0		1.80	0.360
Toxaphene	8001-35-2		U	36.0	18.2

J15

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Report Number: L0608140

00048433

Report Date : August 15, 2006

Sample Number: L0608140-17
 Client ID: 59-SB-06-01QC
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:55
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 12:05
 File ID: 15G6204.F
 Percent Solid: 91.1

Surrogate	% Recovery	Lower	Upper	Qual
2,4,5,6-Tetrachloro-m-xylene	83.7	39	130	
Decachlorobiphenyl	98.1	33	143	

I Semiquantitative result (out of instrument calibration range)
 J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-17
 Client ID: 59-SB-06-01QC
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 09:55
 Sample Tag: CP01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 12:33
 File ID: 15G6204.R
 Percent Solid: 91.1

Analyte	CAS. Number	Result	Qual	PQL	SOL
alpha-BHC	319-84-6		U	1.80	0.360
beta-BHC	319-85-7		U	1.80	0.360
delta-BHC	319-86-8		U	1.80	0.360
gamma-BHC (Lindane)	58-89-9		U	1.80	0.360
Heptachlor	76-44-8	1.12	J	1.80	0.360
Aldrin	309-00-2		U	1.80	0.360
Heptachlor epoxide	1024-57-3	2.26	P	1.80	0.360
Endosulfan I	959-98-8		U	1.80	0.360
Dieldrin	60-57-1		U	1.80	0.360
4,4'-DDE	72-55-9		U	1.80	0.360
Endrin	72-20-8		U	1.80	0.360
Endosulfan II	33213-65-9		U	1.80	0.360
4,4'-DDD	72-54-8		U	1.80	0.360
Endosulfan sulfate	1031-07-8		U	1.80	0.360
4,4'-DDT	50-29-3		U	1.80	0.360
Methoxychlor	72-43-5		U	1.80	0.360
Endrin ketone	53494-70-5		U	1.80	0.360
Endrin aldehyde	7421-93-4		U	1.80	0.360
alpha Chlordane	5103-71-9	47.9	P	1.80	0.360
gamma Chlordane	5103-74-2	52.4		1.80	0.360
Toxaphene	8001-35-2		U	36.0	18.2
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	75.5	39	130		
Decachlorobiphenyl	112	33	143		

R16

J18
R16

J The analyte was positively identified, but the quantitation was below the RL
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

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Report Number: L0608140

00048434

Report Date : August 15, 2006

Sample Number: L0608140-17
 Client ID: 59-SB-06-01QC
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 09:55
 Sample Tag: DL01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 5
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 08:14
 File ID: 15G6152.F
 Percent Solid: 91.1

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	216	108
2,4-DB	94-82-6		U	216	108
2,4,5-T	93-76-5		U	21.6	10.8
2,4,5-TP (Silvex)	93-72-1		U	16.2	8.10
Dalapon	75-99-0		U	540	270
Dicamba	1918-00-9		U	21.6	10.8
Dichloroprop	120-36-5		U	216	108
Dinoseb	88-85-7		U	108	54.0
MCPA	94-74-6		U	21600	10800
MCPP	93-65-2		U	21600	10800
Pentachlorophenol	87-86-5		U	21.6	10.8
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	74.7	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-17
 Client ID: 59-SB-06-01QC
 Matrix: Soil
 Workgroup Number: WG219326
 Collect Date: 08/03/2006 09:55

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:30
 Cal Date:
 Run Date: 08/07/2006 15:30
 File ID: OV_0608071530-04

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	91.1		1.00	1.00

Sample Number: L0608140-18
 Client ID: 59-SB-06-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 10:10
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 13:01
 File ID: 15G6205.R
 Percent Solid: 92.2

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.74	0.349
beta-BHC	319-85-7		U	1.74	0.349
delta-BHC	319-86-8		U	1.74	0.349
gamma-BHC (Lindane)	58-89-9		U	1.74	0.349
Heptachlor	76-44-8	1.81		1.74	0.349
Aldrin	309-00-2		U	1.74	0.349
Heptachlor epoxide	1024-57-3	5.58	P	1.74	0.349
Endosulfan I	959-98-8		U	1.74	0.349
Dieldrin	60-57-1		U	1.74	0.349
4,4'-DDE	72-55-9		U	1.74	0.349
Endrin	72-20-8		U	1.74	0.349

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Report Number: L0608140

Report Date : August 15, 2006

Sample Number: L0608140-18
 Client ID: 59-SB-06-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 10:10
 Sample Tag: CF01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 13:01
 File ID: 15G6205.R
 Percent Solid: 92.2

Analyte	CAS. Number	Result	Qual	PQL	SQL
Endosulfan II	33213-65-9		U	1.74	0.349
4,4'-DDD	72-54-8		U	1.74	0.349
Endosulfan sulfate	1031-07-8		U	1.74	0.349
4,4'-DDT	50-29-3		U	1.74	0.349
Methoxychlor	72-43-5		U	1.74	0.349
Endrin ketone	53494-70-5		U	1.74	0.349
Endrin aldehyde	7421-93-4		U	1.74	0.349
alpha Chlordane	5103-71-9	29.5	P	1.74	0.349
gamma Chlordane	5103-74-2	37.9		1.74	0.349
Toxaphene	8001-35-2		U	34.9	17.7
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	74.4	39	130		
Decachlorobiphenyl	89.2	33	143		

P Concentrations >40% difference between the two GC columns

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-18
 Client ID: 59-SB-06-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 10:10
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 12:33
 File ID: 15G6205.F
 Percent Solid: 92.2

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha-BHC	319-84-6		U	1.74	0.349
beta-BHC	319-85-7		U	1.74	0.349
delta-BHC	319-86-8		U	1.74	0.349
gamma-BHC (Lindane)	58-89-9		U	1.74	0.349
Heptachlor	76-44-8	1.76		1.74	0.349
Aldrin	309-00-2		U	1.74	0.349
Heptachlor epoxide	1024-57-3	9.51	P	1.74	0.349
Endosulfan I	959-98-8		U	1.74	0.349
Dieldrin	60-57-1		U	1.74	0.349
4,4'-DDE	72-55-9		U	1.74	0.349
Endrin	72-20-8		U	1.74	0.349
Endosulfan II	33213-65-9		U	1.74	0.349
4,4'-DDD	72-54-8		U	1.74	0.349
Endosulfan sulfate	1031-07-8		U	1.74	0.349
4,4'-DDT	50-29-3		U	1.74	0.349
Methoxychlor	72-43-5		U	1.74	0.349
Endrin ketone	53494-70-5		U	1.74	0.349
Endrin aldehyde	7421-93-4		U	1.74	0.349
alpha Chlordane	5103-71-9	80.9	I	1.74	0.349
gamma Chlordane	5103-74-2	42.7		1.74	0.349
Toxaphene	8001-35-2		U	34.9	17.7

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Report Number: L0608140

00048436

Report Date : August 15, 2006

Sample Number: L0608140-18
 Client ID: 59-SB-06-02
 Matrix: Soil
 Workgroup Number: WG219418
 Collect Date: 08/03/2006 10:10
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: 3550B
 Analytical Method: 8081A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/10/2006 20:29
 Run Date: 08/11/2006 12:33
 File ID: 15G6205.F
 Percent Solid: 92.2

Surrogate	% Recovery	Lower	Upper	Qual
2,4,5,6-Tetrachloro-m-xylene	80.2	39	130	
Decachlorobiphenyl	94.7	33	143	

I Semiquantitative result (out of instrument calibration range)
 P Concentrations >40% difference between the two GC columns
 U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-18
 Client ID: 59-SB-06-02
 Matrix: Soil
 Workgroup Number: WG219442
 Collect Date: 08/03/2006 10:10
 Sample Tag: 01

PrePrep Method: NONE
 Prep Method: METHOD
 Analytical Method: 8151A
 Analyst: ECL
 Dilution: 1
 Units: ug/kg

Instrument: HP15
 Prep Date: 08/07/2006 07:30
 Cal Date: 08/04/2006 13:51
 Run Date: 08/09/2006 08:41
 File ID: 15G6153.F
 Percent Solid: 92.2

Analyte	CAS. Number	Result	Qual	PQL	SQL
2,4-D	94-75-7		U	42.7	21.3
2,4-DB	94-82-6		U	42.7	21.3
2,4,5-T	93-76-5		U	4.27	2.13
2,4,5-TP (Silvex)	93-72-1		U	3.20	1.60
Dalapon	75-99-0		U	107	53.4
Dicamba	1918-00-9		U	4.27	2.13
Dichloroprop	120-36-5		U	42.7	21.3
Dinoseb	88-85-7		U	21.3	10.7
MCPA	94-74-6		U	4270	2130
MCPB	93-65-2		U	4270	2130
Pentachlorophenol	87-86-5		U	4.27	2.13
Surrogate	% Recovery	Lower	Upper	Qual	
2,4-Dichlorophenylacetic acid	70.0	25	110		

U Not detected at or above adjusted sample detection limit

Sample Number: L0608140-18
 Client ID: 59-SB-06-02
 Matrix: Soil
 Workgroup Number: WG219326
 Collect Date: 08/03/2006 10:10

PrePrep Method: NONE
 Prep Method: D2216-90
 Analytical Method: D2216-90
 Analyst: TMM
 Dilution: 1
 Units: weight %

Instrument: OVEN
 Prep Date: 08/07/2006 15:30
 Cal Date:
 Run Date: 08/07/2006 15:30
 File ID: OV.0608071530-05

Analyte	CAS. Number	Result	Qual	PQL	SQL
Percent Solids	10-02-6	92.2		1.00	1.00

DM
8/23/06

WORKGROUP SUMMARY BY METHOD

WORKGROUP SUMMARY BY METHOD

Analysis:Pesticides

Extraction Method:3550B

Workgroup:WG219235

Lab ID	Client ID	Telp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0608140-01	59-SB-01-01		08/07/06 07:30			SONICATION	CPD
L0608140-02	59-SB-01-02		08/07/06 07:30			SONICATION	CPD
L0608140-03	59-SB-02-01		08/07/06 07:30			SONICATION	CPD
L0608140-04	59-SB-02-02		08/07/06 07:30			SONICATION	CPD
L0608140-05	59-SB-03-01		08/07/06 07:30			SONICATION	CPD
L0608140-06	59-SB-03-02		08/07/06 07:30			SONICATION	CPD
L0608140-07	59-SB-04-01		08/07/06 07:30			SONICATION	CPD
L0608140-08	59-SB-04-02		08/07/06 07:30			SONICATION	CPD
L0608140-09	59-SB-04-02QC		08/07/06 07:30			SONICATION	CPD
L0608140-10	59-SB-05-01		08/07/06 07:30			SONICATION	CPD
L0608140-11	59-SB-05-02		08/07/06 07:30			SONICATION	CPD
L0608140-12	59-SB-08-01		08/07/06 07:30			SONICATION	CPD
L0608140-13	59-SB-07-01		08/07/06 07:30			SONICATION	CPD
L0608140-14	59-SB-08-02		08/07/06 07:30			SONICATION	CPD
L0608140-15	59-SB-07-02		08/07/06 07:30			SONICATION	CPD
L0608140-16	59-SB-06-01		08/07/06 07:30			SONICATION	CPD
L0608140-17	59-SB-06-01QC		08/07/06 07:30			SONICATION	CPD
L0608140-18	59-SB-06-02		08/07/06 07:30			SONICATION	CPD

Analysis:Herbicides

Extraction Method:METHOD

Workgroup:WG219236

Lab ID	Client ID	Telp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0608140-01	59-SB-01-01		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-02	59-SB-01-02		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-03	59-SB-02-01		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-04	59-SB-02-02		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-05	59-SB-03-01		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-06	59-SB-03-02		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-07	59-SB-04-01		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-08	59-SB-04-02		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-09	59-SB-04-02QC		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-10	59-SB-05-01		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-11	59-SB-05-02		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-12	59-SB-08-01		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-13	59-SB-07-01		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-14	59-SB-08-02		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-15	59-SB-07-02		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-16	59-SB-06-01		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-17	59-SB-06-01QC		08/07/06 07:30			SEP-FUNNEL	CSH
L0608140-18	59-SB-06-02		08/07/06 07:30			SEP-FUNNEL	CSH

WORKGROUP SUMMARY BY METHOD

Analysis:Percent Solids

Analytical Method:D2216-90

Workgroup:WG219325

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0608140-01	59-SB-01-01			08/07/06 15:10		OVEN	TMM
L0608140-02	59-SB-01-02			08/07/06 15:10		OVEN	TMM
L0608140-03	59-SB-02-01			08/07/06 15:10		OVEN	TMM
L0608140-04	59-SB-02-02			08/07/06 15:10		OVEN	TMM
L0608140-05	59-SB-03-01			08/07/06 15:10		OVEN	TMM
L0608140-06	59-SB-03-02			08/07/06 15:10		OVEN	TMM
L0608140-07	59-SB-04-01			08/07/06 15:10		OVEN	TMM
L0608140-08	59-SB-04-02			08/07/06 15:10		OVEN	TMM
L0608140-09	59-SB-04-02QC			08/07/06 15:10		OVEN	TMM
L0608140-10	59-SB-05-01			08/07/06 15:10		OVEN	TMM
L0608140-11	59-SB-05-02			08/07/06 15:10		OVEN	TMM
L0608140-12	59-SB-08-01			08/07/06 15:10		OVEN	TMM
L0608140-13	59-SB-07-01			08/07/06 15:10		OVEN	TMM

Analysis:Percent Solids

Analytical Method:D2216-90

Workgroup:WG219326

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0608140-14	59-SB-08-02			08/07/06 15:30		OVEN	TMM
L0608140-15	59-SB-07-02			08/07/06 15:30		OVEN	TMM
L0608140-16	59-SB-06-01			08/07/06 15:30		OVEN	TMM
L0608140-17	59-SB-06-01QC			08/07/06 15:30		OVEN	TMM
L0608140-18	59-SB-06-02			08/07/06 15:30		OVEN	TMM

WORKGROUP SUMMARY BY METHOD

Analysis: Pesticides

Analytical Method: 8081A

Workgroup: WG219418

Lab ID	Client ID	Telp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0608140-01	59-SB-01-01		08/07/06 07:30	08/11/06 03:34	01	HP15	ECL
L0608140-01	59-SB-01-01		08/07/06 07:30	08/11/06 04:02	CF01	HP15	ECL
L0608140-01	59-SB-01-01		08/07/06 07:30	08/14/06 20:10	CFDL01	HP15	ECL
L0608140-01	59-SB-01-01		08/07/06 07:30	08/14/06 19:42	DL01	HP15	ECL
L0608140-02	59-SB-01-02		08/07/06 07:30	08/11/06 04:02	01	HP15	ECL
L0608140-02	59-SB-01-02		08/07/06 07:30	08/11/06 04:30	CF01	HP15	ECL
L0608140-03	59-SB-02-01		08/07/06 07:30	08/11/06 04:59	CFDL01	HP15	ECL
L0608140-03	59-SB-02-01		08/07/06 07:30	08/11/06 04:30	DL01	HP15	ECL
L0608140-04	59-SB-02-02		08/07/06 07:30	08/11/06 04:59	01	HP15	ECL
L0608140-04	59-SB-02-02		08/07/06 07:30	08/11/06 05:27	CF01	HP15	ECL
L0608140-05	59-SB-03-01		08/07/06 07:30	08/11/06 05:55	CFDL01	HP15	ECL
L0608140-05	59-SB-03-01		08/07/06 07:30	08/11/06 05:27	DL01	HP15	ECL
L0608140-06	59-SB-03-02		08/07/06 07:30	08/11/06 05:55	01	HP15	ECL
L0608140-07	59-SB-04-01		08/07/06 07:30	08/11/06 06:24	01	HP15	ECL
L0608140-07	59-SB-04-01		08/07/06 07:30	08/11/06 06:52	CF01	HP15	ECL
L0608140-08	59-SB-04-02		08/07/06 07:30	08/11/06 06:52	01	HP15	ECL
L0608140-08	59-SB-04-02		08/07/06 07:30	08/11/06 07:20	CF01	HP15	ECL
L0608140-09	59-SB-04-02QC		08/07/06 07:30	08/11/06 08:17	01	HP15	ECL
L0608140-09	59-SB-04-02QC		08/07/06 07:30	08/11/06 08:45	CF01	HP15	ECL
L0608140-10	59-SB-05-01		08/07/06 07:30	08/11/06 08:45	01	HP15	ECL
L0608140-10	59-SB-05-01		08/07/06 07:30	08/11/06 09:14	CF01	HP15	ECL
L0608140-11	59-SB-05-02		08/07/06 07:30	08/11/06 09:14	01	HP15	ECL
L0608140-11	59-SB-05-02		08/07/06 07:30	08/11/06 09:42	CF01	HP15	ECL
L0608140-12	59-SB-08-01		08/07/06 07:30	08/11/06 09:42	01	HP15	ECL
L0608140-13	59-SB-07-01		08/07/06 07:30	08/11/06 10:11	01	HP15	ECL
L0608140-13	59-SB-07-01		08/07/06 07:30	08/11/06 10:40	CF01	HP15	ECL
L0608140-14	59-SB-08-02		08/07/06 07:30	08/11/06 10:40	01	HP15	ECL
L0608140-15	59-SB-07-02		08/07/06 07:30	08/11/06 11:08	01	HP15	ECL
L0608140-16	59-SB-06-01		08/07/06 07:30	08/11/06 11:36	01	HP15	ECL
L0608140-16	59-SB-06-01		08/07/06 07:30	08/11/06 12:05	CF01	HP15	ECL
L0608140-17	59-SB-06-01QC		08/07/06 07:30	08/11/06 12:05	01	HP15	ECL
L0608140-17	59-SB-06-01QC		08/07/06 07:30	08/11/06 12:33	CF01	HP15	ECL
L0608140-18	59-SB-06-02		08/07/06 07:30	08/11/06 12:33	01	HP15	ECL
L0608140-18	59-SB-06-02		08/07/06 07:30	08/11/06 13:01	CF01	HP15	ECL

WORKGROUP SUMMARY BY METHOD

Analysis:Herbicides

Analytical Method:8151A

Workgroup:WG219442

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0608140-01	59-SB-01-01		08/07/06 07:30	08/09/06 00:15	01	HP15	ECL
L0608140-02	59-SB-01-02		08/07/06 07:30	08/09/06 00:42	01	HP15	ECL
L0608140-03	59-SB-02-01		08/07/06 07:30	08/09/06 01:08	DL01	HP15	ECL
L0608140-04	59-SB-02-02		08/07/06 07:30	08/09/06 01:34	01	HP15	ECL
L0608140-05	59-SB-03-01		08/07/06 07:30	08/09/06 02:28	DL01	HP15	ECL
L0608140-06	59-SB-03-02		08/07/06 07:30	08/09/06 02:55	01	HP15	ECL
L0608140-07	59-SB-04-01		08/07/06 07:30	08/09/06 03:22	DL01	HP15	ECL
L0608140-08	59-SB-04-02		08/07/06 07:30	08/09/06 03:48	01	HP15	ECL
L0608140-09	59-SB-04-02QC		08/07/06 07:30	08/09/06 04:14	01	HP15	ECL
L0608140-10	59-SB-05-01		08/07/06 07:30	08/09/06 04:41	01	HP15	ECL
L0608140-10	59-SB-05-01		08/07/06 07:30	08/09/06 05:08	CP1	HP15	ECL
L0608140-11	59-SB-05-02		08/07/06 07:30	08/09/06 05:08	01	HP15	ECL
L0608140-12	59-SB-08-01		08/07/06 07:30	08/09/06 05:34	01	HP15	ECL
L0608140-12	59-SB-08-01		08/07/06 07:30	08/09/06 06:01	CP1	HP15	ECL
L0608140-13	59-SB-07-01		08/07/06 07:30	08/09/06 06:01	DL01	HP15	ECL
L0608140-14	59-SB-08-02		08/07/06 07:30	08/09/06 06:27	01	HP15	ECL
L0608140-15	59-SB-07-02		08/07/06 07:30	08/09/06 07:21	01	HP15	ECL
L0608140-16	59-SB-06-01		08/07/06 07:30	08/09/06 07:47	DL01	HP15	ECL
L0608140-17	59-SB-06-01QC		08/07/06 07:30	08/09/06 08:14	DL01	HP15	ECL
L0608140-18	59-SB-06-02		08/07/06 07:30	08/09/06 08:41	01	HP15	ECL

Kemron Environmental Services
Analyst Listing
August 15, 2006

AJF - AMANDA J. FICKIESEN	ALB - ANNIE L. BOCK	ALT - ANN L. THAYER
ARA - ADRIAN R. ACHTERMANN	BRG - BRENDA R. GREGORY	CAA - CASSIE A. AUGENSTEIN
CAF - CHERYL A. FLOWERS	CAK - CHERYL A. KOELSCH	CEB - CHAD E. BARNES
CFB - CHAD F. BOOK	CLC - CHRYS L. CRAWFORD	CLS - CARA L. STRICKLER
CLW - CHARISSA L. WINTERS	CM - CHARLIE MARTIN	CMS - CRYSTAL M. STEPHENS
CPD - CHAD P. DAVIS	CRC - CARLA R. COCHRAN	CSA - LUCINDA S. ARNOLD
CSH - CHRIS S. HILL	DAS - DALLAS A. SULLIVAN	DD - DIANE M. DENNIS
DDE - DEBRA D. ELLIOTT	DEL - DON E. LIGHTFRITZ	DEV - DAVID E. VANDENBERG
DGB - DOUGLAS G. BUTCHER	DIH - DEANNA I. HESSON	DLB - DAVID L. BUMGARNER
DLP - DOROTHY L. PAYNE	DLR - DIANNA L. RAUCH	DR - DEANNA ROBERTS
DRP - DAVE R. PITZER	DSM - DAVID S. MOSSOR	DST - DENNIS S. TEPE
ECL - ERIC C. LAWSON	ED - EMILY E. DECKER	HAV - HEMA VILASAGAR
JAL - JOHN A. LENT	JKT - JANE K. THOMPSON	JLS - JANICE L. SCHIMMEL
JNB - JOSHUA N. BOOTH	JS - JENNIFER L. SOUTHALL	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU	KCZ - KEVIN C. ZUMBRO
KEB - KATHRYN E. BARNES	KHR - KIM H. RHODES	KRA - KATHY R. ALBERTSON
LKN - LINDA K. NEDEFF	LSB - LESLIE S. BUCINA	MDA - MIKE D. ALBERTSON
MDC - MICHAEL D. COCHRAN	MES - MARY E. SCHILLING	MKZ - MARILYN K. ZUMBRO
MLR - MARY L. ROCHOTTE	MLS - MICHAEL L. SCHIMMEL	MMB - MAREN M. BEERY
MSW - MATT S. WILSON	NJB - NATALIE J. BOOTH	PAS - PATRICK A. STREET
PJM - PAUL J. MILLER	RB - ROBERT BUCHANAN	RDC - REBECCA D. CUTLIP
REK - ROBERT E. KYER	RNP - RICK N. PETTY	RWC - RODNEY W. CAMPBELL
SCM - SUSAN C. MOELLENDICK	SLM - STEPHANIE L. MOSSBURG	SLP - SHERI L. PFALZGRAF
SMH - SHAUNA M. HYDE	SRM - SAMUEL R. MCFEE	TMB - TIFFANY M. BAILEY
TMM - TAMMY M. MORRIS	VC - VICKI COLLIER	WFM - WALTER F. MARTIN

List of Valid Qualifiers

August 15, 2006

Qualkey: STD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Result is greater than the associated numerical value.
A	See the report narrative
B	Analyte present in method blank
C	Confirmed by GC/MS
CG	Confluent growth
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
FL	Free Liquid
I	Semiquantitative result (out of instrument calibration range)
J	The analyte was positively identified, but the quantitation was below the RL
J,B	Analyte detected in both the method blank and sample above the MDL.
J,P	ESTIMATE & COLUMNS DON'T AGREE TO WITHIN 40%
L	Sample reporting limits elevated due to matrix interference
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Tentatively identified compound(TIC)
NA	Not applicable
ND	Not detected at or above the reporting limit
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria fail. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
TIC	Library Search Compound
TNTC	Too numerous to count
U	Undetected; the concentration is below the reported MDL.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
Z	Cannot be resolved from isomer - see below

***Special Notes for Organic Analytes

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound and are matrix dependent.

Organic QA/QC

KEMRON Environmental Services
Data Checklist

Date: 10-AUG-2006
Analyst: ECL
Analyst: NA
Method: 8081
Instrument: HP15
Curve Workgroup: WG219647, WG219649
Runlog ID: 11713
Analytical Workgroups: L0607382, L0608024-RE, L0607603, L0608140

System Performance Check	NA
DFTPP	NA
Endrin/DDT Breakdown	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	NA
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	NA
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	NA
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	X
Case Narrative	NA
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	ECL
Secondary Reviewer	MDC
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	NA
Check the reasonableness of the results	X

Primary Reviewer:
11-AUG-2006

ECL

Secondary Reviewer:
13-AUG-2006

Michael Cohen

Generated: AUG-13-2006 09:06:10

KEMRON Environmental Services Data Checklist

Date: 14-AUG-2006
 Analyst: ECL
 Analyst: NA
 Method: 8081
 Instrument: HP15
 Curve Workgroup: WG219883, WG219885
 Runlog ID: 11734
 Analytical Workgroups: L0608140, L0608069, L0608182, L0608223, L0608264

System Performance Check	NA
DTTPP	NA
Endrin/DDT Breakdown	X
Initial Calibration	X
Average Rf	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	NA
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	NA
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	ECL
Secondary Reviewer	MDC
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
15-AUG-2006

Secondary Reviewer:
15-AUG-2006

ECL

Michael Cohen

Generated: AUG-15-2006 10:34:56

KEMRON Environmental Services
Instrument Run Log

Instrument: HP15 Dataset: 081006
Analyst1: ECL Analyst2: NA
Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: 15137

Workgroups: Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2

Internal Standard: NA Surrogate Standard: NA

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15G6157.F	ENDRIN/DDT	1	1	SOS79-14	08/10/06 12:17
2	15G6157.R	ENDRIN/DDT	1	1	SOS79-14	08/10/06 12:45
3	15G6158.F	WG219650-01 ENDRIN/DDT	1	1	SOS79-14	08/10/06 13:37
4	15G6158.R	WG219650-01 ENDRIN/DDT	1	1	SOS79-14	08/10/06 14:05
5	15G6159.F	WG219647-01 TOX ICAL 2000 PPB	1	1	STD13913	08/10/06 14:48
6	15G6159.R	WG219647-01 TOX ICAL 2000 PPB	1	1	STD13913	08/10/06 15:16
7	15G6160.F	WG219647-02 TOX ICAL 1000 PPB	1	1	STD13913	08/10/06 15:16
8	15G6160.R	WG219647-02 TOX ICAL 1000 PPB	1	1	STD13913	08/10/06 15:45
9	15G6161.F	WG219647-03 TOX ICAL 500 PPB	1	1	STD13913	08/10/06 15:45
10	15G6161.R	WG219647-03 TOX ICAL 500 PPB	1	1	STD13913	08/10/06 16:14
11	15G6162.F	WG219647-04 TOX ICAL 250 PPB	1	1	STD13913	08/10/06 16:14
12	15G6162.R	WG219647-04 TOX ICAL 250 PPB	1	1	STD13913	08/10/06 16:43
13	15G6163.F	WG219647-05 TOX ICAL 100 PPB	1	1	STD13913	08/10/06 16:43
14	15G6163.R	WG219647-05 TOX ICAL 100 PPB	1	1	STD13913	08/10/06 17:11
15	15G6164.F	WG219647-06 TOX ALT 500 PPB	1	1	STD14036	08/10/06 17:11
16	15G6164.R	WG219647-06 TOX ALT 500 PPB	1	1	STD14036	08/10/06 17:39
17	15G6165.F	WG219649-01 PEST ICAL 200 PPB	1	1	STD13901	08/10/06 17:39
18	15G6165.R	WG219649-01 PEST ICAL 200 PPB	1	1	STD13901	08/10/06 18:08
19	15G6166.F	WG219649-02 PEST ICAL 50 PPB	1	1	STD13901	08/10/06 18:08
20	15G6166.R	WG219649-02 PEST ICAL 50 PPB	1	1	STD13901	08/10/06 18:36
21	15G6167.F	WG219649-03 PEST ICAL 20 PPB	1	1	STD13901	08/10/06 18:36
22	15G6167.R	WG219649-03 PEST ICAL 20 PPB	1	1	STD13901	08/10/06 19:04
23	15G6168.F	WG219649-04 PEST ICAL 10 PPB	1	1	STD13901	08/10/06 19:04
24	15G6168.R	WG219649-04 PEST ICAL 10 PPB	1	1	STD13901	08/10/06 19:33
25	15G6169.F	WG219649-05 PEST ICAL 4 PPB	1	1	STD13901	08/10/06 19:33
26	15G6169.R	WG219649-05 PEST ICAL 4 PPB	1	1	STD13901	08/10/06 20:01
27	15G6170.F	WG219649-06 PEST ICAL 1 PPB	1	1	STD13901	08/10/06 20:01
28	15G6170.R	WG219649-06 PEST ICAL 1 PPB	1	1	STD13901	08/10/06 20:29
29	15G6171.F	WG219649-07 PEST ALT 20 PPB	1	1	STD13915	08/10/06 20:29
30	15G6171.R	WG219649-07 PEST ALT 20 PPB	1	1	STD13915	08/10/06 20:58
31	15G6172.F	L0607382-18 200x	7	200	SOIL	08/10/06 20:58
32	15G6172.R	L0607382-18 200x	7	200	SOIL	08/10/06 21:26
33	15G6173.F	L0608024-01 RE 10x	7	10		08/10/06 21:26
34	15G6173.R	L0608024-01 RE 10x	7	10		08/10/06 21:55
35	15G6174.F	L0608024-05 RE 10x	7	10		08/10/06 21:55

Page: 1 of 4

Approved: 13-AUG-06



KEMRON Environmental Services
Instrument Run Log

Instrument: HP15 Dataset: 081006
Analyst1: ECL Analyst2: NA
Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: 15137

Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2
Workgroups: _____
Internal Standard: NA Surrogate Standard: NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
36	15G6174.R	L0608024-05 RE 10x	7	10		08/10/06 22:23
37	15G6175.F	WG219551-01 BLANK V265 P149	7	1	SOIL	08/10/06 22:23
38	15G6175.R	WG219551-01 BLANK V265 P149	7	1	SOIL	08/10/06 22:51
39	15G6176.F	WG219551-02 LCS V265 P149	7	1	SOIL	08/10/06 22:51
40	15G6176.R	WG219551-02 LCS V265 P149	7	1	SOIL	08/10/06 23:19
41	15G6177.F	WG219551-03 LCS DUP V265 P149	7	1	SOIL	08/10/06 23:19
42	15G6177.R	WG219551-03 LCS DUP V265 P149	7	1	SOIL	08/10/06 23:48
43	15G6178.F	WG219235-01 BLANK V265 P119	7	1	SOIL	08/10/06 23:48
44	15G6178.R	WG219235-01 BLANK V265 P119	7	1	SOIL	08/11/06 00:16
45	15G6179.F	WG219235-02 LCS V265 P119	7	1	SOIL	08/11/06 00:16
46	15G6179.R	WG219235-02 LCS V265 P119	7	1	SOIL	08/11/06 00:44
47	15G6180.F	WG219235-03 LCS DUP V265 P119	7	1	SOIL	08/11/06 00:44
48	15G6180.R	WG219235-03 LCS DUP V265 P119	7	1	SOIL	08/11/06 01:12
49	15G6181.F	WG219650-02 ENDRIN/DDT	1	1	SOS79-14	08/11/06 01:12
50	15G6181.R	WG219650-02 ENDRIN/DDT	1	1	SOS79-14	08/11/06 01:41
51	15G6182.F	WG219650-03 PEST CCV 20 PPB	1	1	STD13901	08/11/06 01:41
52	15G6182.R	WG219650-03 PEST CCV 20 PPB	1	1	STD13901	08/11/06 02:09
53	15G6183.F	WG219648-01 TOX CCV 250 PPB	1	1	STD13913	08/11/06 02:09
54	15G6183.R	WG219648-01 TOX CCV 250 PPB	1	1	STD13913	08/11/06 02:37
55	15G6184.F	L0607603-03	7	1	SOIL	08/11/06 02:37
56	15G6184.R	L0607603-03	7	1	SOIL	08/11/06 03:06
57	15G6185.F	L0607603-03 10x	7	10	SOIL	08/11/06 03:06
58	15G6185.R	L0607603-03 10x	7	10	SOIL	08/11/06 03:34
59	15G6186.F	L0608140-01	7	1	SOIL	08/11/06 03:34
60	15G6186.R	L0608140-01	7	1	SOIL	08/11/06 04:02
61	15G6187.F	L0608140-02	7	1	SOIL	08/11/06 04:02
62	15G6187.R	L0608140-02	7	1	SOIL	08/11/06 04:30
63	15G6188.F	L0608140-03 10x	7	10	SOIL	08/11/06 04:30
64	15G6188.R	L0608140-03 10x	7	10	SOIL	08/11/06 04:59
65	15G6189.F	L0608140-04	7	1	SOIL	08/11/06 04:59
66	15G6189.R	L0608140-04	7	1	SOIL	08/11/06 05:27
67	15G6190.F	L0608140-05 5x	7	5	SOIL	08/11/06 05:27
68	15G6190.R	L0608140-05 5x	7	5	SOIL	08/11/06 05:55
69	15G6191.F	L0608140-06	7	1	SOIL	08/11/06 05:55
70	15G6191.R	L0608140-06	7	1	SOIL	08/11/06 06:24
71	15G6192.F	L0608140-07	7	1	SOIL	08/11/06 06:24
72	15G6192.R	L0608140-07	7	1	SOIL	08/11/06 06:52

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Approved: 13-AUG-06



KEMRON Environmental Services
Instrument Run Log

Instrument: HP15 Dataset: 081006
Analyst1: ECL Analyst2: NA
Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: 15137

Workgroups: Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2
Internal Standard: NA Surrogate Standard: NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
73	15G6193.F	L0608140-08	7	1	SOIL	08/11/06 06:52
74	15G6193.R	L0608140-08	7	1	SOIL	08/11/06 07:20
75	15G6194.F	WG219650-04 PEST CCV 10 PPB	1	1	STD13901	08/11/06 07:20
76	15G6194.R	WG219650-04 PEST CCV 10 PPB	1	1	STD13901	08/11/06 07:49
77	15G6195.F	WG219648-02 TOX CCV 500 PPB	1	1	STD13913	08/11/06 07:49
78	15G6195.R	WG219648-02 TOX CCV 500 PPB	1	1	STD13913	08/11/06 08:17
79	15G6196.F	L0608140-09	7	1	SOIL	08/11/06 08:17
80	15G6196.R	L0608140-09	7	1	SOIL	08/11/06 08:45
81	15G6197.F	L0608140-10	7	1	SOIL	08/11/06 08:45
82	15G6197.R	L0608140-10	7	1	SOIL	08/11/06 09:14
83	15G6198.F	L0608140-11	7	1	SOIL	08/11/06 09:14
84	15G6198.R	L0608140-11	7	1	SOIL	08/11/06 09:42
85	15G6199.F	L0608140-12	7	1	SOIL	08/11/06 09:42
86	15G6199.R	L0608140-12	7	1	SOIL	08/11/06 10:11
87	15G6200.F	L0608140-13	7	1	SOIL	08/11/06 10:11
88	15G6200.R	L0608140-13	7	1	SOIL	08/11/06 10:40
89	15G6201.F	L0608140-14	7	1	SOIL	08/11/06 10:40
90	15G6201.R	L0608140-14	7	1	SOIL	08/11/06 11:08
91	15G6202.F	L0608140-15	7	1	SOIL	08/11/06 11:08
92	15G6202.R	L0608140-15	7	1	SOIL	08/11/06 11:36
93	15G6203.F	L0608140-16	7	1	SOIL	08/11/06 11:36
94	15G6203.R	L0608140-16	7	1	SOIL	08/11/06 12:05
95	15G6204.F	L0608140-17	7	1	SOIL	08/11/06 12:05
96	15G6204.R	L0608140-17	7	1	SOIL	08/11/06 12:33
97	15G6205.F	L0608140-18	7	1	SOIL	08/11/06 12:33
98	15G6205.R	L0608140-18	7	1	SOIL	08/11/06 13:01
99	15G6206.F	WG219650-05 ENDRI/DDT	1	1	SOS79-14	08/11/06 13:01
100	15G6206.R	WG219650-05 ENDRI/DDT	1	1	SOS79-14	08/11/06 13:29
101	15G6207.F	WG219650-06 PEST CCV 20 PPB	1	1	STD13901	08/11/06 13:29
102	15G6207.R	WG219650-06 PEST CCV 20 PPB	1	1	STD13901	08/11/06 13:58
103	15G6208.F	WG219648-03 TOX CCV 250 PPB	1	1	STD13913	08/11/06 13:58
104	15G6208.R	WG219648-03 TOX CCV 250 PPB	1	1	STD13913	08/11/06 14:26

Comments

Seq.	Rerun	Dil	Reason	Analytes
33				
L0608024-01RE: DCB surrogate failed high due to SMI.				

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Approved: 13-AUG-06



KEMRON Environmental Services
Instrument Run Log

Instrument: HP15 Dataset: 081006
Analyst1: ECL Analyst2: NA
Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: 15137

Workgroups: Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2
Internal Standard: NA Surrogate Standard: NA

Comments

Seq.	Rerun	Dil.	Reason	Analytes
35				
			L0608024-05RE: DCB surrogate failed high due to SMI.	
37				
			WG219551-01: T-M-X surrogate failed low.	
39				
			WG219551-02: T-M-X surrogate failed low.	
41				
			WG219551-03: T-M-X surrogate failed low.	
59	X	500	Over Calibration Range	alpha and gamma chlordane
			L0608140-01: DCB surrogate failed high due to SMI.	
76				
			Endosulfan I failed low on the rear column.	
102				
			Endosulfan I failed low on the rear column.	



00048451

KEMRON Environmental Services Instrument Run Log

Instrument: HP15 Dataset: 081406
 Analyst1: ECL Analyst2: NA
 Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: 15154

Column 1 ID: RTX-CLP

Column 2 ID: RTX-CLP2

Workgroups: _____

Internal Standard: NA

Surrogate Standard: NA

Comments: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15G6240.F	WG219886-01 ENDRI/DDT	1	1	SOS79-14	08/14/06 11:53
2	15G6240.R	WG219886-01 ENDRI/DDT	1	1	SOS79-14	08/14/06 12:21
3	15G6241.F	PEST CCV 20 PPB	1	1	STD13901	08/14/06 12:21
4	15G6241.R	PEST CCV 20 PPB	1	1	STD13901	08/14/06 12:49
5	15G6242.F	WG219883-01 TOX ICAL 2000 PPB	1	1	STD13913	08/14/06 13:34
6	15G6242.R	WG219883-01 TOX ICAL 2000 PPB	1	1	STD13913	08/14/06 14:02
7	15G6243.F	WG219883-02 TOX ICAL 1000 PPB	1	1	STD13913	08/14/06 14:02
8	15G6243.R	WG219883-02 TOX ICAL 1000 PPB	1	1	STD13913	08/14/06 14:31
9	15G6244.F	WG219883-03 TOX ICAL 500 PPB	1	1	STD13913	08/14/06 14:31
10	15G6244.R	WG219883-03 TOX ICAL 500 PPB	1	1	STD13913	08/14/06 14:59
11	15G6245.F	WG219883-04 TOX ICAL 250 PPB	1	1	STD13913	08/14/06 14:59
12	15G6245.R	WG219883-04 TOX ICAL 250 PPB	1	1	STD13913	08/14/06 15:27
13	15G6246.F	WG219883-05 TOX ICAL 100 PPB	1	1	STD13913	08/14/06 15:27
14	15G6246.R	WG219883-05 TOX ICAL 100 PPB	1	1	STD13913	08/14/06 15:56
15	15G6247.F	WG219883-06 TOX ALT 500 PPB	1	1	STD14036	08/14/06 15:56
16	15G6247.R	WG219883-06 TOX ALT 500 PPB	1	1	STD14036	08/14/06 16:24
17	15G6248.F	WG219885-01 PEST ICAL 200 PPB	1	1	STD13901	08/14/06 16:24
18	15G6248.R	WG219885-01 PEST ICAL 200 PPB	1	1	STD13901	08/14/06 16:52
19	15G6249.F	WG219885-02 PEST ICAL 50 PPB	1	1	STD13901	08/14/06 16:52
20	15G6249.R	WG219885-02 PEST ICAL 50 PPB	1	1	STD13901	08/14/06 17:20
21	15G6250.F	WG219885-03 PEST ICAL 20 PPB	1	1	STD13901	08/14/06 17:20
22	15G6250.R	WG219885-03 PEST ICAL 20 PPB	1	1	STD13901	08/14/06 17:49
23	15G6251.F	WG219885-04 PEST ICAL 10 PPB	1	1	STD13901	08/14/06 17:49
24	15G6251.R	WG219885-04 PEST ICAL 10 PPB	1	1	STD13901	08/14/06 18:17
25	15G6252.F	WG219885-05 PEST ICAL 4 PPB	1	1	STD13901	08/14/06 18:17
26	15G6252.R	WG219885-05 PEST ICAL 4 PPB	1	1	STD13901	08/14/06 18:45
27	15G6253.F	WG219885-06 PEST ICAL 1 PPB	1	1	STD13901	08/14/06 18:45
28	15G6253.R	WG219885-06 PEST ICAL 1 PPB	1	1	STD13901	08/14/06 19:13
29	15G6254.F	WG219885-07 PEST ALT 20 PPB	1	1	STD13915	08/14/06 19:13
30	15G6254.R	WG219885-07 PEST ALT 20 PPB	1	1	STD13915	08/14/06 19:42
31	15G6255.F	L0608140-01 500x	7	500	SOIL	08/14/06 19:42
32	15G6255.R	L0608140-01 500x	7	500	SOIL	08/14/06 20:10
33	15G6256.F	WG219455-01 BLANK V264 P145	1	1		08/14/06 20:10
34	15G6256.R	WG219455-01 BLANK V264 P145	1	1		08/14/06 20:38
35	15G6257.F	WG219455-02 LCS V264 P145	1	1		08/14/06 20:38

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Approved: 15-AUG-06

Michael Cohen

KEMRON Environmental Services
Instrument Run Log

Instrument: HP15 Dataset: 081406
Analyst1: ECL Analyst2: NA
Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: 15154

Column 1 ID: RTX-CLP

Column 2 ID: RTX-CLP2

Workgroups:

Internal Standard: NA

Surrogate Standard: NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
36	15G6257.R	WG219455-02 LCS V264 P145	1	1		08/14/06 21:06
37	15G6258.F	WG219455-03 LCS DUP V264 P145	1	1		08/14/06 21:06
38	15G6258.R	WG219455-03 LCS DUP V264 P145	1	1		08/14/06 21:35
39	15G6259.F	L0608069-01	1	1		08/14/06 21:35
40	15G6259.R	L0608069-01	1	1		08/14/06 22:04
41	15G6260.F	L0608182-01	1	1		08/14/06 22:04
42	15G6260.R	L0608182-01	1	1		08/14/06 22:32
43	15G6261.F	WG219886-02 PEST CCV 20 PPB	1	1	STD13901	08/14/06 22:32
44	15G6261.R	WG219886-02 PEST CCV 20 PPB	1	1	STD13901	08/14/06 23:00
45	15G6262.F	WG219884-01 TOX CCV 250 PPB	1	1	STD13913	08/14/06 23:00
46	15G6262.R	WG219884-01 TOX CCV 250 PPB	1	1	STD13913	08/14/06 23:28
47	15G6263.F	WG219686-02 BLANK V264 P159	1	1		08/14/06 23:28
48	15G6263.R	WG219686-02 BLANK V264 P159	1	1		08/14/06 23:57
49	15G6264.F	WG219686-03 LCS V264 P159	1	1		08/14/06 23:57
50	15G6264.R	WG219686-03 LCS V264 P159	1	1		08/15/06 00:25
51	15G6265.F	L0608223-01	1	1		08/15/06 00:25
52	15G6265.R	L0608223-01	1	1		08/15/06 00:53
53	15G6266.F	WG219686-01 L0608223-02 REF	1	1		08/15/06 00:53
54	15G6266.R	WG219686-01 L0608223-02 REF	1	1		08/15/06 01:21
55	15G6267.F	WG219686-04 L0608223-04 MS	1	1		08/15/06 01:21
56	15G6267.R	WG219686-04 L0608223-04 MS	1	1		08/15/06 01:50
57	15G6268.F	WG219686-05 L0608223-05 MSD	1	1		08/15/06 01:50
58	15G6268.R	WG219686-05 L0608223-05 MSD	1	1		08/15/06 02:18
59	15G6269.F	L0608264-01	1	1		08/15/06 02:18
60	15G6269.R	L0608264-01	1	1		08/15/06 02:46
61	15G6270.F	L0608264-03	1	1		08/15/06 02:46
62	15G6270.R	L0608264-03	1	1		08/15/06 03:14
63	15G6271.F	WG219886-03 ENDRI/DDT	1	1	SOS79-14	08/15/06 03:14
64	15G6271.R	WG219886-03 ENDRI/DDT	1	1	SOS79-14	08/15/06 03:43
65	15G6272.F	WG219886-04 PEST CCV 10 PPB	1	1	STD13901	08/15/06 03:43
66	15G6272.R	WG219886-04 PEST CCV 10 PPB	1	1	STD13901	08/15/06 04:11
67	15G6273.F	WG219884-02 TOX CCV 500 PPB	1	1	STD13913	08/15/06 04:11
68	15G6273.R	WG219884-02 TOX CCV 500 PPB	1	1	STD13913	08/15/06 04:39

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Parameter: Pest-S SOP #: EXP02 Revision #: 14
 Extraction Analyst(s): 21, CPD TV/KD Analyst(s): CPD
 Date/Time Extracted: 08-07-06 @ 0730 Date TV/KD: 08/7/06
 Spike/Surrogate Analyst: CPD Witness: Ed
 Surrogate #: ST013849 Earliest Hold Date: 8/16
 Spike #: A = ST013349 Spike #: B = —

Extraction Work Group WG 219235
219418
 Extract Relinquished By: CPD
 Extract Received By & Date: 028-706

	Sample ID	Test Code	pH /			Initial Vol / Wt	Amount Surrogate	Amount Spike	Final Volume	Extract Color	Emulsions /			Comments
			<2	N	>12						A	BN	N	
1	Blank					30.00g	200µl		10ml	T				WG 219235-d
2	LCS					↓		250µl						WG ↓ 02
3	LCS Dup					↓		↓						↓ 03
4	07-603-03	8081				30.00								Lot # D055-728
5	08-140-01					30.14								
6	-02					30.37								
7	-03					30.03				C				
8	-04					30.39g				T				
9	-05					30.88g				C				
10	-06					30.36g				T				
11	-07					30.70g				C				
12	-08					30.28g				T				
13	-09					30.79g								
14	-10					30.41g								
15	-11					30.56g								
16	-12					30.77g								
17	-13					30.37g				C				
18	-14					30.83g				T				
19	-15					30.37g				↓				
20	-16					30.39g				C				
21	-17					30.19g				C				
22	-18					30.76g				T				
23														
24														CPD 8/7/06

Methylene Chloride Lot #: —Hexane Lot #: —Ether Lot #: —Methanol Lot #: —Solvent: Hexane Lot #: C01E47Reagent: Sand Lot #: C02614Reagent: Pow. H₂SO₄ Lot #: B52465Reagent: 9416 Lot #: R6T0453Acid: 50:50 Lot #: R6T10428Florisil Lot #: C19552Silica Gel Lot #: —IR Analyst / Date / Time: —Dried Na₂SO₄ Lot #: C10593

Color Code

T = Transparent

C = Colored

O = Opaque

SW-846 Method

		On	Off	On	Off
Continuous	3520C				
Soxhlet	3540C				
ASE*	3545				
Sep Funnel	3510C				
Sonication	3550B	✓			
Waste	3580A				

* Accelerated Solvent Extractor (ASE)

Clean-ups

Florisil 3620B	✓	GPC 3640A	
Silica Gel 3630C		Other	
Acid 3665A		N/A	
Sulfur 3660B			

Peer Reviewed By: Charles Davis Date: 8/7/06

Extraction Notes For Volume # 265 Page # 119

General Comments: <u>SX 07-603-03 is a PE, Lot # D055-728</u>

Extraction Anomalies: <u>None</u>

Concentration Anomalies: <u>None</u>

Clean-Up Anomalies: <u>None</u>

Supervisor Review: _____ Date: _____

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00048455

Analytical Method: 8081A

AAB#: WG219418

Login Number: L0608140

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal.	Time Held Anal.	Q
59-SB-01-01	08/02/06	08/04/06	08/07/06	14	4.76	08/11/06	40	3.84	
59-SB-01-01	08/02/06	08/04/06	08/07/06	14	4.76	08/11/06	40	3.86	
59-SB-01-01	08/02/06	08/04/06	08/07/06	14	4.76	08/14/06	40	7.51	
59-SB-01-01	08/02/06	08/04/06	08/07/06	14	4.76	08/14/06	40	7.53	
59-SB-01-02	08/02/06	08/04/06	08/07/06	14	4.75	08/11/06	40	3.86	
59-SB-01-02	08/02/06	08/04/06	08/07/06	14	4.75	08/11/06	40	3.88	
59-SB-02-01	08/02/06	08/04/06	08/07/06	14	4.74	08/11/06	40	3.88	
59-SB-02-01	08/02/06	08/04/06	08/07/06	14	4.74	08/11/06	40	3.90	
59-SB-02-02	08/02/06	08/04/06	08/07/06	14	4.73	08/11/06	40	3.90	
59-SB-02-02	08/02/06	08/04/06	08/07/06	14	4.73	08/11/06	40	3.91	
59-SB-03-01	08/02/06	08/04/06	08/07/06	14	4.72	08/11/06	40	3.91	
59-SB-03-01	08/02/06	08/04/06	08/07/06	14	4.72	08/11/06	40	3.93	
59-SB-03-02	08/02/06	08/04/06	08/07/06	14	4.71	08/11/06	40	3.93	
59-SB-04-01	08/02/06	08/04/06	08/07/06	14	4.70	08/11/06	40	3.95	
59-SB-04-01	08/02/06	08/04/06	08/07/06	14	4.70	08/11/06	40	3.97	
59-SB-04-02	08/02/06	08/04/06	08/07/06	14	4.69	08/11/06	40	3.97	
59-SB-04-02	08/02/06	08/04/06	08/07/06	14	4.69	08/11/06	40	3.99	
59-SB-04-02QC	08/02/06	08/04/06	08/07/06	14	4.69	08/11/06	40	4.03	
59-SB-04-02QC	08/02/06	08/04/06	08/07/06	14	4.69	08/11/06	40	4.05	
59-SB-05-01	08/03/06	08/04/06	08/07/06	14	3.97	08/11/06	40	4.05	
59-SB-05-01	08/03/06	08/04/06	08/07/06	14	3.97	08/11/06	40	4.07	
59-SB-05-02	08/03/06	08/04/06	08/07/06	14	3.97	08/11/06	40	4.07	
59-SB-05-02	08/03/06	08/04/06	08/07/06	14	3.97	08/11/06	40	4.09	
59-SB-08-01	08/03/06	08/04/06	08/07/06	14	3.95	08/11/06	40	4.09	
59-SB-07-01	08/03/06	08/04/06	08/07/06	14	3.93	08/11/06	40	4.11	
59-SB-07-01	08/03/06	08/04/06	08/07/06	14	3.93	08/11/06	40	4.13	
59-SB-08-02	08/03/06	08/04/06	08/07/06	14	3.95	08/11/06	40	4.13	
59-SB-07-02	08/03/06	08/04/06	08/07/06	14	3.92	08/11/06	40	4.15	
59-SB-06-01	08/03/06	08/04/06	08/07/06	14	3.90	08/11/06	40	4.17	
59-SB-06-01	08/03/06	08/04/06	08/07/06	14	3.90	08/11/06	40	4.19	
59-SB-06-01QC	08/03/06	08/04/06	08/07/06	14	3.90	08/11/06	40	4.19	
59-SB-06-01QC	08/03/06	08/04/06	08/07/06	14	3.90	08/11/06	40	4.21	
59-SB-06-02	08/03/06	08/04/06	08/07/06	14	3.89	08/11/06	40	4.21	
59-SB-06-02	08/03/06	08/04/06	08/07/06	14	3.89	08/11/06	40	4.23	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

SURROGATE STANDARDS

Login Number: L0608140

Instrument Id: HP15

Workgroup (AAB#): WG219418

Method: 8081

CAL ID: HP15-10-AUG-06

Matrix: SOLID

Sample Number	Dilution	Tag	1	2
L0608140-01	1.00	01	73.2	146
L0608140-01	1.00	CF01	68.4	81.9
L0608140-02	1.00	01	80.3	88.8
L0608140-02	1.00	CF01	84.0	91.8
L0608140-03	10.0	CFDL0	80.6	86.1
		1		
L0608140-03	10.0	DL01	83.1	124
L0608140-04	1.00	01	87.3	96.4
L0608140-04	1.00	CF01	82.9	95.3
L0608140-05	5.00	CFDL0	81.4	105
		1		
L0608140-05	5.00	DL01	78.5	86.1
L0608140-06	1.00	01	71.8	76.9
L0608140-07	1.00	01	78.8	86.8
L0608140-07	1.00	CF01	74.4	85.3
L0608140-08	1.00	01	65.7	87.1
L0608140-08	1.00	CF01	61.5	79.3
L0608140-09	1.00	01	65.0	75.6
L0608140-09	1.00	CF01	60.9	78.2
L0608140-10	1.00	01	73.1	86.7
L0608140-10	1.00	CF01	59.6	87.4
L0608140-11	1.00	01	83.1	91.9
L0608140-11	1.00	CF01	72.8	91.2
L0608140-12	1.00	01	86.6	97.7
L0608140-13	1.00	01	86.5	105
L0608140-13	1.00	CF01	86.6	111
L0608140-14	1.00	01	85.5	96.1
L0608140-15	1.00	01	82.5	92.6
L0608140-16	1.00	01	85.9	96.7
L0608140-16	1.00	CF01	82.8	125
L0608140-17	1.00	01	83.7	98.1
L0608140-17	1.00	CF01	75.5	112
L0608140-18	1.00	01	80.2	94.7
L0608140-18	1.00	CF01	74.4	89.2
WG219235-01	1.00	01	69.7	82.5
WG219235-01	1.00	02	66.6	82.9
WG219235-02	1.00	01	74.3	87.5
WG219235-02	1.00	02	73.6	89.8
WG219235-03	1.00	01	76.1	92.6
WG219235-03	1.00	02	74.6	95.0

Surrogates

Surrogate Limits

1 - 2,4,5,6-Tetrachloro-m-xylene

39 - 130

KEMRON FORMS - Modified 04/18/2006
 Version 1.5 PDF File ID: 540107
 Report generated 08/15/2006 09:39

SURROGATE STANDARDS

2 - Decachlorobiphenyl 33 - 143

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATE STANDARDS

Login Number: L0608140

Instrument Id: HP15

Workgroup (AAB#): WG219418

Method: 8081

CAL ID: HP15-14-AUG-06

Matrix: SOLID

Sample Number	Dilution	Tag	1	2
L0608140-01	500	CFDL0	DL	DL
		1		
L0608140-01	500	DL01	DL	DL

Surrogates

Surrogate Limits

1 - 2,4,5,6-Tetrachloro-m-xylene	39	-	130
2 - Decachlorobiphenyl	33	-	143

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

METHOD BLANK SUMMARY

Login Number: L0608140 _____ Work Group: WG219418 _____
 Blank File ID: 15G6178.F _____ Blank Sample ID: WG219235-01 _____
 Date Analyzed: 08/10/06 _____ Instrument ID: HP15 _____
 Time Analyzed: 23:48 _____ Method: 8081A _____
 Analyst: ECL _____

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG219235-02	15G6179.F	08/11/06 00:16	01
LCS2	WG219235-03	15G6180.F	08/11/06 00:44	01
59-SB-01-01	L0608140-01	15G6186.F	08/11/06 03:34	01
59-SB-01-02	L0608140-02	15G6187.F	08/11/06 04:02	01
59-SB-02-01	L0608140-03	15G6188.F	08/11/06 04:30	DL01
59-SB-02-02	L0608140-04	15G6189.F	08/11/06 04:59	01
59-SB-03-01	L0608140-05	15G6190.F	08/11/06 05:27	DL01
59-SB-03-02	L0608140-06	15G6191.F	08/11/06 05:55	01
59-SB-04-01	L0608140-07	15G6192.F	08/11/06 06:24	01
59-SB-04-02	L0608140-08	15G6193.F	08/11/06 06:52	01
59-SB-04-02QC	L0608140-09	15G6196.F	08/11/06 08:17	01
59-SB-05-01	L0608140-10	15G6197.F	08/11/06 08:45	01
59-SB-05-02	L0608140-11	15G6198.F	08/11/06 09:14	01
59-SB-08-01	L0608140-12	15G6199.F	08/11/06 09:42	01
59-SB-07-01	L0608140-13	15G6200.F	08/11/06 10:11	01
59-SB-08-02	L0608140-14	15G6201.F	08/11/06 10:40	01
59-SB-07-02	L0608140-15	15G6202.F	08/11/06 11:08	01
59-SB-06-01	L0608140-16	15G6203.F	08/11/06 11:36	01
59-SB-06-01QC	L0608140-17	15G6204.F	08/11/06 12:05	01
59-SB-06-02	L0608140-18	15G6205.F	08/11/06 12:33	01
59-SB-01-01	L0608140-01	15G6255.F	08/14/06 19:42	DL01

METHOD BLANK SUMMARY

Login Number: L0608140
 Blank File ID: 15G6178.R
 Date Analyzed: 08/11/06
 Time Analyzed: 00:16
 Analyst: ECL

Work Group: WG219418
 Blank Sample ID: WG219235-01
 Instrument ID: HP15
 Method: 8081A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG219235-02	15G6179.R	08/11/06 00:44	02
LCS2	WG219235-03	15G6180.R	08/11/06 01:12	02
59-SB-01-01	L0608140-01	15G6186.R	08/11/06 04:02	CF01
59-SB-01-02	L0608140-02	15G6187.R	08/11/06 04:30	CF01
59-SB-02-01	L0608140-03	15G6188.R	08/11/06 04:59	CFDL01
59-SB-02-02	L0608140-04	15G6189.R	08/11/06 05:27	CF01
59-SB-03-01	L0608140-05	15G6190.R	08/11/06 05:55	CFDL01
59-SB-04-01	L0608140-07	15G6192.R	08/11/06 06:52	CF01
59-SB-04-02	L0608140-08	15G6193.R	08/11/06 07:20	CF01
59-SB-04-02QC	L0608140-09	15G6196.R	08/11/06 08:45	CF01
59-SB-05-01	L0608140-10	15G6197.R	08/11/06 09:14	CF01
59-SB-05-02	L0608140-11	15G6198.R	08/11/06 09:42	CF01
59-SB-07-01	L0608140-13	15G6200.R	08/11/06 10:40	CF01
59-SB-06-01	L0608140-16	15G6203.R	08/11/06 12:05	CF01
59-SB-06-01QC	L0608140-17	15G6204.R	08/11/06 12:33	CF01
59-SB-06-02	L0608140-18	15G6205.R	08/11/06 13:01	CF01
59-SB-01-01	L0608140-01	15G6255.R	08/14/06 20:10	CFDL01

METHOD BLANK REPORT

00048461

Login Number: L0608140 Run Date: 08/10/2006 Sample ID: WG219235-01
 Instrument ID: HP15 Run Time: 23:48 Prep Method: 3550B
 File ID: 15G6178.F Analyst: ECL Method: 8081A
 Workgroup (AAB#): WG219418 Matrix: Solid Units: ug/kg
 Contract #: DAC256-94-D-0020 Cal ID: HP15-10-AUG-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
alpha-BHC	0.330	1.65	0.330	1	U
beta-BHC	0.330	1.65	0.330	1	U
delta-BHC	0.330	1.65	0.330	1	U
gamma-BHC (Lindane)	0.330	1.65	0.330	1	U
Heptachlor	0.330	1.65	0.330	1	U
Aldrin	0.330	1.65	0.330	1	U
Heptachlor epoxide	0.330	1.65	0.330	1	U
Endosulfan I	0.330	1.65	0.330	1	U
Dieldrin	0.330	1.65	0.330	1	U
4,4'-DDE	0.330	1.65	0.330	1	U
Endrin	0.330	1.65	0.330	1	U
Endosulfan II	0.330	1.65	0.330	1	U
4,4'-DDD	0.330	1.65	0.330	1	U
Endosulfan sulfate	0.330	1.65	0.330	1	U
4,4'-DDT	0.330	1.65	0.330	1	U
Methoxychlor	0.330	1.65	0.330	1	U
Endrin ketone	0.330	1.65	0.330	1	U
Endrin aldehyde	0.330	1.65	0.330	1	U
alpha Chlordane	0.330	1.65	0.330	1	U
gamma Chlordane	0.330	1.65	0.330	1	U
Toxaphene	16.7	33.0	16.7	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4,5,6-Tetrachloro-m-xylene	69.7	39 - 130	PASS
Decachlorobiphenyl	82.5	33 - 143	PASS

MDL Method Detection Limit

RL Reporting/quantitation Limit

* Analyte concentration > RL

METHOD BLANK REPORT

00048462

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219235-01
 Instrument ID: HP15 Run Time: 00:16 Prep Method: 3550B
 File ID: 15G6178.R Analyst: ECL Method: 8081A
 Workgroup (AAB#): WG219418 Matrix: Solid Units: ug/kg
 Contract #: DACA56-94-D-0020 Cal ID: HP15-10-AUG-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
alpha-BHC	0.330	1.65	0.330	1	U
beta-BHC	0.330	1.65	0.330	1	U
delta-BHC	0.330	1.65	0.330	1	U
gamma-BHC (Lindane)	0.330	1.65	0.330	1	U
Heptachlor	0.330	1.65	0.330	1	U
Aldrin	0.330	1.65	0.330	1	U
Heptachlor epoxide	0.330	1.65	0.330	1	U
Endosulfan I	0.330	1.65	0.330	1	U
Dieldrin	0.330	1.65	0.330	1	U
4,4'-DDE	0.330	1.65	0.330	1	U
Endrin	0.330	1.65	0.330	1	U
Endosulfan II	0.330	1.65	0.330	1	U
4,4'-DDD	0.330	1.65	0.330	1	U
Endosulfan sulfate	0.330	1.65	0.330	1	U
4,4'-DDT	0.330	1.65	0.330	1	U
Methoxychlor	0.330	1.65	0.330	1	U
Endrin ketone	0.330	1.65	0.330	1	U
Endrin aldehyde	0.330	1.65	0.330	1	U
alpha Chlordane	0.330	1.65	0.330	1	U
gamma Chlordane	0.330	1.65	0.330	1	U
Toxaphene	16.7	33.0	16.7	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4,5,6-Tetrachloro-m-xylene	66.6	39 - 130	PASS
Decachlorobiphenyl	82.9	33 - 143	PASS

MDL Method Detection Limit

RL Reporting/quantitation Limit

* Analyte concentration > RL

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0608140 Analyst: ECL Prep Method: 3550B
Instrument ID: HP15 Matrix: Soil Method: 8081A
Workgroup (AAB#): WG219418 Units: ug/kg
Sample ID: WG219235-02 LCS File ID: 15G6179.F Run Date: 08/11/2006 00:16
Sample ID: WG219235-03 LCS2 File ID: 15G6180.F Run Date: 08/11/2006 00:44

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
alpha-BHC	16.7	15.7	94.1	16.7	16.4	98.4	4.47	60 - 125	40	
beta-BHC	16.7	14.7	88.3	16.7	15.4	92.5	4.69	60 - 125	40	
delta-BHC	16.7	17.0	102	16.7	17.9	107	4.89	55 - 130	40	
gamma-BHC (Lindane)	16.7	16.3	97.6	16.7	17.0	102	4.33	60 - 125	40	
Heptachlor	16.7	18.2	109	16.7	18.2	109	0.0733	50 - 140	40	
Aldrin	16.7	16.7	100	16.7	17.4	105	4.28	45 - 140	40	
Heptachlor epoxide	16.7	16.1	96.8	16.7	16.9	102	4.70	65 - 130	40	
Endosulfan I	16.7	10.9	65.6	16.7	11.5	69.1	5.20	30 - 130	40	
Dieldrin	16.7	17.1	103	16.7	18.2	109	6.00	65 - 125	40	
4,4'-DDE	16.7	17.9	107	16.7	19.0	114	6.09	70 - 125	40	
Endrin	16.7	19.7	118	16.7	21.1	127	6.61	60 - 135	40	
Endosulfan II	16.7	11.9	71.5	16.7	12.8	76.5	6.73	35 - 140	40	
4,4'-DDD	16.7	17.9	107	16.7	19.1	115	6.87	30 - 135	40	
Endosulfan sulfate	16.7	17.4	104	16.7	18.8	113	8.04	50 - 120	40	
4,4'-DDT	16.7	17.5	105	16.7	19.1	114	8.37	45 - 140	40	
Methoxychlor	16.7	16.2	97.0	16.7	17.4	104	7.45	55 - 145	40	
Endrin ketone	16.7	14.8	88.6	16.7	16.1	96.4	8.43	50 - 120	40	
Endrin aldehyde	16.7	11.9	71.4	16.7	12.6	75.6	5.72	30 - 110	40	
alpha Chlordane	16.7	16.4	98.2	16.7	17.3	104	5.31	65 - 120	40	
gamma Chlordane	16.7	16.4	98.4	16.7	17.2	103	4.84	65 - 125	40	

Surrogates	LCS	LCS2	Surrogate Limits		Qualifier
	% Recovery	% Recovery			
Decachlorobiphenyl	87.5	92.6	33	- 143	PASS
2,4,5,6-Tetrachloro-m-xylene	74.3	76.1	39	- 130	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0608140 Analyst: ECL Prep Method: 3550B
 Instrument ID: HP15 Matrix: Soil Method: 8081A
 Workgroup (AAB#): WG219418 Units: ug/kg
 Sample ID: WG219235-02 LCS File ID: 15G6179.R Run Date: 08/11/2006 00:44
 Sample ID: WG219235-03 LCS2 File ID: 15G6180.R Run Date: 08/11/2006 01:12

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
alpha-BHC	16.7	15.8	95.0	16.7	16.4	98.2	3.29	60 - 125	40	
beta-BHC	16.7	13.9	83.3	16.7	14.5	86.8	4.05	60 - 125	40	
delta-BHC	16.7	15.9	95.3	16.7	16.6	99.8	4.57	55 - 130	40	
gamma-BHC (Lindane)	16.7	16.1	96.4	16.7	16.6	99.7	3.45	60 - 125	40	
Heptachlor	16.7	16.5	98.8	16.7	16.8	101	2.20	50 - 140	40	
Aldrin	16.7	16.0	96.2	16.7	16.6	99.8	3.61	45 - 140	40	
Heptachlor epoxide	16.7	16.0	95.7	16.7	16.5	98.9	3.27	65 - 130	40	
Endosulfan I	16.7	10.3	61.7	16.7	11.0	66.0	6.77	30 - 130	40	
Dieldrin	16.7	16.4	98.7	16.7	17.2	103	4.75	65 - 125	40	
4,4'-DDE	16.7	17.2	103	16.7	18.0	108	4.49	70 - 125	40	
Endrin	16.7	17.1	103	16.7	18.3	110	6.85	60 - 135	40	
Endosulfan II	16.7	11.6	69.6	16.7	12.3	74.1	6.29	35 - 140	40	
4,4'-DDD	16.7	16.6	99.4	16.7	17.6	105	5.78	30 - 135	40	
Endosulfan sulfate	16.7	15.5	93.0	16.7	16.4	98.1	5.34	50 - 120	40	
4,4'-DDT	16.7	19.4	116	16.7	20.7	124	6.56	45 - 140	40	
Methoxychlor	16.7	21.6	129	16.7	23.0	138	6.42	55 - 145	40	
Endrin ketone	16.7	15.0	90.3	16.7	16.0	95.8	5.89	50 - 120	40	
Endrin aldehyde	16.7	12.3	73.6	16.7	13.1	78.4	6.26	30 - 110	40	
alpha Chlordane	16.7	14.1	84.3	16.7	14.7	88.0	4.25	65 - 120	40	
gamma Chlordane	16.7	15.5	93.1	16.7	16.2	97.2	4.33	65 - 125	40	

Surrogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
Decachlorobiphenyl	89.8	95.0	33 - 143	PASS
2,4,5,6-Tetrachloro-m-xylene	73.6	74.6	39 - 130	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8081A

Initial Calibration Date: 10-AUG-06 20:29

ICAL Workgroup: WG219649

Column ID: F

Analyte	AVG RF	% RSD	LINEAR	QUAD
4,4'-DDD	27740000	10.9		
4,4'-DDE	34300000	10.9		
4,4'-DDT	29040000	9.69		
Aldrin	38150000	7.86		
Dieldrin	36070000	6.34		
Endosulfan I	35060000	2.12		
Endosulfan II	30140000	5.21		
Endosulfan Sulfate	27820000	1.70		
Endrin	27450000	7.98		
Endrin Aldehyde	27290000	5.88		
Endrin Ketone	34310000	1.81		
Heptachlor	43620000	3.40		
Heptachlor Epoxide	37950000	1.98		
Methoxychlor	16080000	1.34		
alpha-BHC	47940000	17.6		
alpha-Chlordane	36940000	5.04		
beta-BHC	20660000	3.73		
delta-BHC	45950000	16.7		
gamma-BHC	45210000	13.8		
gamma-Chlordane	38470000	4.96		

Login Number:L0608140

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:10-AUG-06 20:29

ICAL Workgroup:WG219649

Column ID:R

Analyte	AVG RF	% RSD	LINEAR	QUAD
4,4'-DDD	28620000	5.52		
4,4'-DDE	35540000	8.98		
4,4'-DDT	23400000	18.7		
Aldrin	43430000	4.09		
Dieldrin	37890000	3.78		
Endosulfan I	36950000	6.57		
Endosulfan II	30060000	3.95		
Endosulfan Sulfate	25150000	4.14		
Endrin	30890000	4.56		
Endrin Aldehyde	22790000	4.72		
Endrin Ketone	28920000	3.23		
Heptachlor	47310000	1.67		
Heptachlor Epoxide	40790000	3.28		
Methoxychlor	12220000	5.00		
alpha-BHC	57390000	10.9		
alpha-Chlordane	45360000	13.2		
beta-BHC	23810000	2.87		
delta-BHC	53300000	6.96		
gamma-BHC	52620000	9.07		
gamma-Chlordane	42330000	2.37		

INITIAL CALIBRATION SUMMARY

00048467

Login Number:L0608140

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:14-AUG-06 19:13

ICAL Workgroup:WG219885

Column ID:F

Analyte	AVG RF	% RSD	LINEAR	QUAD
4,4'-DDD	29690000	8.78		
4,4'-DDE	35710000	10.4		
4,4'-DDT	26840000	12.0		
Aldrin	39240000	7.36		
Dieldrin	37170000	5.55		
Endosulfan I	36110000	2.04		
Endosulfan II	31590000	3.13		
Endosulfan Sulfate	28840000	2.68		
Endrin	29040000	6.78		
Endrin Aldehyde	26880000	1.74		
Endrin Ketone	34680000	1.71		
Heptachlor	44000000	3.36		
Heptachlor Epoxide	39230000	3.12		
Methoxychlor	14760000	1.76		
alpha-BHC	49470000	17.0		
alpha-Chlordane	38450000	4.27		
beta-BHC	21750000	2.49		
delta-BHC	47340000	16.3		
gamma-BHC	47110000	10.9		
gamma-Chlordane	39740000	4.52		

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8081A

Initial Calibration Date: 14-AUG-06 19:13

ICAL Workgroup: WG219885

Column ID: R

Analyte	AVG RF	% RSD	LINEAR	QUAD
4,4'-DDD	27650000	3.69		
4,4'-DDE	33480000	7.86		
4,4'-DDT	16720000	26.3	0.999	
Aldrin	40950000	3.94		
Dieldrin	34960000	3.77		
Endosulfan I	33320000	3.06		
Endosulfan II	28050000	1.57		
Endosulfan Sulfate	22730000	2.30		
Endrin	22240000	3.18		
Endrin Aldehyde	22540000	3.38		
Endrin Ketone	27640000	4.38		
Heptachlor	42630000	5.33		
Heptachlor Epoxide	37560000	1.24		
Methoxychlor	86330000	8.05		
alpha-BHC	54940000	10.8		
alpha-Chlordane	38320000	4.56		
beta-BHC	22960000	3.17		
delta-BHC	48460000	9.32		
gamma-BHC	49990000	8.12		
gamma-Chlordane	38080000	2.57		

INITIAL CALIBRATION DATA

Login Number: L0608140
 Analytical Method: 8081A

Instrument ID: HP15
 Initial Calibration Date: 10-AUG-06 20:29
 Column ID: F

Analyte	WG219649-01			WG219649-02			WG219649-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	200	6192772752	30960000	50.0	1522039723	30440000	10.0	276903378	27690000
4,4'-DDE	200	7514720142	37570000	50.0	1918056000	38360000	10.0	337977757	33800000
4,4'-DDT	200	6277108514	31390000	50.0	1597749262	31950000	10.0	276214628	27620000
Aldrin	200	8130310537	40650000	50.0	2067381904	41350000	10.0	380427274	38040000
Dieldrin	200	7579330840	37900000	50.0	1928360768	38570000	10.0	361468178	36150000
Endosulfan I	200	6863268265	34320000	50.0	1797759214	35960000	10.0	354300687	35430000
Endosulfan II	200	6200711870	31000000	50.0	1571019119	31420000	10.0	299433092	29940000
Endosulfan Sulfate	200	5607734819	28040000	50.0	1390043527	27800000	10.0	277482259	27750000
Endrin	200	5970321760	29850000	50.0	1477821380	29560000	10.0	275537293	27550000
Endrin Aldehyde	200	5158173145	25790000	50.0	1323365904	26470000	10.0	269524225	26950000
Endrin Ketone	200	6879423802	34400000	50.0	1753521870	35070000	10.0	345591267	34560000
Heptachlor	200	8689702941	43450000	50.0	2276158650	45520000	10.0	440207780	44020000
Heptachlor Epoxide	200	7372878182	36860000	50.0	1932730528	38650000	10.0	384141588	38410000
Methoxychlor	200	3159586451	15800000	50.0	797978744	15960000	10.0	163790667	16380000
alpha-BHC	200	11663569845	58320000	50.0	2752659506	55050000	10.0	467870597	46790000
alpha-Chlordane	200	7743735041	38720000	50.0	1939145658	38780000	10.0	362837087	36280000
beta-BHC	200	4398853131	21990000	50.0	1035826183	20720000	10.0	207352779	20740000
delta-BHC	200	11015494928	55080000	50.0	2627676111	52550000	10.0	457598123	45760000
gamma-BHC	200	10528431495	52640000	50.0	2509032957	50180000	10.0	453771757	45380000
gamma-Chlordane	200	8212002792	41060000	50.0	2009852280	40200000	10.0	378482682	37850000

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8081A

Initial Calibration Date: 10-AUG-06 20:29

Column ID: F

Analyte	WG219649-05			WG219649-06		
	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	4.00	100253491	25060000	1.00	23298321	23300000
4,4'-DDE	4.00	123657411	30910000	1.00	29052069	29050000
4,4'-DDT	4.00	107797848	26950000	1.00	25185686	25190000
Aldrin	4.00	140163320	35040000	1.00	34103480	34100000
Dieldrin	4.00	134682093	33670000	1.00	32976005	32980000
Endosulfan I	4.00	137107252	34280000	1.00	34642803	34640000
Endosulfan II	4.00	118661340	29670000	1.00	27331890	27330000
Endosulfan Sulfate	4.00	109400203	27350000	1.00	28625702	28630000
Endrin	4.00	100774681	25190000	1.00	24553125	24550000
Endrin Aldehyde	4.00	109805081	27450000	1.00	30368341	30370000
Endrin Ketone	4.00	134052402	33510000	1.00	33626133	33630000
Heptachlor	4.00	167661075	41920000	1.00	41957624	41960000
Heptachlor Epoxide	4.00	148901033	37230000	1.00	37990322	37990000
Methoxychlor	4.00	64969939	16240000	1.00	16139348	16140000
alpha-BHC	4.00	162164749	40540000	1.00	36301346	36300000
alpha-Chlordane	4.00	142644807	35660000	1.00	34189848	34190000
beta-BHC	4.00	81721842	20430000	1.00	19623284	19620000
delta-BHC	4.00	156086531	39020000	1.00	35258447	35260000
gamma-BHC	4.00	160770677	40190000	1.00	35896379	35900000
gamma-Chlordane	4.00	144702892	36180000	1.00	36805118	36810000

INITIAL CALIBRATION DATA

00048471

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8081A

Initial Calibration Date: 10-AUG-06 20:29

Column ID: R

Analyte	WG219649-01			WG219649-02			WG219649-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	200	6068563188	30340000	50.0	1469236576	29380000	10.0	292018992	29200000
4,4'-DDE	200	7930733805	39650000	50.0	1898506996	37970000	10.0	351153239	35120000
4,4'-DDT	200	5847526259	29240000	50.0	1278269823	25570000	10.0	235050195	23510000
Aldrin	200	9021329761	45110000	50.0	2257418933	45150000	10.0	432022425	43200000
Dieldrin	200	7927086672	39640000	50.0	1946591531	38930000	10.0	373568984	37360000
Endosulfan I	200	7076051266	35380000	50.0	1813087790	36260000	10.0	350186451	35020000
Endosulfan II	200	6203208943	31020000	50.0	1493452147	29870000	10.0	283983586	28400000
Endosulfan Sulfate	200	5344431680	26720000	50.0	1266159588	25320000	10.0	253596234	25360000
Endrin	200	6486407034	32430000	50.0	1573411760	31470000	10.0	311706248	31170000
Endrin Aldehyde	200	4627102839	23140000	50.0	1137252635	22750000	10.0	208140952	20810000
Endrin Ketone	200	6086357688	30430000	50.0	1457427548	29150000	10.0	289412012	28940000
Heptachlor	200	9339615190	46700000	50.0	2374988215	47500000	10.0	479129541	47910000
Heptachlor Epoxide	200	7925133353	39630000	50.0	2025277056	40510000	10.0	407753560	40780000
Methoxychlor	200	2641084688	13210000	50.0	618793913	12380000	10.0	124197697	12420000
alpha-BHC	200	12886188163	64430000	50.0	3133042420	62660000	10.0	569874980	56990000
alpha-Chlordane	200	8292688670	41460000	50.0	2031761266	40640000	10.0	462516715	46250000
beta-BHC	200	4839383777	24200000	50.0	1166376316	23330000	10.0	239442915	23940000
delta-BHC	200	11808311407	59040000	50.0	2792782897	55860000	10.0	519679279	51970000
gamma-BHC	200	11709426085	58550000	50.0	2800440421	56010000	10.0	525078798	52510000
gamma-Chlordane	200	8565440737	42830000	50.0	2042592852	40850000	10.0	422468506	42250000

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8081A

Initial Calibration Date: 10-AUG-06 20:29

Column ID: R

Analyte	WG219649-05			WG219649-06		
	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	4.00	103630300	25910000	1.00	27686785	27690000
4,4'-DDE	4.00	129669814	32420000	1.00	31424839	31420000
4,4'-DDT	4.00	73062657	18270000	1.00	18262105	18260000
Aldrin	4.00	163471188	40870000	1.00	41857747	41860000
Dieldrin	4.00	142252384	35560000	1.00	37475452	37480000
Endosulfan I	4.00	145356302	36340000	1.00	41687939	41690000
Endosulfan II	4.00	122074315	30520000	1.00	31506061	31510000
Endosulfan Sulfate	4.00	97619265	24400000	1.00	23653573	23650000
Endrin	4.00	113353203	28340000	1.00	30398374	30400000
Endrin Aldehyde	4.00	90513837	22630000	1.00	23901131	23900000
Endrin Ketone	4.00	110692786	27670000	1.00	28255123	28260000
Heptachlor	4.00	187628395	46910000	1.00	48466589	48470000
Heptachlor Epoxide	4.00	158376082	39590000	1.00	43249888	43250000
Methoxychlor	4.00	46458308	11610000	1.00	11541246	11540000
alpha-BHC	4.00	206094381	51520000	1.00	48640935	48640000
alpha-Chlordane	4.00	174222010	43560000	1.00	56873927	56870000
beta-BHC	4.00	99013222	24750000	1.00	22787500	22790000
delta-BHC	4.00	194558474	48640000	1.00	50872745	50870000
gamma-BHC	4.00	192463464	48120000	1.00	46027271	46030000
gamma-Chlordane	4.00	175449673	43860000	1.00	42374472	42370000

Login Number:L0608140

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:14-AUG-06 19:13

Column ID:F

Analyte	WG219885-01			WG219885-02			WG219885-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	200	6439028993	32200000	50.0	1625934312	32520000	10.0	297182273	29720000
4,4'-DDE	200	7923618711	39620000	50.0	1990272208	39810000	10.0	351933120	35190000
4,4'-DDT	200	5947594143	29740000	50.0	1549048072	30980000	10.0	252172428	25220000
Aldrin	200	8316626669	41580000	50.0	2141963052	42840000	10.0	390504936	39050000
Dieldrin	200	7745902150	38730000	50.0	1995520671	39910000	10.0	370745702	37070000
Endosulfan I	200	7011733511	35060000	50.0	1858955107	37180000	10.0	364008506	36400000
Endosulfan II	200	6348118192	31740000	50.0	1661323945	33230000	10.0	311994595	31200000
Endosulfan Sulfate	200	5693062088	28470000	50.0	1442884944	28860000	10.0	290476472	29050000
Endrin	200	6164204477	30820000	50.0	1559606403	31190000	10.0	296563391	29660000
Endrin Aldehyde	200	5249709823	26250000	50.0	1343653456	26870000	10.0	268152376	26820000
Endrin Ketone	200	6915863810	34580000	50.0	1772750400	35460000	10.0	345722953	34570000
Heptachlor	200	8790810168	43950000	50.0	2324152989	46480000	10.0	440230935	44020000
Heptachlor Epoxide	200	7518984024	37590000	50.0	1992878865	39860000	10.0	394502860	39450000
Methoxychlor	200	2923749738	14620000	50.0	735761056	14720000	10.0	152545528	15250000
alpha-BHC	200	11957606840	59790000	50.0	2864062926	57280000	10.0	477430992	47740000
alpha-Chlordane	200	8024677882	40120000	50.0	2035364949	40710000	10.0	376745260	37670000
beta-BHC	200	4526810157	22630000	50.0	1074289549	21490000	10.0	214205544	21420000
delta-BHC	200	11330516992	56650000	50.0	2711965431	54240000	10.0	468643221	46860000
gamma-BHC	200	10786824522	53930000	50.0	2597303245	51950000	10.0	458833448	45880000
gamma-Chlordane	200	8430441106	42150000	50.0	2086223718	41720000	10.0	389906856	38990000

INITIAL CALIBRATION DATA

00048474

Login Number:L0608140

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:14-AUG-06 19:13

Column ID:F

Analyte	WG219885-05			WG219885-06		
	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	4.00	109677393	27420000	1.00	25936160	25940000
4,4'-DDE	4.00	128653271	32160000	1.00	30895812	30900000
4,4'-DDT	4.00	99870912	24970000	1.00	22400163	22400000
Aldrin	4.00	145203552	36300000	1.00	35523174	35520000
Dieldrin	4.00	140058404	35010000	1.00	34624798	34620000
Endosulfan I	4.00	142144998	35540000	1.00	36358774	36360000
Endosulfan II	4.00	124628367	31160000	1.00	30279775	30280000
Endosulfan Sulfate	4.00	113847496	28460000	1.00	30220004	30220000
Endrin	4.00	107724136	26930000	1.00	26445174	26450000
Endrin Aldehyde	4.00	108299384	27070000	1.00	27651040	27650000
Endrin Ketone	4.00	135320006	33830000	1.00	35244241	35240000
Heptachlor	4.00	169444688	42360000	1.00	42669280	42670000
Heptachlor Epoxide	4.00	153733716	38430000	1.00	41133525	41130000
Methoxychlor	4.00	59265165	14820000	1.00	14524342	14520000
alpha-BHC	4.00	169657278	42410000	1.00	38175975	38180000
alpha-Chlordane	4.00	148587962	37150000	1.00	36640267	36640000
beta-BHC	4.00	85321260	21330000	1.00	22221880	22220000
delta-BHC	4.00	163893743	40970000	1.00	36407526	36410000
gamma-BHC	4.00	166336888	41580000	1.00	41581382	41580000
gamma-Chlordane	4.00	150319045	37580000	1.00	38828131	38830000

INITIAL CALIBRATION DATA

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8081A

Initial Calibration Date: 14-AUG-06 19:13

Column ID: R

Analyte	WG219885-01			WG219885-02			WG219885-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	200	5845582858	29230000	50.0	1423743496	28470000	10.0	274735168	27470000
4,4'-DDE	200	7372007891	36860000	50.0	1792718287	35850000	10.0	332777116	33280000
4,4'-DDT	200	4551885940	22760000	50.0	1002157416	20040000	10.0	166020096	16600000
Aldrin	200	8517429425	42590000	50.0	2146877599	42940000	10.0	405949994	40590000
Dieldrin	200	7344438209	36720000	50.0	1814981000	36300000	10.0	347774201	34780000
Endosulfan I	200	6424347911	32120000	50.0	1730170202	34600000	10.0	322494938	32250000
Endosulfan II	200	5736085109	28680000	50.0	1412738503	28250000	10.0	280301565	28030000
Endosulfan Sulfate	200	4737203833	23690000	50.0	1135500070	22710000	10.0	226810424	22680000
Endrin	200	4569201905	22850000	50.0	1160538992	23210000	10.0	216457796	21650000
Endrin Aldehyde	200	4569593525	22850000	50.0	1160923582	23220000	10.0	223335583	22330000
Endrin Ketone	200	5948118600	29740000	50.0	1409845256	28200000	10.0	272390592	27240000
Heptachlor	200	8509089289	42550000	50.0	2152939882	43060000	10.0	421901383	42190000
Heptachlor Epoxide	200	7419183835	37100000	50.0	1918332635	38370000	10.0	374655645	37470000
Methoxychlor	200	1931835163	9659000	50.0	447396261	8948000	10.0	87883139	8788000
alpha-BHC	200	12483605637	62420000	50.0	3025211007	60500000	10.0	537394804	53740000
alpha-Chlordane	200	7640107622	38200000	50.0	1887960207	37760000	10.0	375398130	37540000
beta-BHC	200	4517793809	22590000	50.0	1115628170	22310000	10.0	232126410	23210000
delta-BHC	200	11016981123	55080000	50.0	2611174790	52220000	10.0	472489139	47250000
gamma-BHC	200	11050412374	55250000	50.0	2686710168	53730000	10.0	495131189	49510000
gamma-Chlordane	200	7924130406	39620000	50.0	1939337524	38790000	10.0	377127055	37710000

INITIAL CALIBRATION DATA

Login Number: L0608140
 Analytical Method: 8081A

Instrument ID: HP15
 Initial Calibration Date: 14-AUG-06 19:13
 Column ID: R

Analyte	WG219885-05			WG219885-06		
	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	4.00	107592264	26900000	1.00	26478158	26480000
4,4'-DDE	4.00	123031055	30760000	1.00	30314559	30310000
4,4'-DDT	4.00	54076889	13520000	1.00	10480146	10480000
Aldrin	4.00	155120702	38780000	1.00	39708867	39710000
Dieldrin	4.00	134070688	33520000	1.00	33684145	33680000
Endosulfan I	4.00	137157334	34290000	1.00	33177905	33180000
Endosulfan II	4.00	109799956	27450000	1.00	28201784	28200000
Endosulfan Sulfate	4.00	89610418	22400000	1.00	22769096	22770000
Endrin	4.00	86275560	21570000	1.00	22490712	22490000
Endrin Aldehyde	4.00	92878004	23220000	1.00	21189863	21190000
Endrin Ketone	4.00	109223888	27310000	1.00	26195156	26200000
Heptachlor	4.00	160155152	40040000	1.00	46725512	46730000
Heptachlor Epoxide	4.00	151002177	37750000	1.00	37135250	37140000
Methoxychlor	4.00	33061028	8265000	1.00	7584707	7585000
alpha-BHC	4.00	198219028	49550000	1.00	47324389	47320000
alpha-Chlordane	4.00	150334542	37580000	1.00	41814043	41810000
beta-BHC	4.00	94157876	23540000	1.00	23971139	23970000
delta-BHC	4.00	172411418	43100000	1.00	44766134	44770000
gamma-BHC	4.00	183906040	45980000	1.00	45072312	45070000
gamma-Chlordane	4.00	147440262	36860000	1.00	37947783	37950000

KEMRON Environmental Services
ALTERNATE SOURCE CALIBRATION REPORT

00048477

Login Number: L0608140 Run Date: 08/10/2006 Sample ID: WG219649-07
Instrument ID: HP15 Run Time: 20:29 Method: 8081A
File ID: 15G6171.F Analyst: ECL
ICal Workgroup: WG219649 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	21.0	50300000	5	ug/L	
beta-BHC	20	19.6	20300000	1.9	ug/L	
delta-BHC	20	19.9	45700000	.5	ug/L	
gamma-BHC	20	20.7	46700000	3.3	ug/L	
Heptachlor	20	20.4	44400000	1.9	ug/L	
Aldrin	20	21.3	40600000	6.4	ug/L	
Heptachlor Epoxide	20	20.2	38400000	1.2	ug/L	
Endosulfan I	20	20.1	35300000	.7	ug/L	
Dieldrin	20	21.0	38000000	5.2	ug/L	
4,4'-DDE	20	20.7	35600000	3.7	ug/L	
Endrin	20	19.9	27400000	.3	ug/L	
Endosulfan II	20	20.6	31100000	3.2	ug/L	
4,4'-DDD	20	20.8	28900000	4.2	ug/L	
Endosulfan Sulfate	20	19.6	27200000	2.2	ug/L	
4,4'-DDT	20	20.4	29700000	2.2	ug/L	
Methoxychlor	20	19.2	15500000	3.9	ug/L	
Endrin Ketone	20	19.4	33400000	2.8	ug/L	
Endrin Aldehyde	20	19.2	26200000	4.1	ug/L	
alpha-Chlordane	20	20.3	37500000	1.6	ug/L	
gamma-Chlordane	20	20.5	39500000	2.6	ug/L	

* Exceeds %D Limit

KEMRON Environmental Services
ALTERNATE SOURCE CALIBRATION REPORT

00048478

Login Number: L0608140 Run Date: 08/10/2006 Sample ID: WG219649-07
Instrument ID: HP15 Run Time: 20:58 Method: 8081A
File ID: 15G6171.R Analyst: ECL
ICal Workgroup: WG219649 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	20.8	59700000	4.1	ug/L	
beta-BHC	20	19.8	23500000	1.1	ug/L	
delta-BHC	20	19.0	50500000	5.2	ug/L	
gamma-BHC	20	20.6	54100000	2.8	ug/L	
Heptachlor	20	19.9	47000000	.7	ug/L	
Aldrin	20	20.8	45300000	4.2	ug/L	
Heptachlor Epoxide	20	19.9	40700000	.3	ug/L	
Endosulfan I	20	19.7	36400000	1.4	ug/L	
Dieldrin	20	20.6	39000000	2.8	ug/L	
4,4'-DDE	20	20.4	36200000	1.9	ug/L	
Endrin	20	19.2	29700000	3.8	ug/L	
Endosulfan II	20	19.4	29100000	3.1	ug/L	
4,4'-DDD	20	20.4	29200000	2.1	ug/L	
Endosulfan Sulfate	20	19.3	24300000	3.5	ug/L	
4,4'-DDT	20	18.3	21400000	8.6	ug/L	
Methoxychlor	20	19.3	11800000	3.3	ug/L	
Endrin Ketone	20	19.5	28100000	2.7	ug/L	
Endrin Aldehyde	20	19.1	21800000	4.4	ug/L	
alpha-Chlordane	20	19.0	43100000	5.1	ug/L	
gamma-Chlordane	20	20.1	42600000	.6	ug/L	

* Exceeds %D Limit

KEMRON Environmental Services
ALTERNATE SOURCE CALIBRATION REPORT

00048479

Login Number: L0608140 Run Date: 08/14/2006 Sample ID: WG219885-07
Instrument ID: HP15 Run Time: 19:13 Method: 8081A
File ID: 15G6254.F Analyst: ECL
ICal Workgroup: WG219885 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	21.1	52100000	5.4	ug/L	
beta-BHC	20	19.2	20900000	4	ug/L	
delta-BHC	20	19.8	46900000	1	ug/L	
gamma-BHC	20	20.4	48000000	1.9	ug/L	
Heptachlor	20	20.4	44900000	2.1	ug/L	
Aldrin	20	21.4	41900000	6.9	ug/L	
Heptachlor Epoxide	20	20.1	39500000	.7	ug/L	
Endosulfan I	20	20.2	36500000	1	ug/L	
Dieldrin	20	21.1	39200000	5.6	ug/L	
4,4'-DDE	20	20.6	36900000	3.2	ug/L	
Endrin	20	20.0	29000000	.1	ug/L	
Endosulfan II	20	20.7	32700000	3.4	ug/L	
4,4'-DDD	20	21.0	31200000	5.1	ug/L	
Endosulfan Sulfate	20	19.6	28200000	2.1	ug/L	
4,4'-DDT	20	20.6	27600000	3	ug/L	
Methoxychlor	20	19.6	14500000	2	ug/L	
Endrin Ketone	20	19.4	33600000	3	ug/L	
Endrin Aldehyde	20	19.7	26400000	1.6	ug/L	
alpha-Chlordane	20	20.3	39000000	1.5	ug/L	
gamma-Chlordane	20	20.5	40800000	2.7	ug/L	

* Exceeds %D Limit

KEMRON Environmental Services
ALTERNATE SOURCE CALIBRATION REPORT

00048480

Login Number: L0608140 Run Date: 08/14/2006 Sample ID: WG219885-07
Instrument ID: HP15 Run Time: 19:42 Method: 8081A
File ID: 15G6254.R Analvst: ECL
ICal Workgroup: WG219885 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	20.7	56900000	3.5	ug/L	
beta-BHC	20	19.4	22300000	2.8	ug/L	
delta-BHC	20	19.0	45900000	5.2	ug/L	
gamma-BHC	20	20.4	51000000	2	ug/L	
Heptachlor	20	19.4	41300000	3.2	ug/L	
Aldrin	20	20.8	42600000	4.1	ug/L	
Heptachlor Epoxide	20	20.2	38000000	1.2	ug/L	
Endosulfan I	20	20.2	33700000	1.1	ug/L	
Dieldrin	20	20.6	36000000	2.9	ug/L	
4,4'-DDE	20	20.3	34000000	1.4	ug/L	
Endrin	20	19.3	21400000	3.6	ug/L	
Endosulfan II	20	19.9	28000000	.3	ug/L	
4,4'-DDD	20	20.1	27800000	.7	ug/L	
Endosulfan Sulfate	20	19.4	22100000	2.8	ug/L	
4,4'-DDT	20	17.7	16700000	11.5	ug/L	
Methoxychlor	20	19.3	8340000	3.4	ug/L	
Endrin Ketone	20	19.0	26300000	4.9	ug/L	
Endrin Aldehyde	20	19.7	22200000	1.3	ug/L	
alpha-Chlordane	20	19.3	37000000	3.6	ug/L	
gamma-Chlordane	20	20.4	38800000	2	ug/L	

* Exceeds %D Limit

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048481

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219650-03
Instrument ID: HP15 Run Time: 01:41 Method: 8081A
File ID: 15G6182.F Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	21.4	51200000	6.8	ug/L	
beta-BHC	20	20.2	20900000	1.2	ug/L	
delta-BHC	20	21.5	49300000	7.3	ug/L	
gamma-BHC	20	21.2	48000000	6.1	ug/L	
Heptachlor	20	20.9	45600000	4.5	ug/L	
Aldrin	20	21.2	40400000	5.8	ug/L	
Heptachlor Epoxide	20	20.6	39200000	3.2	ug/L	
Endosulfan I	20	20.6	36100000	3.1	ug/L	
Dieldrin	20	21.0	37800000	4.8	ug/L	
4,4'-DDE	20	21.4	36700000	7	ug/L	
Endrin	20	22.7	31100000	13.3	ug/L	
Endosulfan II	20	20.9	31500000	4.5	ug/L	
4,4'-DDD	20	21.3	29500000	6.4	ug/L	
Endosulfan Sulfate	20	20.2	28100000	.9	ug/L	
4,4'-DDT	20	20.3	29400000	1.3	ug/L	
Methoxychlor	20	20.0	16100000	.1	ug/L	
Endrin Ketone	20	20.1	34400000	.3	ug/L	
Endrin Aldehyde	20	17.4	23700000	13.2	ug/L	
alpha-Chlordane	20	20.8	38300000	3.8	ug/L	
gamma-Chlordane	20	20.4	39300000	2.2	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048482

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219650-03
Instrument ID: HP15 Run Time: 02:09 Method: 8081A
File ID: 15G6182.R Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	20.6	59200000	3.1	ug/L	
beta-BHC	20	20.0	23800000	.2	ug/L	
delta-BHC	20	20.2	53900000	1.2	ug/L	
gamma-BHC	20	20.6	54300000	3.2	ug/L	
Heptachlor	20	20.5	48500000	2.5	ug/L	
Aldrin	20	20.2	43900000	1	ug/L	
Heptachlor Epoxide	20	19.8	40400000	.9	ug/L	
Endosulfan I	20	18.5	34200000	7.4	ug/L	
Dieldrin	20	20.0	38000000	.2	ug/L	
4,4'-DDE	20	20.4	36200000	1.9	ug/L	
Endrin	20	18.8	29100000	5.8	ug/L	
Endosulfan II	20	19.9	29900000	.6	ug/L	
4,4'-DDD	20	20.5	29300000	2.4	ug/L	
Endosulfan Sulfate	20	20.4	25700000	2.2	ug/L	
4,4'-DDT	20	18.5	21700000	7.4	ug/L	
Methoxychlor	20	20.0	12200000	.1	ug/L	
Endrin Ketone	20	20.2	29200000	1.1	ug/L	
Endrin Aldehyde	20	17.3	19700000	13.7	ug/L	
alpha-Chlordane	20	18.0	40700000	10.2	ug/L	
gamma-Chlordane	20	18.9	40100000	5.4	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048483

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219648-01
Instrument ID: HP15 Run Time: 02:09 Method: 8081A
File ID: 15G6183.F Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	250	254	347000	1.5	ug/L	
Toxaphene-2	250	223	421000	10.8	ug/L	
Toxaphene-3	250	262	790000	4.8	ug/L	
Toxaphene-4	250	250	606000	.2	ug/L	
Toxaphene-5	250	230	343000	7.8	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048484

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219648-01
Instrument ID: HP15 Run Time: 02:37 Method: 8081A
File ID: 15G6183_R Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	250	259	368000	3.5	ug/L	
Toxaphene-2	250	264	418000	5.6	ug/L	
Toxaphene-3	250	234	1030000	6.3	ug/L	
Toxaphene-4	250	254	699000	1.5	ug/L	
Toxaphene-5	250	254	328000	1.5	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048485

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219650-04
Instrument ID: HP15 Run Time: 07:20 Method: 8081A
File ID: 15G6194.F Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	10	9.67	46300000	3.3	ug/L	
beta-BHC	10	10.2	21100000	2	ug/L	
delta-BHC	10	9.98	45900000	.2	ug/L	
gamma-BHC	10	10.0	45400000	.4	ug/L	
Heptachlor	10	10.2	44700000	2.4	ug/L	
Aldrin	10	10.0	38200000	0	ug/L	
Heptachlor Epoxide	10	10.1	38500000	1.3	ug/L	
Endosulfan I	10	9.70	34000000	3	ug/L	
Dieldrin	10	9.21	33200000	7.9	ug/L	
4,4'-DDE	10	9.75	33500000	2.5	ug/L	
Endrin	10	11.0	30300000	10.5	ug/L	
Endosulfan II	10	8.96	27000000	10.4	ug/L	
4,4'-DDD	10	9.86	27400000	1.4	ug/L	
Endosulfan Sulfate	10	9.64	26800000	3.6	ug/L	
4,4'-DDT	10	8.66	25100000	13.4	ug/L	
Methoxychlor	10	9.58	15400000	4.2	ug/L	
Endrin Ketone	10	9.28	31900000	7.2	ug/L	
Endrin Aldehyde	10	9.07	24800000	9.3	ug/L	
alpha-Chlordane	10	9.40	34700000	6	ug/L	
gamma-Chlordane	10	9.82	37800000	1.8	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048486

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219650-04
Instrument ID: HP15 Run Time: 07:49 Method: 8081A
File ID: 15G6194_R Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	10	9.33	53500000	6.7	ug/L	
beta-BHC	10	9.85	23500000	1.5	ug/L	
delta-BHC	10	9.44	50300000	5.6	ug/L	
gamma-BHC	10	9.57	50300000	4.3	ug/L	
Heptachlor	10	10.1	47700000	.8	ug/L	
Aldrin	10	9.47	41100000	5.3	ug/L	
Heptachlor Epoxide	10	8.94	36400000	10.6	ug/L	
Endosulfan I	10	8.30	30700000	17	ug/L	*
Dieldrin	10	9.00	34100000	10	ug/L	
4,4'-DDE	10	9.12	32400000	8.8	ug/L	
Endrin	10	9.57	29600000	4.3	ug/L	
Endosulfan II	10	9.23	27800000	7.7	ug/L	
4,4'-DDD	10	9.72	27800000	2.8	ug/L	
Endosulfan Sulfate	10	9.62	24200000	3.8	ug/L	
4,4'-DDT	10	9.43	22100000	5.7	ug/L	
Methoxychlor	10	9.31	11400000	6.9	ug/L	
Endrin Ketone	10	9.60	27800000	4	ug/L	
Endrin Aldehyde	10	11.0	25100000	10.1	ug/L	
alpha-Chlordane	10	9.28	42100000	7.2	ug/L	
gamma-Chlordane	10	9.32	39500000	6.8	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048487

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219648-02
Instrument ID: HP15 Run Time: 07:49 Method: 8081A
File ID: 15G6195.F Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	500	505	345000	.9	ug/L	
Toxaphene-2	500	481	455000	3.8	ug/L	
Toxaphene-3	500	508	766000	1.6	ug/L	
Toxaphene-4	500	494	598000	1.2	ug/L	
Toxaphene-5	500	476	355000	4.7	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048488

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219648-02
Instrument ID: HP15 Run Time: 08:17 Method: 8081A
File ID: 15G6195.R Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	500	501	357000	.3	ug/L	
Toxaphene-2	500	538	425000	7.5	ug/L	
Toxaphene-3	500	429	943000	14.1	ug/L	
Toxaphene-4	500	453	624000	9.4	ug/L	
Toxaphene-5	500	499	322000	.2	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048489

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219650-06
Instrument ID: HP15 Run Time: 13:29 Method: 8081A
File ID: 15G6207.F Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	21.5	51700000	7.7	ug/L	
beta-BHC	20	20.5	21200000	2.7	ug/L	
delta-BHC	20	21.8	50000000	8.9	ug/L	
gamma-BHC	20	21.6	48800000	7.9	ug/L	
Heptachlor	20	21.2	46200000	5.9	ug/L	
Aldrin	20	21.1	40300000	5.6	ug/L	
Heptachlor Epoxide	20	20.6	39000000	2.9	ug/L	
Endosulfan I	20	20.4	35700000	1.8	ug/L	
Dieldrin	20	20.7	37300000	3.4	ug/L	
4,4'-DDE	20	21.3	36500000	6.3	ug/L	
Endrin	20	22.5	30800000	12.4	ug/L	
Endosulfan II	20	19.1	28900000	4.3	ug/L	
4,4'-DDD	20	20.5	28400000	2.5	ug/L	
Endosulfan Sulfate	20	19.3	26900000	3.4	ug/L	
4,4'-DDT	20	18.6	27000000	6.8	ug/L	
Methoxychlor	20	18.7	15000000	6.5	ug/L	
Endrin Ketone	20	18.8	32200000	6.2	ug/L	
Endrin Aldehyde	20	18.0	24600000	9.9	ug/L	
alpha-Chlordane	20	20.0	36900000	0	ug/L	
gamma-Chlordane	20	20.3	39100000	1.5	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048490

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219650-06
Instrument ID: HP15 Run Time: 13:58 Method: 8081A
File ID: 15G6207.R Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	19.6	56300000	1.9	ug/L	
beta-BHC	20	18.9	22500000	5.5	ug/L	
delta-BHC	20	18.9	50500000	5.3	ug/L	
gamma-BHC	20	19.6	51700000	1.8	ug/L	
Heptachlor	20	18.8	44600000	5.8	ug/L	
Aldrin	20	19.3	41800000	3.7	ug/L	
Heptachlor Epoxide	20	18.3	37300000	8.6	ug/L	
Endosulfan I	20	16.8	31000000	16.1	ug/L	*
Dieldrin	20	19.0	36100000	4.8	ug/L	
4,4'-DDE	20	19.6	34800000	2.1	ug/L	
Endrin	20	17.2	26600000	13.9	ug/L	
Endosulfan II	20	18.8	28300000	5.9	ug/L	
4,4'-DDD	20	19.9	28400000	.7	ug/L	
Endosulfan Sulfate	20	19.3	24300000	3.5	ug/L	
4,4'-DDT	20	17.9	21000000	10.3	ug/L	
Methoxychlor	20	17.3	10600000	13.4	ug/L	
Endrin Ketone	20	19.0	27500000	4.9	ug/L	
Endrin Aldehyde	20	18.7	21300000	6.7	ug/L	
alpha-Chlordane	20	17.0	38600000	14.9	ug/L	
gamma-Chlordane	20	18.0	38100000	10	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048491

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219648-03
Instrument ID: HP15 Run Time: 13:58 Method: 8081A
File ID: 15G6208.F Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	250	273	373000	9.1	ug/L	
Toxaphene-2	250	249	471000	.4	ug/L	
Toxaphene-3	250	260	784000	4	ug/L	
Toxaphene-4	250	257	622000	2.8	ug/L	
Toxaphene-5	250	223	332000	10.7	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048492

Login Number: L0608140 Run Date: 08/11/2006 Sample ID: WG219648-03
Instrument ID: HP15 Run Time: 14:26 Method: 8081A
File ID: 15G6208.R Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 10-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	250	295	419000	18	ug/L	*
Toxaphene-2	250	263	415000	5	ug/L	
Toxaphene-3	250	243	1070000	2.8	ug/L	
Toxaphene-4	250	245	674000	2.1	ug/L	
Toxaphene-5	250	244	315000	2.6	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048493

Login Number: L0608140 Run Date: 08/14/2006 Sample ID: WG219886-02
Instrument ID: HP15 Run Time: 22:32 Method: 8081A
File ID: 15G6261.F Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	20.6	50900000	2.8	ug/L	
beta-BHC	20	19.0	20700000	5	ug/L	
delta-BHC	20	20.7	49000000	3.5	ug/L	
gamma-BHC	20	20.1	47400000	.7	ug/L	
Heptachlor	20	20.2	44500000	1.1	ug/L	
Aldrin	20	20.3	39900000	1.7	ug/L	
Heptachlor Epoxide	20	19.9	39000000	.7	ug/L	
Endosulfan I	20	20.0	36100000	0	ug/L	
Dieldrin	20	20.2	37500000	.9	ug/L	
4,4'-DDE	20	20.4	36500000	2.1	ug/L	
Endrin	20	20.2	29300000	1	ug/L	
Endosulfan II	20	20.1	31700000	.4	ug/L	
4,4'-DDD	20	20.4	30300000	2.1	ug/L	
Endosulfan Sulfate	20	19.4	28000000	2.8	ug/L	
4,4'-DDT	20	20.9	28000000	4.5	ug/L	
Methoxychlor	20	20.0	14800000	.2	ug/L	
Endrin Ketone	20	19.9	34600000	.3	ug/L	
Endrin Aldehyde	20	19.9	26700000	.7	ug/L	
alpha-Chlordane	20	19.9	38200000	.5	ug/L	
gamma-Chlordane	20	19.7	39100000	1.5	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048494

Login Number: L0608140 Run Date: 08/14/2006 Sample ID: WG219886-02
Instrument ID: HP15 Run Time: 23:00 Method: 8081A
File ID: 15G6261.R Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
alpha-BHC	20	20.2	55500000	1.1	ug/L	
beta-BHC	20	19.3	22100000	3.7	ug/L	
delta-BHC	20	19.8	47900000	1	ug/L	
gamma-BHC	20	20.0	49900000	.1	ug/L	
Heptachlor	20	18.9	40300000	5.5	ug/L	
Aldrin	20	19.8	40500000	1.1	ug/L	
Heptachlor Epoxide	20	19.7	37000000	1.5	ug/L	
Endosulfan I	20	20.0	33300000	.1	ug/L	
Dieldrin	20	19.8	34500000	1.2	ug/L	
4,4'-DDE	20	20.0	33500000	.1	ug/L	
Endrin	20	18.2	20200000	9.1	ug/L	
Endosulfan II	20	19.7	27700000	1.3	ug/L	
4,4'-DDD	20	19.9	27500000	.6	ug/L	
Endosulfan Sulfate	20	19.6	22300000	2	ug/L	
4,4'-DDT	20	17.9	17000000	10.4	ug/L	
Methoxychlor	20	19.8	8550000	.9	ug/L	
Endrin Ketone	20	19.8	27400000	.8	ug/L	
Endrin Aldehyde	20	20.5	23100000	2.7	ug/L	
alpha-Chlordane	20	18.9	36300000	5.3	ug/L	
gamma-Chlordane	20	19.4	37000000	2.8	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048495

Login Number: L0608140 Run Date: 08/14/2006 Sample ID: WG219884-01
Instrument ID: HP15 Run Time: 23:00 Method: 8081A
File ID: 15G6262.F Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	250	510	701000	104	ug/L	*
Toxaphene-2	250	545	975000	118	ug/L	*
Toxaphene-3	250	513	1520000	105.3	ug/L	*
Toxaphene-4	250	508	1210000	103.1	ug/L	*
Toxaphene-5	250	519	689000	107.5	ug/L	*

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048496

Login Number: L0608140 Run Date: 08/14/2006 Sample ID: WG219884-01
Instrument ID: HP15 Run Time: 23:28 Method: 8081A
File ID: 15G6262.R Analyst: ECL
Workgroup (AAB#): WG219418 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	250	519	728000	107.5	ug/L	*
Toxaphene-2	250	557	629000	122.9	ug/L	*
Toxaphene-3	250	553	1830000	121.2	ug/L	*
Toxaphene-4	250	558	1050000	123.3	ug/L	*
Toxaphene-5	250	549	541000	119.5	ug/L	*

* Exceeds %D Criteria

KEMRON Environmental Services
Data Checklist

Date: 04-AUG-2006
Analyst: ECL
Analyst: NA
Method: 8151
Instrument: HP15
Curve Workgroup: WG219134
Runlog ID: 11605
Analytical Workgroups: L0607643, L0608060, L0608024

System Performance Check	NA
DFTPP	NA
Endrin/DDT Breakdown	NA
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	NA
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	NA
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	NA
Surrogates	X
Internal Standards Criteria	NA
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	NA
Manual Integrations	X
Case Narrative	NA
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	ECL
Secondary Reviewer	MDC
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	NA
Check the reasonableness of the results	X

Primary Reviewer:
07-AUG-2006

Secondary Reviewer:
07-AUG-2006

Generated: AUG-07-2006 10:26:04

00048498

KEMRON Environmental Services
Data Checklist

Date: 08-AUG-2006
Analyst: ECL
Analyst: NA
Method: 8151
Instrument: HP15
Curve Workgroup: NA
Runlog ID: 11658
Analytical Workgroups: L0607618, L0607603, L0607647, L0608162, L0608069, L0608140

System Performance Check	NA
DFIPP	NA
Endrin/DDT Breakdown	NA
Initial Calibration	NA
Average RF	NA
Linear Reg or Higher Order Curve	NA
Second Source standard % Difference	NA
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	NA
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	NA
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	ECL
Secondary Reviewer	MDC
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X
COMMENTS: SAMPLE L0607603-04 NEEDS REEXTRACTED.	

Primary Reviewer:
09-AUG-2006

Secondary Reviewer:
09-AUG-2006

Generated: AUG-09-2006 13:44:59

KEMRON Environmental Services
Instrument Run Log

Instrument: HP15 Dataset: 080406
Analyst1: ECL Analyst2: NA
Method: 8151 SOP: GCS04 Rev: 7

Maintenance Log ID: 15045

Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2
Workgroups: _____
Internal Standard: NA Surrogate Standard: NA

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15G6055.F	WG219134-01 HERB ICAL W5	1	1	STD14225	08/04/06 11:38
2	15G6055.R	WG219134-01 HERB ICAL W5	1	1	STD14225	08/04/06 12:04
3	15G6056.F	WG219134-02 HERB ICAL W4	1	1	STD14225	08/04/06 12:04
4	15G6056.R	WG219134-02 HERB ICAL W4	1	1	STD14225	08/04/06 12:31
5	15G6057.F	WG219134-03 HERB ICAL W3	1	1	STD14225	08/04/06 12:31
6	15G6057.R	WG219134-03 HERB ICAL W3	1	1	STD14225	08/04/06 12:58
7	15G6058.F	WG219134-04 HERB ICAL W2	1	1	STD14225	08/04/06 12:58
8	15G6058.R	WG219134-04 HERB ICAL W2	1	1	STD14225	08/04/06 13:24
9	15G6059.F	WG219134-05 HERB ICAL W1	1	1	STD14225	08/04/06 13:24
10	15G6059.R	WG219134-05 HERB ICAL W1	1	1	STD14225	08/04/06 13:51
11	15G6060.F	WG219134-06 HERB ALT	1	1	SOS78-25	08/04/06 13:51
12	15G6060.R	WG219134-06 HERB ALT	1	1	SOS78-25	08/04/06 14:18
13	15G6061.F	WG218999-01 BLANK V264 P123	1	1		08/04/06 14:18
14	15G6061.R	WG218999-01 BLANK V264 P123	1	1		08/04/06 14:44
15	15G6062.F	WG218999-02 LCS V264 P123	1	1		08/04/06 14:44
16	15G6062.R	WG218999-02 LCS V264 P123	1	1		08/04/06 15:11
17	15G6063.F	WG218999-03 LCS DUP V264 P123	1	1		08/04/06 15:11
18	15G6063.R	WG218999-03 LCS DUP V264 P123	1	1		08/04/06 15:38
19	15G6064.F	L0608060-01	1	1		08/04/06 15:38
20	15G6064.R	L0608060-01	1	1		08/04/06 16:04
21	15G6065.F	L0608060-02	1	1		08/04/06 16:04
22	15G6065.R	L0608060-02	1	1		08/04/06 16:31
23	15G6066.F	L0608060-03	1	1		08/04/06 16:31
24	15G6066.R	L0608060-03	1	1		08/04/06 16:58
25	15G6067.F	L0608060-04	1	1		08/04/06 16:58
26	15G6067.R	L0608060-04	1	1		08/04/06 17:24
27	15G6068.F	L0608060-05	1	1		08/04/06 17:24
28	15G6068.R	L0608060-05	1	1		08/04/06 17:51
29	15G6069.F	L0608060-06	1	1		08/04/06 17:51
30	15G6069.R	L0608060-06	1	1		08/04/06 18:18
31	15G6070.F	L0608060-07	1	1		08/04/06 18:18
32	15G6070.R	L0608060-07	1	1		08/04/06 18:45
33	15G6071.F	WG219135-01 HERB CCV	1	1	STD14225	08/04/06 18:45
34	15G6071.R	WG219135-01 HERB CCV	1	1	STD14225	08/04/06 19:11
35	15G6072.F	WG219134-06 HERB ALT	1	1	SOS78-25	08/04/06 19:11

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Approved: 07-AUG-06



00048500

KEMRON Environmental Services Instrument Run Log

Instrument: HP15 Dataset: 080406
Analyst1: ECL Analyst2: NA
Method: 8151 SOP: GCS04 Rev: 7

Maintenance Log ID: 15045

Column 1 ID: RTX-CLP

Column 2 ID: RTX-CLP2

Workgroups:

Internal Standard: NA

Surrogate Standard: NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
36	15G6072.R	WG219134-06 HERB ALT	1	1	SOS78-25	08/04/06 19:38
37	15G6073.F	L0607643-01	1	1		08/04/06 19:38
38	15G6073.R	L0607643-01	1	1		08/04/06 20:04
39	15G6074.F	LCS CHECK V264 P123	1	1		08/04/06 20:04
40	15G6074.R	LCS CHECK V264 P123	1	1		08/04/06 20:31
41	15G6075.F	WG218935-02 BLANK V265 P93	7	1	SOIL	08/04/06 20:31
42	15G6075.R	WG218935-02 BLANK V265 P93	7	1	SOIL	08/04/06 20:57
43	15G6076.F	WG218935-03 LCS V265 P93	7	1	SOIL	08/04/06 20:57
44	15G6076.R	WG218935-03 LCS V265 P93	7	1	SOIL	08/04/06 21:24
45	15G6077.F	WG218879-01 BLANK V265 P89	7	1	SOIL	08/04/06 21:24
46	15G6077.R	WG218879-01 BLANK V265 P89	7	1	SOIL	08/04/06 21:51
47	15G6078.F	WG218879-02 LCS V265 P89	7	1	SOIL	08/04/06 21:51
48	15G6078.R	WG218879-02 LCS V265 P89	7	1	SOIL	08/04/06 22:18
49	15G6079.F	WG218879-03 LCS DUP V265 P89	7	1	SOIL	08/04/06 22:18
50	15G6079.R	WG218879-03 LCS DUP V265 P89	7	1	SOIL	08/04/06 22:44
51	15G6080.F	LCS CHECK V265 P93	1	1		08/04/06 22:44
52	15G6080.R	LCS CHECK V265 P93	1	1		08/04/06 23:11
53	15G6081.F	L0608024-01 5x	7	5	SOIL	08/04/06 23:11
54	15G6081.R	L0608024-01 5x	7	5	SOIL	08/04/06 23:38
55	15G6082.F	WG219135-02 HERB CCV	1	1	STD14225	08/04/06 23:38
56	15G6082.R	WG219135-02 HERB CCV	1	1	STD14225	08/05/06 00:04
57	15G6083.F	L0608024-02 10x	7	10	SOIL	08/05/06 00:04
58	15G6083.R	L0608024-02 10x	7	10	SOIL	08/05/06 00:31
59	15G6084.F	L0608024-03 10x	7	10	SOIL	08/05/06 00:31
60	15G6084.R	L0608024-03 10x	7	10	SOIL	08/05/06 00:58
61	15G6085.F	L0608024-04 10x	7	10	SOIL	08/05/06 00:58
62	15G6085.R	L0608024-04 10x	7	10	SOIL	08/05/06 01:24
63	15G6086.F	L0608024-05 20x	7	20	SOIL	08/05/06 01:24
64	15G6086.R	L0608024-05 20x	7	20	SOIL	08/05/06 01:51
65	15G6087.F	L0608024-06 5x	7	5	SOIL	08/05/06 01:51
66	15G6087.R	L0608024-06 5x	7	5	SOIL	08/05/06 02:18
67	15G6088.F	WG218935-01 L0608024-07 5x	7	5	SOIL	08/05/06 02:18
68	15G6088.R	WG218935-01 L0608024-07 5x	7	5	SOIL	08/05/06 02:44
69	15G6089.F	WG218935-04 L0608024-08 MS 5x	7	5	SOIL	08/05/06 02:44
70	15G6089.R	WG218935-04 L0608024-08 MS 5x	7	5	SOIL	08/05/06 03:11
71	15G6090.F	WG218935-05 L0608024-09 MSD 5x	7	5	SOIL	08/05/06 03:11
72	15G6090.R	WG218935-05 L0608024-09 MSD 5x	7	5	SOIL	08/05/06 03:38

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Approved: 07-AUG-06



00048501

KEMRON Environmental Services Instrument Run Log

Instrument: HP15 Dataset: 080406
 Analyst1: ECL Analyst2: NA
 Method: 8151 SOP: GCS04 Rev: 7

Maintenance Log ID: 15045

Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2

Workgroups: _____

Internal Standard: NA Surrogate Standard: NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
73	15G6091.F	L0608024-10 20x	7	20	SOIL	08/05/06 03:38
74	15G6091.R	L0608024-10 20x	7	20	SOIL	08/05/06 04:04
75	15G6092.F	L0608024-11 5x	7	5	SOIL	08/05/06 04:04
76	15G6092.R	L0608024-11 5x	7	5	SOIL	08/05/06 04:31
77	15G6093.F	WG219135-03 HERB CCV	1	1	STD14225	08/05/06 04:31
78	15G6093.R	WG219135-03 HERB CCV	1	1	STD14225	08/05/06 04:58

Comments

Seq.	Rerun	Dil.	Reason	Analytes
11				
			NEEDS RERUN.	
61				
			L0608024-04: DCAA surrogate failed high.	
77				
			2,4,5-T failed low on the rear column.	

Michael Cohen

00048502

KEMRON Environmental Services Instrument Run Log

Instrument: HP15 Dataset: 080806
Analyst1: ECL Analyst2: NA
Method: 8151 SOP: GCS04 Rev: 7

Maintenance Log ID: 15091

Column 1 ID: RTX-CLP

Column 2 ID: RTX-CLP2

Workgroups:

Internal Standard: NA

Surrogate Standard: NA

Comments: SAMPLE L0607603-04 NEEDS REEXTRACTED.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15G6116.F	WG219439-01 HERB CCV	1	1	STD14225	08/08/06 14:51
2	15G6116.R	WG219439-01 HERB CCV	1	1	STD14225	08/08/06 15:17
3	15G6117.F	L0607647-02 20x	7	20	SOIL	08/08/06 16:44
4	15G6117.R	L0607647-02 20x	7	20	SOIL	08/08/06 17:10
5	15G6118.F	L0607647-03 20x	7	20	SOIL	08/08/06 17:10
6	15G6118.R	L0607647-03 20x	7	20	SOIL	08/08/06 17:36
7	15G6119.F	WG219341-01 BLANK V264 P141	1	1		08/08/06 17:36
8	15G6119.R	WG219341-01 BLANK V264 P141	1	1		08/08/06 18:03
9	15G6120.F	WG219341-02 LCS V264 P141	1	1		08/08/06 18:03
10	15G6120.R	WG219341-02 LCS V264 P141	1	1		08/08/06 18:30
11	15G6121.F	WG219341-03 LCS DUP V264 P141	1	1		08/08/06 18:30
12	15G6121.R	WG219341-03 LCS DUP V264 P141	1	1		08/08/06 18:56
13	15G6122.F	L0608162-01	17	1		08/08/06 18:56
14	15G6122.R	L0608162-01	17	1		08/08/06 19:23
15	15G6123.F	L0607618-02	17	1		08/08/06 19:23
16	15G6123.R	L0607618-02	17	1		08/08/06 19:49
17	15G6124.F	L0607618-03	17	1		08/08/06 19:49
18	15G6124.R	L0607618-03	17	1		08/08/06 20:16
19	15G6125.F	L0607618-04	17	1		08/08/06 20:16
20	15G6125.R	L0607618-04	17	1		08/08/06 20:42
21	15G6126.F	WG219350-01 FBLANK 8/7	17	1		08/08/06 20:42
22	15G6126.R	WG219350-01 FBLANK 8/7	17	1		08/08/06 21:09
23	15G6127.F	WG219439-02 HERB CCV	1	1	STD14225	08/08/06 21:09
24	15G6127.R	WG219439-02 HERB CCV	1	1	STD14225	08/08/06 21:35
25	15G6128.F	L0608069-01	1	1		08/08/06 21:35
26	15G6128.R	L0608069-01	1	1		08/08/06 22:02
27	15G6129.F	WG219236-01 BLANK V265 P121	7	1	SOIL	08/08/06 22:02
28	15G6129.R	WG219236-01 BLANK V265 P121	7	1	SOIL	08/08/06 22:28
29	15G6130.F	WG219236-02 LCS V265 P121	7	1	SOIL	08/08/06 22:28
30	15G6130.R	WG219236-02 LCS V265 P121	7	1	SOIL	08/08/06 22:55
31	15G6131.F	WG219236-03 LCS DUP V265 P121	7	1	SOIL	08/08/06 22:55
32	15G6131.R	WG219236-03 LCS DUP V265 P121	7	1	SOIL	08/08/06 23:22
33	15G6132.F	L0607603-04	7	1	SOIL	08/08/06 23:22
34	15G6132.R	L0607603-04	7	1	SOIL	08/08/06 23:48
35	15G6133.F	L0607603-04 10x	7	10	SOIL	08/08/06 23:48

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Approved: 09-AUG-06



00048503

KEMRON Environmental Services Instrument Run Log

Instrument: HP15 Dataset: 080806
 Analyst1: ECL Analyst2: NA
 Method: 8151 SOP: GCS04 Rev: 7

Maintenance Log ID: 15091Column 1 ID: RTX-CLPColumn 2 ID: RTX-CLP2

Workgroups: _____

Internal Standard: NASurrogate Standard: NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
36	15G6133.R	L0607603-04 10x	7	10	SOIL	08/09/06 00:15
37	15G6134.F	L0608140-01	7	1	SOIL	08/09/06 00:15
38	15G6134.R	L0608140-01	7	1	SOIL	08/09/06 00:42
39	15G6135.F	L0608140-02	7	1	SOIL	08/09/06 00:42
40	15G6135.R	L0608140-02	7	1	SOIL	08/09/06 01:08
41	15G6136.F	L0608140-03 10x	7	10	SOIL	08/09/06 01:08
42	15G6136.R	L0608140-03 10x	7	10	SOIL	08/09/06 01:34
43	15G6137.F	L0608140-04	7	1	SOIL	08/09/06 01:34
44	15G6137.R	L0608140-04	7	1	SOIL	08/09/06 02:01
45	15G6138.F	WG219439-03 HERB CCV	1	1	STD14225	08/09/06 02:01
46	15G6138.R	WG219439-03 HERB CCV	1	1	STD14225	08/09/06 02:28
47	15G6139.F	L0608140-05 5x	7	5	SOIL	08/09/06 02:28
48	15G6139.R	L0608140-05 5x	7	5	SOIL	08/09/06 02:55
49	15G6140.F	L0608140-06	7	1	SOIL	08/09/06 02:55
50	15G6140.R	L0608140-06	7	1	SOIL	08/09/06 03:22
51	15G6141.F	L0608140-07 5x	7	5	SOIL	08/09/06 03:22
52	15G6141.R	L0608140-07 5x	7	5	SOIL	08/09/06 03:48
53	15G6142.F	L0608140-08	7	1	SOIL	08/09/06 03:48
54	15G6142.R	L0608140-08	7	1	SOIL	08/09/06 04:14
55	15G6143.F	L0608140-09	7	1	SOIL	08/09/06 04:14
56	15G6143.R	L0608140-09	7	1	SOIL	08/09/06 04:41
57	15G6144.F	L0608140-10	7	1	SOIL	08/09/06 04:41
58	15G6144.R	L0608140-10	7	1	SOIL	08/09/06 05:08
59	15G6145.F	L0608140-11	7	1	SOIL	08/09/06 05:08
60	15G6145.R	L0608140-11	7	1	SOIL	08/09/06 05:34
61	15G6146.F	L0608140-12	7	1	SOIL	08/09/06 05:34
62	15G6146.R	L0608140-12	7	1	SOIL	08/09/06 06:01
63	15G6147.F	L0608140-13 5x	7	5	SOIL	08/09/06 06:01
64	15G6147.R	L0608140-13 5x	7	5	SOIL	08/09/06 06:27
65	15G6148.F	L0608140-14	7	1	SOIL	08/09/06 06:27
66	15G6148.R	L0608140-14	7	1	SOIL	08/09/06 06:54
67	15G6149.F	WG219439-04 HERB CCV	1	1	STD14225	08/09/06 06:54
68	15G6149.R	WG219439-04 HERB CCV	1	1	STD14225	08/09/06 07:21
69	15G6150.F	L0608140-15	7	1	SOIL	08/09/06 07:21
70	15G6150.R	L0608140-15	7	1	SOIL	08/09/06 07:47
71	15G6151.F	L0608140-16 5x	7	5	SOIL	08/09/06 07:47
72	15G6151.R	L0608140-16 5x	7	5	SOIL	08/09/06 08:14

Page: 2 of 3

Approved: 09-AUG-06



KEMRON Environmental Services
Instrument Run Log

Instrument: HP15 Dataset: 080806
Analyst1: ECL Analyst2: NA
Method: 8151 SOP: GCS04 Rev: 7

Maintenance Log ID: 15091

Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2
Workgroups: _____
Internal Standard: NA Surrogate Standard: NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
73	15G6152.F	L0608140-17 5x	7	5	SOIL	08/09/06 08:14
74	15G6152.R	L0608140-17 5x	7	5	SOIL	08/09/06 08:41
75	15G6153.F	L0608140-18	7	1	SOIL	08/09/06 08:41
76	15G6153.R	L0608140-18	7	1	SOIL	08/09/06 09:07
77	15G6154.F	WG219439-05 HERB CCV	1	1	STD14225	08/09/06 09:07
78	15G6154.R	WG219439-05 HERB CCV	1	1	STD14225	08/09/06 09:34
79	15G6155.F	ELAB HEB SURROGATE	1	1	STD14264	08/09/06 09:34
80	15G6155.R	ELAB HEB SURROGATE	1	1	STD14264	08/09/06 10:00

Comments

Seq.	Rerun	Dil.	Reason	Analytes
33				
L0607603-04: DCAA surrogate failed low. NEEDS REEXTRACTED.				



Parameter: Herb-S SOP #: EX402 Revision #: 14
 Extraction Analyst(s): 22, CPO TV/KD Analyst(s): CAD
 Date/Time Extracted: 08-07-06 @ 07:30 Date TV/KD: 8-8-06
 Spike/Surrogate Analyst: CSH Witness: CAD
 Surrogate #: STD13588 Earliest Hold Date: 8/16
 Spike #: A = STD13977 Spike #: B = —

Extraction Work Group WG 2A236

Extract Relinquished By: CSH
 Extract Received By & Date: 8/8/06

	Sample ID	Test Code	pH /			Initial Vol / Wt	Amount Surrogate	Amount Spike	Final Volume	Extract Color	Emulsions /			Comments
			<2	N	>12						A	BN	N	
1	Blank		✓			50.00g	1ml		10ml	T				WG 219236-01
2	LCS		✓			1		1ml		1				WG 1 02
3	LCS Dup		✓			1		1		1				03
4	07-603-04	8151	✓			30.00g				C				Lot # 1055-723
5	08-140-01		✓			50.01				1				
6	-02		✓			50.14				T				
7	-03		✓			50.12				C				
8	-04		✓			50.18g				1				
9	-05		✓			50.19g				1				
10	-06		✓			50.61g				T				
11	-07		✓			50.21g				C				
12	-08		✓			50.36g				1				
13	-09		✓			50.28g				1				
14	-10		✓			50.60g				1				
15	-11		✓			50.28g				1				
16	-12		✓			50.96				1				
17	-13		✓			50.71g				T				
18	-14		✓			50.55g				T				
19	-15		✓			50.15g				C				
20	-16		✓			50.28g				1				
21	-17		✓			50.78g				1				
22	-18		✓			50.81g				C				
23							CSH 8-8-06							
24														

Methylene Chloride Lot #: —Hexane Lot #: C01E95Ether Lot #: C15465Methanol Lot #: C09E30Solvent: Acetone Lot #: B52E24Reagent: Isn Octane Lot #: B39588Reagent: Diaz Lot #: R6T10Y84Reagent: Sand Lot #: C02614Acid: Con HCl Lot #: R6T10225Florisil Lot #: —Silica Gel Lot #: —IR Analyst / Date / Time: —Dried Na₂SO₄ Lot #: Acidified: R6T10491

Color Code

T = Transparent

C = Colored

O = Opaque

SW-846 Method

		On	Off	On	Off
Continuous	3520C				
Soxhlet	3540C				
ASE*	3545				
Sep Funnel	3510C	✓			
Sonication	3550B				
Waste	3580A				

* Accelerated Solvent Extractor (ASE)

Clean-ups			
Florisil 3620B		GPC 3640A	
Silica Gel 3630C		Other	✓
Acid 3665A		N/A	
Sulfur 3660B			

Peer Reviewed By: Cheryl FlomenDate: 8-08-06

Extraction Notes For Volume # 265 Page # 121

General Comments:	<u>SX 07-603-04 in a PE, Lot # D055-723</u>

Extraction Anomalies:	<u>NONE</u>

Concentration Anomalies:	<u>NONE</u>

Clean-Up Anomalies:	<u>NONE</u>

Supervisor Review: _____ Date: _____

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00048507

Analytical Method: 8151A
Login Number: L0608140

AAB#: WG219442

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
59-SB-01-01	08/02/06	08/04/06	08/07/06	14	4.76	08/09/06	40	1.70	
59-SB-01-02	08/02/06	08/04/06	08/07/06	14	4.75	08/09/06	40	1.72	
59-SB-02-01	08/02/06	08/04/06	08/07/06	14	4.74	08/09/06	40	1.73	
59-SB-02-02	08/02/06	08/04/06	08/07/06	14	4.73	08/09/06	40	1.75	
59-SB-03-01	08/02/06	08/04/06	08/07/06	14	4.72	08/09/06	40	1.79	
59-SB-03-02	08/02/06	08/04/06	08/07/06	14	4.71	08/09/06	40	1.81	
59-SB-04-01	08/02/06	08/04/06	08/07/06	14	4.70	08/09/06	40	1.83	
59-SB-04-02	08/02/06	08/04/06	08/07/06	14	4.69	08/09/06	40	1.85	
59-SB-04-02QC	08/02/06	08/04/06	08/07/06	14	4.69	08/09/06	40	1.86	
59-SB-05-01	08/03/06	08/04/06	08/07/06	14	3.97	08/09/06	40	1.88	
59-SB-05-01	08/03/06	08/04/06	08/07/06	14	3.97	08/09/06	40	1.90	
59-SB-05-02	08/03/06	08/04/06	08/07/06	14	3.97	08/09/06	40	1.90	
59-SB-08-01	08/03/06	08/04/06	08/07/06	14	3.95	08/09/06	40	1.92	
59-SB-08-01	08/03/06	08/04/06	08/07/06	14	3.95	08/09/06	40	1.94	
59-SB-07-01	08/03/06	08/04/06	08/07/06	14	3.93	08/09/06	40	1.94	
59-SB-08-02	08/03/06	08/04/06	08/07/06	14	3.95	08/09/06	40	1.96	
59-SB-07-02	08/03/06	08/04/06	08/07/06	14	3.92	08/09/06	40	1.99	
59-SB-06-01	08/03/06	08/04/06	08/07/06	14	3.90	08/09/06	40	2.01	
59-SB-06-01QC	08/03/06	08/04/06	08/07/06	14	3.90	08/09/06	40	2.03	
59-SB-06-02	08/03/06	08/04/06	08/07/06	14	3.89	08/09/06	40	2.05	

* EXT = SEE PROJECT QAPP REQUIREMENTS
* ANAL = SEE PROJECT QAPP REQUIREMENTS

SURROGATE STANDARDS

Login Number: L0608140

Instrument Id: HP15

Workgroup (AAB#): WG219442

Method: 8151

CAL ID: HP15-04-AUG-06

Matrix: SOLID

Sample Number	Dilution	Tag	1
L0608140-01	1.00	01	34.2
L0608140-02	1.00	01	52.1
L0608140-03	10.0	DL01	70.7
L0608140-04	1.00	01	35.1
L0608140-05	5.00	DL01	53.7
L0608140-06	1.00	01	52.0
L0608140-07	5.00	DL01	27.8
L0608140-08	1.00	01	47.6
L0608140-09	1.00	01	57.0
L0608140-10	1.00	01	45.3
L0608140-10	1.00	CF1	47.9
L0608140-11	1.00	01	50.4
L0608140-12	1.00	01	91.6
L0608140-12	1.00	CF1	50.0
L0608140-13	5.00	DL01	80.9
L0608140-14	1.00	01	42.9
L0608140-15	1.00	01	58.6
L0608140-16	5.00	DL01	60.5
L0608140-17	5.00	DL01	74.7
L0608140-18	1.00	01	70.0
WG219236-01	1.00	01	28.1
WG219236-01	1.00	02	29.0
WG219236-02	1.00	01	28.8
WG219236-02	1.00	02	31.0
WG219236-03	1.00	01	36.5
WG219236-03	1.00	02	38.6

Surrogates

Surrogate Limits

1 - 2,4-Dichlorophenylacetic acid 25 - 110

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

METHOD BLANK SUMMARY

Login Number: L0608140
 Blank File ID: 15G6129.F
 Date Analyzed: 08/08/06
 Time Analyzed: 22:02
 Analyst: ECL

Work Group: WG219442
 Blank Sample ID: WG219236-01
 Instrument ID: HP15
 Method: 8151A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG219236-02	15G6130.F	08/08/06 22:28	01
LCS2	WG219236-03	15G6131.F	08/08/06 22:55	01
59-SB-01-01	L0608140-01	15G6134.F	08/09/06 00:15	01
59-SB-01-02	L0608140-02	15G6135.F	08/09/06 00:42	01
59-SB-02-01	L0608140-03	15G6136.F	08/09/06 01:08	DL01
59-SB-02-02	L0608140-04	15G6137.F	08/09/06 01:34	01
59-SB-03-01	L0608140-05	15G6139.F	08/09/06 02:28	DL01
59-SB-03-02	L0608140-06	15G6140.F	08/09/06 02:55	01
59-SB-04-01	L0608140-07	15G6141.F	08/09/06 03:22	DL01
59-SB-04-02	L0608140-08	15G6142.F	08/09/06 03:48	01
59-SB-04-02QC	L0608140-09	15G6143.F	08/09/06 04:14	01
59-SB-05-01	L0608140-10	15G6144.F	08/09/06 04:41	01
59-SB-05-02	L0608140-11	15G6145.F	08/09/06 05:08	01
59-SB-08-01	L0608140-12	15G6146.F	08/09/06 05:34	01
59-SB-07-01	L0608140-13	15G6147.F	08/09/06 06:01	DL01
59-SB-08-02	L0608140-14	15G6148.F	08/09/06 06:27	01
59-SB-07-02	L0608140-15	15G6150.F	08/09/06 07:21	01
59-SB-06-01	L0608140-16	15G6151.F	08/09/06 07:47	DL01
59-SB-06-01QC	L0608140-17	15G6152.F	08/09/06 08:14	DL01
59-SB-06-02	L0608140-18	15G6153.F	08/09/06 08:41	01

METHOD BLANK SUMMARY

Login Number: L0608140 _____ Work Group: WG219442 _____
Blank File ID: 15G6129.R _____ Blank Sample ID: WG219236-01 _____
Date Analyzed: 08/08/06 _____ Instrument ID: HP15 _____
Time Analyzed: 22:28 _____ Method: 8151A _____
Analyst: ECL _____

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG219236-02	15G6130.R	08/08/06 22:55	02
LCS2	WG219236-03	15G6131.R	08/08/06 23:22	02
59-SB-05-01	L0608140-10	15G6144.R	08/09/06 05:08	CF1
59-SB-08-01	L0608140-12	15G6146.R	08/09/06 06:01	CF1

METHOD BLANK REPORT

00048511

Login Number: L0608140 Run Date: 08/08/2006 Sample ID: WG219236-01
 Instrument ID: HP15 Run Time: 22:02 Prep Method: METHOD
 File ID: 15G6129.F Analyst: ECL Method: 8151A
 Workgroup (AAB#): WG219442 Matrix: Solid Units: ug/kg
 Contract #: DACA56-94-D-0020 Cal ID: HP15-04-AUG-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
2,4-D	20.0	40.0	20.0	1	U
2,4-DE	20.0	40.0	20.0	1	U
2,4,5-T	2.00	4.00	2.00	1	U
2,4,5-TP (Silvex)	1.50	3.00	1.50	1	U
Dalapon	50.0	100	50.0	1	U
Dicamba	2.00	4.00	2.00	1	U
Dichloroprop	20.0	40.0	20.0	1	U
Dinoseb	10.0	20.0	10.0	1	U
MCPA	2000	4000	2000	1	U
MCPP	2000	4000	2000	1	U
Pentachlorophenol	2.00	4.00	2.00	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4-Dichlorophenylacetic acid	28.1	25 - 110	PASS

MDL Method Detection Limit

RL Reporting/quantitation Limit

* Analyte concentration > RL

Login Number: L0608140 Run Date: 08/08/2006 Sample ID: WG219236-01
Instrument ID: HP15 Run Time: 22:28 Prep Method: METHOD
File ID: 15G6129.R Analyst: ECL Method: 8151A
Workgroup (AAB#): WG219442 Matrix: Solid Units: ug/kg
Contract #: DACA56-94-D-0020 Cal ID: HP15-04-AUG-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
2,4-D	20.0	40.0	20.0	1	U
2,4-DB	20.0	40.0	20.0	1	U
2,4,5-T	2.00	4.00	2.00	1	U
2,4,5-TP (Silvex)	1.50	3.00	1.50	1	U
Dalapon	50.0	100	50.0	1	U
Dicamba	2.00	4.00	2.00	1	U
Dichloroprop	20.0	40.0	20.0	1	U
Dinoseb	10.0	20.0	10.0	1	U
MCPA	2000	4000	2000	1	U
MCPP	2000	4000	2000	1	U
Pentachlorophenol	2.00	4.00	2.00	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4-Dichlorophenylacetic acid	29.0	25 - 110	PASS

MDL Method Detection Limit

RL Reporting/quantitation Limit

* Analyte concentration > RL

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0608140 Analyst: ECL Prep Method: METHOD
 Instrument ID: HP15 Matrix: Soil Method: 8151A
 Workgroup (AAB#): WG219442 Units: ug/kg
 Sample ID: WG219236-02 LCS File ID: 15G6130.F Run Date: 08/08/2006 22:28
 Sample ID: WG219236-03 LCS2 File ID: 15G6131.F Run Date: 08/08/2006 22:55

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
2,4-D	100	50.4	50.4	100	48.4	48.4	4.16	32 - 132	50	
2,4-DB	100	63.8	63.8	100	61.3	61.3	4.09	29 - 134	50	
2,4,5-T	10.0	4.50	45.0	10.0	4.75	47.5	5.45	20 - 144	50	
2,4,5-TP (Silvex)	10.0	3.88	38.8	10.0	3.93	39.3	1.23	31 - 132	50	
Dalapon	250	26.0	10.4	250	27.6	11.0	5.79	10 - 99	50	
Dicamba	10.0	4.68	46.8	10.0	4.96	49.6	5.81	33 - 146	50	
Dichloroprop	100	46.5	46.5	100	45.4	45.4	2.22	35 - 139	50	
Dinoseb	50.0	14.4	28.8	50.0	12.8	25.7	11.5	20 - 120	50	
MCPA	10000	3420	34.2	10000	3720	37.2	8.45	20 - 120	50	
MCPP	10000	2800	28.0	10000	2700	27.0	3.64	20 - 120	50	
Pentachlorophenol	10.0	4.39	43.9	10.0	3.75	37.5	15.8	31 - 132	50	

Surogates	LCS	LCS2	Surrogate Limits		Qualifier
	% Recovery	% Recovery			
2,4-Dichlorophenylacetic acid	28.8	36.5	25	- 110	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0608140 Analvst: ECL Prep Method: METHOD
 Instrument ID: HP15 Matrix: Soil Method: 8151A
 Workgroup (AAB#): WG219442 Units: ug/kg
 Sample ID: WG219236-02 LCS File ID: 15G6130.R Run Date: 08/08/2006 22:55
 Sample ID: WG219236-03 LCS2 File ID: 15G6131.R Run Date: 08/08/2006 23:22

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
2,4-D	100	49.3	49.3	100	47.9	47.9	3.02	32 - 132	50	
2,4-DB	100	49.8	49.8	100	49.3	49.3	1.00	29 - 134	50	
2,4,5-T	10.0	5.67	56.7	10.0	5.82	58.2	2.65	20 - 144	50	
2,4,5-TP (Silvex)	10.0	4.86	48.6	10.0	4.96	49.6	2.08	31 - 132	50	
Dalapon	250	26.3	10.5	250	31.7	12.7	18.5	10 - 99	50	
Dicamba	10.0	3.33	33.3	10.0	4.20	42.0	23.0	33 - 146	50	
Dichloroprop	100	54.2	54.2	100	55.1	55.1	1.65	35 - 139	50	
Dinoseb	50.0	20.6	41.1	50.0	17.8	35.5	14.7	20 - 120	50	
MCPA	10000	3850	38.5	10000	3860	38.6	0.415	20 - 120	50	
MCPP	10000	2190	21.9	10000	2310	23.1	5.25	20 - 120	50	
Pentachlorophenol	10.0	4.85	48.5	10.0	4.08	40.8	17.1	31 - 132	50	

Surrogates	LCS	LCS2	Surrogate Limits		Qualifier
	% Recovery	% Recovery			
2,4-Dichlorophenylacetic acid	31.0	38.6	25	- 110	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

INITIAL CALIBRATION SUMMARY

Login Number: L0608140
Analytical Method: 8151A
ICAL Workgroup: WG219134

Instrument ID: HP15
Initial Calibration Date: 04-AUG-06 13:51
Column ID: F

Analyte	AVG RF	% RSD	LINEAR	QUAD
2,4,5-T	6584000	2.37		
2,4-D	1343000	13.4		
2,4-DB	769800	4.47		
Dalapon	813300	5.23		
Dicamba	4746000	7.61		
Dichloroprop	1100000	12.9		
Dinoseb	3722000	7.06		
MCPA	3712000	5.73		
MCPP	2382000	5.81		
Pentachlorophenol	19010000	2.05		
Silvex	6919000	1.84		

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8151A

Initial Calibration Date: 04-AUG-06 13:51

ICAL Workgroup: WG219134

Column ID: R

Analyte	AVG RF	% RSD	LINEAR	QUAD
2,4,5-T	8193000	5.70		
2,4-D	1603000	12.3		
2,4-DB	1016000	7.43		
Dalapon	1249000	6.51		
Dicamba	4750000	12.3		
Dichloroprop	1236000	12.3		
Dinoseb	4943000	7.81		
MCPA	4125000	2.19		
MCPP	2639000	7.48		
Pentachlorophenol	21050000	3.86		
Silvex	7938000	5.67		

KEMRON Environmental Services

INITIAL CALIBRATION DATA

00048517

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8151A

Initial Calibration Date: 04-AUG-06 13:51

Column ID: F

Analyte	WG219134-01			WG219134-02			WG219134-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
2,4,5-T	200	1273437485	6367000	100	647020202	6470000	25.0	167558073	6702000
2,4-D	2000	2293642795	1147000	1000	1219007340	1219000	250	352455595	1410000
2,4-DB	2000	1462412753	731200	1000	743939297	743900	250	193939775	775800
Dalapon	5000	3880459522	776100	2500	1939982713	776000	625	514530447	823200
Dicamba	200	849452060	4247000	100	448405195	4484000	25.0	126956667	5078000
Dichloroprop	2000	1876082160	938000	1000	997858844	997900	250	292460976	1170000
Dinoseb	1000	3361305243	3361000	500	1775070932	3550000	125	483564632	3869000
MCPA	200	691866087	3459000	100	355063417	3551000	25.0	94985844	3799000
MCPP	200	492859431	2464000	100	244537339	2445000	25.0	59527132	2381000
Pentachlorophenol	200	3718572868	18590000	100	1904734429	19050000	25.0	477048498	19080000
Silvex	200	1347696223	6738000	100	683216901	6832000	25.0	174888818	6996000

INITIAL CALIBRATION DATA

Login Number: L0608140

Instrument ID: HP15

Analytical Method: 8151A

Initial Calibration Date: 04-AUG-06 13:51

Column ID: F

Analyte	WG219134-05		
	CONC	RESP	RF
2,4,5-T	10.0	66773352	6677000
2,4-D	100	161040165	1610000
2,4-DB	100	81949030	819500
Dalapon	250	219818038	879300
Dicamba	10.0	49904313	4990000
Dichloroprop	100	129673236	1297000
Dinoseb	50.0	200776740	4016000
MCPA	10.0	39971558	3997000
MCPP	10.0	21424469	2142000
Pentachlorophenol	10.0	187444208	18740000
Silvex	10.0	70107445	7011000

INITIAL CALIBRATION DATA

00048519

Login Number:L0608140

Instrument ID:HP15

Analytical Method:8151A

Initial Calibration Date:04-AUG-06 13:51

Column ID:R

Analyte	WG219134-01			WG219134-02			WG219134-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
2,4,5-T	200	1512557342	7563000	100	786788470	7868000	25.0	210505808	8420000
2,4-D	2000	2738524093	1369000	1000	1464644504	1465000	250	426338832	1705000
2,4-DB	2000	1861432246	930700	1000	958746267	958700	250	263138184	1053000
Dalapon	5000	5798478212	1160000	2500	2968542162	1187000	625	794301834	1271000
Dicamba	200	826542295	4133000	100	433753583	4338000	25.0	124442090	4978000
Dichloroprop	2000	2125195612	1063000	1000	1125107806	1125000	250	325125153	1301000
Dinoseb	1000	4403109166	4403000	500	2355395887	4711000	125	647223247	5178000
MCPA	200	812091984	4060000	100	410012904	4100000	25.0	104820352	4193000
MCPP	200	554062636	2770000	100	270572396	2706000	25.0	66138984	2646000
Pentachlorophenol	200	3968652438	19840000	100	2058257597	20580000	25.0	536170225	21450000
Silvex	200	1467266884	7336000	100	763799323	7638000	25.0	204180937	8167000

Login Number:L0608140

Analytical Method:8151A

Instrument ID:HP15

Initial Calibration Date:04-AUG-06 13:51

Column ID:R

Analyte	WG219134-05		
	CONC	RESP	RF
2,4,5-T	10.0	87200225	8720000
2,4-D	100	187038976	1870000
2,4-DB	100	112033532	1120000
Dalapon	250	341920429	1368000
Dicamba	10.0	56166318	5617000
Dichloroprop	100	144951818	1450000
Dinoseb	50.0	268568285	5371000
MCPA	10.0	40273471	4027000
MCPP	10.0	22987253	2299000
Pentachlorophenol	10.0	217703841	21770000
Silvex	10.0	84745721	8475000

KEMRON Environmental Services
ALTERNATE SOURCE CALIBRATION REPORT

00048521

Login Number: L0608140 Run Date: 08/04/2006 Sample ID: WG219134-06
Instrument ID: HP15 Run Time: 19:11 Method: 8151A
File ID: 15G6072.F Analyst: ECL
ICal Workgroup: WG219134 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	462	1240000	7.6	ug/L	
2,4-DB	500	493	758000	1.5	ug/L	
2,4,5-T	50	43.1	5670000	13.8	ug/L	
Silvex	50	56.8	7860000	13.7	ug/L	
Dalapon	1250	1200	784000	3.6	ug/L	
Dicamba	50	55.8	5290000	11.6	ug/L	
Dichloroprop	500	559	1230000	11.8	ug/L	
Dinoseb	250	221	3280000	11.8	ug/L	
MCPA	50	52.3	3890000	4.7	mg/L	
MCPP	50	54.5	2590000	9	mg/L	
Pentachlorophenol	50	55.8	21200000	11.6	ug/L	

* Exceeds %D Limit

KEMRON Environmental Services
ALTERNATE SOURCE CALIBRATION REPORT

00048522

Login Number: L0608140 Run Date: 08/04/2006 Sample ID: WG219134-06
Instrument ID: HP15 Run Time: 19:38 Method: 8151A
File ID: 15G6072.R Analyst: ECL
ICal Workgroup: WG219134 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	485	1550000	3	ug/L	
2,4-DB	500	508	1030000	1.7	ug/L	
2,4,5-T	50	43.0	7050000	14	ug/L	
Silvex	50	56.9	9030000	13.7	ug/L	
Dalapon	1250	1200	1200000	4.2	ug/L	
Dicamba	50	57.1	5430000	14.2	ug/L	
Dichloroprop	500	571	1410000	14.3	ug/L	
Dinoseb	250	223	4410000	10.8	ug/L	
MCPA	50	53.8	4440000	7.5	mg/L	
MCPP	50	55.5	2930000	10.9	mg/L	
Pentachlorophenol	50	55.1	23200000	10.1	ug/L	

* Exceeds %D Limit

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048523

Login Number: L0608140 Run Date: 08/08/2006 Sample ID: WG219439-02
Instrument ID: HP15 Run Time: 21:09 Method: 8151A
File ID: 15G6127.F Analyst: ECL
Workgroup (AAB#): WG219442 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	476	1280000	4.9	ug/L	
2,4-DB	500	460	708000	8	ug/L	
2,4,5-T	50	48.4	6370000	3.3	ug/L	
Silvex	50	49.2	6810000	1.6	ug/L	
Dalapon	1250	1180	766000	5.8	ug/L	
Dicamba	50	51.7	4910000	3.4	ug/L	
Dichloroprop	500	483	1060000	3.4	ug/L	
Dinoseb	250	256	3810000	2.3	ug/L	
MCPA	50	48.2	3580000	3.6	mg/L	
MCPP	50	49.4	2350000	1.2	mg/L	
Pentachlorophenol	50	49.0	18600000	2	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048524

Login Number: L0608140 Run Date: 08/08/2006 Sample ID: WG219439-02
Instrument ID: HP15 Run Time: 21:35 Method: 8151A
File ID: 15G6127.R Analyst: ECL
Workgroup (AAB#): WG219442 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	503	1610000	.6	ug/L	
2,4-DE	500	503	1020000	.6	ug/L	
2,4,5-T	50	52.6	8620000	5.3	ug/L	
Silvex	50	51.3	8150000	2.6	ug/L	
Dalapon	1250	1220	1210000	2.8	ug/L	
Dicamba	50	50.6	4800000	1.1	ug/L	
Dichloroprop	500	500	1240000	0	ug/L	
Dinoseb	250	274	5420000	9.7	ug/L	
MCPA	50	49.3	4070000	1.3	mg/L	
MCPP	50	50.9	2690000	1.8	mg/L	
Pentachlorophenol	50	54.0	22800000	8.1	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048525

Login Number: L0608140 Run Date: 08/09/2006 Sample ID: WG219439-03
Instrument ID: HP15 Run Time: 02:01 Method: 8151A
File ID: 15G6138.F Analyst: ECL
Workgroup (AAB#): WG219442 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	467	1250000	6.6	ug/L	
2,4-DB	500	445	685000	11	ug/L	
2,4,5-T	50	45.7	6020000	8.6	ug/L	
Silvex	50	49.1	6790000	1.9	ug/L	
Dalapon	1250	1180	768000	5.5	ug/L	
Dicamba	50	51.5	4890000	3	ug/L	
Dichloroprop	500	476	1050000	4.7	ug/L	
Dinoseb	250	243	3620000	2.6	ug/L	
MCPA	50	47.7	3540000	4.6	mg/L	
MCPP	50	48.3	2300000	3.3	mg/L	
Pentachlorophenol	50	48.5	18400000	3	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048526

Login Number: L0608140 Run Date: 08/09/2006 Sample ID: WG219439-03
Instrument ID: HP15 Run Time: 02:28 Method: 8151A
File ID: 15G6138.R Analyst: ECL
Workgroup (AAB#): WG219442 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	503	1610000	.6	ug/L	
2,4-DB	500	512	1040000	2.5	ug/L	
2,4,5-T	50	50.5	8280000	1.1	ug/L	
Silvex	50	51.0	8090000	1.9	ug/L	
Dalapon	1250	1220	1220000	2.3	ug/L	
Dicamba	50	51.3	4870000	2.5	ug/L	
Dichloroprop	500	491	1210000	1.7	ug/L	
Dinoseb	250	274	5410000	9.5	ug/L	
MCPA	50	48.8	4030000	2.4	mg/L	
MCPP	50	50.8	2680000	1.5	mg/L	
Pentachlorophenol	50	54.2	22800000	8.3	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048527

Login Number: L0608140 Run Date: 08/09/2006 Sample ID: WG219439-04
Instrument ID: HP15 Run Time: 06:54 Method: 8151A
File ID: 15G6149.F Analyst: ECL
Workgroup (AAB#): WG219442 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	471	1270000	5.8	ug/L	
2,4-DB	500	472	727000	5.6	ug/L	
2,4,5-T	50	48.0	6330000	3.9	ug/L	
Silvex	50	51.0	7060000	2	ug/L	
Balapon	1250	1180	769000	5.5	ug/L	
Dicamba	50	53.0	5030000	6	ug/L	
Dichloroprop	500	479	1060000	4.1	ug/L	
Dinoseb	250	249	3700000	.6	ug/L	
MCPA	50	48.2	3580000	3.5	mg/L	
MCPP	50	49.1	2340000	1.8	mg/L	
Pentachlorophenol	50	48.9	18600000	2.2	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048528

Login Number: L0608140 Run Date: 08/09/2006 Sample ID: WG219439-04
Instrument ID: HP15 Run Time: 07:21 Method: 8151A
File ID: 15G6149.R Analyst: ECL
Workgroup (AAB#): WG219442 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	515	1650000	3.1	ug/L	
2,4-DB	500	511	1040000	2.2	ug/L	
2,4,5-T	50	53.3	8730000	6.5	ug/L	
Silvex	50	52.5	8340000	5	ug/L	
Dalapon	1250	1220	1220000	2.5	ug/L	
Dicamba	50	52.4	4980000	4.8	ug/L	
Dichloroprop	500	506	1250000	1.2	ug/L	
Dinoseb	250	282	5570000	12.6	ug/L	
MCPA	50	50.0	4130000	0	mg/L	
MCPP	50	52.0	2750000	4.1	mg/L	
Pentachlorophenol	50	55.6	23400000	11.3	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048529

Login Number: L0608140 Run Date: 08/09/2006 Sample ID: WG219439-05
Instrument ID: HP15 Run Time: 09:07 Method: 8151A
File ID: 15G6154.F Analyst: ECL
Workgroup (AAB#): WG219442 Cal ID: HP15 - 04-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
2,4-D	500	478	1280000	4.4	ug/L	
2,4-DB	500	452	696000	9.6	ug/L	
2,4,5-T	50	46.9	6170000	6.3	ug/L	
Silvex	50	50.0	6910000	.1	ug/L	
Dalapon	1250	1170	761000	6.4	ug/L	
Dicamba	50	52.7	5000000	5.4	ug/L	
Dichloroprop	500	482	1060000	3.6	ug/L	
Dinoseb	250	244	3630000	2.4	ug/L	
MCPA	50	47.9	3550000	4.3	mg/L	
MCPP	50	48.6	2310000	2.9	mg/L	
Pentachlorophenol	50	48.8	18600000	2.3	ug/L	

* Exceeds %D Criteria

COC No. A 63090

156 Starlite Drive

Marietta, OH 45750



Phone: 740-373-4071

Fax: 740-373-4835

CHAIN-OF-CUSTODY RECORD

Company Name: Shaw E & I		Contact Phone #: (713) 996-4408		Project Name: CHMAP		Signature: <i>[Signature]</i>		Protocol		Program		ADDITIONAL REQUIREMENTS	
Project Contact: Diane Meyer		Location: Karnack, TX		Project Name: CHMAP		Signature: <i>[Signature]</i>		CWA		NPDES			
Turn Around Requirements: Standard								SW846		AFCEE			
Project #: 845714										RCRA			
Sampler (print): Allen Williams										USAGE			
										Other			
Sample I.D. No.	Grab	Date	Time	Hold	NUMBER OF CONTAINERS	Pesticides	Herbicides						
59SB01-01	✓	8/2/06	13:15		1	X	X						
59SB01-02	✓	8/2/06	13:35		1	X	X						
59SB02-01	✓	8/2/06	13:50		1	X	X						
59SB02-02	✓	8/2/06	14:05		1	X	X						
59SB03-01	✓	8/2/06	14:15		1	X	X						
59SB03-02	✓	8/2/06	14:30		1	X	X						
59SB04-01	✓	8/2/06	14:46		1	X	X						
59SB04-02	✓	8/2/06	14:50		1	X	X						
59SB05-01	✓	8/2/06	14:50		1	X	X						
59SB05-02	✓	8/2/06	14:50		1	X	X						
59SB06-01	✓	8/3/06	08:10		1	X	X						
59SB06-02	✓	8/3/06	08:20		1	X	X						
59SB07-01	✓	8/3/06	08:35		1	X	X						
59SB07-02	✓	8/3/06	09:05		1	X	X						
59SB08-01	✓	8/3/06	08:45		1	X	X						
59SB08-02	✓	8/3/06	09:20		1	X	X						
59SB09-01	✓	8/3/06	09:55		1	X	X						
59SB09-02	✓	8/3/06	09:55		1	X	X						
59SB09-03	✓	8/3/06	10:10		1	X	X						
59SB09-04	✓	8/3/06	10:10		1	X	X						
Relinquished by: <i>[Signature]</i>	Date: 8/3/06	Time: 12:40	Received by: <i>[Signature]</i>	Date: 8/3/06	Time: 12:40	Relinquished by: <i>[Signature]</i>	Date: 8/4/06	Time: 10:00	Cooler Temp in °C: 3°	Remarks: OK sealed, SRS intact	00048530		

*Homogenize all composite samples prior to analysis

SAMPLE RECEIPT FORM

Date: 8-4-06 Client: Shaw E & I156 STARLITE DRIVE
MARIETTA, OH
45750
(740) 373-4071Shipped By: () Fed-Ex () UPS () DHL () KEMRON () Client () Other 10:00Opened By: gdsLogged By: WHD Login # L06 8-140IR Temp Gun: () D YAG

COOLER INFORMATION

Number	Cooler ID	Temp °C	Airbill#	COC#	Other
1	<u>2109</u>	<u>3</u>	<u>194563 2021</u>	<u>63090</u>	
2					
3					
4					
5					
6					

Were all coolers sealed?

Y

N

N/A

Were custody seals used on all coolers?

Y

N

N/A

Were custody seals intact?

Y

N

N/A

Was visible ice present?

Y

N

N/A

Were all coolers in the temperature range of 2-6C? (>6C*)

Y

N

N/A

Were the samples frozen?*

YN

N/A

Were COC papers provided?

Y

N

N/A

Were all sample containers intact?*

Y

N

N/A

Were all sample labels intact?

Y

N

N/A

Were all sample labels legible?*

Y

N

N/A

Did all sample labels match the COC?*

Y

N

N/A

Was the label information complete?*

Y

N

N/A

Were the correct containers used?*

Y

N

N/A

Were the correct preservatives added to water samples?*

Y

N

N/A

Was the pH tested on preserved water samples?

Y

N

N/A

Were pH ranges acceptable?*

Y

N

N/A

Was sufficient amount of sample provided?*

Y

N

N/A

Were bubbles present in VOA samples?*

Y

N

N/A

Were COC's signed and dated?

Y

N

N/A

Did samples arrive before hold time expired?*

Y

N

N/A

Are discrepancy forms attached?

Y

N

N/A

*Requires a discrepancy form

Comments: _____

CRF #1

Revised 8/22/03

KEMRON Environmental Services
Internal Chain of Custody Report

00048532

Login: L0608140
Account: 2773
Project: 2773.025
Samples: 18
Due Date: 11-AUG-2006

Samplenum Container ID Products
L0608140-01 259484 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:09	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-02 259485 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:09	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-03 259486 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:09	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:27	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-04 259487 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:09	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:27	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

KEMRON Environmental Services
Internal Chain of Custody Report

00048533

Login: L0608140
Account: 2773
Project: 2773.025
Samples: 18
Due Date: 11-AUG-2006

Samplenum Container ID Products
L0608140-05 259488 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:09	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-06 259489 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:09	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-07 259490 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:09	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:27	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-08 259491 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:09	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:27	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

KEMRON Environmental Services
Internal Chain of Custody Report

00048534

Login: L0608140
Account: 2773
Project: 2773.025
Samples: 18
Due Date: 11-AUG-2006

Samplenum Container ID Products
L0608140-09 259492 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-10 259493 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-11 259494 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-12 259495 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:27	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

KEMRON Environmental Services
Internal Chain of Custody Report

00048535

Login: L0608140
Account: 2773
Project: 2773.025
Samples: 18
Due Date: 11-AUG-2006

Samplenum Container ID Products
L0608140-13 259496 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-14 259497 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-15 259498 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

Samplenum Container ID Products
L0608140-16 259499 8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

KEMRON Environmental Services
Internal Chain of Custody Report

00048536

Login: L0608140
Account: 2773
Project: 2773.025
Samples: 18
Due Date: 11-AUG-2006

<u>Samplenum</u>	<u>Container ID</u>	<u>Products</u>
L0608140-17	259500	8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

<u>Samplenum</u>	<u>Container ID</u>	<u>Products</u>
L0608140-18	259501	8081 8151 PCT-S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			04-AUG-2006 15:09	CLS	
2	PREP	W1	EXT	07-AUG-2006 06:10	CEB	JKT
3	STORE	EXT	W1	07-AUG-2006 12:26	BRG	CEB
4	ANALYZ	W1	WET	07-AUG-2006 14:34	JB	BRG
5	STORE	WET	A1	08-AUG-2006 08:21	JS	JB

156 Starlite Drive
Marietta, OH 45750

Phone: 740-373-4071
Fax: 740-373-4835



CHAIN-OF-CUSTODY RECORD

Company Name:		Shaw C&T				
Project Contact:		Contact Phone #:				
Allen Willmore / Diane Meyer		713 247-9292 / 713 996-4408				
Turn Around Requirements:		Location:				
Standard		Karnack, TX				
Project #:		Project Name:				
845714		LHAAP				
Sampler (print):		Signature:				
Allen Willmore		[Signature]				
Sample I.D. No.	Grab	Date	Time	Protocol	CWA	SW846
67VW01/64W009		8/6/06	15:25			✓
67WV02		8/6/06	11:40			✓
EQUIPMENT HINSE HA		8/6/06	13:05			✓
NUMBER OF CONTAINERS						
Hold						
D Gases						
VOCs 8260						
Anions						
Pesticides						
TOR						
1 broken VOC bag						
EQUIPMENT BLANK SAMPLE						
Samples were collected on 8/7/2006 per Allen Willmore SLM 8/8/06						
Log Post Separately SLM 8/8/06						
00048537						

*Homogenize all composite samples prior to analysis

00048538
B2414

SAMPLE RECEIPT FORM

Date: 8-8-06 Client: Shaw E&IShipped By: () Fed-Ex () UPS () DHL () KEMRON () Client () Other 9:45Opened By: [Signature]Logged By: [Signature] Login # L06 8-182IR Temp Gun: () D MG156 STARLITE DRIVE
MARIETTA, OH
45750
(740) 373-4071

COOLER INFORMATION

Number	Cooler ID	Temp °C	Airbill#	COC#	Other
1	9387	3	J1945631951		
2					
3					
4					
5					
6					

Were all coolers sealed?

☒ Y ☐ N N/A

Were custody seals used on all coolers?

☐ Y ☒ N N/A

Were custody seals intact?

☐ Y ☐ N ☒ N/A

Was visible ice present?

☒ Y ☐ N N/A

Were all coolers in the temperature range of 2-6C? (>6C*)

☒ Y ☐ N N/A

Were the samples frozen?*

☐ Y ☒ N N/A

Were COC papers provided?

☒ Y ☐ N N/A

Were all sample containers intact?*

☒ Y ☐ N N/A

Were all sample labels intact?

☒ Y ☐ N N/A

Were all sample labels legible?*

☒ Y ☐ N N/A

Did all sample labels match the COC?*

☒ Y ☐ N N/A

Was the label information complete?*

☒ Y ☐ N N/A

Were the correct containers used?*

☒ Y ☐ N N/A

Were the correct preservatives added to water samples?*

☐ Y ☐ N ☒ N/A

Was the pH tested on preserved water samples?

☐ Y ☐ N ☒ N/A

Were pH ranges acceptable?*

☐ Y ☐ N ☒ N/A

Was sufficient amount of sample provided?*

☒ Y ☐ N N/A

Were bubbles present in VOA samples?*

☐ Y ☐ N ☒ N/A

Were COC's signed and dated?

☒ Y ☐ N N/A

Did samples arrive before hold time expired?*

☒ Y ☐ N N/A

Are discrepancy forms attached?

☐ Y ☐ N ☒ N/A

*Requires a discrepancy form

Comments: _____



156 Starlite Drive, Marietta, OH 45750 • TEL 740-373-4071 • FAX 740-373-4835 • <http://www.kemron.com>

Laboratory Report Number: L0608182

Please find enclosed the analytical results for the samples you submitted to KEMRON Environmental Services.

Review and compilation of your report was completed by KEMRON's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box below at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

Debra Elliott - Team Leader

delliott@kemron-lab.com

Amanda Fickiesen - Client Services Specialist

afickiesen@kemron-lab.com

Cheryl Koelsch - Team Chemist/Data Specialist

ckoelsch@kemron-lab.com

Annie Bock - Client Services Specialist

abock@kemron-lab.com

Stephanie Mossburg - Team Chemist/Data Specialist

smossburg@kemron-lab.com

Kathy Albertson - Team Chemist/Data Specialist

kalbertson@kemron-lab.com

This report was reviewed on August 15, 2006.

A handwritten signature in cursive script that reads "Stephanie Mossburg".

STEPHANIE MOSSBURG - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the NELAP standards and other applicable contract terms and conditions. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of KEMRON Environmental Services.

This report was certified on August 15, 2006.

A handwritten signature in cursive script that reads "David E. Vandenberg".

David Vandenberg - Vice President

FL DOH NELAP ID: E8755

This report contains a total of 44 pages.

Protecting Our Environmental Future

LABORATORY REPORT

00048540

L0608182

08/15/06 12:07

Submitted By

KEMRON Environmental Services

156 Starlite Drive

Marietta, OH 45750

(740) 373-4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Building
3010 Briarpark
Houston, TX 77042
Attention: Diane Meyer

Account Number: 2773

Work ID: LHAAP

P.O. Number: 200328

Sample Summary

Client ID	Lab ID	Date Collected	Date Received
EQUIPMENT RINSE HA	L0608182-01	07-AUG-06	08-AUG-06

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

KEMRON Login No.: L0608182

CHAIN OF CUSTODY: The chain of custody number was 62298.

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 3 degrees C.

SAMPLE MANAGEMENT: All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Approved: 10-AUG-06
<i>Stephanie M. Wozniak</i>

KEMRON ENVIRONMENTAL SERVICES
GC PESTICIDES

KEMRON Login No.: L0608182

METHOD

Preparation: SW- 846 3550B(Soils) 3510C(Waters)

Analysis: SW-846 8081

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: For all compounds which yielded a %RSD greater than 20 %, linear or higher order equations were applied. All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Continuing Calibration: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: There were no MS/MSD results associated with this sample delivery group, due to insufficient volume of sample. The laboratory included an LCS and LCS duplicate in the preparation batch in lieu of the NELAC prescribed MS/MSD. KEMRON recommends site specific MS/MSD samples to avoid possible data qualification.

SAMPLES

Surrogates: All acceptance criteria were met.

Endrin/DDT Breakdown: All acceptance criteria were met.

Samples: For all samples which yielded results with an RPD of greater than 40% between the primary and confirmation column the appropriate flag was applied. All acceptance criteria were met.

Manual Integration Reason Codes

KEMRON laboratory management has identified four general cases with valid reasons supporting the use of manual integration techniques.

Reason #1: Data System Fails to Select Correct Peak

In some cases the chromatography system selects and integrates the "wrong peak". In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.

This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

Reason #3: Improperly Integrated Isomers and/or coeluting compounds.

This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline

There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

Reason #5: Miscellaneous

Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Laboratory Director or the QA/QC Supervisor will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Analyst: ECL

Approved: 15-AUG-06



Laboratory Data Package Cover Page

00048544

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

- a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: ☐ This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MICHAEL D. COCHRAN



Semivolatiles Lab Supervisor

August 15, 2006

Name (Printed)

Signature

Official Title (printed)

DATE

RG-366/TRRP-13 December 2002

A1

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608182
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG219455
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 15, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?			✓		
Were % moisture (or solids) reported for all soil and sediment samples?			✓		
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	✓				
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

00048546

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608182
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG219455
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 15, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?			✓		
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0608182
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG219455
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: August 15, 2006

Description	Yes	No	NA(1)	NR(2)	ER(3)
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0608182
Project Name:	798-LONGHORN
Method:	808I
Prep Batch Number(s):	WG219455
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	August 15, 2006

EXCEPTIONS REPORT**ER# - Description**

Footnotes:

- (1) NA = Not applicable to method or project
- (2) NR = Not reviewed
- (3) ER# = Exception report number

KEMRON ENVIRONMENTAL SERVICES

Report Number: L0608182

00048550

Report Date : August 15, 2006

Sample Number: L0608182-01

Client ID: EQUIPMENT RINSE HA

Matrix: Water

Workgroup Number: WG219575

Collect Date: 08/07/2006 13:05

Sample Tag: 01

PrePrep Method: NONE

Prep Method: 3510C

Analytical Method: 8081A

Analyst: ECL

Dilution: 1

Units: ug/L

Instrument: HP15

Prep Date: 08/09/2006 07:20

Cal Date: 08/14/2006 19:13

Run Date: 08/14/2006 22:04

File ID: 15G6260.F

Analyte	CAS. Number	Result	Qual	PQL	SQL
4,4'-DDD	72-54-8		U	0.0730	0.0146
4,4'-DDE	72-55-9		U	0.0730	0.0146
4,4'-DDT	50-29-3		U	0.0730	0.0146
Aldrin	309-00-2		U	0.0730	0.0146
alpha-BHC	319-84-6		U	0.0730	0.0146
beta-BHC	319-85-7		U	0.0730	0.0146
delta-BHC	319-86-8		U	0.0730	0.0146
Dieldrin	60-57-1		U	0.0730	0.0146
Endosulfan I	959-98-8		U	0.0730	0.0146
Endosulfan II	33213-65-9		U	0.0730	0.0146
Endosulfan sulfate	1031-07-8		U	0.0730	0.0146
Endrin	72-20-8		U	0.0730	0.0146
Endrin aldehyde	7421-93-4		U	0.0730	0.0146
gamma-BHC (Lindane)	58-89-9		U	0.0730	0.0146
Heptachlor	76-44-8		U	0.0730	0.0146
Heptachlor epoxide	1024-57-3		U	0.0730	0.0146
Methoxychlor	72-43-5		U	0.0730	0.0146
Endrin ketone	53494-70-5		U	0.0730	0.0146
alpha Chlordane	5103-71-9		U	0.0730	0.0146
gamma Chlordane	5103-74-2		U	0.0730	0.0146
Toxaphene	8001-35-2		U	1.46	0.438
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	39.0	20	180		
Decachlorobiphenyl	54.0	25	140		

UJ 05B

U Not detected at or above adjusted sample detection limit

1 of 1

Dm
8/15/06

WORKGROUP SUMMARY BY METHOD

WORKGROUP SUMMARY BY METHOD

Analysis:Pesticides

Extraction Method:3510C

Workgroup:WG219455

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0608182-01	EQUIPMENT RINSE HA		08/08/06 10:30			SEP-FUNNEL	ED

Analysis:Pesticides

Analytical Method:8081A

Workgroup:WG219575

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0608182-01	EQUIPMENT RINSE HA		08/09/06 07:20	08/14/06 22:04	01	HP15	ECL

Kemron Environmental Services
Analyst Listing
August 15, 2006

AJF - AMANDA J. FICKIESEN	ALB - ANNIE L. BOCK	ALT - ANN L. THAYER
ARA - ADRIAN R. ACHTERMANN	BRG - BRENDA R. GREGORY	CAA - CASSIE A. AUGENSTEIN
CAF - CHERYL A. FLOWERS	CAK - CHERYL A. KOELSCH	CEB - CHAD E. BARNES
CFB - CHAD F. BOOK	CLC - CHRYS L. CRAWFORD	CLS - CARA L. STRICKLER
CLW - CHARISSA L. WINTERS	CM - CHARLIE MARTIN	CMS - CRYSTAL M. STEPHENS
CPD - CHAD P. DAVIS	CRC - CARLA R. COCHRAN	CSA - LUCINDA S. ARNOLD
CSH - CHRIS S. HILL	DAS - DALLAS A. SULLIVAN	DD - DIANE M. DENNIS
DDE - DEBRA D. ELLIOTT	DEL - DON E. LIGHTFRITZ	DEV - DAVID E. VANDENBERG
DGB - DOUGLAS G. BUTCHER	DIH - DEANNA I. HESSON	DLB - DAVID L. BUMGARNER
DLP - DOROTHY L. PAYNE	DLR - DIANNA L. RAUCH	DR - DEANNA ROBERTS
DRP - DAVE R. PITZER	DSM - DAVID S. MOSSOR	DST - DENNIS S. TEPE
ECL - ERIC C. LAWSON	ED - EMILY E. DECKER	HAV - HEMA VILASAGAR
JAL - JOHN A. LENT	JKT - JANE K. THOMPSON	JLS - JANICE L. SCHIMMEL
JNB - JOSHUA N. BOOTH	JS - JENNIFER L. SOUTHALL	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU	KCZ - KEVIN C. ZUMBRO
KEB - KATHRYN E. BARNES	KHR - KIM H. RHODES	KRA - KATHY R. ALBERTSON
LKN - LINDA K. NEDEFF	LSB - LESLIE S. BUCINA	MDA - MIKE D. ALBERTSON
MDC - MICHAEL D. COCHRAN	MES - MARY E. SCHILLING	MKZ - MARILYN K. ZUMBRO
MLR - MARY L. ROCHOTTE	MLS - MICHAEL L. SCHIMMEL	MMB - MAREN M. BEERY
MSW - MATT S. WILSON	NJB - NATALIE J. BOOTH	PAS - PATRICK A. STREET
PJM - PAUL J. MILLER	RB - ROBERT BUCHANAN	RDC - REBECCA D. CUTLIP
REK - ROBERT E. KYER	RNP - RICK N. PETTY	RWC - RODNEY W. CAMPBELL
SCM - SUSAN C. MOELLENDICK	SLM - STEPHANIE L. MOSSBURG	SLP - SHERI L. PFALZGRAF
SMH - SHAUNA M. HYDE	SRM - SAMUEL R. MCFEE	TMB - TIFFANY M. BAILEY
TMM - TAMMY M. MORRIS	VC - VICKI COLLIER	WFM - WALTER F. MARTIN

List of Valid Qualifiers

August 15, 2006

Qualkey: STD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Result is greater than the associated numerical value.
A	See the report narrative
B	Analyte present in method blank
C	Confirmed by GC/MS
CG	Confluent growth
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
FL	Free Liquid
I	Semiquantitative result (out of instrument calibration range)
J	The analyte was positively identified, but the quantitation was below the RL
J,B	Analyte detected in both the method blank and sample above the MDL.
J,P	ESTIMATE & COLUMNS DON'T AGREE TO WITHIN 40%
L	Sample reporting limits elevated due to matrix interference
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Tentatively identified compound(TIC)
NA	Not applicable
ND	Not detected at or above the reporting limit
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria fail. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
TIC	Library Search Compound
TNTC	Too numerous to count
U	Undetected; the concentration is below the reported MDL.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
Z	Cannot be resolved from isomer - see below

***Special Notes for Organic Analytes

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound and are matrix dependent.

Organic QA/QC

KEMRON Environmental Services
Data Checklist

Date: 14-AUG-2006
Analyst: ECL
Analyst: NA
Method: 8081
Instrument: HP15
Curve Workgroup: WG219883, WG219885
Runlog ID: 11734
Analytical Workgroups: L0608140, L0608069, L0608182, L0608223, L0608264

System Performance Check	NA
DFIPP	NA
Endrin/DDI Breakdown	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	NA
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	X
Surrogates	X
Internal Standards Criteria	NA
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	ECL
Secondary Reviewer	MDC
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
15-AUG-2006

Secondary Reviewer:
15-AUG-2006




Generated: AUG-15-2006 10:34:56

KEMRON Environmental Services
Instrument Run Log

Instrument: HP15 Dataset: 081406
Analyst1: ECL Analyst2: NA
Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: 15154

Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2
Workgroups:


Internal Standard: NA Surrogate Standard: NA

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15G6240.F	WG219886-01 ENDRI/DDT	1	1	SOS79-14	08/14/06 11:53
2	15G6240.R	WG219886-01 ENDRI/DDT	1	1	SOS79-14	08/14/06 12:21
3	15G6241.F	PEST CCV 20 PPB	1	1	STD13901	08/14/06 12:21
4	15G6241.R	PEST CCV 20 PPB	1	1	STD13901	08/14/06 12:49
5	15G6242.F	WG219883-01 TOX ICAL 2000 PPB	1	1	STD13913	08/14/06 13:34
6	15G6242.R	WG219883-01 TOX ICAL 2000 PPB	1	1	STD13913	08/14/06 14:02
7	15G6243.F	WG219883-02 TOX ICAL 1000 PPB	1	1	STD13913	08/14/06 14:02
8	15G6243.R	WG219883-02 TOX ICAL 1000 PPB	1	1	STD13913	08/14/06 14:31
9	15G6244.F	WG219883-03 TOX ICAL 500 PPB	1	1	STD13913	08/14/06 14:31
10	15G6244.R	WG219883-03 TOX ICAL 500 PPB	1	1	STD13913	08/14/06 14:59
11	15G6245.F	WG219883-04 TOX ICAL 250 PPB	1	1	STD13913	08/14/06 14:59
12	15G6245.R	WG219883-04 TOX ICAL 250 PPB	1	1	STD13913	08/14/06 15:27
13	15G6246.F	WG219883-05 TOX ICAL 100 PPB	1	1	STD13913	08/14/06 15:27
14	15G6246.R	WG219883-05 TOX ICAL 100 PPB	1	1	STD13913	08/14/06 15:56
15	15G6247.F	WG219883-06 TOX ALT 500 PPB	1	1	STD14036	08/14/06 15:56
16	15G6247.R	WG219883-06 TOX ALT 500 PPB	1	1	STD14036	08/14/06 16:24
17	15G6248.F	WG219885-01 PEST ICAL 200 PPB	1	1	STD13901	08/14/06 16:24
18	15G6248.R	WG219885-01 PEST ICAL 200 PPB	1	1	STD13901	08/14/06 16:52
19	15G6249.F	WG219885-02 PEST ICAL 50 PPB	1	1	STD13901	08/14/06 16:52
20	15G6249.R	WG219885-02 PEST ICAL 50 PPB	1	1	STD13901	08/14/06 17:20
21	15G6250.F	WG219885-03 PEST ICAL 20 PPB	1	1	STD13901	08/14/06 17:20
22	15G6250.R	WG219885-03 PEST ICAL 20 PPB	1	1	STD13901	08/14/06 17:49
23	15G6251.F	WG219885-04 PEST ICAL 10 PPB	1	1	STD13901	08/14/06 17:49
24	15G6251.R	WG219885-04 PEST ICAL 10 PPB	1	1	STD13901	08/14/06 18:17
25	15G6252.F	WG219885-05 PEST ICAL 4 PPB	1	1	STD13901	08/14/06 18:17
26	15G6252.R	WG219885-05 PEST ICAL 4 PPB	1	1	STD13901	08/14/06 18:45
27	15G6253.F	WG219885-06 PEST ICAL 1 PPB	1	1	STD13901	08/14/06 18:45
28	15G6253.R	WG219885-06 PEST ICAL 1 PPB	1	1	STD13901	08/14/06 19:13
29	15G6254.F	WG219885-07 PEST ALT 20 PPB	1	1	STD13915	08/14/06 19:13
30	15G6254.R	WG219885-07 PEST ALT 20 PPB	1	1	STD13915	08/14/06 19:42
31	15G6255.F	L0608140-01 500x	7	500	SOIL	08/14/06 19:42
32	15G6255.R	L0608140-01 500x	7	500	SOIL	08/14/06 20:10
33	15G6256.F	WG219455-01 BLANK V264 P145	1	1		08/14/06 20:10
34	15G6256.R	WG219455-01 BLANK V264 P145	1	1		08/14/06 20:38
35	15G6257.F	WG219455-02 LCS V264 P145	1	1		08/14/06 20:38

Page: 1 of 2

Approved: 15-AUG-06



KEMRON Environmental Services
Instrument Run Log

Run Log ID: 00048558

Instrument: HP15 Dataset: 081406
Analyst1: ECL Analyst2: NA
Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: 15154

Workgroups: Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2
Internal Standard: NA Surrogate Standard: NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
36	15G6257.R	WG219455-02 LCS V264 P145	1	1		08/14/06 21:06
37	15G6258.F	WG219455-03 LCS DUP V264 P145	1	1		08/14/06 21:06
38	15G6258.R	WG219455-03 LCS DUP V264 P145	1	1		08/14/06 21:35
39	15G6259.F	L0608069-01	1	1		08/14/06 21:35
40	15G6259.R	L0608069-01	1	1		08/14/06 22:04
41	15G6260.F	L0608182-01	1	1		08/14/06 22:04
42	15G6260.R	L0608182-01	1	1		08/14/06 22:32
43	15G6261.F	WG219886-02 PEST CCV 20 PPB	1	1	STD13901	08/14/06 22:32
44	15G6261.R	WG219886-02 PEST CCV 20 PPB	1	1	STD13901	08/14/06 23:00
45	15G6262.F	WG219884-01 TOX CCV 250 PPB	1	1	STD13913	08/14/06 23:00
46	15G6262.R	WG219884-01 TOX CCV 250 PPB	1	1	STD13913	08/14/06 23:28
47	15G6263.F	WG219686-02 BLANK V264 P159	1	1		08/14/06 23:28
48	15G6263.R	WG219686-02 BLANK V264 P159	1	1		08/14/06 23:57
49	15G6264.F	WG219686-03 LCS V264 P159	1	1		08/14/06 23:57
50	15G6264.R	WG219686-03 LCS V264 P159	1	1		08/15/06 00:25
51	15G6265.F	L0608223-01	1	1		08/15/06 00:25
52	15G6265.R	L0608223-01	1	1		08/15/06 00:53
53	15G6266.F	WG219686-01 L0608223-02 REF	1	1		08/15/06 00:53
54	15G6266.R	WG219686-01 L0608223-02 REF	1	1		08/15/06 01:21
55	15G6267.F	WG219686-04 L0608223-04 MS	1	1		08/15/06 01:21
56	15G6267.R	WG219686-04 L0608223-04 MS	1	1		08/15/06 01:50
57	15G6268.F	WG219686-05 L0608223-05 MSD	1	1		08/15/06 01:50
58	15G6268.R	WG219686-05 L0608223-05 MSD	1	1		08/15/06 02:18
59	15G6269.F	L0608264-01	1	1		08/15/06 02:18
60	15G6269.R	L0608264-01	1	1		08/15/06 02:46
61	15G6270.F	L0608264-03	1	1		08/15/06 02:46
62	15G6270.R	L0608264-03	1	1		08/15/06 03:14
63	15G6271.F	WG219886-03 ENDRIN/DDT	1	1	SOS79-14	08/15/06 03:14
64	15G6271.R	WG219886-03 ENDRIN/DDT	1	1	SOS79-14	08/15/06 03:43
65	15G6272.F	WG219886-04 PEST CCV 10 PPB	1	1	STD13901	08/15/06 03:43
66	15G6272.R	WG219886-04 PEST CCV 10 PPB	1	1	STD13901	08/15/06 04:11
67	15G6273.F	WG219884-02 TOX CCV 500 PPB	1	1	STD13913	08/15/06 04:11
68	15G6273.R	WG219884-02 TOX CCV 500 PPB	1	1	STD13913	08/15/06 04:39

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Page: 2 of 2

Approved: 15-AUG-06

Michael Colman

Parameter: Pest-H₂O SOP #: EXP01 Revision #: 12
 Extraction Analyst(s): Ed TV/KD Analyst(s): Ed
 Date/Time Extracted: 08-09-06 0720 Date TV/KD: 08-09-06
 Spike/Surrogate Analyst: Ed Witness: CAH
 Surrogate #: STD13849 Earliest Hold Date: 8/9
 Spike #: A = STD13349#1 Spike #: B = —

R1098188

Extraction Work Group WG 219455Extract Relinquished By: EdExtract Received By & Date: ED 8-9-06

	Sample ID	Test Code	pH /			Initial Vol / Wt	Amount Surrogate	Amount Spike	Final Volume	Extract Color	Emulsions /			Comments
			<2	N	>12						A	BN	N	
1	Blank			✓		1000ml	200µl		10ml	T				WG 219455-01
2	LCS			✓				250µl		T				WG -02
3	LCS Dup			✓						T				-03
4	08-069-01	8081		✓		1000ml				T				
5	08-182-01			✓		1000				T				
6						685				T				
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														

Methylene Chloride Lot #: C18E32Hexane Lot #: C22E25Ether Lot #: —Methanol Lot #: —Solvent: — Lot #: —Reagent: 94:6 Lot #: R6T10453Reagent: 50:50 Lot #: R6T10428Reagent: — Lot #: —Acid: — Lot #: —Florisil Lot #: C13577Silica Gel Lot #: —IR Analyst / Date / Time: —Dried Na₂SO₄ Lot #: C10593

Color Code
 T = Transparent
 C = Colored
 O = Opaque

SW-846 Method		On	Off	On	Off
Continuous	3520C				
Soxhlet	3540C				
ASE*	3545				
Sep Funnel	3510C	✓			
Sonication	3550B				
Waste	3580A				

* Accelerated Solvent Extractor (ASE)

Clean-ups			
Florisil 3620B	✓	GPC 3640A	
Silica Gel 3630C		Other	
Acid 3665A		N/A	
Sulfur 3660B			

Peer Reviewed By: Cheryl Flower Date: 8-09-06

Extraction Notes For Volume # 264 Page # 145

General Comments:	<u>NONE</u>

Extraction Anomalies:	<u>NONE</u>

Concentration Anomalies:	<u>NONE</u>

Clean-Up Anomalies:	<u>NONE</u>

Supervisor Review: _____ Date: _____

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00048561

Analytical Method: 8081A

AAB#: WG219575

Login Number: L0608182

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
EQUIPMENT RINSE HA	08/07/06	08/08/06	08/09/06	7	1.76	08/14/06	40	5.61	

* EXT = SEE PROJECT QAPP REQUIREMENTS

* ANAL = SEE PROJECT QAPP REQUIREMENTS

SURROGATE STANDARDS

Login Number:L0608182

Instrument Id:HP15

Workgroup (AAB#):WG219575

Method:8081

CAL ID: HP15-14-AUG-06

Matrix:WATER

Sample Number	Dilution	Tag	1	2
L0608182-01	1.00	01	39.0	54.0
L0608182-01	1.00	C201	40.1	55.6
WG219455-01	1.00	01	43.0	83.6
WG219455-01	1.00	C201	45.4	86.0
WG219455-02	1.00	01	40.8	71.8
WG219455-02	1.00	C201	43.2	73.7
WG219455-03	1.00	01	47.3	85.6
WG219455-03	1.00	C201	49.6	87.3

Surrogates

Surrogate Limits

1 - 2,4,5,6-Tetrachloro-m-xylene	20	-	180
2 - Decachlorobiphenyl	25	-	140

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

METHOD BLANK SUMMARY

Login Number: L0608182
Blank File ID: 15G6256.F
Date Analyzed: 08/14/06
Time Analyzed: 20:10
Analyst: ECL

Work Group: WG219575
Blank Sample ID: WG219455-01
Instrument ID: HP15
Method: 8081A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG219455-02	15G6257.F	08/14/06 20:38	01
LCS2	WG219455-03	15G6258.F	08/14/06 21:06	01
EQUIPMENT RINSE HA	L0608182-01	15G6260.F	08/14/06 22:04	01

Login Number: L0608182 Run Date: 08/14/2006 Sample ID: WG219455-01
 Instrument ID: HP15 Run Time: 20:10 Prep Method: 3510C
 File ID: 15G6256.F Analyst: ECL Method: 8081A
 Workgroup (AAB#): WG219575 Matrix: Water Units: ug/L
 Contract #: DACA56-94-D-0020 Cal ID: HP15-14-AUG-06

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
4,4'-DDD	0.0100	0.0500	0.0100	1	U
4,4'-DDE	0.0100	0.0500	0.0100	1	U
4,4'-DDT	0.0100	0.0500	0.0100	1	U
Aldrin	0.0100	0.0500	0.0100	1	U
alpha-BHC	0.0100	0.0500	0.0100	1	U
beta-BHC	0.0100	0.0500	0.0100	1	U
delta-BHC	0.0100	0.0500	0.0100	1	U
Dieldrin	0.0100	0.0500	0.0100	1	U
Endosulfan I	0.0100	0.0500	0.0100	1	U
Endosulfan II	0.0100	0.0500	0.0100	1	U
Endosulfan sulfate	0.0100	0.0500	0.0100	1	U
Endrin	0.0100	0.0500	0.0100	1	U
Endrin aldehyde	0.0100	0.0500	0.0100	1	U
gamma-BHC (Lindane)	0.0100	0.0500	0.0100	1	U
Heptachlor	0.0100	0.0500	0.0100	1	U
Heptachlor epoxide	0.0100	0.0500	0.0100	1	U
Methoxychlor	0.0100	0.0500	0.0100	1	U
Endrin ketone	0.0100	0.0500	0.0100	1	U
alpha Chlordane	0.0100	0.0500	0.0100	1	U
gamma Chlordane	0.0100	0.0500	0.0100	1	U
Toxaphene	0.300	1.00	0.300	1	U

Surrogates	% Recovery	Surrogate Limits		Qualifier
2,4,5,6-Tetrachloro-m-xylene	43.0	20	- 180	PASS
Decachlorobiphenyl	83.6	25	- 140	PASS

MDL Method Detection Limit

RL Reporting/quantitation Limit

* Analyte concentration > RL

LABORATORY CONTROL SAMPLE (LCS)

Login Number: L0608182 Analyst: ECL Prep Method: 3510C
 Instrument ID: HP15 Matrix: Water Method: 8081A
 Workgroup (AAB#): WG219575 Units: ug/L
 Sample ID: WG219455-02 LCS File ID: 15G6257.F Run Date: 08/14/2006 20:38
 Sample ID: WG219455-03 LCS2 File ID: 15G6258.F Run Date: 08/14/2006 21:06

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
4,4'-DDD	0.500	0.516	103	0.500	0.583	117	12.3	50 - 145	40	
4,4'-DDE	0.500	0.478	95.6	0.500	0.545	109	13.1	50 - 145	40	
4,4'-DDT	0.500	0.577	115	0.500	0.661	132	13.6	45 - 140	40	
Aldrin	0.500	0.364	72.8	0.500	0.411	82.1	12.1	42 - 138	40	
alpha-BHC	0.500	0.418	83.6	0.500	0.478	95.6	13.4	50 - 130	40	
beta-BHC	0.500	0.430	86.0	0.500	0.476	95.2	10.1	65 - 125	40	
delta-BHC	0.500	0.485	97.0	0.500	0.538	108	10.4	45 - 135	40	
Dieldrin	0.500	0.502	100	0.500	0.559	112	10.8	62 - 140	40	
Endosulfan I	0.500	0.308	61.6	0.500	0.342	68.4	10.5	42 - 110	40	
Endosulfan II	0.500	0.340	68.0	0.500	0.372	74.5	9.13	30 - 130	40	
Endosulfan sulfate	0.500	0.527	105	0.500	0.578	116	9.19	40 - 135	40	
Endrin	0.500	0.548	110	0.500	0.616	123	11.8	50 - 150	40	
Endrin aldehyde	0.500	0.375	74.9	0.500	0.404	80.8	7.50	40 - 130	40	
gamma-BHC (Lindane)	0.500	0.435	87.1	0.500	0.490	97.9	11.7	50 - 130	40	
Heptachlor	0.500	0.395	79.0	0.500	0.438	87.7	10.4	40 - 130	40	
Heptachlor epoxide	0.500	0.451	90.2	0.500	0.502	100	10.7	62 - 130	40	
Methoxychlor	0.500	0.532	106	0.500	0.585	117	9.48	55 - 150	40	
Endrin ketone	0.500	0.478	95.5	0.500	0.519	104	8.41	40 - 140	40	
alpha Chlordane	0.500	0.452	90.5	0.500	0.504	101	10.7	65 - 130	40	
gamma Chlordane	0.500	0.445	89.0	0.500	0.497	99.4	11.0	60 - 135	40	

Surrogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
Decachlorobiphenyl	71.8	85.6	25 - 140	PASS
2,4,5,6-Tetrachloro-m-xylene	40.8	47.3	20 - 180	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

Login Number: L0608182

Instrument ID: HP15

Analytical Method: 8081A

Initial Calibration Date: 14-AUG-06 19:13

ICAL Workgroup: WG219885

Column ID: F

Analyte	AVG RF	% RSD	LINEAR	QUAD
4,4'-DDD	29690000	8.78		
4,4'-DDE	35710000	10.4		
4,4'-DDT	26840000	12.0		
Aldrin	39240000	7.36		
Dieldrin	37170000	5.55		
Endosulfan I	36110000	2.04		
Endosulfan II	31590000	3.13		
Endosulfan Sulfate	28840000	2.68		
Endrin	29040000	6.78		
Endrin Aldehyde	26880000	1.74		
Endrin Ketone	34680000	1.71		
Heptachlor	44000000	3.36		
Heptachlor Epoxide	39230000	3.12		
Methoxychlor	14760000	1.76		
alpha-BHC	49470000	17.0		
alpha-Chlordane	38450000	4.27		
beta-BHC	21750000	2.49		
delta-BHC	47340000	16.3		
gamma-BHC	47110000	10.9		
gamma-Chlordane	39740000	4.52		

INITIAL CALIBRATION SUMMARY

00048567

Login Number:L0608182

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:14-AUG-06 19:13

ICAL Workgroup:WG219885

Column ID:R

Analyte	AVG RF	% RSD	LINEAR	QUAD
4,4'-DDD	27650000	3.69		
4,4'-DDE	33480000	7.86		
4,4'-DDT	16720000	26.3	0.999	
Aldrin	40950000	3.94		
Dieldrin	34960000	3.77		
Endosulfan I	33320000	3.06		
Endosulfan II	28050000	1.57		
Endosulfan Sulfate	22730000	2.30		
Endrin	22240000	3.18		
Endrin Aldehyde	22540000	3.38		
Endrin Ketone	27640000	4.38		
Heptachlor	42630000	5.33		
Heptachlor Epoxide	37560000	1.24		
Methoxychlor	8633000	8.05		
alpha-BHC	54940000	10.8		
alpha-Chlordane	38320000	4.56		
beta-BHC	22960000	3.17		
delta-BHC	48460000	9.32		
gamma-BHC	49990000	8.12		
gamma-Chlordane	38080000	2.57		

Login Number:L0608182

Analytical Method:8081A

Instrument ID:HP15

Initial Calibration Date:14-AUG-06 19:13

Column ID:F

Analyte	WG219885-01			WG219885-02			WG219885-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	200	6439028993	32200000	50.0	1625934312	32520000	10.0	297182273	29720000
4,4'-DDE	200	7923618711	39620000	50.0	1990272208	39810000	10.0	351933120	35190000
4,4'-DDT	200	5947594143	29740000	50.0	1549048072	30980000	10.0	252172428	25220000
Aldrin	200	8316626669	41580000	50.0	2141963052	42840000	10.0	390504936	39050000
Dieldrin	200	7745902150	38730000	50.0	1995520671	39910000	10.0	370745702	37070000
Endosulfan I	200	7011733511	35060000	50.0	1858955107	37180000	10.0	364008506	36400000
Endosulfan II	200	6348118192	31740000	50.0	1661323945	33230000	10.0	311994595	31200000
Endosulfan Sulfate	200	5693062088	28470000	50.0	1442884944	28860000	10.0	290476472	29050000
Endrin	200	6164204477	30820000	50.0	1559606403	31190000	10.0	296563391	29660000
Endrin Aldehyde	200	5249709823	26250000	50.0	1343653456	26870000	10.0	268152376	26820000
Endrin Ketone	200	6915863810	34580000	50.0	1772750400	35460000	10.0	345722953	34570000
Heptachlor	200	8790810168	43950000	50.0	2324152989	46480000	10.0	440230935	44020000
Heptachlor Epoxide	200	7518984024	37590000	50.0	1992878865	39860000	10.0	394502860	39450000
Methoxychlor	200	2923749738	14620000	50.0	735761056	14720000	10.0	152545528	15250000
alpha-BHC	200	11957606840	59790000	50.0	2864062926	57280000	10.0	477430992	47740000
alpha-Chlordane	200	8024677882	40120000	50.0	2035364949	40710000	10.0	376745260	37670000
beta-BHC	200	4526810157	22630000	50.0	1074289549	21490000	10.0	214205544	21420000
delta-BHC	200	11330516992	56650000	50.0	2711965431	54240000	10.0	468643221	46860000
gamma-BHC	200	10786824522	53930000	50.0	2597303245	51950000	10.0	458833448	45880000
gamma-Chlordane	200	8430441106	42150000	50.0	2086223718	41720000	10.0	389906856	38990000

INITIAL CALIBRATION DATA

Login Number:L0608182

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:14-AUG-06 19:13

Column ID:F

Analyte	WG219885-05			WG219885-06		
	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	4.00	109677393	27420000	1.00	25936160	25940000
4,4'-DDE	4.00	128653271	32160000	1.00	30895812	30900000
4,4'-DDT	4.00	99870912	24970000	1.00	22400163	22400000
Aldrin	4.00	145203552	36300000	1.00	35523174	35520000
Dieldrin	4.00	140058404	35010000	1.00	34624798	34620000
Endosulfan I	4.00	142144998	35540000	1.00	36358774	36360000
Endosulfan II	4.00	124628367	31160000	1.00	30279775	30280000
Endosulfan Sulfate	4.00	113847496	28460000	1.00	30220004	30220000
Endrin	4.00	107724136	26930000	1.00	26445174	26450000
Endrin Aldehyde	4.00	108299384	27070000	1.00	27651040	27650000
Endrin Ketone	4.00	135320006	33830000	1.00	35244241	35240000
Heptachlor	4.00	169444688	42360000	1.00	42669280	42670000
Heptachlor Epoxide	4.00	153733716	38430000	1.00	41133525	41130000
Methoxychlor	4.00	59265165	14820000	1.00	14524342	14520000
alpha-BHC	4.00	169657278	42410000	1.00	38175975	38180000
alpha-Chlordane	4.00	148587962	37150000	1.00	36640267	36640000
beta-BHC	4.00	85321260	21330000	1.00	22221880	22220000
delta-BHC	4.00	163893743	40970000	1.00	36407526	36410000
gamma-BHC	4.00	166336888	41580000	1.00	41581382	41580000
gamma-Chlordane	4.00	150319045	37580000	1.00	38828131	38830000

Login Number:L0608182

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:14-AUG-06 19:13

Column ID:R

Analyte	WG219885-01			WG219885-02			WG219885-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	200	5845582858	29230000	50.0	1423743496	28470000	10.0	274735168	27470000
4,4'-DDE	200	7372007891	36860000	50.0	1792718287	35850000	10.0	332777116	33280000
4,4'-DDT	200	4551885940	22760000	50.0	1002157416	20040000	10.0	166020096	16600000
Aldrin	200	8517429425	42590000	50.0	2146877599	42940000	10.0	405949994	40590000
Dieldrin	200	7344438209	36720000	50.0	1814981000	36300000	10.0	347774201	34780000
Endosulfan I	200	6424347911	32120000	50.0	1730170202	34600000	10.0	322494938	32250000
Endosulfan II	200	5736085109	28680000	50.0	1412738503	28250000	10.0	280301565	28030000
Endosulfan Sulfate	200	4737203833	23690000	50.0	1135500070	22710000	10.0	226810424	22680000
Endrin	200	4569201905	22850000	50.0	1160538992	23210000	10.0	216457796	21650000
Endrin Aldehyde	200	4569593525	22850000	50.0	1160923582	23220000	10.0	223335583	22330000
Endrin Ketone	200	5948118600	29740000	50.0	1409845256	28200000	10.0	272390592	27240000
Heptachlor	200	8509089289	42550000	50.0	2152939882	43060000	10.0	421901383	42190000
Heptachlor Epoxide	200	7419183835	37100000	50.0	1918332635	38370000	10.0	374655645	37470000
Methoxychlor	200	1931835163	9659000	50.0	447396261	8948000	10.0	87883139	8788000
alpha-BHC	200	12483605637	62420000	50.0	3025211007	60500000	10.0	537394804	53740000
alpha-Chlordane	200	7640107622	38200000	50.0	1887960207	37760000	10.0	375398130	37540000
beta-BHC	200	4517793809	22590000	50.0	1115628170	22310000	10.0	232126410	23210000
delta-BHC	200	11016981123	55080000	50.0	2611174790	52220000	10.0	472489139	47250000
gamma-BHC	200	11050412374	55250000	50.0	2686710168	53730000	10.0	495131189	49510000
gamma-Chlordane	200	7924130406	39620000	50.0	1939337524	38790000	10.0	377127055	37710000

INITIAL CALIBRATION DATA

00048571

Login Number: L0608182

Instrument ID: HP15

Analytical Method: 8081A

Initial Calibration Date: 14-AUG-06 19:13

Column ID: R

Analyte	WG219885-05			WG219885-06		
	CONC	RESP	RF	CONC	RESP	RF
4,4'-DDD	4.00	107592264	26900000	1.00	26478158	26480000
4,4'-DDE	4.00	123031055	30760000	1.00	30314559	30310000
4,4'-DDT	4.00	54076889	13520000	1.00	10480146	10480000
Aldrin	4.00	155120702	38780000	1.00	39708867	39710000
Dieldrin	4.00	134070688	33520000	1.00	33684145	33680000
Endosulfan I	4.00	137157334	34290000	1.00	33177905	33180000
Endosulfan II	4.00	109799956	27450000	1.00	28201784	28200000
Endosulfan Sulfate	4.00	89610418	22400000	1.00	22769096	22770000
Endrin	4.00	86275560	21570000	1.00	22490712	22490000
Endrin Aldehyde	4.00	92878004	23220000	1.00	21189863	21190000
Endrin Ketone	4.00	109223888	27310000	1.00	26195156	26200000
Heptachlor	4.00	160155152	40040000	1.00	46725512	46730000
Heptachlor Epoxide	4.00	151002177	37750000	1.00	37135250	37140000
Methoxychlor	4.00	33061028	8265000	1.00	7584707	7585000
alpha-BHC	4.00	198219028	49550000	1.00	47324389	47320000
alpha-Chlordane	4.00	150334542	37580000	1.00	41814043	41810000
beta-BHC	4.00	94157876	23540000	1.00	23971139	23970000
delta-BHC	4.00	172411418	43100000	1.00	44766134	44770000
gamma-BHC	4.00	183906040	45980000	1.00	45072312	45070000
gamma-Chlordane	4.00	147440262	36860000	1.00	37947783	37950000

KEMRON Environmental Services
ALTERNATE SOURCE CALIBRATION REPORT

00048572

Login Number: L0608182 Run Date: 08/14/2006 Sample ID: WG219885-07
Instrument ID: HP15 Run Time: 19:13 Method: 8081A
File ID: 15G6254.F Analyst: ECL
ICal Workgroup: WG219885 Cal ID: HP15- 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
4,4'-DDD	20	21.0	31200000	5.1	ug/L	
4,4'-DDE	20	20.6	36900000	3.2	ug/L	
4,4'-DDT	20	20.6	27600000	3	ug/L	
Aldrin	20	21.4	41900000	6.9	ug/L	
alpha-BHC	20	21.1	52100000	5.4	ug/L	
beta-BHC	20	19.2	20900000	4	ug/L	
delta-BHC	20	19.8	46900000	1	ug/L	
Dieldrin	20	21.1	39200000	5.6	ug/L	
Endosulfan I	20	20.2	36500000	1	ug/L	
Endosulfan II	20	20.7	32700000	3.4	ug/L	
Endosulfan Sulfate	20	19.6	28200000	2.1	ug/L	
Endrin	20	20.0	29000000	.1	ug/L	
Endrin Aldehyde	20	19.7	26400000	1.6	ug/L	
gamma-BHC	20	20.4	48000000	1.9	ug/L	
Heptachlor	20	20.4	44900000	2.1	ug/L	
Heptachlor Epoxide	20	20.1	39500000	.7	ug/L	
Methoxychlor	20	19.6	14500000	2	ug/L	
Endrin Ketone	20	19.4	33600000	3	ug/L	
alpha-Chlordane	20	20.3	39000000	1.5	ug/L	
gamma-Chlordane	20	20.5	40800000	2.7	ug/L	

* Exceeds %D Limit

KEMRON Environmental Services
ALTERNATE SOURCE CALIBRATION REPORT

00048573

Login Number: L0608182 Run Date: 08/14/2006 Sample ID: WG219885-07
Instrument ID: HP15 Run Time: 19:42 Method: 8081A
File ID: 15G6254.R Analyst: ECL
ICal Workgroup: WG219885 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
4,4'-DDD	20	20.1	27800000	.7	ug/L	
4,4'-DDE	20	20.3	34000000	1.4	ug/L	
4,4'-DDT	20	17.7	16700000	11.5	ug/L	
Aldrin	20	20.8	42600000	4.1	ug/L	
alpha-BHC	20	20.7	56900000	3.5	ug/L	
beta-BHC	20	19.4	22300000	2.8	ug/L	
delta-BHC	20	19.0	45900000	5.2	ug/L	
Dieldrin	20	20.6	36000000	2.9	ug/L	
Endosulfan I	20	20.2	33700000	1.1	ug/L	
Endosulfan II	20	19.9	28000000	.3	ug/L	
Endosulfan Sulfate	20	19.4	22100000	2.8	ug/L	
Endrin	20	19.3	21400000	3.6	ug/L	
Endrin Aldehyde	20	19.7	22200000	1.3	ug/L	
gamma-BHC	20	20.4	51000000	2	ug/L	
Heptachlor	20	19.4	41300000	3.2	ug/L	
Heptachlor Epoxide	20	20.2	38000000	1.2	ug/L	
Methoxychlor	20	19.3	8340000	3.4	ug/L	
Endrin Ketone	20	19.0	26300000	4.9	ug/L	
alpha-Chlordane	20	19.3	37000000	3.6	ug/L	
gamma-Chlordane	20	20.4	38800000	2	ug/L	

* Exceeds %D Limit

Login Number: L0608182 Run Date: 08/14/2006 Sample ID: WG219886-02
 Instrument ID: HP15 Run Time: 22:32 Method: 8081A
 File ID: 15G6261.F Analyst: ECL
 Workgroup (AAB#): WG219575 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
4,4'-DDD	20	20.4	30300000	2.1	ug/L	
4,4'-DDE	20	20.4	36500000	2.1	ug/L	
4,4'-DDT	20	20.9	28000000	4.5	ug/L	
Aldrin	20	20.3	39900000	1.7	ug/L	
alpha-BHC	20	20.6	50900000	2.8	ug/L	
beta-BHC	20	19.0	20700000	5	ug/L	
delta-BHC	20	20.7	49000000	3.5	ug/L	
Dieldrin	20	20.2	37500000	.9	ug/L	
Endosulfan I	20	20.0	36100000	0	ug/L	
Endosulfan II	20	20.1	31700000	.4	ug/L	
Endosulfan Sulfate	20	19.4	28000000	2.8	ug/L	
Endrin	20	20.2	29300000	1	ug/L	
Endrin Aldehyde	20	19.9	26700000	.7	ug/L	
gamma-BHC	20	20.1	47400000	.7	ug/L	
Heptachlor	20	20.2	44500000	1.1	ug/L	
Heptachlor Epoxide	20	19.9	39000000	.7	ug/L	
Methoxychlor	20	20.0	14800000	.2	ug/L	
Endrin Ketone	20	19.9	34600000	.3	ug/L	
alpha-Chlordane	20	19.9	38200000	.5	ug/L	
gamma-Chlordane	20	19.7	39100000	1.5	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048575

Login Number: L0608182 Run Date: 08/14/2006 Sample ID: WG219886-02
Instrument ID: HP15 Run Time: 23:00 Method: 8081A
File ID: 15G6261.R Analyst: ECL
Workgroup (AAB#): WG219575 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
4,4'-DDD	20	19.9	27500000	.6	ug/L	
4,4'-DDE	20	20.0	33500000	.1	ug/L	
4,4'-DDT	20	17.9	17000000	10.4	ug/L	
Aldrin	20	19.8	40500000	1.1	ug/L	
alpha-BHC	20	20.2	55500000	1.1	ug/L	
beta-BHC	20	19.3	22100000	3.7	ug/L	
delta-BHC	20	19.8	47900000	1	ug/L	
Dieldrin	20	19.8	34500000	1.2	ug/L	
Endosulfan I	20	20.0	33300000	.1	ug/L	
Endosulfan II	20	19.7	27700000	1.3	ug/L	
Endosulfan Sulfate	20	19.6	22300000	2	ug/L	
Endrin	20	18.2	20200000	9.1	ug/L	
Endrin Aldehyde	20	20.5	23100000	2.7	ug/L	
gamma-BHC	20	20.0	49900000	.1	ug/L	
Heptachlor	20	18.9	40300000	5.5	ug/L	
Heptachlor Epoxide	20	19.7	37000000	1.5	ug/L	
Methoxychlor	20	19.8	8550000	.9	ug/L	
Endrin Ketone	20	19.8	27400000	.8	ug/L	
alpha-Chlordane	20	18.9	36300000	5.3	ug/L	
gamma-Chlordane	20	19.4	37000000	2.8	ug/L	

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048576

Login Number: L0608182 Run Date: 08/14/2006 Sample ID: WG219884-01
Instrument ID: HP15 Run Time: 23:00 Method: 8081A
File ID: 15G6262.F Analvst: ECL
Workgroup (AAB#): WG219575 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	250	510	701000	104	ug/L	*
Toxaphene-2	250	545	975000	118	ug/L	*
Toxaphene-3	250	513	1520000	105.3	ug/L	*
Toxaphene-4	250	508	1210000	103.1	ug/L	*
Toxaphene-5	250	519	689000	107.5	ug/L	*

* Exceeds %D Criteria

KEMRON Environmental Services
CONTINUING CALIBRATION VERIFICATION (CCV)

00048577

Login Number: L0608182 Run Date: 08/14/2006 Sample ID: WG219884-01
Instrument ID: HP15 Run Time: 23:28 Method: 8081A
File ID: 15G6262.R Analyst: ECL
Workgroup (AAB#): WG219575 Cal ID: HP15 - 14-AUG-06

Analyte	Expected	Found	RF	%D	UNITS	Q
Toxaphene-1	250	519	728000	107.5	ug/L	*
Toxaphene-2	250	557	629000	122.9	ug/L	*
Toxaphene-3	250	553	1830000	121.2	ug/L	*
Toxaphene-4	250	558	1050000	123.3	ug/L	*
Toxaphene-5	250	549	541000	119.5	ug/L	*

* Exceeds %D Criteria

156 Starlite Drive
Marietta, OH 45750

Phone: 740-373-4071
Fax: 740-373-4835



CHAIN-OF-CUSTODY RECORD

Company Name:		Shaw E+I				
Project Contact:		Contact Phone #:				
Allen Willmore/Diane Meyer		713 247-9212 / 713 996-4408				
Turn Around Requirements:		Location: Karmack				
Standard		Hazardous To				
Project #:		Project Name:				
845714		LHAAP				
Sampler (print):		Signature:				
Allen Willmore		[Signature]				
Sample I.D. No.	Grab	Date	Time	CWA	SW846	Protocol
67WV01/44W09		8/6/06	15:25			✓
67WV02		8/6/06	11:40			✓
EQUIPMENT BASE HA		8/6/06	13:05			✓
ADDITIONAL REQUIREMENTS 1 broken VOC bag EQUIPMENT BLANK SW Samples were collected on 8/7/2006 per Allen Willmore SLM 8/5/06 Log sent Separately SLM 8/9/06						

Relinquished by (Signature)	Date	Time	Received by (Signature)	Date	Time	Relinquished by (Signature)	Date	Time	Cooler Temp in °C	Remarks:
[Signature]	8/6/06	17:15	[Signature]			[Signature]				
Relinquished by (Signature)			Received for Laboratory by (Signature)							

00048578

cleaned via intact

*Homogenize all composite samples prior to analysis

00048579

B2614

SAMPLE RECEIPT FORM

Date: 8-8-06 Client: Shaw E&IShipped By: () Fed-Ex () UPS () DHL () KEMRON () Client () Other 9:45Opened By: [Signature]Logged By: [Signature] Login # L06 8-182IR Temp Gun: () D 71G156 STARLITE DRIVE
MARIETTA, OH
45750
(740) 373-4071

COOLER INFORMATION

Number	Cooler ID	Temp °C	Airbill#	COC#	Other
1	9387	3	J1945631951		
2					
3					
4					
5					
6					

Were all coolers sealed? ☒ Y ☐ N N/A
 Were custody seals used on all coolers? ☐ Y ☒ N N/A
 Were custody seals intact? ☐ Y ☐ N ☒ N/A
 Was visible ice present? ☒ Y ☐ N N/A
 Were all coolers in the temperature range of 2-6C? (>6C*) ☒ Y ☐ N N/A
 Were the samples frozen?* ☐ Y ☒ N N/A
 Were COC papers provided? ☒ Y ☐ N N/A
 Were all sample containers intact?* ☒ Y ☐ N N/A
 Were all sample labels intact? ☒ Y ☐ N N/A
 Were all sample labels legible?* ☒ Y ☐ N N/A
 Did all sample labels match the COC?* ☒ Y ☐ N N/A
 Was the label information complete?* ☒ Y ☐ N N/A
 Were the correct containers used?* ☒ Y ☐ N N/A
 Were the correct preservatives added to water samples?* ☐ Y ☐ N ☒ N/A
 Was the pH tested on preserved water samples? ☐ Y ☐ N ☒ N/A
 Were pH ranges acceptable?* ☐ Y ☐ N ☒ N/A
 Was sufficient amount of sample provided?* ☒ Y ☐ N N/A
 Were bubbles present in VOA samples?* ☐ Y ☐ N ☒ N/A
 Were COC's signed and dated? ☒ Y ☐ N N/A
 Did samples arrive before hold time expired?* ☒ Y ☐ N N/A
 Are discrepancy forms attached? ☐ Y ☐ N ☒ N/A
 *Requires a discrepancy form

Comments: _____

CRF #1

Revised 8/22/03

Subject: [Fwd: Please change sample dates from 8/6/06 to 8/7/06]
Date: Tue, 08 Aug 2006 08:42:50 -0400
From: Stephanie Mossburg <smossburg@kemron-lab.com>
To: Brenda Gregory <bgregory@kemron-lab.com>

Let me know when the Longhorn samples arrive please.

Subject: Please change sample dates from 8/6/06 to 8/7/06
Date: Tue, 8 Aug 2006 07:39:11 -0500
From: "Wagner, Delbert" <delbert.wagner@shawgrp.com>
To: <smossburg@kemron-lab.com>

Stephanie:

All dates were for the samples received on 8/8/06 were actually taken on 8/7/06 instead of 8/6/06. In error, we wrote 8/6/06 on all sample containers and Chains of Custodies.

Thanks

M. Allen Willmore, Jr.

Shaw E & I

3010 Briarpark Drive, Suite 4N

Houston, Texas 77042

*****Internet Email Confidentiality
Footer*****

Privileged/Confidential Information may be contained in this message.
If you are not the addressee indicated in this message (or responsible for delivery of the message to such person), you may not copy or deliver this message to anyone. In such case, you should destroy this message and notify the sender by reply email. Please advise immediately if you or your employer do not consent to Internet email for messages of this kind. Opinions, conclusions and other information in this message

Subject: Please change sample dates from 8/6/06 to 8/7/06
From: "Wagner, Delbert" <delbert.wagner@shawgrp.com>
Date: Tue, 8 Aug 2006 07:39:11 -0500
To: <smossburg@kemron-lab.com>

Stephanie:

All dates were for the samples received on 8/8/06 were actually taken on 8/7/06 instead of 8/6/06. In error, we wrote 8/6/06 on all sample containers and Chains of Custodies.

Thanks

M. Allen Willmore, Jr.
Shaw E & I
3010 Briarpark Drive, Suite 4N
Houston, Texas 77042

*****Internet Email Confidentiality
Footer*****

Privileged/Confidential Information may be contained in this message.
If you are not the addressee indicated in this message (or responsible for delivery of the message to such person), you may not copy or deliver this message to anyone. In such case, you should destroy this message and notify the sender by reply email. Please advise immediately if you or your employer do not consent to Internet email for messages of this kind. Opinions, conclusions and other information in this message that do not relate to the official business of The Shaw Group Inc. or its subsidiaries shall be understood as neither given nor endorsed by it.

The Shaw Group Inc.
<http://www.shawgrp.com>

KEMRON Environmental Services
Internal Chain of Custody Report

00048582

Login: L0608182
Account: 2773
Project: 2773.025
Samples: 1
Due Date: 15-AUG-2006

<u>Samplenum</u>	<u>Container ID</u>	<u>Products</u>
L0608182-01	259930	8081

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			08-AUG-2006 11:39	JS	
2	PREP	W1	EXT	09-AUG-2006 06:21	CEB	JKT
3	DISP	EXT	DISP	11-AUG-2006 08:23	JS	DEL

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			08-AUG-2006 11:39	JS	
2	STORE	EXT	A1	14-AUG-2006 08:39	CSH	CSH

Data Review/Validation Checklist: Data Package Completeness				
Client Name: <i>LHAAP</i>	Project Number: <i>117591</i>			
Affected Property Location:	Project Manager: <i>S. Praveen</i>			
Laboratory: <i>Kemron</i>	Laboratory Job No: <i>L0706514</i>			
Reviewer: <i>L. Dwy</i>	Date Checked: <i>7/31/07</i>			
ITEM	YES	NO	N/A	COMMENTS
R1 Date of sample collection included?	<input checked="" type="checkbox"/>			
R1 Sample receipt temperature 2-6°C?	<input checked="" type="checkbox"/>			
R1 Signed C-O-Cs included?	<input checked="" type="checkbox"/>			
R2 Field I.D. included?	<input checked="" type="checkbox"/>			
R2 Laboratory I.D. included?	<input checked="" type="checkbox"/>			
R3 Date of analysis included?	<input checked="" type="checkbox"/>			
R3 Date of sample prep. included?	<input checked="" type="checkbox"/>			
R3 Detection levels included?	<input checked="" type="checkbox"/>			
R3 Holding time to analysis expired?		<input checked="" type="checkbox"/>		
R3 Holding time to prep expired?		<input checked="" type="checkbox"/>		
R3 Met method quantitation limits?	<input checked="" type="checkbox"/>			
R3 Method reference included?	<input checked="" type="checkbox"/>			
R3 Sample matrix included?	<input checked="" type="checkbox"/>			
R3 Sample results included?	<input checked="" type="checkbox"/>			
R9 Evaluate unadjusted MQLs?			<input checked="" type="checkbox"/>	
R10 Exception reports included, where required?			<input checked="" type="checkbox"/>	
R10 Are justifications for elevated SQLs provided?			<input checked="" type="checkbox"/>	
Definitions: AA – Atomic Absorption; %D – Percent Difference; ICP – Inductively Coupled Plasma; IDL – Instrument Detection Limit; MDL – Method Detection Limit; %R – Percent Recovery; RF – Response Factor; RPD – Relative Percent Difference; RRT – Relative Retention Times; RSD – Relative Standard Deviation				
COMMENTS				

[illegible]

[illegible]



156 Starlite Drive, Marietta, OH 45750 • TEL 740-373-4071 • FAX 740-373-4835 • <http://www.kemron.com>

Laboratory Report Number: L0706514

Please find enclosed the analytical results for the samples you submitted to KEMRON Environmental Services.

Review and compilation of your report was completed by KEMRON's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box below at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

Debra Elliott - Team Leader
delliott@kemron-lab.com

Amanda Ficklesen - Client Services Specialist
aficklesen@kemron-lab.com

Kathy Albertson - Team Chemist/Data Specialist
kalbertson@kemron-lab.com

Annie Bock - Client Services Specialist
abock@kemron-lab.com

Stephanie Mossburg - Team Chemist/Data Specialist
smossburg@kemron-lab.com

Katie Barnes - Team Assistant
kbarnes@kemron-lab.com

Brenda Gregory - Client Services Specialist
bgregory@kemron-lab.com

Cara Strickler - Team Assistant
cstrickler@kemron-lab.com

Jacqueline Parsons - Team Assistant
jparsons@kemron-lab.com

This report was reviewed on July 30, 2007.

A handwritten signature in cursive script that reads "Stephanie Mossburg".

STEPHANIE MOSSBURG - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the NELAP standards and other applicable contract terms and conditions. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of KEMRON Environmental Services.

This report was certified on July 30, 2007.

A handwritten signature in cursive script that reads "David E. Vandenberg".

David Vandenberg - Vice President

FL DOH NELAP ID: E8755
This report contains a total of 107 pages.

Protecting Our Environmental Future



KEMRON REPORT L0706514
PREPARED FOR Shaw E I, Inc.
WORK ID: LONGHORN AAP KARNACK TX

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KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

KEMRON Login No.: L0706514

CHAIN OF CUSTODY: The chain of custody number was 10959.

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 5 degrees C.

SAMPLE MANAGEMENT: All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Approved: 26-JUN-07

Stephanie Mousburg

Laboratory Data Package Cover Page

00048589

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

- a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

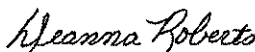
R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: ☐ This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

DEANNA . ROBERTS



June 26, 2007

Name (Printed)

Signature

Official Title (printed)

DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0706514
 Project Name: 798-LONGHORN
 Method: PCTSOLIDS
 Prep Batch Number(s): WG243344
 Reviewer Name: DEANNA . ROBERTS
 LRC Date: June 26, 2007

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?			✓		
Were blanks analyzed at the appropriate frequency?			✓		
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?			✓		
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?			✓		
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?			✓		
Were LCSs analyzed at the required frequency?			✓		
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?			✓		
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?			✓		
Has the initial calibration curve been verified using an appropriate second source standard?			✓		
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?			✓		
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?			✓		
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?			✓		
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?			✓		
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	<u>KEMRON</u>
Laboratory Log Number:	<u>L0706514</u>
Project Name:	<u>798-LONGHORN</u>
Method:	<u>PCTSOLIDS</u>
Prep Batch Number(s):	<u>WG243344</u>
Reviewer Name:	<u>DEANNA . ROBERTS</u>
LRC Date:	<u>June 26, 2007</u>

EXCEPTIONS REPORT

ER# - Description

Footnotes:

- (1) NA = Not applicable to method or project
- (2) NR = Not reviewed
- (3) ER# = Exception report number

Laboratory Data Package Cover Page

00048594

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

- a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: ☐ This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MICHAEL D. COCHRAN



Semivolatiles Lab Supervisor

June 28, 2007

Name (Printed)

Signature

Official Title (printed)

DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0706514
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG243208
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: June 27, 2007

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?		✓			1
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

00048596

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0706514
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG243208
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: June 27, 2007

Description	Yes	No	NA(1)	NR(2)	ER(3)
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?			✓		
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0706514
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG243208
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: June 27, 2007

Description	Yes	No	NA(1)	NR(2)	ER(3)
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?	✓				
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0706514
Project Name:	798-LONGHORN
Method:	8081
Prep Batch Number(s):	WG243208
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	June 27, 2007

EXCEPTIONS REPORT

ER# - Description

1. SAMPLE 01 FAILED T-M-X LOW.

Footnotes:

- (1) NA = Not applicable to method or project
- (2) NR = Not reviewed
- (3) ER# = Exception report number

KEMRON ENVIRONMENTAL SERVICES
GC PESTICIDES

KEMRON Login No.: L0706514

METHOD

Preparation: SW- 846 3550B(Soils) 3510C(Waters)

Analysis: SW-846 8081

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: For all compounds which yielded a %RSD greater than 20 %, linear or higher order equations were applied. All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Continuing Calibration: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: There were no MS/MSD results associated with this sample delivery group, due to insufficient volume of sample. The laboratory included an LCS and LCS duplicate in the preparation batch in lieu of the NELAC prescribed MS/MSD. KEMRON recommends site specific MS/MSD samples to avoid possible data qualification.

SAMPLES

Surrogates: Sample 01 yielded a % recovery for 2,4,5,6-tetrachloro-m-xylene that was below the acceptance limit. Sample 02 yielded a % recovery for decachlorobiphenyl that was below the acceptance limit. All other acceptance criteria were met.

Endrin/DDT Breakdown: All acceptance criteria were met.

Samples: For all samples which yielded results with an RPD of greater than 40% between the primary and confirmation column the appropriate flag was applied. All acceptance criteria were met.

Manual Integration Reason Codes

KEMRON laboratory management has identified four general cases with valid reasons supporting the use of manual integration techniques.

Reason #1: Data System Fails to Select Correct Peak

In some cases the chromatography system selects and integrates the "wrong peak". In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.

This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

Reason #3: Improperly Integrated Isomers and/or coeluting compounds.

This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline

There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

Reason #5: Miscellaneous

Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Laboratory Director or the QA/QC Supervisor will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Analyst: ECL

Approved: 27-JUN-07



LABORATORY REPORT

00048602

L0706514

07/30/07 13:59

Submitted By

KEMRON Environmental Services

156 Starlite Drive

Marietta, OH 45750

(740) 373-4071

For

Account Name: Shaw E & I, Inc.
 ABB Lummus Building
 3010 Briarpark Drive Suite 4N
 Houston, TX 77042
 Attention: Larry Duty

Account Number: 2773

Work ID: LHAAP

Invoice Number: 587381

P.O. Number: 200328

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
LHP-SITE59-SB01A-0-1FT	L0706514-01	8081A	1	22-JUN-07
LHP-SITE59-SB01A-0-1FT	L0706514-01	8081A	1	22-JUN-07
LHP-SITE59-SB01A-0-1FT	L0706514-02	8081A	1	22-JUN-07
LHP-SITE59-SB01A-0-1FT	L0706514-02	8081A	1	22-JUN-07
LHP-SITE59-SB02A-0-1FT	L0706514-03	8081A	1	22-JUN-07
LHP-SITE59-SB02A-0-1FT	L0706514-03	8081A	1	22-JUN-07
LHP-SITE59-SB02A-0-1FT	L0706514-04	8081A	1	22-JUN-07
LHP-SITE59-SB02A-0-1FT	L0706514-04	8081A	1	22-JUN-07

Report Number: L0706514

Report Date : July 30, 2007

Sample Number: L0706514-01

Client ID: LHP-SITE59-SB01A-0-1FT

Matrix: Soil

Workgroup Number: WG243426

Collect Date: 06/21/2007 09:00

Sample Tag: 02

PrePrep Method: NONE

Prep Method: 3550B

Analytical Method: 8081A

Analyst: ECL

Dilution: 1

Units: ug/kg

Instrument: HP15

Prep Date: 06/22/2007 08:30

Cal Date: 06/20/2007 17:23

Run Date: 06/26/2007 10:56

File ID: 15G10113.F

Percent Solid: 91.2

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha Chlordane	5103-71-9	15.7		1.80	0.436
gamma Chlordane	5103-74-2	6.26		1.80	0.436
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	31.7	39	130	*	
Decachlorobiphenyl	76.2	33	143		

J, L, SUR
J, L, SUR

* Surrogate or spike compound out of range

Report Number: L0706514

Report Date : July 30, 2007

Sample Number: L0706514-01
Client ID: LHP-SITE59-SB01A-0-1PT
Matrix: Soil
Workgroup Number: WG243426
Collect Date: 06/21/2007 09:00
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 3550B
Analytical Method: 8081A
Analyst: BCL
Dilution: 1
Units: ug/kg

Instrument: HP15
Prep Date: 06/22/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 11:25
File ID: 15G10113.R
Percent Solid: 91.2

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha Chlordane	5103-71-9	6.13		1.80	0.436
gamma Chlordane	5103-74-2	5.87		1.80	0.436
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	34.0	39	130	*	
Decachlorobiphenyl	78.6	33	143		

J, L, SUR
J, L, SUR

* Surrogate or spike compound out of range

Report Number: L0706514

Report Date : July 30, 2007

Sample Number: L0706514-02
Client ID: LHP-SITE59-SB01A-0-1FT
Matrix: Leachate
Workgroup Number: WG243459
Collect Date: 06/21/2007 09:00
Sample Tag: 02

PrePrep Method: 1312
Prep Method: 3510C
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/L

Instrument: HP15
Prep Date: 06/26/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 17:36
File ID: 15G10127.F

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha Chlordane	5103-71-9	0.0292	J	0.0510	0.0102
gamma Chlordane	5103-74-2	0.0185	J	0.0510	0.0102
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	46.2	20	180		
Decachlorobiphenyl	19.8	25	140	*	

J, L, SUR
J, L, SUR

J The analyte was positively identified, but the quantitation was below the RL
* Surrogate or spike compound out of range

Report Number: L0706514

Report Date : July 30, 2007

Sample Number: L0706514-02
Client ID: LHP-SITE59-SB01A-0-1FT
Matrix: Leachate
Workgroup Number: WG243459
Collect Date: 06/21/2007 09:00
Sample Tag: 01

PrePrep Method: I312
Prep Method: 3510C
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/L

Instrument: HP15
Prep Date: 06/26/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 18:04
File ID: 15610127.R

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha Chlordane	5103-71-9	0.0143	J	0.0510	0.0102
gamma Chlordane	5103-74-2	0.0108	J	0.0510	0.0102
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	46.3	20	180		
Decachlorobiphenyl	19.3	25	140	*	

J, L, SUR
J, L, SUR

J The analyte was positively identified, but the quantitation was below the RL
* Surrogate or spike compound out of range

Report Number: L0706514

Report Date : July 30, 2007

Sample Number: L0706514-03
Client ID: LHP-SITE59-SB02A-0-1FT
Matrix: Soil
Workgroup Number: WG243426
Collect Date: 06/21/2007 09:30
Sample Tag: 02

PrePrep Method: NONE
Prep Method: 3550B
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/kg
Instrument: HP15
Prep Date: 06/22/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 10:28
File ID: 15G10112.F
Percent Solid: 90.7

Analyte	CAS. Number	Result	Qual	PQL	SQL
Heptachlor epoxide	1024-57-3	33.6		1.81	0.438
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	69.1	39	130		
Decachlorobiphenyl	78.3	33	143		

Report Number: L0706514

Report Date : July 30, 2007

Sample Number: L0706514-03 PrePrep Method: NONE Instrument: HP15
Client ID: LHP-SITE59-SB02A-0-1FT Prep Method: 3550B Prep Date: 06/22/2007 08:30
Matrix: Soil Analytical Method: 8081A Cal Date: 06/20/2007 17:23
Workgroup Number: WG243426 Analyst: ECL Run Date: 06/26/2007 10:56
Collect Date: 06/21/2007 09:30 Dilution: 1 File ID: 15G10112.R
Sample Tag: 01 Units: ug/kg Percent Solid: 90.7

Analyte	CAS. Number	Result	Qual	PQL	SQL
Heptachlor epoxide	1024-57-3	17.8		1.81	0.438
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	64.9	39	130		
Decachlorobiphenyl	82.4	33	143		

Report Number: L0706514

Report Date : July 30, 2007

Sample Number: L0706514-04 PrePrep Method: 1312 Instrument: HP15
Client ID: LHP-SITE59-SB02A-0-1FT Prep Method: 3510C Prep Date: 06/26/2007 08:30
Matrix: Leachate Analytical Method: 8081A Cal Date: 06/20/2007 17:23
Workgroup Number: WG243459 Analyst: ECL Run Date: 06/26/2007 18:33
Collect Date: 06/21/2007 09:30 Dilution: 1 File ID: 15G10128.R
Sample Tag: 01 Units: ug/L

Analyte	CAS. Number	Result	Qual	PQL	SQL
Heptachlor epoxide	1024-57-3	0.0665		0.0510	0.0102
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	37.0	20	180		
Decachlorobiphenyl	41.7	25	140		

Report Number: L0706514

Report Date : July 30, 2007

Sample Number: L0706514-04 PrePrep Method: 1312 Instrument: HP15
Client ID: LHP-SITE59-SB02A-0-1FT Prep Method: 3510C Prep Date: 06/26/2007 08:30
Matrix: Leachate Analytical Method: 8081A Cal Date: 06/20/2007 17:23
Workgroup Number: WG243459 Analyst: ECL Run Date: 06/26/2007 18:04
Collect Date: 06/21/2007 09:30 Dilution: 1 File ID: 15G10128.F
Sample Tag: 02 Units: ug/L

Analyte	CAS. Number	Result	Qual	PQL	SQL
Heptachlor epoxide	1024-57-3	0.0597		0.0510	0.0102
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	38.5	20	180		
Decachlorobiphenyl	42.3	25	140		

156 Starlite Drive, Marietta, OH 45750 • TEL 740-373-4071 • FAX 740-373-4835 • <http://www.kemron.com>

Laboratory Report Number: L0706514

Please find enclosed the analytical results for the samples you submitted to KEMRON Environmental Services.

Review and compilation of your report was completed by KEMRON's Sales and Service Team. If you have questions, comments or require further assistance regarding this report, please contact your team member noted in the reviewed box below at 800-373-4071. Team member e-mail addresses also appear here for your convenience.

Debra Elliott - Team Leader

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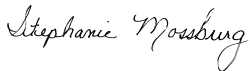
Cara Strickler - Team Assistant

cstrickler@kemron-lab.com

Jacqueline Parsons - Team Assistant

jparsons@kemron-lab.com

This report was reviewed on July 30, 2007.



STEPHANIE MOSSBURG - Team Chemist/Data Specialist

I certify that all test results meet all of the requirements of the NELAP standards and other applicable contract terms and conditions. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of KEMRON Environmental Services.

This report was certified on July 30, 2007.



David Vandenberg - Vice President

FL DOH NELAP ID: E8755

This report contains a total of 107 pages.

Protecting Our Environmental Future



KEMRON REPORT L0706514
PREPARED FOR Shaw E I, Inc.
WORK ID: LONGHORN AAP KARNACK TX

00048612

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1.0 Introduction

KEMRON ENVIRONMENTAL SERVICES
REPORT NARRATIVE

KEMRON Login No.: L0706514

CHAIN OF CUSTODY: The chain of custody number was 10959.

SHIPMENT CONDITIONS: The chain of custody forms were received sealed in a cooler. The cooler temperature was 5 degrees C.

SAMPLE MANAGEMENT: All samples received were intact.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Approved: 26-JUN-07

<i>Stephanie Mossburg</i>

Laboratory Data Package Cover Page

00048615

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

- a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

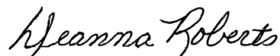
R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: ☐ This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

DEANNA . ROBERTS



June 26, 2007

Name (Printed)

Signature

Official Title (printed)

DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
Laboratory Log Number: L0706514
Project Name: 798-LONGHORN
Method: PCTSOLIDS
Prep Batch Number(s): WG243344
Reviewer Name: DEANNA . ROBERTS
LRC Date: June 26, 2007

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?			✓		
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?			✓		
Were sample quantitation limits reported for all analytes not detected?			✓		
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?			✓		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			✓		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?			✓		
Were blanks analyzed at the appropriate frequency?			✓		
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?			✓		
Were blank concentrations <MQL?			✓		
Laboratory control samples (LCS):					
Were all COCs included in the LCS?			✓		
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?			✓		
Were LCSs analyzed at the required frequency?			✓		
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?			✓		
Does the detectability data document the laboratorys capability to detect the COCs at the MDL used to calculate the SQLs?			✓		
Was the LCSD RPD within QC limits?			✓		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			00048617		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	✓				
Were analytical duplicates analyzed at the appropriate frequency?	✓				
Were RPDs or relative standard deviations within the laboratory QC limits?	✓				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?			✓		
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?			✓		
Are unadjusted MQLs included in the laboratory data package?			✓		
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?	✓				
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?			✓		
Were response factors and/or relative response factors for each analyte within QC limits?			✓		
Were percent RSDs or correlation coefficient criteria met?			✓		
Was the number of standards recommended in the method used for all analytes?			✓		
Were all points generated between the lowest and highest standard used to calculate the curve?			✓		
Are ICAL data available for all instruments used?			✓		
Has the initial calibration curve been verified using an appropriate second source standard?			✓		
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?			✓		
Were percent differences for each analyte within the method-required QC limits?			✓		
Was the ICAL curve verified for each analyte?			✓		
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			✓		
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?			✓		
Is the MDL either adjusted or supported by the analysis of DCSs?			✓		
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Standards documentation			00048618		
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?			✓		
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?			✓		
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0706514
Project Name:	798-LONGHORN
Method:	PCTSOLIDS
Prep Batch Number(s):	WG243344
Reviewer Name:	DEANNA . ROBERTS
LRC Date:	June 26, 2007

EXCEPTIONS REPORT

ER# - Description

Footnotes:

- (1) NA = Not applicable to method or project
- (2) NR = Not reviewed
- (3) ER# = Exception report number

Laboratory Data Package Cover Page

00048620

This data Package consists of:

This signature page, the laboratory review checklists, and the following reportable data:

R1 Field chain-of-custody documentation;

R2 sample identification cross-reference;

R3 Test reports (analytical data sheets) for each environmental sample that includes:

- a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
- b) dilution factors,
- c) preparation methods,
- d) Cleanup methods, and
- e) If required for the project, tentatively identified compounds (TICs)

R4 Surrogate recovery data including:

- a) Calculated recovery (%R) for each analyte, and
- b) The laboratory's surrogate QC limits.

R5 Test reports/summary forms for blank samples;

R6 Test reports/summary forms FOR laboratory control samples (LCSs) including:

- a) LCS spiking amount,
- b) Calculated %R for each analyte, and
- c) The laboratory's LCS QC limits.

R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:

- a) Samples associated with the MS/MSD clearly identified,
- b) MS/MSD spiking amounts,
- c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
- d) Calculated %R and relative percent differences (RPDs), and
- e) The laboratory's MS/MSD QC limits

R8 Laboratory analytical duplicate (if applicable) recovery and precision:

- a) the amount of analyte measured in the duplicate,
- b) the calculated RPD, and
- c) the laboratory's QC limits for analytical duplicates.

R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix;

R10 Other problems or anomalies.

The exception Report for every "No" or "Not Reviewed (NR)" item in laboratory review checklist.

Release statement: I am responsible for the release of this laboratory data package. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exceptions reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, If applicable: ☐ This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report (for example, the APAR) in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

MICHAEL D. COCHRAN



Semivolatiles Lab Supervisor

June 28, 2007

Name (Printed)

Signature

Official Title (printed)

DATE

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
Laboratory Log Number: L0706514
Project Name: 798-LONGHORN
Method: 8081
Prep Batch Number(s): WG243208
Reviewer Name: MICHAEL D. COCHRAN
LRC Date: June 27, 2007

Description	Yes	No	NA(1)	NR(2)	ER(3)
Chain-Of-Custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	✓				
Were all departures from standard conditions described in an exception report?	✓				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	✓				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	✓				
Test reports					
Were all samples prepared and analyzed within holding times?	✓				
Other than those results <MQL, were all other raw values bracketed by calibration standards?	✓				
Were calculations checked by a peer or supervisor?	✓				
Were all analyte identifications checked by a peer or supervisor?	✓				
Were sample quantitation limits reported for all analytes not detected?	✓				
Were all results for soil and sediment samples reported on a dry weight basis?	✓				
Were % moisture (or solids) reported for all soil and sediment samples?	✓				
If required for the project, TICs reported?			✓		
Surrogate recovery data					
Were surrogates added prior to extraction?	✓				
Were surrogate percent recoveries in all samples within the laboratory QC limits?		✓			1
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	✓				
Were blanks analyzed at the appropriate frequency?	✓				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	✓				
Were blank concentrations <MQL?	✓				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	✓				
Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	✓				
Were LCSs analyzed at the required frequency?	✓				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	✓				
Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	✓				
Was the LCSD RPD within QC limits?	✓				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			✓		
Were MS/MSD analyzed at the appropriate frequency?			✓		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			✓		

Description	Yes	No	NA(1)	NR(2)	ER(3)
Were MS/MSD RPDs within laboratory QC limits?			00048622		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0706514
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG243208
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: June 27, 2007

Description	Yes	No	NA(1)	NR(2)	ER(3)
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			✓		
Were analytical duplicates analyzed at the appropriate frequency?			✓		
Were RPDs or relative standard deviations within the laboratory QC limits?			✓		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	✓				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	✓				
Are unadjusted MQLs included in the laboratory data package?	✓				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	✓				
Were all necessary corrective actions performed for the reported data?			✓		
Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	✓				
ICAL					
Were response factors and/or relative response factors for each analyte within QC limits?	✓				
Were percent RSDs or correlation coefficient criteria met?	✓				
Was the number of standards recommended in the method used for all analytes?	✓				
Were all points generated between the lowest and highest standard used to calculate the curve?	✓				
Are ICAL data available for all instruments used?	✓				
Has the initial calibration curve been verified using an appropriate second source standard?	✓				
Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	✓				
Were percent differences for each analyte within the method-required QC limits?	✓				
Was the ICAL curve verified for each analyte?	✓				
Was the absolute value of the analyte concentration in the inorganic CCB <MDL?			✓		
Mass spectral tuning:					
Was the appropriate compound for the method used for tuning?			✓		
Were ion abundance data within the method-required QC limits?			✓		
Internal standards (IS):					
Were IS area counts and retention times within the method-required QC limits?			✓		
Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section 4.12.2)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	✓				
Were data associated with manual integrations flagged on the raw data?			✓		

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name: KEMRON
 Laboratory Log Number: L0706514
 Project Name: 798-LONGHORN
 Method: 8081
 Prep Batch Number(s): WG243208
 Reviewer Name: MICHAEL D. COCHRAN
 LRC Date: June 27, 2007

Description	Yes	No	NA(1)	NR(2)	ER(3)
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?	✓				
Tentatively identified compounds (TICs):					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			✓		
Interference Check Sample (ICS) results:					
Were percent recoveries within method QC limits?			✓		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			✓		
Method detection limit (MDL) studies					
Was a MDL study performed for each reported analyte?	✓				
Is the MDL either adjusted or supported by the analysis of DCSs?	✓				
Proficiency test reports:					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	✓				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	✓				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	✓				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	✓				
Is documentation of the analyst's competency up-to-date and on file?	✓				
Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	✓				
Laboratory standard operating procedures (SOPs):					
Are laboratory SOPs current and on file for each method performed?	✓				

KEMRON Environmental Services
Laboratory Review Checklist

Laboratory Name:	KEMRON
Laboratory Log Number:	L0706514
Project Name:	798-LONGHORN
Method:	8081
Prep Batch Number(s):	WG243208
Reviewer Name:	MICHAEL D. COCHRAN
LRC Date:	June 27, 2007

EXCEPTIONS REPORT

ER# - Description

1. SAMPLE 01 FAILED T-M-X LOW.

Footnotes:

- (1) NA = Not applicable to method or project
- (2) NR = Not reviewed
- (3) ER# = Exception report number

2.1 Semivolatiles Data

2.1.1 Pesticide GC Data (8081)

2.1.1.1 Summary Data

KEMRON ENVIRONMENTAL SERVICES
GC PESTICIDES

00048629

KEMRON Login No.: L0706514**METHOD****Preparation:** SW- 846 3550B(Soils) 3510C(Waters)**Analysis:** SW-846 8081**HOLDING TIMES****Sample Preparation:** All holding times were met.**Sample Analysis:** All holding times were met.**PREPARATION**

Sample preparation proceeded normally.

CALIBRATION**Initial Calibration:** For all compounds which yielded a %RSD greater than 20 %, linear or higher order equations were applied. All acceptance criteria were met.**Alternate Source Standards:** All acceptance criteria were met.**Continuing Calibration:** All acceptance criteria were met.**BATCH QA/QC****Method Blank:** All acceptance criteria were met.**Laboratory Control Sample:** All acceptance criteria were met.**Matrix Spikes:** There were no MS/MSD results associated with this sample delivery group, due to insufficient volume of sample. The laboratory included an LCS and LCS duplicate in the preparation batch in lieu of the NELAC prescribed MS/MSD. KEMRON recommends site specific MS/MSD samples to avoid possible data qualification.**SAMPLES****Surrogates:** Sample 01 yielded a % recovery for 2,4,5,6-tetrachloro-m-xylene that was below the acceptance limit. Sample 02 yielded a % recovery for decachlorobiphenyl that was below the acceptance limit. All other acceptance criteria were met.**Endrin/DDT Breakdown:** All acceptance criteria were met.**Samples:** For all samples which yielded results with an RPD of greater than 40% between the primary and confirmation column the appropriate flag was applied. All acceptance criteria were met.**Manual Integration Reason Codes**

Reason #1: Data System Fails to Select Correct Peak

In some cases the chromatography system selects and integrates the "wrong peak". In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.

This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

Reason #3: Improperly Integrated Isomers and/or coeluting compounds.

This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline

There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

Reason #5: Miscellaneous

Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Laboratory Director or the QA/QC Supervisor will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and KEMRON Environmental Services, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Analyst: ECL

Approved: 27-JUN-07



LABORATORY REPORT

L0706514

00048631

07/30/07 13:59

Submitted By

KEMRON Environmental Services

156 Starlite Drive

Marietta , OH 45750

(740) 373 - 4071

For

Account Name: Shaw E & I, Inc.
ABB Lummus Building
3010 Briarpark Drive Suite 4N
Houston, TX 77042
Attention: Larry Duty

Account Number: 2773
Work ID: LHAAP
Invoice Number: 587381
P.O. Number: 200328

Sample Analysis Summary

Client ID	Lab ID	Method	Dilution	Date Received
LHP-SITE59-SB01A-0-1FT	L0706514-01	8081A	1	22-JUN-07
LHP-SITE59-SB01A-0-1FT	L0706514-01	8081A	1	22-JUN-07
LHP-SITE59-SB01A-0-1FT	L0706514-02	8081A	1	22-JUN-07
LHP-SITE59-SB01A-0-1FT	L0706514-02	8081A	1	22-JUN-07
LHP-SITE59-SB02A-0-1FT	L0706514-03	8081A	1	22-JUN-07
LHP-SITE59-SB02A-0-1FT	L0706514-03	8081A	1	22-JUN-07
LHP-SITE59-SB02A-0-1FT	L0706514-04	8081A	1	22-JUN-07
LHP-SITE59-SB02A-0-1FT	L0706514-04	8081A	1	22-JUN-07

Report Number: L0706514

Report Date : July 30, 2007

00048632

Sample Number: L0706514-01
Client ID: LHP-SITE59-SB01A-0-1FT
Matrix: Soil
Workgroup Number: WG243426
Collect Date: 06/21/2007 09:00
Sample Tag: 02

PrePrep Method: NONE
Prep Method: 3550B
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/kg

Instrument: HP15
Prep Date: 06/22/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 10:56
File ID: 15G10113.F
Percent Solid: 91.2

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha Chlordane	5103-71-9	15.7		1.80	0.436
gamma Chlordane	5103-74-2	6.26		1.80	0.436
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	31.7	39	130	*	
Decachlorobiphenyl	76.2	33	143		

* Surrogate or spike compound out of range

Report Number: L0706514

Report Date : July 30, 2007

00048633

Sample Number: L0706514-01
Client ID: LHP-SITE59-SB01A-0-1FT
Matrix: Soil
Workgroup Number: WG243426
Collect Date: 06/21/2007 09:00
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 3550B
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/kg

Instrument: HP15
Prep Date: 06/22/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 11:25
File ID: 15G10113.R
Percent Solid: 91.2

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha Chlordane	5103-71-9	6.13		1.80	0.436
gamma Chlordane	5103-74-2	5.87		1.80	0.436
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	34.0	39	130	*	
Decachlorobiphenyl	78.6	33	143		

* Surrogate or spike compound out of range

Report Number: L0706514

Report Date : July 30, 2007

00048634

Sample Number: L0706514-02
Client ID: LHP-SITE59-SB01A-0-1FT
Matrix: Leachate
Workgroup Number: WG243459
Collect Date: 06/21/2007 09:00
Sample Tag: 02

PrePrep Method: 1312
Prep Method: 3510C
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/L

Instrument: HP15
Prep Date: 06/26/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 17:36
File ID: 15G10127.F

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha Chlordane	5103-71-9	0.0292	J	0.0510	0.0102
gamma Chlordane	5103-74-2	0.0185	J	0.0510	0.0102
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	46.2	20	180		
Decachlorobiphenyl	19.8	25	140	*	

J The analyte was positively identified, but the quantitation was below the RL

* Surrogate or spike compound out of range

Report Number: L0706514

Report Date : July 30, 2007

00048635

Sample Number: L0706514-02
Client ID: LHP-SITE59-SB01A-0-1FT
Matrix: Leachate
Workgroup Number: WG243459
Collect Date: 06/21/2007 09:00
Sample Tag: 01

PrePrep Method: 1312
Prep Method: 3510C
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/L

Instrument: HP15
Prep Date: 06/26/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 18:04
File ID: 15G10127.R

Analyte	CAS. Number	Result	Qual	PQL	SQL
alpha Chlordane	5103-71-9	0.0143	J	0.0510	0.0102
gamma Chlordane	5103-74-2	0.0108	J	0.0510	0.0102
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	46.3	20	180		
Decachlorobiphenyl	19.3	25	140	*	

J The analyte was positively identified, but the quantitation was below the RL

* Surrogate or spike compound out of range

Report Number: **L0706514**Report Date : **July 30, 2007****00048636**

Sample Number: **L0706514-03**
Client ID: **LHP-SITE59-SB02A-0-1FT**
Matrix: **Soil**
Workgroup Number: **WG243426**
Collect Date: **06/21/2007 09:30**
Sample Tag: **02**

PrePrep Method: **NONE**
Prep Method: **3550B**
Analytical Method: **8081A**
Analyst: **ECL**
Dilution: **1**
Units: **ug/kg**

Instrument: **HP15**
Prep Date: **06/22/2007 08:30**
Cal Date: **06/20/2007 17:23**
Run Date: **06/26/2007 10:28**
File ID: **15G10112.F**
Percent Solid: **90.7**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Heptachlor epoxide	1024-57-3	33.6		1.81	0.438
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	69.1	39	130		
Decachlorobiphenyl	78.3	33	143		

Report Number: L0706514

Report Date : July 30, 2007

00048637

Sample Number: L0706514-03
Client ID: LHP-SITE59-SB02A-0-1FT
Matrix: Soil
Workgroup Number: WG243426
Collect Date: 06/21/2007 09:30
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 3550B
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/kg

Instrument: HP15
Prep Date: 06/22/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 10:56
File ID: 15G10112.R
Percent Solid: 90.7

Analyte	CAS. Number	Result	Qual	PQL	SQL
Heptachlor epoxide	1024-57-3	17.8		1.81	0.438
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	64.9	39	130		
Decachlorobiphenyl	82.4	33	143		

Report Number: **L0706514**Report Date : **July 30, 2007****00048638**

Sample Number: **L0706514-04**
Client ID: **LHP-SITE59-SB02A-0-1FT**
Matrix: **Leachate**
Workgroup Number: **WG243459**
Collect Date: **06/21/2007 09:30**
Sample Tag: **01**

PrePrep Method: **1312**
Prep Method: **3510C**
Analytical Method: **8081A**
Analyst: **ECL**
Dilution: **1**
Units: **ug/L**

Instrument: **HP15**
Prep Date: **06/26/2007 08:30**
Cal Date: **06/20/2007 17:23**
Run Date: **06/26/2007 18:33**
File ID: **15G10128.R**

Analyte	CAS. Number	Result	Qual	PQL	SQL
Heptachlor epoxide	1024-57-3	0.0665		0.0510	0.0102
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	37.0	20	180		
Decachlorobiphenyl	41.7	25	140		

Report Number: L0706514

Report Date : July 30, 2007

00048639

Sample Number: L0706514-04
Client ID: LHP-SITE59-SB02A-0-1FT
Matrix: Leachate
Workgroup Number: WG243459
Collect Date: 06/21/2007 09:30
Sample Tag: 02

PrePrep Method: 1312
Prep Method: 3510C
Analytical Method: 8081A
Analyst: ECL
Dilution: 1
Units: ug/L

Instrument: HP15
Prep Date: 06/26/2007 08:30
Cal Date: 06/20/2007 17:23
Run Date: 06/26/2007 18:04
File ID: 15G10128.F

Analyte	CAS. Number	Result	Qual	PQL	SQL
Heptachlor epoxide	1024-57-3	0.0597		0.0510	0.0102
Surrogate	% Recovery	Lower	Upper	Qual	
2,4,5,6-Tetrachloro-m-xylene	38.5	20	180		
Decachlorobiphenyl	42.3	25	140		

2.1.1.2 QC Summary Data

Example 8081 Calculations**1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:**

$$RF = \frac{A_s}{C_s}$$

where:

 A_s = Area of the compound being measured in the standard C_s = Concentration of the compound being measured (ng/mL)

Example:

10000

100

RF = 100

2.0 Calculating the concentration (C) of a compound in water using data from prep log and quantitation report:*

$$C = \frac{(A_x)(Vf)(D)}{(RF)(Vi)}$$

where:

 A_x = Area of the compound begin measured Vf = Final volume of sample extract (mL). (prep log) D = Dilution factor for sample as a multiplier (10X=10) RF = Response factor from ICAL calculated above. Vi = Initial volume of sample (mL). (prep log)

Example:

10000

1

1

100

1000

C(ug/L) = 0.1

3.0 Calculating the concentration (C) of a compound in soil using data from prep log and quantitation report:*

$$C = \frac{(A_x)(Vf)(D)}{(RF)(Wi)}$$

where:

 A_x = Area of the compound begin measured Vf = Final volume of sample extract (mL). (prep log) D = Dilution factor for sample as a multiplier (10X=10) RF = Response factor from ICAL calculated above. Wi = Initial weight of sample (g).

Example:

10000

1

1

100

30

C(ug/kg) = 3.333333

* Concentrations appearing on instrument quantitation reports are on-column results and do not take into account initial volume, final volume and dilution factor.

Parameter: Pest Soil SOP #: EXP02 Revision #: 14
 Extraction Analyst(s): CPD TV/KD Analyst(s): CPD
 Date/Time Extracted: 6-22-07/0830 Date TV/KD: 6-22-07
 Spike/Surrogate Analyst: CPD Witness: CSH
 Surrogate #: STD19912 Earliest Hold Date: 7/3
 Spike #: A = STD16963 Spike #: B = —

Extraction Work Group WG 243208243426Extract Relinquished By: CPDExtract Received By & Date: CAN 6/25/07

	Sample ID	Test Code	pH /			Initial Vol / Wt	Amount Surrogate	Amount Spike	Final Volume	Extract Color	Emulsions /			Comments
			<2	N	>12						A	BN	N	
1	Blank					30.00g	200ul		10ul	T				WG 243208-01
2	LCS					1		250ul	1	1				WG 1-02
3	LCS Dup							1		1				WG 1-03
4	06-483-06	8081				30.77g				1				
5	06-514-0	8081-SPE				30.15g				1				
6	-03	1				30.24g				C				
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														

Methylene Chloride Lot #: —Hexane Lot #: —Ether Lot #: —Methanol Lot #: —Solvent: Hexane Lot #: CS1E19Reagent: Sand Lot #: C41589Reagent: Pow N₂O₄ Lot #: B52465Reagent: 94% 1727 Lot #: 50:50 R6T 11726Acid: — Lot #: —Florilil Lot #: E04559Silica Gel Lot #: —IR Analyst / Date / Time: —Dried Na₂SO₄ Lot #: CA02125

Color Code

T = Transparent

C = Colored

O = Opaque

SW-846 Method

		On	Off	On	Off
Continuous	3520C				
Soxhlet	3540C				
ASE*	3545				
Sep Funnel	3510C				
Sonication	3550B				
Waste	3580A				

* Accelerated Solvent Extractor (ASE)

Clean-ups			
Florilil 3620B		GPC 3640A	
Silica Gel 3630C		Other	
Acid 3665A		N/A	
Sulfur 3660B			

Peer Reviewed By: Cheryl Flowers Date: 6-22-07

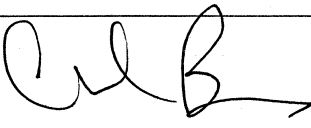
Extraction Notes For Volume # 282 Page # 35

General Comments: <u>None</u>

Extraction Anomalies: <u>None</u>

Concentration Anomalies: <u>None</u>

Clean-Up Anomalies: <u>None</u>

Supervisor Review:  Date: 6/25/7

Parameter: PESTH2O SOP #: E1P01 Revision #: 12
 Extraction Analyst(s): CSH TV/KD Analyst(s): CSH
 Date/Time Extracted: 6-26-07 0830 Date TV/KD: 6-26-7
 Spike/Surrogate Analyst: CSH Witness: CPD
 Surrogate #: STD19912 Earliest Hold Date: 6/27
 Spike #: A = STD16963 Spike #: B = -

Extraction Work Group WG 243408

Extract Relinquished By: CSH
 Extract Received By & Date: EL2 6-26-07

	Sample ID	Test Code	pH /			Initial Vol / Wt	Amount Surrogate	Amount Spike	Final Volume	Extract Color	Emulsions /			Comments
			<2	N	>12						A	BN	N	
1	Blank			✓		1000mL	200mL		10mL	T				WG243408-01
2	LCS			✓				250mL						WG -02
3	LCS DuP			✓										-03
4	06560-04	8081		✓										
5	-05			✓		960mL								
6	-06			✓		1000mL								
7	-07			✓		960mL								
8	-08			✓		1000mL								
9	SALPBLK4/25 8081-SALP			✓		980mL								WG243405-01
10	06514-02			✓										
11	-04			✓										
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														

Methylene Chloride Lot #: E14E06Hexane Lot #: E16E21Ether Lot #: -Methanol Lot #: -Solvent: - Lot #: -Reagent: 9446 Lot #: R6711433Reagent: 50150 Lot #: R6711440Reagent: - Lot #: -Acid: - Lot #: -Florisil Lot #: E04559Silica Gel Lot #: -IR Analyst / Date / Time: -Dried Na₂SO₄ Lot #: COA12125

Color Code

T = Transparent

C = Colored

O = Opaque

SW-846 Method

		On	Off	On	Off
Continuous	3520C				
Soxhlet	3540C				
ASE*	3545				
Sep Funnel	3510C	✓			
Sonication	3550B				
Waste	3580A				

* Accelerated Solvent Extractor (ASE)

Clean-ups

Florisil 3620B	✓	GPC 3640A	
Silica Gel 3630C		Other	
Acid 3665A		N/A	
Sulfur 3660B			

Peer Reviewed By: Charles DavisDate: 6-26-07

Extraction Notes For Volume # 281 Page # 161

General Comments: <u>NONE</u>

Extraction Anomalies: <u>NONE</u>

Concentration Anomalies: <u>NONE</u>

Clean-Up Anomalies: <u>NONE</u>

Supervisor Review: _____ Date: _____

TCLP Non-Volatile

 Analyst(s): RWC
 Date: 06-25-07

Analyst/Date		Analyst/Date	
RWC 6-25-07		RWC 6-26-07	
Time On	Temp On °C	Time Off	Temp Off °C
1530	24	0730	22

Jug#	Sample #	Tests	Method	Fluid #	Matrix*	%Solid	Size Reduction		Int. Wt. (g)	Fluid Vol. (mL)
							Yes	No		
N/A	06-46401	ME SV PCB	1311	Filtered	W	<.5		✓	100	100
D	06-49701			F1-643	S	100			100.03	2000
D	06-50101								100.04	I
G-15	06-530-01	SV		I					50.03	1000
D	06-53201			I					25.00	500
D	06-55201			F2-230					25.07	I
D	06-55301			I					25.01	I
D	06-55401			F1-643					25.05	I
D	06-55501								25.06	I
D	05-639-01								100.01	2000
D	02								100.04	I
D	03								100.05	I
D	05								100.02	I
D	06								100.03	I
D	07								*94.59	1892
D	08								100.07	2000
D	09								*50.02	1000
D	10								*50.04	I
D	11								*25.02	500
N/A	FBLK	SV				N/A			2000	2000
G-30	06-514-02	8081	1312	SF2-175	S/S	100	✓		100.01	I
G-3	04						✓		100.03	I
N/A	FBLK				N/A	N/A	✓		2000	I

RWC 6-25-07

*Matrix Code = (S-solid)(SS-sand, soil or sludge)(P-paint)(O-organic or waste)(W-water)

Comments: *used all sx client provided (05-639's) these sx's were a thick "grease-like" ORGANIC MATERIAL - had to consider these "solid" as per SW846 - Method 1311 - RWC 6-25-07

Peer Review By: _____

Supervisor Review: _____

KEMRON Environmental Services

Instrument Run Log

00048647

Instrument: HP15 Dataset: 062007
 Analyst1: ECL Analyst2: NA
 Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: _____

Column 1 ID: RTX-CLPColumn 2 ID: RTX-CLP2Workgroups: WG243107, WG243037Internal STD: NA Surrogate STD: STD19912 Calibration STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15G10061.F	WG243052-01 ENDRIN/DDT	1	1	STD18194	06/20/07 11:15
2	15G10061.R	WG243052-01 ENDRIN/DDT	1	1	STD18194	06/20/07 11:43
3	15G10062.F	WG243049-01 TOX ICAL 2000 PPB	1	1	STD17350	06/20/07 11:43
4	15G10062.R	WG243049-01 TOX ICAL 2000 PPB	1	1	STD17350	06/20/07 12:11
5	15G10063.F	WG243049-02 TOX ICAL 1000 PPB	1	1	STD17350	06/20/07 12:11
6	15G10063.R	WG243049-02 TOX ICAL 1000 PPB	1	1	STD17350	06/20/07 12:40
7	15G10064.F	WG243049-03 TOX ICAL 500 PPB	1	1	STD17350	06/20/07 12:40
8	15G10064.R	WG243049-03 TOX ICAL 500 PPB	1	1	STD17350	06/20/07 13:08
9	15G10065.F	WG243049-04 TOX ICAL 250 PPB	1	1	STD17350	06/20/07 13:08
10	15G10065.R	WG243049-04 TOX ICAL 250 PPB	1	1	STD17350	06/20/07 13:36
11	15G10066.F	WG243049-05 TOX ICAL 100 PPB	1	1	STD17350	06/20/07 13:36
12	15G10066.R	WG243049-05 TOX ICAL 100 PPB	1	1	STD17350	06/20/07 14:05
13	15G10067.F	WG243049-06 TOX ALT 500 PPB	1	1	STD18094	06/20/07 14:05
14	15G10067.R	WG243049-06 TOX ALT 500 PPB	1	1	STD18094	06/20/07 14:33
15	15G10068.F	WG243051-01 PEST ICAL 200 PPB	1	1	STD18706	06/20/07 14:33
16	15G10068.R	WG243051-01 PEST ICAL 200 PPB	1	1	STD18706	06/20/07 15:02
17	15G10069.F	WG243051-02 PEST ICAL 50 PPB	1	1	STD18706	06/20/07 15:02
18	15G10069.R	WG243051-02 PEST ICAL 50 PPB	1	1	STD18706	06/20/07 15:30
19	15G10070.F	WG243051-03 PEST ICAL 20 PPB	1	1	STD18706	06/20/07 15:30
20	15G10070.R	WG243051-03 PEST ICAL 20 PPB	1	1	STD18706	06/20/07 15:59
21	15G10071.F	WG243051-04 PEST ICAL 10 PPB	1	1	STD18706	06/20/07 15:59
22	15G10071.R	WG243051-04 PEST ICAL 10 PPB	1	1	STD18706	06/20/07 16:27
23	15G10072.F	WG243051-05 PEST ICAL 4 PPB	1	1	STD18706	06/20/07 16:27
24	15G10072.R	WG243051-05 PEST ICAL 4 PPB	1	1	STD18706	06/20/07 16:55
25	15G10073.F	WG243051-06 PEST ICAL 1 PPB	1	1	STD18706	06/20/07 16:55
26	15G10073.R	WG243051-06 PEST ICAL 1 PPB	1	1	STD18706	06/20/07 17:23
27	15G10074.F	WG243051-07 PEST ALT 20 PPB	1	1	STD19689	06/20/07 17:23
28	15G10074.R	WG243051-07 PEST ALT 20 PPB	1	1	STD19689	06/20/07 17:52
29	15G10075.F	WG243015-01 BLANK V282 P11	7	1	SOIL	06/20/07 17:52
30	15G10075.R	WG243015-01 BLANK V282 P11	7	1	SOIL	06/20/07 18:20
31	15G10076.F	WG243015-02 LCS V282 P11	7	1	SOIL	06/20/07 18:20
32	15G10076.R	WG243015-02 LCS V282 P11	7	1	SOIL	06/20/07 18:48
33	15G10077.F	WG243015-03 LCS DUP V282 P11	7	1	SOIL	06/20/07 18:48
34	15G10077.R	WG243015-03 LCS DUP V282 P11	7	1	SOIL	06/20/07 19:16
35	15G10078.F	L0706204-02 RE	7	1		06/20/07 19:16

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Approved: 21-JUN-07



KEMRON Environmental Services

Instrument Run Log

00048648

Instrument: HP15 Dataset: 062007
 Analyst1: ECL Analyst2: NA
 Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: _____

Column 1 ID: RTX-CLP

Column 2 ID: RTX-CLP2

Workgroups: WG243107, WG243037

Internal STD: NA Surrogate STD: STD19912

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
36	15G10078.R	L0706204-02 RE	7	1		06/20/07 19:45
37	15G10079.F	L0706060-01 RE	7	1		06/20/07 19:45
38	15G10079.R	L0706060-01 RE	7	1		06/20/07 20:13
39	15G10080.F	L0706060-02 RE	7	1		06/20/07 20:13
40	15G10080.R	L0706060-02 RE	7	1		06/20/07 20:41
41	15G10081.F	WG242934-02 BLANK V281 P129	1	1		06/20/07 20:41
42	15G10081.R	WG242934-02 BLANK V281 P129	1	1		06/20/07 21:10
43	15G10082.F	WG242934-03 LCS V281 P129	1	1		06/20/07 21:10
44	15G10082.R	WG242934-03 LCS V281 P129	1	1		06/20/07 21:39
45	15G10083.F	WG242934-06 TOX LCS V281 P129	1	1		06/20/07 21:39
46	15G10083.R	WG242934-06 TOX LCS V281 P129	1	1		06/20/07 22:07
47	15G10084.F	WG243052-02 ENDRIN/DDT	1	1	STD18194	06/20/07 22:07
48	15G10084.R	WG243052-02 ENDRIN/DDT	1	1	STD18194	06/20/07 22:35
49	15G10085.F	WG243052-03 PEST CCV 20 PPB	1	1	STD18706	06/20/07 22:35
50	15G10085.R	WG243052-03 PEST CCV 20 PPB	1	1	STD18706	06/20/07 23:04
51	15G10086.F	WG243050-01 TOX CCV 250 PPB	1	1	STD17350	06/20/07 23:04
52	15G10086.R	WG243050-01 TOX CCV 250 PPB	1	1	STD17350	06/20/07 23:33
53	15G10087.F	WG242934-01 L0706401-01 REF	1	1		06/20/07 23:33
54	15G10087.R	WG242934-01 L0706401-01 REF	1	1		06/21/07 00:01
55	15G10088.F	WG242934-04 L0706401-02 MS	1	1		06/21/07 00:01
56	15G10088.R	WG242934-04 L0706401-02 MS	1	1		06/21/07 00:29
57	15G10089.F	WG242934-05 L0706401-03 MSD	1	1		06/21/07 00:29
58	15G10089.R	WG242934-05 L0706401-03 MSD	1	1		06/21/07 00:58
59	15G10090.F	L0706401-04	1	1		06/21/07 00:58
60	15G10090.R	L0706401-04	1	1		06/21/07 01:26
61	15G10091.F	L0706401-05	1	1		06/21/07 01:26
62	15G10091.R	L0706401-05	1	1		06/21/07 01:54
63	15G10092.F	L0706401-06	1	1		06/21/07 01:54
64	15G10092.R	L0706401-06	1	1		06/21/07 02:23
65	15G10093.F	L0706321-01	17	1		06/21/07 02:23
66	15G10093.R	L0706321-01	17	1		06/21/07 02:51
67	15G10094.F	L0706321-02	17	1		06/21/07 02:51
68	15G10094.R	L0706321-02	17	1		06/21/07 03:19
69	15G10095.F	L0706321-03	17	1		06/21/07 03:19
70	15G10095.R	L0706321-03	17	1		06/21/07 03:48
71	15G10096.F	L0706321-04	17	1		06/21/07 03:48
72	15G10096.R	L0706321-04	17	1		06/21/07 04:16

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Approved: 21-JUN-07



KEMRON Environmental Services

Instrument Run Log

00048649

Instrument: HP15 Dataset: 062007
 Analyst1: ECL Analyst2: NA
 Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: _____

Column 1 ID: RTX-CLP

Column 2 ID: RTX-CLP2

Workgroups: WG243107, WG243037

Internal STD: NA Surrogate STD: STD19912

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
73	15G10097.F	WG243052-04 PEST CCV 10 PPB	1	1	STD18706	06/21/07 04:16
74	15G10097.R	WG243052-04 PEST CCV 10 PPB	1	1	STD18706	06/21/07 04:44
75	15G10098.F	WG243050-02 TOX CCV 500 PPB	1	1	STD17350	06/21/07 04:44
76	15G10098.R	WG243050-02 TOX CCV 500 PPB	1	1	STD17350	06/21/07 05:13
77	15G10099.F	L0706321-05	17	1		06/21/07 05:13
78	15G10099.R	L0706321-05	17	1		06/21/07 05:41
79	15G10100.F	L0706321-06	17	1		06/21/07 05:41
80	15G10100.R	L0706321-06	17	1		06/21/07 06:09
81	15G10101.F	L0706321-07	17	1		06/21/07 06:09
82	15G10101.R	L0706321-07	17	1		06/21/07 06:38
83	15G10102.F	L0706321-08	17	1		06/21/07 06:38
84	15G10102.R	L0706321-08	17	1		06/21/07 07:06
85	15G10103.F	L0706321-09	17	1		06/21/07 07:06
86	15G10103.R	L0706321-09	17	1		06/21/07 07:34
87	15G10104.F	L0706321-10	17	1		06/21/07 07:34
88	15G10104.R	L0706321-10	17	1		06/21/07 08:03
89	15G10105.F	L0706321-11	17	1		06/21/07 08:03
90	15G10105.R	L0706321-11	17	1		06/21/07 08:31
91	15G10106.F	WG243052-05 ENDRIN/DDT	1	1	STD18194	06/21/07 08:31
92	15G10106.R	WG243052-05 ENDRIN/DDT	1	1	STD18194	06/21/07 09:00
93	15G10107.F	WG243052-06 PEST CCV 20 PPB	1	1	STD18706	06/21/07 09:00
94	15G10107.R	WG243052-06 PEST CCV 20 PPB	1	1	STD18706	06/21/07 09:28
95	15G10108.F	WG243050-03 TOX CCV 250 PPB	1	1	STD17350	06/21/07 09:28
96	15G10108.R	WG243050-03 TOX CCV 250 PPB	1	1	STD17350	06/21/07 09:56

Comments

Seq.	Rerun	Dil.	Reason	Analytes
41				
			WG242934-02 BLANK V281 P129: DCB surrogate failed low.	
59				
			L0706401-04: DCB surrogate failed low.	
71				
			L0706321-04: T-M-X surrogate failed low.	
79				
			L0706321-06: T-M-X surrogate failed low.	
81				
			L0706321-07: Both surrogates failed low.	

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Approved: 21-JUN-07



KEMRON Environmental Services

Instrument Run Log

00048650

Instrument: HP15 Dataset: 062007
 Analyst1: ECL Analyst2: NA
 Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: _____

Column 1 ID: RTX-CLP Column 2 ID: RTX-CLP2
 Workgroups: WG243107, WG243037

Internal STD: NA Surrogate STD: STD19912

Comments

Seq.	Rerun	Dil.	Reason	Analytes
83				
			L0706321-08: T-M-X surrogate failed low.	



KEMRON Environmental Services

Instrument Run Log

00048651

Instrument: HP15 Dataset: 062607
 Analyst1: ECL Analyst2: NA
 Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: _____

Column 1 ID: RTX-CLPColumn 2 ID: RTX-CLP2Workgroups: WG243426, WG243424, WG243459, WG243432Internal STD: NA Surrogate STD: STD19912 Calibration STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15G10109.F	WG243451-01 ENDRIN/DDT	1	1	STD18194	06/26/07 09:03
2	15G10109.R	WG243451-01 ENDRIN/DDT	1	1	STD18194	06/26/07 09:32
3	15G10110.F	WG243451-02 PEST CCV 20 PPB	1	1	STD18706	06/26/07 09:32
4	15G10110.R	WG243451-02 PEST CCV 20 PPB	1	1	STD18706	06/26/07 10:00
5	15G10111.F	WG243452-01 TOX CCV 250 PPB	1	1	STD17350	06/26/07 10:00
6	15G10111.R	WG243452-01 TOX CCV 250 PPB	1	1	STD17350	06/26/07 10:28
7	15G10112.F	L0706514-03	7	1	SOIL	06/26/07 10:28
8	15G10112.R	L0706514-03	7	1	SOIL	06/26/07 10:56
9	15G10113.F	L0706514-01	7	1	SOIL	06/26/07 10:56
10	15G10113.R	L0706514-01	7	1	SOIL	06/26/07 11:25
11	15G10114.F	WG243208-01 BLANK V282 P35	7	1	SOIL	06/26/07 11:25
12	15G10114.R	WG243208-01 BLANK V282 P35	7	1	SOIL	06/26/07 11:53
13	15G10115.F	WG243208-02 LCS V282 P35	7	1	SOIL	06/26/07 11:53
14	15G10115.R	WG243208-02 LCS V282 P35	7	1	SOIL	06/26/07 12:21
15	15G10116.F	WG243208-03 LCS DUP V282 P35	7	1	SOIL	06/26/07 12:21
16	15G10116.R	WG243208-03 LCS DUP V282 P35	7	1	SOIL	06/26/07 12:50
17	15G10117.F	L0706483-06	7	1	SOIL	06/26/07 12:50
18	15G10117.R	L0706483-06	7	1	SOIL	06/26/07 13:18
19	15G10118.F	WG243314-01 BLANK V281 P153	1	1		06/26/07 13:18
20	15G10118.R	WG243314-01 BLANK V281 P153	1	1		06/26/07 13:46
21	15G10119.F	WG243314-02 LCS V281 P153	1	1		06/26/07 13:46
22	15G10119.R	WG243314-02 LCS V281 P153	1	1		06/26/07 14:15
23	15G10120.F	WG243314-03 LCS DUP V281 P153	1	1		06/26/07 14:15
24	15G10120.R	WG243314-03 LCS DUP V281 P153	1	1		06/26/07 14:44
25	15G10121.F	L0706484-04	1	1		06/26/07 14:44
26	15G10121.R	L0706484-04	1	1		06/26/07 15:12
27	15G10122.F	WG243451-03 PEST CCV 10 PPB	1	1	STD18706	06/26/07 15:12
28	15G10122.R	WG243451-03 PEST CCV 10 PPB	1	1	STD18706	06/26/07 15:41
29	15G10123.F	WG243452-02 TOX CCV 500 PPB	1	1	STD17350	06/26/07 15:41
30	15G10123.R	WG243452-02 TOX CCV 500 PPB	1	1	STD17350	06/26/07 16:09
31	15G10124.F	WG243408-01 BLANK V281 P161	1	1		06/26/07 16:09
32	15G10124.R	WG243408-01 BLANK V281 P161	1	1		06/26/07 16:38
33	15G10125.F	WG243408-02 LCS V281 P161	1	1		06/26/07 16:38
34	15G10125.R	WG243408-02 LCS V281 P161	1	1		06/26/07 17:08
35	15G10126.F	WG243408-03 LCS DUP V281 P161	1	1		06/26/07 17:08

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Approved: 27-JUN-07



KEMRON Environmental Services

Instrument Run Log

00048652

Instrument: HP15 Dataset: 062607
 Analyst1: ECL Analyst2: NA
 Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: _____

Column 1 ID: RTX-CLP

Column 2 ID: RTX-CLP2

Workgroups: WG243426, WG243424, WG243459, WG243432

Internal STD: NA Surrogate STD: STD19912

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
36	15G10126.R	WG243408-03 LCS DUP V281 P161	1	1		06/26/07 17:36
37	15G10127.F	L0706514-02	18	1		06/26/07 17:36
38	15G10127.R	L0706514-02	18	1		06/26/07 18:04
39	15G10128.F	L0706514-04	18	1		06/26/07 18:04
40	15G10128.R	L0706514-04	18	1		06/26/07 18:33
41	15G10129.F	WG243405-01 SPLP BLANK 6/25	18	1		06/26/07 18:33
42	15G10129.R	WG243405-01 SPLP BLANK 6/25	18	1		06/26/07 19:01
43	15G10130.F	L0706560-04	1	1		06/26/07 19:01
44	15G10130.R	L0706560-04	1	1		06/26/07 19:29
45	15G10131.F	L0706560-05	1	1		06/26/07 19:29
46	15G10131.R	L0706560-05	1	1		06/26/07 19:58
47	15G10132.F	L0706560-06	1	1		06/26/07 19:58
48	15G10132.R	L0706560-06	1	1		06/26/07 20:26
49	15G10133.F	L0706560-07	1	1		06/26/07 20:26
50	15G10133.R	L0706560-07	1	1		06/26/07 20:54
51	15G10134.F	WG243451-04 PEST CCV 20 PPB	1	1	STD18706	06/26/07 20:54
52	15G10134.R	WG243451-04 PEST CCV 20 PPB	1	1	STD18706	06/26/07 21:23
53	15G10135.F	WG243452-03 TOX CCV 250 PPB	1	1	STD17350	06/26/07 21:23
54	15G10135.R	WG243452-03 TOX CCV 250 PPB	1	1	STD17350	06/26/07 21:52
55	15G10136.F	L0706560-08	1	1		06/26/07 21:52
56	15G10136.R	L0706560-08	1	1		06/26/07 22:20
57	15G10137.F	WG243304-01 BLANK V281 P149	1	1		06/26/07 22:20
58	15G10137.R	WG243304-01 BLANK V281 P149	1	1		06/26/07 22:48
59	15G10138.F	WG243304-02 LCS V281 P149	1	1		06/26/07 22:48
60	15G10138.R	WG243304-02 LCS V281 P149	1	1		06/26/07 23:17
61	15G10139.F	WG243304-03 LCS DUP V281 P149	1	1		06/26/07 23:17
62	15G10139.R	WG243304-03 LCS DUP V281 P149	1	1		06/26/07 23:45
63	15G10140.F	L0706483-07	1	1		06/26/07 23:45
64	15G10140.R	L0706483-07	1	1		06/27/07 00:14
65	15G10141.F	L0706483-06	18	1		06/27/07 00:14
66	15G10141.R	L0706483-06	18	1		06/27/07 00:42
67	15G10142.F	WG243202-01 SPLP BLANK 6/21	18	1		06/27/07 00:42
68	15G10142.R	WG243202-01 SPLP BLANK 6/21	18	1		06/27/07 01:10
69	15G10143.F	PESTICIDE SPIKE 20 PPB	1	1	STD20257	06/27/07 01:10
70	15G10143.R	PESTICIDE SPIKE 20 PPB	1	1	STD20257	06/27/07 01:39
71	15G10144.F	L0706514-03 10x	7	10	SOIL	06/27/07 01:39
72	15G10144.R	L0706514-03 10x	7	10	SOIL	06/27/07 02:07

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Approved: 27-JUN-07



KEMRON Environmental Services

Instrument Run Log

00048653

Instrument: HP15 Dataset: 062607
 Analyst1: ECL Analyst2: NA
 Method: 8081 SOP: GCS09 Rev: 8

Maintenance Log ID: _____

Column 1 ID: RTX-CLP

Column 2 ID: RTX-CLP2

Workgroups: WG243426, WG243424, WG243459, WG243432

Internal STD: NA Surrogate STD: STD19912

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
73	15G10145.F	WG243451-05 ENDRIN/DDT	1	1	STD18194	06/27/07 02:07
74	15G10145.R	WG243451-05 ENDRIN/DDT	1	1	STD18194	06/27/07 02:35
75	15G10146.F	WG243451-06 PEST CCV 10 PPB	1	1	STD18706	06/27/07 02:35
76	15G10146.R	WG243451-06 PEST CCV 10 PPB	1	1	STD18706	06/27/07 03:04
77	15G10147.F	WG243452-04 TOX CCV 500 PPB	1	1	STD17350	06/27/07 03:04
78	15G10147.R	WG243452-04 TOX CCV 500 PPB	1	1	STD17350	06/27/07 03:32

Comments

Seq.	Rerun	Dil.	Reason	Analytes
9				
			L0706514-01: T-M-X surrogate failed low.	
21				
			WG243314-02 LCS V281 P153: DCB surrogate failed low.	
25				
			L0706484-04: DCB surrogate failed low.	
38				
			L0706514-02: DCB surrogate failed low.	

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Approved: 27-JUN-07



KEMRON Environmental Services
Data Checklist

00048654

Date: 20-JUN-2007
 Analyst: ECL
 Analyst: NA
 Method: 8081
 Instrument: HP15
 Curve Workgroup: NA
 Runlog ID: 16769
 Analytical Workgroups: L0706204-RE, L0706060-RE, L0706401, L0706321

ANALYTICAL	
System Performance Check	NA
DFTPP (MS)	NA
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	X
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	X
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	X
Project/client specific requirements	NA
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	ECL
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MDC

Primary Reviewer:
21-JUN-2007



Secondary Reviewer:
21-JUN-2007



Generated: JUN-21-2007 12:10:58

KEMRON Environmental Services
Data Checklist

00048655

Date: 26-JUN-2007
Analyst: ECL
Analyst: NA
Method: 8081
Instrument: HP15
Curve Workgroup: NA
Runlog ID: 16849
Analytical Workgroups: L0706514, L0706483, L0706484, L0706560,

ANALYTICAL	
System Performance Check	NA
DFTPP (MS)	NA
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	X
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	NA
Manual integrations	X
Project/client specific requirements	NA
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	X
Check for completeness	X
Primary Reviewer	ECL
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MDC

Primary Reviewer:
27-JUN-2007



Secondary Reviewer:
27-JUN-2007



Generated: JUN-27-2007 11:07:19

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00048656

Analytical Method: 8081A
Login Number: L0706514

AAB#: WG243426

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
LHP-SITE59-SB02A-0-1FT	06/21/07	06/22/07	06/22/07	14	0.958	06/26/07	40	4.10	
LHP-SITE59-SB01A-0-1FT	06/21/07	06/22/07	06/22/07	14	0.979	06/26/07	40	4.12	
LHP-SITE59-SB01A-0-1FT	06/21/07	06/22/07	06/22/07	14	0.979	06/26/07	40	4.10	
LHP-SITE59-SB02A-0-1FT	06/21/07	06/22/07	06/22/07	14	0.958	06/26/07	40	4.08	

* EXT = SEE PROJECT QAPP REQUIREMENTS

* ANAL = SEE PROJECT QAPP REQUIREMENTS

KEMRON Environmental Services
HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

00048657

Analytical Method:8081A
Login Number:L0706514

AAB#:WG243459

Client ID	Date Collected	Date Received	Date Extracted	Max Hold Time Ext.	Time Held Ext.	Date Analyzed	Max Hold Time Anal	Time Held Anal.	Q
LHP-SITE59-SB01A-0-1FT	06/21/07	06/22/07	06/26/07	40	4.98	06/26/07	40	0.399	
LHP-SITE59-SB02A-0-1FT	06/21/07	06/22/07	06/26/07	40	4.96	06/26/07	40	0.419	
LHP-SITE59-SB02A-0-1FT	06/21/07	06/22/07	06/26/07	40	4.96	06/26/07	40	0.399	
LHP-SITE59-SB01A-0-1FT	06/21/07	06/22/07	06/26/07	40	4.98	06/26/07	40	0.379	

* EXT = SEE PROJECT QAPP REQUIREMENTS

*ANAL = SEE PROJECT QAPP REQUIREMENTS

SURROGATE STANDARDS

00048658

Login Number:L0706514_____

Instrument Id:HP15_____

Workgroup (AAB#):WG243426_____

Method:8081_____

CAL ID:_____HP15-20-JUN-07_____

Matrix:Soil_____

Sample Number	Dilution	Tag	1	2
L0706514-01	1.00	01	34.0	78.6
L0706514-01	1.00	02	31.7	76.2
L0706514-03	1.00	01	64.9	82.4
L0706514-03	1.00	02	69.1	78.3
WG243208-01	1.00	01	65.3	78.9
WG243208-01	1.00	02	63.6	76.7
WG243208-02	1.00	01	74.8	86.8
WG243208-02	1.00	02	71.7	84.5
WG243208-03	1.00	01	83.4	97.4
WG243208-03	1.00	02	84.0	96.2

Surrogates	Surrogate Limits
1 - 2,4,5,6-Tetrachloro-m-xylene	39 - 130
2 - Decachlorobiphenyl	33 - 143

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATE STANDARDS

00048659

Login Number:L0706514_____

Instrument Id:HP15_____

Workgroup (AAB#):WG243459_____

Method:8081_____

CAL ID:_____HP15-20-JUN-07_____

Matrix:Leachate_____

Sample Number	Dilution	Tag	1	2
L0706514-02	1.00	01	46.3	<u>19.3</u>
L0706514-02	1.00	02	46.2	<u>19.8</u>
L0706514-04	1.00	01	37.0	41.7
L0706514-04	1.00	02	38.5	42.3
WG243408-01	1.00	01	47.2	68.0
WG243408-01	1.00	02	51.8	66.4
WG243408-02	1.00	01	48.5	52.4
WG243408-02	1.00	02	52.7	51.4
WG243408-03	1.00	01	53.5	54.1
WG243408-03	1.00	02	58.8	51.6

Surrogates		Surrogate Limits		
1	- 2,4,5,6-Tetrachloro-m-xylene	20	-	180
2	- Decachlorobiphenyl	25	-	140

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

METHOD BLANK SUMMARY

00048660

Login Number: L0706514 _____ Work Group: WG243426 _____
Blank File ID: 15G10114.R _____ Blank Sample ID: WG243208-01 _____
Prep Date: 06/22/07 08:30 _____ Instrument ID: HP15 _____
Analyzed Date: 06/26/07 11:53 _____ Method: 8081A _____
Analyst: ECL _____

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LHP-SITE59-SB02A-0-1FT	L0706514-03	15G10112.F	06/26/07 10:28	02
LHP-SITE59-SB02A-0-1FT	L0706514-03	15G10112.R	06/26/07 10:56	01
LHP-SITE59-SB01A-0-1FT	L0706514-01	15G10113.F	06/26/07 10:56	02
LHP-SITE59-SB01A-0-1FT	L0706514-01	15G10113.R	06/26/07 11:25	01
LCS	WG243208-02	15G10115.F	06/26/07 11:53	02
LCS	WG243208-02	15G10115.R	06/26/07 12:21	01
LCS2	WG243208-03	15G10116.F	06/26/07 12:21	02
LCS2	WG243208-03	15G10116.R	06/26/07 12:50	01

METHOD BLANK SUMMARY

00048661

Login Number: L0706514 _____ Work Group: WG243459 _____
Blank File ID: 15G10124.R _____ Blank Sample ID: WG243408-01 _____
Prep Date: 06/26/07 08:30 _____ Instrument ID: HP15 _____
Analyzed Date: 06/26/07 16:38 _____ Method: 8081A _____
Analyst: ECL _____

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG243408-02	15G10125.F	06/26/07 16:38	02
LCS2	WG243408-03	15G10126.F	06/26/07 17:08	02
LCS	WG243408-02	15G10125.R	06/26/07 17:08	01
LCS2	WG243408-03	15G10126.R	06/26/07 17:36	01
LHP-SITE59-SB01A-0-1FT	L0706514-02	15G10127.F	06/26/07 17:36	02
LHP-SITE59-SB01A-0-1FT	L0706514-02	15G10127.R	06/26/07 18:04	01
LHP-SITE59-SB02A-0-1FT	L0706514-04	15G10128.F	06/26/07 18:04	02
LHP-SITE59-SB02A-0-1FT	L0706514-04	15G10128.R	06/26/07 18:33	01

METHOD BLANK REPORT

00048662

Login Number: L0706514 Prep Date: 06/22/07 08:30 Sample ID: WG243208-01
 Instrument ID: HP15 Run Date: 06/26/07 11:25 Prep Method: 3550B
 File ID: 15G10114.F Analyst: ECL Method: 8081A
 Workgroup (AAB#): WG243426 Matrix: Soil Units: ug/kg
 Contract #: DACA56-94-D-0020 Cal ID: HP15-20-JUN-07

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Heptachlor epoxide	0.400	1.65	0.400	1	U
alpha Chlordane	0.400	1.65	0.400	1	U
gamma Chlordane	0.400	1.65	0.400	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4,5,6-Tetrachloro-m-xylene	63.6	39 - 130	PASS
Decachlorobiphenyl	76.7	33 - 143	PASS

SQL Method Detection Limit

PQL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

* Analyte concentration > RL

METHOD BLANK REPORT

00048663

Login Number: L0706514 Prep Date: 06/22/07 08:30 Sample ID: WG243208-01
 Instrument ID: HP15 Run Date: 06/26/07 11:53 Prep Method: 3550B
 File ID: 15G10114.R Analyst: ECL Method: 8081A
 Workgroup (AAB#): WG243426 Matrix: Soil Units: ug/kg
 Contract #: DACA56-94-D-0020 Cal ID: HP15-20-JUN-07

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Heptachlor epoxide	0.400	1.65	0.400	1	U
alpha Chlordane	0.400	1.65	0.400	1	U
gamma Chlordane	0.400	1.65	0.400	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4,5,6-Tetrachloro-m-xylene	65.3	39 - 130	PASS
Decachlorobiphenyl	78.9	33 - 143	PASS

SQL Method Detection Limit

PQL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

* Analyte concentration > RL

METHOD BLANK REPORT

00048664

Login Number: L0706514 Prep Date: 06/26/07 08:30 Sample ID: WG243408-01
 Instrument ID: HP15 Run Date: 06/26/07 16:09 Prep Method: 3510C
 File ID: 15G10124.F Analyst: ECL Method: 8081A
 Workgroup (AAB#): WG243459 Matrix: Leachate Units: ug/L
 Contract #: DACA56-94-D-0020 Cal ID: HP15-20-JUN-07

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Heptachlor epoxide	0.0100	0.0500	0.0100	1	U
alpha Chlordane	0.0100	0.0500	0.0100	1	U
gamma Chlordane	0.0100	0.0500	0.0100	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4,5,6-Tetrachloro-m-xylene	51.8	20 - 180	PASS
Decachlorobiphenyl	66.4	25 - 140	PASS

SQL Method Detection Limit

PQL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

* Analyte concentration > RL

METHOD BLANK REPORT

00048665

Login Number: L0706514 Prep Date: 06/26/07 08:30 Sample ID: WG243408-01
 Instrument ID: HP15 Run Date: 06/26/07 16:38 Prep Method: 3510C
 File ID: 15G10124.R Analyst: ECL Method: 8081A
 Workgroup (AAB#): WG243459 Matrix: Leachate Units: ug/L
 Contract #: DACA56-94-D-0020 Cal ID: HP15-20-JUN-07

Analytes	SQL	PQL	Concentration	Dilution	Qualifier
Heptachlor epoxide	0.0100	0.0500	0.0100	1	U
alpha Chlordane	0.0100	0.0500	0.0100	1	U
gamma Chlordane	0.0100	0.0500	0.0100	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4,5,6-Tetrachloro-m-xylene	47.2	20 - 180	PASS
Decachlorobiphenyl	68.0	25 - 140	PASS

SQL Method Detection Limit

PQL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

* Analyte concentration > RL

LABORATORY CONTROL SAMPLE (LCS)

00048666

Login Number: L0706514 Analyst: ECL Prep Method: 3550B
 Instrument ID: HP15 Matrix: Soil Method: 8081A
 Workgroup (AAB#): WG243426 Units: ug/kg
 Sample ID: WG243208-02 LCS File ID: 15G10115.R Run Date: 06/26/2007 12:21
 Sample ID: WG243208-03 LCS2 File ID: 15G10116.R Run Date: 06/26/2007 12:50

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Heptachlor epoxide	16.7	15.5	93.2	16.7	16.7	100	7.06	65 - 130	40	
alpha Chlordane	16.7	16.0	95.8	16.7	17.2	103	7.29	65 - 120	40	
gamma Chlordane	16.7	16.0	96.2	16.7	17.2	103	6.98	65 - 125	40	

Surogates	LCS	LCS2	Surrogate Limits		Qualifier
	% Recovery	% Recovery			
Decachlorobiphenyl	86.8	97.4	33	- 143	PASS
2,4,5,6-Tetrachloro-m-xylene	74.8	83.4	39	- 130	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

LABORATORY CONTROL SAMPLE (LCS)

00048667

Login Number: L0706514 Analyst: ECL Prep Method: 3550B
 Instrument ID: HP15 Matrix: Soil Method: 8081A
 Workgroup (AAB#): WG243426 Units: ug/kg
 Sample ID: WG243208-02 LCS File ID: 15G10115.F Run Date: 06/26/2007 11:53
 Sample ID: WG243208-03 LCS2 File ID: 15G10116.F Run Date: 06/26/2007 12:21

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Heptachlor epoxide	16.7	15.0	90.0	16.7	16.6	99.5	10.0	65 - 130	40	
alpha Chlordane	16.7	15.6	93.3	16.7	17.1	103	9.63	65 - 120	40	
gamma Chlordane	16.7	15.5	92.8	16.7	17.0	102	9.52	65 - 125	40	

Surogates	LCS	LCS2	Surrogate Limits		Qualifier
	% Recovery	% Recovery			
Decachlorobiphenyl	84.5	96.2	33	- 143	PASS
2,4,5,6-Tetrachloro-m-xylene	71.7	84.0	39	- 130	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

LABORATORY CONTROL SAMPLE (LCS)

00048668

Login Number: L0706514 Analyst: ECL Prep Method: 3510C
 Instrument ID: HP15 Matrix: Leachate Method: 8081A
 Workgroup (AAB#): WG243459 Units: ug/L
 Sample ID: WG243408-02 LCS File ID: 15G10125.R Run Date: 06/26/2007 17:08
 Sample ID: WG243408-03 LCS2 File ID: 15G10126.R Run Date: 06/26/2007 17:36

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Heptachlor epoxide	0.500	0.503	101	0.500	0.498	99.7	0.939	62 - 130	40	
alpha Chlordane	0.500	0.520	104	0.500	0.517	103	0.578	65 - 130	40	
gamma Chlordane	0.500	0.518	104	0.500	0.518	104	0.154	60 - 135	40	

Surogates	LCS	LCS2	Surrogate Limits		Qualifier
	% Recovery	% Recovery			
Decachlorobiphenyl	52.4	54.1	25	- 140	PASS
2,4,5,6-Tetrachloro-m-xylene	48.5	53.5	20	- 180	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

LABORATORY CONTROL SAMPLE (LCS)

00048669

Login Number: L0706514 Analyst: ECL Prep Method: 3510C
 Instrument ID: HP15 Matrix: Leachate Method: 8081A
 Workgroup (AAB#): WG243459 Units: ug/L
 Sample ID: WG243408-02 LCS File ID: 15G10125.F Run Date: 06/26/2007 16:38
 Sample ID: WG243408-03 LCS2 File ID: 15G10126.F Run Date: 06/26/2007 17:08

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Heptachlor epoxide	0.500	0.502	100	0.500	0.499	99.8	0.540	62 - 130	40	
alpha Chlordane	0.500	0.519	104	0.500	0.525	105	1.11	65 - 130	40	
gamma Chlordane	0.500	0.506	101	0.500	0.511	102	1.06	60 - 135	40	

Surogates	LCS	LCS2	Surrogate Limits		Qualifier
	% Recovery	% Recovery			
Decachlorobiphenyl	51.4	51.6	25	- 140	PASS
2,4,5,6-Tetrachloro-m-xylene	52.7	58.8	20	- 180	PASS

* FAILS %REC LIMIT

FAILS RPD LIMIT

INITIAL CALIBRATION SUMMARY

00048670

Login Number:L0706514

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

ICAL Workgroup:WG243051

Column ID:F

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD(R ²)
Heptachlor Epoxide		61860000	2.55		
alpha-Chlordane		60890000	1.83		
gamma-Chlordane		64020000	2.89		

R = Correlation coefficient; 0.995 minimum

R² = Coefficient of determination; 0.99 minimum

INITIAL CALIBRATION SUMMARY

00048671

Login Number:L0706514

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

ICAL Workgroup:WG243051

Column ID:R

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD(R ²)
Heptachlor Epoxide		63710000	3.25		
alpha-Chlordane		63740000	3.21		
gamma-Chlordane		66770000	3.05		

R = Correlation coefficient; 0.995 minimum

R² = Coefficient of determination; 0.99 minimum

INITIAL CALIBRATION DATA

Login Number:L0706514

Instrument ID:HP15

00048672

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

Column ID:F

Analyte	WG243051-01			WG243051-02			WG243051-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Heptachlor Epoxide	200	12068873200	60340000	50.0	3042130320	60840000	20.0	1225806220	61290000
alpha-Chlordane	200	12539464500	62700000	50.0	3039579750	60790000	20.0	1207363630	60370000
gamma-Chlordane	200	13443145700	67220000	50.0	3212204840	64240000	20.0	1263216720	63160000

INITIAL CALIBRATION DATA

Login Number:L0706514

Instrument ID:HP15

00048673

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

Column ID:F

Analyte	WG243051-04			WG243051-05			WG243051-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Heptachlor Epoxide	10.0	629568364	62960000	4.00	244785013	61200000	1.00	64527353.0	64530000
alpha-Chlordane	10.0	602226005	60220000	4.00	238464167	59620000	1.00	61651213.0	61650000
gamma-Chlordane	10.0	638228043	63820000	4.00	246224210	61560000	1.00	64129023.0	64130000

INITIAL CALIBRATION DATA

Login Number:L0706514

Instrument ID:HP15

00048674

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

Column ID:R

Analyte	WG243051-01			WG243051-02			WG243051-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Heptachlor Epoxide	200	12205757500	61030000	50.0	3153395130	63070000	20.0	1263279330	63160000
alpha-Chlordane	200	12730526300	63650000	50.0	3146655540	62930000	20.0	1239485460	61970000
gamma-Chlordane	200	13596591000	67980000	50.0	3332171740	66640000	20.0	1296501460	64830000

INITIAL CALIBRATION DATA

Login Number:L0706514

Instrument ID:HP15

00048675

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

Column ID:R

Analyte	WG243051-04			WG243051-05			WG243051-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Heptachlor Epoxide	10.0	636185475	63620000	4.00	255952182	63990000	1.00	67370821.0	67370000
alpha-Chlordane	10.0	629764034	62980000	4.00	252584821	63150000	1.00	67773370.0	67770000
gamma-Chlordane	10.0	656262763	65630000	4.00	261236899	65310000	1.00	70234991.0	70230000

INITIAL CALIBRATION SUMMARY

00048676

Login Number:L0706514

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

ICAL Workgroup:WG243051

Column ID:F

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD(R ²)
Heptachlor Epoxide		61860000	2.55		
alpha-Chlordane		60890000	1.83		
gamma-Chlordane		64020000	2.89		

R = Correlation coefficient; 0.995 minimum

R² = Coefficient of determination; 0.99 minimum

INITIAL CALIBRATION SUMMARY

00048677

Login Number:L0706514

Instrument ID:HP15

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

ICAL Workgroup:WG243051

Column ID:R

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD(R ²)
Heptachlor Epoxide		63710000	3.25		
alpha-Chlordane		63740000	3.21		
gamma-Chlordane		66770000	3.05		

R = Correlation coefficient; 0.995 minimum

R² = Coefficient of determination; 0.99 minimum

INITIAL CALIBRATION DATA

Login Number:L0706514

Instrument ID:HP15

00048678

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

Column ID:F

Analyte	WG243051-01			WG243051-02			WG243051-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Heptachlor Epoxide	200	12068873200	60340000	50.0	3042130320	60840000	20.0	1225806220	61290000
alpha-Chlordane	200	12539464500	62700000	50.0	3039579750	60790000	20.0	1207363630	60370000
gamma-Chlordane	200	13443145700	67220000	50.0	3212204840	64240000	20.0	1263216720	63160000

INITIAL CALIBRATION DATA

Login Number:L0706514

Instrument ID:HP15

00048679

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

Column ID:F

Analyte	WG243051-04			WG243051-05			WG243051-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Heptachlor Epoxide	10.0	629568364	62960000	4.00	244785013	61200000	1.00	64527353.0	64530000
alpha-Chlordane	10.0	602226005	60220000	4.00	238464167	59620000	1.00	61651213.0	61650000
gamma-Chlordane	10.0	638228043	63820000	4.00	246224210	61560000	1.00	64129023.0	64130000

INITIAL CALIBRATION DATA

Login Number:L0706514

Instrument ID:HP15

00048680

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

Column ID:R

Analyte	WG243051-01			WG243051-02			WG243051-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Heptachlor Epoxide	200	12205757500	61030000	50.0	3153395130	63070000	20.0	1263279330	63160000
alpha-Chlordane	200	12730526300	63650000	50.0	3146655540	62930000	20.0	1239485460	61970000
gamma-Chlordane	200	13596591000	67980000	50.0	3332171740	66640000	20.0	1296501460	64830000

INITIAL CALIBRATION DATA

Login Number:L0706514

Instrument ID:HP15

00048681

Analytical Method:8081A

Initial Calibration Date:20-JUN-07 17:23

Column ID:R

Analyte	WG243051-04			WG243051-05			WG243051-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Heptachlor Epoxide	10.0	636185475	63620000	4.00	255952182	63990000	1.00	67370821.0	67370000
alpha-Chlordane	10.0	629764034	62980000	4.00	252584821	63150000	1.00	67773370.0	67770000
gamma-Chlordane	10.0	656262763	65630000	4.00	261236899	65310000	1.00	70234991.0	70230000

ALTERNATE SOURCE CALIBRATION REPORT

00048682

Login Number: L0706514 Run Date: 06/20/2007 Sample ID: WG243051-07
Instrument ID: HP15 Run Time: 17:23 Method: 8081A
File ID: 15G10074.F Analyst: ECL
ICal Workgroup: WG243051 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Heptachlor Epoxide		20.0	20.0	ug/L	61700000	0.200	20	
alpha-Chlordane		20.0	19.8	ug/L	60200000	1.10	20	
gamma-Chlordane		20.0	19.7	ug/L	62900000	1.70	20	

* Exceeds %D Limit

ALTERNATE SOURCE CALIBRATION REPORT

00048683

Login Number: L0706514 Run Date: 06/20/2007 Sample ID: WG243051-07
Instrument ID: HP15 Run Time: 17:52 Method: 8081A
File ID: 15G10074.R Analyst: ECL
ICal Workgroup: WG243051 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Heptachlor Epoxide		20.0	19.7	ug/L	62900000	1.30	20	
alpha-Chlordane		20.0	19.3	ug/L	61400000	3.70	20	
gamma-Chlordane		20.0	19.2	ug/L	64100000	4.00	20	

* Exceeds %D Limit

ALTERNATE SOURCE CALIBRATION REPORT

00048684

Login Number: L0706514 Run Date: 06/20/2007 Sample ID: WG243051-07
Instrument ID: HP15 Run Time: 17:23 Method: 8081A
File ID: 15G10074.F Analyst: ECL
ICal Workgroup: WG243051 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Heptachlor Epoxide		20.0	20.0	ug/L	61700000	0.200	20	
alpha-Chlordane		20.0	19.8	ug/L	60200000	1.10	20	
gamma-Chlordane		20.0	19.7	ug/L	62900000	1.70	20	

* Exceeds %D Limit

ALTERNATE SOURCE CALIBRATION REPORT

00048685

Login Number: L0706514 Run Date: 06/20/2007 Sample ID: WG243051-07
Instrument ID: HP15 Run Time: 17:52 Method: 8081A
File ID: 15G10074.R Analyst: ECL
ICal Workgroup: WG243051 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Heptachlor Epoxide		20.0	19.7	ug/L	62900000	1.30	20	
alpha-Chlordane		20.0	19.3	ug/L	61400000	3.70	20	
gamma-Chlordane		20.0	19.2	ug/L	64100000	4.00	20	

* Exceeds %D Limit

CONTINUING CALIBRATION VERIFICATION (CCV)

00048686

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-02
Instrument ID: HP15 Run Time: 09:32 Method: 8081A
File ID: 15G10110.F Analvst: ECL
Workgroup (AAB#): WG243426 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Heptachlor Epoxide		20.0	18.9	ug/L	58600000	5.25	20	
alpha-Chlordane		20.0	19.1	ug/L	58000000	4.70	20	
gamma-Chlordane		20.0	18.9	ug/L	60500000	5.52	20	

* Exceeds %D Criteria

CONTINUING CALIBRATION VERIFICATION (CCV)

00048687

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-02
Instrument ID: HP15 Run Time: 10:00 Method: 8081A
File ID: 15G10110.R Analvst: ECL
Workgroup (AAB#): WG243426 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Heptachlor Epoxide		20.0	19.5	ug/L	62300000	2.26	20	
alpha-Chlordane		20.0	19.1	ug/L	60900000	4.47	20	
gamma-Chlordane		20.0	19.1	ug/L	63800000	4.52	20	

* Exceeds %D Criteria

CONTINUING CALIBRATION VERIFICATION (CCV)

00048688

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-03
Instrument ID: HP15 Run Time: 15:12 Method: 8081A
File ID: 15G10122.F Analvst: ECL
Workgroup (AAB#): WG243426 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Heptachlor Epoxide		10.0	9.81	ug/L	60700000	1.86	20	
alpha-Chlordane		10.0	9.71	ug/L	59100000	2.92	20	
gamma-Chlordane		10.0	9.67	ug/L	61900000	3.31	20	

* Exceeds %D Criteria

CONTINUING CALIBRATION VERIFICATION (CCV)

00048689

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-03
Instrument ID: HP15 Run Time: 15:41 Method: 8081A
File ID: 15G10122.R Analvst: ECL
Workgroup (AAB#): WG243426 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Heptachlor Epoxide		10.0	10.1	ug/L	64400000	1.10	20	
alpha-Chlordane		10.0	9.98	ug/L	63600000	0.152	20	
gamma-Chlordane		10.0	9.90	ug/L	66100000	0.980	20	

* Exceeds %D Criteria

CONTINUING CALIBRATION VERIFICATION (CCV)

00048690

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-03
Instrument ID: HP15 Run Time: 15:12 Method: 8081A
File ID: 15G10122.F Analvst: ECL
Workgroup (AAB#): WG243459 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Heptachlor Epoxide		10.0	9.81	ug/L	60700000	1.86	20	
alpha-Chlordane		10.0	9.71	ug/L	59100000	2.92	20	
gamma-Chlordane		10.0	9.67	ug/L	61900000	3.31	20	

* Exceeds %D Criteria

CONTINUING CALIBRATION VERIFICATION (CCV)

00048691

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-03
Instrument ID: HP15 Run Time: 15:41 Method: 8081A
File ID: 15G10122.R Analvst: ECL
Workgroup (AAB#): WG243459 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Heptachlor Epoxide		10.0	10.1	ug/L	64400000	1.10	20	
alpha-Chlordane		10.0	9.98	ug/L	63600000	0.152	20	
gamma-Chlordane		10.0	9.90	ug/L	66100000	0.980	20	

* Exceeds %D Criteria

CONTINUING CALIBRATION VERIFICATION (CCV)

00048692

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-04
Instrument ID: HP15 Run Time: 20:54 Method: 8081A
File ID: 15G10134.F Analvst: ECL
Workgroup (AAB#): WG243459 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Heptachlor Epoxide		20.0	20.4	ug/L	62900000	1.76	20	
alpha-Chlordane		20.0	20.1	ug/L	61200000	0.524	20	
gamma-Chlordane		20.0	20.4	ug/L	65200000	1.85	20	

* Exceeds %D Criteria

CONTINUING CALIBRATION VERIFICATION (CCV)

00048693

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-04
Instrument ID: HP15 Run Time: 21:23 Method: 8081A
File ID: 15G10134.R Analvst: ECL
Workgroup (AAB#): WG243459 Cal ID: HP15 - 20-JUN-07

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Heptachlor Epoxide		20.0	19.1	ug/L	60800000	4.61	20	
alpha-Chlordane		20.0	19.3	ug/L	61400000	3.73	20	
gamma-Chlordane		20.0	19.2	ug/L	64300000	3.77	20	

* Exceeds %D Criteria

ENDRIN/4,4'-DDT BREAKDOWN (BRKDWN)

00048694

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-01
Instrument ID: HP15 Run Time: 09:03 Method: 8081
File ID: 15G10109.F Analyst: ECL Column ID: FRONT

DDT BREAKDOWN	
Analyte	Response
4,4'-DDD	32198651
4,4'-DDE	11030747
4,4'-DDT	2485827325
DDT % BREAKDOWN: 1.71	

ENDRIN BREAKDOWN	
Analyte	Response
ENDRIN	2648810428
ENDRIN ALDEHYDE	39528814
ENDRIN KETONE	66188800
ENDRIN % BREAKDOWN: 3.84	

* Exceeds 15% Criteria

ENDRIN/4,4'-DDT BREAKDOWN (BRKDWN)

00048695

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-01
Instrument ID: HP15 Run Time: 09:32 Method: 8081
File ID: 15G10109.R Analvst: ECL Column ID: REAR

DDT BREAKDOWN	
Analyte	Response
4,4'-DDD	56951366
4,4'-DDE	23053188
4,4'-DDT	2352589808
DDT % BREAKDOWN: 3.29	

ENDRIN BREAKDOWN	
Analyte	Response
ENDRIN	2707966466
ENDRIN ALDEHYDE	37183053
ENDRIN KETONE	61905496
ENDRIN % BREAKDOWN: 3.53	

* Exceeds 15% Criteria

ENDRIN/4,4'-DDT BREAKDOWN (BRKDWN)

00048696

Login Number: L0706514 Run Date: 06/27/2007 Sample ID: WG243451-05
Instrument ID: HP15 Run Time: 02:07 Method: 8081
File ID: 15G10145.F Analyst: ECL Column ID: FRONT

DDT BREAKDOWN	
Analyte	Response
4,4'-DDD	26396005
4,4'-DDE	38407568
4,4'-DDT	2873821302
DDT % BREAKDOWN: 2.21	

ENDRIN BREAKDOWN	
Analyte	Response
ENDRIN	3110361105
ENDRIN ALDEHYDE	18384906
ENDRIN KETONE	44992038
ENDRIN % BREAKDOWN: 2.00	

* Exceeds 15% Criteria

ENDRIN/4,4'-DDT BREAKDOWN (BRKDWN)

00048697

Login Number: L0706514 Run Date: 06/27/2007 Sample ID: WG243451-05
Instrument ID: HP15 Run Time: 02:35 Method: 8081
File ID: 15G10145.R Analyst: ECL Column ID: REAR

DDT BREAKDOWN	
Analyte	Response
4,4'-DDD	49081103
4,4'-DDE	21654193
4,4'-DDT	2521629359
DDT % BREAKDOWN: 2.73	

ENDRIN BREAKDOWN	
Analyte	Response
ENDRIN	2910644920
ENDRIN ALDEHYDE	24593047
ENDRIN KETONE	50252992
ENDRIN % BREAKDOWN: 2.51	

* Exceeds 15% Criteria

00048698

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-01
Instrument ID: HP15 Run Time: 09:03 Method: 8081
File ID: 15G10109.F Analyst: ECL Column ID: FRONT

DDT BREAKDOWN	
Analyte	Response
4,4'-DDD	32198651
4,4'-DDE	11030747
4,4'-DDT	2485827325
DDT % BREAKDOWN: 1.71	

ENDRIN BREAKDOWN	
Analyte	Response
ENDRIN	2648810428
ENDRIN ALDEHYDE	39528814
ENDRIN KETONE	66188800
ENDRIN % BREAKDOWN: 3.84	

* Exceeds 15% Criteria

00048699

Login Number: L0706514 Run Date: 06/26/2007 Sample ID: WG243451-01
Instrument ID: HP15 Run Time: 09:32 Method: 8081
File ID: 15G10109.R Analyst: ECL Column ID: REAR

DDT BREAKDOWN	
Analyte	Response
4,4'-DDD	56951366
4,4'-DDE	23053188
4,4'-DDT	2352589808
DDT % BREAKDOWN: 3.29	

ENDRIN BREAKDOWN	
Analyte	Response
ENDRIN	2707966466
ENDRIN ALDEHYDE	37183053
ENDRIN KETONE	61905496
ENDRIN % BREAKDOWN: 3.53	

* Exceeds 15% Criteria

ENDRIN/4,4'-DDT BREAKDOWN (BRKDWN)

00048700

Login Number: L0706514 Run Date: 06/27/2007 Sample ID: WG243451-05
Instrument ID: HP15 Run Time: 02:07 Method: 8081
File ID: 15G10145.F Analyst: ECL Column ID: FRONT

DDT BREAKDOWN	
Analyte	Response
4,4'-DDD	26396005
4,4'-DDE	38407568
4,4'-DDT	2873821302
DDT % BREAKDOWN: 2.21	

ENDRIN BREAKDOWN	
Analyte	Response
ENDRIN	3110361105
ENDRIN ALDEHYDE	18384906
ENDRIN KETONE	44992038
ENDRIN % BREAKDOWN: 2.00	

* Exceeds 15% Criteria

ENDRIN/4,4'-DDT BREAKDOWN (BRKDWN)

00048701

Login Number: L0706514 Run Date: 06/27/2007 Sample ID: WG243451-05
Instrument ID: HP15 Run Time: 02:35 Method: 8081
File ID: 15G10145.R Analyst: ECL Column ID: REAR

DDT BREAKDOWN	
Analyte	Response
4,4'-DDD	49081103
4,4'-DDE	21654193
4,4'-DDT	2521629359
DDT % BREAKDOWN: 2.73	

ENDRIN BREAKDOWN	
Analyte	Response
ENDRIN	2910644920
ENDRIN ALDEHYDE	24593047
ENDRIN KETONE	50252992
ENDRIN % BREAKDOWN: 2.51	

* Exceeds 15% Criteria

2.2 General Chemistry Data

2.2.1 Percent Solids Data

2.2.1.1 Raw Data

1.0 Calculating the percent solids of a sample.

$$\%Solids = \frac{WT3 - WT1}{WT2 - WT1} \times F$$

Where:

WT1 = Weight, in grams, of the empty container

1.30 g

WT2 = Weight, in grams, of the container and wet sample

21.274 g

WT3 = Weight, in grams, of the container and dried sample

5.21 g

F = Factor to get units as percent weight

100

%Solids = Percent solids present in sample.

19.58%

PERCENT SOLIDS

SOP K0003 Rev: 9Balance: OHAUS EIRW60/Other

Sample	Empty Pan WT 1	WET WT 2	DRY WT 3A	WET WT 3B	DRY WT 3C
06-412-01	1.28	27.63	26.75		
06-420-1,23	1.28	26.30	21.15		
04	1.27	22.97	18.12		
05	1.27	22.94	16.99		
-06	1.28	26.70	20.30		
-07	1.28	20.46	15.40		
-08	1.27	21.03	15.25		
-09	1.28	19.77	15.36		
-10	1.28	17.78	13.50		
-11	1.27	20.03	14.97		
-12	1.28	19.38	15.35		
-13	1.27	18.90	14.49		
-15	1.27	22.87	17.66		
-14	1.27	23.80	19.07		
06 493 -02	1.27	22.71	18.23		
-03	1.28	20.74	16.63		
-04	1.27	21.65	17.23		
06-514-01	1.27	24.08	22.08		
02	1.27	22.42	19.44		
-03	1.28	22.43	20.46		
Duplicate: 06-420-07	1.28	26.87	15.63		

Analyst: Haley J. Reed
Heanna RobertsADT (on): 6/25/07 0910
ADT (off): 6/26/07 0940
ADT (off): _____

DCN#69825

Heanna Roberts

Approved: June 26, 2007

KEMRON ENVIRONMENTAL SERVICES
PERCENT SOLID REPORT

Workgroup (AAB#):WG243344 Run Date:06/25/2007
Method:D2216-90 Run Time:09:10
Analyst:DR

SAMPLE NUMBER	Pan WT.	Int WT.	Fn1 WT.	% Solid	% Moist	UNITS
L0706412-01	1.280	27.63	26.75	96.66		%
L0706420-01	1.280	26.30	21.15	79.42		%
L0706420-02	1.280	26.30	21.15	79.42		%
L0706420-03	1.280	26.30	21.15	79.42		%
L0706420-04	1.270	22.97	18.12	77.65		%
L0706420-05	1.270	22.94	16.99	72.54		%
L0706420-06	1.280	26.70	20.30	74.82		%
L0706420-07	1.280	20.46	15.40	73.62		%
L0706420-08	1.270	21.03	15.25	70.75		%
L0706420-09	1.280	19.77	15.36	76.15		%
L0706420-10	1.280	17.78	13.50	74.06		%
L0706420-11	1.270	20.03	14.97	73.03		%
L0706420-12	1.280	19.38	15.35	77.73		%
L0706420-13	1.270	18.90	14.49	74.99		%
L0706420-14	1.270	23.80	19.07	79.01		%
L0706420-15	1.270	22.87	17.66	75.88		%
L0706493-02	1.270	22.71	18.23	79.10		%
L0706493-03	1.280	20.74	16.63	78.88		%
L0706493-04	1.270	21.65	17.23	78.31		%
L0706514-01	1.270	24.08	22.08	91.23		%
L0706514-03	1.280	22.43	20.46	90.69		%
WG243344-01	1.280	20.46	15.40	73.62	26.38	%
WG243344-02	1.280	20.87	15.63	73.25	26.75	%

Heanna Roberts

Approved: June 26, 2007

3.0 Attachments

Kemron Environmental Services
Analyst Listing
July 30, 2007

00048709

AJF - AMANDA J. FICKIESEN	AJM - ANTHONY J. MOSSBURG	ALB - ANNIE L. BOCK
ARA - ADRIAN R. ACHTERMANN	ASP - AARON S. PETRIE	BRG - BRENDA R. GREGORY
CAA - CASSIE A. AUGENSTEIN	CAF - CHERYL A. FLOWERS	CAK - CHERYL A. KOELSCH
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD	CLS - CARA L. STRICKLER
CLW - CHARISSA L. WINTERS	CM - CHARLIE MARTIN	CMS - CRYSTAL M. STEPHENS
CPD - CHAD P. DAVIS	CSH - CHRIS S. HILL	DD - DIANE M. DENNIS
DDE - DEBRA D. ELLIOTT	DEL - DON E. LIGHTFRITZ	DEV - DAVID E. VANDENBERG
DGB - DOUGLAS G. BUTCHER	DIH - DEANNA I. HESSON	DLB - DAVID L. BUMGARNER
DLP - DOROTHY L. PAYNE	DLR - DIANNA L. RAUCH	DR - DEANNA ROBERTS
DRP - DAVE R. PITZER	DSF - DEBRA S. FREDERICK	DST - DENNIS S. TEPE
ECL - ERIC C. LAWSON	ED - EMILY E. DECKER	ERE - ERIN R. ELDER
FJB - FRANCES J. BOLDEN	HAV - HEMA VILASAGAR	HJR - HOLLY J. REED
JAB - JUANITA A. BECKER	JAL - JOHN A. LENT	JCO - JOE C. OWENS
JKP - JACQUELINE K. PARSONS	JKT - JANE K. THOMPSON	JLS - JANICE L. SCHIMMEL
JNB - JOSHUA N. BOOTH	JWR - JOHN W. RICHARDS	JWS - JACK W. SHEAVES
JYH - JI Y. HU	KCZ - KEVIN C. ZUMBRO	KEB - KATHRYN E. BARNES
KHR - KIM H. RHODES	KRA - KATHY R. ALBERTSON	KRV - KATHRINE R. VICKERS
LKN - LINDA K. NEDEFF	LSB - LESLIE S. BUCINA	MDA - MIKE D. ALBERTSON
MDC - MICHAEL D. COCHRAN	MES - MARY E. SCHILLING	MKZ - MARILYN K. ZUMBRO
MLR - MARY L. ROCHOTTE	MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
MSW - MATT S. WILSON	NJB - NATALIE J. BOOTH	PJM - PAUL J. MILLER
RAH - ROY A. HALSTEAD	RB - ROBERT BUCHANAN	REK - ROBERT E. KYER
RNP - RICK N. PETTY	RWC - RODNEY W. CAMPBELL	SLM - STEPHANIE L. MOSSBURG
SLP - SHERI L. PFALZGRAF	SMH - SHAUNA M. HYDE	TDH - TRICIA D. HUCK
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS	VC - VICKI COLLIER
WFM - WALTER F. MARTIN		

<u>Qualifier</u>	<u>Description</u>
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Result is greater than the associated numerical value.
A	See the report narrative
B	Analyte present in method blank
C	Confirmed by GC/MS
CG	Confluent growth
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
FL	Free Liquid
I	Semiquantitative result (out of instrument calibration range)
J	The analyte was positively identified, but the quantitation was below the RL
J,B	Analyte detected in both the method blank and sample above the MDL.
J,P	ESTIMATE & COLUMNS DON'T AGREE TO WITHIN 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
L	Sample reporting limits elevated due to matrix interference
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Tentatively identified compound(TIC)
NA	Not applicable
ND	Not detected at or above the reporting limit
ND,L	Not detected; sample reporting limit (RL) elevated due to interference
ND,S	Not detected; analyzed by method of standard addition (MSA)
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria fail. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
TIC	Library Search Compound
TNTC	Too numerous to count
U	Undetected; the concentration is below the reported MDL.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
Z	Cannot be resolved from isomer - see below

*****Special Notes for Organic Analytes**

1. Acrolein and acrylonitrile by method 624 are semi-quantitative screens only.
2. 1,2-Diphenylhydrazine is unstable and is reported as azobenzene.
3. N-nitrosodiphenylamine cannot be separated from diphenylamine.
4. 3-Methylphenol and 4-Methylphenol are unresolvable compounds.
5. m-Xylene and p-Xylene are unresolvable compounds.
6. The reporting limits for Appendix II/IX compounds by method 8270 are based on EPA estimated PQLs referenced in 40 CFR Part 264, Appendix IX. They are not always achievable for every compound and are matrix dependent.

CHAIN-OF-CUSTODY

No. 10959

Laboratory Name: Kemron				Address: 156 Starlite Dr. Marietta, OH. 45750				Contact: STEPHANIE MOSSBERG								
Project Name: LHAAP				Project Location: KARNACK, TX.				Analysis and Method Desired (Indicate separate containers)				Remarks				
Project No.: 845714				Project Contact: LARRY DUTY		Project Telephone No.: 713-996-4547		Number of Containers	SPLP Pesticides	TOTAL Pesticides						
Point of contact: LARRY DUTY						Project Manager/Supervisor:										
Telephone No.: 713-996-4547																
Item No.	Sample Number	Date	Time	Comp	Grab	Matrix	Sample Description, Location									
1	LHP-SITE59-SB01a-0-1A	6/21/07	9:00			S	Soil, SITE59	2	1	1						
2	LHP-SITE59-SB02a-0-1A	6/21/07	9:30			S	Soil, SITE59	2	1	1						
3																
4																
5																
6																
7																
8																
9																
10																
Transfers Relinquished By (Signature)				Date/Time		Transfers Accepted By (Signature)				Date/Time		Special Instructions				
<i>Scott Beezinger</i>				6/21/07 3:00												
												FedEx Airbill No.:				
						Laboratory <i>Jane K. Thompson</i> 6/22/07				Sampler's Signature <i>Scott Beezinger</i>						
TAT: _____ Standard _____ Rush Due: _____ Seals Intact? _____ N _____ Received Good Condition _____ Y _____ N <u>5</u> Cold _____																

White - Lab Copy Canary - Field Copy Pink - File Copy

Client: <u>Shaw</u>				
Workorder Number: <u>B</u>				
Date Received: <u>6-22-07</u>				
Delivered by: <input type="checkbox"/> Fedx <input checked="" type="checkbox"/> UPS <input type="checkbox"/> Client <input type="checkbox"/> Courier Time: <u>2:20</u>				
Opened by: <u>AM</u>				
IR Temp Gun: <input checked="" type="checkbox"/> D <input type="checkbox"/> G				
Logged by: <u>B19</u> L <u>6-514</u>				

Cooler information

Cooler ID	Temp C	Airbill#	COC#	Other
928	5°	12 66V 725 01 98291271	10959	soils

Inspection Checklist

	Y	N	NA	Discrepancy ID
Were shipping coolers sealed?	X			
Were custody seals intact?	X			
Were cooler temperatures in range of 0 - 6°?	X			
Was ice present?	X			
Were COC's received/information complete/signed/dated?	X			
Were sample containers and labels intact?	✓			
Were correct containers used?	✓			
Were correct preservatives used (water only)?			✓	
Were pH ranges acceptable?			✓	
Were VOA samples free of headspace?			✓	
Were samples received within EPA hold times?	✓			

Discrepancy/Comments/Other Problems

Distribution

Name of KEMRON representative
Client/Company:
Person Contacted:
Date contacted:

Resolution/other comments:

Login: L0706514
Account: 2773
Project: 2773.025
Samples: 4
Due Date: 26-JUN-2007

Samplenum Container ID Products
L0706514-02 349016 SPLP-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	22-JUN-2007 11:50	BRG	
2	PREP	W1	TCL	25-JUN-2007 08:45	RWC	ERE
3	STORE	TCL	A1	25-JUN-2007 13:45	ERE	RWC

Samplenum Container ID Products
L0706514-04 349018 SPLP-EX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	TCL	22-JUN-2007 11:50	BRG	
2	STORE	TCL	A1	25-JUN-2007 13:45	ERE	RWC

Samplenum Container ID Products
L0706514-02 349432 8081-SPLP

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	EXT	26-JUN-2007 06:57	RWC	
2	DISP	EXT	DISP	27-JUN-2007 08:24	AJM	AJM

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			26-JUN-2007 06:57	RWC	

Samplenum Container ID Products
L0706514-03 349017 8081-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	22-JUN-2007 11:50	BRG	
2	PREP	W1	EXT	22-JUN-2007 11:59	CSH	JKT
3	STORE	EXT	W1	22-JUN-2007 12:28	JKT	CSH
4	ANALYZ	W1	WET	25-JUN-2007 09:57	HJR	ERE
5	STORE	WET	A1	26-JUN-2007 08:29	JKT	HJR

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

KEMRON Environmental Services
Internal Chain of Custody Report

00048714

Login: L0706514
Account: 2773
Project: 2773.025
Samples: 4
Due Date: 26-JUN-2007

Samplenum **Container ID** **Products**
L0706514-01 349015 8081-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	W1	22-JUN-2007 11:50	BRG	
2	PREP	W1	EXT	22-JUN-2007 11:59	CSH	JKT
3	STORE	EXT	W1	22-JUN-2007 12:29	JKT	CSH
4	ANALYZ	W1	WET	25-JUN-2007 09:57	HJR	ERE
5	STORE	WET	A1	26-JUN-2007 08:29	JKT	HJR

Samplenum **Container ID** **Products**
L0706514-04 349433 8081-SPLP

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN	COOLER	EXT	26-JUN-2007 06:57	RWC	
2	DISP	EXT	DISP	27-JUN-2007 08:23	AJM	AJM

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish
1	LOGIN			26-JUN-2007 06:57	RWC	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

WORKGROUP SUMMARY BY METHOD

Analysis:Pesticides - Special

Extraction Method:3550B

Workgroup:WG243208

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0706514-01	LHP-SITE59-SB01A-0-1FT		06/22/07 08:30			SONICATION	CPD
L0706514-03	LHP-SITE59-SB02A-0-1FT		06/22/07 08:30			SONICATION	CPD

Analysis:Percent Solids

Analytical Method:D2216-90

Workgroup:WG243344

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0706514-01	LHP-SITE59-SB01A-0-1FT			06/25/07 09:10		OVEN	DR
L0706514-03	LHP-SITE59-SB02A-0-1FT			06/25/07 09:10		OVEN	DR

Analysis:Percent Solids

Extraction Method:D2216-90

Workgroup:WG243344

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0706514-01	LHP-SITE59-SB01A-0-1FT			06/25/07 09:10		OVEN	TMM
L0706514-03	LHP-SITE59-SB02A-0-1FT			06/25/07 09:10		OVEN	TMM

Analysis:Pesticides - SPLP

Extraction Method:3510C

Workgroup:WG243408

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0706514-02	LHP-SITE59-SB01A-0-1FT		06/26/07 08:30			SEP-FUNNEL	CSH
L0706514-04	LHP-SITE59-SB02A-0-1FT		06/26/07 08:30			SEP-FUNNEL	CSH

Analysis:Pesticides - Special

Analytical Method:8081A

Workgroup:WG243426

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0706514-01	LHP-SITE59-SB01A-0-1FT		06/22/07 08:30	06/26/07 11:25	01	HP15	ECL
L0706514-01	LHP-SITE59-SB01A-0-1FT		06/22/07 08:30	06/26/07 10:56	02	HP15	ECL
L0706514-03	LHP-SITE59-SB02A-0-1FT		06/22/07 08:30	06/26/07 10:56	01	HP15	ECL
L0706514-03	LHP-SITE59-SB02A-0-1FT		06/22/07 08:30	06/26/07 10:28	02	HP15	ECL

Analysis:Pesticides - SPLP

Analytical Method:8081A

Workgroup:WG243459

Lab ID	Client ID	Tclp Date	Prep Date	Analysis Date	Tag	Inst Id	Analyst
L0706514-02	LHP-SITE59-SB01A-0-1FT		06/26/07 08:30	06/26/07 18:04	01	HP15	ECL
L0706514-02	LHP-SITE59-SB01A-0-1FT		06/26/07 08:30	06/26/07 17:36	02	HP15	ECL
L0706514-04	LHP-SITE59-SB02A-0-1FT		06/26/07 08:30	06/26/07 18:33	01	HP15	ECL
L0706514-04	LHP-SITE59-SB02A-0-1FT		06/26/07 08:30	06/26/07 18:04	02	HP15	ECL

Kathleen Hartnett White, *Chairman*
Larry R. Soward, *Commissioner*
H. S. Buddy Garcia, *Commissioner*
Glenn Shankle, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution
August 8, 2007

Ms. Rose Zeiler
Army / BRAC Site Manager
Longhorn Army Ammunition Plant
Post Office Box 220
Ratcliff, AR 72951

Re: Draft Final Environmental Conditions of Property V (ECOP V)
Longhorn Army Ammunition Plant (LHAAP)

Dear Ms. Zeiler:

The Texas Commission on Environmental Quality (TCEQ) is in receipt of the Draft Final Environmental Conditions of Property V (ECOP V) addressing the environmental suitability of 50 acres of Longhorn land for transfer to the United States Fish and Wildlife Service for incorporation into the Caddo Lake National Wildlife Refuge. This transfer includes one remediation site designated as LHAAP-12 which includes Land Use Control (LUC) as a component of the remedy.

In accordance with the Remedial Design Addendum for LHAAP-12, the LUC related provisions are to be included in the Letter of Transfer from the Department of the U.S. Army to the Department of Interior. To facilitate agency review, the LUC provisions are included in the ECOP V (Attachment 2 – Environmental Protection Provisions). TCEQ appreciates the opportunity to review the LUC related provisions and covenants. We have reviewed the document and have no comments.

If you have any questions or need additional information, please feel free to contact me at (512) 239-2443.

Sincerely,

A handwritten signature in black ink, appearing to read "Fay Duke", written over a horizontal line.

Fay Duke, Project Manager
Team 2, Environmental Cleanup Section II
Remediation Division

FD/

cc: Mr. Stephen L. Tzhone, U. S. Environmental Protection Agency Region 6, Dallas, TX
Mr. Cliff Murray, U.S. Army Corps of Engineers, Tulsa, OK
Dr. Barry Forsythe, U.S. Fish and Wildlife Service, Dallas, TX
Mr. Paul Bruckwicki, U.S. Fish and Wildlife Service, Karnack, TX

LONGHORN ARMY AMMUNITION PLANT,

00048719

Karnack, Texas

MONTHLY MANAGERS' MEETING

AGENDA

DATE: Tuesday, 14 August 2007
TIME: 1:00 p.m.
PLACE: Teleconference Toll-Free Number: 866-797-9304, Passcode: 4155734

Welcome **RMZ**

Review of July 2007 Meeting Minutes and Action Items **RMZ**

Shaw

- Shaw to provide BERA surface water sampling results by mid-August.
- Shaw to provide regulators a 5-year review report by early August.
- Shaw to provide perimeter well results at the next RAB meeting.
- Shaw to provide creek sampling results

TCEQ

- Fay Duke will follow up with Anne Strahl on comments to SI to LHAAP-59 report.

Army

- Provide MMRP action memorandum to regulators by end of July 2007 or early August.

Defense Environmental Restoration Program (DERP) PBC Update **DC/PS**

- Document Status/Environmental Sites (Table)
- BERA Interim Deliverables
- Update on Upcoming Field Work
- 5-Year Review
- Full implementation of re-injection at Sites 18/24

DERP Total Environmental Restoration Contract Update **PS/JE**

- Documents Status/Environmental Sites (Table)
- Fieldwork: Well abandonment and installation at Site 37
- Decision Documentation for Site 59
- RODs for Sites 8, 32, 37, 48, 53, and 67
- Schedule for OPS on LHAAP-12
- LUC Management Plan

MMRP Update **JRL**

- Action Memorandum and Public Notice for EE/CA
- Projected Schedule for Removal Action
- MRS Priority Protocol

Transfer Update **RMZ**

- ECOPs IV and V
- Pits and Hazards Abatement
- Utility Easement
- Power House Demolition



**Subject: Draft Final Minutes, Monthly Managers Meeting,
Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: Conference Call

Date of Meeting: August 14, 2007; 1:00 PM – 2:15 PM

Meeting Participants:

BRAC:	Rose M. Zeiler
USACE-Tulsa:	Cliff Murray, John Lambert
USAEC	Jeff Armstrong
Shaw Environmental:	Praveen Srivastav, John Elliott, Greg Jones, Kay Everett
USEPA Region 6:	Steve Tzhone, Scott Harris
TCEQ:	Fay Duke, Dale Vodak
USFWS:	Barry Forsythe

Welcome

Rose Zeiler welcomed everyone to the meeting and began reviewing the action items identified from the last meeting.

Action Items from July 2007 Manager's Meeting

Shaw

- **Shaw to provide BERA surface water sampling results by mid-August.** – Shaw responded that the sampling was completed and the results were sent to the Army the morning of the meeting (Aug 14). There was some discussion regarding when the redline document for the BERA would be presented to the EPA. Praveen Srivastav estimated that the redline document may be submitted by mid-September.
- **Shaw to provide regulators a 5-year review report by early August.** – The 5-year report was submitted to the Army on August 3 and was under review with the Army. Jeff Armstrong mentioned that the document may need legal review and he would find out status on the following Monday. A tentative date for submittal to the regulators is August 23; however, Rose suggested the Army regroup on the Monday after legal consult is available.

- **Shaw to provide perimeter well results at the next RAB meeting.**— Will be done.
- **Shaw to provide creek sampling results**— Completed—sent by email 18 July 2007. All results were nondetect. Praveen mentioned that Shaw may start conducting the analysis at the on site laboratory rather than send it out, as is the current practice. This may be able to help detect and mitigate any excursions in a timelier manner.

TCEQ

- **Fay Duke will follow up with Anne Strahl on comments to the SI LHAAP-59 report.** – Completed to everyone's satisfaction.

Army

- **Army to provide a copy of the MMRP action memorandum to regulators by end of July 2007 or early August.**— John Lambert indicated that the EE/CA went out for the 30 day public review and comment period. Action Memo will follow at the end of the public review. Schedule would be discussed later in the meeting.

Steve Tzhone asked about the 3rd quarter groundwater treatment plant report. Praveen said it is almost complete and is coming out next week or so. Steve asked about the responses to the USGS comments on the quarterly report. Praveen Srivastav replied that Shaw submitted draft responses to the Army. Rose Zeiler said she concurred with the responses and sent back to USACE. Shaw will provide to EPA later today once confirmed that Tulsa has also reviewed and any comments resolved.

Defense Environmental Restoration Program (DERP) PBC Update (Praveen Srivastav)

Document Status/Environmental Sites (Table). Praveen Srivastav briefly went over the highlights on the document status/environmental sites table. Since there is no anticipated BERA component on LHAAP-58, Praveen asked if the regulators would like to review the Draft Final Feasibility Study (FS) on LHAAP-58 or wait until the BERA is completed. Steve Tzhone said they would prefer to wait until the BERA is finalized.

FS on LHAAP-16 (DF Addendum) and 17 (Draft) are on hold for the BERA. Fay stated that there is an existing FS written much earlier. She asked if this FS for Site 16 is a stand-alone document from the existing one. Praveen indicated that RAOs and alternatives were considered interim at the time of the previous FS because BERA had not been done and RAOs were not complete for this site. The current LHAAP-16 FS is actually an addendum to the previous FS and should be used in conjunction with this original document. The RAOs were revised and another alternative was added in the FS addendum.

Comments on the Draft Final SI for LHAAP-06, 07, 51, 55, 64, 66, 68 were received from the Army and the document will be sent to regulators along with the SPLP data. Fay Duke stated that there was a problem with the system (especially regarding the report for LHAAP-59) whereby several documents jumped to final without TCEQ having an opportunity to review the revised document. Praveen said the stakeholders would receive the re-evaluation and response to comments before incorporating into the document. Fay said that she may have to comment on the final documents if changes are not submitted or the revised document is not provided for a preview.

Site investigation report for LHAAP-03 will be submitted to the Army this week, and the draft Site Evaluation Report for LHAAP-49 is being prepared and will be sent out to the Army also this week. The EE/CA for LHAAP-04 is being prepared.

BERA Interim Deliverables. There are four interim deliverables (figures and data requested regarding mercury and nitro-toluenes at LHAAP-29; recalcs of TRVs; perchlorate data in surface water and lead in surface water) to be submitted by August 24 or 27th. Once the EPA has a chance to review, a phone call with everybody to get comments and resolve any issues was suggested. Shaw can then incorporate this data into BERA and provide the redline document for the regulators by mid-September if the review and resolution of the interim deliverables is timely. Steve Tzhone said he wanted to keep the momentum going and would give other risk assessors a heads-up. Fay said that she did not know what she could commit to until she could check with Vickie Reat.

Update on Upcoming Field Work. An email was sent by Shaw regarding upcoming field work planned to commence after Labor Day. The activity involves the installation of two wells at LHAAP-16. A figure indicating the proposed locations will be provided to the stakeholders this week. Soil samples have been collected at the Pistol Range site near the location where a high concentration of lead in soil was previously identified.

5-Year Review. See action item above for an update.

Full Implementation of Re-Injection at Sites 18/24. The pilot test at LHAAP-18/24 was successful and indicated higher injection rates than expected (17 gallons/minute). Shaw is now planning the full scale optimization. Because of the success of the pilot test, Shaw would like to continue injecting the water during the optimization process and wanted EPA to acknowledge and approve. Steve agreed with the plan. Rose mentioned that the INF pond is being used at present because the creek is not flowing, necessitating a halt in the discharge to the creek.

Operation at GWTP has been normal and repairs have been completed. As mentioned before, there has been low flow in the creek and discharge has been diverted to the INF pond. Once Shaw starts injecting discharge water underground, some of the discharge water problem will be resolved.

Defense Environmental Restoration Program (DERP) TERC Update (John Elliott)

Document Status/Environmental Sites (Table). John Elliott discussed the highlights of the Document Status Table for the TERC contract. John suggested that stakeholders adjust the dates for all RODs listed since they will be completed once the BERA is finalized.

EPA expects to have the comments on the OPS for LHAAP-12 by the 24 August. Steve said that EPA will hold comments on ECOP V and submit comments at the same time as OPS.

The Proposed Plan for LHAAP-32 has also been finalized electronically and is awaiting the completion of the BERA.

The revised Proposed Plan for LHAAP-48/53 will be submitted by August 16, 2007. Rose said USCHPPM sent comments after submittal to the regulators. She indicated that after resolution of those comments, changes would be redlined and sent so that the regulators can see what changes, although minor, were made.

Fay Duke said that her review of the site investigation report for LHAAP-59 concluded that everything was not below detection. She said that the total results for the SPLP result did not match the original concentration of the soil sample. She went on to say that there were no discussions of where the sample was located and no field notes were provided. She said there should be a discussion on how the soil was collected and any backup documentation. On those documents where the re-evaluations/re-screenings have to be conducted, Fay prefers that the document not be finalized before another review by regulators. She also said that since the original screening was incorrect, and she did not have an opportunity to review the revised document, she has comments on the Final SI for LHAAP-59. Rose Zeiler suggested that her comments would be addressed and the document would be revised as "final revision 1."

LHAAP-59 may not go through the RI/FS or ROD process and may be closed after the Final Site Investigation report. Rose Zeiler indicated that Army's internal recordkeeping on this process will entail completing a "Decision Document" which the Army will sign. It was pointed out that the Decision Document is not a regulatory document. Since it is an NPL site, Army wanted to know if there were any objections in proceeding in that direction for LHAAP-59. No objections were made.

Field work for well installations at LHAAP-37 and a well abandonment is scheduled for September 2007. Shaw will provide a two-week notice in advance of upcoming field work.

LUC Management Plan. Rose has not looked at this document yet. Annual inspection forms and what are on them was discussed. These should be inserted in the LUC Management Plan. Basically, the checklist should indicate that there is no residence present, that fences are still in place, no saplings on the cap, etc. The discussion led to who would be conducting these annual inspections and that the logical entity would be USFWS as part of the LUC Management Plan (although not part of the 5-year review inspection report). Until actual transfer, Shaw would be conducting their inspection as part of the 5-year review, and under the LUC Management Plan. The USFWS would complete this checklist annually under the LUC Management Plan and they can file this checklist in their files. Therefore, the inspections would be available to the regulators upon request. The facility under permit is not under a corrective action. Dale Vodak said that if this site is transferred to USFWS then it sounded like it was an O & M issue. Fay Duke indicated that she is used to seeing annual O&M reports from other sites. Rose Zeiler pointed out that there is no requirement in the ROD for annual reporting and the only requirement is for 5-year reviews. Rose indicated that she will check with the BRAC legal whether or not there was requirement for annual O&M reporting. Steve Tzhone said that he would check with EPA legal.

MMRP Update

John Lambert said that the MMRP EE/CA was placed in the Marshall library for public review and comment period beginning August 6th and ending September 5th. At that time and providing there has been no negative public comment, the USACE is planning to award the contract for removal action. The Action Memo will begin the process within the agency for signature and review, a work plan will be prepared and the work will begin probably in December 2007 or January 2008, assuming a September 2007 contract award. The work is estimated to take a full 6 months for the whole and will involve sites LHAAP-54 and -27.

Transfer Update

ECOP IV and ECOP V. USFWS has submitted the actual request for the land identified in ECOP IV. ECOP IV consists of tracts of land in production areas 2 and 3 and part of the East Further Investigation Area (EFIA). ECOP V is proceeding.

Pits and Hazards Abatement. The contractor is onsite and is working on fences and gates. USFWS said that the production areas will be closed for some time. The fencing is in place and is secure. Likewise, a gate on the road to the Groundwater Treatment Plant (GWTP) will be placed just past the bridge at Harrison Bayou to limit unauthorized access to the GWTP. At LHAAP-29, gates will be installed on all four corners. Mark Williams had assured the Army and all stakeholders that when environmental work at LHAAP-29 commences, they'll ensure that access to the area is restricted. In addition, the front gate is presently open, but there are brightly colored barricades with posted signs just beyond the entrance.

Utility Easement. The estimated costs in running the power lines for the Army from the USFWS to the GWTP are expected to be higher than what was initially anticipated. During the estimating process, it was noted that many of the existing power poles (which they had planned to use) would have to be replaced because they failed the "hammer test"—a procedure for determining the viability of the pole.

Power House Demolition. This project is in a holding pattern. The Army discussed the possibility of reopening the construction landfill for use in disposal of the demolition debris from the power house. The landfill still needs to be inspected before it can be closed. The new contractor may not want to use this landfill unless it was certified. Dale informed the stakeholders that if the landfill was closed, there was a strong likelihood that the TCEQ would not approve reopening the landfill.

Next Meeting

Next monthly manager's meeting is scheduled for September 11, 2007 at 2:00 PM at the Longhorn trailer. The quarterly RAB meeting will be held that evening at 6:30 PM.

Meeting Adjourned

Action Items:**Shaw**

- Shaw to provide BERA interim deliverables by August 24 or 27.
- Shaw to provide regulators a 5-year review report by late August.
- Shaw to provide response to USGS comments on quarterly groundwater reports.
- Shaw to provide perimeter well results at the next RAB meeting.

EPA

- Steve Tzhone to check on the requirement for annual O&M reporting with EPA legal

Army

- Rose Zeiler to check on the requirement for annual O&M reporting with BRAC legal

TCEQ

- Fay Duke to provide comments on LHAAP-59 report

Technical Document Status Table
TERC Task Order NO. 0109
Longhorn Army Ammunition Plant

Site	Documents in Progress	Draft Document				Draft Final Document								Final	
		Draft Submittal Date	Army Comments	Shaw RTC	Comment Resolution	Draft Final Submittal Date	AEC Comments	EPA Comments	TCEQ Comments	Shaw RTC	Army Comments	Comment Resolution	Army forward RTC to TCEQ & EPA	Comment Resolution	Final Submittal Date
08	Proposed Plan, LHAAP-08	05/01/06	05/24/06			07/07/06	08/25/06	08/21/06	09/20/06	09/29/06			11/21/06	TCEQ 12/07/06 EPA 02/21/07	
08	Record of Decision, LHAAP-08	10/26/07													
12	Operating Properly and Successfully Demonstration Report, LHAAP-12	07/25/07	07/27/07	07/31/07	08/02/07	08/02/07	NA	08/27/07	NA	08/29/07	08/29/07	08/29/07	08/29/07	08/31/07	09/07/07
32	Proposed Plan, LHAAP-32					07/21/06	08/25/06	09/05/06	09/12/06	09/19/06			11/21/06	TCEQ 12/07/06 EPA 01/26/07	
32	Record of Decision, LHAAP-32	10/26/07													
37/67	Proposed Plan, LHAAP-37/67	05/02/06	05/24/06	06/06/06	06/22/06	07/18/06	08/25/06	09/05/06	09/20/06	10/19/06	10/31/06	11/07/06	11/21/06	TCEQ 04/27/07 EPA 02/21/07	08/29/07
37/67	Record of Decision, LHAAP-37/67	11/07/07													
37/67	Remedial Design/LUCs, LHAAP-37/67	02/28/08													
48/53	Revised Proposed Plan, LHAAP-48/53	09/25/06	10/31/06	11/14/06	01/12/07	04/09/07	USACHPPM 04/25/07 OC 05/15/07	6/12/07 via USACE	04/27/07	06/27/07	07/12/07 07/13/07	08/16/07	08/27/07	TCEQ _____ EPA 08/27/07	
48/53	Record of Decision, LHAAP-48/53	10/26/07													
59	Site Investigation Report, LHAAP-59	11/02/06	11/07/06	11/09/06	11/15/06	11/21/06	None Required	03/20/07	01/11/2007, 03/20/07, & 03/22/07	04/02/07	RMZ 04/12/07 USACE 04/11/07	04/12/07	04/25/07	TCEQ 06/15/07 EPA 04/30/07	08/02/07
59	Decision Document, LHAAP-59	11/30/07													

Shaw Forecasted Submittal Date

Shaw Action Item

Army Action Item

EPA & TCEQ Action Item

Current Action item

**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
August 14, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
ERA									
	Draft Final Step 3 report (Vol I of BERA)	1/16/07		x	6/12/07	Meeting held 6/22/07.	Complete	x	TCEQ comments received 5/3/07. EPA comments received 5/18/07
	Draft Final BERA (Vol II of BERA)	3/6/07		x	6/12/07	Meeting held 6/22/07.	Complete	x	TCEQ comments received 5/3/07. EPA comments received 5/18/07.
	BERA RTCs (revised)	6/28/07		x			Complete	x	Plan is to incorporate these comments and subsequent responses directly into DF document and issue BERA as final. Surface water sampling data will also be included in final.
	Final Step 3 report (Vol I of BERA)	TBD					Pending review of interim deliverables (below)		Expected issue in Late Aug/Early Sept.
	Final BERA (Vol II of BERA)	TBD					Complete Pending review of interim deliverables (below)		Expected issue in Late Aug/Early Sept.
	BERA Surface Water Sampling Plan	7/9/07		x			Complete	x	Sampling completed 7/22-7/23/07
	Draft BERA Interim Deliverables package	7/26/07	x		8/10/07		Under Army Review		Supplemental information requested/discussed at Comment resolution meeting.
	BERA interim Deliverables package	8/17/07					Pending receipt of Army Comments		
	Draft Surface Water Study Summary Tech Memo	8/17/07 (Army)					In preparation		Surface water study to support lead as attributable to background.
ENVIRONMENTAL									
	Draft Final SI/Evaluation Report, LHAAP-02	3/30/06		x			Comments rec'd from TCEQ 8/29/06. EPA comments rec'd 5/12/06.	x	Final will be issued when BERA information available.



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
August 14, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
	Draft Final Proposed Plan, LHAAP-60	7/7/06		x			Comments rec'd from TCEQ 8/1/06. EPA comments rec'd 8/21/06.	x	Final to be submitted when BERA information available.
	Draft Final Feasibility Study, LHAAP-58	9/7/07					Army comments being addressed		No eco risk expected at the site based on Draft Final BERA. Draft Final to be submitted to the regulators after BERA is finalized.
	Draft Feasibility Study, LHAAP-17	TBD					On hold pending BERA		Draft versions 80% complete. Draft will be issued when BERA information available.
	Draft Final Feasibility Study, LHAAP-16	TBD					On hold pending BERA		Decision made to hold DF document until BERA information available based on EPA comments regarding CERCLA process.
	Draft Final SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68 (combined)	1/11/07		x	2/10/07		Complete	x	Final will be issued based on resolution of RTC for DF
	Revised RTC on DF SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68	8/15/07	x				In preparation		
	Draft SI Report for LHAAP-35/36	7/16/07 (Army)	x		8/2/07		Complete	x	Final Army comments received 8/13/07. Draft Final in preparation.
	Draft Final SI Report for LHAAP-35/36	8/20/07					In preparation		Final Army comments received 8/13/07. Draft Final in preparation.
	Draft Final LHAAP-16 MNA Evaluation Proposal	3/2/07		x		EPA comments rec'd 3/28/07, TCEQ has provided verbal comments – no formal written comments rec'd.	Final being revised to reflect recent discussions once open issues resolved.	x	<ul style="list-style-type: none"> No formal comments received from TCEQ. Perchlorate standard for stream still needs to be resolved.

Longhorn Distribution List

Member	Agency	Address	Phone No. e-mail address	No. of Copies
Cliff Murray Tulsa District	U.S. Army Corp of Engineers	US Army Corp of Engineers 1645 South 101 st - East Avenue Tulsa, Oklahoma 74128-4529	Office: 918-669-7573 Cliff.Murray@SWT03.usace.army.mil	2
Dr. Rose Zeiler	BRAC; Longhorn Site Manager	P.O. Box 220 Ratcliff, AR 72951 727 South Brooklyn Rd Ratcliff, AR 72951	Office: 479-635-0110 rose.zeiler@us.army.mil	1
Jeff Armstrong	Army Environmental Center	Commander USAEC SFIM-AEC-ERA (Attn: Jeff Armstrong) Beal Road Bldg E-4880 APG, MD 21010-5401	Office: 410-436-1516 jeffrey.armstrong@us.army.mil	1
Stephen Tzhone	US Environmental Protection Agency	US Environmental Protection Agency Superfund Division (6SF-AT) 1445 Ross Avenue Dallas, TX 75202-2733	Office: 214-665-8409 tzhone.stephen@epamail.epa.gov	2
Fay Duke	Texas Commission of Environmental Quality	Texas Commission on Environmental Quality TCEQ Environmental Cleanup Section II, Team 2 (MC-221) 12100 Park 35 Circle, Bldg D Austin, TX 78753	Office: 512-239-2443 fduke@tceq.state.tx.us	2 - most 4-eco
Dale Vodak	Texas Commission of Environmental Quality	Texas Commission on Environmental Quality 2916 Teague Drive Tyler, TX 75701	Office: 903-535-5147 dvodak@tceq.state.tx.us	1
Paul Bruckwicki	US Fish and Wildlife Service	US Fish and Wildlife Service PO Box 230 Karnack, TX 75661 (mailing only) Caddo Lake NWR Hwy 134 & Spur 449 Karnack, TX 75661	Office: 903-679-4536 Cell: 903-407-0852 paul_bruckwicki@fws.gov	1
Barry Forsythe	US Fish & Wildlife Service EPA Liaison (6SF-LT)	US Fish & Wildlife Service EPA Liaison (6SF-LT) 1445 Ross Avenue, Suite 1200 Dallas, TX 75202	Office: 214-665-8467 forsythe.barry@epa.gov	1-eco

Total external distribution for routine final (non eco) reports = 10



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
August 14, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
	Draft 5 Year Review Report for LHAAP-12, 16, and 18/24	8/3/07	x		8/10/07 (requested) 8/21/07 (standard)		Under Army review		Report issued 8/3/07 with expedited turnaround requested in effort to meet EPA schedule.
	Draft SI Report for LHAAP-03	8/16/07 (Army)					In preparation		Will be incorporated into FINAL SI report for sites -06, -07, -51, -55, -64, -66, -68. Revised version expected to be issued late July 2007.
	Draft Site Evaluation Report for LHAAP-49	8/17/07 (Army)					In preparation		
	Draft EE/CA for LHAAP-04	TBD					In preparation		On hold pending resolution of BERA issues.



Shaw Environmental & Infrastructure, Inc.

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September 7, 2007

Shaw/TERC 07-080

Mr. Cliff Murray
U.S. Army Corps of Engineers – Tulsa District
1645 South 101st - East Avenue
Tulsa, Oklahoma 74128-4629

RE: **Task Order No. 109**
Total Environmental Restoration Contract (TERC)
Contract No. DACA56-94-D-0020
Environmental Investigation and Remediation at
Longhorn Army Ammunition Plant, Karnack, Texas
Final Operating Properly and Successfully Demonstration Report LHAAP-12,
Longhorn Army Ammunition Plant, Karnack, Texas

Dear Mr. Murray:

Shaw Environmental, Inc. is pleased to submit the attached *Final Operating Properly and Successfully Demonstration Report LHAAP-12*. We are also sending copies of the document directly to individuals on the attached project document distribution list.

Please contact me if you have any questions or require additional information.

Sincerely,

John Elliott, PMP
Project Manager



00048732

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

September 7, 2007

DAIM-BD-LO

Mr. Steve Tzhone
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Final Operating Properly and Successfully Demonstration Report LHAAP-12, Longhorn
Army Ammunition Plant, Karnack, Texas, September 2007

Dear Mr. Tzhone,

The above-referenced document is transmitted to you for your files.

Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by
email at rose.zeiler@us.army.mil.

Sincerely,

A handwritten signature in black ink, reading "Rose M. Zeiler", is positioned below the "Sincerely," text.

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:

Fay Duke, TCEQ, Austin, TX
Paul Bruckwicki, Caddo Lake NWR, TX
Cliff Murray, COE – Tulsa District, OK
John R. Lambert, COE – Tulsa District, OK
John Elliott, Shaw, Houston, TX
Praveen Srivastav, Shaw, Houston, TX
Kay Everett, Shaw, Houston, TX



00048733

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

September 7, 2007

DAIM-BD-LO

Ms. Fay Duke
Texas Commission on Environmental Quality
Environmental Cleanup Section II (MC-221)
12100 Park 35 Circle
Austin, TX 78753

Re: Final Operating Properly and Successfully Demonstration Report LHAAP-12, Longhorn
Army Ammunition Plant, Karnack, Texas, September 2007

Dear Ms. Duke,

The above-referenced document is transmitted to you for your files.

Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by
email at rose.zeiler@us.army.mil.

Sincerely,

A handwritten signature in cursive script, reading "Rose M. Zeiler", is positioned below the word "Sincerely,".

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:

Stephen Tzhone, USEPA Region 6, Dallas, TX
Paul Bruckwicki, Caddo Lake NWR, TX
Cliff Murray, COE – Tulsa District, OK
John R. Lambert, COE – Tulsa District, OK
John Elliott, Shaw, Houston, TX
Praveen Srivastav, Shaw, Houston, TX
Kay Everett, Shaw, Houston, TX

Comments on Draft Final Operating Properly and Successfully Demonstration Report Landfill 12 (LHAAP-12)
Longhorn Army Ammunition Plant, Karnack, Texas, dated August 27, 2007

Reviewer: Steve Tzhone, USEPA, Region 6
Respondents: Shaw Environmental, Inc.

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commentor Agrees (A) with response, or Does not Agree (D) with response.

Comment #	Page	Section/Paragraph	Comment	C, D ¹ , E or X	Response	A or D ²
1		Section 6.0, "Conclusions," 3 rd para	The statement in Section 6.0, "Conclusions," third paragraph, that, "Contaminants are retained in the shallow groundwater zone and have neither migrated to surface water, nor into the intermediate zone," is not strongly supported by the information contained in this document. The report indicates in Section 1.2.2, in the third paragraph on page 1-5, that the underlying clay layer is only a "few feet" thick in areas. Appendix C presented analytical data for only two intermediate wells, one of which had low-level detections of TCE and DCE. No information on the location of these two wells was presented, and they have been abandoned and not sampled since 2004. Given the thin nature of the clay layer, the small amount of intermediate zone monitoring data, and the low-level detections in the intermediate zone, the report's conclusions may be accurate, but could be better supported by the inclusion of additional information on ground water levels and gradients, monitoring well screened intervals, geologic cross sections, and topography. For purposes of the OPS Demonstration Report, the inclusion of additional information as specified would be acceptable.	C/D	<p>Appendix C presents analytical data for four intermediate wells; 12MW11, 12MW13, 12MW14, and 12MW19. 12MW11 is incorrectly identified as a deep monitoring well in the draft final document and will be corrected to an intermediate monitoring well in the final document. Of the four intermediate monitoring wells, only 12WW13 had low-level (J-qualified) detections of TCE and DCE. A figure (Figure 2-1) depicting the locations of the intermediate wells is attached and will be included in the Final OPS Demonstration Report. This figure will also be corrected to depict 12MW11 as an intermediate well.</p> <p>Also attached is a set of cross sections from the Final Remedial Investigation Report for the Group 2 Sites Remedial Investigation Report (Sites 12, 17, 18/24, 29 and 32), April 2001. The original index map is supplemented with the Figure 2-1 (mentioned above) showing the more recent wells. Included is also a set of annotated cross sections showing locations of newer wells provided in Appendix A of the Final LHAAP-12 Well Abandonment and Installation Report, Groundwater Data Gaps Investigation, Groups 2 and 4, April 2007.</p>	A 8/31/07
2		Section 6.0, "Conclusions," 3 rd para	The statement in Section 6.0, "Conclusions," third paragraph, that, "Natural attenuation is effectively controlling any plume migration and diminishing the size of area exhibiting COC concentrations exceeding MCL values," is not strongly supported by the information contained in this document. Review of Figure 2-3, comparing plume extent in July 1998 to December 2006, indicates the areal extent of the plume appears to be stable, not diminishing. Further, review of all of the historical analytical data in	C	<p>The referenced sentence in Section 6.0 will be revised to state: "Natural attenuation has stabilized the plume and has achieved the RAO of preventing migration of the plume to surface water."</p> <p>The second and third sentence of the fifth paragraph on page 3-4 will be deleted.</p>	A 8/31/07

**Comments on Draft Final Operating Properly and Successfully Demonstration Report Landfill 12 (LHAAP-12)
Longhorn Army Ammunition Plant, Karnack, Texas, dated August 27, 2007**

Reviewer: Steve Tzhone, USEPA, Region 6

Respondents: Shaw Environmental, Inc.

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commentor Agrees (A) with response, or Does not Agree (D) with response.

Comment #	Page	Section/Paragraph	Comment	C, D ¹ , E or X	Response	A or D ²
2 (cont.)			Appendix C of monitoring wells 12WW12 and its replacement well 12WW24, indicates that no trend of diminishing concentrations for TCE, DCE or VC are present, and the concentrations are relatively stable. It appears that this statement, along with a similar statement in Section 3.4.2 on page 3-4 (which also states a decreasing trend exists in this well), are based on only the last two sampling events, and do not consider other, similar vacillations in the data set. While the RAO of preventing migration of the plume to surface water appears to be currently met, EPA recommends revising these statements to simply indicate the plume is stable and meets the RAO, and remove all statements about diminishing areas and concentrations.			
3		Sections 4.5.1 and 4.5.2	The report indicates in Sections 4.5.1 and 4.5.2, that maintenance and inspections of the landfill cap will transfer to the FWS. With respect to the FWS performing ongoing maintenance and inspections at LHAAP-12, it is acceptable as long as the Army recognizes that it remains responsible to EPA for the ongoing maintenance at the Longhorn Army Ammunition Plant site (Site). The Army is the responsible party at this Site under CERCLA Sections 120(a) and 107(a), not the FWS. For these Sections, please include an additional statement as to the Army's recognition of its responsibility regardless of any separate agreements that the Army has with other entities. Also, has the FWS agreed to accept and fund this responsibility? If so, please provide references or additional information on this topic as well.	C	<p>Although the U.S. Army intends to transfer certain LUC responsibilities to USFWS, the Army recognizes that it remains ultimately responsible to the EPA for ensuring LUC objectives are met to protect the integrity of the selected remedy at LHAAP-12.</p> <p>Certain terms and conditions required for transfer, including but not limited to LUC obligations and corresponding covenants, are stipulated in the Environmental Protection Provisions as presented in Attachment 2 of the Environmental Condition of Property V (ECOP V). The Environmental Protection Provisions will be incorporated by reference into the Letter of Transfer from the Department of the U.S. Army to the Department of the Interior to ensure the protection of human health and the environment and in furtherance of ongoing and completed remediation activities at LHAAP-12.</p>	A 8/31/07

**Comments on Draft Final Operating Properly and Successfully Demonstration Report Landfill 12 (LHAAP-12)
Longhorn Army Ammunition Plant, Karnack, Texas, dated August 27, 2007**

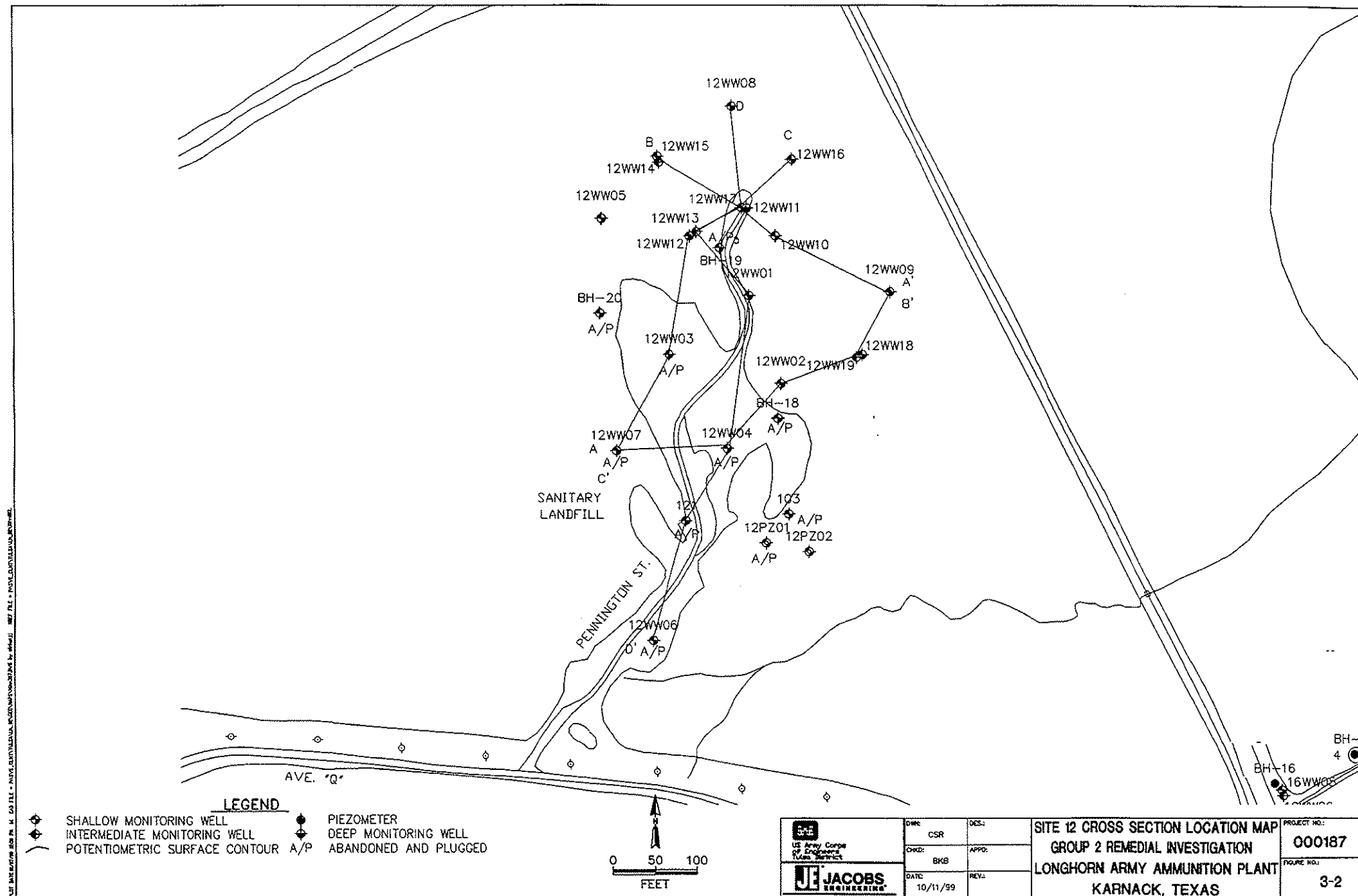
Reviewer: Steve Tzhone, USEPA, Region 6

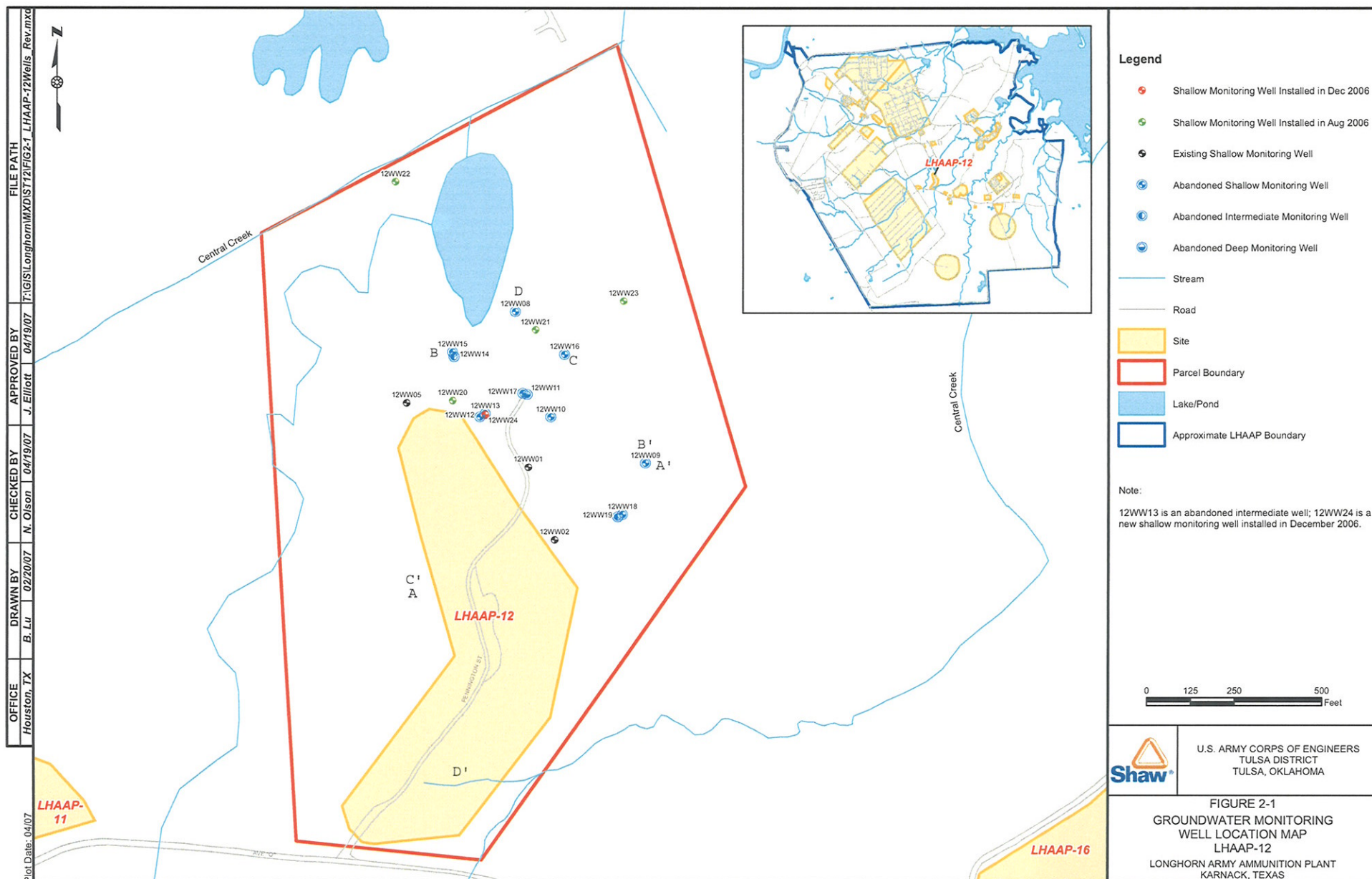
Respondents: Shaw Environmental, Inc.

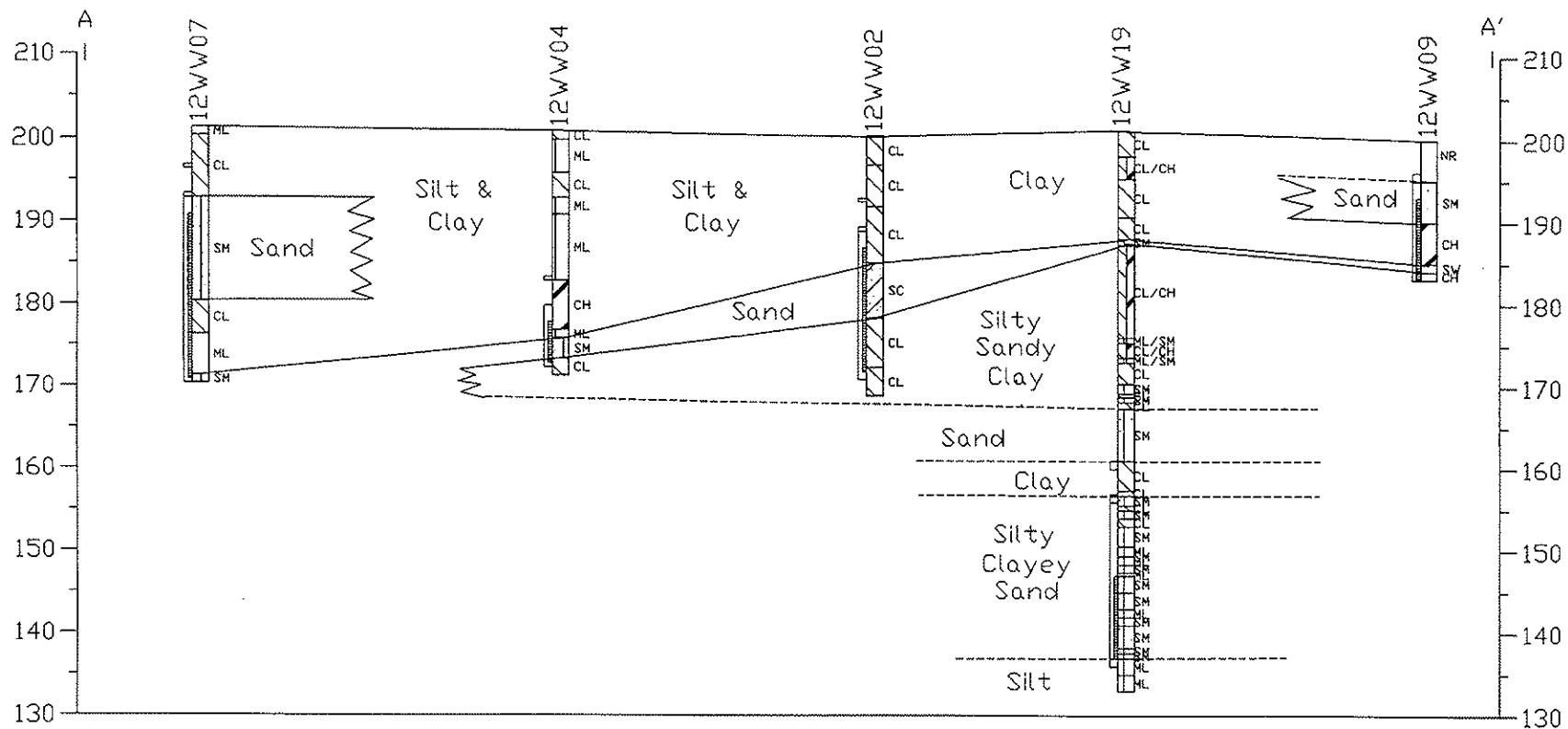
1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).

2. Commentor Agrees (A) with response, or Does not Agree (D) with response.

Comment #	Page	Section/Paragraph	Comment	C, D ¹ , E or X	Response	A or D ²
4		Appendix B	The last three quarterly inspection checklists in Appendix B noted "action needed" on erosion damage and vegetation mowing, but no action was taken. Vegetation height increased from "4 to 18 inches" in December 2006, to "6 to 18 inches" in February 2007, to "8 to 24 inches" in June 2007. Please provide references or additional information as to the completion of these actions.	C	Landfill 12 was recently mowed on August 9, 2007. Future mowing will occur on an as needed basis (yearly, at a minimum). As specified in Section 2.4.2.2, the slight erosion was not considered to compromise the performance of the cap. The existing slight erosion will be monitored and repaired as necessary. Any deficiencies noted in future inspections will be corrected as soon as possible.	A 8/31/07
5		Figure 2-3	Figure 2-3 indicates that many of the 2006 sample results had reporting limits for VC of 10 ppb, well above the MCL of 2 ppb. Is there a reason for this? This method has a PQL of 1 ppb.	C	The electronic data deliverable (EDD) provided by the analytical laboratory (Kemron Environmental Services) provided an arbitrary reporting limit of 10 ppb for vinyl chloride (VC). The actual Sample Quantitation Limit (SQL) for the referenced samples, as depicted on the analytical reports, is 0.25 ppb. Figure 2-3 and the LHAAP-12 Historical COC Concentrations table (Appendix C) will be corrected to indicate <0.25 ppb VC for the referenced samples. Shaw's Program Chemist has confirmed the above information with Kemron Environmental Services.	A 8/31/07







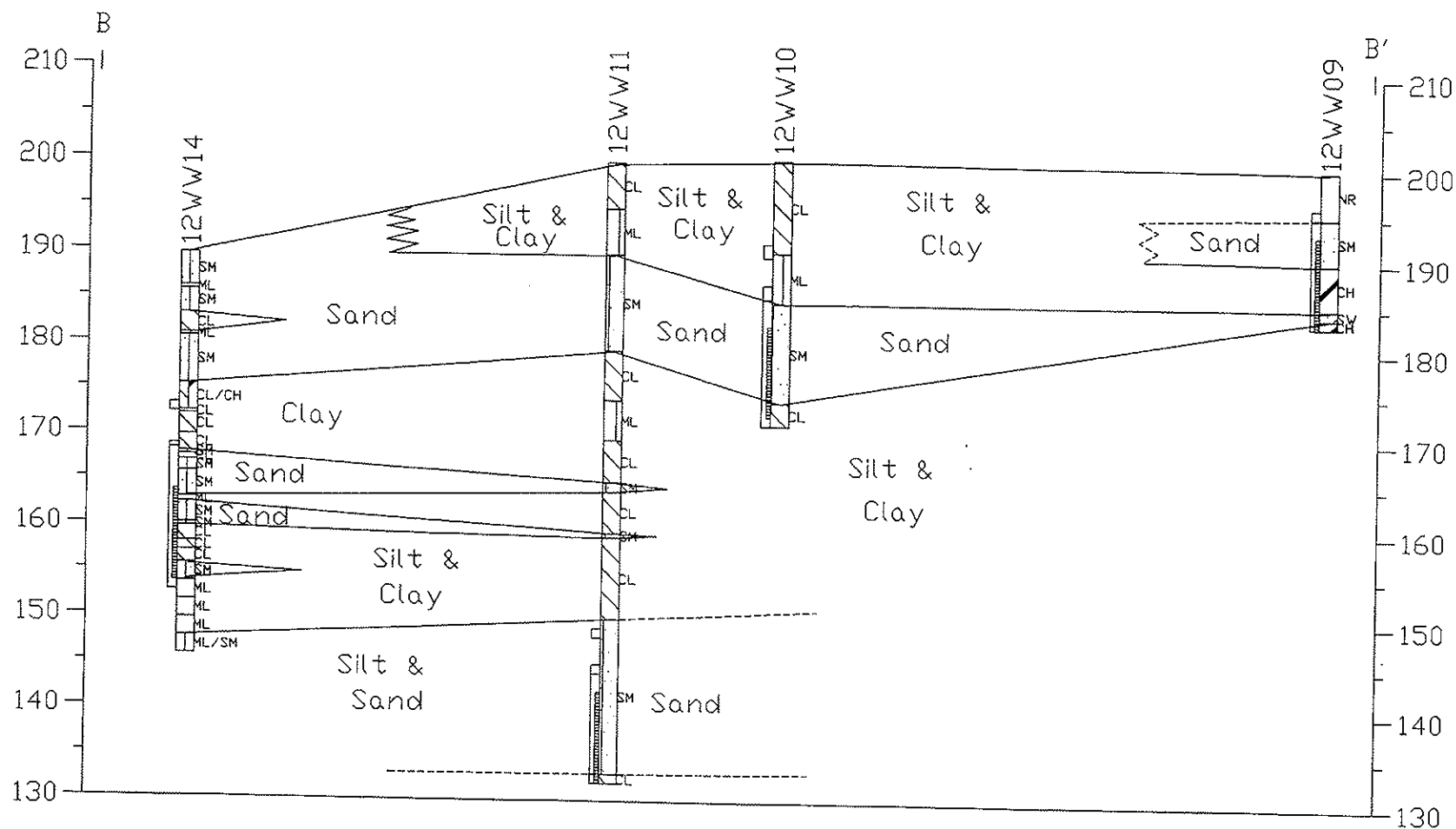
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VERTICAL
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40
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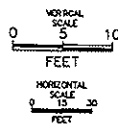


SITE 12 GEOLOGIC CROSS SECTION A-A'
GROUP 2 REMEDIAL INVESTIGATION
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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CHD:	PTS	APP:	000187
DATE	FEB 99	REV:	FIGURE NO:
			3-3

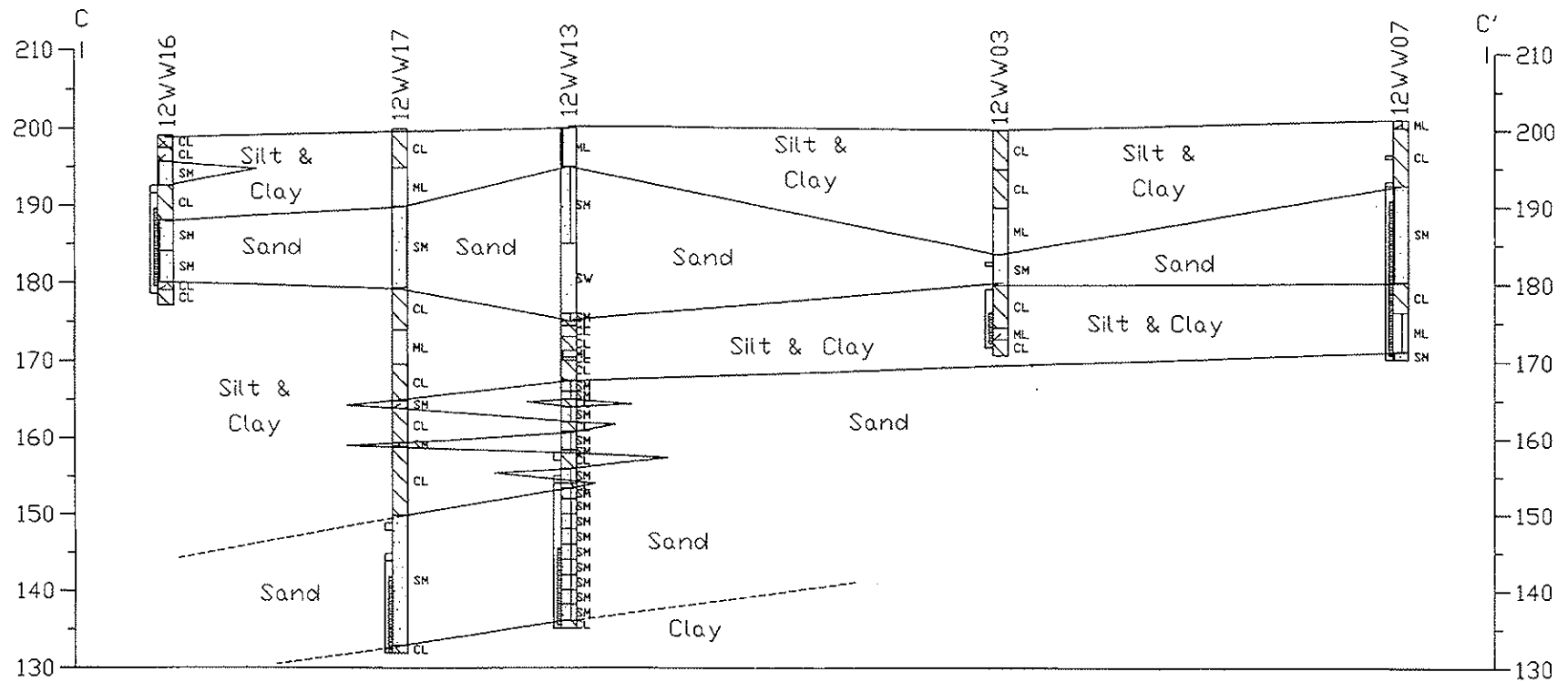


CROSS SECTION B-B'



SITE 12 GEOLOGIC CROSS SECTION B-B'
GROUP 2 REMEDIAL INVESTIGATION
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

DATE	BSM	DATE	PROJECT NO.
CHNG	PTS	APPR	000187
DATE	FEB 99	REV	FIGURE NO.
			3-4



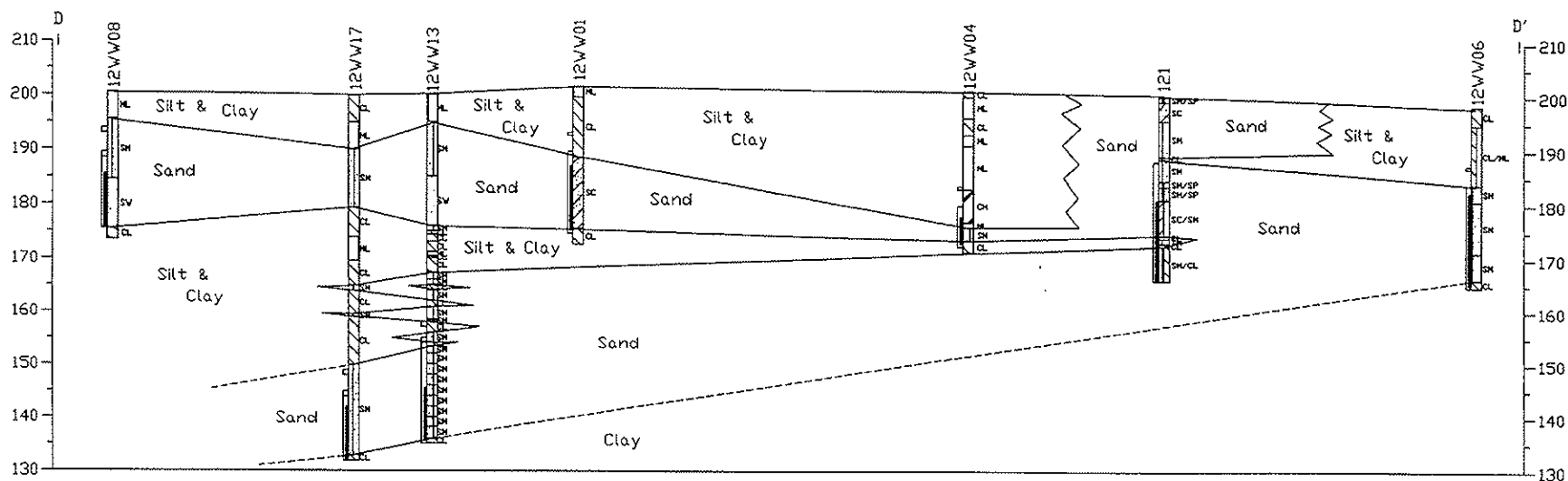
CROSS SECTION C-C'

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SCALE
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HORIZONTAL
SCALE
0 20 40
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SITE 12 GEOLOGIC CROSS SECTION C-C'
GROUP 2 REMEDIAL INVESTIGATION
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

DATE BSM	DEC:	PROJECT NO. 000187
CHG: PTS	APP:	FIGURE NO.: 3-5
DATE FEB 99	REV:	



CROSS SECTION D-D'

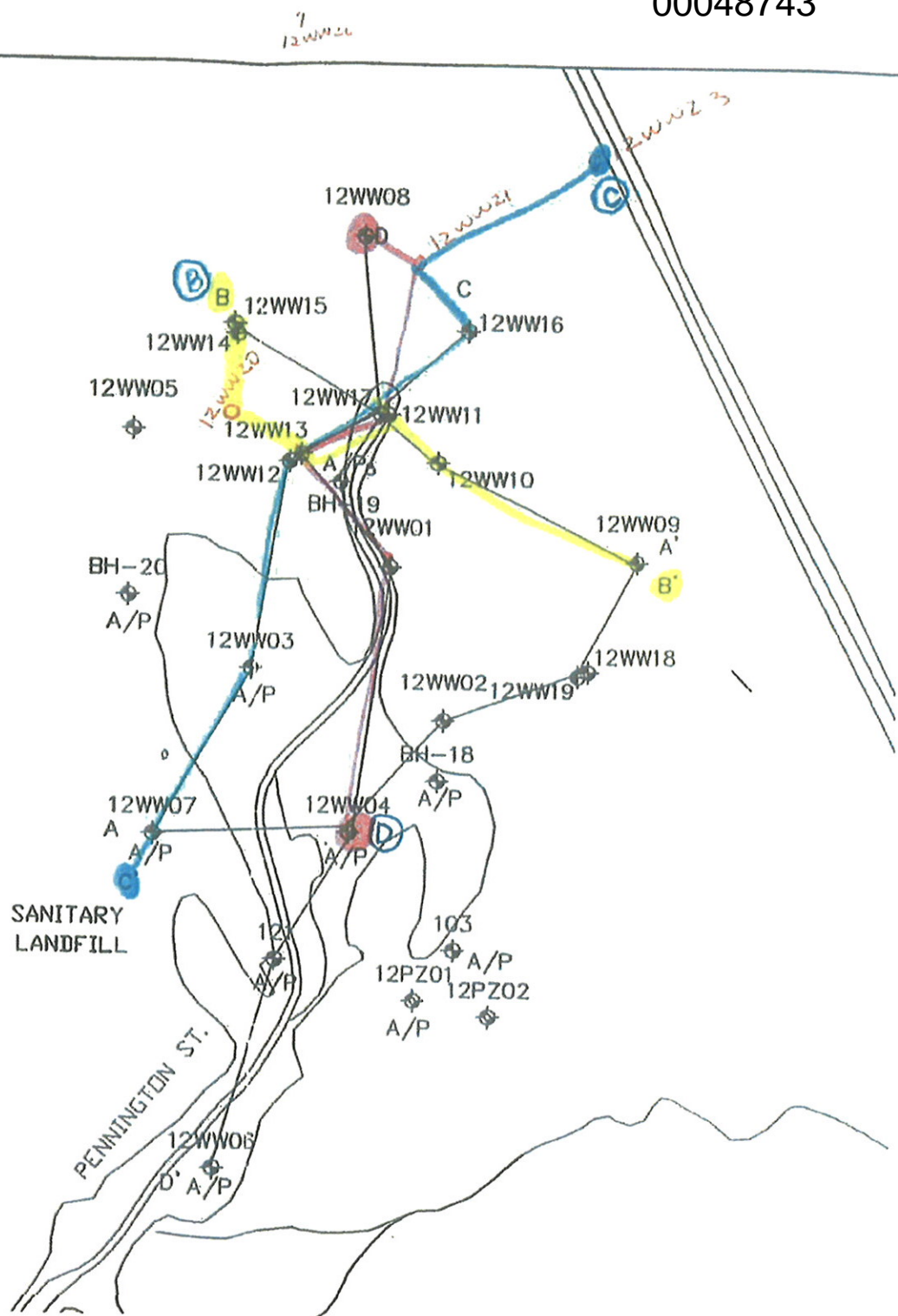
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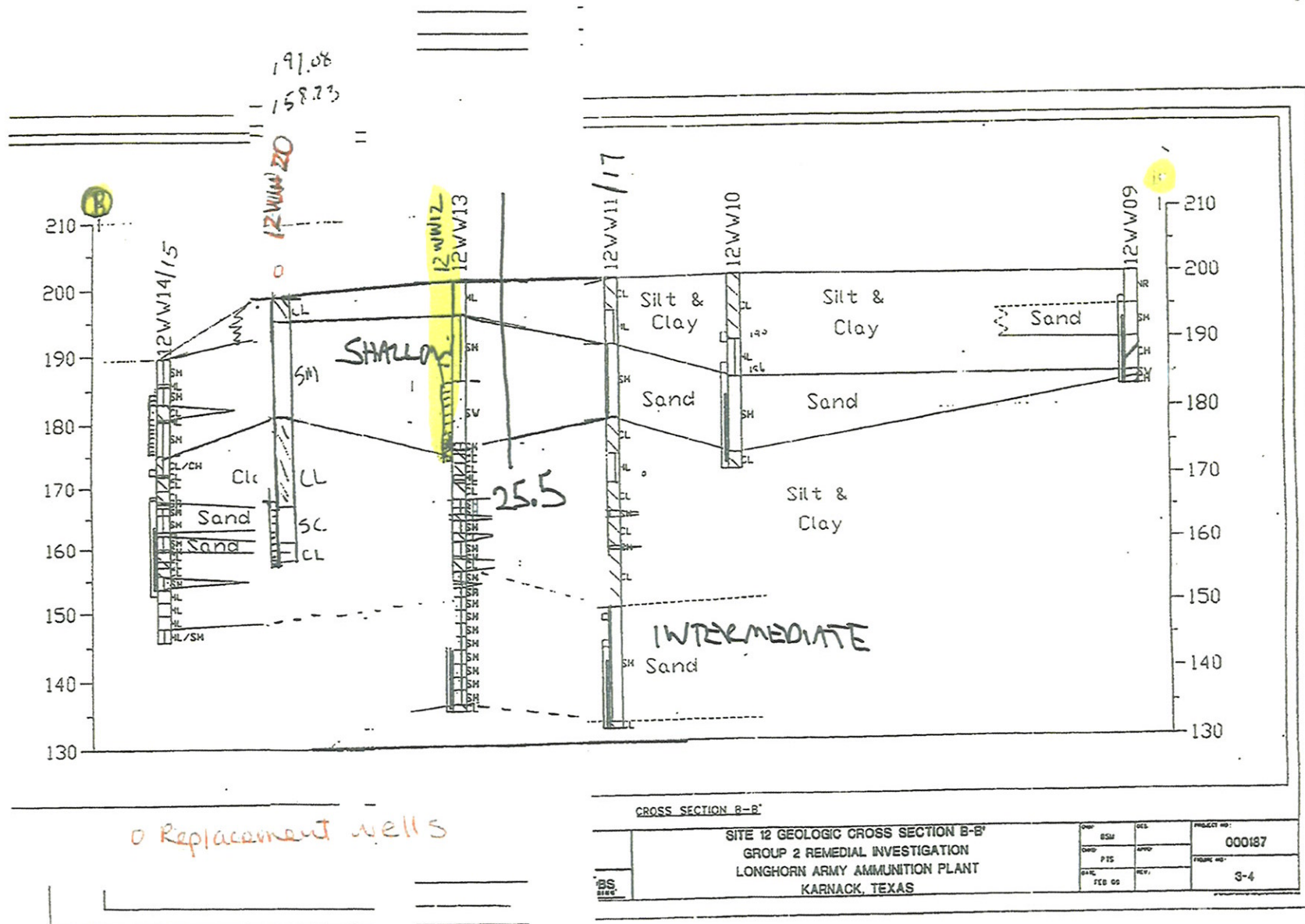
SITE 12 GEOLOGIC CROSS SECTION D-D'
GROUP 2 REMEDIAL INVESTIGATION
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

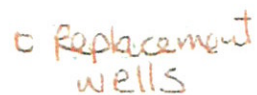
DATE:	DES.:	PROJECT NO.:
FEB 99	BSM	000187
	APPD.:	FIGURE NO.:
	PTS	3-6
	REV.:	



LHAAP 12
Locations
of Cross-sections

O PVC Replacement wells

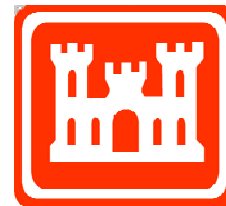




**SITE 12 GEOLOGIC CROSS SECTION C-C'
GROUP 2 REMEDIAL INVESTIGATION
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**

CRIME:	BSN
CHARGE:	PTS
DATE:	FEB 90

FINAL
OPERATING PROPERLY AND SUCCESSFULLY
DEMONSTRATION REPORT
LANDFILL 12 (LHAAP-12)
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



Prepared for
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TERC No. DACA56-94-D-0020, Task Order No. 109
Shaw Project No. 845714

September 2007

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Acronyms and Abbreviations

ARAR	applicable or relevant and appropriate requirement
Army	U.S. Department of the Army
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm/sec	centimeters per second
COC	constituents of concern
DCE	Dichloroethene
DoD	Department of Defense
ECOP	Environmental Condition of Property
FFA	Federal Facilities Agreement
GSA	General Services Administration
IRA	interim remedial action
LHAAP	Longhorn Army Ammunition Plant
LOE	lines of evidence
LUC	land use controls
MCL	maximum contaminant levels
µg/L	micrograms per liter
MNA	monitored natural attenuation
MOA	Memorandum of Agreement
NPL	Superfund National Priorities List
O&M	operation and maintenance
OLOE	other lines of evidence
OPS	operating properly and successfully
PLOE	primary lines of evidence
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
ROD	Record of Decision
Shaw	Shaw Environmental, Inc.
SLOE	secondary lines of evidence
SVOC	semivolatile organic compounds
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
TNT	Trinitrotoluene
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Material
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VC	vinyl chloride
VOC	volatile organic compounds

1.0 Introduction

This report presents information that demonstrates that remedial actions are operating properly and successfully (OPS), in accordance with the remedial design objectives for Landfill 12 at Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas. LHAAP consists of approximately 8,400 acres. The property associated with this report is the 50.541-acre parcel designated LHAAP-12. Within the LHAAP-12 parcel are designated institutional or land-use control boundaries including a 9.429 acre tract and a 45.939 acre tract. Landfill 12, having an area of approximately 7 acres, is located within the 9.429-acre tract.

The U.S. Army (the Army) is the lead agency for environmental response actions at LHAAP. The Army is charged with planning and implementing remedial actions at LHAAP in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the existing Federal Facilities Agreement, and facilitating the timely transfer of LHAAP property from the Department of Defense (DoD) to the Department of Interior U.S. Fish and Wildlife Service (USFWS) as response actions are completed at individual sites. The purpose of the OPS demonstration for the final remedy of LHAAP-12 is to evaluate the landfill cap for source control, evaluate the groundwater monitored natural attenuation system for containment of the plume of volatile organic compounds in the shallow groundwater zone at LHAAP-12, protection of surface water quality from groundwater discharge, and the LUCs associated with these remedies.

The LHAAP Federal Facilities Agreement (FFA) applies to the LHAAP-12 property. The FFA was effective as of December 30, 1991, by and between the LHAAP, the Texas Water Commission (currently known as the Texas Commission on Environmental Quality [TCEQ]), and the USEPA Region 6.

LHAAP was declared excess to Army needs in 1997 and the plant was closed. During the federal screening process, USFWS requested all of LHAAP. A Memorandum of Agreement (MOA) between the U.S. Department of the Army (Army) and the Department of the Interior, signed on October 21, 2000, provides for the permanent terms and conditions for the transfer of property at LHAAP, Harrison County, Texas, from the Army, through the General Services Administration (GSA), to the Department of the Interior, USFWS to be utilized as a national wildlife refuge.

Because the transfer of LHAAP-12 will be a federal-to-federal transaction governed by the MOA, and the U.S. Government remains the owner of the property, there is not a statutory requirement for an OPS demonstration. However, this OPS document is being submitted as a

precondition of the transfer pursuant to the transfer MOA. A successful demonstration of OPS to the USEPA will allow for the continuance of the transfer process for LHAAP-12.

The environmental condition of the LHAAP-12 parcel is documented in the Draft-Final Environmental Condition of Property V (ECOP V) dated July 2007. The ECOP also documents the determination of the suitability of this parcel for this transfer from the Army to USFWS as a national wildlife refuge. Approximately 6,300 acres have been transferred to the USFWS for management as the Caddo Lake National Wildlife Refuge. LHAAP-12 is surrounded by an area that has already been transferred to the USFWS.

This report presents the demonstration that the final remedy prescribed for LHAAP-12 in the Remedial Design Addendum (Shaw, 2007a) is operating properly and successfully, and that the necessary mechanisms are in place to ensure protection of human health and the environment.

1.1 OPS Demonstration Approach

The approach to the OPS demonstration for the final remedy of LHAAP-12 is to evaluate compliance with the remedial action objectives established in the Record of Decision (ROD) for LHAAP-12 (Shaw, 2006) and demonstrate that the remedial systems are operating properly and successfully, in accordance with approved design. The RAOs developed for LHAAP-12 include:

- Protection of human health by preventing human exposure to TCE contaminated groundwater
- Protection of human health and the environment by reducing the leaching and migration of landfill contaminants into the groundwater
- Protection of human health and the environment by preventing TCE contaminated groundwater from migrating into nearby surface water

1.1.1 Definition

The phrase “operating properly and successfully” involves two separate concepts. A remedial action is operating “properly” if it is operating as designed. That same system is operating “successfully” if its operation will achieve the performance goals delineated in the decision document. Additionally, to be successful, “that remedy must be protective of human health and the environment.”

The success of a particular remedial action is evaluated based on whether it effectively addresses the contaminant(s) it is designed to remediate and whether the remedial action is operating properly and successfully. USEPA evaluates the suite of actions comprehensively before OPS approval in order to ensure all necessary remedial actions have been taken prior to property transfer.

1.1.2 OPS Criteria

This report was prepared in accordance with the guidance provided in the USEPA document entitled “Guidance for Evaluation of Federal Agency Demonstrations that Remedial Actions are Operating Properly and Successfully under CERCLA Section 120(h)(3)” (USEPA, 1996). The remedial action for groundwater contamination at LHAAP-12 includes: 1) a cap over Landfill 12 for source control (i.e., to prevent infiltration of precipitation and subsequent generation/migration of additional leachate from wastes left in place), 2) a groundwater monitored natural attenuation (MNA) system to provide containment of TCE in groundwater, and 3) a set of land-use controls to protect the landfill cap and protect the future maintenance worker by preventing exposure to contaminated groundwater. The OPS evaluations with respect to the specific criteria for each system are presented in Section 2 (Landfill Cap OPS Demonstration) and Section 3 (Groundwater Monitored Natural Attenuation OPS Demonstration). The OPS evaluation of Land Use Controls is presented in Section 4 (Land Use Controls).

1.1.3 Statutory Setting

The MOA between the Army and the Department of the Interior provides for the permanent terms and conditions for the transfer of property at LHAAP from the Army, through the GSA, to the USFWS. This OPS demonstration is a condition of that MOA. Section 120(s)(3) of CERCLA requires an OPS demonstration and an associated covenant in the deed where a federal agency transfers real property to a nonfederal entity. However, this transfer will be federal to federal. As such it is administrative only; there will be no deed, and there is no statutory driver for this OPS demonstration.

1.2 Site Name, Location, and Description

Landfill 12 (LHAAP-12)
Longhorn Army Ammunition Plant
Karnack, Texas

Comprehensive Environmental Response, Compensation, and Liability Information System
USEPA Identification Number: TX6213820529 (for entire LHAAP facility)

Lead Agency: U.S. Army, Department of Defense

Source of Restoration Funding: U.S. Army, Department of Defense, DERA

The former Longhorn Army Ammunition Plant (LHAAP) is an inactive, government-owned, formerly contractor-operated and -maintained Department of Defense facility located in central east Texas in the northeast corner of Harrison County. As shown on **Figure 1-1**, LHAAP is approximately 14 miles northeast of Marshall, Texas, and approximately 40 miles west of

Shreveport, Louisiana. The former Army installation occupied approximately 8,400 acres between State Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake and is accessed by State Highways 43 and 134.

LHAAP was placed on the National Priorities List (NPL) in August 1990. Activities to remediate contamination began in 1990. After its listing on the NPL, the Army, the USEPA, and the Texas Water Commission (currently known as the TCEQ) entered into a CERCLA Section 120 FFA for remedial activities at LHAAP. The FFA became effective December 30, 1991. LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property.

1.2.1 Historical Operations

LHAAP was established in December 1941 with the primary mission of manufacturing trinitrotoluene (TNT). Production of TNT began at Plant 1 in October 1942 and continued through World War II until August 1945, when the facility was placed on standby status until February 1952. In 1952, the facility was reactivated and production of pyrotechnic ammunition, such as photoflash bombs, simulators, hand signals, and tracers for 40 mm ammunition continued at Plant 2 through 1956.

In December 1954, a third facility, Plant 3, began production of solid-fuel rocket motors for tactical missiles. Rocket motor production at Plant 3 continued to be the primary operation at LHAAP until 1965 when Plant 2 was reactivated for the production of pyrotechnic and illuminating ammunition. In the years following the Vietnam conflict, LHAAP continued to produce flares and other basic pyrotechnic or illuminating items for the U.S. Department of Defense inventory. From September 1988 to May 1991, LHAAP was also used for the static firing and elimination of Pershing I and II rocket motors in compliance with the Intermediate-Range Nuclear Forces Treaty in effect between the United States and the former Union of Soviet Socialist Republics.

Disposal at the LHAAP-12 landfill began in 1963. The landfill was used intermittently for the disposal of industrial solid waste, possibly containing small quantities of hazardous constituents, generated at LHAAP. Disposal began in the upstream end of a diversion ditch that traversed the site from Central Creek. By December 1978, a previously undisturbed hillside adjoining the ditch had become another location for waste disposal. The hillside subsequently became the northeast boundary of the site. In the early 1980s, a large area alongside the southeastern margin of the former diversion ditch was cleared for waste disposal and was used for this purpose until closure of the site in 1994.

1.2.2 Environmental Setting

The LHAAP-12 capped landfill, as shown on **Figure 1-2**, encompasses approximately 7 acres and is located in the central portion of LHAAP, approximately 1,700 feet east-northeast of the intersection of Pennington Street and Avenue Q. The site is an open area of grass bounded by heavy timber. Central Creek, which eventually drains into Caddo Lake, is located approximately 500 feet northwest of LHAAP-12. Runoff from the site is primarily by sheet flow and is collected by unnamed tributaries and diversion ditches that drain into Central Creek and ultimately enter Caddo Lake via Central Creek. Caddo Lake is a source of drinking water for several communities in Louisiana. The site is surrounded by an area (approximately 6,300 acres) that was transferred by the Army to the USFWS for management as the Caddo Lake National Wildlife Refuge.

Surficial soil at LHAAP-12 ranges in thickness from 0 to 10 feet and consists of clayey silt and silty clay. Excavations at the site had removed soil cover to the native surficial Quaternary soil and exposed the underlying sand, silt, and clay of the Wilcox Group.

The shallow silty to clayey sand layer of the Wilcox Group ranges in thickness from 3 to 12 feet and contains the shallow groundwater zone. A clay layer, ranging in thickness from a few feet to approximately 20 feet, underlies the shallow groundwater zone.

Groundwater at the site generally occurs under unconfined conditions. The elevation of the groundwater at the landfill fluctuates with seasonal variations in rainfall. Groundwater at LHAAP-12 occurs at depths of 20 to 25 feet beneath the landfill surface and flows generally to the east and northeast, away from the landfill. For the shallow groundwater zone, hydraulic conductivity values ranged from a minimum value of 3.5×10^{-7} centimeter per second (cm/sec) in the north-central portion of the site to a maximum value of 4.54×10^{-3} cm/sec north of the landfill.

In 2004, a survey to collect creek elevation data was conducted by Shaw Environmental, Inc. (Shaw). The survey data indicate that the shallow groundwater potentiometric surface may be several feet below the bottom of Central Creek during the dry season, and, thus, shallow groundwater may not discharge into Central Creek during the dry season. However, groundwater may discharge into Central Creek and Harrison Bayou during certain parts of the year when the water table is high.

1.3 Site Investigation and Development of Remediation Objectives

The site characterization activities undertaken at LHAAP-12 defined the nature and extent of contamination in soil, sediment, and groundwater. This information was used to develop site-specific remedial action objectives and select the final remedy for LHAAP-12.

1.3.1 Site Investigations Summary

As part of the Installation Restoration Program, the Army began an environmental investigation in 1976. The assessments/investigations conducted at LHAAP-12 since then include the following:

- In 1980, U.S. Army Toxic and Hazardous Material (USATHAMA, 1980) conducted a record search to assess the impact of the LHAAP installation activities including usage, storage, treatment, and disposal of toxic and hazardous materials on the environment, and define conditions that may have adversely affected human health and the environment.
- Contamination Survey – In 1982 as part of the LHAAP contamination survey, Environmental Protection Systems collected six groundwater samples for laboratory analyses. Subsequently in 1987, as part of the Resource Conservation and Recovery Act (RCRA) permit application process, and as a continuation of the contamination survey, U.S. Army Environmental Hygiene Agency (USAEHA) identified, described, and evaluated all solid waste management units at LHAAP (USAEHA, 1987). Units requiring further sampling, investigation and corrective action were delineated.
- RCRA Facility Assessment (RFA) – In 1988, a preliminary RFA was conducted by the U.S. Army (Maley, 1988). Waste at the various sites was characterized but no samples were collected.
- Site and Remedial Investigation/Feasibility Study – Beginning in 1980, a media sampling and analysis program was implemented at LHAAP-12 to determine if a release of potential contaminants from the landfill operations had affected the soil, sediment, surface water, and/or groundwater in the area. From 1993 to 1998, remedial investigation activities were conducted in three phases to identify the presence and extent of contaminants of potential concern in various media. Seventeen monitoring wells were installed in the shallow groundwater zone during the investigations. Four monitoring wells were installed in the intermediate groundwater zone. Soil samples were taken from the monitoring well borings along with one additional boring. A total of 19 surface water and sediment samples were collected from adjacent ditches. As for most of the sites, earlier analyses were limited to volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), explosives, metals, and anions. Later samples were analyzed for pesticides/polychlorinated biphenyls and dioxins/furans. Investigation results indicated that there was no significant contamination above screening values in the surrounding soils, sediment, or surface water. Multiple constituents were detected in the groundwater; primarily TCE and perchlorate. From 2002 to 2004, an FS was conducted for LHAAP-12 to present an analysis of remedial approaches and provide a basis for remedy selection consistent with the intended future use of the site as a wildlife refuge (Jacobs, 2002a; Shaw, 2005a and 2005b).
- Perchlorate Investigation – In 2000 and 2001, six soil samples and ten groundwater samples were collected for perchlorate analysis. In 2002, during a plant-wide perchlorate investigation completed by Solutions to Environmental Problems, Inc.

(STEP, 2003), eight groundwater samples were collected for perchlorate analysis during each of two sampling events.

- **Baseline Risk Assessment** – From 1998 to 2004, a baseline human health risk assessment, a screening-level ecological risk evaluation, and a residential risk screening were conducted (Jacobs, 2002b; Shaw, 2004, 2005b). The human health risk assessment of the non-source area indicated that both cancer risk and non-cancer hazard were acceptable for a future maintenance worker exposed to on-site soil. However, the groundwater posed an unacceptable cancer risk and non-cancer hazard to a future maintenance worker. The screening-level ecological risk assessment indicated low potential for ecological risks at the site. The residential risk screening assessment of the non-source area showed that the site soils posed no risk to a potential residential receptor.

Results of the site characterization efforts indicated that there was no significant contamination above screening values in the surrounding soils, sediment, or surface water. Chemical constituents were detected in the groundwater in concentrations exceeding the maximum contaminant levels (MCLs) – primarily TCE and its daughter products cis-1,2-DCE and VC. The groundwater contamination present at the site was likely caused by historic leaching of contaminants from the landfill waste to the groundwater via rainwater infiltration prior to the capping of the landfill.

As part of the site characterization activities, the baseline human health risk assessment and screening level risk evaluations conducted for LHAAP-12 determined current and future effects of contaminants on human health and the environment. During the FS, the final remedial action objective (RAO) was established to address contamination associated with LHAAP-12 media. The primary goals were to protect the existing remedy (landfill cap) or prevent exposure to the landfill waste material, prevent exposure to the contaminated groundwater posing a human health risk, meet applicable or relevant and appropriate requirement (ARARs) for groundwater, and prevent potential site groundwater exposure to nearby surface water bodies such that ARARs are met.

1.3.2 Remediation Objectives and Approach

A ROD for LHAAP-12 was signed in 1995 establishing the construction of a cap as an interim remedial action (IRA) for the site to mitigate potential risks posed by buried landfill waste (Army and USEPA, 1995). The selected remedy, as specified in the IRA ROD, included LUCs for the protection of the cap. In June 2006, the final ROD for LHAAP-12 was signed by Army and EPA (Shaw, 2006). The final remedy consists of LUCs in conjunction with MNA. The LUCs are for the protection of the landfill cap and the restriction of groundwater use. The RAOs set forth in the final ROD are:

- Protection of human health by preventing human exposure to TCE-contaminated groundwater;
- Protection of human health and the environment by reducing the leaching and migration of landfill hazardous substances in to the groundwater; and,
- Protection of human health and the environment by preventing TCE-contaminated groundwater from migrating into nearby surface water.

To ensure that the RAOs are met through the interim and final remedies selected in the CERCLA Record of Decisions (RODs) for LHAAP-12, implementation, monitoring and maintenance details were addressed in the remedial design phase.

LUCs for the protection of the landfill cap include warning signage and security fencing, use restrictions, regular inspections, and maintenance of the cap. The LUCs will continue to be necessary to prevent a risk to human health or the environment through degradation of the cap. The Army or its representatives conduct groundwater-monitoring activities to evaluate the effectiveness of the existing landfill cap. The need to continue groundwater monitoring for this purpose will be evaluated at five-year reviews.

Due to the unacceptable risk posed by TCE in the shallow groundwater at LHAAP-12, a LUC is in place in the impacted area to prevent human exposure to the contaminated groundwater. The selected LUC will prevent human exposure to TCE-contaminated groundwater through the restriction of groundwater use. The LUC will remain in place until the ARARs, as established in accordance with the NCP (40 Code of Federal Regulations Part 300), are met.

Due to the potential for TCE-contaminated groundwater to migrate, MNA is being implemented to assure that the plume will not migrate to nearby surface water at levels that may present an unacceptable risk to human health and the environment. The monitoring and reporting associated with this remedy will continue to verify ARARs are met. Monitoring is being used to

demonstrate the effectiveness of the cap and MNA remedies and to ensure that TCE-contaminated groundwater does not adversely affect nearby surface water.

1.4 Organization of this Report

Following this introduction, this report includes three sections that provide the information required by USEPA to demonstrate OPS for LHAAP-12 remedial actions. **Section 2.0** presents information that demonstrates OPS for source control via the landfill cap at LHAAP-12. **Section 3.0** addresses OPS demonstration for the groundwater containment with MNA. **Section 4.0** presents the basis for demonstrating that institutional (i.e., land use) controls are operating properly and successfully and will perform as expected in the future. **Section 5.0** addresses Five-Year Reviews and briefly summarizes results of the most recently conducted review. **Section 6.0** presents the conclusion drawn from the information/data provided in this OPS Demonstration Report. **Section 7.0** lists references used in preparing this OPS demonstration report.

Figure 1-1
LHAAP Facility Location Map

Figure 1-2
Site Location Map LHAAP-12

2.0 *Landfill Cap (Source Control) OPS Demonstration*

2.1 *Introduction*

This section describes the selection of a cap as the interim remedy at LHAAP-12, summarizes the design, construction, and operation and maintenance (O&M) of the cap, and provides information that demonstrates OPS for the cap.

2.2 *Remedial Alternative Selection/Regulatory Status*

A ROD for LHAAP-12 was signed in 1995 establishing the construction of a cap as an early IRA for the site to mitigate potential risks posed by buried landfill waste (Army and USEPA, 1995). The selected remedy, as specified in the IRA ROD, included LUCs for the protection of the cap.

2.3 *LHAAP-12 Cap Design, Construction, Operation and Maintenance, and Monitoring*

The landfill cap design was established in the *Final Project Work Plans, Interim Remedial Action, Landfills 12 and 16* (OHM, 1996). The cap construction at LHAAP-12 began in 1996 and was completed in 1998. The cap consists of the following components:

- A low permeability cover consisting of a soil-bentonite geocomposite liner placed over a foundation soil layer used to provide proper grading of the landfill surfaces.
- A second low permeability layer consisting of a geosynthetic membrane liner placed over the soil bentonite layer.
- A soil cover with adequate slopes and a vegetative cover placed at the top.
- Perimeter berms and drainage swales to control surface drainage.

Figure 2-1 shows the design configuration of the cap components. A plan view of the landfill cap showing drainage features is presented in **Figure 2-2**.

The multilayer cap is designed to reduce the potential for vertical migration of contaminants via rainfall infiltration through the landfill. The Army implemented LUCs by properly maintaining and routinely inspecting the landfill cap to protect the remedy and monitor the effectiveness of the cap. Also protecting the remedy is the perimeter fence surrounding the capped landfill, which effectively prevents access to the site.

The Army is undertaking annual physical inspections and reporting to confirm continued compliance with all LUC objectives. The Army will maintain the annual LUC Compliance Inspection document on site for review by USEPA and TCEQ upon request. In addition, any

deficiency(ies) noted during the annual inspection are explained in writing indicating the specific deficiency(ies) found and what efforts or measures have or will be taken to correct the deficiency(ies). Upon transfer, such responsibilities will shift to the USFWS via appropriate provisions placed in the transfer documentation. The need to continue annual inspections will be revisited at five- year reviews.

2.4 OPS Demonstration

The objective of the OPS demonstration for the LHAAP-12 landfill cap is to document to the satisfaction of USEPA that the cap is performing as designed to substantially limit infiltration of precipitation and generation of landfill leachate, and to prevent human exposure to potentially contaminated waste. The objective also includes that appropriate LUCs, already implemented, are reliable and will remain in place throughout the life of the landfill.

2.4.1 Operating Properly Demonstration

For the LHAAP-12 landfill to function properly, it must be constructed in accordance with the approved design. The landfill cap must also be protected, maintained and monitored to ensure it continues to function as designed

Construction of the landfill cap was completed in 1998. The cap was constructed in accordance with the design specifications in the *Final Project Work Plans, Interim Remedial Action, Landfills 12 and 16* (OHM, 1996). Final cap construction is documented in the *Final Construction Completion Report, Interim Remedial Action, Landfills 12 and 16 Cap Construction, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas* (OHM, 1998), which includes as-built drawings of the cap. (See also **Appendix A** of this OPS Demonstration Report). The LUC (perimeter fence) effectively prevents access to the site, thereby protecting the remedy.

Administrative LUCs associated with the cap are also in place and will remain so in perpetuity unless otherwise removed by the Army per agreement with the USEPA and TCEQ. These administrative LUCs restrict access (the cap restricts access to contaminated landfill contents) and prevent damage to the cap components. LUCs include site access and usage restrictions to protect the remedy. These LUCs were implemented through the *Industrial Solid Waste Notice of Land Use Controls at LHAAP-12* that the Army filed with the State of Texas, Harrison County in June 2007. That document includes the following statement which provides documentation of landfill restriction as part of the OPS demonstration: “No activity shall be conducted or permitted that would damage the integrity of the landfill cover (i.e., digging or disturbing the existing cover or contents of the landfill). The LUCs will remain in place for perpetuity unless otherwise removed by the Army per agreement with the USEPA and TCEQ.”

Because the landfill cap was constructed in accordance with an approved design and the remedy achieves the remedial action objectives established in the ROD, LHAAP-12 has been demonstrated as operating properly. Demonstration that the landfill cap is operating successfully includes a review of historical inspections and a presentation of historical groundwater analytical data.

2.4.2 Operating Successfully Demonstration

The LHAAP-12 Landfill cap was designed and constructed to meet two remedial action objectives: 1) source control to prevent contact with *in situ* landfill waste, and 2) protection of human health and the environment by reducing the leaching and migration of landfill hazardous substances into the groundwater. Visual inspections confirm the physical integrity of the cap and have identified no evidence that water is penetrating the cap since construction was completed in 1998. The cap system substantially reduces infiltration and thus minimizes the generation of leachate and the transport of contaminants to groundwater. Historical groundwater analytical data for TCE, cis-1,2-DCE and VC from two snapshots in time (in 1998, shortly after completion of the cap construction fieldwork, and in December 2006 during the MNA study), is used to demonstrate that the contaminant plume has been stable (not increasing in size) since the construction of the landfill (see **Figure 2-3**).

Results of periodic landfill inspections that are performed to ensure remedial action objectives are met are summarized below. Periodic landfill inspections include those performed quarterly, annually, and during five-year reviews.

2.4.2.1 Summary of Five-Year Reviews

Since the construction of the landfill cap, two (2) five-year reviews for LHAAP-12 have been conducted. The first review was conducted from August 2001 to January 2002. The second five-year review was recently performed in July 2007, of which a formal report has not been published yet. Results of the first review indicated that LHAAP-12's interim remedies had been implemented as designed and that minor issues that needed to be addressed did not compromise the overall effectiveness of the landfill cap. Specifically, the landfill cap was found to be secure and the landfill surface showed none of the following adverse aspects: settlement, cracks and holes, significant erosion, stressed vegetative cover, bulges, and slope instability.

Results of the most recent five-year review conducted for LHAAP-12 in July 2007 found Landfill 12 to be secure and in good condition with only very minor erosion noticed in one area and a few pine saplings (less than 2 feet tall). Maintenance will remedy the area of minor erosion and mowing (as recent as the end of July 2007) has eliminated the growth of tree saplings. The area of minor erosion will be backfilled and regraded prior to the next periodic inspection scheduled in September 2007. Photographs of LHAAP-12 taken during the most recent Five-Year Review are included in **Appendix E**.

2.4.2.2 Summary of Periodic Landfill Inspections

Periodic inspections of the LHAAP-12 capped landfill have been performed since June 2000, shortly after the official date for cap construction completion (August 31, 1999). A review of these periodic inspections indicates that the landfill cap is in good condition and that the LUCs already in place are operating successfully. Landfill inspections have typically occurred on a quarterly basis. Copies of periodic field inspection checklists are provided in **Appendix B** to demonstrate the operation of the landfill cap.

A landfill inspection was recently performed on June 13, 2007. The inspection verified that the cap was in good condition. At the time of the inspection, slight erosion was noticed in one area and the height of vegetative cover required action. The slight erosion and height of vegetation (8 to 24 inches) were not considered to compromise the performance of the cap. During the inspection, the fencing surrounding the landfill and associated signage was in good condition. No evidence of animal burrowing, excessive cracking or dessication and settlement or subsidence in the cap was noted during the recent inspection.

Figure 2-1
Design Configuration of LHAAP-12 Cap Cross Section

Figure 2-2
Plan View of Landfill Cap LHAAP-12

Figure 2-3
Landfill Cap Effectiveness and Containment of Contaminant Plumes LHAAP-12

3.0 *Groundwater Monitored Natural Attenuation OPS Demonstration*

3.1 *Introduction*

The final remedy for LHAAP-12 includes the MNA component in addition to source control and LUC components. MNA entails the use of natural attenuation within the context of a monitoring plan to demonstrate containment of plume contaminant concentrations and achievement of remedial action objectives. Natural attenuation is the reduction of contaminant concentrations in groundwater resulting from the combined effect of intrinsic biodegradation, dispersion, dilution, volatilization, and sorption mechanisms. Summaries of the MNA selection, design, construction, monitoring, and OPS demonstration are presented below.

3.2 *Remedial Alternative Selection/ Regulatory Status*

Four remedial alternatives were evaluated for feasibility in achieving the RAOs and the statutory requirements under CERCLA. The selected remedial alternative, Alternative 2, includes land use controls for groundwater use restrictions, continued maintenance of the existing landfill cap, LUCs for protection of the existing landfill cap, and monitored natural attenuation. Alternative 2 is consistent with the intended future use of the site as a part of a wildlife refuge. The MNA component was implemented to assure the protection of human health and the environment by containment of TCE-contaminated groundwater and preventing migration of contaminants into nearby surface water at levels that exceed MCLs.

3.3 *Monitored Natural Attenuation Design, Construction, and Monitoring*

The requirements for MNA design, construction and monitoring are established in the *Final Remedial Design Addendum, Landfill 12 (LHAAP-12)* (Shaw, 2007a). The MNA component at LHAAP-12 consists of a network of new and existing monitoring wells and a groundwater monitoring plan. Five long-term monitoring wells screened within the shallow groundwater zone comprise the monitoring network. Three are on-site monitoring wells 12WW20, 12WW21, and 12WW24. Two are downgradient compliance monitoring wells 12WW22 and 12WW23. Monitoring well information is shown in **Table 3-1**.

Table 3-1
Monitoring Well Information

Monitoring Well ID	Installation Date	Depth (feet)	State Plane Coordinate System, Texas North Central (4202), NAD 83, (feet)	
			Easting X Coordinate	Northing Y Coordinate
12WW20	1/6/2005	38	3311532.6	6954562.6
12WW21	1/6/2005	40	3311769.5	6954764.0
12WW22	1/6/2005	38	3311368.7	6955188.5
12WW23	1/6/2005	23	3312020.8	6954846.6
12WW24	12/7/2006	26	3311625.7	6954522.7

Figure 3-1 depicts the configuration of the monitoring well network. Each monitoring well is constructed of 4-inch-diameter, Schedule 40 polyvinyl chloride casing and slotted well screen. Installation depths range from 25 to 41 feet below ground surface. Monitoring well information, including well construction diagrams, is provided in the RD Addendum (Shaw, 2007). Because the intermediate and deep groundwater zones are not impacted with COCs, the monitoring wells in those zones have been abandoned and MNA evaluation was conducted for the shallow zone only. **Figure 3-2** shows the historical monitoring well locations and those monitoring wells that have been abandoned.

Sampling and analysis of the MNA system to evaluate the effectiveness of natural attenuation in groundwater at LHAAP-12 was performed in August 2006 and December 2006 in accordance with the Remedial Design Addendum. Data collected from these sampling events along with historical data for LHAAP-12 were used in the evaluation. Results of the MNA evaluation at LHAAP-12 are published in the *Final Natural Attenuation Evaluation, LHAAP-12, LHAAP-35B(37), and LHAAP-67* (Shaw, 2007b) and are summarized in this report.

Further sampling and analyses is being performed in accordance with the Groundwater Monitoring Plan (contained in the RD Addendum) to monitor the effectiveness of natural attenuation in reducing contaminant concentrations over time, to evaluate plume containment and to ensure that TCE-contaminated groundwater does not adversely affect nearby surface water. Sampling of the on-site wells, 12WW20 and 12WW21, will be performed to monitor the effectiveness of natural attenuation in reducing contaminant concentrations over time. The wells are being analyzed quarterly for VOCs, nitrates, nitrites, sulfates, pH, Eh (redox potential), conductivity, temperature, dissolved oxygen, ferrous iron, chloride, methane, ethane, ethene,

inorganic and organic carbon, and *Dehalococcoides*. The next sampling event will be performed before the end of September 2007.

3.4 OPS Demonstration and Performance Data

The objective of this OPS demonstration is to demonstrate that the LHAAP-12 groundwater MNA system is performing as designed and that remedial action objectives are being achieved. The main RAO established in the ROD for MNA is stated below:

- Ensure that TCE-contaminated groundwater does not migrate into nearby surface water at unacceptable levels.

The MNA remedy is operating properly and successfully as demonstrated below.

3.4.1 Operating Properly Demonstration

Currently, groundwater MNA is operating properly because construction is complete and in accordance with the approved design, and the system is operating in accordance with the design. Documentation that the groundwater MNA system was constructed in accordance with the design is contained in the *Final Remedial Design Addendum, Landfill 12 (LHAAP-12), Longhorn Army Ammunition Plant, Karnack, Texas* (Shaw, 2007a). The Groundwater Monitoring Plan and monitoring well information, including well construction diagrams, is documented in the RD Addendum (see Appendix A of that document).

3.4.2 Operating Successfully Demonstration

The following sections present the results of the natural attenuation evaluation as they pertain to demonstrating that MNA is operating successfully. Guidance provided by TCEQ for MNA as a remedial action, found in *Monitored Natural Attenuation Demonstrations (RG-366/TRRP-33, October 2001)*, was used for the evaluation of natural attenuation effectiveness. LHAAP is being addressed under CERCLA. Although, risk-based ARARs of the Risk Reduction Rule are considered rather than the Texas Risk Reduction Program, the TRRP MNA guidance is comparable to USEPA guidance and was used during the natural attenuation evaluation.

The MNA study for LHAAP-12 was performed to demonstrate the occurrence of natural attenuation of groundwater COCs and that MNA is successful in achieving the RAO. The COCs at LHAAP-12 are TCE, cis-1,2-DCE, and VC in the shallow groundwater zone. In August 2006, VC in one shallow well (12WW02), was the only COC that exceeded its MCL at LHAAP-12. After obtaining these results, however, it was clear that a replacement monitoring well nearer former 12WW12 would be required in order to monitor detectible levels of TCE. Findings and conclusions for the August 2006 MNA evaluation are summarized below, as applicable to LHAAP-12. The supporting analytical data are presented in **Appendix C**.

Historical VOC trends indicate the occurrence of biodegradation via anaerobic reductive dechlorination, as evidenced by the production of TCE daughter products cis-1,2-DCE and VC, and the production of the harmless end product ethene. The lack of detections in downgradient monitoring wells also indicates that natural attenuation processes have limited plume migration.

The qualitative assessment of the geochemical indicators in the shallow groundwater zone at LHAAP-12 presents evidence that geochemical conditions are adequate for the complete reductive dechlorination of TCE, cis-1,2-DCE, and VC. The low DO and NO_3^- concentrations indicate that the aquifer is anaerobic, which favors reductive dechlorination. The reduced SO_4^{2-} levels, elevated methane concentrations, elevated TOC and inorganic carbon concentrations, and the detection of ethene in 12WW02 indicate that adequate conditions exist near that well to sustain complete reductive dechlorination of the VC to innocuous ethene.

The elevated levels of dechlorinating microorganisms in 12WW02 coupled with the production of ethane in 12WW02 is further corroborating evidence that site conditions are conducive for the complete dechlorination of site COCs via natural attenuation as the sole remedy.

A second round of MNA sampling was completed in December 2006, which represents an updated evaluation of MNA as a remedy for the contaminated groundwater at LHAAP-12. This sampling event evaluated the reduction in COCs over time and distance and geochemical indicators. The results of the tiered evaluation and conclusions are summarized below for LHAAP-12.

During the December 2006 sampling event, well 12WW24 exhibited TCE (396 $\mu\text{g/L}$), cis-1,2-DCE (113 $\mu\text{g/L}$), and VC (5.35 $\mu\text{g/L}$) exceeding MCLs of 5, 70, and 2 $\mu\text{g/L}$, respectively. Monitoring well 12WW24 was installed within 10 feet of the abandoned well 12WW12; therefore, the data from these two wells are comparable. VC was detected in 12WW02 at a concentration of 4.3 $\mu\text{g/L}$, exceeding the MCL.

The historical VOC trends indicate the occurrence of biodegradation via anaerobic reductive dechlorination, as evidenced by the production of TCE daughter products cis-1,2-DCE, VC, and ethene in the impacted area. In well 12WW02, VC levels above the MCL, a lack of VC accumulation and production of ethene at 0.77 $\mu\text{g/L}$ are strong indicators that support the occurrence of natural attenuation under the PLOE. The downgradient well 12WW21 exhibited non-detect COC concentrations that indicate natural attenuation processes have limited migration of the plume.

The qualitative assessment of geochemical indicators in the shallow groundwater zone at LHAAP-12 presents evidence that geochemical conditions are adequate for complete dechlorination. The DO levels are mostly below 1.0 mg/L, and the non-detect NO_3^-

concentrations indicate that the aquifer is primarily anaerobic. However, there is a slight shift towards less reducing conditions evidenced by relative higher levels of DO and SO_4^{-2} when compared to the sampling event of August 2006. Nevertheless, the elevated methane, TOC, inorganic carbon concentrations, and the detection of ethene in 12WW02 and 12WW24 suggest that methanogenic conditions capable of complete dechlorination exist at this site.

The natural attenuation evaluation utilizing the data through December 2006 demonstrates that MNA is a feasible remedy for the remaining COCs in the shallow groundwater at LHAAP-12. Contaminants are retained in the shallow groundwater zone and have neither migrated to surface water, nor into the intermediate zone. Natural attenuation is effectively containing the plume.

Further demonstration that MNA is effectively containing the plume can be seen in **Figure 2-3** using data sets from 1998 (shortly after completion of cap construction fieldwork) and the December 2006 MNA sampling data discussed above. As depicted in this figure contaminant of the plume is successful; the plume is stable and has not increased in size since the construction of the cap was completed. Also indicated in this figure is the effective breakdown of TCE into its daughter products, cis-1,2-DCE and VC.

Going forward, LHAAP-12 COCs in groundwater are being monitored in accordance with the Groundwater Monitoring Plan (Appendix A of the RD Addendum) to confirm that natural attenuation is reducing contaminant levels and thereby preventing migration of contaminated groundwater to surface water at levels that may present an unacceptable risk to human health and the environment.

Figure 3-1
Groundwater Monitoring Well Network LHAAP-12

Figure 3-2
Historical Groundwater Monitoring Well Location Map LHAAP-12

4.0 *Land Use Controls*

4.1 *Introduction*

In the course of transferring administrative control of federal property to another federal agency, the Army must first assess, determine, and document the environmental condition of the property in the ECOP. Although not a statutory requirement, the Army at Longhorn will also demonstrate to EPA for the benefit of the USFWS that the remedies at Landfill 12, including LUCs, are OPS. For LHAAP-12, protection and maintenance LUCs are associated with the Landfill Cap and a groundwater restriction LUC is associated with the Groundwater MNA System.

Until LHAAP-12 is transferred, the Army or its representatives is responsible for LUC implementation, maintenance, inspection, reporting and enforcement. The Army will address LUC problems within its control that are likely to impact remedy integrity and will address problems as soon as practicable. A transfer letter from GSA to USFWS that attaches the ECOP including Environmental Protection Provisions is the legal instrument passing on the LUCs and other environmental notifications and restrictions to USFWS.

Although the Army may transfer responsibility for various implementation actions, the Army will retain its responsibility for remedy integrity. This means that the Army is responsible for addressing failure to meet performance objectives that would undermine the Army's CERCLA remedy. The Army is also responsible for: 1) incorporating RD information and outlining the transferee's LUC obligations into property transfer documentation; 2) recording survey plat and notice of restrictions for both the landfill cap and cover system boundary at the Harrison County Courthouse; 3) recording groundwater use restriction and survey plat at the Harrison County Courthouse; and 4) notifying Texas Department of Licensing and Regulation of the groundwater restriction which includes the prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval from the Army, the USEPA, and the TCEQ. Items 2 through 4 have been accomplished and documentation is provided in **Appendix D**. The Army will implement item 1 upon transfer.

The Army has developed the Comprehensive Base-wide LUC Management Plan, which initially consists of the RD Addendum, activities checklist, and a survey plat showing the locations where the LHAAP-12 LUCs are applied. The purpose of this Comprehensive Base-wide LUC Management Plan is to compile all of the site-specific LUCs into one comprehensive location for both pre-transfer uses by the installation and for post-transfer use by the transferee. A land-use control and maintenance map is presented as **Figure 4-2**.

4.1.1 *LHAAP-12 LUC Performance Objectives*

The LUC and MNA performance objectives will be incorporated into the transfer documentation and provided to the transferee. The LUC performance objectives are as follows:

- Ensure the integrity of the existing landfill cover (LUC)
- Ensure no consumption of TCE-contaminated groundwater (LUC)

4.1.2 *LHAAP-12 Property and Parcel Descriptions*

The LHAAP-12 parcel is a 50.541-acre tract located in Harrison County, Texas, near the town of Karnack as described with survey plat and metes and bounds established in Exhibit A of *Industrial Solid Waste, Notice of Land Use Controls at LHAAP-12* (Army, 2007). The parcel consists of the municipal-type military landfill and surrounding land. The landfill cap is approximately 7 acres in size.

4.1.3 *On-Site Property Requiring Land Use Controls*

The landfill cap, as well as contaminated groundwater in the area surrounding the landfill, requires LUCs, as set forth in the ROD. Within the LHAAP-12 parcel the designated LUC boundaries are as follows:

- ***Landfill and Residential Use Restrictions.*** The landfill and residential use restriction boundary consists of the 9.429 acre tract and includes the 7-acre capped landfill and an area extending to the surrounding fence.
- ***Groundwater Use Restriction.*** The groundwater use restriction boundary consists of the 45.939-acre tract, which includes the capped landfill and extends beyond the landfill boundary.

4.2 *Future Use of Properties Requiring Institutional Controls*

Future use of the LHAAP-12 parcel is intended as a national wildlife refuge consistent with non-residential use. A change in land use would require an act of the United States Congress. Upon transfer to the USFWS, the Landfill 12 area, including the two LUC restricted tracts, the future use will be used solely for the purpose of a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. Refuge activities may include hunting, fishing, wildlife observation, wildlife photography, wildlife education and wildlife interpretation. Refuge and employees will access and utilize the area unabated. A change in use from wildlife refuge requires an Act of Congress.

4.3 *Potential Residual Risks*

4.3.1 *Introduction*

To the extent that LUCs are properly administered, exposure pathways will not be complete. Examples of potential risk pathways at LHAAP-12 include:

- Exposure to soil contaminants left in-place under the landfill cap.
- Future maintenance worker exposure to current groundwater contaminants above MCLs.

4.3.2 *Prohibited Activities*

Specific activities that could complete an exposure/risk pathway via soil and groundwater are prohibited. For the parcels associated with LHAAP-12, the LUCs that are intended to prohibit certain activities. Prohibited activities are summarized below:

- Within the 9.429-acre tract of LHAAP-12 that includes the 7-acre capped landfill, any activities (i.e, including residential development) that may result in the degradation of the cap are prohibited.
- Within the 45.939-acre tract of the LHAAP-12 parcel, water well installation for any purpose other than environmental monitoring and testing without prior approval by the Army, USEPA, and TCEQ is prohibited..

4.4 *On-Site Land Use Controls*

4.4.1 *LUCs for LHAAP-12 Landfill Cap*

The LUCs that have been implemented by the Army or its representatives for the LHAAP-12 landfill cap include:

- Maintenance of the integrity of the landfill cap, including, at a minimum, repairs to desiccation cracks, erosion, or gulying upon observance.
- Maintenance of a vegetative cover on the landfill cap, including regular mowing.
- Maintenance of fence line and signage around landfill cap.
- Prohibition of any activities that would affect the integrity of cap.

The LUCs will remain in place for perpetuity unless otherwise removed by the Army per agreement with the USEPA and TCEQ.

4.4.2 *LUCs for LHAAP-12 Groundwater MNA*

The LUC that has been implemented by the Army or its representatives for the LHAAP-12 groundwater MNA consists of prohibition of any activities that would cause exposure to the

contaminated groundwater. The Army notified the Texas Department of Licensing and Regulation of the groundwater restriction, which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the Army, the USEPA and the TCEQ (**Appendix D**). The LUC will remain in place until ARARs are met.

4.5 *Monitoring, Reporting, and Enforcement of Institutional Controls*

To ensure that LUCs remain in place and continue to provide their intended objectives, ongoing monitoring, reporting and enforcement of the LUCs is required.

4.5.1 *Monitoring and Frequency of Monitoring*

The USFWS will have the primary responsibility for the ongoing maintenance and annual inspections of the LUCs at LHAAP-12 after transfer. The Army will retain overall monitoring oversight and responsibility for performing five-year reviews of LUCs, and will ensure their integrity and effectiveness. The following table (**Table 4-1**) provides a list of the areas within LHAAP-12 with LUCs, a brief description of the control, and the monitoring frequency.

Table 4-1
Land Use Controls Monitoring Frequency

LHAAP-12 Area	Land Use Controls	Monitoring Frequency
General Area	Retain site access for monitoring and inspection.	Yearly, as a minimum, and as needed.
	Undertake other responses or remedial actions required or as necessary.	Yearly, as a minimum, and as needed.
LHAAP-12 Capped Landfill Area	Prohibit unauthorized land use	Yearly, as a minimum, and as needed.
	Prohibit disturbance of the landfill cap (e.g., digging or otherwise disturbing the existing cap)	Yearly, as a minimum, and as needed.
	Maintenance of the integrity of the landfill cap, including, at a minimum, repairs to desiccation cracks, erosion, or gulying upon observance	Yearly, as a minimum, and as needed.
	Maintenance of a vegetative cover on the landfill cap including regular mowing	Yearly, as a minimum, and as needed.
	Maintenance of fence line and signage around landfill cap.	Yearly, as a minimum, and as needed.
Onsite Groundwater	Prohibit any intrusive activity other than installation of a new borehole/well, or use of an existing well, for any purpose other than environmental monitoring.	Yearly, as a minimum, and as needed.

4.5.2 Reporting

Since construction of the landfill cap, the Army has performed annual physical inspections and reporting to confirm continued compliance with all LUC objectives. The Army will continue to maintain on site annual LUC Compliance Inspection documents consistent with the form presented in **Figure 4-1** and will provide to USEPA and TCEQ upon request. In addition, any deficiency(ies) found during the annual inspection will continue to be documented with a separate written explanation indicating the specific deficiency(ies) found and what efforts or measures have or will be taken to correct those deficiencies and filed with the annual inspection. Upon transfer, such responsibilities may shift to the transferee via appropriate provisions placed in the ECOP. The need to continue annual inspections will be revisited during five-year reviews.

4.5.3 Enforcement of Land Use Controls

Should the LUC remedy fail, the Army will coordinate with USEPA and TCEQ to ensure that appropriate actions are taken to reestablish its protectiveness. These actions may range from informal resolutions with the transferee or violator, to the institution of judicial action under the auspices of Texas property law or CERCLA. Alternatively, should the circumstances warrant such, the Army could choose to exercise its response authorities under CERCLA, and then seek cost recovery after the fact from the person(s) or entity(ies) who violated a given LUC. Should the Army become aware that any future transferee or user of the property has violated any LUC requirement over which a local agency may have independent jurisdiction; the Army will notify these agencies of such violation(s) and work cooperatively with them to re-achieve transferee/user compliance with the LUCs.

Modification or Termination of Land Use Controls. The Army will not, without USEPA concurrence, make a significant modification to, or terminate a LUC, or make a land use change inconsistent with the LUC objectives and use assumptions of the selected remedy. Likewise, the Army will seek prior USEPA concurrence before commencing actions that may affect remedy integrity.

The LUCs will remain in effect until the Army and USEPA agree that they can be terminated. The decision to terminate LUCs will be documented consistent with the National Contingency Plan process for post-ROD changes, potentially including an explanation of significant differences or a remedial action completion report. If the property has been transferred and a determination by the Army and USEPA has been made to terminate one or more of the LUCs, the Army will provide to the transferee of the property an appropriate release for recordation pertaining to the site and will advise other local stakeholders of the action in a timely manner.

4.6 *Effectiveness of LUCs*

Land use controls are reliable and will remain in place to provide future protection of human health and the environment. Additionally, a monitoring program for the cap and the groundwater MNA is being performed and will continue in perpetuity unless otherwise agreed upon between the Army and its transferee (the USFWS), USEPA Region 6 and the TCEQ.

Cap LUCs instituted in 1995/96 with cap construction and interim ROD have been effective. The cap is in good shape, the use is consistent, the fence is good, the sign(s) are in place, yearly mowing is ongoing and documentation of the continued integrity of the cap, signage and fencing may be found in files at the GWTP. Inspections will continue as stipulated in the RD Addendum. Copies of inspection checklists are contained in **Appendix B**.

Regarding the groundwater LUC, since the final ROD has been signed in 2006 the groundwater use restriction has remained in effect.

In accordance with the Remedial Design Addendum dated June 2007 for LHAAP-12, an inspection of the site was conducted by the U.S. Fish and Wildlife Service on_____.

A summary of land use control mechanisms is as follows:

- Land use and restriction covenants included in ECOP – [Indicate whether the ECOP is on file with the notice of transfer]
- Groundwater restriction – [Indicate whether groundwater restrictions are still required at LHAAP-12]

A summary of compliance with land use and restriction covenants is as follows:

- No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-12
- No reuse activity at LHAAP-12 that would adversely affect the integrity of the landfill cap
- The fence and posted signs are properly maintained at LHAAP-12
- The vegetative cover is properly maintained over the landfill
- Landfill cap is properly maintained with no evidence of erosion, cracking, settlement, or other damage to engineered components

I, the undersigned, do document that the inspection was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: _____

Name/Title _____

Signature: _____

Completed annual compliance inspection forms, with relevant annual compliance certification forms, shall be completed no later than March 1 of each year for the previous calendar year.

U.S. Department of the Army
TCEQ
USEPA Region 6

Figure 4-1
Sample Annual Land Use Control Compliance Inspection Documentation

Figure 4-2
Land Use Control and Maintenance Map LHAAP-12

5.0 *Five-Year Reviews*

The Army will conduct Five-Year Reviews of the LHAAP-12 remedy, as required by CERCLA and the NCP, because residual contamination in excess of established unrestricted use cleanup criteria will remain on site. As part of the CERCLA Section 121 (c) Five-Year Review, the Army will prepare a report certifying the continued effectiveness of the remedy including all LUCs implemented at LHAAP-12. The report will include the information contained in the annual reports and an evaluation of LUCs to determine if the LUCs or the inspection and reporting requirements need modification. The need to continue the LUC to restrict groundwater use and continue MNA will be reviewed every five years.

6.0 Conclusion

The information provided in this reports demonstrates that the final remedy for LHAAP-12 is operating properly and successfully, and that LUCs will be successful in preserving the final remedy. To ensure that LUCs remain in place and continue to provide their intended objectives, ongoing monitoring, reporting and enforcement of the LUCs will be performed by USFWS, upon transfer of LHAAP-12 from the Army.

The LHAAP-12 landfill cap and groundwater MNA are operating properly because both remedial action components have been constructed as designed, and are operating in accordance with the approved design. The cap is also functioning successfully, in that exposure to the buried waste is controlled and reduction of the leaching and migration of landfill hazardous substances into the groundwater is evident. Land use controls are reliable and will remain in place to provide future protection of human health and the environment. Additionally, a monitoring program for the cap and the groundwater MNA is being performed and will continue in perpetuity unless otherwise agreed upon between the Army and its transferee (the USFWS), USEPA Region 6 and the TCEQ.

The natural attenuation evaluation utilizing the data through December 2006 demonstrates that MNA is a feasible remedy for the remaining COCs in the shallow groundwater at LHAAP-12. Contaminants are retained in the shallow groundwater zone and have neither migrated to surface water, nor into the intermediate zone. Natural attenuation has stabilized the plume and has achieved the RAO of preventing migration of the plume to surface water. The LUCs to be implemented by the Army or its representatives for the LHAAP-12 groundwater MNA consists of prohibition of any activities that would cause exposure to the contaminated groundwater.

Based on the information provided in this OPS Demonstration Report, it is concluded that the remediation system for LHAAP-12 (i.e., landfill cap and groundwater MNA system) is operating properly and successfully.

7.0 References

Jacobs, 2002a, *Draft Final Feasibility Study for the Group 2 Sites (Sites 12, 17, 18/24, 29, 32, and 49), Longhorn Army Ammunition Plant, Karnack, Texas, Prepared for the U.S. Army Corps of Engineers*, May.

Jacobs, 2002b, *Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 2 Sites (Sites 12, 17, 18/24, 29, 32, 49, Harrison Bayou, and Caddo Lake), Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, Prepared for the U.S. Army Corps of Engineers*, August.

OHM Remediation Services Corporation, 1996, *Final Project Work Plans, Interim Remedial Action – Landfills 12 & 16, Longhorn Army Ammunition Plant, Karnack, Texas*, June.

OHM Remediation Services Corporation, 1998, *Final Construction Completion Report, Interim Remedial Action Landfill 12 and 16 Cap Construction, Longhorn Army Ammunition Plant, Karnack, Texas*, December.

Shaw Environmental, Inc. (Shaw), 2004, *Screening-Level Ecological Risk Evaluation for Site 12 Soil, Longhorn Army Ammunition Plant, Karnack, Texas*, September.

Shaw, 2005a, *Final Feasibility Study, Site 12 Group 2, Longhorn Army Ammunition Plant, Karnack, Texas*, January.

Shaw, 2005b, *Addendum to Final Feasibility Study, Site 12 Group 2, Longhorn Army Ammunition Plant, Karnack, Texas*, prepared for the U.S. Army Corps of Engineers, Tulsa District, March.

Shaw, 2006, *Final Record of Decision, Landfill 12 (LHAAP-12), Longhorn Army Ammunition Plant, Karnack, Texas*, Houston, Texas, November.

Shaw, 2007a, *Final Remedial Design Addendum, Landfill 12 (LHAAP-12), Longhorn Army Ammunition Plant, Karnack, Texas*, June.

Shaw, 2007b, *Final Natural Attenuation Evaluation, LHAAP-12, LHAAP-35B(37), and LHAAP-67, Longhorn Army Ammunition Plant, Karnack, Texas*, June.

Solutions to Environmental Problems (STEP), Inc., 2003, *Draft Final Plant-Wide Perchlorate Investigation, Longhorn Army Ammunition Plant, Texas*, March.

U.S. Army and USEPA, 1995, *Record of Decision for Early Interim Remedial Action at the LHAAP 12 and 16 Landfills, Longhorn Army Ammunition Plant, Karnack, Texas*, September.

U.S. Army, 2007, *Industrial Solid Waste, Notice of Land Use Controls at LHAAP-12*, June.

U.S. Environmental Protection Agency (USEPA), 1996, *Guidance for Evaluation of Federal Agency Demonstrations that Remedial Actions are Operating Properly and Successfully under CERCLA Section 120(h)(3)*, PB97-143 770

U.S. Army Environmental Hygiene Agency, 1987, *Final Groundwater Contamination Survey No. 38-26-0851-89 Evaluation of Solid Waste Management Units, Longhorn Army Ammunition Plant, Karnack, Texas*, May.

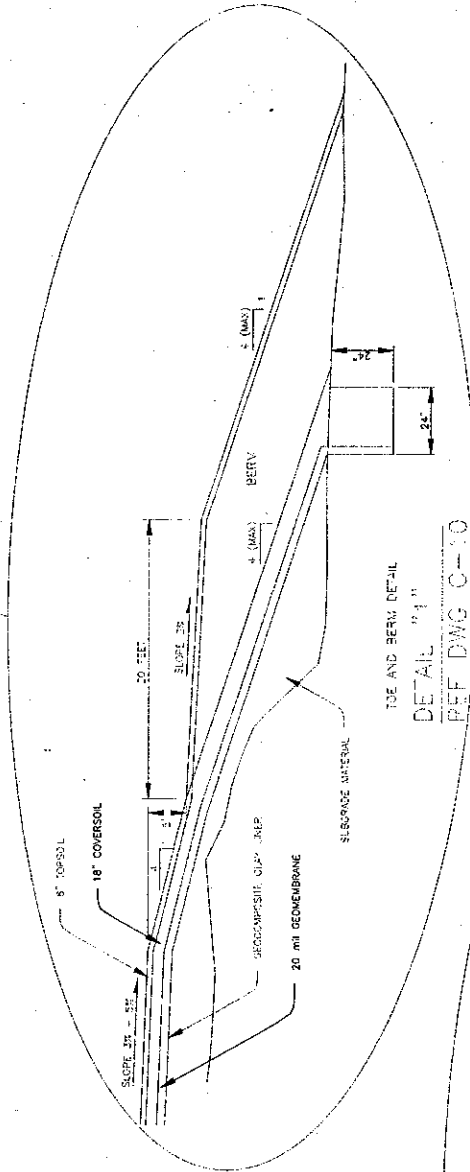
U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), 1980, *Installation Assessment of Longhorn Army Ammunition Plant, Report No. 150*, February.

Appendix A

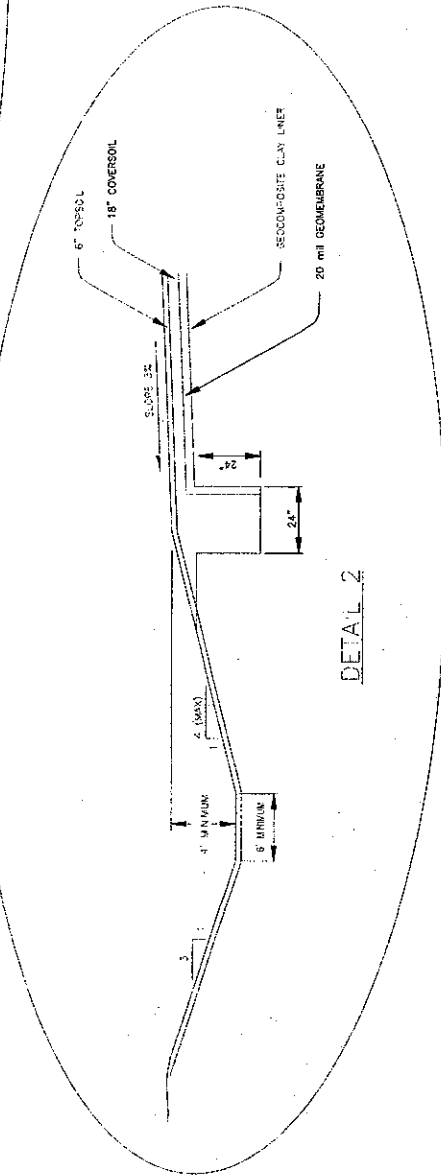
LHAAP-12 Landfill Cap As-Built Drawings

[illegible]

TYPICAL SECTION

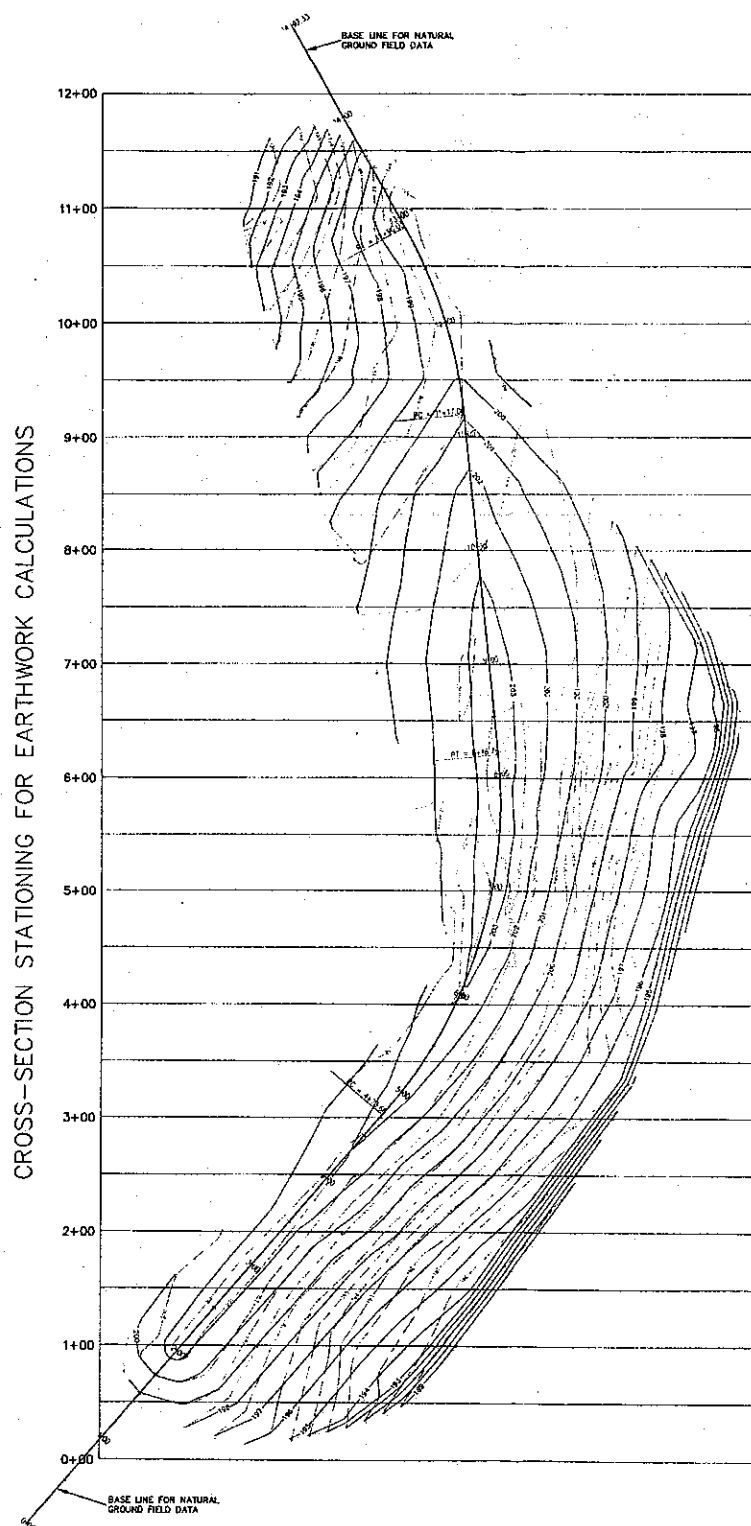
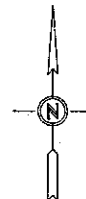


TOE AND BERM DETAIL
DETAIL "A"
REF DWG C-



DETAIL 2

00048790



TOTAL FILL = 20,573 CU YD
(fill volume represents bank yardage with no shrinkage factor applied)

Data Acquired:
July 17 & 21, 1997

NOTE:
There are two independent sets of stationing shown on this plan. The first set of stationing was used to gather natural ground field data. The cross-section stationing was used for volume calculations and corresponds to those shown on sheets 2, 3, and 4. Volume calculations were done using the average end area method, applying sections at 5 ft intervals (e.g. 2+00, 2+05, 2+10, etc.) over the entire site. For illustrative purposes, only the 50 ft station intervals are shown.

REVISIONS
August 8, 1997

Sheet 1 of 4

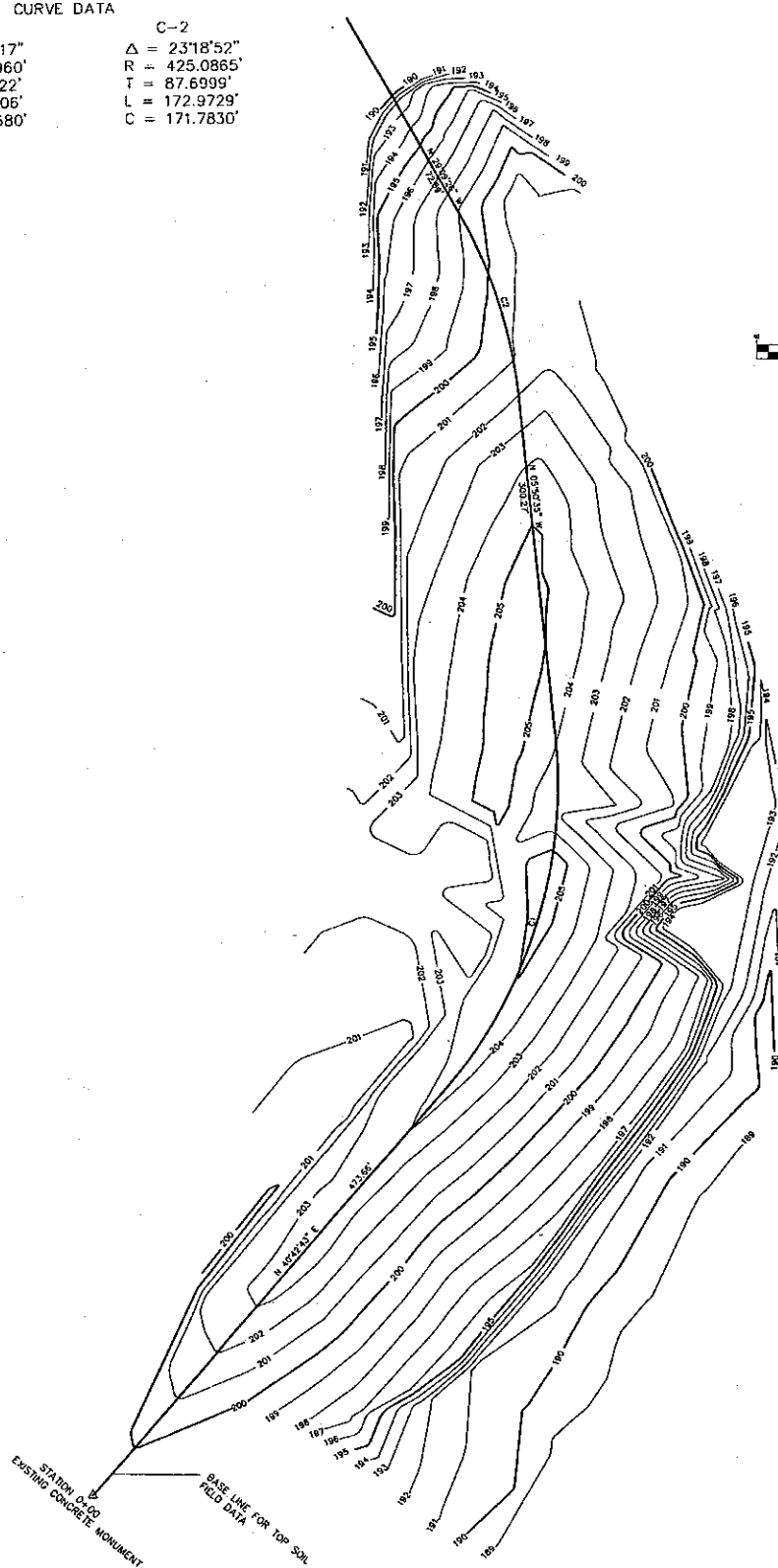
LHAAP - LANDFILL 12
PLAN VIEW

PREPARED BY
HART ENGINEERING CO.
CONSULTING ENGINEERS
AND SURVEYORS

P.O. Box 2804	415 N. CENTER ST.	LONGVIEW, TX 75608
DATE: 1 Aug 97	FAX: 758-2407	903-758-0166
DRAWN BY: JLB	SCALE: 1" = 50'	DATE: 12-913
CHKD BY: JLB	SCALE: 1" = 50'	DATE: 12-913

CURVE DATA

C-1	C-2
$\Delta = 46^{\circ}33'17''$	$\Delta = 23^{\circ}18'52''$
$R = 422.2960'$	$R = 425.0885'$
$T = 181.6722'$	$T = 87.6999'$
$L = 343.1306'$	$L = 172.9729'$
$C = 333.7680'$	$C = 171.7830'$



Data Acquired:
OCTOBER 17, 1997

Sheet 1 of 1

NO.	DATE	DESCRIPTION	BY

LHAAP - LANDFILL 12 TOPO

PLAN VIEW --- TOP SOL.

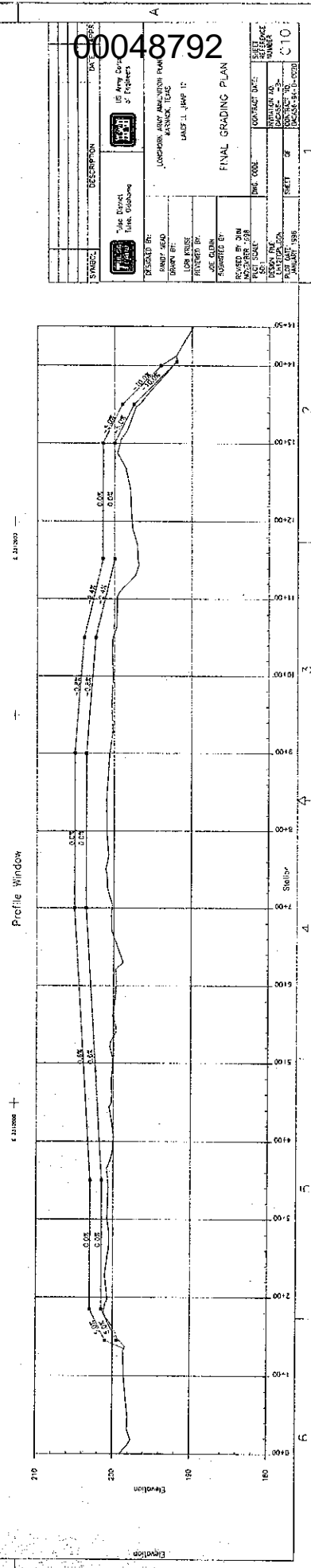
PREPARED BY

WINN ENVIRONMENTAL
SERVICES, INC.

P.O. Box 2251 1900 SE LOOP 281 LONGVIEW, TX 75607

DATE: 10/21/97 FAX: 758-2701 903-758-1171

DRAWN BY L.W.D. SCALE 1"=50' JOB NO. 97-2008 DWG NAME TOPSOL.DWG

[illegible]

Appendix B

Landfill 12 Inspection Checklists

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)

N.O.R. 001

LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 6-22-2000

TIME: 1:55 pm

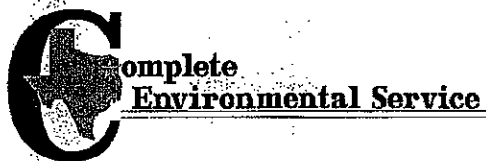
Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION		✓
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE		✓
WARNING SIGNS		✓

OBSERVATIONS: 1) Minor Erosion on South side of landfill.
 2) Top strand down on south side of landfill.
 3) Warning sign down on south side of landfill, and East side & West side.
 4) Minor Erosion on East side of landfill

CORRECTIVE ACTION: Repair erosion and fence. Reattach all warning signs to fence with aluminum wire rather than nylon ties.

INSPECTORS NAME AND TITLE: William R. Corrigan / 6WTP Manager



POST CLOSURE CARE INSPECTION CHECKLIST

**LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT**

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 2-19-01

TIME: 11:30

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION		X
GULLYING		X
VEGETATION	X	
TURF	X	
FIREANTS	X	
DEBRIS	X	
SECURITY FENCE		X
WARNING SIGNS	X	

OBSERVATIONS: Trees down on fence on Southwest corner.
Gully and erosion on North side of Landfill.
Some warning signs were down.

CORRECTIVE ACTION: Warning signs were attached with metal rings instead of electrical ties.

INSPECTORS NAME AND TITLE: Scott Beesinger Quality Control Manager



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 5/16/01

TIME: 10:40

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION		✓
GULLYING		✓
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: Gully and erosion on north side of landfill.

CORRECTIVE ACTION:

INSPECTORS NAME AND TITLE

Scott Beesiger Quality Control Manager



**Complete
Environmental Service**

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)

N.O.R. 001

LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 8/8/01

TIME: 11:50

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION		✓
GULLYING		✓
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: Gullying and erosion on north side of Landfill.

CORRECTIVE ACTION:

INSPECTORS NAME AND TITLE:

Scott Beesiger Quality Control Manager



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 11/19/01

TIME: 11:00

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION		✓
GULLYING		✓
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: EROSION AND GULLYING ON NORTH SIDE

CORRECTIVE ACTION:

INSPECTORS NAME AND TITLE:

Scott Beesinger Quality Control Manager



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 2/21/02
TIME: 13:00

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS:

CORRECTIVE ACTION:

INSPECTORS NAME AND TITLE:

Scott Beesinger *Quality Control Manager*



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 5/3/02

TIME: 14:15

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: ONE WARNING SIGN ~~WAS~~ HAD FALLEN OFF FENCE.

CORRECTIVE ACTION: REATTACHED WARNING SIGN TO FENCE

INSPECTORS NAME AND TITLE: _____



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 8/5/02

TIME: 12:15

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE:

Scott Reisinger Quality Control Manager



**Complete
Environmental Service**

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)

N.O.R. 001

LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 11/12/02

TIME: 15:00

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE: Scott Boesinger



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 2/19/03

TIME: 09:00

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTOR'S NAME AND TITLE: _____

Scott Basinger



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 5/28/03

TIME: 15:15

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE: Scott Beesinger



POST CLOSURE CARE INSPECTION CHECKLIST

**LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT**

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 8/28/03

TIME: 12:00

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE: _____

Stat Reisinger



POST CLOSURE CARE INSPECTION CHECKLIST

**LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT**

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 12/3/03

TIME: 09:10

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

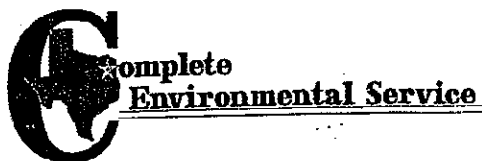
	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE:

Scott Boesing *Quality Control Manager*



POST CLOSURE CARE INSPECTION CHECKLIST

**LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT**

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 3/2/04
TIME: 11:45

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE:

Scott Beesinger



**Complete
Environmental Service**

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 5/26/04

TIME: 11:00

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: Security Fence was broken in one place.

CORRECTIVE ACTION: Repaired broken strand of barbed wire

INSPECTORS NAME AND TITLE: Scott Presinger



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 8/11/04

TIME: 09:15

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE:

Scott Bessinger Quality Control Manager



POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 12/15/04
TIME: 13:30

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE:

Scott Zelsinger Quality Control Manager



POST CLOSURE CARE INSPECTION CHECKLIST

**LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT**

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 2-10-05

TIME: 15:00

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: One warning sign down

CORRECTIVE ACTION: Re-attached one warning sign

INSPECTORS NAME AND TITLE:

Scott Beesinger



**Complete
Environmental Service**

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)

N.O.R. 001

LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 5/26/05

TIME: 10:45

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE:

Scott Beechey Quality Control Manager



**Complete
Environmental Service**

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 8/4/05
TIME: 09:35

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: Dead pine tree on fence on
west side of landfill

CORRECTIVE ACTION: Removed tree from fence attached
Barbed wire to T-post and tightened fence

INSPECTORS NAME AND TITLE:

Scott Bessinger Quality Control Manager



**Complete
Environmental Service**

POST CLOSURE CARE INSPECTION CHECKLIST

**LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT**

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 11/17/05
TIME: 11:00

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE:

Scott Beesinger *Quality Control Manager*

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 2/15/06TIME: 12:30

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE:

Scott Boesiger Plant Maintenance Foreman

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)

N.O.R. 001

LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 5/15/06

TIME: 11:05

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE: _____

Seth Beez

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 8/16/06

TIME: 10:20

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE: Scott Beesinger

POST CLOSURE CARE INSPECTION CHECKLIST

LANDFILL 12 (SANITARY LANDFILL)
N.O.R. 001
LONGHORN ARMY AMMUNITION PLANT

INSPECTION FREQUENCY REQUIRED: QUARTERLY

DATE: 11/15/06

TIME: 10:25

Directions: Indicate conditions as acceptable or unacceptable. Explain observations and the date and nature of any repairs or other corrective action.

	ACCEPTABLE	UNACCEPTABLE
EROSION	✓	
GULLYING	✓	
VEGETATION	✓	
TURF	✓	
FIREANTS	✓	
DEBRIS	✓	
SECURITY FENCE	✓	
WARNING SIGNS	✓	

OBSERVATIONS: _____

CORRECTIVE ACTION: _____

INSPECTORS NAME AND TITLE: _____

Scott Beesinger

Landfill Inspection Check List
Landfill 12
Longhorn Army Ammunition Plant, Karnack, Texas

SI. No.	Item	Findings/Existing Conditions	Action Needed?	Action Performed (Duration)
1	Condition of Access Road	Good	None	None
2	Site Fencing and Signage	Good	None	None
3	Evidence of Trespassers?	No	None	None
4	Inspection of Vegetative Landfill Cover	Satisfactory	None	None
5	Inspection of Erosion Control Measures	Satisfactory	None	None
6	Inspection of Drainage Culverts and Pipes	Not Applicable	None	None
7	Drainage Channel/Ditches	Not Applicable	None	None
8	Erosion Damage	Slight	Yes	None
9	Status of Cover Vegetation? Bare Spots, Dead Grass, etc.	Satisfactory	None	None
10	Presence of Tree Seedlings, Kudzu, etc.?	No	None	None
11	Height of Vegetation	4 to 18 inches	Yes	None
12	Evidence of Burrowing Animals?	No	None	None
13	Excessive Cracking or Desiccation?	No	None	None
14	Any Evidence of Settlement/Subsidence?	No	None	None
15	Inspect Monitoring Wells Surrounding Site	Not Applicable	None	None
16	Note Any Changes to Land Use	No	None	None

Landfill Inspected: Former Sanitary Landfill

Date of Inspection:
Name/Organization:

12/5/2006
Shaw Environmental

Signature: *Amey Konda*

Landfill Inspection Check List
Landfill 12
Longhorn Army Ammunition Plant, Karnack, Texas

Sl. No.	Item	Findings/Existing Conditions	Action Needed?	Action Performed (Duration)
1	Condition of Access Road	Good	None	None
2	Site Fencing and Signage	Good	None	None
3	Evidence of Trespassers?	No	None	None
4	Inspection of Vegetative Landfill Cover	Satisfactory	None	None
5	Inspection of Erosion Control Measures	Satisfactory	None	None
6	Inspection of Drainage Culverts and Pipes	Not Applicable	None	None
7	Drainage Channel/Ditches	Not Applicable	None	None
8	Erosion Damage	Slight	Yes	None
9	Status of Cover Vegetation? Bare Spots, Dead Grass, etc.	Satisfactory	None	None
10	Presence of Tree Seedlings, Kudzu, etc.?	No	None	None
11	Height of Vegetation	6 to 18 inches	Yes	None
12	Evidence of Burrowing Animals?	No	None	None
13	Excessive Cracking or Desiccation?	No	None	None
14	Any Evidence of Settlement/Subsidence?	No	None	None
15	Inspect Monitoring Wells Surrounding Site	Not Applicable	None	None
16	Note Any Changes to Land Use	No	None	None

Landfill Inspected: Former Sanitary Landfill

Date of Inspection: 2/2/2007

Name/Organization: Shaw Environmental

Signature: *Amey D. Bhatia*

Landfill Inspection Check List
Landfill 12
Longhorn Army Ammunition Plant, Karnack, Texas

Sl. No.	Item	Findings/Existing Conditions	Action Needed?	Action Performed (Duration)
1	Condition of Access Road	Good	None	None
2	Site Fencing and Signage	Good	None	None
3	Evidence of Trespassers?	No	None	None
4	Inspection of Vegetative Landfill Cover	Satisfactory	None	None
5	Inspection of Erosion Control Measures	Satisfactory	None	None
6	Inspection of Drainage Culverts and Pipes	Not Applicable	None	None
7	Drainage Channel/Ditches	Not Applicable	None	None
8	Erosion Damage	Slight	Yes	None
9	Status of Cover Vegetation? Bare Spots, Dead Grass, etc.	Satisfactory	None	None
10	Presence of Tree Seedlings, Kudzu, etc.?	No	None	None
11	Height of Vegetation	8 to 24 inches	Yes	None
12	Evidence of Burrowing Animals?	No	None	None
13	Excessive Cracking or Desiccation?	No	None	None
14	Any Evidence of Settlement/Subsidence?	No	None	None
15	Inspect Monitoring Wells Surrounding Site	Not Applicable	None	None
16	Note Any Changes to Land Use	No	None	None

Landfill Inspected: Former Sanitary Landfill

Signature: *Andrew Gordon*

Date of Inspection:
Name/Organization:

6/13/2007
Shaw Environmental

Appendix C

*Groundwater MNA August 2006 and December 2006
Analytical Summary Tables*

LHAAP-12
MONITORED NATURAL ATTENUATION
STUDY DATA
HISTORICAL COC CONCENTRATIONS

LHAAP-12 Historical COC Concentrations

				COC Concentrations in µg/L								
				TCE MCL = 5			cis-1,2-DCE MCL = 70			VC MCL = 2		
Well ID	Zone	Status	Date	Result	Qual	VQ	Result	Qual	VQ	Result	Qual	VQ
103	Shallow	Abandoned	28-May-93	5	U	U	5	U	U	10	U	U
			19-Apr-95	5	U	U	NR	U	U	10	U	U
121	Shallow	Abandoned	30-May-93	5	U	U	5	U	U	10	U	U
			18-Apr-95	5	U	U	NR	U	U	10	U	U
12WW01	Shallow	Active	13-Jun-93	27			5	U	U	10	U	U
			20-Apr-95	5	U	U	NR	U	U	10	U	U
			15-Jul-98	1	U	U	1	U	U	1	U	U
			27-Feb-03	1	U	U	1	U	U	1	U	U
			19-Feb-04	1	U	U	1	U	U	1	U	U
			8-Dec-04	1	U	U	1	U	U	1	U	U
			11-Aug-06	5	U	U	10	U	U	0.575	J	J
			19-Dec-06	5	U	U	10	U	U	0.25	U	U
12WW02	Shallow	Active	14-Jun-93	5	U	U	5	U	U	10	U	U
			19-Apr-95	5	U	U	NR	U	U	10	U	U
			15-Jul-98	1	U	U	0.65	J	J	2.1		
			27-Feb-03	1	U	U	3.33			7.24		
			19-Feb-04	1	U	U	2.86			5.34		
			8-Dec-04	1	U	U	2.57			3.75		
			11-Aug-06	5	U	U	1.77	J	J	6.88	J	J
			19-Dec-06	5	U	U	1.39	J	J	4.3	J	J
12WW03	Shallow	Abandoned	14-Jun-93	16			5	U	U	10	U	U
			19-Apr-95	5	U	U	NR	U	U	10	U	U
12WW04	Shallow	Abandoned	12-Jun-93	5	U	U	5	U	U	10	U	U
			18-Apr-95	5	U	U	NR	U	U	10	U	U
12WW05	Shallow	Active	12-Jun-93	5	U	U	5	U	U	10	U	U
			20-Apr-95	5	U	U	NR	U	U	10	U	U
			15-Jul-98	5	U	U	5	U	U	5	U	U
			12-Mar-99	1	U	U	1	U	U	1	U	U
			26-Feb-03	1	U	U	1	U	U	1	U	U
			20-Feb-04	1	U	U	1	U	U	1	U	U
			9-Dec-04	1	U	U	1	U	U	1	U	U
			11-Aug-06	5	U	U	10	U	U	0.25	U	U
12WW06	Shallow	Abandoned	12-Jun-93	5	U	U	5	U	U	10	U	U
			19-Apr-95	5	U	U	NR	U	U	10	U	U
12WW07	Shallow	Abandoned	13-Jun-93	5	U	U	5	U	U	10	U	U
			19-Apr-95	5	U	U	NR	U	U	10	U	U
12WW08	Shallow	Abandoned	20-Apr-95	5	U	U	NR	U	U	10	U	U
			15-Jul-98	1	U	U	1	U	U	1	U	U
			26-Feb-03	1	U	U	1	U	U	1	U	U
			20-Feb-04	1	U	U	1	U	U	1	U	U
12WW09	Shallow	Abandoned	9-Dec-04	1	U	U	1	U	U	1	U	U
12WW10	Shallow	Abandoned	19-Apr-95	5	U	U	NR	U	U	10	U	U
			15-Jul-98	1	U	U	1	U	U	1	U	U
			27-Feb-03	14.5			2.91			2.46		
			19-Feb-04	1.84			0.311	J	J	1	U	U
			8-Dec-04	6.96			0.812	J	J	1	U	U
12WW11	Intermediate	Abandoned	19-Apr-95	5	U	U	NR	U	U	10	U	U
			15-Jul-98	1	U	U	1	U	U	1	U	U
			26-Feb-03	1	U	U	1	U	U	1	U	U
			19-Feb-04	1	U	U	1	U	U	1	U	U
			10-Dec-04	1	U	U	1	U	U	1	U	U

LHAAP-12 Historical COC Concentrations (continued)

				COC Concentrations in µg/L								
Well ID	Zone	Status	Date	TCE MCL = 5			cis-1,2-DCE MCL = 70			VC MCL = 2		
				Result	Qual	VQ	Result	Qual	VQ	Result	Qual	VQ
12WW12	Shallow	Abandoned	20-Apr-95	495			NR			10	U	U
			15-Jul-98	420			110			8	U	U
			26-Feb-03	385			144			5.65		
			20-Feb-04	427			137			4.03		
			8-Dec-04	508	D		136	D		2.22		
12WW13	Intermediate	Abandoned	15-Jul-98	1	U	U	1	U	U	1	U	U
			26-Feb-03	0.829	J	J	0.478	J	J	1	U	U
			20-Feb-04	0.481	J	J	1	U	U	1	U	U
			9-Dec-04	0.643	J	J	1	U	U	1	U	U
12WW14	Intermediate	Abandoned	15-Jul-98	4	U	U	4	U	U	4	U	U
			12-Mar-99	1	U	U	1	U	U	1	U	U
			26-Feb-03	1	U	U	1	U	U	1	U	U
			20-Feb-04	1	U	U	1	U	U	1	U	U
			9-Dec-04	1	U	U	1	U	U	1	U	U
12WW15	Shallow	Abandoned	15-Jul-98	1	U	U	1	U	U	1	U	U
			26-Feb-03	1	U	U	1	U	U	1	U	U
			20-Feb-04	1	U	U	1	U	U	1	U	U
			9-Dec-04	1	U	U	1	U	U	1	U	U
12WW16	Shallow	Abandoned	15-Jul-98	1	U	U	1	U	U	1	U	U
			26-Feb-03	1	U	U	1	U	U	1	U	U
			20-Feb-04	Dry			Dry			Dry		
			9-Dec-04	Dry			Dry			Dry		
12WW17	Shallow	Abandoned	15-Jul-98	1	U	U	1	U	U	1	U	U
			27-Feb-03	1	U	U	1	U	U	1	U	U
			20-Feb-04	Dry			Dry			Dry		
			9-Dec-04	Dry			Dry			Dry		
12WW18	Shallow	Abandoned	15-Jul-98	1	U	U	1	U	U	1	U	U
			27-Feb-03	1	U	U	1	U	U	1	U	U
			19-Feb-04	1	U	U	1	U	U	1	U	U
			8-Dec-04	1	U	U	1	U	U	1	U	U
12WW19	Intermediate	Abandoned	15-Jul-98	1	U	U	1	U	U	1	U	U
			27-Feb-03	1	U	U	1	U	U	1	U	U
			19-Feb-04	1	U	U	1	U	U	1	U	U
			10-Dec-04	1	U	U	1	U	U	1	U	U
12WW20	Shallow	Active	13-Jan-06	0.645	J	J	0.499	J	J	1	U	U
			10-Aug-06	0.704	J	J	0.615	J	J	0.25	U	U
			19-Dec-06	0.713	J	J	0.594	J	J	0.25	U	U
12WW21	Shallow	Active	12-Jan-06	1	U	U	1	U	U	1	U	U
			10-Aug-06	5	U	U	10	U	U	0.25	U	U
			19-Dec-06	5	U	U	10	U	U	0.25	U	U
12WW22	Shallow	Active	13-Jan-06	1	U	U	1	U	U	1	U	U
12WW23	Shallow	Active	13-Jan-06	1	U	U	1	U	U	1	U	U
12MW24	Shallow	Active	19-Dec-06	396			113			5.35		

Notes and Abbreviations:

Shaded and bold values exceeded their MCLs.

The sample quantitation limit (SQL) is provided for vinyl chloride data in August and December 2006.

2004 sampling event data from USACE and ALL Consulting, 2006, Final Groundwater Monitoring Report, Site 12 and 16, Spring 2003, April 2004, and Winter 2004.

1,1-DCE 1,1-dichloroethene

COC Chemical of Concern

D Dilution

J Estimated result detected above the method detection limit but below the reporting limit

MCL Maximum contaminant level

NR Not reported by laboratory

PCE Tetrachloroethene

Qual Laboratory qualifier

TCE Trichloroethene

U Not detected. The reporting limit is shown.

VQ Validation qualifier

µg/L micrograms per liter

LHAAP-12
MONITORED NATURAL ATTENUATION
STUDY DATA
AUGUST 2006 SAMPLING EVENT

[illegible]

B sample blank contained analyte

Sample	Blank	Controlled allyle	Celsius
1	0.00	0.00	0.00
2	0.00	0.00	0.00
3	0.00	0.00	0.00
4	0.00	0.00	0.00
5	0.00	0.00	0.00
6	0.00	0.00	0.00
7	0.00	0.00	0.00
8	0.00	0.00	0.00
9	0.00	0.00	0.00
10	0.00	0.00	0.00
11	0.00	0.00	0.00
12	0.00	0.00	0.00
13	0.00	0.00	0.00
14	0.00	0.00	0.00
15	0.00	0.00	0.00
16	0.00	0.00	0.00
17	0.00	0.00	0.00
18	0.00	0.00	0.00
19	0.00	0.00	0.00
20	0.00	0.00	0.00
21	0.00	0.00	0.00
22	0.00	0.00	0.00
23	0.00	0.00	0.00
24	0.00	0.00	0.00
25	0.00	0.00	0.00
26	0.00	0.00	0.00
27	0.00	0.00	0.00
28	0.00	0.00	0.00
29	0.00	0.00	0.00
30	0.00	0.00	0.00
31	0.00	0.00	0.00
32	0.00	0.00	0.00
33	0.00	0.00	0.00
34	0.00	0.00	0.00
35	0.00	0.00	0.00
36	0.00	0.00	0.00
37	0.00	0.00	0.00
38	0.00	0.00	0.00
39	0.00	0.00	0.00
40	0.00	0.00	0.00
41	0.00	0.00	0.00
42	0.00	0.00	0.00
43	0.00	0.00	0.00
44	0.00	0.00	0.00
45	0.00	0.00	0.00
46	0.00	0.00	0.00
47	0.00	0.00	0.00
48	0.00	0.00	0.00
49	0.00	0.00	0.00
50	0.00	0.00	0.00
51	0.00	0.00	0.00
52	0.00	0.00	0.00
53	0.00	0.00	0.00
54	0.00	0.00	0.00
55	0.00	0.00	0.00
56	0.00	0.00	0.00
57	0.00	0.00	0.00
58	0.00	0.00	0.00
59	0.00	0.00	0.00
60	0.00	0.00	0.00
61	0.00	0.00	0.00
62	0.00	0.00	0.00
63	0.00	0.00	0.00
64	0.00	0.00	0.00
65	0.00	0.00	0.00
66	0.00	0.00	0.00
67	0.00	0.00	0.00
68	0.00	0.00	0.00
69	0.00	0.00	0.00
70	0.00	0.00	0.00
71	0.00	0.00	0.00
72	0.00	0.00	0.00
73	0.00	0.00	0.00
74	0.00	0.00	0.00
75	0.00	0.00	0.00
76	0.00	0.00	0.00
77	0.00	0.00	0.00
78	0.00	0.00	0.00
79	0.00	0.00	0.00
80	0.00	0.00	0.00
81	0.00	0.00	0.00
82	0.00	0.00	0.00
83	0.00	0.00	0.00
84	0.00	0.00	0.00
85	0.00	0.00	0.00
86	0.00	0.00	0.00
87	0.00	0.00	0.00
88	0.00	0.00	0.00
89	0.00	0.00	0.00
90	0.00	0.00	0.00

cells/mL

Estimated result of

mg/L
milligrams per liter

	mL
	mg/L
	milligrams per liter

ms/cm
milijemens per c

Analysis	not analyzed	analysis per
NA		

W

**LHAAP-12
MONITORED NATURAL ATTENUATION
STUDY DATA
DECEMBER 2006 SAMPLING EVENT**

Analytical Detections Summary for December 2006 Groundwater Samples LHAAP-12

LOCATION CODE:		12WW01	12WW02	12WW05	12WW20	12WW21	12WW24	12WW24		
Sample Number:		12WW01-121906	12WW02-121906	12WW05-121906	12WW20-121906	12WW21-121906	12WW24-121906	12WW24-121906		
Sample Date:		19-Dec-08	19-Dec-08	19-Dec-08	19-Dec-08	19-Dec-08	19-Dec-08	19-Dec-08		
Parameter	Units	Result	Qual	VQ	Result	Qual	VQ	Result	Qual	VQ
Field Test										
Temperature	Degree C	17.69			20.59			19.41		
Conductivity	ms/cm	4.724			1.52			1.942		
pH	STD UNIT	5.63			5.98			5.52		
ORP	MILLIVOLTS	118.3			117.7			169.7		
Dissolved Oxygen	mg/L	2.5			0.33			0.33		
Turbidity	NTU	34.5			0			6.5		
Gases										
Ethane	ug/L	0.5	U	U	0.335	J	J	0.5	U	U
Ethane	ug/L	0.5	U	U	0.771			0.476	J	J
Methane	ug/L	0.295	J	B	4.78			7.6	B	B
General Chemistry										
Chloride	mg/L	742			152			289		
Nitrate	mg/L	2.4	U	U	0.6	U	U	1.2	U	U
Nitrite	mg/L	1.6	U	U	0.4	U	U	0.8	U	U
Sulfate	mg/L	386			46.9			178		
Total Inorganic Carbon	mg/L	33.6			98.4			16.2		
Total Organic Carbon	mg/L	8.44			17.7			4.52		
Volatiles										
1,1,1-Trichloroethane	ug/L	5	U	U	5	U	U	5	U	U
1,1-Dichloroethane	ug/L	5	U	U	4.11	J	J	5	U	U
1,4-Dichlorobenzene	ug/L	5	U	U	0.254	J	J	5	U	U
Acetone	ug/L	111			10	U	U	10	U	U
Benzene	ug/L	5	U	U	0.23	J	J	5	U	U
Chlorobenzene	ug/L	5	U	U	0.177	J	J	5	U	U
Chloroethane	ug/L	10	U	U	0.685	J	J	10	U	U
cis-1,2-Dichloroethane	ug/L	10	U	U	1.39	J	J	10	U	U
trans-1,2-Dichloroethane	ug/L	5	U	U	5	U	U	5	U	U
Trichloroethene	ug/L	5	U	U	5	U	U	0.713	J	J
Vinyl chloride	ug/L	10	U	U	4.3	J	J	10	U	U
								5.35	J	J
								5.4	J	J
								5.35	J	J
								5.35	J	J
								5.35	J	J
								5.35	J	J
								5.35	J	J
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Notes and Abbreviation:

C Celsius

J Estimated result detected above the method, detected limit but below the reporting limit

mg/L milligrams per liter

mL milliliter

ms/cm millisiemens per centimeter

NA Not Analyzed

NTU nephelometric turbidity units

ORP oxidation-reduction potential

Qual laboratory qualifier

STD UNIT standard unit

U Not detected. The reporting limit is shown

VOC volatile organic compound

VQ validation qualifier

ug/L micrograms per liter

Appendix D

*Industrial Solid Waste, Notice of Land Use Controls at
LHAAP-12 & TDLR Notification of Drilling Prohibition*

FILED FOR RECORD

07 JUN 13 AM 10: 09

FATSY COX
CO CLERK, HARRISON COBY Cox DEPUTY

STATE OF TEXAS

HARRISON COUNTY

INDUSTRIAL SOLID WASTE
NOTICE OF LAND USE CONTROLS AT LHAAP-12

KNOW ALL MEN BY THESE PRESENTS THAT:

Pursuant to the Rules of the Texas Commission on Environmental Quality (TCEQ) pertaining to Industrial Solid Waste Management, this document is hereby filed in the Public Records of Harrison County, Texas in compliance with the recordation requirements of said rules:

I

The U.S. Army, Department of Defense, has performed a remediation of the land described herein. The remediation site is a capped landfill located on the Former Longhorn Army Ammunition Plant (LHAAP) and is designated as LHAAP-12. The site is included in TCEQ Notice of Registration No. 30990 as Unit Number 001. LHAAP was placed on the National Priorities List (NPL) during August 1990. After its listing on the NPL, the U.S. Army, United States Environmental Protection Agency (USEPA), and TCEQ (formerly known as Texas Water Commission) entered into an agreement under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120 for remedial activities. The CERCLA Section 120 Agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. Remedial activities at LHAAP-12 were performed in accordance with the FFA requirements.

The landfill was used intermittently for the disposal of industrial solid waste, possibly containing small quantities of hazardous constituents generated at LHAAP. A Record of Decision (ROD) for LHAAP-12 was signed by USEPA in 1995 establishing the construction of a cap as an interim remedial action for the site to mitigate potential risks posed by the burial of landfill waste. Construction of the landfill cap was completed in 1998. The final remedy consists of land use controls (LUCs) in conjunction with monitored natural attenuation as documented in the Final ROD signed by USEPA on July 24, 2006. The site was not remediated to levels suitable for unrestricted use. LUCs at LHAAP-12 are required to ensure the integrity of the landfill cap and cover system and prevent human exposure to contaminated groundwater. Further information may be found by examination of the Notice of Registration No. 30990 files, which are available for inspection upon request at TCEQ, Central File Room Customer Service Center, Building E, 12100 Park 35 Circle, Austin, Texas, 78753, (512) 239-2900, Monday through Friday 8:00 a.m. to 5:00 p.m. or the Administrative Record available at the

Marshall Public Library, 300 S. Alamo Blvd, Marshall, Texas 75670, (903) 935-4465, Monday through Thursday 10:00 a.m. to 8 p.m., Friday and Saturday 10:00 a.m. to 5:30 p.m.

The TCEQ requires certain persons to provide recordation in the real property records to notify the public of the conditions of the land and/or the occurrence of remediation. This notification is not a representation or warranty by the TCEQ of the suitability of this land for any purpose.

II

The LHAAP-12 parcel is a 50.541 acre tract, more or less, located in Harrison County, Texas, near the town of Karnack, being more particularly described with survey plat and metes and bounds established in Exhibit A. Within the LHAAP-12 parcel are designated LUC boundaries including a 9.429 acre tract, more or less, and a 45.939 acre tract, more or less, as described in Exhibit A. The LUC boundaries are also presented in the attached Figure 1.

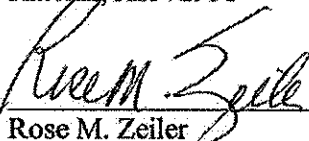
Future use of the parcel is intended as a national wildlife refuge consistent with non-residential use. The United States Department of the Army has undertaken careful environmental study of the LHAAP-12 site and concluded that the LUCs set forth below are required to ensure protection of human health and the environment.

- (1) **Landfill Restriction.** A closed non-hazardous landfill (LHAAP-12) of approximately 7 acres is located within the 9.429 acre tract. The landfill restriction boundary consists of the 7-acre capped landfill and an area extending to the surrounding fence. LUCs have been established to protect the integrity of the remedy. No activity shall be conducted or permitted that would damage the integrity of the landfill cover (i.e. digging or disturbing the existing cover or contents of the landfill). The LUCs will remain in place for perpetuity unless otherwise removed by the U.S. Army per agreement with the USEPA and TCEQ.
- (2) **Residential Use Restriction.** The residential use restriction boundary consists of the 9.429 acre-tract, more or less, and includes the 7-acre capped landfill and an area extending to the surrounding fence. This tract shall be used solely for the purpose of a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this certification, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.
- (3) **Groundwater Restriction.** The groundwater use restriction boundary consists of the 45.939 acre tract, more or less, and extends beyond the landfill

boundary. Groundwater underlying this land is contaminated with trichloroethene (TCE) and other volatile organic compounds and shall not be accessed or used for any purpose without the prior written approval of U.S. Army, the USEPA and the TCEQ. A LUC restricting the use of groundwater has been established for the protection of human health. The U.S. Army will notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA and the TCEQ. The LUC will remain in place until applicable or relevant and appropriate requirements (ARARs) as established in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulation 300) are met. Due to the potential for TCE-contaminated groundwater to migrate, monitored natural attenuation will be implemented to assure that TCE-contaminated groundwater will not migrate to nearby surface water at levels that may present an unacceptable risk to human health and the environment. The monitoring and reporting associated with this remedy will continue until ARARs are achieved.

The owner of the site is the Department of the Army, and its address where more specific information may be obtained from is as follows:

ATTN: DAIM-BD-LO (R. Zeiler)
Post Office Box 220
Ratcliff AR 72951

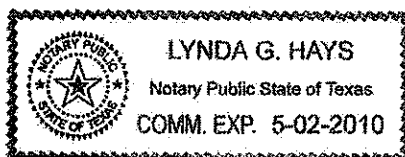


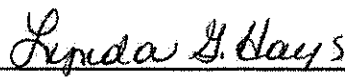
Rose M. Zeiler
Longhorn AAP Site Manager

EXECUTED this the 13th day of June, 2007.

BEFORE ME, on this the 13th day of June, personally appeared Rose M. Zeiler, of United States Army, United States Department of Defense, known to me to be the person and agent of said agency whose name is subscribed to the foregoing instrument, and she acknowledged to me that she executed the same for the purposes and in the capacity therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 13 day of *June*, 2007.

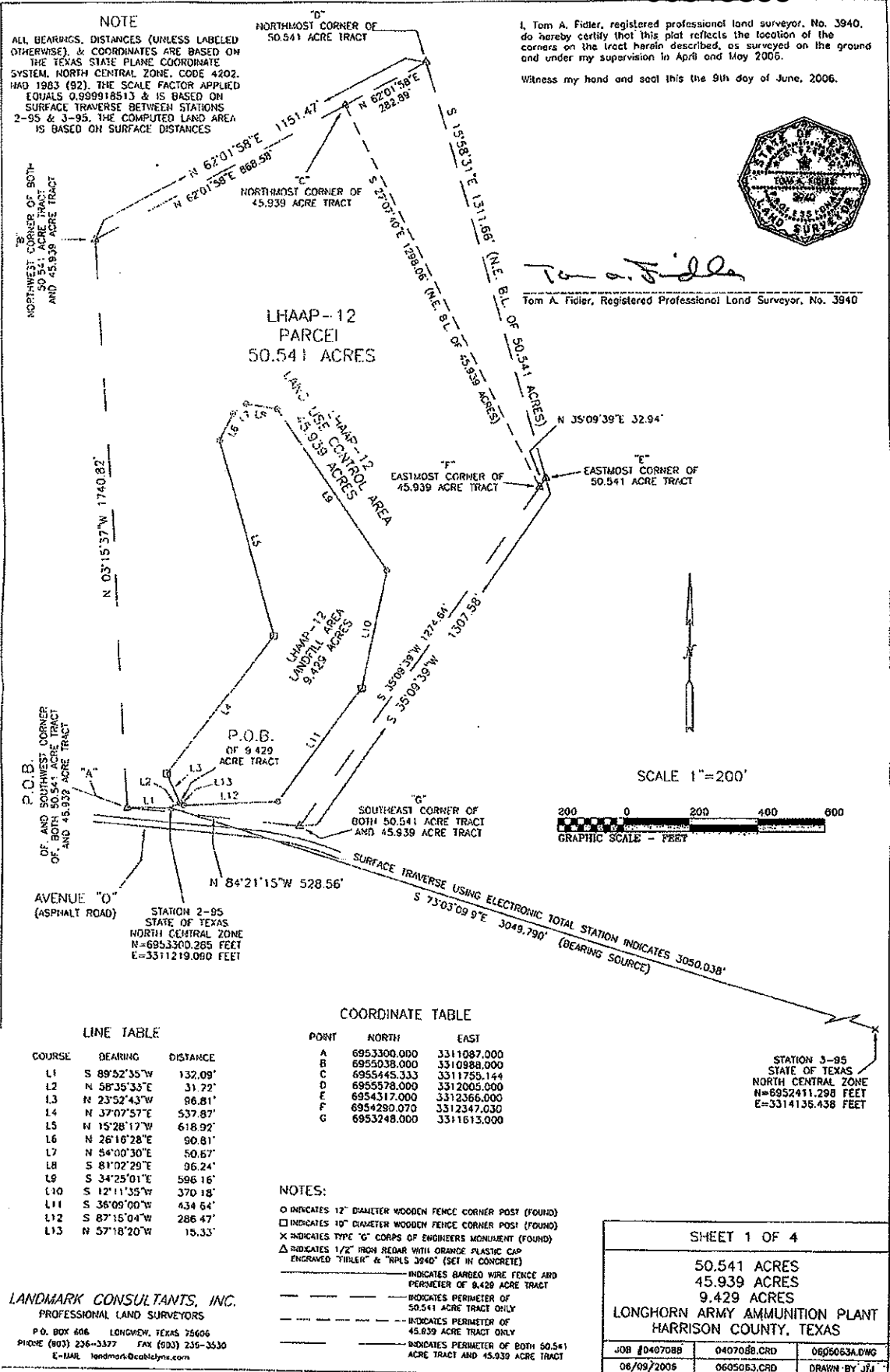



Notary Public in and for the State of Texas,
County of Harrison

00048834

Doc	Bk	Vol	Pg
7009064	OR	3640	4

EXHIBIT A



SHEET 2 OF 4

FIELD NOTES DESCRIPTION OF
"LHAAP-12 PARCEL"
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Parcel" being 50.541 acres of land out of the Longhorn Ordnance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said tract "LHAAP-12 Parcel" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95" (N=6953300.285 feet & E=3311219.090 feet) and "3-95" (N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE S 89deg52'35"W 132.09' to an I.R.O.P.C. set in concrete for the S.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 03deg15'37"W 1740.82' along the W.B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northwest corner,

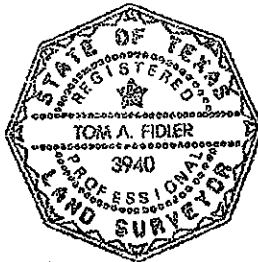
THENCE N 62deg01'58"E 1151.47' along the N.W. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northmost corner,

THENCE S 15deg58'31"E 1311.66' along the N.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Eastmost corner,

THENCE S 35deg09'39"W 1307.58' along the S.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Southeast corner,

THENCE N 84deg21'15"W 528.56' along the S.B.L. of this tract to this POINT OF BEGINNING, containing 50.541 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

SHEET 3 OF 4

FIELD NOTES DESCRIPTION OF
"LHAAP-12 LAND USE CONTROL AREA"
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Land Use Control Area" being 45.939 acres of land out of the Longhorn Ordnance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said "LHAAP-12 Land Use Control Area" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95" (N=6953300.285 feet & E=3311219.090 feet) and "3-95" (N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE S 89deg52'35"W 132.09' to an I.R.O.P.C. set in concrete for the S.W.C. of this tract and this POINT OF BEGINNING,

THENCE N 03deg15'37"W 1740.82' along the W.B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northwest corner,

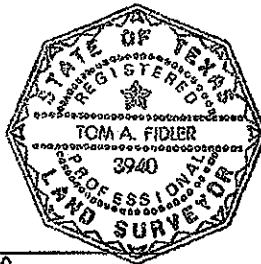
THENCE N 62deg01'58"E 868.58' along the N.W. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Northmost corner,

THENCE S 27deg07'40"E 1298.06' along the N.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Eastmost corner,

THENCE S 35deg09'39"W 1274.64' along the S.E. B.L. of this tract to an I.R.O.P.C. set in concrete for this tract's Southeast corner,

THENCE N 84deg21'15"W 528.56' along the S.B.L. of this tract to this POINT OF BEGINNING, containing 45.939 acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in the State of Texas, do hereby certify that this field notes description is the result of a survey made on the ground and under my supervision.



Tom A. Fidler
Tom A. Fidler, R.P.L.S. Number 3940

SHEET 4a OF 4

FIELD NOTES DESCRIPTION OF
"LHAAP-12 LANDFILL AREA"
CADDO LAKE NATIONAL WILDLIFE REFUGE
HARRISON COUNTY, TEXAS

The hereinafter described tract of land is located in Harrison County, Texas, near the town of Karnack, tract "LHAAP-12 Landfill Area" being 9.429 acres of land out of the Longhorn Ordnance Works Reservation (also known as the Longhorn Army Ammunition Plant, Karnack, Texas), said "LHAAP-12 Landfill Area" being more particularly described as follows:

Surveyor's Note: All bearings and distances herein (unless labeled surface distance) are based on the Texas State Plane Coordinate System, North Central Zone, Code 4202, NAD 1983 (92). The scale factor applied equals 0.999918513, and is based on surface traverse (using electronic total station) between type "G" Corps of Engineers monuments "2-95" (N=6953300.285 feet & E=3311219.090 feet) and "3-95" (N=6952411.298 feet & E=3314136.438 feet). Said traverse indicates a surface distance of 3050.038 feet between said monuments. The computed land area is based on surface distances. As used herein, the abbreviation I.R.O.P.C. indicates 1/2" iron rebar with orange plastic cap engraved "Fidler" & "RPLS 3940".

Commencing at the monument "2-95" referenced above,

THENCE N 58deg35'33"E 31.72' to a 12" diameter wooden fence corner post found for a Southwest corner of this tract and this POINT OF BEGINNING,

THENCE generally along a barbed wire fence the following eleven courses,

N 23deg52'43"W 96.81' to a 10" diameter wooden fence corner post found for the Westmost corner of this tract,

N 37deg07'57"E 537.87' to a 10" diameter wooden fence corner post,

N 15deg28'17"W 618.92' to a 12" diameter wooden fence corner post,

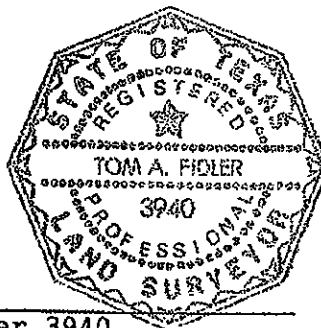
N 26deg16'28"E 90.81' to a 12" diameter wooden fence corner post,

N 54deg00'30"E 50.67' to a 12" diameter wooden fence corner post found for the Northmost corner of this tract,

SHEET 4b OF 4

S 81deg02'29"E 96.24' to a 12" diameter wooden fence corner post,
S 34deg25'01"E 596.16' to a 12" diameter wooden fence corner post
found for the Eastmost corner of this tract,
S 12deg11'35"W 370.18' to a 10" diameter wooden fence corner post,
S 36deg09'00"W 434.64' to a 12" diameter wooden fence corner post,
S 87deg15'04"W 286.47' to a 12" diameter wooden fence corner post,
N 57deg18'20"W 15.33' to this POINT OF BEGINNING, containing 9.429
acres, more or less.

I, Tom A. Fidler, registered professional land surveyor No. 3940 in
the State of Texas, do hereby certify that this field notes
description is the result of a survey made on the ground and under
my supervision.



Tom A. Fidler, R.P.L.S. Number 3940

00048840

Doc	Bk	Vol	Pg
7009064	OR	3640	10

FIGURE 1

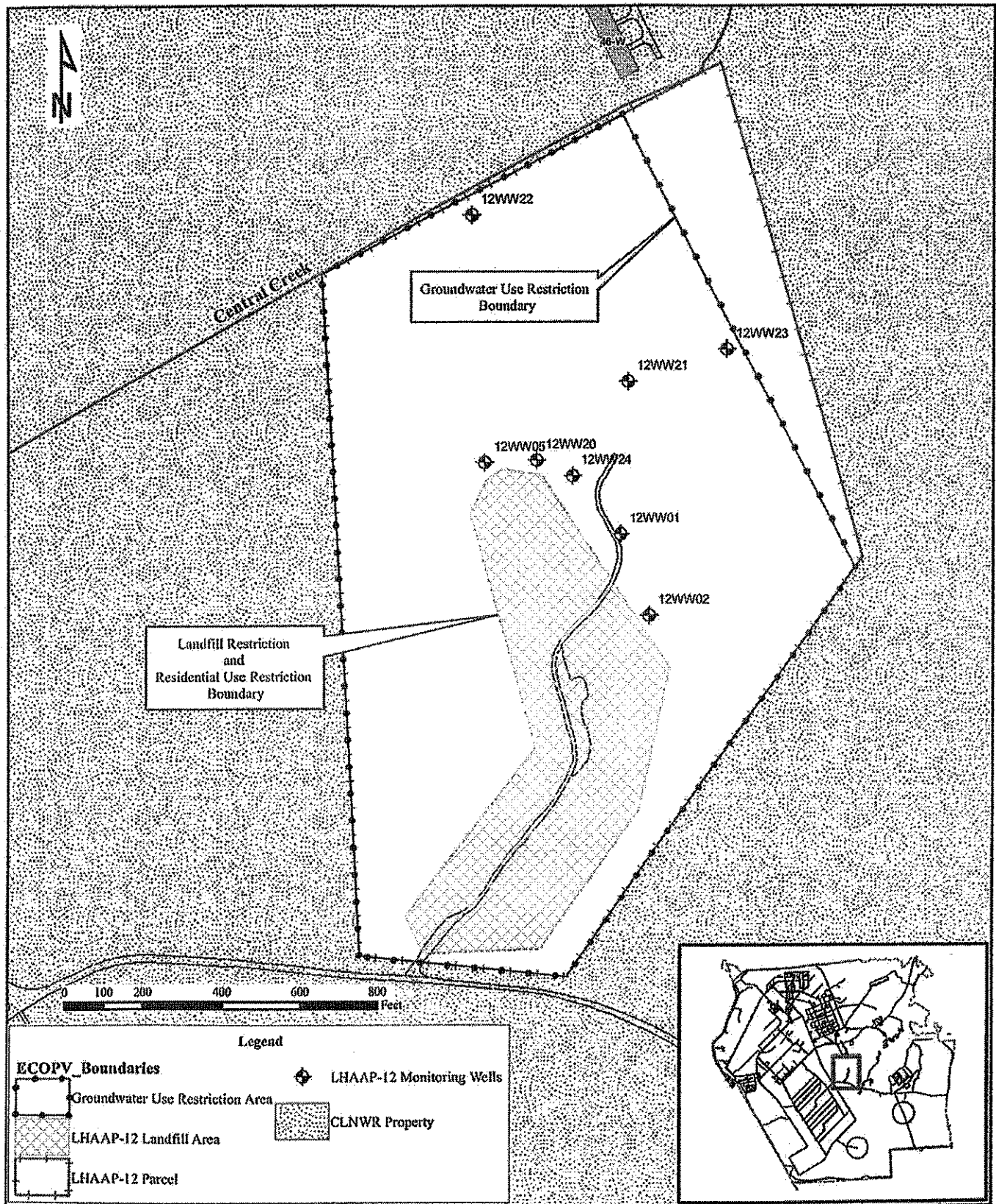


FIGURE 1

Land Use Control Boundaries

00048842

Doc	8k	Vol	Pg
7009064	OR	3640	12

STATE OF TEXAS

COUNTY OF HARRISON

I hereby certify that this instrument was
filed on the date and time stamped hereon by me
and was duly recorded in the volume and page
of the named records of:

Harrison County

as stamped hereon by me.

Jun 13, 2007

HONORABLE PATSY COX, COUNTY CLERK
Harrison County



DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

July 23, 2007

DAIM-BD-LO

Texas Department of Licensing and Regulation
Post Office Box 12157
Austin, TX 78711

ATTN: Water Well Drillers and Pump Installers

Re: Prohibition of Water Well Installation on the Landfill 12 Parcel at the Former Longhorn Army Ammunition Plant, located in Harrison County, Texas, near the town of **Karnack**

With this correspondence notification is given that a prohibition against water well installation is in effect at the above referenced site. The U.S. Army has performed an environmental remediation of the 50.541 acre Landfill 12 Parcel, a tract of land located in Harrison County, Texas at the Former Longhorn Army Ammunition Plant (LHAAP). As a National Priority List (NPL) site, LHAAP is being environmentally restored in accordance with the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 120. The groundwater in and around Landfill 12 is contaminated with trichloroethene (TCE) and other volatile organic compounds. Land use controls (LUCs), including a groundwater restriction, were implemented at the Landfill 12 Parcel as part of the final environmental remedy. As a result of the restriction, the groundwater may not be accessed or used for any purpose other than environmental monitoring and testing without the prior written approval of the U.S. Army, the US Environmental Protection Agency (USEPA) and the Texas Commission on Environmental Quality (TCEQ). This includes water well drilling and installation. This restriction is long-term and will remain in place until the above agencies agree to its termination.

Pursuant to the Rules of the TCEQ pertaining to Industrial Solid Waste Management, a recordation of the LUCs for this tract of land were filed in the Public Records of Harrison County, Texas. A copy of the recordation including a legal description and map is enclosed for your information.

Point of contact for this action is the undersigned. If you have any questions or require further information, I may be contacted at 479-635-0110, or by email at rose.zeiler@us.army.mil.

Sincerely,

A handwritten signature in cursive script, reading "Rose M. Zeiler", is written over a horizontal line.

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

One Enclosure**Copies furnished:****Fay Duke, TCEQ, Austin, TX****Steve Tzhone, USEPA Region 6, Dallas, TX****Paul Bruckwicki, Caddo Lake NWR, TX****Cliff Murray, COE - Tulsa District, OK****John R. Lambert, COE - Tulsa District, OK****P. Srivastav, Shaw, Houston, TX (for project file)**

7006 2150 0002 9130 0903

U.S. Postal Service	
CERTIFIED MAIL™ RECEIPT	
<i>(Domestic Mail Only; No Insurance Coverage Provided)</i>	
For delivery information visit our website at www.usps.com	
OFFICIAL USE	
Postage	\$ 1.14
Certified Fee	2.65
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	\$3.79

Sent To	Water Well Drillers & Pump Installers
Street, Apt. No., or PO Box No.	PO Box 12157
City, State, ZIP+4	Austin, TX 78711

PS Form 3800, August 2006 See Reverse for Instructions

Appendix E

Five-Year Review Photographs of LHAAP-12

LHAAP-12, 5-Year Review Photos (July 2007)**ENTRANCE TO LHAAP-12 LANDFILL****VIEWING NORTH AT WESTERN PERIMETER OF LHAAP-12 LANDFILL**



VIEWING NORTH AT EASTERN SLOPE OF LHAAP-12



**VIEWING NORTHWEST FROM EASTERN SLOPE OF LHAAP-12
PINE SAPLINGS SHOWN IN FOREGROUND**

FINAL
ENVIRONMENTAL CONDITION OF PROPERTY V
(ECOP V)

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

September 2007

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Acronyms and Abbreviations

AST	aboveground storage tank
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLNWR	Caddo Lake National Wildlife Refuge
CFR	Code of Federal Regulations
DOD	Department of Defense
DOI	Department of the Interior
ECOP	Environmental Condition of Property
ECP	DoD Environmental Condition of Property (classification of an area)
FFA	Federal Facility Agreement
LHAAP	Longhorn Army Ammunition Plant
LUC	Land Use Control
MEC	munitions and explosives of concern
PCB	polychlorinated biphenyl
RD	Remedial Design
ROD	Record of Decision
TCEQ	Texas Commission on Environmental Quality
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank

FINAL ENVIRONMENTAL CONDITION OF PROPERTY V (ECOP V)

**Longhorn Army Ammunition Plant, Karnack, Texas
September 2007**

1.0 PURPOSE

The purpose of this Environmental Condition of Property (ECOP) is to document the environmental condition of the described parcel of land (the “Property”) which comprises part of Longhorn Army Ammunition Plant for transfer to the Department of the Interior (DOI) - U.S. Fish and Wildlife Service (USFWS) - for the purpose of a national wildlife refuge. The transfer is consistent with DoD and U.S. Army Policy. The determination of the suitability for this transfer from the U.S. Army to USFWS is based primarily upon the results of the Environmental Site Assessment, Phase I and II Report, a document which meets the requirement of an Environmental Baseline Survey (Plexus, 2005).

2.0 PROPERTY DESCRIPTION

Longhorn Army Ammunition Plant (LHAAP) is located in central-east Texas in the northeastern corner of Harrison County, between State Highway 43 at Karnack, Texas and the western shore of Caddo Lake (**Figure 1**). As shown on **Figure 2**, the Property consists of 50.54 acres, which includes approximately 41 acres of undeveloped land. The Property is surrounded by an area that has already been transferred to USFWS for management as the Caddo Lake National Wildlife Refuge (CLNWR). The proposed reuse for the Property is industrial or recreational, consistent with the intended use as a national wildlife refuge.

3.0 ENVIRONMENTAL CONDITION OF PROPERTY

The U.S. Army has determined the Property’s environmental condition through information obtained during the course of a series of environmental investigations that commenced at LHAAP in 1988. These investigations include but are not limited to: RCRA Facility Assessment, Remedial Investigation, and Phase I and Phase II Site Assessments. The conditions of the Property are comprehensively presented in a February 2005 document entitled: Environmental Site Assessments, Phase I and II Report (ESA), Production Areas, Longhorn Army Ammunition Plant. The ESA meets the requirements of an Environmental Baseline Survey and has been provided to the USFWS. A comprehensive list of the documents reviewed in determining the environmental conditions of the Property are listed in **Attachment 1**.

The DOD Environmental Condition of Property (ECP) is Category 4, defined as areas where release, disposal, and/or migration of hazardous substance has occurred and all removal or remedial actions to protect human health and the environment have been taken. A description of the Property is presented in **Table 1**.

4.0 ENVIRONMENTAL REMEDIATION SITES AND INFORMATION

One remediation site, a capped landfill of approximately 7 acres, is located on the Property and is designated as LHAAP-12. The site was not remediated to levels suitable for unrestricted use. The landfill was used intermittently for the disposal of industrial solid waste, possibly containing small quantities of hazardous constituents generated at LHAAP. A Record of Decision (ROD) for LHAAP-12 was signed in 1995 establishing the construction of a cap as an interim remedial action (IRA) for the site to mitigate potential risks posed by the burial of landfill waste (U.S. Army and USEPA, 1995). The IRA included land use controls (LUCs) for the protection of the cap. LUCs are any restriction or administrative action including engineering and institutional controls arising from the need to reduce risk to human health and the environment as part of a cleanup remedy. The final remedy consists of LUCs in conjunction with monitored natural attenuation as documented in the Final ROD signed by EPA on July 24, 2006 (Shaw, 2006). LUCs at LHAAP-12 are required to ensure the integrity of the landfill cap and cover system and prevent human exposure to contaminated groundwater. The land use control objectives are as follows: no residential use or residential development of the property, no digging or disturbing the existing cover or contents of the landfill, and no withdrawal or use of LHAAP-12 groundwater for other than environmental monitoring and testing. LUC implementation and maintenance requirements are set forth in the Remedial Design (RD) Addendum for LHAAP-12 (Shaw, 2007b), a primary document of the FFA. The Letter of Transfer will include the LUC objectives and the following land use restrictions: residential use restriction, landfill restriction, and groundwater use restriction. The residential use restriction and landfill restriction boundary includes the 7-acre capped landfill and an area extending to the surrounding fence (approximately 9.4 acres). The groundwater use restriction boundary extends beyond the landfill boundary (approximately 46 acres) as shown on **Figure 2**. The U.S. Army will transfer certain LUC responsibilities to USFWS associated with implementation, maintenance, periodic inspections, reporting and enforcement of LUCs. The appropriate covenants for inclusion into the Letter of Transfer are provided in the Environmental Protection Provisions (**Attachment 2**).

4.1 Storage, Release, or Disposal of Hazardous Substances

There is evidence of a hazardous substance release to the groundwater at LHAAP-12 as indicated by elevated concentrations of trichloroethene (TCE). Groundwater contamination is localized in close proximity to monitoring well 12WW24, located at the northern boundary of the capped

area (**Figure 2**). A maximum TCE concentration of 495 µg/l was detected during 1995. The groundwater contamination was likely caused by historic leaching of hazardous substances from the landfill waste to the groundwater via rainwater infiltration prior to capping the landfill. No records of hazardous substance quantities disposed in the landfill are available. Although the quantity of TCE that may have been disposed in the landfill is unknown, it is unlikely that TCE was disposed in excess of the 40 CFR 373 reportable quantity (i.e. 100 lbs).

4.2 Petroleum and Petroleum Products

4.2.1 Underground and Above-Ground Storage Tanks (UST/AST)

There is no evidence that petroleum or petroleum products were stored in underground or above-ground storage tanks on the Property.

4.2.2 Non-UST / AST

There is no evidence that non-UST/AST petroleum products in excess of 55 gallons were stored for one year or more on the Property.

4.3 Polychlorinated Biphenyls

There is no evidence that PCB-containing equipment is located or was previously located on the Property.

4.4 Asbestos

There are no existing buildings on the Property and therefore no potential for asbestos containing materials.

4.5 Lead-Based Paint

There are no existing buildings on the Property and therefore no potential for lead-based paint.

4.6 Radiological Materials

There is no evidence that radioactive material or sources were stored or used on the Property.

4.7 Radon

A radon survey was not conducted on the Property since there were no buildings located on the Property.

4.8 Munitions and Explosives of Concern (MEC)

Munitions and Explosives of Concern (MEC), which distinguishes categories of military munitions that may pose unique explosives safety risks, means: (A) unexploded ordnance (UXO), as defined in 10 U.S.C. §101(e)(5); (B) discarded military munitions (DMM), as defined

in 10 U.S.C. §2710(e)(2); or (C) munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard. Three phases of range/site inventory were completed at LHAAP and concluded that the Property does not include any munitions response action sites nor is it known or suspected to contain MEC (EEM, 2002).

4.9 Other Property Conditions

There are no other hazardous conditions on the Property that present an unacceptable risk to human health and the environment.

5.0 ADJACENT PROPERTY CONDITIONS

There are no conditions adjacent to the Property that present an unacceptable risk to human health and the environment.

6.0 ENVIRONMENTAL REMEDIATION AGREEMENTS

The LHAAP Federal Facilities Agreement (FFA), effective as of December 30, 1991, by and between the LHAAP, the Texas Water Commission (currently known as the Texas Commission on Environmental Quality (TCEQ)), and the USEPA Region 6 applies to the Property. All remediation activities on the Property, required by such agreement or order, are completed or in place and operating properly and successfully (See Section 4.0 Environmental Remediation Sites). The Letter of Transfer will include a provision reserving the U.S. Army's right to conduct remediation activities (**Attachment 2**).

7.0 GROUNDWATER MONITORING WELLS

The Property proposed for transfer contains eight monitoring wells as shown on **Figure 2**. A list of monitoring wells including survey information is provided in **Table 2**. The Letter of Transfer will include the groundwater monitoring well notice and covenant provided in the Environmental Protection Provisions (**Attachment 2**).

8.0 POTENTIAL WETLANDS

Although an official wetland survey has not been conducted, the potential for wetlands on the Property is negligible.

9.0 ENDANGERED OR THREATENED SPECIES

No Federally endangered species have been confirmed on the Property proposed for transfer. Following is a list of Federally threatened species that are known or suspected to occur in the vicinity of LHAAP (species that have been confirmed are listed in italics):

□ Federal Listed Threatened Species:

Bald Eagle

Louisiana Black Bear

Following is a list of State threatened species that are known or suspected to occur in the vicinity of LHAAP. Two State endangered species (in italics) have been confirmed on Longhorn and are potentially present on the Property proposed for transfer:

□ State Listed Threatened Species:

Louisiana Black Bear

Rafinesque's Big-Eared Bat

Alligator Snapping Turtle

Timber Rattlesnake

Bluehead Shiner

Some evidence is available regarding the potential presence of the Timber Rattlesnake at Longhorn. This State-listed species is described in historical site documents as being confirmed present on the site based on a visual observation documented in 1993. Wildlife experts familiar with the site have indicated that potential habitat suitable for the Timber Rattlesnake is present on site and LHAAP is within this species' historical range. However, there is no recent documented evidence of this species being present on site and it has not been observed by USFWS wildlife personnel stationed at the installation. It is assumed that the Timber Rattlesnake is potentially present (Shaw, 2007a).

10.0 ARCHEOLOGICAL PROPERTIES

The presence of archeological sites on the Property is unknown as a survey has not been performed.

11.0 REGULATORY COORDINATION

In accordance with the RD Addendum for LHAAP-12, the USEPA Region 6 and TCEQ will be provided a copy of this ECOP V for regulatory review of all LUC-related provisions. Copies will also be provided to the USFWS and the Restoration Advisory Board for information.

12.0 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

The environmental impacts associated with the proposed transfer of the Property have been analyzed in accordance with the National Environmental Policy Act. The results of this analysis have been documented in the Categorical Exclusion and Record of Environmental Consideration (U.S. Army, 2007) which is supported by the Final Environmental Site Assessment Phase I and II Report for the Production Areas, prepared by Plexus Scientific Corporation, February 2005. There were no encumbrances or conditions identified in the NEPA analysis as necessary to protect human health or the environment.

13.0 ENVIRONMENTAL PROTECTION PROVISIONS

On the basis of the above results from the Environmental Baseline Survey and other environmental studies, and in consideration of the intended use of the Property, certain terms and conditions are required for the proposed transfer. These terms and conditions will be set forth in the Environmental Protection Provisions (**Attachment 2**) and will be included in the Letter of Transfer. In the event that the Property or any part thereof, is sold, conveyed, transferred, leased, or otherwise disposed of, the notices, covenants, and restrictions contained in the Environmental Protection Provisions (**Attachment 2**) shall be inserted in any instrument of conveyance.

14.0 CONCLUSION

Based on the above, the Property is determined to be suitable for transfer to the USFWS. The Property must be kept as a national wildlife refuge unless there is an act of Congress that removes the parcel or the land is exchanged in accordance with the National Wildlife Refuge System Act of 1966 and the National Wildlife Refuge System Act Amendments of 1974. The U.S. Army remains responsible for the completion of the environmental program at LHAAP as provided in the FFA.

Thomas E. Lederle
Industrial Branch Chief
BRAC Division, ASCIM
United States Army

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Thomas E. Lederle
Industrial Branch Chief
BRAC Division, ASCIM
United States Army

Attachment 1
References

References

Engineering-Environmental Management, Inc. 2002, ***Final U.S. Army Closed, Transferring, and Transferred Range/Site Inventory for Longhorn Army Ammunition Plant, Texas***, September 15.

Jacobs Engineering (Jacobs), 2001, ***Final Remedial Investigation Report (Volume 1-3) for the Group 2 Sites: 12, 17, 18/24, 29, and 32, at the LHAAP, Karnack, Texas***, April.

Jacobs, 2002, ***Final Baseline Human Health and Screening Ecological Risk Assessment for the Group 2 Sites, Sites 12, 17, 18/24, 29, 32, and 49, Harrison Bayou and Caddo Lake, LHAAP, Karnack, Texas***, August.

Plexus Scientific Corporation, 2005, ***Environmental Site Assessment Phase I and II Report, Final, Production Areas***, February. (Note: This document meets the requirements of an Environmental Baseline Survey)

Shaw Environmental, Inc. (Shaw), 2004, ***Screening-Level Ecological Risk Evaluation for Site 12 Soil, Longhorn Army Ammunition Plant, Karnack, Texas***, September.

Shaw, 2006, ***Final Record of Decision, Landfill 12 (LHAAP-12), Longhorn Army Ammunition Plant, Karnack, Texas***, April. (Note: signed by EPA July 24, 2006).

Shaw, 2007a, ***Installation-Wide Baseline Ecological Risk Assessment, LHAAP, Volume I: Step 3 Report, Draft Final***, January.

Shaw, 2007b, ***Final Remedial Design Addendum Landfill-12 (LHAAP-12)***, June.

U.S. Army and USEPA, 1995, ***Record of Decision for Early Interim Remedial Action at LHAAP12 and 16 Landfills, LHAAP, Karnack, Texas***, September.

U.S. Army, 2007, ***Record of Environmental Consideration for Proposed Transfer Addressed in ECOP V***, August.

Attachment 2
Environmental Protection Provisions

ATTACHMENT 2

Environmental Protection Provisions

The following conditions, restrictions, and notifications will be incorporated by reference into the Letter of Transfer from the Department of the U.S. Army to the Department of Interior (DOI) to ensure the protection of human health and the environment and in furtherance of ongoing and completed remediation activities at the Property.

1. Inclusion of Provisions:

The Federal agency to whom the Property is transferred shall neither transfer the Property, lease the Property, nor grant any interest, privilege, or license whatsoever in connection with the Property without the inclusion of the environmental protection provisions contained herein, and shall require the inclusion of such environmental protection provisions in all further deeds, transfers, leases, or grant of any interest, privilege, or license, unless there is a specific legal finding authorizing a change and specifically addressing any liabilities that will result from the change. The Property must be kept as a national wildlife refuge unless there is an act of Congress that removes the parcel or the land is exchanged in accordance with the National Wildlife Refuge System Act of 1966 and the National Wildlife Refuge System Act Amendments of 1974.

2. Federal Facilities Agreement:

The U.S. Army acknowledges that portions of Longhorn Army Ammunition Plant have been identified as National Priorities List (NPL) sites under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended. The USFWS acknowledges that the U.S. Army has provided it with a copy of the LHAAP Federal Facility Agreement (FFA) dated December 30, 1991 and will provide the USFWS with a copy of any amendments thereto. The USFWS, its successors and assigns, agree that should any conflict arise between the terms of the FFA as they presently exist or may be amended, and the provisions of this property transfer, the terms of the FFA will take precedence. The USFWS, its successors and assigns, further agree that notwithstanding any other provisions of the transfer, the U.S. Army assumes no liability to the USFWS, its successors and assigns, should implementation of the FFA interfere with the use of the Property. The USFWS, its successors and assigns, shall have no claim on account of any such interference against the U.S. Army or any officer, agent, employee or contractor thereof.

3. No Liability for Non-Army Contamination:

The U.S. Army shall not incur liability for response action or corrective action found to be necessary after the date of transfer, in any case in which the Federal agency to whom the Property is

transferred, or other non-Army person or entity, is identified as the party responsible for contamination of the Property.

4. CERCLA Access Notice:

The USEPA and TCEQ and their officers, agents, employees, contractors, and subcontractors have the right, upon reasonable notice to the USFWS, to enter upon the Property in any case in which a response action or corrective action is found to be necessary after the date of transfer of the Property, or such access is necessary to carry out a response action or corrective action on adjoining property, including, without limitation, the following purposes:

To conduct investigations and surveys, including, where necessary, drilling, soil and water sampling, testing-pitting, test soil borings and other activities;

To inspect field activities of the U.S. Army and its contractors and subcontractors;

To conduct any test or survey related to the environmental conditions at the transferred Property or to verify any data submitted to the USEPA or TCEQ by the U.S. Army relating to such conditions;

To construct, operate, maintain or undertake any other response or remedial actions as required or necessary including, but not limited to, monitoring wells, pumping wells and treatment facilities.

5. Land Use Restrictions and Covenants

A. The United States Department of the Army has undertaken careful environmental study of the Property and concluded that the land use restrictions set forth below are required to ensure protection of human health and the environment. The USFWS, its successors or assigns, shall not undertake nor allow any activity on or use of the property that would violate the land use restrictions contained herein. The land use restriction boundaries have been surveyed and metes and bounds established and recorded in Harrison County Courthouse. A map depicting the land use restriction locations is provided as **Figure 2**.

(1) Residential Use Restriction. The USFWS, its successors and assigns, shall use the Property solely for the purpose of a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. For purposes of this provision, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12.

(2) Groundwater Restriction. USFWS is hereby informed and acknowledges that the groundwater under the Property is contaminated with TCE and other VOCs. The USFWS, its successors and assigns, shall not access or use ground water underlying the Property for any

purpose without the prior written approval of U.S. Army, the USEPA and the TCEQ. For the purpose of this restriction, "ground water" shall have the same meaning as in section 101(12) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). A Land Use Control (LUC) restricting the use of groundwater has been established for the protection of human health. Prior to transfer, the U.S. Army will record the groundwater use restriction and survey plat at the Harrison County Courthouse. The U.S. Army will also notify the Texas Department of Licensing and Regulation of the groundwater restriction which includes prohibition of water well installation for any purpose other than environmental monitoring and testing without prior approval by the U.S. Army, the USEPA and the TCEQ. The LUC will remain in place until applicable or relevant and appropriate requirements (ARARs) as established in accordance with the NCP (40 CFR 300) are met.

(3) Landfill Restriction. USFWS is hereby informed and acknowledges that a closed non-hazardous landfill (LHAAP-12) is located on the Property. LUCs have been established to protect the integrity of the remedy. Prior to transfer, the U.S. Army will record the landfill restriction and survey plat at the Harrison County Courthouse. The USFWS, its successors and assigns, shall not conduct or permit others to conduct any activity that would damage the integrity of the landfill cover (i.e. digging or disturbing the existing cover or contents of the landfill). The LUCs will remain in place for perpetuity unless otherwise removed by the U.S. Army per agreement with the USEPA and TCEQ.

B. Modifying Restrictions. USFWS, its successors and assigns, shall not, without U.S. Army and USEPA concurrence, make a significant modification to, or terminate a LUC, or make a land use change inconsistent with the LUC objectives and use assumptions of the selected remedy. LUCs shall remain in effect until such time the U.S. Army, USEPA, and TCEQ agree that the concentrations of hazardous substances has been reduced to levels that allow for unlimited exposure and unlimited use.

C. LUC Obligations. The LUC objectives specified in the Final ROD for LHAAP-12 are as follows: no residential use or residential development of the property, no digging or disturbing the existing cover or contents of the landfill, and no withdrawal or use of LHAAP-12 groundwater for other than environmental monitoring and testing. LUC implementation and maintenance requirements are set forth in the Remedial Design (RD) Addendum for LHAAP-12 (Shaw, 2007b), a primary document of the FFA. The USFWS acknowledges that the U.S. Army has provided a copy of the RD dated June 21, 2007 and will provide USFWS a copy of any amendments thereto. Implementation, maintenance, inspection, reporting, and enforcement of LUCs are required to ensure protection of the remedy and prevention of human exposure to TCE-contaminated groundwater. In compliance with the LUCs, the USFWS, its successors and assigns, covenants and agrees to implement LUCs through the following:

- Maintenance of the integrity of the landfill cap, including at a minimum, minor repairs such as desiccation cracks, or gulying upon observance
- Maintenance of a vegetative cover on the landfill cap including regular mowing
- Maintenance of fence line and signage around the landfill cap
- Prohibition of any activities that would affect the integrity of the cap
- Prohibition of any activities that would cause exposure to contaminated groundwater

The USFWS, its successors and assigns, also covenants and agrees to the following LUC inspection and reporting responsibilities:

- Conduct periodic physical inspections (no less than an annual basis) to determine whether the required LUC mechanism remains effective
- Report any disturbance to the landfill cover system to the U.S. Army, USEPA, and TCEQ
- Prepare annual inspection reports confirming that LUCs implemented on the property are in compliance and upon request provide copies to the U.S. Army, USEPA, and TCEQ
- Retain copies of each report with availability to the Army during preparation of CERCLA Five Year Reviews

The U.S. Army will remain responsible for: (1) conducting CERCLA 121(c) five year reviews; (2) notification of the appropriate regulators of any known LUC deficiencies or violations; (3) access to the property to conduct any necessary response; (4) reservation of the authority to change, modify or terminate LUCs and any related transfer or lease provisions; and (5) ensuring that the LUC objectives are met to protect the integrity of the selected remedy.

6. Notice of the Potential for the Presence of Munitions and Explosives Concern, and Covenant:

Based upon a review of existing records and available information, none of the land proposed for transfer is known or suspected to contain munitions and explosives of concern (MEC). The term MEC means specific categories of military munitions that may pose unique explosives safety risks and includes: (1) Unexploded Ordnance (UXO), as defined in 10 U.S.C. §101(e)(5); (2) Discarded military munitions (DMM), as defined in 10 U.S.C. §2710(e)(2); or (3) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard. In the event that USFWS, its successors, or assign should discover any MEC on the Property, they shall immediately stop any intrusive or ground-disturbing work in the area or in

any adjacent areas and shall not attempt to remove or destroy it, but shall immediately notify the Harrison County Sheriff's Department (phone number: 903-923-4000), so that appropriate explosive ordnance disposal personnel can be dispatched to address such MEC as required under applicable law and regulations. An alternate contact is the City of Marshall Fire Department (phone number: 903-938-6711). Local authorities must contact the U.S. Army's 705th Explosives Ordnance Detachment (EOD) at Fort Polk, LA (phone number: 337-531-5502; the 24-hour emergency phone number is 337-531-5505).

7. Notice of the Presence of Groundwater Monitoring Wells and Covenant:

- a. The USFWS is hereby informed and does acknowledge the presence on the Property of eight (8) groundwater monitoring wells that may be necessary for the U.S. Army to complete monitoring after the date of transfer of title to the Property, or portions thereof.
- b. Promptly upon the determination by the U.S. Army that a well is no longer necessary for monitoring, the U.S. Army will close such well at the U.S. Army's sole cost and expense in accordance with applicable laws, regulations, and ordinances.

8. Conditions, Restrictions, and Covenants Binding and Enforceable:

These restrictions and covenants are binding on the USFWS, its successors and assigns, and shall be included in subsequent deeds; shall run with the land; are forever enforceable; shall benefit the public in general and the territory surrounding the Property, including lands retained by the U.S. Army; and shall further the common environmental objectives of the U.S. Army and the State of Texas and are therefore enforceable by the U.S. Army and the State of Texas.

Tables

**TABLE 1 – DESCRIPTION OF PROPERTY
LONGHORN ARMY AMMUNITION PLANT (LHAAP), KARNACK, TEXAS**

PARCEL	Property Description	ECP Category	Remedial Actions
LHAAP-12	<p>Disposal in the LHAAP 12 landfill was started prior to April 1963. The landfill was used intermittently for the disposal of industrial solid waste, possibly containing hazardous constituents, generated at LHAAP. This was standard landfill practice among public and private industry at the time. Disposal began in a diversion ditch from Central Creek and one of its principal tributaries and continued until 1978 when disposal was moved onto a hillside in the northeast portion of the site. In the early 1980's, areas southeast of the diversion ditch were cleared and used for disposal. Disposal in the LHAAP 12 landfill ceased in April 1994. The waste buried in the diversion ditch is suspected to be the primary source of contamination in the LHAAP 12 landfill.</p>	4	<p>A release, disposal, or migration of hazardous substance has occurred at Landfill 12, and the approved remedy is in place and operating.</p> <p>An IRA was implemented in 1998 to address the landfill waste materials. The containment remedy, a multilayer cap and cover system was necessary to mitigate potential risks posed by buried source material at the site. Placement of a multilayer cap isolated wastes in the landfill. The IRA addressed the risks associated with landfill source materials by eliminating the direct exposure pathway to source area waste material, preventing contaminant transport to surface water via surface runoff, and reducing leaching of contaminants to the groundwater. The IRA ROD called for warning signage, use restrictions, regular inspections, maintenance and repairs of the cap and cover system, and CERCLA 5-year reviews. The final remedy is LUCs for the protection of the cap and prevention of human exposure to TCE-contaminated groundwater in conjunction with MNA. The remedy meets the remedial action objectives developed for this site to protect human health and the environment by preventing human exposure to TCE-contaminated groundwater, preventing TCE-contaminated groundwater from migrating into the nearby surface water, and reducing the leaching and migration of landfill hazardous substances into the groundwater.</p> <p>A final ROD documents that remedial action has been taken and land use controls implemented to protect human health and the environment. Groundwater monitoring will be performed to evaluate the effectiveness of the remedy. The final ROD was signed by EPA on July 24, 2006. The U.S. Army will conduct CERCLA 5-year reviews since LHAAP-12 was not remediated for unrestricted use.</p>

Category 4: Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions to protect human health and the environment have been taken.

TABLE 2 – Groundwater Monitoring Well Locations

Monitoring Well ID	Installation Date	Depth (feet)	State Plane Coordinate System, Texas North Central (4202), NAD 83, feet	
			Easting X_Coordinate	Northing Y_Coordinate
12WW01	4/27/1993	27	3311750.5	6954375.0
12WW02	4/28/1993	29.5	3311825.4	6954166.7
12WW05	5/3/1993	36	3311401.7	6954556.7
12WW20	1/6/2005	38	3311532.6	6954562.6
12WW21	1/6/2005	40	3311769.5	6954764.0
12WW22	1/6/2005	38	3311368.7	6955188.5
12WW23	1/6/2005	23	3312020.8	6954846.6
12WW24	12/7/2006	26	3311625.7	6954522.7

Figures

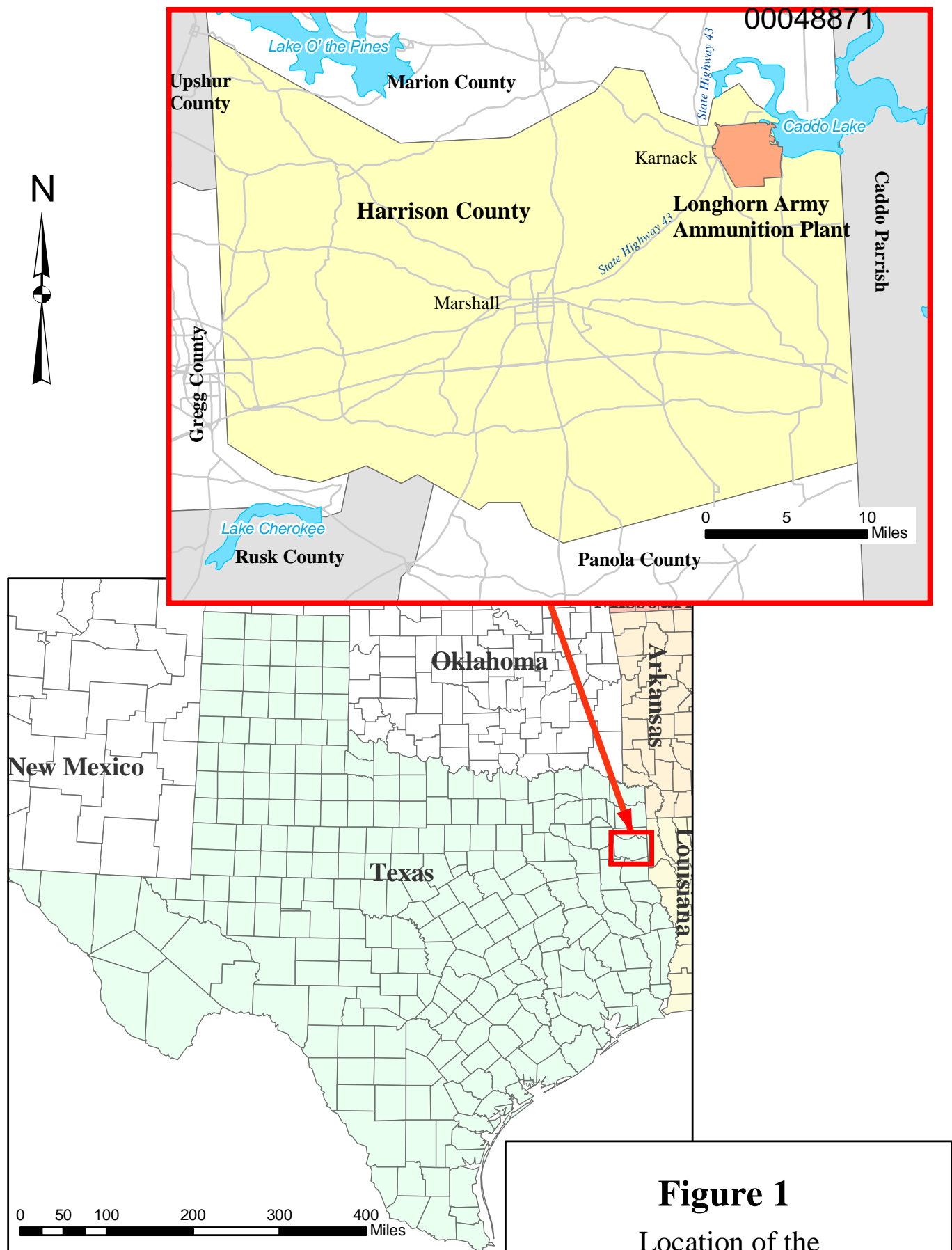
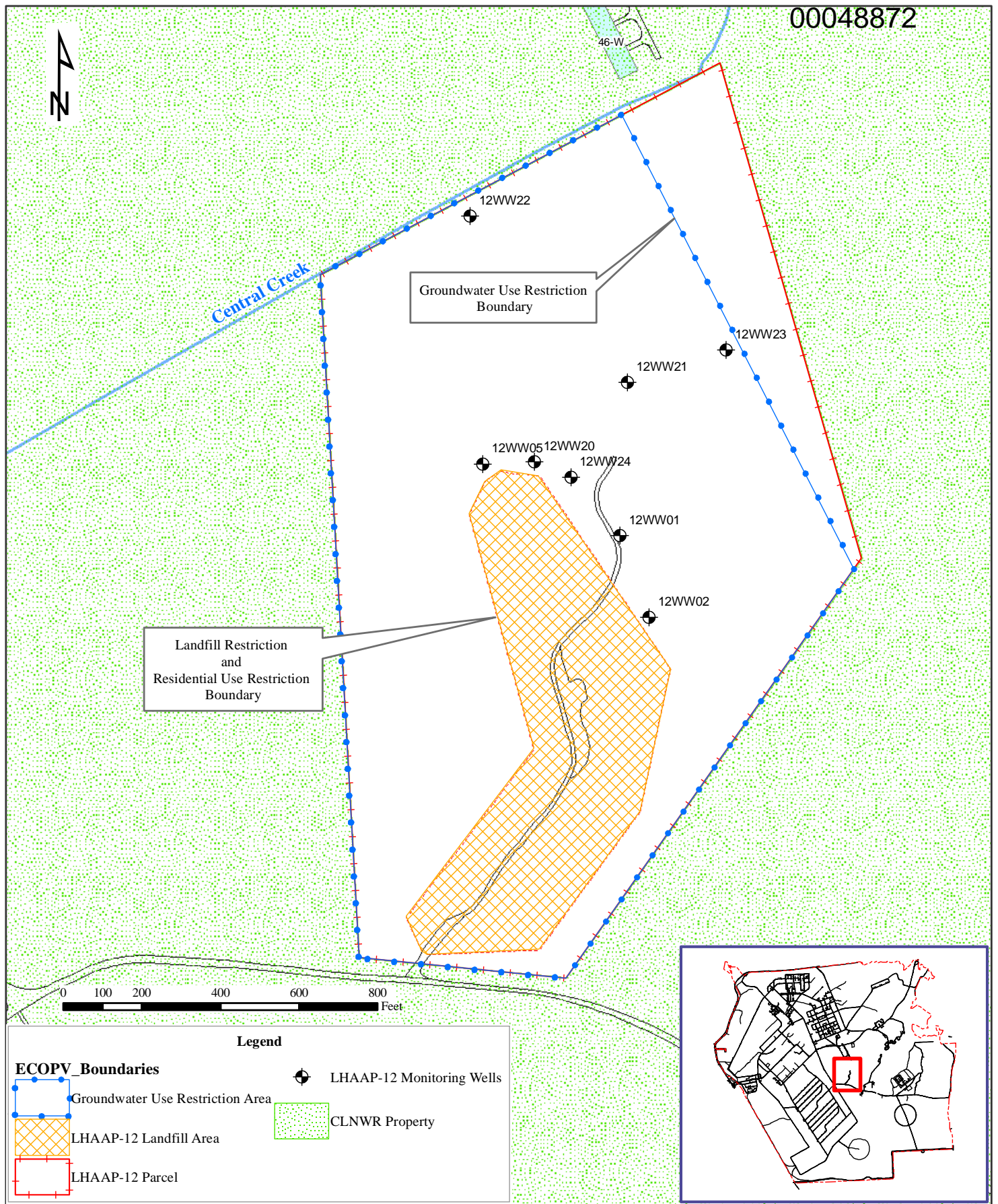


Figure 1
Location of the
Longhorn Army Ammunition Plant
Harrison County, Texas



LONGHORN ARMY AMMUNITION PLANT

ENVIRONMENTAL CONDITION OF PROPERTY (ECOP) V

FIGURE 2. Location of Proposed Transfer Property and Land Use Control Boundaries



00048873

LONGHORN ARMY AMMUNITION PLANT
RESTORATION ADVISORY BOARD
Karnack, Texas
(479) 635-0110

AGENDA

DATE: Tuesday, September 11, 2007
TIME: 6:30 – 7:30 PM
PLACE: Karnack Community Center, Karnack, Texas

- 06:30** Welcome {RMZ & PF}
- 06:35** Open items {RMZ}
- 06:40** Defense Environmental Restoration Program (DERP) Performance Based Contract (PBC) Update {Shaw}
Groundwater Treatment Plant (GWTP) Update
5-Year Review Report for LHAAP-12, 16, and 18/24
Ecological Risk Assessment Status
Field Work Update
Documents Status/ Environmental Sites
Perimeter Well Monitoring
- 06:50** DERP Total Environmental Restoration Contract Update {Shaw}
Documents Status/ Environmental Sites
Draft Final Proposed Plans for 8, 32, 37, 48, 53, & 67
Site 59 SI Report
Well installation/abandonment at LHAAP-37
OPS Demonstration Report for LHAAP-12
- 07:00** Military Munitions Response Program (MMRP) Update {USACE}
- 07:25** Other Environmental Restoration Issues/Concerns {RMZ }
Demolition Landfill Closure
- 07:30** Adjourn {RMZ}



**Subject: Draft Final Minutes, Quarterly Restoration Advisory Board (RAB)
Meeting, Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: Karnack Community Center, Karnack, Texas

Date of Meeting: September 11, 2007, 6:30 – 07:45 PM

Meeting Participants:

LHAAP/BRAC:	Rose M. Zeiler
USACE-Tulsa:	Cliff Murray, John R. Lambert
USFWS:	Mark Williams
Shaw Environmental:	Praveen Srivastav
USEPA Region 6:	Stephen Tzhone, Scott Harris
TCEQ:	Fay Duke
Community:	RAB Co-Chair: Paul Fortune; RAB: Nigel Shivers, Shirley Shivers, Tony Novak, Judith Johnson

An agenda for the meeting was distributed prior to the meeting

Welcome – Paul Fortune and Rose Zeiler

Paul Fortune opened the meeting and brought the 2007 second quarter of the Restoration Advisory Board meeting to order.

The draft final minutes from the June 2007 meeting were distributed prior to the meeting. No comments or changes were made to the minutes.

Open Items – Rose Zeiler

None.

Defense Environmental Restoration Program (DERP) Performance Based Contract (PBC) Update–Praveen Srivastav

Groundwater Treatment Plant (GWTP) Update

Praveen Srivastav indicated that operations at the GWTP were normal for the past quarter. He indicated that Shaw is currently in the process of optimizing the recovery of contaminants at the plant. Paul asked how long it would take to clean up (groundwater at LHAAP-18/24) and

how much contaminated water has been removed or treated by the system. Praveen indicated that the amount of groundwater that has been treated by the plant is available in the GWTP quarterly reports. He further stated that it is difficult to estimate the time it would take to clean up the groundwater because the original quantities of solvents released at the site are unknown. Nigel Shivers asked about the optimization of the treatment process Shaw is considering. Praveen explained that Shaw will reinject the treated water from the GWTP into the ground to flush the system. The concept is that more water goes through the subsurface, more contaminants will be removed.

5-Year Review Report for LHAAP-12, -16, and 18/24

Document is pending the resolution of comments.

Ecological Risk Assessment Status

The Final Baseline Ecological Risk Assessment (BERA) is close to completion. A number of documents are on hold until the BERA is finalized. Once the regulators' comments are resolved and the document finalized, many of the sites on hold pending this assessment will progress to the next stage.

Field Work Update

Praveen said that Shaw has installed wells at the Pistol Range and LHAAP-16. Shaw has also decided to install a well downgradient of LHAAP-47 to delineate the solvent plume. Sampling will proceed at LHAAP-47 after the well installation is complete.

Document Status/Environmental Sites

A document status table was provided. Praveen briefly went over the highlights on the document status/environmental sites table.

Perimeter Well Monitoring

Perimeter well sampling was completed in August 2007. Data will be provided at the next meeting.

DERP Total Environmental Restoration Contract (TERC) Update –Praveen Srivastav

Praveen Srivastav discussed the highlights of the Document Status Table for the TERC contract.

Draft Final Proposed Plans for 8, 32, 37, 48, 53, & 67

These documents are on hold for the finalization of the BERA.

Site 59 SI Report

As requested by the regulators in the review of the SI report for LHAAP-59, additional samples will be collected at LHAAP-59 near 59SB01 and analyzed for pesticides because the total results for the initial SPLP sample were much lower than the original total results.

DERP Corps of Engineers Update – USACE

Military Munitions Response Program (MMRP) Update – John Lambert

John Lambert said that the public comment period for the EE/CA ended on Sep 5, 2007. No comments were received. The Draft Action Memorandum is ready and out for BRAC review and signature. The contract for the removal action will be awarded as soon as the Action Memo is signed. He also indicated that Munitions Response Site (MRS) Prioritization Protocol was released in August 2007 for public comment. The comment period ended Sep 10. The Explosive Safety Submission is expected to be completed by Dec 2007/Jan 2008 and a response complete report for the project is expected by July 2008. The regulators will get an opportunity to review the removal work plan.

John Lambert presented the Munitions Response Site Prioritization Protocol process for characterizing programmatic risk of MRSs so that Army can plan and program funding for sites on a prioritized basis.

Paul Fortune asked when the Army started looking for the ordinance. Rose replied that it began in 2002.

Tony Novak commented that some one said that the Army is analyzing for certain materials. He wondered where that contractor is. John Lambert replied that it was CAPE, the previous contractor who conducted the EE/CA. Army will have a new contractor to conduct the next phase of the work. Rose added that CAPE's responsibility was looking for munitions explosives constituents (MEC) and munitions chemical constituents associated with UXO that may pose a risk to human health and safety.

Paul asked if that was a private contractor. Rose indicated that they are and that there is also a lot of USACE oversight. Paul wanted to know if they will now clear a much larger area. John said that they will burn surface area and conduct a surface clearance of sites LHAAP-27 and LHAAP-54. The process will include the use of magnetometers to screen the ground and subsurface.

Mark Williams added that the only subsurface work is in 11 acres in the OB/OD area. He said they will not be digging at site LHAAP-54. John clarified and said it will be all surface clearance for sites LHAAP-27 and LHAAP-54 (subsurface clearance only for the OB/OD area) but that surface clearance still includes the use of a magnetometer for items buried at shallow levels.

Other Environmental Restoration Issues/Concerns - Rose Zeiler

Demolition Landfill Closure

Rose indicated that the old construction landfill has a cover but it has not been formally closed. The State has informed the Army that it has no objections to continued use of the landfill. Therefore, the Army may dispose of demolition debris from the Power House at the construction landfill.

Next RAB Meeting

The next RAB meeting will be held on December 11, 2007 at 6:30 PM.

Adjourn

September Meeting Attachments and Handouts:

June 2007 RAB Meeting Minutes; June Attendees Signup Sheet; USACE Status of Technical Documents TERC; Status of Technical Documents MARC PBC



Shaw Environmental, Inc.

Longhorn Army Ammunition Plant Restoration Advisory Board Meeting



Location	Karnack Community Center, Karnack, Texas		
Date	11-Sep-2007	6:30 PM	page 1 of 1

Please sign in the space provided or add your name and address on next page if your name does not appear below.

ATTENDEES

Name (printed)	Signature	Organization	Phone	E-mail
RAB Members				
Paul Fortune	<i>Paul Fortune</i>		903.930.5679	plfortune@hotmail.com
Robert Speight				r.speightjr@att.net
Larry McCathran				MMcattle@yahoo.com
Nigel R. Shivers	<i>Nigel R. Shivers</i>	RAB		2shivers@gower.net
Shirley Shivers	<i>✓ Came towards end of mtg.</i>			2shivers@gower.net
Tom Walker	<i>Tom Walker</i>			twalkercaddolake@gmail.com
Tony Novak	<i>Tony Novak</i>			paldog@earthlink.net
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Ken Shaw				kens@shreve.net
more spaces on next page				
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John Elliott		SHAW	(713) 996-4517	john.elliott@shawgrp.com
Kay Everett		SHAW	(713) 996-4421	kay.everett@shawgrp.com

~~continued on next page~~

END OF SIGNUP SHEET



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
September 11, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
	ERA								
	BERA RTCs (revised)	6/28/07		x			Complete	x	Plan is to incorporate these comments and subsequent responses directly into DF document and issue BERA as final. Surface water sampling data will also be included in final.
	Final Step 3 report (Vol I of BERA) – RLS Version	TBD					Pending review of interim deliverables (below)		Expected issue in Early Oct and dependent upon receipt of comments from regulators.
	Final BERA (Vol II of BERA) – RLS Version	TBD					Complete Pending review of interim deliverables (below)		Expected issue in Early Oct and dependent upon receipt of comments from regulators.
	BERA interim Deliverables package	8/21/07		x			Under regulatory review	x	Supplemental information requested/discussed at Comment resolution meeting.
	ENVIRONMENTAL								
	Draft Final SI/Evaluation Report, LHAAP-02	3/30/06		x			Comments rec'd from TCEQ 8/29/06. EPA comments rec'd 5/12/06.	x	Final will be issued when BERA information available.
	Draft Final Proposed Plan, LHAAP-60	7/7/06		x			Comments rec'd from TCEQ 8/1/06. EPA comments rec'd 8/21/06.	x	Final to be submitted when BERA information available.
	Draft Final Feasibility Study, LHAAP-58	10/7/07					On hold pending BERA		No eco risk expected at the site based on Draft Final BERA. Draft Final to be submitted to the regulators after BERA is finalized.
	Draft Feasibility Study, LHAAP-17	TBD					On hold pending BERA		Draft versions 80% complete. Draft will be issued when BERA information available.



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
September 11, 2007**

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	Revised RTC on DF SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68	8/16/07		x	9/18/07		Under regulatory review	x	
	Final SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68 (combined)	10/12/07					Pending Final will be issued based on resolution of RTC for DF		
	Draft Final SI Report for LHAAP-35/36	8/21/07		x	9/25/07		Under regulatory review	x	
	Draft Final LHAAP-16 MNA Evaluation Proposal	TBD		x		EPA comments rec'd 3/28/07, TCEQ has provided verbal comments – no formal written comments rec'd.	Final being revised to reflect recent discussions once open issues resolved.	x	<ul style="list-style-type: none"> No formal comments received from TCEQ. Perchlorate standard for stream still needs to be resolved.
	Draft Final 5 Year Review Report for LHAAP-12, 16, and 18/24	8/30/07		x			Under regulatory review	x	Expedited turnarounds requested in effort to meet EPA schedule.
	Draft SI Report for LHAAP-03	8/16/07 (Army)	x		8/31/07		Complete. Army comments received 9/4/07		
	Draft Final SI Report for LHAAP-03	9/14/07 (Army)			10/15/07		In preparation		Will be incorporated into FINAL SI report for sites -06, -07, -51, -55, -64, -66, -68. Revised version expected to be issued late July 2007.
	Draft Site Evaluation Report for LHAAP-49	8/17/07 (Army)	x		9/4/07		Complete		



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
September 11, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
	Draft Final Site Evaluation Report for LHAAP-49	9/14/07 (Army)	x		10/15/07		In preparation		
	Draft EE/CA for LHAAP-04	TBD					In preparation		On hold pending resolution of BERA issues.

Technical Document Status Table
TERC Task Order NO. 0109
Longhorn Army Ammunition Plant

00048882

Site	Documents in Progress	Draft Document				Draft Final Document									Final
		Draft Submittal Date	Army Comments	Shaw RTC	Comment Resolution	Draft Final Submittal Date	AEC Comments	EPA Comments	TCEQ Comments	Shaw RTC	Army Comments	Comment Resolution	Army forward RTC to TCEQ & EPA	Comment Resolution	Final Submittal Date
08	Proposed Plan, LHAAP-08	05/01/06	05/24/06			07/07/06	08/25/06	08/21/06	09/20/06	09/29/06			11/21/06	TCEQ 12/07/06 EPA 02/21/07	
08	Record of Decision, LHAAP-08	10/26/07													
12	Operating Properly and Successfully Demonstration Report, LHAAP-12	07/25/07	07/27/07	07/31/07	08/02/07	08/02/07	NA	08/27/07	NA	08/29/07	08/29/07	08/29/07	08/29/07	08/31/07	09/07/07
32	Proposed Plan, LHAAP-32					07/21/06	08/25/06	09/05/06	09/12/06	09/19/06			11/21/06	TCEQ 12/07/06 EPA 01/26/07	
32	Record of Decision, LHAAP-32	10/26/07													
37/67	Proposed Plan, LHAAP-37/67	05/02/06	05/24/06	06/06/06	06/22/06	07/18/06	08/25/06	09/05/06	09/20/06	10/19/06	10/31/06	11/07/06	11/21/06	TCEQ 04/27/07 EPA 02/21/07	08/29/07
37/67	Record of Decision, LHAAP-37/67	10/26/07													
37/67	Remedial Design/LUCs, LHAAP-37/67	02/28/08													
48/53	Revised Proposed Plan, LHAAP-48/53	09/25/06	10/31/06	11/14/06	01/12/07	04/09/07	USACHPPM 04/25/07 OC 05/15/07	6/12/07 via USACE	04/27/07	06/27/07	07/12/07 07/13/07	08/16/07	08/27/07	TCEQ _____ EPA 08/27/07	
48/53	Record of Decision, LHAAP-48/53	10/26/07													
59	Site Investigation Report, LHAAP-59	11/02/06	11/07/06	11/09/06	11/15/06	11/21/06	None Required	03/20/07	01/11/2007, 03/20/07, & 03/22/07	04/02/07	RMZ 04/12/07 USACE 04/11/07	04/12/07	04/25/07	TCEQ 06/15/07 EPA 04/30/07	08/02/07
59	Decision Document, LHAAP-59	10/26/07													

Shaw Forecasted Submittal Date

Shaw Action Item

Army Action Item

EPA & TCEQ Action Item

Current Action item

LONGHORN ARMY AMMUNITION PLANT,

00048883

Karnack, Texas

MONTHLY MANAGERS' MEETING

AGENDA

DATE: Tuesday, 11 September 2007
TIME: 2:00 p.m.
PLACE: Longhorn Army Trailer: 903-679-3192

Welcome **RMZ**

Review of August 2007 Meeting Minutes and Action Items **RMZ**

Shaw

- Shaw to provide BERA interim deliverables by August 24 or 27.
- Shaw to provide regulators a 5-year review report by late August.
- Shaw to provide response to USGS comments on quarterly groundwater reports.
- Shaw to provide perimeter well results at the next RAB meeting.

EPA

- Steve Tzhone to check on the requirement for annual O&M reporting with EPA legal

Army

- Rose Zeiler to check on the requirement for annual O&M reporting with BRAC legal

TCEQ

Fay Duke to provide comments on LHAAP-59 report

Programmatic Issues **SZ/FD**

Reasonably Anticipated Use and LUCs
Finalization of documents – process

Defense Environmental Restoration Program (DERP) PBC Update **DC/PS**

- Document Status/Environmental Sites (Table)
- BERA Status
- Update on Ongoing Field Work – Installation of wells at LHAAP-16 and Pistol Range, groundwater sampling at LHAAP-16, Pistol Range, LHAAP-46, and LHAAP-47
- 5-Year Review
- Status of Pilot Study at LHAAP-18/24
- Groundwater Treatment Plant Update

DERP Total Environmental Restoration Contract Update **JE/PS**

- Documents Status/Environmental Sites (Table)
- Fieldwork: Well abandonment and installation at Site 37
- Additional sampling at Site 59
- RODs for Sites 8, 32, 37, 48, 53, and 67
- Concurrence letter for OPS on LHAAP-12
- LUC Management Plan
- O & M Plans

MMRP Update

- Update on Action Memorandum and Award
- Projected Schedule for Removal Action
- MRS Priority Protocol

Transfer Update

RMZ

- ECOP IV transfer
- ECOP V (Concurrence letter from EPA)
- Pits and Hazards Abatement
- Utility License Progress
- Power House Demolition – Outlook
- Status of Demolition Landfill



**Subject: Draft Final Minutes, Monthly Managers Meeting,
Longhorn Army Ammunition Plant (LHAAP)**

Location of Meeting: Army Trailer, Longhorn AAP, TX

Date of Meeting: September 11, 2007; 2:30 PM – 4:30 PM

Meeting Participants:

BRAC:	Rose M. Zeiler
USACE-Tulsa:	Cliff Murray, John Lambert
USAEC	Jeff Armstrong (phone)
Shaw Environmental:	Praveen Srivastav, Dave Cobb (phone)
USEPA Region 6:	Steve Tzhone
TCEQ:	Fay Duke, Dale Vodak
USFWS:	Paul Bruckwicki

Welcome

Rose Zeiler welcomed everyone to the meeting and began reviewing the action items identified from the last meeting.

Action Items from July 2007 Manager's Meeting

Shaw

- **Shaw to provide BERA Interim Deliverables by August 24 or 27** – The deliverables were provided on August 21
- **Shaw to provide regulators the 5-year review report by late August** – The report was submitted to the regulators on August 31.
- **Shaw to provide perimeter well results at the next RAB meeting** – Shaw planned to present the results during the RAB meeting.
- **Shaw to provide responses to USGS comments on quarterly groundwater reports** – The responses were provided on August 14. Quarterly report for 2nd Quarter 2007 would be distributed this week.

EPA

- **Steve Tzhone to check on the requirement for annual O&M reporting with EPA legal** – According to EPA, annual O&M reporting is required. Further discussion on this topic is summarized below.

TCEQ

- **Fay Duke to provide comments on LHAAP-59 Report** – Fay will provide comments soon. Further discussion on the site is summarized below.

Army

- **Rose Zeiler to check on the requirement for annual O&M reporting with BRAC.**

Annual O&M Reporting Requirements

A discussion took place on the whether or not the Army/USFWS are required to submit annual O&M reports to the regulators. EPA and TCEQ stated that it is their understanding that the Army/USFWS should submit the annual O&M reports to the regulatory agencies. Rose Zeiler and John Lambert indicated that annual certifications/inspections were included in the Remedial Design Addendum for Site 12 and the Land Use Control (LUC) Management Plan. These certifications will be held on site and made available for review by regulators. Rose stated that the Army is required to submit the 5-year review reports to the regulators and that the annual certifications/inspections will be included in that report. She emphasized that the Federal government will retain restoration liability after transfer to the USFWS, but that annual reporting and LUC maintenance will be held by USFWS. Fay asked if this meant USFWS would be responsible for on-site field-related implementation and maintenance of LUCs and the Army would remain responsible for the Five Year Review and groundwater monitoring. Rose confirmed, saying that USFWS would do annual mowing, sign and fence maintenance and minor landfill erosion repairs along with annual inspections and certifications. The Army retains responsibility for groundwater monitoring and the ultimate responsibility for the protectiveness of the remedies.

Programmatic Issues

Reasonably Anticipated Future Use and Land Use Controls. Fay Duke stated that if RRR Standard 2 is used to demonstrate that the site meets industrial use requirements, then industrial use has to be ensured via deed recordation. Rose clarified that this would not be a land use control since there is no remedy and that the term “deed” is not appropriate since there is no change in ownership. However, a notification recordation might be more appropriate terminology.

Site 49 and Ecological Risk. There was some discussion on LHAAP-49. Steve Tzhone indicated that USFWS was expecting a hot spot removal of mercury at the site, but that it was EPA’s conclusion that there was no ecological risk at LHAAP-49 to drive a clean up. Barry Forsythe had relayed to him that there was a past verbal agreement regarding removal of mercury hot spot. USFWS is concerned that no further action is being proposed for the site. Rose Zeiler stated that she does not recall any “verbal agreement.”. Rather, before the award of the Performance Based Contract (PBC) to Shaw, Army proposed a removal action to address metals in the soil. The approach was presented at a managers’ meeting and an engineering evaluation/cost analysis (EE/CA) was prepared. The draft EE/CA provided to the

Army was reviewed and determined not to meet the criteria to support an NTCRA. It was the intention of Army to further investigate meeting the criteria, when the effort was shelved in anticipation of the PBC award. The document was never submitted to the regulators. Praveen Srivastav indicated that the recommendation of no further action for LHAAP-49 is based on the determination of no human health and ecological risk. Jacobs risk assessment showed acceptable risk at the site and Shaw's evaluation of the additional data indicates that the conclusion of Jacobs' risk assessment remain unchanged. Any actions at the site have to be based on risk as required by CERCLA. The Site Evaluation report for LHAAP-49 is being submitted for regulatory review and Shaw/Army will respond to any comments generated on the report.

Finalization of Documents. Discussion occurred on what documents may be used to close sites where there is no human health or ecological risk. Steve Tzhone indicated that if a site is under remedial investigation then a proposed plan and record of decision will be required. He thought that most of Longhorn AAP installation has undergone remedial investigation and therefore proposed plans and RODs would be required to close out any of the sites. Fay Duke stated that the Army has invoked risk evaluation by using Standard 2 MSCs at site LHAAP-59, which would place the site at RI level, requiring proposed plan and ROD. The Army's opinion is that a site may be closed after a site inspection without issuing a decision document where there is no risk. The group discussed whether screening levels used to demonstrate no risk should have any bearing on what stage the site is at, SI or RI. A decision on this subject was postponed until further discussions have taken place.

Defense Environmental Restoration Program (DERP) PBC Update (Dave Cobb/Praveen Srivastav)

Document Status/Environmental Sites (Table). Dave Cobb briefly went over the highlights on the document status/environmental sites table. The responses to comments on the SI report for sites LHAAP-06, 07, 51, 55, 64, 66, 68 are in review with the regulators. Fay Duke indicated that she is half way through the responses. Steve Tzhone indicated that he is going to assign the review to Scott Harris. Fay and Steve indicated that they will also have the report for LHAAP-35/36 reviewed during the month of September.

Update on Field Work. Praveen Srivastav informed that Shaw has installed wells at the Pistol Range and LHAAP-16. Shaw has also decided to install a well downgradient of LHAAP-47 to delineate the solvent plume. Sampling will proceed at LHAAP-47 after the well installation is complete.

5-Year Review. Steve Tzhone informed that he has received comments from EPA Headquarters and from Chris Villarreal. He is waiting on further internal EPA comments and from Fay Duke. Steve mentioned that EPA legal has raised an issue with respect to the remedial action objectives for LHAAP-12. He indicated that the RAOs for LHAAP-12 do not include groundwater restoration and a ROD amendment may be required to add this RAO. Fay Duke stated that an OPS would not have been approved had restoration been an RAO. Fay Duke also suggested that the addition of the restoration RAO may be addressed with an explanation of significant difference (ESD).

Operation at GWTP was interrupted because of a gas line break by SWEPCO during installation of an electric pole on August 17. The plant has been down since then. SWEPCO has refused to repair the line at their expense. Shaw is having the line repaired and the plant should be in operation within a few days.

Defense Environmental Restoration Program (DERP) TERC Update (Praveen Srivastav)

Document Status/Environmental Sites (Table). Praveen Srivastav discussed the highlights of the Document Status Table for the TERC contract. Some discussion occurred on LHAAP-59 report currently in regulatory review. Fay Duke indicated that she would like to see additional samples collected near the location 59SB01-01 where SPLP sample was collected. The total results for the SPLP sample were much lower than the original total results. Rose Zeiler agreed and it was decided to collect 2 samples for total and SPLP analysis for pesticides near 59SB01-01. It was also agreed that there would be no further requests for samples if the sample concentrations were low.

MMRP Update (John Lambert)

John Lambert said that the public comment period for the EE/CA ended on Sep 5. No comments were received. The Draft Action Memo is ready and out for BRAC review and signatures. The contract for the removal action will be awarded as soon as the Action Memo is signed. He also indicated that Munitions Response Site (MRS) Prioritization Protocol was released in August 2007 for public comment. The comment period ended Sep 10. The Explosive Safety Submission is expected to be completed by Dec 2007/Jan 2008 and a response complete report for the project is expected by July 2008. The regulators will get an opportunity to review the removal work plan.

Transfer Update (Rose M. Zeiler)

ECOP IV and ECOP V. Rose Zeiler indicated that USFWS has submitted the request for the land identified in ECOP IV. There seems to be a hold up at USFWS. ECOP IV consists of tracts of land in Production Areas 2 and 3 and part of the East Further Investigation Area (EFIA). EPA concurrence letter on ECOP V, the Landfill 12 Parcel, is expected soon.

Pits and Hazards Abatement. Work is done on pits where no contamination was present. It appears that approximately 87,000 gallons of contaminated water will have to be treated.

Utility Easement. The Army is providing a license to SWEPCO for right of way to install electric poles and maintain the poles and lines. Rose showed a map that is being provided to SWEPCO to guide their excavation activities for installation of electric poles. The map showed areas to be avoided near LHAAP-49 due to potential soil contamination.

Demolition Landfill. Rose indicated that the old construction landfill has a cover but it has not been formally closed. The Army may dispose of demolition debris from the Power House at the construction landfill. Dale Vodak stated that opening the landfill for more disposal is not likely to be well received at TCEQ. He will check with his office to find out about using the landfill.

Meeting Adjourned

Action Items:

EPA

- Steve Tzhone to provide comments on 5-year review report

TCEQ

- Fay Duke to provide comments on LHAAP-59 report
- Dale Vodak to check on use of the demolition landfill

Army/Shaw

- Conduct additional sampling at LHAAP-59 and report results

ATTENDEES

[illegible]



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
September 11, 2007**

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	BERA interim Deliverables package	8/21/07		x			Under regulatory review	x	Supplemental information requested/discussed at Comment resolution meeting.
	ENVIRONMENTAL								
	Draft Final SI/Evaluation Report, LHAAP-02	3/30/06		x			Comments rec'd from TCEQ 8/29/06. EPA comments rec'd 5/12/06.	x	Final will be issued when BERA information available.
	Draft Final Proposed Plan, LHAAP-60	7/7/06		x			Comments rec'd from TCEQ 8/1/06. EPA comments rec'd 8/21/06.	x	Final to be submitted when BERA information available.
	Draft Final Feasibility Study, LHAAP-58	10/7/07					On hold pending BERA		No eco risk expected at the site based on Draft Final BERA. Draft Final to be submitted to the regulators after BERA is finalized.
	Draft Feasibility Study, LHAAP-17	TBD					On hold pending BERA		Draft versions 80% complete. Draft will be issued when BERA information available.



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Longhorn Army Ammunition Plant – PBC Contract
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	Revised RTC on DF SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68	8/16/07		x	9/18/07		Under regulatory review	x	
	Final SI Report for LHAAP-06, 07, -51, -55, -64, -66, -68 (combined)	10/12/07					Pending Final will be issued based on resolution of RTC for DF		
	Draft Final SI Report for LHAAP-35/36	8/21/07		x	9/25/07		Under regulatory review	x	
	Draft Final LHAAP-16 MNA Evaluation Proposal	TBD		x		EPA comments rec'd 3/28/07, TCEQ has provided verbal comments – no formal written comments rec'd.	Final being revised to reflect recent discussions once open issues resolved.	x	<ul style="list-style-type: none"> No formal comments received from TCEQ. Perchlorate standard for stream still needs to be resolved.
	Draft Final 5 Year Review Report for LHAAP-12, 16, and 18/24	8/30/07		x			Under regulatory review	x	Expedited turnarounds requested in effort to meet EPA schedule.
	Draft SI Report for LHAAP-03	8/16/07 (Army)	x		8/31/07		Complete. Army comments received 9/4/07		
	Draft Final SI Report for LHAAP-03	9/14/07 (Army)			10/15/07		In preparation		Will be incorporated into FINAL SI report for sites -06, -07, -51, -55, -64, -66, -68. Revised version expected to be issued late July 2007.
	Draft Site Evaluation Report for LHAAP-49	8/17/07 (Army)	x		9/4/07		Complete		



**Status of Technical Documents – 4 week look ahead
Longhorn Army Ammunition Plant – PBC Contract
September 11, 2007**

No.	Documents in Progress	Submittal Date	Army	Regulator	Comments Due from USACE/ Regulators	Comment Resolution	Status	On Stakeholder's Portal?	Remarks
	Draft Final Site Evaluation Report for LHAAP-49	9/14/07 (Army)	x		10/15/07		In preparation		
	Draft EE/CA for LHAAP-04	TBD					In preparation		On hold pending resolution of BERA issues.

Technical Document Status Table
TERC Task Order NO. 0109
Longhorn Army Ammunition Plant

00048894

Site	Documents in Progress	Draft Document				Draft Final Document									Final
		Draft Submittal Date	Army Comments	Shaw RTC	Comment Resolution	Draft Final Submittal Date	AEC Comments	EPA Comments	TCEQ Comments	Shaw RTC	Army Comments	Comment Resolution	Army forward RTC to TCEQ & EPA	Comment Resolution	Final Submittal Date
08	Proposed Plan, LHAAP-08	05/01/06	05/24/06			07/07/06	08/25/06	08/21/06	09/20/06	09/29/06			11/21/06	TCEQ 12/07/06 EPA 02/21/07	
08	Record of Decision, LHAAP-08	10/26/07													
12	Operating Properly and Successfully Demonstration Report, LHAAP-12	07/25/07	07/27/07	07/31/07	08/02/07	08/02/07	NA	08/27/07	NA	08/29/07	08/29/07	08/29/07	08/29/07	08/31/07	09/07/07
32	Proposed Plan, LHAAP-32					07/21/06	08/25/06	09/05/06	09/12/06	09/19/06			11/21/06	TCEQ 12/07/06 EPA 01/26/07	
32	Record of Decision, LHAAP-32	10/26/07													
37/67	Proposed Plan, LHAAP-37/67	05/02/06	05/24/06	06/06/06	06/22/06	07/18/06	08/25/06	09/05/06	09/20/06	10/19/06	10/31/06	11/07/06	11/21/06	TCEQ 04/27/07 EPA 02/21/07	08/29/07
37/67	Record of Decision, LHAAP-37/67	10/26/07													
37/67	Remedial Design/LUCs, LHAAP-37/67	02/28/08													
48/53	Revised Proposed Plan, LHAAP-48/53	09/25/06	10/31/06	11/14/06	01/12/07	04/09/07	USACHPPM 04/25/07 OC 05/15/07	6/12/07 via USACE	04/27/07	06/27/07	07/12/07 07/13/07	08/16/07	08/27/07	TCEQ _____ EPA 08/27/07	
48/53	Record of Decision, LHAAP-48/53	10/26/07													
59	Site Investigation Report, LHAAP-59	11/02/06	11/07/06	11/09/06	11/15/06	11/21/06	None Required	03/20/07	01/11/2007, 03/20/07, & 03/22/07	04/02/07	RMZ 04/12/07 USACE 04/11/07	04/12/07	04/25/07	TCEQ 06/15/07 EPA 04/30/07	08/02/07
59	Decision Document, LHAAP-59	10/26/07													

Shaw Forecasted Submittal Date

Shaw Action Item

Army Action Item

EPA & TCEQ Action Item

Current Action item