LONGHORN ARMY AMMUNITION PLANT

KARNACK, TEXAS

ADMINISTRATIVE RECORD

VOLUME 1 of 4

Year - 2002

Bate Stamp Numbers
027264 - 028356

Prepared for:

Department of the Army
Longhorn Army Ammunition Plant

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD - CHRONOLOGICAL INDEX

VOLUME 1 of 4

Year - 2002

A: Title: Letter - Subject: Discharge Criteria for Perchlorate at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas
Author: James S.H. Sher, P.E., Project Manager, Superfund Cleanup Section, Texas Natural Resource Conservation Commission (TNRCC), Austin, Texas
Recipient: David Tolbert, Commander's Representative, LHAAP
copied to: Chris Villarreal, US Environmental Protection Agency (EPA),
& Jonna Polk, U.S. Army Corps of Engineers (USACE), Tulsa District
Date: 08 January 2002
Bate Stamp: 027264

B: Title: Letter - Subject: Texas Risk Reduction Rules for the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas
Author: Kristian A. Mauricio, Assistant Project Manager, Superfund Cleanup Section, Texas Natural Resource Conservation Commission (TNRCC), Austin, Texas
Recipient: David Tolbert, Commander's Representative, LHAAP
copied to: Chris Villarreal, US Environmental Protection Agency (EPA),
& Jonna Polk, U.S. Army Corps of Engineers (USACE), Tulsa District
Date: 28 January 2002
Bate Stamp: 027265

C: Title: Meeting Agenda – Monthly Manager's Meeting, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas
Recipient: All Parties
Date: 30 January 2002
Bate Stamp: 027266 – 027269

D: Title: Meeting Minutes – Monthly Manager's Meeting, Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas
Recipient: All Parties
Date: 30 January 2002
Bate Stamp: 027270 – 027272

E: Title: Final Report - Remedial Investigation Report - Volume 1: Report, for Group 4 Sites, Sites 35A, 35B, 35C, 46, 47, 48, 50, 60, and Goose Prairie Creek at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas
Author: Jacobs Engineering Group, Inc., Oak Ridge, Tennessee
Recipient: U.S. Army Corps of Engineers (USACE), Tulsa District
Date: January, 2002
Bate Stamp: 027273 – 027520

VOLUME 1 of 4 (continued)

Year - 2002

F: Title: Final Report - Remedial Investigation Report - Volume 2: Appendices, for Group 4 Sites, Sites 35A, 35B, 35C, 46, 47, 48, 50, 60, and Goose Prairie Creek at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas
Author: Jacobs Engineering Group, Inc., Oak Ridge, Tennessee
Recipient: U.S. Army Corps of Engineers (USACE), Tulsa District
Date: January, 2002
Bate Stamp: 027521 – 028356

027264

Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Kathleen Hartnett White, *Commissioner*
Jeffrey A. Saitas, *Executive Director*

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

January 8, 2002

Mr. David Tolbert, Commander's Representative
Longhorn/Louisiana Army Ammunition Plants
Attn.: SIOLH-CR
P.O. Box 658
Doyline, LA 71023

Re: Discharge Criteria for Perchlorate at Longhorn Army Ammunition Plant

Dear Mr. Tolbert:

The Texas Natural Resource Conservation Commission (TNRRC) has set a new standard for perchlorate. The new perchlorate discharge criteria is 6 ppb for daily average and 13 ppb for daily maximum. This criteria shall be implemented at Longhorn Army Ammunition Plant (LHAAP) within one week of the receipt of this notification. Please notify the TNRCC as to the date that the new standard is implemented.

Please incorporate this new standard in the five year review for LHAAP.

Sincerely,

James S.H. Sher, P.E.
Superfund Cleanup Section

JS/KM/mmw

cc: Mr. Chris Villerreal, EPA Region 6 (6SF-AP)
Ms. Jonna Polk, U.S. Army Corps of Engineers, Tulsa District

Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Kathleen Hartnett White, *Commissioner*
Jeffrey A. Saitas, *Executive Director*

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

January 28, 2002

Mr. David Tolbert, Commander's Representative
Longhorn/Louisiana Army Ammunition Plants
Attn.: SIOLH-CR
P.O. Box 658
Doyline, LA 71023

Re: Longhorn Army Ammunition Plant- Risk Reduction Rules

Dear Mr. Tolbert:

It is the understanding of the Texas Natural Resource Conservation Commission (TNRCC) that Longhorn Army Ammunition Plant is under the Texas Risk Reduction Rules, not the Texas Risk Reduction Program (TRRP). Therefore reference to TRRP is not appropriate. Please remove all references regarding TRRP in any future documentation.

If you have questions, please contact me at (512)239-2493.

Sincerely,

Kristian A. Mauricio

Kristian A. Mauricio, Assistant Project Manager
Superfund Cleanup Section

KM/mmw

cc: Mr. Chris Villerreal, EPA Region 6 (6SF-AP)
Jonna Polk, U.S. Army Corps of Engineers, Tulsa District

027266

Longhorn Army Ammunition Plant
Monthly Managers' Meeting

30 January 2002
1:00 p.m.

Agenda

Executive Summary	Jonna Polk
Caddo Lake Sampling	Cliff Murray
Group 2 Feasibilty Study Alternatives	Julie Pfeffer
Site 16 Proposed Plan	Julie Pfeffer
Meeting Schedule	David Tolbert
Adjourn	

LONGHORN ARMY AMMUNITION PLANT
IRP STATUS SUMMARY

As of 30 January, 2002

PROJECT NAME	PROJECT PHASE	PROJECT STATUS	NEXT MAJOR MILESTONE(S)
Group # 2 (Sites 12, 17, 18, 24, 29, and 32)	Remedial Investigation/ Feasibility Study	- Quarterly sampling completed 17 January 02.	- Risk Assessment – 12 April 02. - Feasibility Study – 28 May 02.
Group # 4 (Wastewater Sumps And Sites 50 & 60)	Remedial Investigation/ Feasibility Study	- Quarterly sampling completed 17 January 02.	- Risk Assessment – 31 July 02. - Feasibility Study – 28 Oct 02.
Burn Ground #3 (Sites 18 and 24)	Interim Remedial Action	- Contract option awarded to Complete Environmental on 31 May 00. - Fluidized Bed Reactor results received 30 May indicated that the FBR ran successfully at the design flow rate.	- IRA Five Year Review report – Feb 02.
Perchlorate		- Final quarter of sampling conducted February 01. - Final quarterly results presented at April 01 monthly meeting. - Geoprobe investigations conducted week of 11 June 01.	- Work Plan under review.
Transition Management Group		- Transition Management Group met 15 August 01.	- Meeting scheduled for February 02.

027261

LONGHORN ARMY AMMUNITION PLANT
IRP STATUS SUMMARY

As of 30 January, 2002

PROJECT NAME	PROJECT PHASE	PROJECT STATUS	NEXT MAJOR MILESTONE(S)
Landfill Site 16	RI/FS	- RA Report to team 31 March 00. - Final HHRA and Draft Final ERA sent to team on 1 June.	- Final Feasibility Study – 25 Feb 02.

027268

027269

Longhorn Army Ammunition Plant
Monthly Managers' Meeting

30 January 2002
1:00 p.m.

Sign – In Sheet

Name	Organization	Phone	E-Mail
Daniel Sloan	Jacobs	865-220-4914	dan.sloan@jacobs
Kristy Mauricio	TNRCC	(512)239-2493	KMAURICI@TNRCC.State.TX.US
James Sher	TNRCC	(514)239-2444	JSHER@TNRCC.State.Tx.us
Barry Forsythe	USFWS	(214)665-8467	forsythe.barry@epa.gov
Julie Pfeffer	Jacobs	865-220-4853	julie.pfeffer@jacobs.co
CHRIS VILLARREAL	EPA	(214)665-6753	villarreal.chris@epa.gov
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Bill Corrigan	CES	903-679-3448	ces@shreve.net
CRAIG GIGGLEMAN	USFWS	817/277-1100	817/277-1129 fx
CYRIL ONEWOKAE	HQ OSC	(309) 782-1350	onewokaec@osc.army.m
Roy HOEKSTRA	STEP	865-481-7887 ext 279	royhe STEPENV.com
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Paul Bruckwicki	USFWS	903 679 2045	
Douglas D. Carvel	MEC	713-585-7003	doug.carvel@mentech.com
JONNA POLK		918/669-7482	JONNA.POLK@USACE.ARMY.MI

027270

JACOBS ENGINEERING
Engineers and Constructors

PROJECT NOTE: PN-015

CLIENT, PROJECT LOCATION, AND CONTRACT NUMBER	PROJECT NO.: C5018700	SUBJECT: Draft
TULSA COE-LONGHORN PROJECT KARNACK, TEXAS CONTRACT # DACA56-97-D-0001	PAGE 1 OF 2	Meeting Minutes

DATE HELD: January 30, 2002	CONFIRMATION OF:
LOCATION: LHAAP	☒ MEETING
DATE ISSUED: February 4, 2002	☐ TELEPHONE CONVERSATION
RECORDED BY: Julie Pfeffer	☐ OTHER
	ISSUED BY: Julie Pfeffer JACOBS PROJECT MANAGER

PARTICIPANTS (* Denotes Part Time Participation)

See Attached

REMARKS	ACTION REQUIRED BY

Jonna Polk began the meeting with introductions and a review of the status of the various activities at the installation. She also requested that all messages sent to her and Cliff Murray be sent also to Dawn Knight. David Tolbert asked for continued updates on the schedule for perchlorate sampling. Jonna reminded participants that she needed comments on the perchlorate sampling work plan.

Cliff Murray reviewed results from past sediment sampling in Caddo Lake. The metals results indicate metals appear to be discharging from Goose Prairie Creek into Caddo Lake but not from the other three streams. Mercury results in particular illustrated this release pathway. North Cove had greater levels of metals in sediment than South Cove. No comparison to standards or criteria were made and the levels may still be low. Cliff recommended additional metals sampling in North Cove and beyond both coves. Perchlorate samples will also be taken. In general, the sampling suggestions were accepted although a suggestion was made to resample the first sampling locations. The USACE would like to sample the week of February 25.

Julie Pfeffer then proposed a monitoring plan to document compliance by a selected remedy at Site 16 with the remediation levels. TNRCC and EPA expressed a preference to discuss the details of a monitoring plan after the remediation levels and alternative are selected. AEC personnel expressed a preference to agree on the monitoring requirements before an alternative is selected. It was agreed to negotiate the levels and alternative during preparation of the PP and negotiate the monitoring details during preparation of the ROD. Issues that were raised during this discussion include:

- Should Harrison Bayou remediation levels be drinking water levels? (TNRCC suggestion)
- Have the remediation levels to meet anti-degradation ARARs been calculated as required by the regulation (EPA questioned this but indicated it is a TNRCC regulation and TNRCC needs to provided guidance).
- The Army is heading towards a preferred remedy similar to Alternative 3 in the draft final FS. EPA and TNRCC indicated this was a good starting place.

JACOBS ENGINEERING
Engineers and Constructors

PROJECT NOTE: PN-015

CLIENT, PROJECT LOCATION, AND CONTRACT NUMBER	PROJECT NO.: C5018700	SUBJECT: Draft
TULSA COE-LONGHORN PROJECT KARNACK, TEXAS CONTRACT # DACA56-97-D-0001	PAGE 2 OF 2	Meeting Minutes

- TNRCC requested removing TRRP completely from the document.

Julie then presented an overview of the proposed Group 2 alternatives. Two reasons for using Group-wide alternatives are to achieve remedy consistency between sites and economies of scale. She provided some background material along with proposed remedial action objectives and remediation levels. She indicated Jacobs was ready to begin to engineer Group-wide alternatives. Some suggestions that were made include:

- ACL appeared to be an acceptable option to consider for groundwater and should be considered for Site 16 also.
- As the Group 4 alternatives are developed, cross-cutting problems between Group 2 and 4 need to be evaluated for further opportunities of economies of scale (the example was treating explosives in soil).
- The selected remedy may be at a Group level but the future budget may need to be done at a site level.

The next monthly manager's meeting was tentatively scheduled for 1:00 p.m. on February 19, 2002, at LHAAP.

Distribution:
Attendees
Project File
Document Control

Longhorn Army Ammunition Plant
Technical Review Committee Meeting

30 January 2002
1:00 p.m.

Attendees

Name	Organization	Phone	E-Mail
Daniel Sloan	Jacobs	865-220-4914	dan.sloan@jacobs.com
Kristy Mauricio	TNRCC	512-239-2493	kmaurici@tnrcc.state.tx.us
James Sher	TNRCC	512-239-2444	jsher@tnrcc.state.tx.us
Barry Forsythe	USFWS	214-665-8467	forsythe.barry@epa.gov
Julie Pfeffer	Jacobs	865-220-4853	julie.pfeffer@jacobs.com
Chris Villarreal	EPA	214-665-6753	villarreal.chris@epa.gov
Dawn Knight	COE	918-669-7047	dawn.knight@usace.army.mil
Bill Corrigan	CES	903-679-3448	ces@shreve.net
Craig Giggleman	USFWS	817-277-1100	817-277-1129 (fax)
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David Tolbert	LHAAP	318-459-5100	d_tolbert@msn.com
Lynn Muckelrath	LHAAP	903-679-2047	muckelrathl@osc.army.mil
Cliff Murray	COE	918-669-7573	cliff.murray@usace.army.mil
Paul Bruckwicki	USFWS	903-679-2045	
Douglas D. Carvel	MEC	713-585-7003	doug.carvel@mentech.com
Jonna Polk	COE	918-669-7482	jonna.polk@usace.army.mil
Jim Daniel	teleconference		
Dereck Romitti			

027273

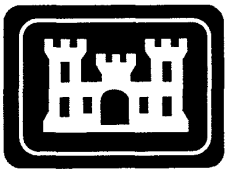
Final
REMEDIAL INVESTIGATION REPORT
Volume 1: Report

for the

GROUP 4 SITES
Sites 35A, 35B, 35C, 46, 47, 48, 50, 60, and Goose Prairie Creek

Longhorn Army Ammunition Plant
Karnack, Texas

Submitted to
U.S. Army Corps of Engineers
Tulsa District
Contract No. DACA56-97-D-0001



January 2002

Jacobs Engineering Group Inc.
Oak Ridge, Tennessee

027274

Final

Remedial Investigation Report

Volume 1: Report

Group 4 Sites

Sites 35A, 35B, 35C, 46, 47, 48, 50, 60, and Goose Prairie Creek

Longhorn Army Ammunition Plant

Karnack, Texas

January 2002

Prepared for
U.S. Army Corps of Engineers
Tulsa District
Contract No. DACA56-97-D-0001

Prepared by
Jacobs Engineering Group Inc.
125 Broadway Avenue
Oak Ridge, Tennessee 37830

027275

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LIST OF ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirements
Army	U.S. Department of the Army
AWQC	ambient water quality criteria
bgs	below ground surface
BHC	benzene hexachloride
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	*Code of Federal Regulations*
DCA	dichloroethane
DCE	dichloroethene
DDD	dichloro diphenyl dichloro ethane
DDE	dichloro diphenyl dichloro ethylene
DDT	dichlorodiphenyl-trichloroethane
EPA	U.S. Environmental Protection Agency
EPS	Environmental Protection Systems
FID	flame ionization detector
FFA	Federal Facility Agreement
FR	*Federal Register*
FS	feasibility study
ITS	Intertek Testing Services
LHAAP	Longhorn Army Ammunition Plant
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OSWER	Office of Solid Waste and Emergency Response
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PCL	protective concentration level
PID	photoionization detector
ppm	part per million
PRG	preliminary remediation goal
PVC	polyvinyl chloride
QC	quality control
RCRA	Resource Conservation and Recovery Act of 1976
ROD	record of decision
RI	remedial investigation
SCAPS	Site Characterization and Analysis Penetrometer System
SMCL	secondary maximum contaminant level
SSL	soil screening level
SVOC	semivolatile organic compound
TAC	*Texas Administrative Code*

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

TBC	to-be-considered (guidance)
TCA	trichloroethane
TCE	trichloroethene
TNRCC	Texas Natural Resource Conservation Commission
TNT	2,4,6-trinitrotoluene
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TRRP	Texas Risk Reduction Program
TSCA	Toxic Substances Control Act of 1976
TWQS	Texas Water Quality Standards
USAEHA	U.S. Army Environmental Hygiene Agency
USCS	Unified Soil Classification System
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound

EXECUTIVE SUMMARY

This Remedial Investigation report presents the findings of investigations performed at the Group 4 Sites (Site 35A—the Shop Area, Site 35B—the Chemical Laboratory, Site 35C—the Static Test Area, Site 46—Plant 2 Area, Site 47—Plant 3 Area, Site 48—the Y-Area, Site 50—the Former Sump Water Tank, and Site 60—Pesticide Storage Buildings) along with other waste process and waste rack sumps and the surface water body that drains most of these sites, Goose Prairie Creek, at the Longhorn Army Ammunition Plant (LHAAP) in Karnack, Texas.

The purposes of this report are (1) to identify the nature of contamination present at each site as compared to background and human health and surface water ecological comparison criteria and then (2) to discuss the extent along with fate and transport of key contaminants present at each of these sites. The nature of contamination is identified by comparing contaminant concentrations to background levels and comparison levels (potential applicable or relevant and appropriate requirements and to-be-considered guidance). A baseline risk assessment is being conducted separately. The risk assessment will assess the impact of all contamination found at the sites.

The following paragraphs summarize the investigation's findings of the primary contamination at each site. Sumps not specifically associated with one of the Group 4 sites are discussed first.

- **Independent sumps:** There are four sumps not associated with Group 4 sites. Twelve soil samples were taken around these sumps and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. In addition five soil samples were taken for pesticide, polychlorinated biphenyl (PCB), and dioxin/furan analyses. A single sample was taken from a sump, which contained small levels of tetrachloroethene and trichloroethene that were not found in surrounding soils. The soils have minor elevated levels of inorganics. The independent sumps and surrounding media are not significantly contaminated.

- **Site 35A—Shop Area:** This area provided support services to the installation (laundry, automotive, woodworking, metalworking, painting, etc.). A variety of samples was taken here, including 1 from a sump, 22 surface soil samples, 11 subsurface soil samples, 19 groundwater samples, and 2 surface water and sediment samples. Most samples were analyzed for VOCs, SVOCs, explosive compounds, and metals. A few were also submitted for pesticides, PCBs, and dioxins/furans. Metal contamination is found at low levels, most significantly in the surface soils. VOCs in groundwater are the most significant contamination at Site 35A; however, the VOC contamination is in two isolated areas.

- **Site 35B—Chemical Laboratory:** Research and testing of materials used in production processes was conducted here. Eight soil samples and eight groundwater samples were collected and analyzed for VOCs, SVOCs, explosive compounds, and metals. Fewer samples were submitted for pesticide/PCB and dioxin/furan analyses. Isolated metal contamination (cadmium, lead, and selenium) has been found in the soils. Like Site 35A, there is VOC contamination under Site 35B in the groundwater, but these contaminants were not found in the site's soil. A source has not been identified. There is no large plume of VOC contamination currently identified.

- **Site 35C—Static Test Area:** This area was used to test and evaluate products produced at LHAAP. Soils (32 samples) and groundwater (19 samples) were sampled here at numerous locations for VOCs, SVOCs, explosives, and metals. Like at the other sites, fewer samples were submitted for PCB/pesticide and dioxin/furan analyses. Dioxins were found at levels higher than at other Group 4 sites in a soil sample next to a sump. Additionally, isolated metal contamination is found in both the soil and the groundwater; however, the constituents are not the same. There does not appear to be any migration of contaminants from Site 35C.

- **Site 46—Plant 2:** This 190-acre manufacturing area has been sampled extensively over the last 10 years. Over 200 soil samples have been taken along with nearly 50 groundwater samples. Adjacent sediment and surface water have been sampled. The analyte suite was the same as for the other sites. VOCs are found in sumps and in the soils and groundwater at the site, however, at low levels compared to other sites. Lead and barium are found at elevated levels at several surface soil locations throughout the site. Some sediment samples also had slightly elevated barium and lead results, potentially indicating past runoff migration. The surface water in the adjacent stream, however, does not exceed Texas Water Quality Standards (TWQS). There is some elevated dioxin in soils near sumps.

- **Site 47—Plant 3:** Plant 3 is a 275-acre production area. Over 300 soil samples and nearly 100 groundwater samples have been taken. Fluid samples were taken from 14 sumps. There were some VOCs detected in the sumps, but the adjacent soil samples did not show elevated VOC levels. Other soil samples contained VOC contamination, and VOCs were detected in the groundwater. Geoprobe results show that the groundwater contamination has spread into the intermediate zone and could be near Goose Prairie Creek. However, surface water quality has not been impacted by the groundwater. Cadmium and lead appear elevated in soil while chromium levels are high in some groundwater monitoring wells. No major source of either contamination has been identified, but there may be several smaller sources since the contamination appears to be isolated.

- **Site 48—Y-Area:** The Y-Area was a small production area that was active until recently. Nearly 50 soil samples and 10 groundwater samples have been analyzed for VOCs, SVOCs,

and metals. Fewer have been analyzed for PCBs/pesticides, dioxins/furans, and explosive compounds. Dioxin results from soil samples near Sump 100 were some of the highest found. VOC contamination was detected in some soils near sumps, but not in the underlying groundwater. The soils near the sumps also are contaminated with metals, notably cadmium, lead, and barium. There is no evidence of contaminant migration; either the mass of VOCs in the soil is too small to affect the groundwater and/or the metals are relatively immobile in the soil matrix.

- **Site 50—Former Sump Water Tank:** This tank was an aboveground tank for collecting industrial wastewater. The soils, groundwater, surface water, and sediment around the tank were tested for VOCs, SVOCs, explosive compounds, and metals. PCB/pesticide and dioxin/furan analyses were also conducted on a subset of the samples. Although some metals at the site in the soils and sediments are above background levels, the levels are low and there is no discernible pattern to this limited contamination. Aluminum is the only metal to exceed its surface water quality criterion in Goose Prairie Creek, and it exceeds the criterion both upstream and downstream of the site. Groundwater contamination is more extensive. High levels of VOCs are found under the site; however, the source is unknown. High perchlorate levels in groundwater may be due to Building 25C releases. The adjacent surface water body does not appear to be impacted by the groundwater.

- **Site 60—Pesticide Storage Buildings:** Several buildings that were used to store pesticides are included in this site. A few soil samples were collected for the typical analyte list. However, over 35 soil samples were collected for pesticide and herbicide analysis. Dieldrin was found in one sample at high levels, but no other significant contamination was found. Lead and selenium were detected at low levels in a few locations.

- **Goose Prairie Creek and Wetlands:** Surface water and sediment from the major drainage way for the Group 4 sites, Goose Prairie Creek, was sampled. Additionally, sediments from the wetlands at the entrance to Caddo Lake as well as sediments in Caddo Lake adjacent to each discharge location from the installation were sampled. The samples were analyzed for the typical suite of analytes. Low levels of metals are found in all sediments, but only lead appears to be notably elevated. Several metals are also detected in Goose Prairie Creek and associated wetlands at levels above TWQS. However, the levels are not very high.

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1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

This Remedial Investigation (RI) Report presents the findings of investigations performed at the Group 4 Sites (Independent Sumps and Sites 35A, 35B, 35C, 46, 47, 48, 50, and 60) located at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. It also presents results of sampling in Goose Prairie Creek, associated wetlands, and Caddo Lake. The RI activities were conducted under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the U.S. Department of the Army (Army).

The objective of this RI was to characterize the presence and extent of contamination in surface waters, sediments, surface and subsurface soils, and groundwater at the Group 4 Sites. Investigations evaluated conditions within each site's boundaries and adjacent areas. Data generated by the field activities performed at the Group 4 Sites have been compiled to summarize the condition of each site. These data will provide information required for the risk assessment, which is being conducted separately.

1.2 FACILITY BACKGROUND

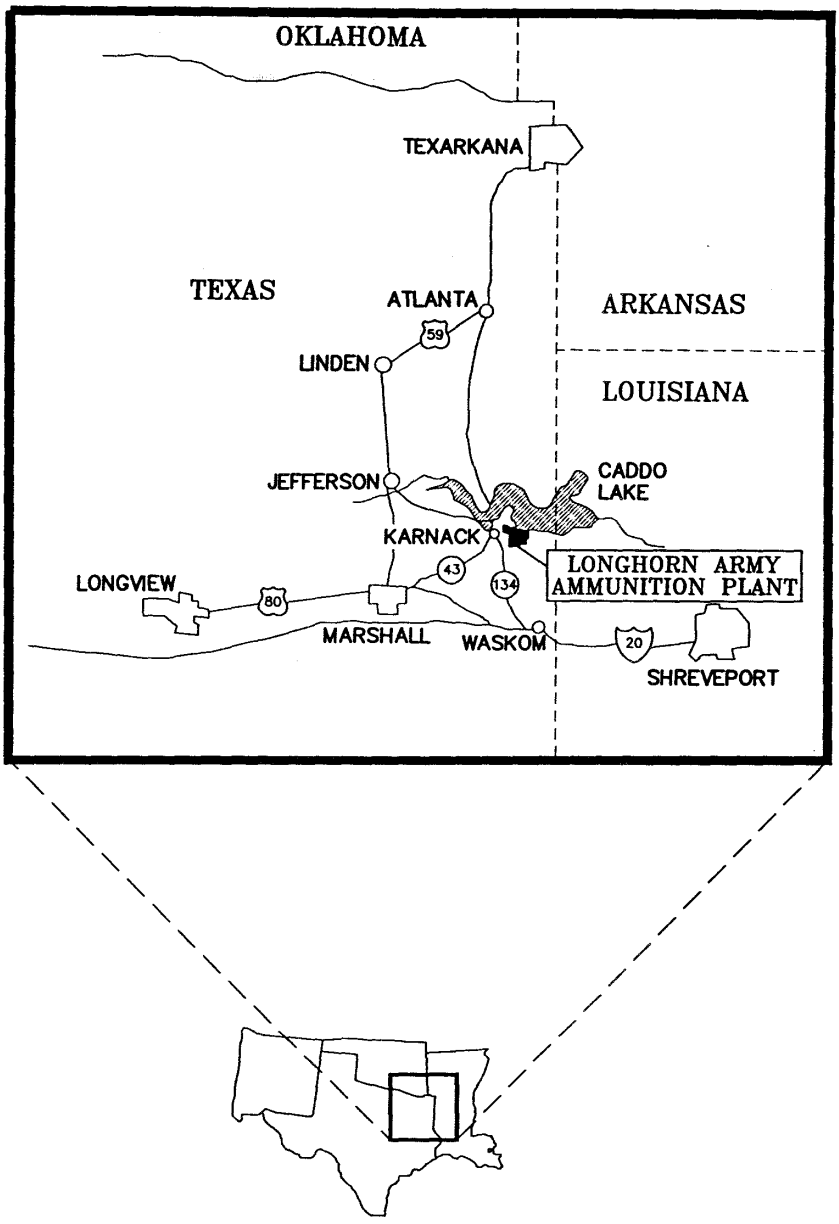
LHAAP is a government-owned, formerly contractor-operated and -maintained industrial facility under the jurisdiction of the Army. Currently, there is no manufacturing/operating contractor at the LHAAP installation.

1.2.1 Facility Description

LHAAP is located in central-east Texas in the northeastern corner of Harrison County. The installation occupies 8493 acres between State Highway 43 at Karnack, Texas, and the western shore of Caddo Lake, as shown in Figure 1-1. The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the east. State Highways 43 and 134 provide access to the installation. Caddo Lake, a large freshwater lake situated on the Texas-Louisiana state line, bounds LHAAP to the north and east. The eastern fence of LHAAP is 3.5 miles from the Texas-Louisiana state border. The incorporated communities of Uncertain and Karnack, Texas, are located immediately north and west of the installation boundary, respectively. The remaining surrounding area is referred to as the Piney Woods of East Texas and is sparsely populated.

1.2.2 Facility History

LHAAP was established in October 1942 with the primary mission of producing 2,4,6-trinitrotoluene (TNT) flakes (Plant 1 area). Monsanto Chemical Company was the first manufacturing contractor-



Not to Scale

US Army Corps of Engineers
Tulsa District

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Location Map
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Karnack, Texas

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operator of the plant. TNT flake production continued through World War II until August 1945, when the Monsanto Chemical Company's role ended and the plant went on standby status until February 1952. From 1952 until 1956, Universal Match Corporation was the contractor-operator, producing such pyrotechnic ammunition as photoflash bombs, simulators, hand signals, and 40-millimeter (mm) tracers. The Plant 2 area was reportedly the main site of the pyrotechnic operations at LHAAP. During November 1955, Thiokol Corporation began operation of the rocket motor facility (Plant 3 area). Thiokol Corporation assumed responsibility for total operation of the plant with the departure of Universal Match Corporation in 1956. Production of rocket motors continued to be the primary operation at LHAAP until 1965, when the production of pyrotechnic and illuminating ammunition was reestablished. Thiokol's status as contractor-operator was terminated in June 1996.

From September 1988 to May 1991, the installation was also used for the static firing and elimination of Pershing I and II rocket motors in compliance with the Intermediate-Range Nuclear Force Treaty in effect between the United States and the former Union of Soviet Socialist Republics.

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

In October 1996, approximately 1435 acres surrounding Harrison Bayou were leased to the Caddo Lake Institute for biological and ecological studies by local schools. The plant became inactive and was determined to be in excess of the Army's needs in July 1997. In July 1998, the Army contracted Earth Tech to liquidate salvageable property.

1.2.3 LHAAP Setting

The following sections discuss the LHAAP site and its physical characteristics.

1.2.3.1 Physiography

LHAAP is characterized by mixed pine and hardwood forests that cover gently rolling to hilly terrain with an average slope of 3 percent toward the northeast. Most of the terrain at LHAAP has slopes of 3 percent or less, but slopes as steep as 12 percent are common in the western and northwestern portions of the installation and along the Harrison Bayou floodplain. The area surrounding the facility is a mixture of forest and agricultural land. Ground surface elevations at LHAAP vary from 170 feet to 335 feet based on the National Geodetic Vertical Datum, 1929 (NGVD1929).

1.2.3.2 Surface hydrology

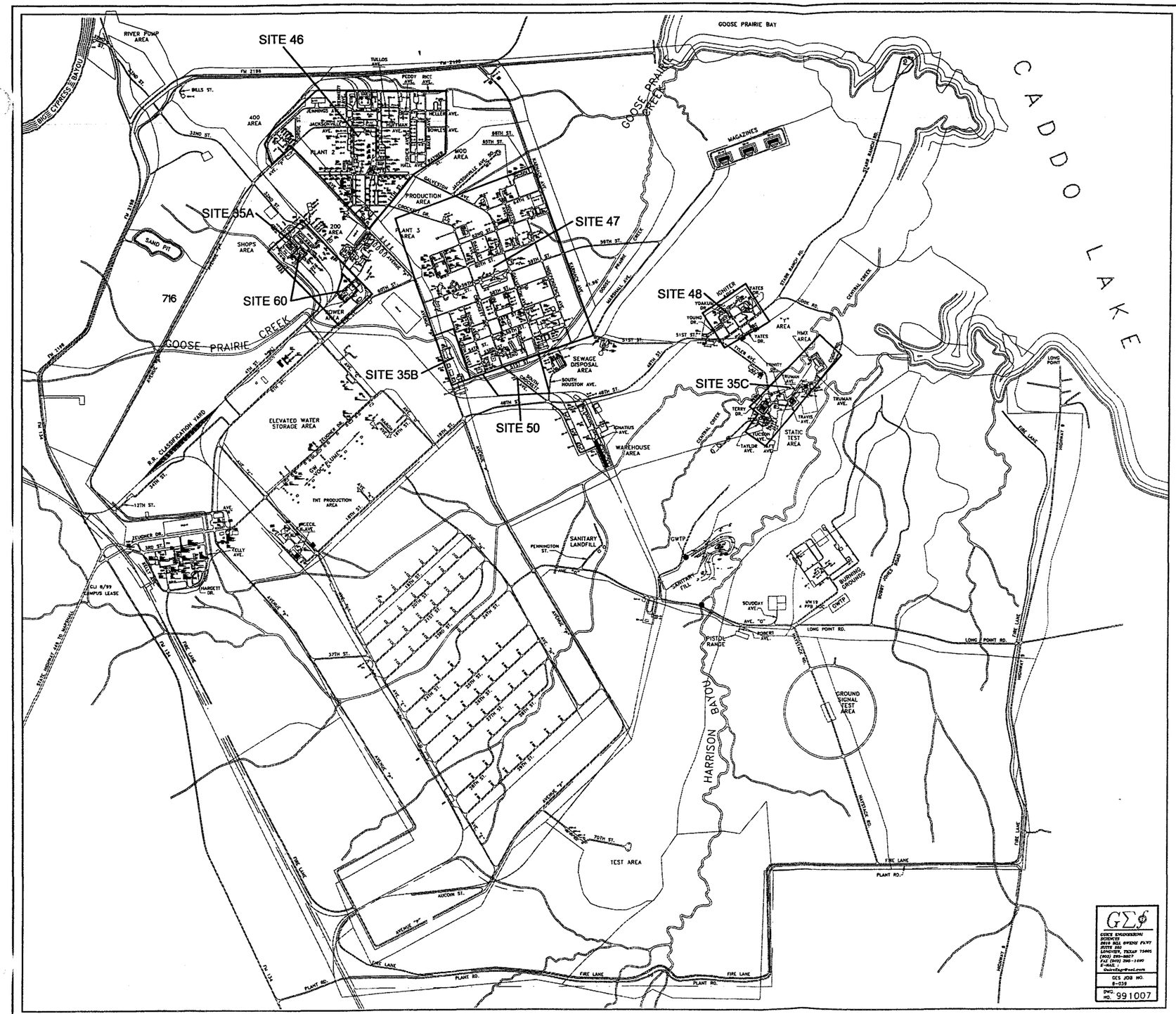
Surface water at LHAAP drains to the northeast into Caddo Lake via four drainage systems: Saunder's Branch, Harrison Bayou, Central Creek, and Goose Prairie Creek (Figure 1-2). Caddo Lake is a part of Big Cypress Bayou. Saunder's Branch of Martin's Creek flows onto LHAAP near the southeastern corner of the installation and flows northward into Caddo Lake. Approximately 11 percent of the heavily wooded eastern section of the plant is drained by this system. Harrison Bayou enters LHAAP on the southern edge of the installation. The bayou captures approximately 30 percent of the surface drainage of LHAAP and bisects the installation in a northeasterly direction. Central Creek enters LHAAP on its western edge just south of the town of Karnack. Approximately 30 percent of the surface drainage from the installation is transported to Caddo Lake via this drainage course. The headwaters of Goose Prairie Creek are located near the northwestern corner of the plant and consist of one larger creek and several smaller tributaries. Goose Prairie Creek flows across the northern edge of the installation and drains approximately 30 percent of LHAAP.

Caddo Lake was originally formed by a logjam on the Big Cypress Bayou in Caddo Parish, Louisiana. Following the removal of the logjam the lake was reestablished with the construction of Caddo Dam. The original dam was constructed in 1914 for local navigation purposes and was reconstructed in 1971. The spillway elevation of the lake is 168.9 feet. Big Cypress Bayou resumes east of Caddo Lake and joins the Red River at Shreveport, Louisiana. The Red River flows southeastward across Louisiana and joins the Mississippi River at Simmesport, Louisiana. In October 1993, Caddo Lake was acknowledged under the Ramsar Treaty as a wetland of international significance, 1 of only 13 such regions recognized in the United States.

1.2.3.3 Geology

The subsurface geology at LHAAP consists primarily of a thin veneer of Quaternary alluvium mantling Tertiary age formations of the Wilcox and Midway Groups. Underlying these sediments are Cretaceous age formations of the Navarro and Taylor Groups.

The stratigraphic thickness of the Wilcox Group ranges from a maximum 350 feet in the northwestern corner of LHAAP to approximately 130 to 140 feet along the eastern side of the facility near Caddo Lake. The Wilcox Group constitutes the majority of the unconsolidated sediments underlying LHAAP. It consists of interbedded fine- to medium-grained sands, silts, and clays that are variously light gray, red, brown, and/or tan and contain occasional seams of lignite. This Eocene series undifferentiated formation was deposited in a regressive fluvial-deltaic and transgressive marine environment and shows considerable heterogeneity across the facility.



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Tulsa District

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Group 4 Site Locations
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Karnack, Texas

02Jan02 - Figure 1-2.DWG | Figure 1-2

Boring logs generated during monitoring well construction show that the unconsolidated sediments of the Wilcox Group typically consist of a series of three sandy water-bearing zones separated by layers of silty clay. The uppermost portion of the Wilcox Group at LHAAP consists of medium plastic sandy silts and clays, which range from approximately 5 to 15 feet thick. These surficial sediments are underlain by the shallow saturated zone, which varies from 10 to 20 feet thick. This sand zone consists of silty, fine-grained sand containing some silt and clay lenses. At the ground surface, this zone is dry to moist and becomes saturated 15 to 20 feet below ground surface (bgs). A 5- to 20-foot-thick, medium to highly plastic silt and clay layer underlies the shallow saturated zone. An intermediate saturated sand zone, consisting of a fine to medium silty sand, is encountered below the semiconfining layer 30 to 50 feet bgs. The intermediate saturated zone is generally less silty than the shallow saturated zone and exhibits a higher hydraulic conductivity. Beneath the intermediate saturated zone, a 5- to 30-foot silt to silty clay layer is encountered. Underlying this silt to silty clay layer is a massive, homogeneous silty, clayey, fine sand that continues to the top of the underlying Midway Formation.

The Midway Formation is generally encountered at depths of approximately 200 to 300 feet and is a thick, calcareous to noncalcareous clay containing some sand. The exact thickness of the Midway Formation is difficult to determine because it cannot be readily differentiated from the underlying upper Navarro Group (Upper Cretaceous). These formations form the base of the overlying Eocene aquifer system, effectively isolating it from deeper flow systems (Fogg and Kretler 1982).

1.2.3.4 Hydrogeology

Groundwater and geologic data obtained during the RI field activities at the Group 4 Sites indicate varying degrees of heterogeneity within the subsurface hydrogeology across the facility. This is indicative of the fluvial-deltaic-type depositional environment typical of Quaternary and Wilcox Group sediments underlying LHAAP. The unconsolidated sediments of the Wilcox Group consist primarily of elongated, interconnected, channel-fill sand deposits within alluvial belts interbedded with less permeable interchannel sediments. The interbedded, less permeable deposits form aquitards that limit the flow between the saturated zones. Boring logs, Site Characterization and Analysis Penetrometer System (SCAPS) data, and downhole geophysics show that the subsurface hydrogeology at LHAAP can generally be characterized as consisting of three saturated water-bearing zones, (a shallow zone, an intermediate zone, and a deep zone) that are separated by semiconfining clay layers.

Groundwater generally occurs under unconfined conditions, whether in the alluvial or Wilcox Group strata. Perched and localized confining conditions frequently occur within the Wilcox Group deposits due to the high clay content and highly variable stratigraphy. The base of the Wilcox Group water-bearing zone beneath LHAAP is defined by the contact of the Wilcox Group with the underlying Midway Group. The Midway Group consists predominantly of very low permeability clays that yield little or no water. The Wilcox Group is considered the base of fresh water in the area.

The depth to groundwater across the facility ranges from 1 to 70 feet, with the depth to groundwater typically being 12 to 16 feet. The regional groundwater flow direction beneath the facility is generally east-northeast toward Caddo Lake but varies by site location. The potentiometric surface map depicting the shallow groundwater surface from the December 1998 data is presented in Figure 1-3.

Groundwater under and near LHAAP is currently used as a drinking water source. There are currently five active water supply wells near LHAAP. One well is located in and owned by Caddo Lake State Park. The well is completed to a depth of 315 feet and has been in use since 1935. A second well owned by the Karnack Water Supply Corporation services the town of Karnack and is located approximately 2 miles southeast of town. This well is approximately 430 feet deep and has been in use since 1942. The Caddo Lake Water Supply Corporation has three wells located both north and northwest of LHAAP. These three wells are identified as Caddo Lake Water Supply Corporation Wells 1, 2, and 3 and are all hydraulically upgradient to LHAAP. Due to the remote locations of these wells from LHAAP, water removal from these wells is not expected to affect groundwater flow at the site. In addition, there are several livestock and domestic wells located in the vicinity of LHAAP with depths averaging approximately 250 feet.

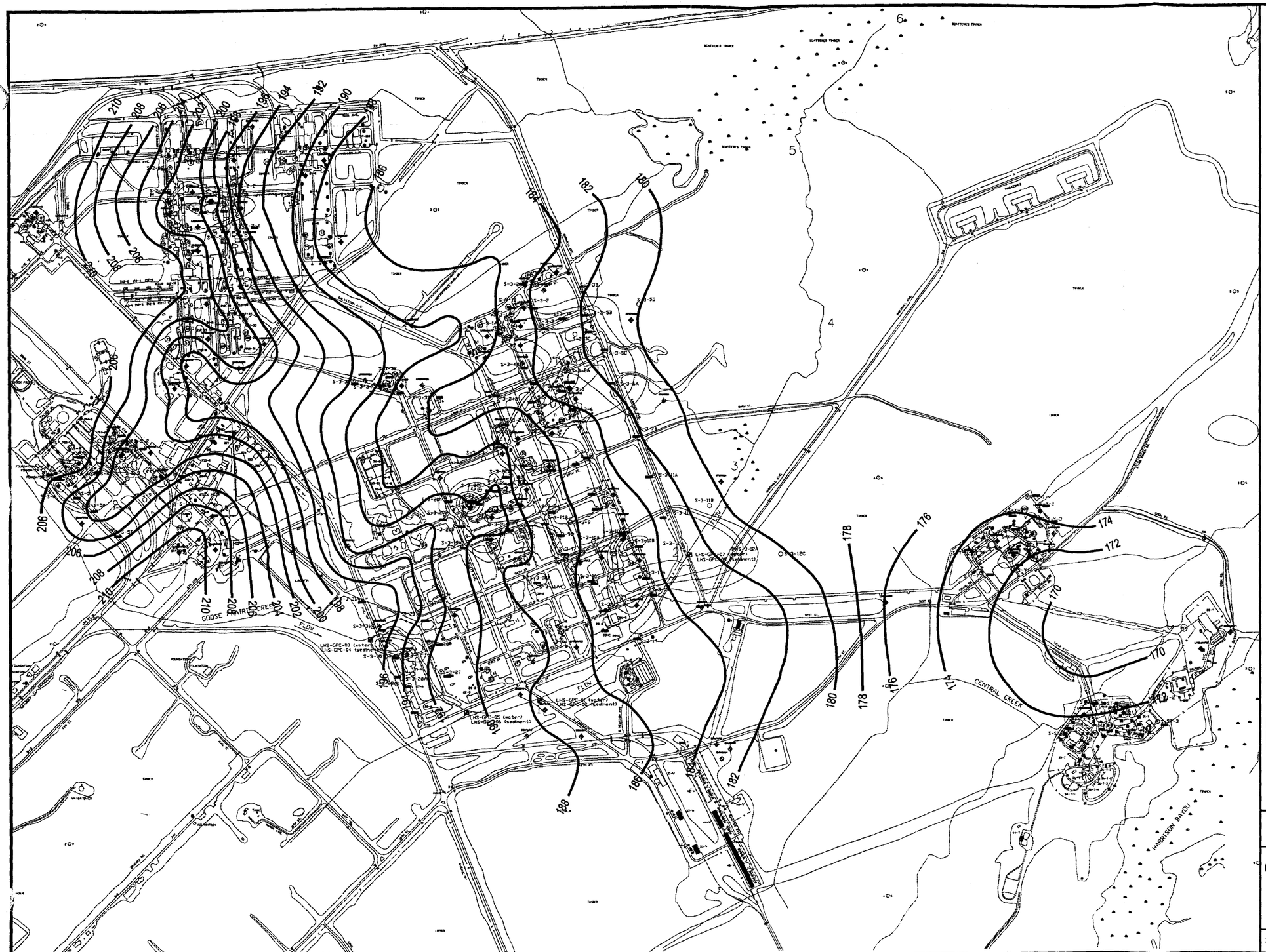
There is a water supply well located on LHAAP, which is currently in use. It is located at the Fire Station/Security Office and supplies water to the buildings currently in use on the installation. Two additional wells previously supplied water to the installation, but these have since been plugged and abandoned.

1.2.3.5 Meteorology

LHAAP is situated near the unincorporated community of Karnack, Texas, in the northeastern region of the state at approximately 32° north of the equator. This location allows for mild winters and hot summers, with an average relative humidity of 55 percent. In winter, the average temperature is 46°F and the average daily minimum temperature is 35°F. In summer, the average temperature is 81°F and the average daily maximum temperature is 92°F. Precipitation is uniformly distributed throughout the year, although summer and fall are frequently drought seasons. December through May is often the wettest period. The total average annual precipitation is 46.9 inches. Snowfalls are infrequent with an average seasonal snowfall of 1.5 inches (USDA 1994).

1.2.4 Investigation History and Documentation

Site investigations to assess the environmental quality of LHAAP, concerning the past use, storage, treatment, and disposal of toxic and hazardous materials, began during the 1970s as part of the U.S. Army Installation Restoration Program. The U.S. Army Environmental Hygiene Agency (USAEHA)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of Engineers
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JACOBS
Group 4 Potentiometric Surface (12/98)
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas
31Dec01 - Fig_1-3.DWG
Figure 1-3
GOOSE CREEK
CENTRAL CREEK
HARRISON BAYOU
FLDN
TPDCK
SCATTERED TPDCK

conducted the early studies. The U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) identified 27 sites of potential contamination before 1980. EPA Region 6 placed LHAAP on the NPL in August 1990. The initial 27 sites were consolidated into 22 sites that were divided into five groups. Group 1 consists of four sites (XX, 01, 11, and 27); Group 2 consists of six sites (12, 17, 18, 24, 29, and 32); Group 3 consists of two sites (13 and 14); Group 4 consists of eight sites (35A, 35B, 35C, 46, 47, 48, 50, and 60); and Group 5 consists of two sites (52 and 63). Site 16 was originally part of the Group 2 sites but has been separated out to accelerate remedial activities. Sites 18 and 24 have also had accelerated remedial activities that include additional investigations as well as interim remedial treatment of the groundwater and soils associated with these sites. Primary site types include storage areas, landfills, open burning grounds, industrial areas, burial pits, underground storage tanks, sumps, and wastewater treatment plants. Environmental investigations have been completed for the Groups 1, 3, and 5 sites with the determination that no further action was required for the sites within these groups. RI/Feasibility Study (FS) activities are ongoing for Site 16 and the Group 2 and Group 4 sites. The LHAAP contaminants of interest initially identified by USAEHA were heavy metals, volatile organic compounds (VOCs), and high explosives. Recently, the potential of environmental impact due to perchlorate compounds became a concern to stakeholders at LHAAP. Sample matrices included groundwater, surface water, sediments, and soils.

1.3 REPORT ORGANIZATION

This RI report is divided into the following 15 sections:

- Section 1.0 identifies the purpose, background information, site description, regional surface hydrology, geology and hydrogeology and outlines the report organization.
- Section 2.0 discusses the history of field activities at the Group 4 sites.
- Section 3.0 contains the comparison criteria to which the analytical data were compared and presents the potential chemical-specific ARARs for these sites.
- Section 4.0 discusses the results of the field activities performed at the waste process sumps that are independent of the sites in Group 4.
- Section 5.0 discusses the results of the field activities performed at Site 35A.
- Section 6.0 discusses the results of the field activities performed at Site 35B.
- Section 7.0 discusses the results of the field activities performed at Site 35C.

- Section 8.0 discusses the results of the field activities performed at Site 46.
- Section 9.0 discusses the results of the field activities performed at Site 47.
- Section 10.0 discusses the results of the field activities performed at Site 48.
- Section 11.0 discusses the results of the field activities performed at Site 50.
- Section 12.0 discusses the results of the field activities performed at Site 60.
- Section 13.0 discusses the results of the field activities performed along Goose Prairie Creek and in its associated wetlands.
- Section 14.0 presents the summary for each of the Group 4 Sites.
- Section 15.0 presents a list of referenced documents used to prepare this report.

2.0 INVESTIGATION ACTIVITIES

The eight Group 4 Sites addressed in this report are listed below, and their locations are presented in Figure 1-2.

- Site 35A—Shop Area
- Site 35B—Chemical Laboratory
- Site 35C—Static Test Area
- Site 46—Plant 2 Area
- Site 47—Plant 3 Area
- Site 48—Y Area
- Site 50—Former Sump Water Tank
- Site 60—Pesticide Storage Buildings 411, 411-A, and 714

This report also discusses the Waste Process sumps that are independent of the Group 4 sites and the analytical results of the samples collected within the waterway of Goose Prairie Creek that runs though LHAAP.

Table 2-1 presents a chronological summary of previous investigations conducted at the Group 4 sites from 1992 to the present. The sample locations and summary of the multiple-phase investigations are presented in more detail later in this document for each corresponding site.

Site work at the Group 4 sites was performed in a phased approach. Phase I was initiated to evaluate potentially contaminated sites for possible uncontrolled releases to the environment and to identify site-related contaminants. Phase II investigation work was conducted to further investigate those areas identified in Phase I that required additional investigation to characterize the contaminants present. Because of the large number of sumps and potential sources of contamination in the production area, the number of wells installed was not sufficient to delineate the areas of contamination in the groundwater. Therefore, following the Phase II investigation, a Pre-Phase III investigation was conducted by the U.S. Army Corps of Engineers (USACE) in May 1996. This investigation used direct push groundwater sampling devices to assist in delineating the extent of VOC contamination in the shallow groundwater beneath the Group 4 project area and to help determine additional monitoring well locations. (Results are not presented because of the non-comparable sampling technique.) Based upon the results of this Pre-Phase III investigation, the scope of the Phase III investigation was defined. The goal of the Phase III RI was to complete the investigation of the Group 4 sites and establish the extent of groundwater contamination. Activities conducted after Phase III were completed to respond to specific data needs such as the extent of perchlorate contamination in soils and groundwater. Throughout these efforts, the USACE collected quarterly surface water samples in Goose Prairie Creek.

The waste process sumps were removed by OHM Remediation Services Corp. in 1996–97. All removal and closure activities are documented in the report *Removal and Closure of Wastewater Sumps, Longhorn Army Ammunition Plant, Karnack, Texas* (OHM 1997).

Table 2-1
Chronological Investigation Summary, Group 4 RI, LHAAP, Karnack Texas

Waste Process and Waste Rack Sumps (Facilitywide)*
Pre-Phase I
BCM, 1992 • Inventory of 124 waste process sumps at the facility USACE, 1993 • Inventory of 125 waste process and 20 waste rack sumps at the facility
Phases I–III
USACE, Phase I 1993 • Collected 24 background samples • Collected 20 liquid and 6 sludge sump contents samples for laboratory analysis • Completed 141 borings at 141 sump locations and collected 540 soil samples
USACE, Phase II 1994 • Collected 137 soil samples from 71 monitoring well locations and from 61 ditch and drainage ways • Installed 71 monitoring wells and collected groundwater samples from each well
Jacobs, Phase III 1998 • Collected 288 soil samples at 142 waste process sump locations
Site 35A Shop Area
Pre-Phase I
BCM, 1992 • Inventory of the 7 waste process sumps at this site
USACE, 1993 • Inventory of the 7 waste process sumps at this site
Phases I–III
USACE, Phase I 1993 • Collected 1 sump content sample for laboratory analysis • Completed 11 borings at 7 sump locations and collected 21 soil samples
USACE, Phase II 1994 • Collected 12 soil samples from 7 monitoring well locations and from 5 ditch and drainage ways • Installed 7 monitoring wells and collected groundwater samples from each well
Jacobs, Phase III 1998 • Collected 14 soil samples at 7 waste process sump locations • Collected 2 surface water and 2 sediment samples • Collected 10 soil samples from 6 locations • Installed 4 monitoring wells and collected groundwater samples from each of the 4 new wells and 7 existing wells
Additional Investigations
• Collected 14 groundwater samples (2 rounds in 1996) • Collected groundwater samples from 1 well in 2000 and 2001 for perchlorate analysis
Site 35B: Chemical Laboratory
Pre-Phase I
USACE, 1993 • Inventory of the 1 waste rack sump at this site

Table 2-1 (continued)

Phases I–III
USACE, Phase I 1993 • Completed 1 boring at the 1 waste rack sump location and collected 2 soil samples
USACE, Phase II 1994 • Collected 3 soil samples from 2 monitoring well locations and from 1 ditch and drainage way • Installed 2 monitoring wells and collected groundwater samples from each well
Jacobs, Phase III 1998 • Collected 2 soil samples at 1 waste rack location • Collected 3 soil samples from 1 location • Installed 2 monitoring wells and collected groundwater samples from each of the 2 new wells and 2 existing wells
Additional Investigations
• Collected groundwater samples from 2 wells in 1996
Site 35C: Static Test Area
Pre-Phase I
EPS, 1984 • Installed 2 monitoring wells and collected groundwater samples from each well
BCM, 1992 • Inventory of the 4 waste process sumps
USACE, 1993 • Inventory of the 4 waste process sumps
Phases I–III
USACE, Phase I 1993 • Completed 12 borings at the 4 sump locations and collected 22 soil samples
USACE, Phase II 1994 • Collected 7 soil samples from 5 monitoring well locations and from 2 ditch and drainage ways • Installed 5 monitoring wells and collected groundwater samples from each well
Jacobs, Phase III 1998 • Collected 8 soil samples at 4 waste rack sump locations • Collected 3 soil samples from 1 location • Collected groundwater samples from 7 existing wells
Additional Investigations
• Sampled 7 wells in 2 rounds in 1996 • Collected 3 groundwater samples and 4 soil samples for perchlorate analysis in 2000 and 2001
Site 46: Plant 2 Area
Pre-Phase I
BCM, 1992 • Inventory of the 47 waste process sumps
USACE, 1993 • Inventory of the 47 waste process sumps and 14 waste rack sumps
Phases I–III
USACE, Phase I 1993 • Collected 5 sump content samples for laboratory analysis • Completed 87 borings at the 60 sump locations and collected 194 soil samples
USACE, Phase II 1994 • Collected 39 soil samples from 20 monitoring well locations and from 19 soil locations • Installed 20 monitoring wells and collected groundwater samples from each well
Jacobs, Phase III 1998 • Collected 122 soil samples at 47 waste process sumps and 14 waste rack sump locations • Collected 8 surface water and 8 sediment samples

Table 2-1 (continued)

• Collected 21 soil samples from 15 locations • Installed 4 monitoring wells and collected groundwater samples from each of the 4 new wells and the 20 existing wells
Additional Investigations
• Collected 2 rounds of groundwater samples in 1996 • Collected samples from 5 wells for perchlorate analysis in 2000 and 2001
Site 47: Plant 3 Area
Pre-Phase I
EPS, 1984 • Installed 1 monitoring well and collected 1 groundwater sample
BCM, 1992 • Inventory of the 50 waste process sumps at this site
USACE, 1993 • Inventory of the 50 waste process sumps and 3 waste rack sumps at this site
Phases I–III
USACE, Phase I 1993 • Collected 19 sump content samples for laboratory analysis • Completed 120 borings at the 52 sump locations and collected 241 soil samples
USACE, Phase II 1994 • Collected 61 soil samples from 31 monitoring well locations and from 29 ditch and drainage ways • Installed 32 monitoring wells and collected groundwater samples from 32 wells
Jacobs, Phase III 1998 • Collected 104 soil samples at 50 waste process sumps and 2 waste rack sump locations and resampled 2 waste process sump locations and collected 4 soil samples • Collected 9 soil samples from 3 locations • Installed 22 monitoring wells and collected groundwater samples from each of the 22 new wells and the 31 existing wells
Additional Investigations
• Installed and sampled 4 shallow monitoring wells • Collected 2 rounds of groundwater samples in 1996 • Collected 132 soil samples for perchlorate analysis
Site 48: Y Area
Pre-Phase I
BCM, 1992 • Inventory of the 9 waste process sumps
USACE, 1993 • Inventory of the 9 waste process sumps and 3 waste rack sumps
Phases I–III
USACE, Phase I 1993 • Completed 14 borings at the 12 sump locations and collected 33 soil samples
USACE, Phase II 1994 • Collected 11 soil samples from 5 monitoring well locations and from 6 ditch and drainage ways • Installed 5 monitoring wells and collected groundwater samples from 5 wells
Jacobs, Phase III 1998 • Collected 24 soil samples at 9 waste process sumps and 3 waste rack sump locations • Collected 3 soil samples from 1 location • Collected groundwater samples from the 5 existing wells
Additional Investigations
• Collected 2 rounds of groundwater samples in 1996

Table 2-1 (continued)

Site 50: Former Sump Water Tank Area
Site Investigation
Jacobs, 1995 • Collected 2 sediment samples • Collected 17 soil samples from 5 locations
Phase III
Jacobs, Phase III 1998 • Collected 6 sediment and 6 surface water samples • Collected 4 soil samples from 2 locations • Installed 4 monitoring wells and collected groundwater samples from each of the 4 new wells
Additional Investigations
• Collected 4 soil samples for perchlorate analysis • Collected 7 groundwater samples for perchlorate analysis in 2000 and 2001
Site 60: Pesticide Storage Buildings 411, 411A, and 714
Site Investigation
Jacobs, 1995 • Collected 42 soil samples from 15 locations
Phases I–III
USACE, Phase I 1993 • Completed 2 soil borings
Jacobs, Phase III 1998 • Collected 2 sediment and 2 surface water samples • Collected 20 soil samples from 17 locations
Goose Prairie Creek and Wetlands
USACE, Phase II 1994 • Collected 4 surface water and 4 sediment samples along Goose Prairie Creek
Jacobs, Phase III 1998 • Collected 30 shallow groundwater samples using Geoprobe • Collected 10 sediment and 10 surface water samples along Goose Prairie Creek • Collected 4 sediment and 4 surface water samples from the Goose Prairie Creek Wetlands area
Additional Investigations
• Collected quarterly surface water samples from Goose Prairie Creek • Collected 8 sediment samples in Goose Prairie Creek Cove • Collected 24 sediment samples in Caddo Lake

BCM = BCM Engineers
EPS = Environmental Protection Systems
Jacobs = Jacobs Engineering Group Inc.
LHAAP = Longhorn Army Ammunition Plant
RI = remedial investigation
USACE = U.S. Army Corps of Engineers

* Most of the samples presented under the facility-wide sumps are also presented under individual site sections.

3.0 COMPARISON CRITERIA

To provide a basis for understanding the relevance of analytical results, comparison criteria are generated. These criteria assist in focusing attention on the more relevant results. The comparison criteria are used to describe the nature and extent of contamination; they are not used in this report to screen out contaminants from further consideration. Some of the criteria discussed will be used in the risk assessment to discuss risk assessment uncertainty (background levels), and some of the criteria, especially the applicable or relevant and appropriate requirements (ARARs), will be used in the FS in selecting remediation levels. However, the criteria are used in this report for clarification only.

Two sets of criteria are used in describing the relevance of analytical results. The first set contains background levels. Metals and anions are naturally occurring; therefore, their presence in environmental samples of all media is not necessarily indicative of contamination from site operations. For this reason, it is necessary to establish the upper end of the range of background (or uncontaminated) concentrations of metals and anions that naturally occur. If a contaminant is present in concentrations less than the background threshold level established for this site, the contaminant is not used to describe the nature and extent of potential contamination because these levels are likely to be naturally occurring and not related to site operations.

The second set of criteria consists of chemical-specific ARARs and to-be-considered (TBC) guidance levels. Chemical-specific ARARs are promulgated regulations that set permissible contaminant limits in various media. If these regulations are deemed to be applicable or relevant and appropriate for the installation, they must eventually be met upon completion of remediation, or a waiver must be obtained. The regulations identified as ARARs in this report are potential ARARs. They do not become enforceable unless they are also present in the record of decision (ROD). Along with potential ARARs, other chemical levels are identified that have some relevance for LHAAP but may not have been promulgated. These are considered by EPA as TBC guidance and are used for clarification purposes only at this time.

The general approach used to compare analytical data to comparison criteria is as follows:

- Background levels constitute the overriding criteria. The background value defines natural and anthropogenic chemical levels present at a site, so it takes precedence.

- ARARs are used when there are no background criteria or where contaminant levels exceed background criteria. The ARARs identified for the media of concern at this time are maximum contaminant levels (MCLs) for groundwater as a potential drinking water source and Texas Water Quality Standards (TWQS) for surface water.

- A TBC value is used for comparison purposes if there are no background guidance values or potential ARARs.

The potential chemical-specific ARARs and TBCs for LHAAP for soil and groundwater are all for the protection of human health. However, ARARs for surface water are for the protection of human health and aquatic species. Therefore, the focus of the nature and extent investigation for soil and groundwater is necessarily on those contaminants that could potentially cause an impact to human health. Because the groundwater contamination in place does not create a hazard to ecological species and the soil data collected are from source areas where there is limited ecological habitat, this is an acceptable outcome of the comparison. The focus of the discussion of surface water contamination considers both protection of human health and of the environment.

3.1 BACKGROUND CRITERIA

The background values for LHAAP were taken from two 1995 reports prepared by the USACE (1995a; 1995b). To determine the extent of naturally existing concentrations of chemicals in groundwater, a combination of new and existing monitoring wells was sampled. To avoid the possibility of encountering groundwater contaminated by operations at LHAAP and still test waters as close to the installation as possible, the preferred locations for monitoring wells were on the border of the installation and hydraulically upgradient. In 1982, three upgradient boundary wells were installed at 20 to 22 feet bgs. Since 1992 the wells have been sampled quarterly. An additional pair of wells was installed in the northwestern corner of the installation at depths of 85 to 109 feet. All five background wells were sampled in late 1994 and again in early 1995. EPA guidance was followed for analyses of these samples whose data were to be used for background comparison. Analyses were conducted on unfiltered samples. The maximum detected value is used in this report for groundwater background levels. The maximum background levels documented in the USACE report had to be slightly modified to reflect removal of data analyzed by the laboratory, Intertek Testing Services (ITS). EPA has requested that all data analyzed by ITS for this project not be considered. During the period of time covered by this project, ITS had trouble with data quality. Only the calcium and potassium groundwater maximum background values were affected. Calcium background was changed to 308 mg/L and potassium was changed to 4.3 mg/L. These changes were so slight no results or conclusions have changed.

In summer 1994, a background soil-sampling event was conducted. The locations on the installation were selected randomly after areas potentially impacted were excluded. The excluded areas included land up to 300 feet from railroads and roadways, land downwind from burn or test sites, low-lying land, or land adjacent to production or waste disposal facilities. About 70 percent of the installation's area was excluded. From the remaining land, 14 soil borings were installed, and samples from the installation of one of the background wells were also collected. Surface soil samples were collected (0–6 inches) as well as subsurface soil samples to 10 feet bgs. Again, EPA procedures were followed for sample analysis.

Table 3-1 presents the surface soil and subsurface soil background values. Table 3-2 presents the background groundwater values. Soil background values were used in sediment result evaluations while groundwater background values were used in surface water result evaluations. Maximum measured concentrations are used in this report for both surface and subsurface soil background levels; however the tables present the mean values also.

3.2 ARARS AND TBCS

This section describes potential chemical-specific ARARs for media at LHAAP. Tables 3-3, 3-4, and 3.5 contain the numeric ARARs and other guidance for soil, groundwater, and surface water, respectively. The maximum background values are included for quick reference.

Table 3-1
Soil Background Results, Group 4 RI, LHAAP, Karnack, Texas

Metals	Surface Soil			Subsurface Soil		
	Number of Detections	Mean (mg/kg)	Maximum (mg/kg)	Number of Detections	Mean (mg/kg)	Maximum (mg/kg)
Aluminum	15/15	6,218	20,700	31/31	9,959.7	23,900
Antimony	0/15	-	-	0/31	-	-
Arsenic	3/15	15.2	29.7	5/31	13	36.8
Barium	15/15	107.3	287	31/31	56.6*	138*
Cadmium	0/15	-	-	0/31	-	-
Calcium	15/15	459	1,090	31/31	716.8	2,740
Chromium	15/15	11.7	22.8	31/31	12.3*	26.2*
Cobalt	15/15	6.8	19.1	31/31	4.5*	12.5*
Copper	15/15	2.4	6.7	31/31	4.3*	10.7*
Iron	15/15	10,515	31,000	31/31	15,979	42,300
Lead	14/15	6.8*	17.4*	30/31	4.7	13
Magnesium	15/15	219*	474*	31/31	1,042*	2,240*
Manganese	15/15	818.1	2,330	31/31	82.2*	376*
Mercury	0/15	-	-	0/31	-	-
Nickel	15/15	3.9*	6.3*	31/31	7*	19.1*
Potassium	15/15	247.9*	481*	31/31	497.8	887
Selenium	0/15	-	-	0/31	-	-
Silver	1/15	2.3	2.3	1/31	1.6	1.6
Strontium	15/15	5.7*	13.3*	31/31	17.7*	39.1*
Thallium	1/15	14.1	14.1	2/31	10.1	10.6
Zinc	15/15	8.4	16.2	31/31	22.3	84.5

* Outlier value removed

LHAAP = Longhorn Army Ammunition Plant

RI = remedial investigation

Table 3-2
Groundwater Background Results, Group 4 RI, LHAAP, Karnack, Texas

Metal/Anion	Number of Detections	Mean (mg/L)	Maximum (mg/L)
Chloride	35/35	710	1,416
Nitrate/Nitrite	22/36	0.076[a]	0.18[a]
Sulfate	33/35	893	3,475
Aluminum	38/38	4.59[a]	13.4[a]
Antimony	0/5	-	- -
Arsenic	12/38	0.011	0.022
Barium	38/38	0.44	1.99
Cadmium	19/38	0.026	0.055
Calcium	10/10	139	308[b]
Chromium	25/38	0.035[a]	0.11[a]
Cobalt	4/10	0.029	0.053
Copper	4/10	0.026	0.043
Iron	38/38	20.35[a]	68[a]
Lead	23/38	0.155	0.3
Magnesium	38/38	124.5	277
Manganese	38/38	3.9	11.8
Mercury	3/38	0.001	0.001
Nickel	9/10	0.039	0.06
Potassium	5/5	4.45[a]	4.3[a,b]
Selenium	3/38	0.08	0.14
Silver	8/38	0.017	0.03
Sodium	33/33	563	1,470
Strontium	10/10	3.1	6.15
Thallium	0/10	-	-
Zinc	6/10	0.09	0.23

[a] Outlier data removed

[b] ITS data included in mean values but removed from maximum values.

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

Table 3-3
Soil Comparison Criteria, Group 4 RI, LHAAP, Karnack, Texas

Chemical	TRRP Tier 1 PCL [30 TAC 350.75(b)]	Background Surface Soil	Background Subsurface Soil
Inorganic Chemicals and Anions (mg/kg)			
Aluminum	260,000	20,700	23,900
Antimony	2.7		
Arsenic	13	29.7	36.8
Barium	220	287	138
Beryllium	0.92		
Cadmium	0.75		
Calcium		1,090	2,740
Chromium (total)	1,200	22.8	26.2
Cobalt	2,000	19.1	12.5
Copper	520	6.7	10.7
Cyanide	20		
Iron		31,000	42,300
Lead	1.5	17.4	13.0
Magnesium		474	2,240
Manganese	5,100	2,330	376
Mercury	1		
Nickel	230	6.3	19.1
Nitrate	9.6		
Nitrite			
Perchlorate	0.27		
Potassium		481	887
Selenium	1.1		
Silver	0.71	2.3	1.6
Sodium			
Strontium		13.3	39.1
Thallium	0.87	14.1	10.6
Vanadium	5,100		
Zinc	3,500	16.2	84.5
Organic Chemicals (mg/kg)			
Acenaphthene	350		
Acenaphthylene	610		
Acetone	7.1		
Aldrin	0.12		
Anthracene	10,000		
Aroclor-1016 (PCBs)	5.3		
Aroclor-1221 (PCBs)	5.3		
Aroclor-1232 (PCBs)	5.3		
Aroclor-1242 (PCBs)	5.3		
Aroclor-1248 (PCBs)	5.3		
Aroclor-1254 (PCBs)	5.3		

Table 3-3 (continued)

Chemical	TRRP Tier 1 PCL [30 TAC 350.75(b)]	Background Surface Soil	Background Subsurface Soil
Aroclor-1260 (PCBs)	5.3		
Benzene	0.013		
Benzoic acid	280		
Benzo(a)anthracene	20		
Benzo(a)pyrene	3.8		
Benzo(b)fluoranthene	67		
Benzo(g,h,i)perylene	69,000		
Benzo(k)fluoranthene	690		
alpha-BHC	0.0089		
beta-BHC	0.032		
delta-BHC	0.19		
gamma-BHC (Lindane)	0.0046		
bis(2-Chloroethoxy) methane	0.000066		
bis(2-Chloroethyl) ether	0.0024		
bis(2-Ethylhexyl) phthalate	82		
Bromochloromethane	4.5		
Bromodichloromethane	0.22		
Bromoform	0.27		
Bromomethane	0.2		
4-Bromophenyl-phenylether	0.4		
Butyl benzyl phthalate	4,000		
Carbazole	5.1		
Carbon disulfide	20		
Carbon tetrachloride	0.031		
alpha-Chlordane	830		
gamma-Chlordane	46		
4-Chloroaniline	0.67		
Chlorobenzene (Mono-)	0.55		
Chloroethane	46		
Chloroform	0.21		
Chloromethane	0.45		
4-Chloro-3-methylphenol	6.8		
2-Chloronaphthalene	1,000		
2-Chlorophenol	2.4		
4-Chlorophenyl-phenylether	0.036		
Chrysene	1,700		
Cyclohexane	8,800		
2,4-D	1.3		
4,4'-DDD	15		
4,4'-DDE	13		
4,4'-DDT	17		
Dibenzo(a,h)anthracene	11		

Table 3-3 (continued)

Chemical	TRRP Tier 1 PCL [30 TAC 350.75(b)]	Background Surface Soil	Background Subsurface Soil
Dibenzofuran	50		
Dibromochloromethane	0.23		
1,2-Dibromo-3-chloropropane	0.00087		
Dichlorodifluoromethane	360		
1,2-Dibromoethane (Ethylene dibromide)	0.0001		
1,2-Dichlorobenzene	8.9		
1,3-Dichlorobenzene	10		
1,4-Dichlorobenzene	1.1		
3,3-Dichlorobenzidene	0.07		
1,1-Dichloroethane	14		
1,2-Dichloroethane	0.0069		
1,1-Dichloroethene	0.025		
cis-1,2-Dichloroethene	0.12		
trans-1,2-Dichloroethene	0.25		
Dichloromethane (Methylene chloride)	0.0065		
2,4-Dichlorophenol	0.53		
1,2-Dichloropropane	0.011		
cis-1,3,-Dichloropropene	0.0074		
trans-1,3-Dichloropropene	0.04		
Dieldrin	0.055		
Di(2-ethylhexyl) phthalate	82		
Diethylphthalate	230		
2,4-Dimethylphenol	4.8		
Dimethylphthalate	93		
Di-n-butylphthalate	5,000		
4,6-Dinitro-2-methylphenol	0.14		
2,4-Dinitrophenol	0.14		
2,4-Dinitrotoluene	0.006		
2,6-Dinitrotoluene	0.0054		
Di-n-octylphthalate	1,000,000		
Endrin	0.38		
Endrin aldehyde	940		
Endrin ketone	76		
Endosulfan I	46		
Endosulfan II	140		
Endosulfan sulfate	7,000		
Ethylbenzene	3.8		
Fluoranthene	2,900		
Fluorene	450		
Heptachlor	0.094		

Table 3-3 (continued)

Chemical	TRRP Tier 1 PCL [30 TAC 350.75(b)]	Background Surface Soil	Background Subsurface Soil
Heptachlor epoxide	0.029		
Hexachlorobenzene	0.56		
Hexachlorobutadiene	2.1		
Hexachlorocyclopentadiene	9.6		
Hexachloroethane	2.7		
2-Hexanone	5.8		
Indeno(1,2,3-cd)pyrene	190		
Isophorone	3.4		
Isopropylbenzene (Cumene)	520		
Methoxychlor	62		
Methyl acetate	2.9		
Methylene chloride – see Dichloromethane			
Methyl ethyl ketone (2-butanone)	44		
2-Methylnaphthalene	130		
4-Methyl-2-pentanone	7.4		
2-Methylphenol (*o*-Cresol)	11		
4-Methylphenol (*p*-Cresol)	0.94		
Methyl tert-butyl ether	0.93		
Naphthalene	47		
2-Nitroaniline	0.033		
3-Nitroaniline	0.038		
4-Nitroaniline	0.064		
Nitrobenzene	0.13		
2-Nitrophenol	0.2		
4-Nitrophenol	0.15		
n-Nitroso-di-n-propylamine	0.00039		
n-Nitrosodiphenylamine	3.2		
Pentachlorophenol	0.0092		
Phenanthrene	620		
Phenol	57		
Pyrene	1,700		
Styrene	1.6		
2,3,7,8-TCDD (Dioxin)	0.0085		
2,4,5-TP (Silvex)	2.6		
1,2,4,5-Tetrachlorobenzene	0.72		
1,1,2,2-Tetrachloroethane	0.026		
Tetrachloroethene	0.025		
Toluene	4.1		
Toxaphene	5.8		
1,2,3-Trichlorobenzene	39		
1,2,4-Trichlorobenzene	2.4		

Table 3-3 (continued)

Chemical	TRRP Tier 1 PCL [30 TAC 350.75(b)]	Background Surface Soil	Background Subsurface Soil
1,1,1-Trichloroethane	0.81		
1,1,2-Trichloroethane	0.01		
Trichloroethene	0.017		
Trichlorofluoromethane	190		
2,4,5-Trichlorophenol	51		
2,4,6-Trichlorophenol	0.66		-
1,1,2-Trichloro-1,2,2-trifluoroethane	120,000		
1,2,4-Trimethyl benzene	72		
Vinyl chloride	0.011		
Xylenes (total)	61		

DDD= dichloro diphenyl dichloroethene
DDE= dichloro diphenyl dichloroethane
DDT= dichloro diphenyl trichloroethane
LHAAP = Longhorn Army Ammunition Plant
PCL = protective concentration level
RI = remedial investigation
TAC = *Texas Administrative Code*
TRRP = Texas Risk Reduction Program

Table 3-4
Groundwater Comparison Criteria, Group 4 RI, LHAAP, Karnack, Texas

Chemical	ARAR			Guidance	
	Federal	Texas Natural Resource Conservation Commission			
	SDWA MCL[a] (40 CFR 141)	MCL[a] (30 TAC 290)	SMCL (30 TAC 290.118)[b]	TRRP Tier 1 PCLs [30 TAC 350.75(b)]	Background
Inorganic Chemicals and Anions (mg/L)					
Aluminum			0.05–0.2	73	13.4
Antimony	0.006	0.006		0.006	
Arsenic	0.05 (0.01)[c]	0.05		0.05	0.022
Barium	2	2		2	1.99
Beryllium	0.004	0.004		0.004	
Cadmium	0.005	0.005		0.005	0.055
Calcium					308
Chloride			300		1416
Chromium (total)	0.1	0.1		0.1	0.11
Cobalt				4.4	0.053
Copper	TT(1.3)[d]	TT(1.3)[d]	1.0	1.3	0.043
Cyanide	0.2	0.2		0.2	
Iron			0.3		68
Lead	TT(0.015)[d]	TT(0.015)[d]		0.015	0.3
Magnesium					277
Manganese			0.05	10	11.8
Mercury (inorganic)	0.002	0.002		0.002	0.001
Nickel				1.5	0.06
Nitrate	10	10		10.0	
Nitrite	1	1		1.0	
Nitrate + Nitrite (as N)	10	10			0.18
Perchlorate				0.066	
Potassium					4.3
Selenium	0.05	0.05		0.05	0.14
Silver	[e]		0.1	0.37	0.03
Sodium					1470
Strontium				22	6.15
Sulfate	400/500[f]		300		3475
Thallium	0.002	0.002		0.002	
Vanadium				0.51	
Zinc			5.0	22	0.23

Table 3-4 (continued)

Chemical	ARAR			Guidance	
	Federal	Texas Natural Resource Conservation Commission			
	SDWA MCL[a] (40 CFR 141)	MCL[a] (30 TAC 290)	SMCL (30 TAC 290.118)[b]	TRRP Tier 1 PCLs [30 TAC 350.75(b)]	Background
Organic Chemicals (mg/L)					
Acenaphthene				4.4	
Acenaphthylene				4.4	
Acetone				7.3	
Aldrin				0.00012	
Anthracene				22	
Aroclor-1016 (PCBs)	0.0005	0.0005		0.0005	
Aroclor-1221 (PCBs)	0.0005	0.0005		0.0005	
Aroclor-1232 (PCBs)	0.0005	0.0005		0.0005	
Aroclor-1242 (PCBs)	0.0005	0.0005		0.0005	
Aroclor-1248 (PCBs)	0.0005	0.0005		0.0005	
Aroclor-1254 (PCBs)	0.0005	0.0005		0.0005	
Aroclor-1260 (PCBs)	0.0005	0.0005		0.0005	
Benzene	0.005	0.005		0.005	
Benzo(a)anthracene				0.0028	
Benzo(a)pyrene	0.0002	0.0002		0.0002	
Benzo(b)fluoranthene				0.0028	
Benzo(g,h,i)perylene				2.2	
Benzo(k)fluoranthene				0.028	
alpha-BHC				0.00032	
beta-BHC				0.0011	
delta-BHC				0.0011	
gamma-BHC (Lindane)	0.0002	0.0002		0.0002	
bis(2-Chloroethoxy) methane				0.0000093	
bis(2-Chloroethyl) ether				0.0019	
bis(2-Ethylhexyl) phthalate				0.006	
Bromochloromethane				2.9	
Bromodichloromethane[g] (TTHM)	0.08	0.08		0.1	
Bromoform[g] (TTHM)				0.1	
Bromomethane				0.1	
4-Bromophenyl-phenylether				0.00014	
Butyl benzyl phthalate				15	
Carbazole				0.1	
Carbon disulfide				7.3	
Carbon tetrachloride	0.005	0.005		0.005	
alpha-Chlordane	0.002	0.002		0.0058	

Table 3-4 (continued)

Chemical	ARAR			Guidance	
	Federal	Texas Natural Resource Conservation Commission			
	SDWA MCL[a] (40 CFR 141)	MCL[a] (30 TAC 290)	SMCL (30 TAC 290.118)[b]	TRRP Tier 1 PCLs [30 TAC 350.75(b)]	Background
gamma-Chlordane	0.002	0.002		0.0058	
4-Chloroaniline				0.29	
Chlorobenzene (Mono-)	0.1	0.1		0.1	
Chloroethane				29	
Chloroform (TTHM)[g]	0.08	0.08		0.1	
Chloromethane				0.16	
4-Chloro-3-methylphenol				0.37	
2-Chloronaphthalene				5.8	
2-Chlorophenol				0.37	
4-Chlorophenyl-phenylether				0.00014	
Chrysene				0.28	
Cyclohexane				370	
2,4-D	0.07	0.07		0.07	
4,4′-DDD				0.0085	
4,4′-DDE				0.006	
4,4′-DDT				0.006	
Dibenzo(a,h)anthracene				0.00028	
Dibenzofuran				0.29	
Dibromochloromethane[g] (TTHM)	0.08	0.08		0.1	
1,2-Dibromo-3-chloropropane	0.0002	0.0002		0.0002	
Dichlorodifluoromethane				15	
1,2-Dibromoethane (Ethylene dibromide)	0.0005	0.00005		0.00005	
1,2-Dichlorobenzene	0.6	0.6		0.6	
1,3-Dichlorobenzene				2.2	
1,4-Dichlorobenzene	0.075	0.075		0.075	
3,3-Dichlorobenzidine				0.0045	
1,1-Dichloroethane				7.3	
1,2-Dichloroethane	0.005	0.005		0.005	
1,1-Dichloroethene	0.007	0.007		0.007	
cis-1,2-Dichloroethene	0.07	0.07		0.07	
trans-1,2-Dichloroethene	0.1	0.1		0.1	
Dichloromethane (Methylene chloride)	0.005	0.005		0.005	
2,4-Dichlorophenol				0.22	
1,2-Dichloropropane	0.005	0.005		0.005	

Table 3-4 (continued)

Chemical	ARAR			Guidance	
	Federal	Texas Natural Resource Conservation Commission			
	SDWA MCL[a] (40 CFR 141)	MCL[a] (30 TAC 290)	SMCL (30 TAC 290.118)[b]	TRRP Tier 1 PCLs [30 TAC 350.75(b)]	Background
cis-1,3-Dichloropropene				0.0038	
trans-1,3-Dichloropropene				0.02	
Dieldrin				0.00013	
Di(2-ethylhexyl) phthalate	0.006	0.006			
Diethylphthalate				58	
2,4-Dimethylphenol				1.5	
Dimethylphthalate				58	
Di-n-butylphthalate				7.3	
4,6-Dinitro-2-methylphenol				0.15	
2,4-Dinitrophenol				0.15	
2,4-Dinitrotoluene				0.003	
2,6-Dinitrotoluene				0.003	
Di-n-octylphthalate				1.5	
Endrin	0.002	0.002		0.002	
Endrin aldehyde				0.022	
Endrin ketone				0.022	
Endosulfan I				0.15	
Endosulfan II				0.44	
Endosulfan sulfate				0.44	
Ethylbenzene	0.7	0.7		0.7	
Fluoranthene				2.9	
Fluorene				2.9	
Heptachlor	0.0004	0.0004		0.0004	
Heptachlor epoxide	0.0002	0.0002		0.0002	
Hexachlorobenzene	0.001	0.001		0.001	
Hexachlorobutadiene				0.015	
Hexachlorocyclopentadiene	0.05	0.05		0.05	
Hexachloroethane				0.073	
2-Hexanone				4.4	
Indeno(1,2,3-cd)pyrene				0.0028	
Isophorone				2.2	
Isopropylbenzene (Cumene)				7.3	
Methoxychlor	0.04	0.04		0.04	
Methyl acetate				2.9	
Methylene choride – see Dichloromethane					

Table 3-4 (continued)

Chemical	ARAR			Guidance	
	Federal	Texas Natural Resource Conservation Commission			
	SDWA MCL[a] (40 CFR 141)	MCL[a] (30 TAC 290)	SMCL (30 TAC 290.118)[b]	TRRP Tier 1 PCLs [30 TAC 350.75(b)]	Background
Methyl ethyl ketone (2-butanone)				44	-
2-Methylnaphthalene				1.5	
4-Methyl-2-pentanone				5.8	
2-Methylphenol (*o*-Cresol)				3.7	
4-Methylphenol (*p*-Cresol)				0.37	
Methyl tert-butyl ether (MTBE)				0.73	
Naphthalene				1.5	
2-Nitroaniline				0.022	
3-Nitroaniline				0.022	
4-Nitroaniline				0.054	
Nitrobenzene				0.037	
2-Nitrophenol				0.15	
4-Nitrophenol				0.15	
n-Nitroso-di-n-propylamine				0.00029	
n-Nitrosodiphenylamine				0.42	
Pentachlorophenol	0.001	0.001		0.001	
Phenanthrene				2.2	
Phenol				44	
Pyrene				2.2	
Styrene		0.1		0.1	
2,3,7,8-TCDD (Dioxin)	3×10^{-8}	3×10^{-8}		3×10^{-8}	
2,4,5-TP (Silvex)	0.05	0.05		0.05	
1,2,4,5-Tetrachlorobenzene				0.022	
1,1,2,2-Tetrachloroethane				0.01	
Tetrachloroethene	0.005	0.005		0.005	
Toluene	1	1		1	
Toxaphene	0.003	0.003		0.003	
1,2,3-Trichlorobenzene				0.22	
1,2,4-Trichlorobenzene	0.07	0.07		0.07	
1,1,1-Trichloroethane	0.2	0.2		0.2	
1,1,2- Trichloroethane	0.005	0.005		0.005	
Trichloroethene	0.005	0.005		0.005	
Trichlorofluoromethane				22	
2,4,5-Trichlorophenol				7.3	
2,4,6-Trichlorophenol				0.19	

Table 3-4 (continued)

Chemical	ARAR			Guidance	
	Federal	Texas Natural Resource Conservation Commission			
	SDWA MCL[a] (40 CFR 141)	MCL[a] (30 TAC 290)	SMCL (30 TAC 290.118)[b]	TRRP Tier 1 PCLs [30 TAC 350.75(b)]	Background
1,1,2-Trichloro-1,2,2-trifluoroethane				2200	-
1,2,4-Trimethyl benzene				3.7	
Vinyl chloride	0.002	0.002		0.002	
Xylenes (total)	10	10		10	

[a]The federal MCLs are relevant and appropriate for remediation of Class I (potable) groundwater only if no state MCL is available for a particular contaminant. All federal nonzero MCLGs are equivalent to their respective MCLs and are, therefore, not listed on this table.
[b]Texas has promulgated the federal SMCLs into the TAC; therefore, these promulgated state standards are potentially relevant and appropriate, depending on site-specific characteristics and groundwater use.
[c]Number in parentheses is the new federal MCL for arsenic, as issued January 23, 2001 (66 FR 6976); the effective date of this MCL has been stayed until January 23, 2006, while EPA continues to research the scientific data.
[d]Number in parentheses is an "action level" that, if exceeded when measured in the 90th percentile at the consumer's tap, triggers initiation of corrosion control studies and treatment requirements.
[e]The interim federal SDWA MCL for this chemical was revoked and a federal secondary MCL of 0.1 mg/L established instead.
[f]This is a federal proposed MCL/MCLG only; EPA has deferred setting a final MCL/MCLG pending further study.
[g]Total trihalomethanes refers to the sum of the concentration of chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

ARAR = applicable or relevant and appropriate requirement
CFR = *Code of Federal Regulations*
EPA = U.S. Environmental Protection Agency
FR = *Federal Register*
> = greater than
LHAAP = Longhorn Army Ammunition Plant
MCL = maximum contaminant level
MCLG = maximum contaminant level goal
MFL = million fibers per liter
PCB = polychlorinated biphenyl
PCL = protective concentration level
RI = remedial investigation
SDWA = Safe Drinking Water Act of 1974
SMCL = secondary maximum contaminant level
TAC = *Texas Administrative Code*
TRRP = Texas Risk Reduction Program
TT = treatment technique
TTHM = total trihalomethanes

3.2.1 Definitions and Methods

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at 40 *Code of Federal Regulations* (CFR) 300.430(f)(1)(ii)(B) states that on-site remedial actions conducted under CERCLA must attain, or have waived, legally applicable or relevant and appropriate requirements under federal or more stringent state environmental or facility siting laws identified at the time the ROD is signed.

Applicable requirements are those cleanup standards, standards of control, and other "substantive" environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site (40 CFR 300.5). The requirement is applicable if all the jurisdictional and site-specific prerequisites of the requirement are met; that is, a requirement is applicable if it directly and fully addresses the situation at the site.

Table 3-5
Potential Federal and State Chemical-Specific ARARs for Surface Water Contamination (μg/L or ppb), Group 4 RI, LHAAP, Karnack, Texas

Analyte ["(c)" indicates a carcinogen]	Protection of Human Health		Protection of Aquatic Life	
	Texas WQC Freshwater Consumption of Water and Fish[a] [(30 TAC 307.6(d)(1)]	Texas WQC Freshwater Consumption of Fish Only[a] [(30 TAC 307.6(d)(1)]	Texas WQC Freshwater Acute Criteria[b,c] [30 TAC 307.6(c)(1)]	Texas WQC Freshwater Chronic Criteria[c,d] [30 TAC 307.6(c)(1)]
Acrolein		780[e]		
Acrylonitrile (c)	1.28	10.9		
Aldrin (c)	0.00408	0.00426	3.0	
Aluminum			991w[f,g]	
Anthracene		110,000[e]		
Antimony		4,300[e]		
Arsenic (c) (inorganic)	50	1.4[e]	360w[f,g]	190w[f,g]
Barium	2,000			
Benzene (c)	5	106		
Benzidene (c)	0.00106	0.00347		
Benzo(a)anthracene (c)	0.099	0.810		
Benzo(a)pyrene (c)	0.099	0.810		
Benzo(b)fluoroanthene (c)		0.31[e]		
Benzo(k)fluoranthene (c)		0.31[e]		
alpha-BHC (c)	0.163	0.413		
beta-BHC (c)	0.570	1.45		
gamma-BHC [Lindane] (c)	0.2	2.00	2.0	0.08
bis(2-Chloroethyl)ether (c)		14.0[e]		
bis(Chloromethyl)ether	0.00462	0.0193		
bis(2-Chloroisopropyl)ether		170,000[e]		
bis(2-Ethylhexyl) phthalate (c)		59.0[e]		
Bromodichloromethane (c)		220[e]		
Bromoform (c)		3600[e]		
Cadmium	5		(Note) 26.4	(Note) 1.03
Carbon tetrachloride (c)	3.76	8.4		
Chlordane (c)	0.0210	0.0213[i]	2.4	0.004
Chlorobenzene	776	1,380		
Chlorodibromomethane (c)	9.20	71.6		
Chloroform (c)	100	1,292		
Chromium (hexavalent)	100	3,320[f]	15.7[f]	10.6[f]
Chromium (trivalent)			(Note) 549	(Note) 178
Chrysene (c)	0.417	8.1		
Copper			(Note) 18.4	(Note) 12.3
Cresols	3,313	13,116		
Cyanide (free)	200	220,000[e]	45.8	10.7
4,4-DDD (c)	0.0103	0.010		
4,4-DDE (c)	0.00730	0.007		

Table 3-5 (continued)

Analyte ["(c)" indicates a carcinogen]	Protection of Human Health		Protection of Aquatic Life	
	Texas WQC Freshwater Consumption of Water and Fish[a] [(30 TAC 307.6(d)(1)]	Texas WQC Freshwater Consumption of Fish Only[a] [(30 TAC 307.6(d)(1)]	Texas WQC Freshwater Acute Criteria[b,c] [30 TAC 307.6(c)(1)]	Texas WQC Freshwater Chronic Criteria[c,d] [30 TAC 307.6(c)(1)]
4,4-DDT (c)	0.00730	0.007	1.1[e]	0.001[e]
Dibenzo(a,h)anthracene (c)		0.31[e]		
1,2-Dibromoethane	0.014	0.335		
1,2-Dichlorobenzene		17,000[e]		
1,3-Dichlorobenzene		2,600[e]		
1,4-Dichlorobenzene	75	2,600[e]		
3,3-Dichlorobenzidine (c)		0.77[e]		
Dichlorobromomethane – see Bromodichloromethane				
1,2-Dichloroethane (c)	5	73.9		
1,1-Dichloroethylene (c)	1.63	5.84		
2,4-Dichlorophenol		790[e]		
1,3-Dichloropropene	22.8	161		
Dieldrin (c)	0.00171	0.002	2.5	0.002
Diethylphthalate		120,000[e]		
Dimethylphthalate		2,900,000[e]		
Di-*n*-butyl phthalate		12,000[e]		
2,4-Dinitrophenol		14,000[e]		
2,4-Dinitrotoluene (c)		91[e]		
2,3,7,8-TCDD (Dioxin)	1.34E-07[j]	1.40E-07[j]		
alpha-Endosulfan		2.0[e]	0.22	0.056
beta-Endosulfan		2.0[e]	0.22	0.056
Endosulfan sulfate		2.0[e]	0.22	0.056
Endrin	1.27	1.34	0.18	0.002
Endrin aldehyde		0.81[e]		
Ethylbenzene		29,000[e]		
bis(2-Ethylhexyl) phthalate (c)		59[e]		
Fluoranthene		370[e]		
Fluorene		14,000[e]		
Heptachlor (c)	0.00260	0.00265	0.52	0.004
Heptachlor epoxide (c)	0.159	1.1	0.52[e]	
Hexachlorobenzene (c)	0.0194	0.0198		
Hexachlorobutadiene (c)	2.99	3.6		
Hexachlorocyclopentadiene		17,000[e]		
Hexachloroethane (c)	84.2	278		
Hexachlorophene	0.0531	0.053		
Indeno(1,2,3-cd)pyrene (c)		0.31[e]		
Isophorone (c)		6,000[e]		

Table 3-5 (continued)

Analyte ["(c)" indicates a carcinogen]	Protection of Human Health		Protection of Aquatic Life	
	Texas WQC Freshwater Consumption of Water and Fish[a] [(30 TAC 307.6(d)(1)]	Texas WQC Freshwater Consumption of Fish Only[a] [(30 TAC 307.6(d)(1)]	Texas WQC Freshwater Acute Criteria[b,c] [30 TAC 307.6(c)(1)]	Texas WQC Freshwater Chronic Criteria[c,d] [30 TAC 307.6(c)(1)]
Lead	4.98	25.3[f]	(Note) 72.6	(Note) 2.52
Malathion				0.01 -
Mercury	0.0122[i]	0.0122[i]	2.4	1.3
Methoxychlor	2.21	2.22		0.03
Methyl bromide		4,000[e]		
2-Methyl-4,6-dinitrophenol		765[e]		
Methylene chloride (c) (Dichloromethane)		16,000[e]		
Methyl ethyl ketone	52,917	9.94E+06		
Nickel		4,600[e]	(Note) 1,415	(Note) 157
Nitrate-Nitrogen (as total nitrogen)	10,000			
Nitrobenzene	37.3	233		
n-Nitrosodiethylamine	0.0382	7.68		
n-Nitrosodi-n-butylamine	1.84	13.5		
n-Nitrosodimethylamine (c)		81[e]		
n-Nitrosodiphenylamine (c)		160[e]		
Parathion (ethyl)			0.065	0.013
PCB-1242, -1254, -1221, -1232, -1248, -1260, -1016				0.014[e]
Total PCBs	0.0013	0.0013	2.0	0.014
Pentachlorobenzene	6.10	6.68		
Pentachlorophenol (c)	1.0	135	20[k]	13[k]
Phenanthrene			30	30
Phenol		4,600,000[e]		
Pyrene		11,000[e]		
Pyridine	88.1	13,333		
Selenium	50		20[l]	5[l]
Silver (as free iron)			0.8	
1,2,4,5-Tetrachlorobenzene	0.241	0.243		
1,1,2,2-Tetrachloroethane (c)		110[e]		
Tetrachloroethylene (c)	5	323		
Thallium		6.3[e]		
Toluene		200,000[e]		
Toxaphene (c)	0.005	0.014	0.78	0.0002
2,4,5-TP [Silvex]	47.0	50.3		
1,1,1-Trichloroethane	200	12,586		
1,1,2-Trichloroethane (c)		420[e]		
Trichloroethylene (c)	5	612		

Table 3-5 (continued)

Analyte ["(c)" indicates a carcinogen]	Protection of Human Health		Protection of Aquatic Life	
	Texas WQC Freshwater Consumption of Water and Fish[a] [(30 TAC 307.6(d)(1)]	Texas WQC Freshwater Consumption of Fish Only[a] [(30 TAC 307.6(d)(1)]	Texas WQC Freshwater Acute Criteria[b,c] [30 TAC 307.6(c)(1)]	Texas WQC Freshwater Chronic Criteria[c,d] [30 TAC 307.6(c)(1)]
2,4,5-Trichlorophenol	953	1,069	136	64
2,4,6-Trichlorophenol (c)		65[e]		-
TTHM	100			
Vinyl chloride (c)	2	415		
Zinc			(Note) 114	(Note) 104

[a]For known or suspected carcinogens, the criteria calculated are based on an incremental cancer risk level of 10^{-5}.
[b]Texas acute criteria do not apply within the zone of initial dilution but do apply within a designated mixing zone.
[c]EPA has issued notice that it intends to revise the aquatic life criteria for copper, silver, lead, cadmium, iron, and selenium and to develop new criteria for atrazine, diazinon, nonylphenol, methyl tertiary butyl ether (MTBE) and manganese (64 FR 58409, October 29, 1999).
[d]Texas chronic criteria do not apply within the zone of initial dilution or within a designated mixing zone; compliance must be achieved at the edge of the mixing zone.
[e]These federal AWQC [as listed in 40 CFR 31.36(b)(1)] are potential ARARs only if there is no state promulgated WQ standard for a particular contaminant. If a state WQ standard is available, the state standard is legally applicable and takes priority over the federal AWQC; if a state WQ standard is unavailable, the federal AWQC may be relevant and appropriate, depending on site circumstances (EPA 1989, 1991). Federal criteria for carcinogens are based on an incremental cancer risk level of 10^{-6} but, per EPA direction, were recalculated to a risk level of 10^{-5} for the purpose of comparison to the Texas risk level of 10^{-5} [40 CFR 131.36(b)(1), footnote a].
[f]Criterion is for the dissolved fraction in water; all other criteria are for total recoverable concentrations.
[g]This criterion is multiplied by a water-effects ratio in order to incorporate the effects of local water chemistry on toxicity. The water-effects ratio is equal to 1 except where sufficient data is available to establish a site-specific water-effects ratio. The number preceding the "w" in the freshwater aquatic life criteria equations is a EPA conversion factor.
[h]This criterion is expressed as a function of total hardness (mg/L as $CaCO_3$) and should be calculated using the listed equation; hardness concentrations should be input as mg/L.
[i]Criterion expressed as total recoverable and is based on USFDA action levels (1 mg/kg) in fish tissue; freshwater BCF = 81,700. EPA recently issued a new recommended human health water quality criterion of 0.3 mg/kg for methylmercury in fish tissue (66 FR 1344, January 8, 2001) and expects the criterion to be used by states as guidance in establishing or updating their water quality standards.
[j]This Texas criterion is for all dioxins/furans.
[k]This criterion is expressed as a function of pH using the following equations: $(1.005(pH)-4.830)e$ for the acute criterion and $(1.005(pH)-5.290)e$ for the chronic criterion value displayed corresponds to a pH of 7.8.
[l]Criterion expressed as total recoverable.

Note: Value calculated assuming a water-effects ratio of 1 and a default hardness of 100 mg/L as $CaCO_3$.

ARAR = applicable or relevant and appropriate requirement
AWQC = ambient water quality criteria
BCF = bioconcentration factor
CCC = criterion continuous concentration
CFR = *Code of Federal Regulations*
CMC = criterion maximum concentration
CS = chronic criterion for protection of aquatic organisms
EPA = Environmental Protection Agency
FR = *Federal Register*
LHAAP = Longhorn Army Ammunition Plant
TAC = *Texas Administrative Code*
TTHM = total trihalomethanes
USFDA = U.S. Food and Drug Administration
WQ = water quality
WQC = water quality criteria

Relevant and appropriate requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site (40 CFR 300.5). The criteria for determining relevance and appropriateness are listed at 40 CFR 300.400(g)(2). A relevant and appropriate requirement must be complied with to the same extent as an applicable requirement.

To qualify as a state ARAR mandating cleanup standards under 40 CFR 300.400(g)(4) of the NCP, a state requirement must be (1) promulgated (of general applicability and legally enforceable), (2) an environmental or facility siting law or regulation, (3) substantive (not procedural or administrative), (4) more stringent than a comparable federal requirement, (5) identified by the state in a timely manner, and (6) consistently applied throughout the state. Pursuant to EPA guidance (1989a), where EPA has delegated to the State of Texas the authority to implement a federal program, the Texas regulations replace the equivalent federal requirements as the potential ARARs.

ARARs are generally divided into chemical-, location-, and action-specific requirements. Chemical-specific ARARs are usually promulgated health- or risk-based numerical values or methods used to determine acceptable concentrations of chemicals that may be found in, or discharged to, the environment. Location-specific ARARs restrict actions or contaminant concentrations in certain environmentally sensitive areas. Action-specific ARARs are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous wastes.

An on-site action need not comply with administrative parts of requirements identified as ARARs. According to EPA guidance (1988b), administrative requirements are mechanisms that facilitate the implementation of the related substantive requirements of a statute or regulation (e.g., approval of or consultation with administrative bodies, documentation, permit issuance, reporting, record keeping, and enforcement).

The NCP in 40 CFR 300.400(e)(1) exempts on-site actions from having to obtain federal, state, or local permits and defines "on-site" as meaning "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for the implementation of the response action." However, on-site actions must still be in compliance with any substantive permit requirements. Off-site actions must only comply with requirements that are legally applicable, but they must comply with both the substantive and the administrative parts of those requirements. Permits, if required, must be obtained for all remedial activities conducted off site [40 CFR 300.400(e)(2)]. Statutory waivers may not be used for off-site actions.

EPA has noted in its CERCLA guidance that if attainment of a numeric value that is a potential chemical-specific ARAR is impossible because the background level of the chemical subject to CERCLA authority is higher than that of the potential ARAR, the numeric criterion would not be considered an ARAR (EPA 1991).

In addition to ARARs, 40 CFR 300.400(g)(3) states that federal or state nonpromulgated advisories or guidance may be identified as TBC guidance for contaminants, conditions, and/or actions at the site. TBCs include nonpromulgated criteria, advisories, guidance, and proposed standards. TBCs are not ARARs because they are usually not promulgated and are not enforceable. TBCs may be used to interpret ARARs and to determine preliminary remediation goals (PRGs) when ARARs do not exist for particular contaminants or are not sufficiently protective to develop cleanup goals. TBCs, such as

guidance or policy documents, developed to implement regulations may be considered and used where necessary to ensure protectiveness. Potential TBCs evaluated as part of this investigation are listed on the ARARs tables and discussed herein.

Pursuant to EPA guidance (1988a; 1988b), while chemical- and location-specific ARARs can be identified and listed in a RI report during the RI phase of the remedial action as the nature and extent of contamination at the site is documented, action-specific ARARs should be identified and considered as part of the screening and detailed analysis of alternatives during the FS phase. Therefore, action-specific ARARs are not included in this report; they will be analyzed and listed in detail in the FS report as specific remedial alternatives are developed. Location-specific ARARs will also be addressed in the FS once the area requiring action is identified.

3.2.2 Chemical-Specific ARARs for Soil

Soil that is treated in situ, or that is excavated, treated ex situ, and then replaced on site may be subject to the chemical-specific requirements and guidance identified in this section. Based upon a review of federal and state regulations and guidance, the sources of potential ARARs/TBCs are: (1) TNRCC protective concentration levels (PCLs) under the Texas Risk Reduction Program (TRRP) [30 *Texas Administrative Code* (TAC) 350]; (2) EPA's guidance for the cleanup of lead in soil (1994; 1998); and (3) EPA's *Soil Screening Guidance* (1996).

3.2.2.1 Texas Risk Reduction Program

The TRRP (30 TAC 350) is the TNRCC's tiered process for developing cleanup objectives (termed PCLs) for contaminated soil and groundwater at sites regulated by certain state-administered programs (30 TAC 350.2). The objectives are developed to ensure that risks to human health posed by environmental conditions do not exceed acceptable levels and take into account site conditions and land use (i.e., residential, commercial/industrial). The Tier 1 PCLs do not address ecological concerns, but the process includes a determination as to whether the Tier 1 PCLs must be adjusted downward to ensure protection of ecological receptors (30 TAC 350.77).

The TRRP applies to cleanup actions commencing after May 1, 2000, under the following state programs:

- Municipal Solid Waste (30 TAC 330)
- Underground Injection Control Program (30 TAC 331)
- Composting (30 TAC 332)
- Brownfield Initiatives (30 TAC 333)
- Underground and Aboveground Storage Tanks (30 TAC 334)
- Industrial Solid Waste and Municipal Hazardous Waste (30 TAC 335)
- Hazardous Substances Facility Assessment and Remediation (30 TAC 335)
- Radioactive Substance Rule (30 TAC 336)
- Sludge Use, Disposal and Transportation (30 TAC 312).

Governmental entities, however, that are not responsible parties performing remedial actions under these programs are excluded pursuant to a legal applicability clause under 30 TAC 350.4(62). In addition, the TNRCC in responding to comments on the proposed rule specifically stated, "this rulemaking is not applicable to the federal Superfund program other than that it may apply as an applicable or relevant and appropriate requirement" (TRRP Preamble, p. 62, Rule Log No. 96106-350-WA). Therefore, the TRRP PCLs are not legally applicable requirements under the ARARs process.

According to EPA guidance in its *CERCLA Compliance with Other Laws Manual* (EPA 1988b), pg. 1-68, "a requirement may also be found relevant but not appropriate when another requirement is available that was designed to apply to that specific situation, reflecting an explicit decision about the requirements appropriate to that situation." The federal NCP includes a process for developing exposure scenarios and cleanup levels for federal Superfund sites that is specific to and appropriate for these situations and would override the TRRP process. The exposure scenarios and assumptions used for the calculation of PCLs under the TRRP methodology are very conservative in nature and limited to soil and groundwater for human health exposure pathways. The Tier 1 PCLs do not allow for consideration of lateral transport, but require exposure to occur at, above, and below the source area. For all PCLs the only exposures considered are residential and commercial/industrial. As such, the TRRP PCLs, while relevant, are not sufficiently similar to the scenarios and assumptions established under the CERCLA Risk Assessment Guidance (RAG) process (EPA 1989b) for evaluating risk and developing remedial alternatives and cleanup levels for CERCLA sites. Finally, there is a written agreement between the Army and TNRCC that the Texas Risk Reduction Rules (TRR)(30 TAC 335), rather than the TRRP, will be considered as potentially relevant and appropriate requirements for developing alternatives and setting remediation levels for LHAAP CERCLA actions. The PCLs will be used as guidance for initial evaluation of soil and groundwater contaminant data; site-specific cleanup objectives for soil and groundwater will be developed in the FS and will take into consideration all of the ARARs/TBC guidance discussed herein.

3.2.2.2 EPA soil lead cleanup guidance

EPA has issued interim guidance for lead in soil at CERCLA sites that recommends cleanup levels based on studies of lead concentration in the blood of children (EPA 1994; 1998). The guidance recommends screening levels of 400 parts per million (ppm) for residential land use. Screening levels are defined as levels of contamination above which there may be enough concern to warrant a site-specific study of risks and are not meant to be used as cleanup criteria. If a cleanup level for lead in soil is needed, EPA recommends that a risk-based level that incorporates potential future land uses be calculated in accordance with these guidance documents. Accordingly, proposed end uses for the land will need to be considered when developing final cleanup levels, if needed, for lead in soil.

EPA recently published a final rule establishing standards for lead-based paint hazards in pre-1978 housing and child-occupied facilities [66 *Federal Register* (FR) 1206, January 5, 2001; effective March 6, 2001]. It establishes, among other things, a standard defined as "soil-lead hazard" as follows: "A soil-lead hazard is bare soil on residential real property or on the property of a child-occupied facility

that contains total lead equal to or exceeding 400 ppm in a play area or an average of 1200 ppm of bare soil in the rest of the yard based on soil samples" (40 CFR 745.65). This standard applies only to residential real property, not to *any* soil or property, so would not be legally applicable (under the ARARs process) to remediation of contaminated soil under CERCLA.

In the preamble to the final rule, EPA specifically addresses the relationship of the soil hazard standard to Superfund soil cleanup standards (66 FR 1233): "The [Toxic Substances Control Act] TSCA soil hazard levels of 400 ppm (play areas) and an average 1200 ppm (rest of yard) should not be understood as a minimum cleanup level for lead in soil at hazardous waste sites, and levels greater than these could be consistent with CERCLA requirements, depending on site-specific factors. Soil lead levels less than these still may pose serious health risks and may warrant timely response actions including abatement. The hazard standard in this TSCA rule was intended as a 'worst first' level that will aid in setting priorities to address the greatest lead risks promptly at residential and child-occupied facilities affected by lead-based paint ... the studies that take place at CERCLA or [Resource Conservation and Recovery] RCRA sites involve multiple hazardous substances ... that require that response levels be developed with site-specific information." EPA also states that its soil lead guidance [Office of Solid Waste and Emergency Response (OSWER) Directives 9355.4-12 and 9200.4-27P], which recommends that the integrated exposure uptake biokinetic model be applied to use site-specific information to develop a cleanup level for lead, should guide cleanup at these sites rather the TSCA lead-based-paint rule. Therefore, this lead-based-paint rule is not an ARAR for cleanup of lead-contaminated soil at CERCLA sites.

3.2.2.3 EPA Superfund soil screening guidance

In October 1999 EPA withdrew its proposed Subpart S corrective action rule, which had proposed soil action levels that would trigger corrective action measures for solid waste management units at hazardous waste management facilities under RCRA, because EPA determined the rule was not necessary (64 FR 54604, October 7, 1999). The action levels in the proposed rule were considered by EPA in the development of its Superfund *Soil Screening Guidance* issued May 31, 1996 (61 FR 27349).

The *Soil Screening Guidance* is presented in three documents: (1) a Quick Reference Fact Sheet (EPA 1996), which provides an overview of the development and use of soil screening levels (SSLs); (2) a User's Guide, which provides details for implementing a simple method for calculating site-specific SSLs; and (3) a Technical Background Document, which presents generic SSLs and the technical foundation for the methods for establishing SSLs. The guidance is intended to be used to screen out areas, exposure pathways, or chemicals of concern from further consideration, assuming certain conditions are present, or to determine that further study is warranted at a site. EPA notes that it is not a rule, does not have the force of a regulation, nor should it be interpreted to represent cleanup standards for soil at a site. The guidance is not an ARAR or TBC for setting final cleanup standards for soil.

3.2.3 Chemical-Specific ARARs for Air

Proposed remedial action alternatives (other than a "no action" alternative) developed during the FS stage may involve excavation activities that may release fugitive particulate matter into the ambient air. Contaminants emitted into the air during remediation must meet certain chemical-specific ARARs; however, because these requirements are triggered by a proposed action, they will be addressed as action-specific ARARs in the FS.

3.2.4 Chemical-Specific ARARs for Surface Water

There is the potential for contaminants in soil or groundwater to leach into or be transported to surface water bodies in the area. If it is determined that these pathways of contamination exist, remediation of the surface water must ensure that chemical-specific ARARs for surface water are met. These ARARs, as listed in Table 3-5, include the legally applicable Texas surface water quality standards (30 TAC 307) and, for those contaminants that have no Texas surface water quality standard set, the relevant and appropriate federal Ambient Water Quality Criteria (AWQC). The Texas pollutant effluent standards (30 TAC 314) and the pretreatment requirements for existing sources of pollution (30 TAC 315) will be addressed as action-specific ARARs in the FS if the proposed alternatives include effluent pretreatment and/or discharge.

3.2.4.1 State surface water quality standards

Texas has promulgated water quality standards in 30 TAC 307 for toxic materials in surface waters. These standards for chemical constituents must be met in waters of the State, depending on the site-specific classifications for the particular waters or segments of waters (as listed in 30 TAC 307.10, Appendices A–E) and for those waters for which there is no specific use designation (30 TAC 307.4). The numeric standards are found at 30 TAC 307.4 (*General Criteria*), 30 TAC 307.5 (*Antidegradation*), 30 TAC 307.6 (*Toxic Materials*) (as listed in Table 3-3), and 30 TAC 307.7 (*Site-Specific Uses and Criteria*). 30 TAC 307.8 (*Application of the Standards*) and 30 TAC 307.9 (*Determination of Standards Attainment*) address how compliance with the standards is implemented and measured. As potentially impacted surface water at the LHAAP site is evaluated, compliance with these surface water quality standards will be addressed.

3.2.4.2 Federal Ambient Water Quality Criteria

The federal AWQC, as listed in 40 CFR 131.36(b)(1) [*EPA's Section 304(a) Criteria for Toxic Pollutants*], are potential ARARs for surface water. The federal AWQC are typically incorporated by individual states into their promulgated water quality standards for individual surface water bodies in the state. A state's promulgated standards then become the legally applicable standards for these surface water bodies. CERCLA Section 121(d)(2)(A) and the NCP at 40 CFR 300.430(e)(2)(i)(E) specifically state that remedial actions shall at least attain federal AWQC if they are "relevant and appropriate under

the circumstances of the release." If there is no state promulgated water quality standard for a particular contaminant, but a federal AWQC is available, the federal AWQC would be considered relevant and appropriate for that particular contaminant. The federal numeric AWQC will be addressed and included as ARARs in documents evaluating surface water contamination.

3.2.5 Chemical-Specific ARARs for Groundwater

Contaminants in soil have the potential to leach into the underlying groundwater. If the RI determines that groundwater has been contaminated from leachate and/or soil at levels exceeding the chemical-specific limits identified in Table 3-4, direct remediation of the groundwater or remediation of the source(s) contributing to the groundwater contamination may be necessary and would be addressed in the FS. The sources of potential ARARs and TBC guidance for groundwater remediation at the LHAAP site include the TRRP PCLs and the federal and state public drinking water system standards.

3.2.5.1 State groundwater quality standards

Texas has no general promulgated groundwater quality standards that limit the concentration of particular chemical constituents in groundwater based on classification. Under the TRRP, however, the state has promulgated PCLs for remediation of contaminated groundwater. As with soil, the standards for groundwater remediation are developed to ensure that risks to human health posed by environmental conditions do not exceed acceptable levels and take into account site conditions and land use (i.e., residential, commercial/industrial); the groundwater near the LHAAP site is used as a source of drinking water. The Tier 1 groundwater PCLs do not address ecological concerns, but the process includes a determination as to whether the Tier 1 PCLs must be adjusted downward to ensure protection of ecological receptors (30 TAC 350.77). Governmental entities that are not responsible parties performing remedial actions under state-administered programs are excluded pursuant to a legal applicability clause under 30 TAC 350.4(62) from the TRRP; therefore, the TRRP PCLs are not applicable requirements under the ARARs process. However, the Tier 1 PCLs for groundwater are included in Table 3-4 as guidance to be used for initial evaluation of groundwater and, as appropriate, for the development of site-specific remediation levels.

3.2.5.2 State/federal Safe Drinking Water Act MCLs/MCL goals

Federal sources of potential ARARs are the MCLs (40 CFR 141.12, 141.61, and 141.62) and the nonzero MCLGs (40 CFR 141.50 and 141.51) under the federal Safe Drinking Water Act of 1974. The federal drinking water standards are typically incorporated by individual states into their promulgated water quality standards for public water supply systems in the state. A state's promulgated standards (as listed under 30 TAC 290 Subchapter F for Texas) then become legally applicable standards, as measured at the tap, for these systems and are administered by the state under an EPA-authorized program.

The NCP at 40 CFR 300.430(e)(2)(i)(B) and (C) states that federal MCLGs set at levels above zero may be relevant and appropriate requirements for contaminants in groundwater determined to be a current or potential source of drinking water. If an MCLG is determined not to be relevant and appropriate (based upon criteria listed in 40 CFR 300.400(g)(2)] or the MCLG is set at zero, the corresponding MCL is the cleanup standard for such groundwater, where the MCL is relevant and appropriate under the circulmstances of the release. The groundwater at the LHAAP site has apparently never been officially classified, either pursuant to TAC 350.52 (*Groundwater Resource Classification*) or the Texas Groundwater Protection Committee's unpromulgated groundwater classification system, as a Class I groundwater or a public water supply system. The groundwater at the installation could be considered a potable resource water, however, since it is used as drinking water by on-site industrial workers. Therefore, federal and state MCLs and non-zero MCLGs may be relevant and appropriate requirements for the cleanup of LHAAP groundwater.

Pursuant to EPA guidance (1989a), where the EPA has delegated to a state the authority to implement a federal program, the state regulations replace the equivalent federal requirements as the potential ARARs. Table 3-4 lists the TNRCC promulgated MCLs. The federal MCLs are also listed in the event that no state standard is available for a particular contaminant. All federal nonzero MCLGs for these contaminants are identical to the MCLs and are, therefore, not listed in Table 3-4. Texas has no promulgated MCLGs.

The federal proposed MCLs, proposed nonzero MCLGs, and secondary MCLs are sources of potential TBCs. Secondary drinking water standards are unenforceable federal guidelines regarding taste, odor, color, and certain other aesthetic effects of drinking water that are recommended to the states by EPA as reasonable goals for drinking water. As such, these federal secondary MCLs are not environmental protection criteria that meet the definition of ARARs or TBC guidance. The federal proposed MCLs and nonzero MCLGs, however, are included as TBCs in Table 3-4 and are footnoted as such.

Texas has promulgated the federal secondary MCLs in 30 TAC 290.118 as secondary maximum contaminant levels (SMCLs) applicable to all public water systems and considers these SMCLs as enforceable limits; therefore, these limits are potential ARARs. In that context, while not legally applicable to the LHAAP groundwater because it is not officially classified as a potable resource water, the SMCLs may be considered relevant and appropriate for this groundwater that is being used as a source of drinking water. The available Texas SMCLs are listed in Table 3-4.

4.0 INDEPENDENT WASTE PROCESS AND WASTE RACK SUMPS

This section provides an overview of the RI activities performed at the facility's waste process sumps and waste rack sumps that are not associated with a specific facility covered within this document. The purpose of the RI is to define the nature and extent of contamination caused by the facility's operation of the sumps and how the residual sump contents and associated soils have been impacted. This section describes the physical characteristics and investigation activities and compiles the analytical data generated during the Phase I and Phase III investigations to document the nature and extent of the contamination detected in the soils adjacent to the waste process sumps and waste rack sumps at the LHAAP facility. Only data collected for sumps not associated with Group 4 sites are presented in this section.

4.1 WASTE PROCESS SUMPS AND WASTE RACK SUMPS BACKGROUND

This section describes all the waste process and waste rack sumps, their history, and the information collected about them before initiation of the RI activities.

4.1.1 Site Description

There are 125 process waste process sumps and 20 waste rack sumps distributed among 76 buildings and/or locations throughout LHAAP, as shown on Figure 4-1. The majority of the sumps were located within two main production areas: Plant 2 Area (Site 46) and Plant 3 Area (Site 47). The other sumps were located within the Shop Area (Site 35A), Chemical Laboratory (Site 35B), Y-Area (Site 48), and Static Test Area (Site 35C). In addition, four sumps—S-114, S-115, S-116, and S-118—are associated with Site 18 and Site 29, which are Group 2 sites.

4.1.2 Waste Process Sumps and Waste Rack Sumps History

Two general classes of waste sumps exist at LHAAP: (1) process waste sumps specific to buildings in production areas and (2) related facilities and sumps associated with waste racks in central locations throughout production areas.

Process waste sumps consisted of rectangular, square, or circular concrete sumps constructed with the top at or slightly above grade. There was a considerable variation in sump configuration, dimensions, and volumes. Depths of sumps varied from 1.5 feet to 11 feet, with most sumps having wood and/or metal covers equipped with liquid gauging devices and access doors for sump content removal. Drain lines leading from the process facilities to waste sumps were typically covered concrete and/or tile troughs constructed at grade level.

Waste rack sumps were outdoor waste racks constructed at centralized production area locations during 1984 and 1985. Each waste rack sump consisted of a covered metal grate suspended above a shallow,

ground level concrete catch basin. Process containers were placed on these racks prior to collection and disposal. Rainwater runoff from waste racks was collected in the concrete catch basins and transported via a drain trough [a covered 5-foot-length of 12-inch-diameter polyvinyl chloride (PVC) pipe] to accompanying waste rack sumps. Each sump had a rated capacity of 260 gallons with an overflow capacity of 360 gallons.

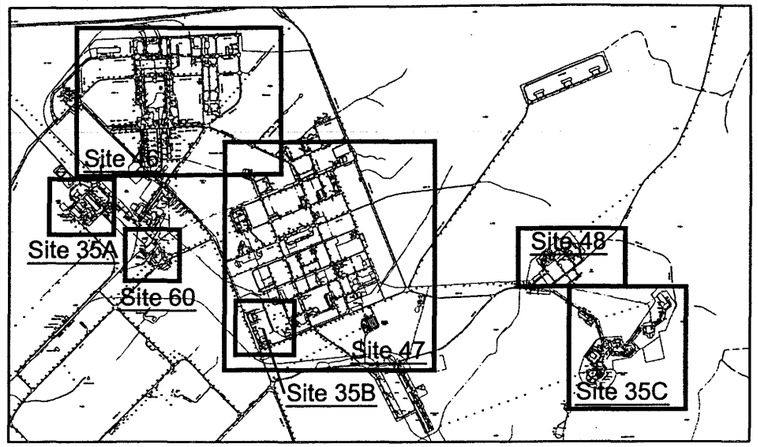
Because of the age and construction of the sumps at LHAAP, releases of sump materials were a possible source of contamination for area surface water, sediments, soils, and groundwater. The presence of structural joints and drain lines as well as the potential for fracture of these joints, created a potential for subsurface release along drain lines or beneath sumps. Activation of deluge fire protection systems also created the potential for sump overflow to the environment. Large volumes of water were periodically released to suppress fires, which resulted in localized flooding at buildings equipped with deluge fire protection systems (USACE 1994).

4.1.3 Pre-Phase I Investigations

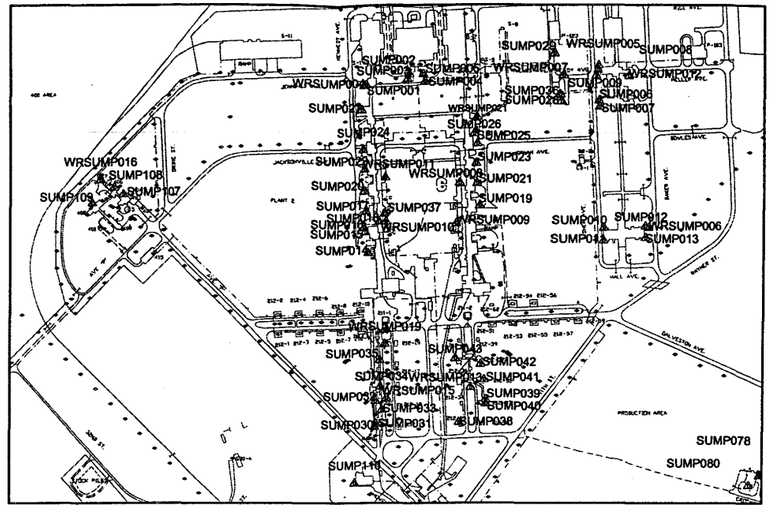
Two investigations or inventories were conducted during the operation of the plant and before the initiation of RI activities.

4.1.3.1 Wastewater collection system and treatment evaluation

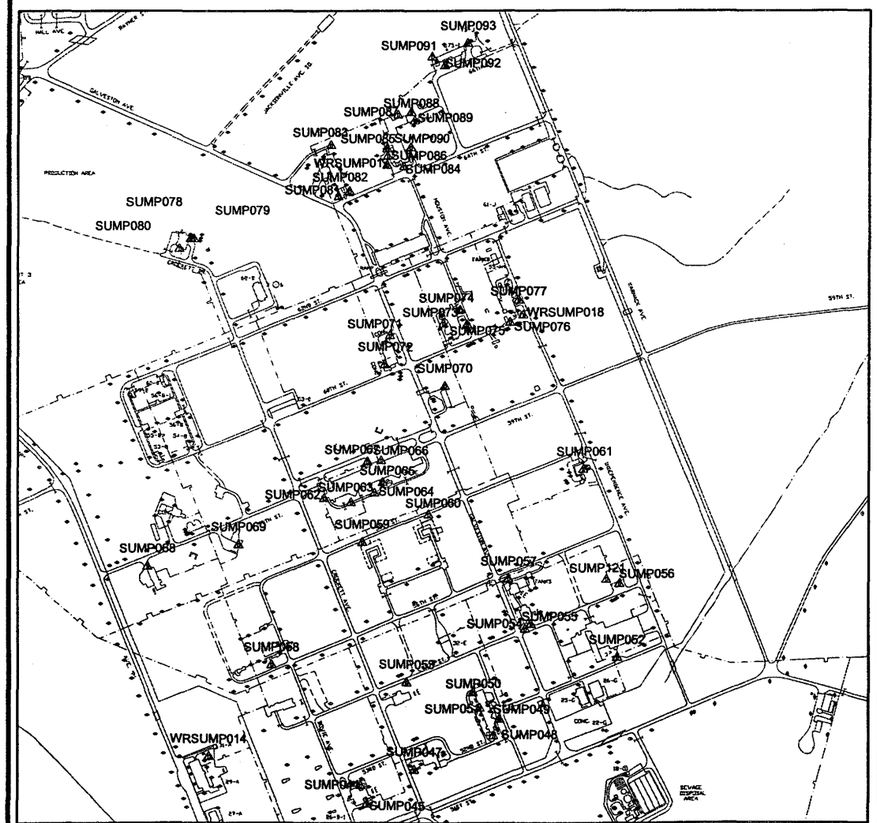
Initial field investigative activities relative to the Group 4 sumps began in November 1991 when BCM Engineers was retained by the LHAAP Operating Contractor, Thiokol, to evaluate the integrity of the sumps system and the industrial wastewater treatment system at LHAAP (BCM 1992). Although the focus was to develop more efficient wastewater management alternatives, the locations of all 125 sumps were surveyed and limited subsurface investigations were conducted at 12 of the sump locations. The subsurface investigation consisted of drilling 12 subsurface soil borings, one at each of 12 randomly selected sump sites, and collecting 24 soil samples (top and bottom of boring) for chemical analysis. Based on the inspection of the sumps, BCM concluded that the structural integrity of many of the sumps was questionable and that many sumps appeared to have overflowed into nearby drainage ditches or onto the ground surface (BCM 1992). Analytical results of soils indicated that VOC contamination consisting primarily of trichloroethene (TCE) in concentrations up to 25,000 µg/kg were present adjacent to 7 of the 12 sumps sampled. Table 4-1 summarizes the analytical results of the BCM soil sampling field activities for the sump S-116 associated with Site 18, a Group 2 site. Other soil results are presented in the site-specific text later in this document.



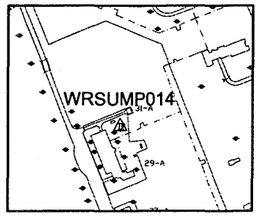
Site Map



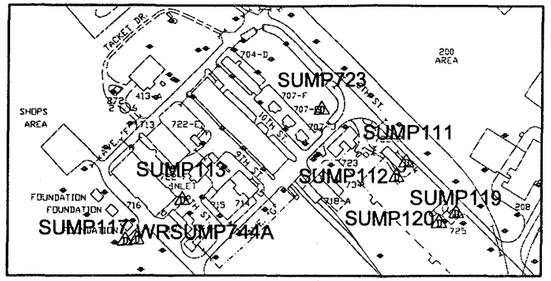
Site 46



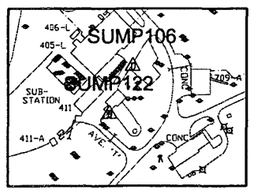
Site 47



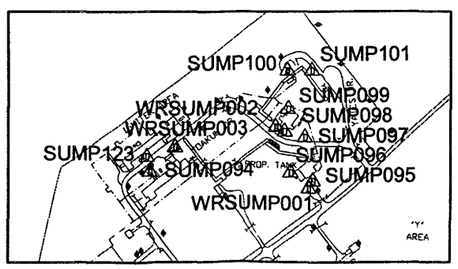
Site 35B



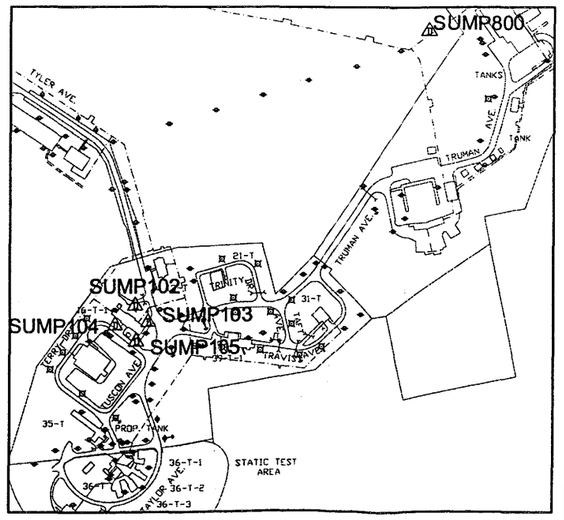
Site 35A



Site 60



Site 48



Site 35C

Legend

- Buildings
- Streams/Creeks/Diversion Ditch
- Roads
- Sump Locations

US Army Corps of Engineers
Tulsa District

JACOBS

Group 4 Sump Sampling Locations
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Kamack, Texas

19Dec01 - Figure 4-1.DWG | Figure 4-1

Table 4-1
Summary of BCM Sump Soil Boring Results, Group 4 RI, LHAAP, Karnack, Texas

Parameter	Units	Sump 116	
		0–2 Feet	8–10 Feet
pH	S.U.	9.5	6.8
Total organic carbon	mg/kg	5,790	22,700
Total solids	percent	78.9	84.1
Aluminum	mg/kg	5,370	6,750
Arsenic	mg/kg	1.53	0.084
Barium	mg/kg	23.6	337
Beryllium	mg/kg	ND	ND
Chromium	mg/kg	6.54	7.65
Lead	mg/kg	8.04	9.83
Mercury	mg/kg	NA	0.119
Magnesium	mg/kg	361	485
Selenium	mg/kg	ND	ND
Methylene chloride	µg/kg	ND	1,660
Toluene	µg/kg	ND	618
1,1,1-Trichloroethane	µg/kg	ND	1,030
Trichloroethene	µg/kg	21.5	25,000

Note: Purgeable organics not detected at any location include: acrolein; acrylonitrile; benzene, bromoform; carbon tetrachloride; chlorobenzene; dibromochloromethane; bromochloromethane; chloroethane; 2-chloroethylvinylether; chloroform; 1,1-dichloroethane; 1,2-dichloroethane; 1,2-dichloropropane; cis-1,3-dichloropropene; trans-1,3-dichloropropene; ethylbenzene; bromomethane; chloromethane; 1,1,2,2-tetrachloroethane; trans-1,2-dichloroethene; 1,1,2-trichloroethane; and vinyl chloride.

BCM = BCM Engineers
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not determined
RI = remedial investigation
S.U. = standard unit

4.1.3.2 USACE sumps inventory

Recognizing that the advanced age and poor design of many of the sumps at LHAAP created a potential for environmental contamination, the USACE conducted a detailed inventory of all active, inactive, and closed sumps at LHAAP in 1993. The inventory identified a total of 125 process sumps and 20 sumps associated with process waste racks distributed among 76 buildings located throughout the Plant Production Areas, Y-Area, and Static Test Area. Each sump location was identified by number, operational status, dimensions, and volume (USACE 1994). Table 4-2 summarizes the waste process sumps identified in the inventory report. In addition, site photographs and detailed maps showing the location of each sump and associated drain lines relative to production buildings were provided in the inventory report. Results of the sumps inventory were used to develop detailed soil and groundwater investigation work plans.

Table 4-2
Process Waste Sump Characteristics Summary as of 1993, Group 4 RI, LHAAP, Karnack, Texas

Sump Number	Site	Building Number	Status	Contents	Outside Dimensions (ft)				Volume (gal)	Comments
					L	W	Depth	Dia.		
01	46	P-1	Active	Liquid	15	5	5	---	2,030	
02	46	P-3	Active	Liquid	9.4	5.5	5	---	1,755	
03	46	P-3	Active	Liquid	9.4	5.5	5	---	1,675	
04	46	P-3	Inactive	Liquid	9.4	5.5	5	---	1,835	
05	46	P-3	Closed	Sand	9.4	5.5	4	---	1,271	
06	46	P-116	Inactive	Liquid	9.4	5.5	11	---	3,623	
07	46	P-116	Active	Liquid	9.4	5.5	9	---	2,904	
08	46	P-117	Active	Liquid	11.5	7.5	5	---	2,922	
09	46	P-117	Active	Liquid	11.5	7	7	---	3,545	
10	46	P-118	Active	Liquid	9.4	5.5	9	---	2,990	
11	46	P-118	Active	Liquid	9.4	5.5	11	---	3,584	
12	46	P-118	Active	Liquid	9.4	5.5	10	---	3,156	
13	46	P-118	Inactive	Liquid	9.4	5.5	9	---	2,922	
14	46	B-5	Closed	Sand	9.3	5.5	4	---	1,077	
15	46	B-7	Unknown	Liquid	9.4	5.5	5	---	1,596	
16	46	B-7	Active	Liquid	---	---	4	5	476	
17	46	B-9	Closed	Liquid	9.4	5	2.5	---	718	
18	46	B-9	Closed	Sand	---	---	5	6	1,077	
19	46	B-10	Active	Liquid	9.5	5.5	5	---	1,476	
20	46	B-11	Active	Liquid	9.3	5.3	5.5	---	1,750	
21	46	B-12	Active	Liquid	14	5	3.5	---	1,456	
22	46	B-13	Active	Liquid	9.3	4.3	7	---	1,683	
23	46	B-14	Active	Liquid	14	5	3.5	---	1,596	
24	46	B-15	Active	Liquid	10	5.5	1.5	---	539	
25	46	B-16	Active	Liquid	9.2	5.3	5	---	1,537	
26	46	Shed C	Active	Liquid	8.3	8.7	3.5	---	1,586	
27	46	P-9	Active	Liquid	13.5	5.3	5	---	2,364	
28	46	P-124	Active	Liquid	---	---	3	4.8	374	
29	46	P-123	Active	Liquid	9.4	5.5	11	---	3,553	
30	46	212-12	Active	Liquid	---	---	3	5.4	535	
31	46	212-12	Inactive	Liquid	---	---	3	5.4	556	
32	46	212-14	Active	Liquid	---	---	3.5	6	738	
33	46	212-14	Inactive	Sand	---	---	4.0	4.3	162	
34	46	212-16	Active	Liquid	---	---	3	5.7	516	
35	46	212-18	Active	Liquid	---	---	3.5	5	486	
36	46	P-122	Removed	---	---	---	---	---	---	
37	46	212-29	Closed	Sand	---	---	3	4.3	330	
38	46	212-32	Active	Liquid	6	6	2	---	400	
39	46	212-33	Removed	---	---	---	---	2.5	---	
40	46	212-33	Active	Liquid	6.5	4.5	3	---	559	
41	46	212-35	Active	Liquid	---	---	3	4	270	
42	46	212-37	Active	Liquid	---	---	3	4	276	
43	46	212-38	Closed	Liquid	---	---	1.5	3.5	106	
44	47	25-C	Closed	Liquid	9.4	9.4	4	---	2,394	
45	47	25-C	Active	Liquid	9.4	9.4	6.5	---	3,763	
46	47	25-C	Removed	---	---	---	---	---	---	Location unknown
47	47	25-D	Active	Liquid	11	11	1.5	---	1,076	
48	47	26-E	Active	Liquid	9.3	4.3	---	---	Unknown	
49	47	26-E	Active	Liquid	6	3	3	---	280	
50	47	26-E	Active	Liquid	9.3	4.3	4	---	977	

Table 4-2 (continued)

Sump Number	Site	Building Number	Status	Contents	Outside Dimensions (ft)				Volume (gal)	Comments
					L	W	Depth	Dia.		
51	47	26-E	Active	Liquid	6	3	6	---	598	
52	47	28-G	Closed	Sand	8	5	2	---	524	
53	47	29-D	Active	Liquid	13	7	7	---	4,424	
54	47	31-G	Active	Liquid	7.4	4.4	5	---	978	
55	47	31-G	Active	Liquid	7.4	4.4	4.5	---	875	
56	47	32-H	Inactive	Liquid	7.6	3.5	3	---	496	
57	47	33-G	Closed	Sand	11.3	7.3	6	---	3,141	
58	47	36-B	Removed	---	---	---	---	---	---	Drain present, sump removed
59	47	41-E	Closed	Sand	17.5	5.5	4	---	2,633	
60	47	42-E	Inactive	Liquid	17.5	5.5	5	---	3,110	
61	47	42-H	Active	Liquid	9.8	9.6	8	---	5,224	
62	47	45-E	Closed	Sand	9	6.3	2.5	---	943	
63	47	45-E	Closed	Sand	9.5	6	2.5	---	943	
64	47	45-E	Closed	Sand	9.5	6	4	---	1,346	
65	47	45-E	Unknown	Liquid	9.5	6	4	---	1,481	
66	47	45-E	Active	Liquid	9	6	4	---	1,481	
67	47	45-E	Closed	Sand	9	6	3	---	943	
68	47	46-A	Inactive	Liquid	9.5	6	5.5	---	1,941	
69	47	46-B	Inactive	Liquid	7.3	5.5	5.5	---	1,372	
70	47	50-G	Active	Liquid	21.3	6	7	---	6,134	
71	47	54-F	Inactive	Liquid	9	6	6	---	2,020	
72	47	54-F	Inactive	Liquid	9	6	6	---	2,169	
73	47	54-G	Closed	Liquid	9	6.4	2.5	---	898	
74	47	54-G	Active	Liquid	6.3	4.4	3	---	501	
75	47	54-G	Active	Liquid	9.5	6.5	3.5	---	1,346	
76	47	54-H	Active	Liquid	9.3	6.4	6	---	2,268	
77	47	54-H	Active	Liquid	9.3	6.4	6	---	2,222	
78	47	68-C	Active	Liquid	---	---	3.5	4.3	359	
79	47	68-C	Active	Liquid	---	---	3.5	4.3	386	
80	47	68-C	Closed	Unknown	7.3	4.6	1	---	200	Could not remove cover
81	47	68-F	Inactive	Liquid	22	10	9	---	13,713	
82	47	68-F	Inactive	Liquid	13.4	7.4	6	---	3,839	
83	47	68-F	Inactive	Liquid	13.4	7.4	8.5	---	5,470	
84	47	68-G	Closed	Liquid	6	5	1.5	---	200	
85	47	68-G	Closed	Sand	7	7	3.5	---	1,048	
86	47	68-G	Inactive	Liquid	15.4	15	7	---	11,310	
87	47	68-G	Closed	Liquid	6	5	2.5	---	441	
88	47	68-G	Closed	Liquid	8.4	7.4	6	---	2,513	
89	47	68-G	Closed	Sand	8.4	7.4	6	---	2,513	
90	47	68-G	Active	Liquid	11.4	9	8	---	5,685	
91	47	75-I	Inactive	Liquid	9.4	7.3	5	---	2,066	
92	47	75-I	Inactive	Liquid	9.4	7.3	6.5	---	2,893	
93	47	75-I	Inactive	Liquid	9.4	7.3	5.5	---	2,464	
94	48	16-Y	Closed	Sand	---	---	2	6	355	
95	48	34-Y	Active	Liquid	7.7	7.5	5.5	---	2,006	
96	48	34-Y	Closed	Sand	---	---	1.5	5	212	
97	48	38-Y	Active	Liquid	---	---	4	5.25	624	
98	48	38-Y	Closed	Sand	---	---	2	6	405	
99	48	38-Y	Active	Liquid	---	---	2	3.7	159	
100	48	45-Y	Closed	Liquid	---	---	1.5	6	265	
101	48	45-Y	Active	Liquid	---	---	4	5.5	661	

Table 4-2 (continued)

Sump Number	Site	Building Number	Status	Contents	Outside Dimensions (ft)				Volume (gal)	Comments
					L	W	Depth	Dia.		
102	35C	16-T	Closed	Sand	8	8.3	4	---	1,833	
103	35C	16-T	Closed	Sand	9.3-	9.3	4	---	2,394	
104	35C	16-T	Closed	Sand	8.3	8.3	7.5	---	3,351	
105	35C	16-T	Closed	Sand	9.3	9.3	4	---	2,199	
106	60	401	Removed	---	Unknown				---	Powerhouse interior
107	46	403	Closed	Liquid	---	---	2	5	297	
108	46	406	Closed	Sand	9.3	5.4	1.5	---	393	
109	46	408	Closed	Liquid	9.3	5	2	---	617	
110	46	207	Inactive	Liquid	6.4	4.4	4.5	---	748	
111	35A	722-P	Active	Liquid	2	2	3.5	---	55	
112	35A	722-P	Active	Liquid	---	---	4.5	3	233	
113	35A	744	Inactive	Liquid	---	---	4	3.5	276	
114	**18**	**25-X**	**Active**	**Liquid**	**19.4**	**12**	**3.5**	**---**	**5,554**	
115	**18**	**33-X**	**Active**	**Liquid**	**20**	**10**	**7**	**---**	**9,273**	
116	**18**	**37-X**	**Inactive**	**Liquid**	**19.4**	**12**	**5.5**	**---**	**8,954**	
117	35A	744-A	Active	Solids	---	---	---	6	714	Vehicle wash
118	**29**	**813**	**Active**	**Liquid**	**8**	**8**	**3**	**---**	**1,283**	
119	35A	725	Closed	Concrete	7.4	5.3	5	---	1,192	Filled with concrete
120	35A	725	Closed	Concrete	15.7	5.3	4	---	2,042	Filled with concrete
121	47	32-H	Inactive	Liquid	Unknown		---	---	2,407	Swampy area
122	60	401-C	Active	Liquid	7	7	4	---	1,212	
123	48	18-Y	Active	Liquid	---	---	---	---	743	Aboveground tank
723	35A	723	Active	Liquid	16	4	---	---	---	Unnumbered sump
800	35C	23-T	Active	Liquid	11	10.3	---	---	---	Sump at tank farm

Bolded text indicates the four sumps discussed in Section 4.0. Others are discussed in site-specific sections.

Dia. = diameter
L = length
LHAAP = Longhorn Army Ammunition Plant
RI = remedial investigation
W = width

4.2 PHYSICAL CHARACTERISTICS OF SITE

Since the waste sumps are located throughout LHAAP, information concerning the topography, soils, and geology is provided in Section 1.2.3 of this report.

4.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the activities completed during the Phases I and III investigations at the waste process sumps S-114, S-115, S-116, and S-118. Subjects addressed include contaminant sources and soil investigations. Table 4-3 summarizes the field activities completed during each investigation phase.

Table 4-3
Waste Process and Waste Rack Sump Investigation Activities, Group 4 RI, LHAAP, Karnack, Texas

Phase I
• Completion of 8 soil borings and collection of 20 soil samples at 4 waste process sumps • Completion of 12 soil background borings (BG-1 through BG-12) to a depth of 11 ft and collection of 2 soil samples (0–2 ft and 9–11 ft) at each location • Collection of 1 fluid sample from sump location S-116
Phase III
• Collection of 6 soil samples at 2 intervals 0–0.5 ft and various depths to a maximum of 17 ft bgs

bgs = below ground surface
LHAAP = Longhorn Army Ammunition Plant
RI = remedial investigation

4.3.1 Contaminant Source Investigation

The primary sources of potential contaminants associated with the waste process and waste rack sumps are waste materials periodically disposed of at the sumps. To determine the condition of sump residues that remained at the sumps, samples of sludge and liquid from location S-116 were collected during the Phase I investigation. The samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), and metals.

4.3.2 Background Investigation

During the Phase I investigation, 12 background soil borings (BG-1–BG-12) were sampled at two intervals (0–0.5 feet and 9–11 feet). Samples were analyzed for VOCs, SVOCs, 19 metals, and cyanide. The results of the background samples were to have been used to calculate values for comparison with the soil sump data generated in 1993. However, the locations chosen to represent background are within areas of the facility that are potentially impacted by other site contaminant sources. Therefore, these background values are not used in this report.

4.3.3 Surface and Subsurface Soil Investigation

Forty soil samples were collected and submitted for chemical analysis during the Phase I and Phase III investigations at the locations adjacent to the four sumps. The samples were analyzed for VOCs, SVOCs, and metals. None of the sumps covered in this section were selected for additional analysis of explosive compounds, cyanide, or total petroleum hydrocarbons (TPH). Recovered soil samples from each sump location were visually classified for lithologic characteristics using the Unified Soil Classification System (USCS) and recorded on the geologic boring logs presented in Appendix A.

The Phase III investigation was developed to provide information on three metals (beryllium, nickel, and vanadium) that were not analyzed for during the Phase I investigation and to provide additional soil information for risk assessment purposes. Six soil borings were completed during the Phase III

investigation with six soil samples analyzed for beryllium, nickel, and vanadium. In addition, six soil samples collected near three process sumps were also analyzed for pesticides, polychlorinated biphenyls (PCBs), and dioxins/furans. Survey data for the soil borings completed during the Phase III investigation are provided in Appendix A.

4.4 NATURE AND EXTENT OF CONTAMINATION

Field activities to delineate the extent of soil contamination resulting from the operation of the facility's waste process and waste rack sumps not associated with Group 4 sites were included in Phase I and Phase III investigations. The following section summarizes the detected compounds and associated concentrations for the sump contents and associated soil samples. Duplicate samples are included in the evaluation but not in the analytical test summary count. Table 4-4 summarizes the media tested and analyses performed during each investigation. A complete list of detected constituents by media is presented in Appendix C.

This section provides an overview of the sump content and soil results for those sumps not associated with Group 4 sites. A summary of the sumps associated with each of the Group 4 sites is provided in the respective sections of this report.

The following subsections summarize the compounds identified and range of detected concentrations for each medium sampled that was associated with the waste process and waste rack sumps. Analytical results are compared and compounds that exceeded background and PCL values are identified. Sump contents and soil media sample analysis results are also summarized.

Table 4-4
Analytical Test Summary for Non-Group 4 Waste Process Sumps, Group 4 RI, LHAAP, Karnack, Texas

Investigation / Medium	Analytical Tests				
	VOCs	SVOCs	PCBs/ Pesticides	Dioxins/ Furans	Metals
Phase I					
Sump Contents	1	1			1
Background Samples	24	24			24
Surface Soils	8	8			8
Subsurface Soils	12	12			12
Phase III					
Surface Soils			3	3	3*
Subsurface Soils			3	2	3*

*Beryllium, nickel, and vanadium analysis only

LHAAP = Longhorn Army Ammunition Plant
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

4.4.1 Sump Content Results

During the Phase I investigation, one liquid sample was collected from sump S-116 and analyzed for VOCs, SVOCs, and metals. Table 4-5 is a compilation of the sump fluid analytical data comparing measurable concentrations to groundwater PCLs. Groundwater PCLs would not be used as a cleanup level for sump contents, but they do serve as an interesting comparison.

Five VOCs were detected in the liquid sample collected from sump S-116 during the Phase I field activities. No SVOCs were detected in the sample. Antimony, arsenic, barium, chromium, copper, potassium, and zinc were detected in sump S-116 at levels exceeding groundwater background values. However, of these metals, only antimony, barium, and chromium exceeded drinking water PCLs. The greatest exceedance was by antimony, which was detected at 10 times greater than the PCL. Of the VOCs detected, only tetrachloroethene (PCE) and TCE exceeded drinking water PCLs (both 5 µg/L). No sludge sample was collected from sump S-116.

Table 4-5
Summary of Sump S-116 Fluid Detections, Group 4 RI, LHAAP, Karnack, Texas

Parameter	Units	Concentration	Background Value	PCL
Volatile Organic Compounds				
Acetone	µg/L	2417		7,300
1,1-Dichloroethane	µg/L	13.1		7,300
Tetrachloroethene	µg/L	**15.8**		5
1,1,1-Trichloroethane	µg/L	72.2		100
Trichloroethene	µg/L	**12**		5
Metals				
Aluminum	(mg/L)	10	13.4	0.2
Antimony	(mg/L)	**0.062**	-	0.006
Arsenic	(mg/L)	0.04	0.022	0.05
Barium	(mg/L)	**6.3**	1.99	2
Cadmium	(mg/L)	0.0041	0.055	0.005
Calcium	(mg/L)	21.2	308	-
Chromium	(mg/L)	**0.209**	0.11	0.1
Cobalt	(mg/L)	0.0037	0.053	4.4
Copper	(mg/L)	0.327	0.043	1.3
Iron	(mg/L)	3.36	68	-
Lead	(mg/L)	0.095	0.3	0.015
Magnesium	(mg/L)	36.7	277	-
Manganese	(mg/L)	0.251	11.8	10
Mercury	(mg/L)	0.00026	0.001	0.002
Potassium	(mg/L)	19.6	4.3	-
Silver	(mg/L)	0.0052	0.03	-
Strontium	(mg/L)	2.37	6.15	22
Zinc	(mg/L)	1.24	0.23	22

Bold – Concentration exceeds PCL and is above background

LHAAP = Longhorn Army Ammunition Plant PCL = protective concentration level RI = remedial investigation

4.4.2 Soil Results

During Phase I field activities, 20 soil samples were collected for analysis from eight borings completed adjacent to waste process sumps S-114, S-115, S-116, and S-118. The sump locations are shown on Figure 4-1. An additional six samples were collected during the Phase III field activities and analyzed for beryllium, nickel, and vanadium while six other samples were analyzed for PCBs/pesticides and dioxins/furans. A complete listing of compounds detected is presented in Appendix C.

4.4.2.1 Organic compounds

Only one VOC—acetone, in one sample—was detected in soil samples near these sumps (7440 µg/kg with a PCL of 7100 µg/kg). This sample came from a boring at S-114 at 3.0 feet bgs. One SVOC—bis(2-ethylhexyl) phthalate—was frequently detected in the soil samples at concentrations below the PCL value. All of the samples from sump S-115 contained bis(2-ethylhexyl) phthalate.

Among the samples analyzed for pesticides and PCBs during Phase III, only the surface soil sample from S-114 contained a detectable concentration of PCB-1254, which was estimated at 66 µg/kg. The soil samples from the surface and 3 feet bgs at S-114 and S-118 contained dioxins and furans. The most common dioxin detected in these soil samples is octachlorodibenzo-p-dioxin. It was detected in all of the samples tested and was present at the highest concentrations measured (maximum 5.9 µg/kg). In most cases, it was accompanied by hexachlorodibenzo-p-dioxin and heptachlorodibenzo-p-dioxin, but at much lower concentrations. Octachlorodibenzo-p-dioxin is routinely the most common dioxin/furan compound present in LHAAP soils. All soils and sediment sample results for this compound were evaluated across LHAAP to determine the concentrations typically found. Fifty percent of the detected results were below 1 µg/kg. Ninety percent were below 4 µg/kg and 95 percent below 7.5 µg/kg. Therefore the 5.9 µg/kg is greater than over 90 percent of the site results but is not an outlier. The dibenzo-p-dioxins are apparently widespread and have higher concentrations at the surface, suggesting that they may have been deposited from the atmosphere, either from off-site sources or from activities at the burning grounds.

4.4.2.2 Metals

Of the 18 metals detected in soil samples collected from the vicinity of the sumps S-114, S-115, S-116, and S-118, 12 were present in concentrations in excess of their backgrounds—aluminum, antimony, barium, calcium, copper, lead, magnesium, nickel, potassium, strontium, vanadium, and zinc (Table 4-6). Three of the metals (antimony, barium, and lead) were detected at concentrations that exceed the 30-acre PCL values. Antimony exceeded its PCL (2.7 mg/kg) in the surface soil samples at S-116 (4.2 mg/kg) and S-118 (4.3 mg/kg). Both barium PCL (220 mg/kg) exceedances were in samples from S-116—one shallow, LHS11601 (221 mg/kg), and one deeper, LHS11602 (651 mg/kg). Because the PCL for lead (1.5 mg/kg) is less than its surface soil background concentration (17.4 mg/kg), any samples with concentrations greater than background will exceed the PCL. The deeper sample from S-116 borehole

Table 4-6
Summary of Independent Sump Soil Metals Contamination, Group 4 RI, LHAAP, Karnack, Texas

Metal (mg/kg)	Minimum Detected	Maximum Detected	Maximum Detected Location	Surface Soil Background	PCL
Aluminum	2,100	23,500	S-114	20,700	260,000
Antimony	4.2	4.3	S-118	ND	2.7
Arsenic	1.1	4.9	S-114	29.7	13
Barium	14	651	S-116	287	220
Beryllium	0.6	0.832	S-114	NA	0.92
Calcium	2,620	11,300	S-116	1,090	---
Chromium, total	5.7	27.9	S-116	22.8	1,200
Cobalt	1	10.1	S-114	19.1	2,000
Copper	2	25.3	S-116	6.7	520
Iron	8,190	26,100	S-114	31,000	---
Lead	1.6	84.3	S-116	17.4	1.5
Magnesium	238	2,600	S-114	474	---
Manganese	14	358	S-118	2,330	5,100
Nickel	7.9	16	S-114	6.3	230
Potassium	237	1,260	S-114	481	---
Strontium	4.9	36.6	S-114	13.3	---
Vanadium	8.75	50	S-118	NA	5,100
Zinc	7	69.2	S-116	16.2	3,500

LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation

LHS11601 (4 feet bgs) and both boreholes at S-118, LHS11801 and LHS11802, contained elevated lead (84.3, 14.0, and 14.9 mg/kg, respectively). The soils near sump S-116 contain multiple metals with elevated concentrations.

All measured concentrations were well below the PCLs for the samples collected during Phase III that were analyzed only for beryllium, nickel, and vanadium.

4.5 CONTAMINANT FATE AND TRANSPORT

With the exception of dioxins, the majority of the organic compound detections in soils are isolated and are not considered indicators of contamination. Therefore the VOCs found in the sump liquid most likely were not released at significant levels to the environment. The sumps have been removed and are no longer sources of contamination. Among the metals, antimony, barium, calcium, copper, lead, magnesium, nickel, potassium, strontium, vanadium, and zinc concentrations were detected at levels more than twice background. The metals contaminants in the independent sump soils at levels of concern are limited to antimony, barium, and lead. These metals should be present in the soil as either low solubility minerals or absorbed as metal ions on clays or iron and manganese oxyhydroxides. The soil metals are subject to migration via infiltration; however, this leaching takes many years and it is extremely unlikely that these levels of metals in soil would ever negatively impact underlying groundwater.

5.0 SITE 35A: SHOP AREA

This section presents the results of the RI activities performed at Site 35A (Shop Area). The purpose of the RI was to define the nature and extent and fate and transport of soil, sediment, surface water, and groundwater contamination at the site. This section describes the site background, physical characteristics, and investigation activities and compiles the analytical data generated during and since the Phase I investigation to document the nature and extent of the contamination detected at Site 35A.

5.1 SITE BACKGROUND

5.1.1 Site Description

Site 35A is located in the north-central portion of LHAAP and covers an area of approximately 15 acres, as shown on Figure 1-2.

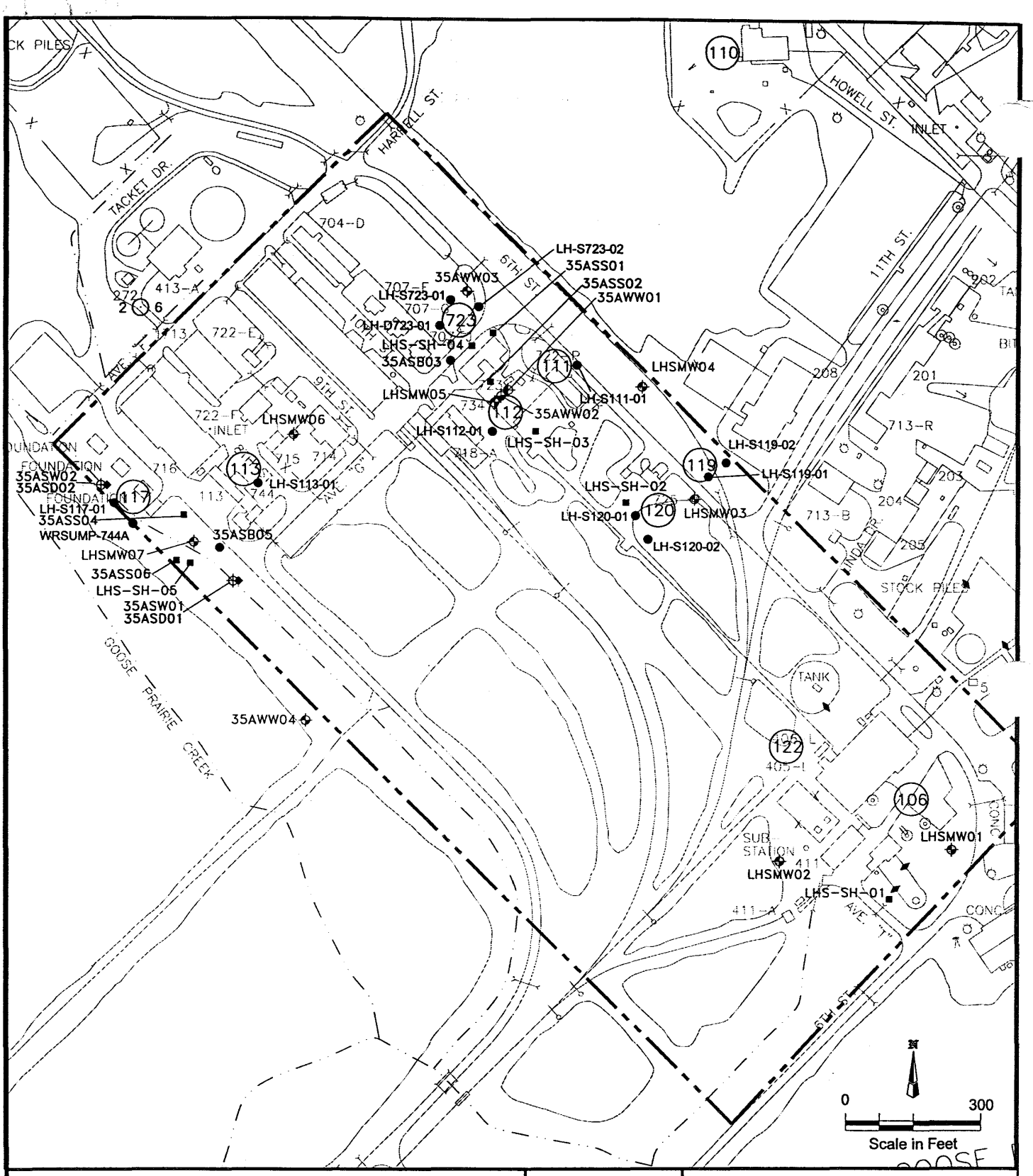
5.1.2 Site History

The Shop Area was established in 1942 as part of the facility's initial construction. To fulfill this logistical mission, LHAAP's production operations required a broad range of support activities. A plant-operated laundry and automotive, woodworking, metalworking, painting, refrigeration, and electrical shops served the needs of the facility's 440 production and administration buildings, utility systems, and network of streets, roads, and railroad tracks.

Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Seven waste process sumps and one waste rack sump were located on the site; the current site layout is shown on Figure 5-1. The site was active from approximately 1942 through 1996.

5.1.3 Pre-Phase I Investigations

Initial field investigative activities relative to the Group 4 sumps started in November 1991 when BCM Engineers was retained by the LHAAP Operating Contractor, Thiokol, to evaluate the integrity of the sumps system and the industrial wastewater treatment system at LHAAP (BCM 1992). Although the focus was to develop more efficient wastewater management alternatives, the locations of all 125 sumps at the LHAAP facility were surveyed and limited subsurface investigations were conducted at 12 sump locations. Seven of the 125 sumps were located at Site 35A; however, no subsurface investigations were conducted at sumps located within Site 35A during this initial investigation. Section 5.3.1 provides additional information about subsequent investigations of the Site 35A sumps.



Legend

- Buildings
- Streams/Creeks/ Diversion Ditch
- Roads
- Soil Boring Sampling Location
- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Surface Water Sampling Location
- Sediment Sampling Location
- Shallow Soil Sampling Location
- (117) Sump Location

US Army Corps of Engineers Tulsa District

JACOBS

Site 35A Sampling Locations Group 4 Remedial Investigatio

Longhorn Army Ammunition Plant
Karnack, Texas

31Dec01 - Figure 5-1.DWG

Figure 5-1

5.2 PHYSICAL CHARACTERISTICS OF SITE

This section describes physical conditions at Site 35A. Subjects addressed include surface features and hydrology, geology and soils, and hydrogeology. Information presented in this section is based on data obtained from the investigation activities and the reports documenting previous investigations.

5.2.1 Surface Features and Surface Hydrology

Site 35A is located in the northwestern portion of LHAAP, near the intersection of 6th Street and Avenue F as shown on Figure 5-1. The surface features at Site 35A include a mixture of asphalt-paved streets, asphalt parking areas around the former buildings, and some vegetation-covered areas. The topography at the site is relatively flat with approximately 5 feet of elevation change from west to east. Surface drainage generally flows from northeast to southwest, either through runoff or is controlled by man-made drainage swales and culverts that eventually drain into Goose Prairie Creek to the southwest.

5.2.2 Geology and Soils

Subsurface data collected during drilling activities at Site 35A indicate clay to silty clay soils from the surface to the full depth of 136 feet bgs at deep soil boring 35AWW02. This boring extends into the top of the Midway Formation. Figure 5-1 shows the boring locations at Site 35A. All of the borings indicate relatively thin, discontinuous sand layers of varying thickness at different depth intervals in the soil column. The northernmost soil boring (35AWW03) and a southern soil boring (LHSMW03) encountered thin sand lenses (1–2 feet thick) beginning at approximately 7 feet bgs. These thin sand lenses do not appear to be continuous from north to south. The borings 35AWW01 and LHSMW04 located between borings 35AWW03 and LHSMW03 did not exhibit the sand lenses at a shallow depth. These shallow sand lenses are underlain by clay to silty clay soil that extends to a thicker saturated sand zone that is encountered at approximately 15 feet bgs in borings 35AWW03 and 35AWW01. This saturated sand zone varies from 3 to 5 feet in thickness and is composed of poorly sorted sand to clayey sand. A saturated sand zone was not encountered in boring LHSMW04 until a depth of approximately 25 feet bgs. A cross-section of the subsurface, trending from northwest to southeast, was prepared from the soil borings at Site 35A and is included as Figure 5-2.

5.2.3 Hydrogeology

Eleven monitoring wells were installed at Site 35A. Nine monitoring wells are completed in the first saturated zone (19 to 32 feet bgs). One monitoring well (35AWW02) was completed as a deep monitoring well (136 feet) set in the Wilcox Formation, and another (an intermediate well 35AWW01) was completed at 71 feet. LHSMW02 is downgradient of the site while the others are located on the site.

Rising head hydraulic conductivity tests (slug tests) were conducted at selected monitoring wells installed at Site 35A. Hydraulic conductivity values were calculated using the Bouwer-Rice method and are presented in Table 5-1. For the shallow or first saturated zone, hydraulic conductivity values range from a minimum value of 3.5×10^{-5} cm/sec at well LHSMW01 to a maximum value of 1.4×10^{-3} cm/sec at well 35AWW02. Only one monitoring well, 35AWW02, was completed in the deep saturated zone. The calculated hydraulic conductivity value for the deep saturated zone is 1.3×10^{-3} cm/sec. These hydraulic conductivity values are consistent with the expected range of values for sands and silty sands (Freeze and Cherry 1979).

Potentiometric surface maps for the intermediate and deep saturated zones were not prepared for Site 35A due to limited data within these saturated zones. However, a potentiometric surface map comprised of data collected from the Group 4 shallow monitoring wells was prepared and is included as Figure 1-3. Based on this map, the shallow groundwater gradient is to the southeast across Site 35A.

5.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the activities performed during the investigations at Site 35A. Subjects addressed include contaminant source, surface water, sediment, soils, and groundwater investigations. Table 5-2 summarizes the field activities completed during each investigation phase.

Table 5-1
Monitoring Well Construction Summary, Site 35A, Group 4 RI, LHAAP, Karnack, Texas

Well Identification	Well Depth (feet)	Groundwater Zone	Surface Elevation	Measuring Point Elevation	Casing Diameter (inches)	Screen Interval (feet)	Hydraulic Conductivity (cm/sec)
35AWW01	71	Intermediate	214.96	218.03	4	60–70	---
35AWW02	136	Deep	215.06	218.05	4	126–136	1.3×10^{-3}
35AWW03	19	Shallow	216.73	219.66	4	9–19	1.5×10^{-5}
35AWW04	23	Shallow	217.15	220.66	4	13–23	3.4×10^{-4}
LHSMW01	16	Shallow	211.19	214.43	4	4.5–14.5	3.5×10^{-5}
LHSMW02	16	Shallow	213.75	215.43	4	5.5–15.5	---
LHSMW03	32	Shallow	214.24	217.26	4	21.8–31.8	---
LHSMW04	30	Shallow	214.04	216.95	4	18.2–28.2	1.4×10^{-3}
LHSMW05	32	Shallow	215.17	217.59	4	11.9–21.9	---
LHSMW06	22	Shallow	219.86	223.18	4	10–20	---
LHSMW07	27.9	Shallow	218.54	221.27	4	17–27	7.9×10^{-4}

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

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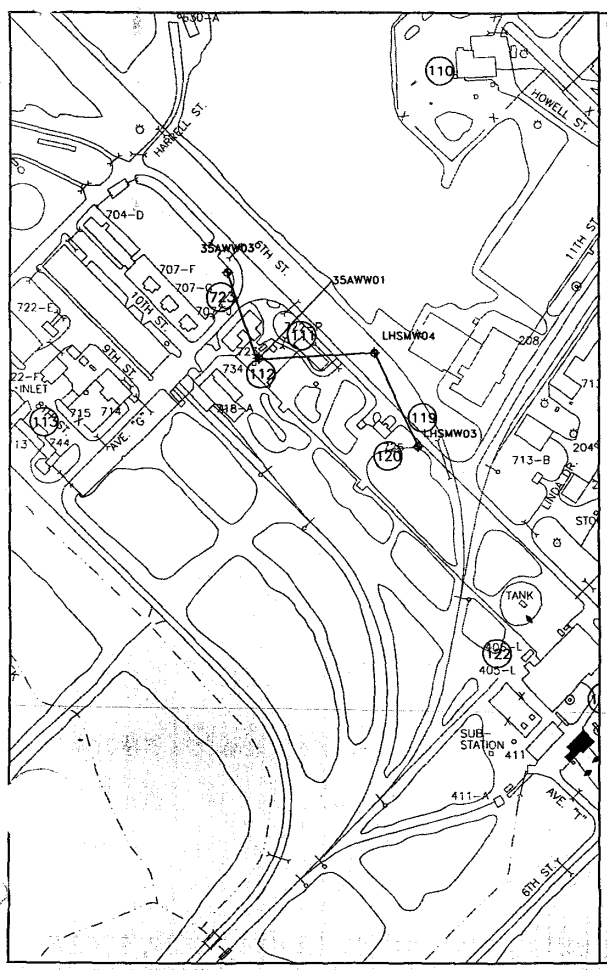
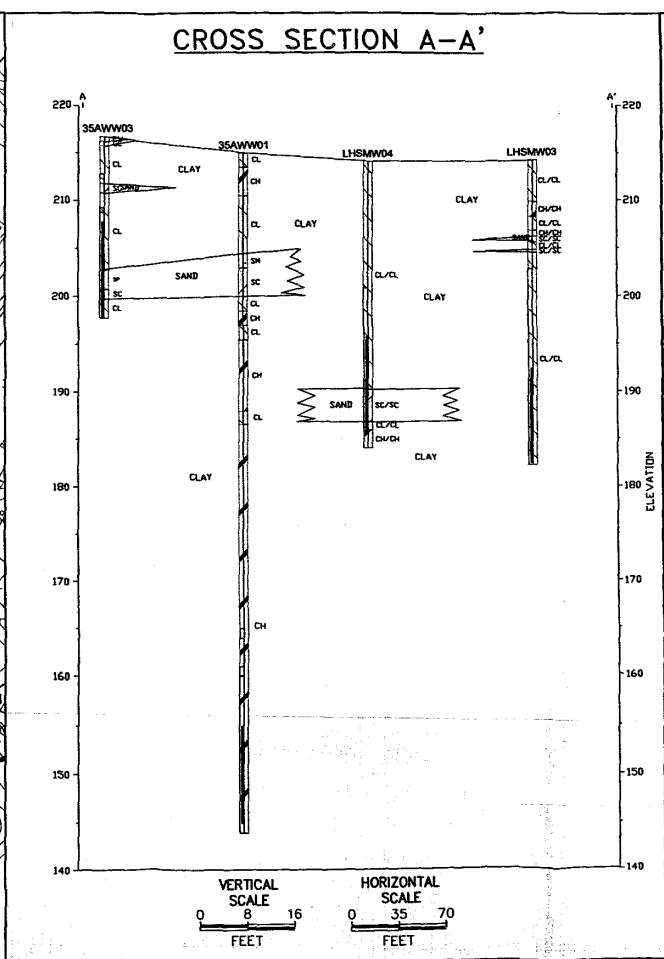

HOWELL ST.
HARWELL ST.
704-D
35AWW03
6TH ST.
35AWW01
707-F
707-G
722-E
722-F
10TH ST.
9TH ST.
LHSMW04
734
112
111
INLET
715
714
AVE. "G"
113
744
718-A
119
LHSMW03
120
726
713-B
204
208
11TH ST.
LINDALE DR.
TANK
122
403-L
SUB-STATION
411
411-A
AVE. "T"
6TH ST.
110


CROSS SECTION A–A'
A
A'
35AWW03
35AWW01
LHSMW04
LHSMW03
CLAY
SAND
SC/SC
CL/CL
CH/CH
CH
220
210
200
190
180
170
160
150
140
ELEVATION
VERTICAL SCALE
0 8 16
FEET
HORIZONTAL SCALE
0 35 70
FEET

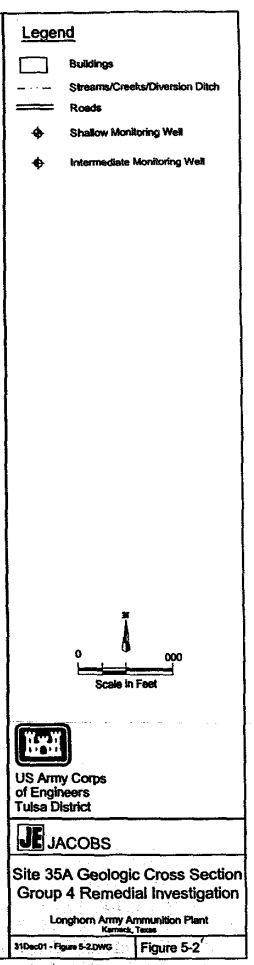

Legend
Buildings
Streams/Creeks/Diversion Ditch
Roads
Shallow Monitoring Well
Intermediate Monitoring Well
0
000
Scale In Feet
US Army Corps of Engineers
Tulsa District
JACOBS
Site 35A Geologic Cross Section
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas
31Dec01 - Figure 5-2.DWG
Figure 5-2

Table 5-2
Investigation Activities, Site 35A, Group 4 RI, LHAAP, Karnak, Texas

Phase I
• Collected 1 sump contents sample from sump S-113 (LH\LQS113) • Completed 11 soil borings (LHS11101, LHS11201, LHS11301, LHS11701, LHS11901, LHS11902, LHS12001, LHS12002, LHS72301, LHS72302, and LHDL72301) at sumps 111, 112, 113, 117, 119, 120, and 723 to various depths and collected a total of 21 soil samples (10 surface soil and 11 subsurface)
Phase II
• Collected 5 surface soil samples from 5 sample locations (LHSSH01 through LHSSH05) • Installed 7 monitoring wells (LHSMW01 through LHSMW07) and collected 7 surface soil and 7 groundwater samples from each well
Phase III
• Collected 14 sump soil samples (7 surface and 7 subsurface) at 6 sumps and 1 waste rack sump locations (sumps 111, 112, 113, 117, 119, 120, and WRS-744A) • Collected 2 sediment samples (35ASD01 and 35ASD02) and 2 surface water samples (35ASW01and 35ASW02) • Collected 10 soil samples (6 surface and 4 subsurface) from 6 sample locations (35ASS01, 35ASS02, 35ASB03, 35ASS04, 35ASB05, and 35ASS06) • Installed 4 monitoring wells (35AWW01 through 35AWW04) and collected groundwater samples from each of these wells and 7 existing wells (LHSMW01 through LHSMW07)
Additional Investigations
• Collected 14 groundwater samples (2 rounds of groundwater samples) at LHSMW01 through LHSMW07 in 1996. • Collected groundwater samples from LHSMW01 for perchlorate analysis in 2000 and 2001

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

5.3.1 Source Investigation

A source of potential contaminants at Site 35A was waste materials historically collected in the waste process sumps. During the Phase I investigation, a sump content sample was collected from sump S-113 and analyzed for TPH only to determine whether the sump was a source of gasoline or diesel fuel contamination to the environment. The physical descriptions of the sumps are presented in Section 4.0, Table 4-2.

5.3.2 Surface and Subsurface Soil Investigation

Eleven soil borings were completed adjacent to the seven sumps located at Site 35A during the Phase I investigation to assist in evaluating the nature and extent of soil contamination immediately adjacent to the sump locations. In general, shallow surface soil samples were collected from 0–2 feet bgs. Ten surface soil samples were collected and analyzed for VOCs, SVOCs, and metals. Six of the samples were also analyzed for explosive compounds. Subsurface soil samples were collected from a 2-foot interval from 2 to 7 feet bgs. Eleven subsurface soil samples were collected and submitted for laboratory analysis of VOCs, SVOCs, and metals. Six of the samples were also analyzed for explosive compounds. In addition,

the surface and subsurface soil samples collected from locations near sumps S-113 and S-117 were analyzed for methylene chloride, and the surface soil sample collected at the drain line (LHDL72301) was analyzed for explosives.

A single soil boring was completed adjacent to six sump locations and one waste rack sump location during the Phase III investigation. Seven surface soil samples were collected from 0 to 0.5 feet bgs. Five subsurface soil samples were collected from 3 to 5 feet bgs at sumps S-112, S-113, S-117, and S-120 and waste rack sump WRSUMP744A; two subsurface soil samples were collected at 5.5–6 and 6–6.5 feet bgs at sumps S-111 and S-119, respectively. All surface and subsurface soil samples were analyzed for beryllium, nickel, and vanadium. Surface and subsurface soil samples were also analyzed for pesticides/PCBs and dioxins/furans near four of the sump locations (sumps S-112, S-113, S-117, and S-120).

In addition to soil samples collected adjacent to sumps, 32 soil samples were collected at locations throughout the site (as shown on Figure 5-1) during the Phase II and Phase III investigations and submitted for chemical analysis. The purpose of collecting and analyzing these samples was to determine whether past activities including spills had impacted the area.

Twelve soil locations (LHSSH01 through LHSSH05 and LHSMW01 through LHSMW07) were sampled during the Phase II field investigation. The surface soil samples were collected from 0 to 0.5 feet bgs with 10 surface soil samples analyzed for VOCs, SVOCs, and metals. Seven of these samples were analyzed for explosives. Soil samples collected from LHSMW07 were also analyzed for TPH.

Six soil borings (at locations 35ASS01, 35ASS02, 35ASB03, 35ASS04, 35ASB05, and 35ASS06) were completed during the Phase III investigation. Six surface soil samples were collected from 0 to 0.5 feet bgs. Two of the surface soil samples (at locations 35ASB03 and 35ASB05) were analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides/PCBs, dioxins/furans, and polycyclic aromatic hydrocarbons (PAHs). Four surface soil samples (at locations 35ASS01, 35ASS02, 35ASS04, and 35ASS06) were analyzed only for PAHs. Four subsurface soil samples were collected from two of the sample locations (35ASB03 and 35ASB05 at 1–3 feet bgs and 3–5 feet bgs). All of the subsurface soil samples were analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides/PCBs, and dioxins/furans.

5.3.3 Surface Water and Sediment Investigation

During the Phase III investigation two sediment samples (at locations 35ASD01 and 35ASD02) and two surface water samples (at locations 35ASW01and 35ASW02) were collected as shown on Figure 5-1. The area targeted for investigation was the ditch located in the southwestern portion of the site. This ditch collected surface runoff from the area adjacent to sumps S-113 and S-117. Surface water and sediment samples were analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides, and PCBs.

Additionally, surface water samples were analyzed for hardness, and sediment samples were analyzed for grain size distribution, cyanides, and total organic carbon (TOC). The sample from location 35ASD01 was also analyzed for dioxins/furans.

5.3.4 Groundwater Investigation

Eleven groundwater monitoring wells were installed during the Phase II through Phase III field activities at Site 35A. One deep monitoring well was installed at 136 feet bgs, one intermediate monitoring well was installed at 71 feet bgs, and nine shallow groundwater monitoring wells were installed from 16 to 32 feet bgs. These monitoring well locations are depicted in Figure 5-1. Shallow groundwater is the layer that would become contaminated from surface and sump activities. The deeper wells were installed to determine whether contamination was migrating deeper.

Recovered soil samples from each monitoring well boring were visually classified for lithologic characteristics using the USCS and recorded on the geologic boring logs presented in Appendix A. Soil samples were screened in the field with an ionization detector [photoionization detector (PID) or flame ionization detector (FID)] to detect VOCs in the samples. A downhole geophysical survey (natural gamma ray and single-point resistivity) was performed at monitoring well bore hole 35AWW02 to provide additional stratigraphic data relative to the subsurface geology. Survey data for the soil borings and monitoring wells are provided in Appendix A.

Table 5-1 summarizes the well construction details of monitoring wells installed. Nineteen groundwater samples were collected during the Phase II and Phase III investigations, and 14 groundwater samples were collected in 1996 to assist in defining the shallow, intermediate, and deep groundwater conditions.

Seven groundwater samples were collected in fall 1994 during the Phase II investigation from monitoring wells LHSMW01 through LHSMW07. These samples were submitted for laboratory analysis of VOCs, SVOCs, explosive compounds, and metals.

During the Phase III investigation, five groundwater samples were collected in fall 1998 from monitoring wells [35AWW01, 35AWW02, 35AWW03, and 35AWW04 (sampled twice)] installed, and seven groundwater samples were collected from monitoring wells LHSMW01 through LHSMW07 in spring 1998. All 12 groundwater samples were collected during the Phase III investigation and were submitted for laboratory analyses for VOCs, SVOCs, explosive compounds, and metals. A single sample was collected from each of the monitoring wells except 35AWW04, which was sampled in September and November 1998. Two of the groundwater samples (LHSMW05 and LHSMW07) were also submitted for analyses for pesticides/PCBs and dioxins/furans. LHSMW07 was also analyzed for TPH.

In 1996, groundwater samples were collected at the end of January and the beginning of February and again in August at seven monitoring wells (LHSMW01 through LHSMW07). Fourteen groundwater

samples were analyzed for VOCs, SVOCs, explosive compounds, metals, and anions. Samples from two wells (LHSMW01 and LHSMW05) were also analyzed for pesticides/PCBs, chlorinated herbicides, and cyanide. LHSMW01 was sampled for perchlorate in 2000 and 2001.

5.4 NATURE AND EXTENT OF CONTAMINATION

The following section summarizes the detected compounds and associated concentrations for the sump contents, soil, sediment, surface water, and groundwater samples. Table 5-3 presents a general summary of the media tested and analyses performed during each investigation. A complete list of detected compounds is presented in Appendix C.

5.4.1 Contaminant Source Results

During the Phase I investigation one liquid sample was collected from sump S-113 and analyzed for TPH. A concentration of 600,000 µg/L was detected for medium petroleum distillates.

All sumps and sump contents were removed in 1996 and 1997; therefore, the sumps are no longer sources contributing contamination. Potential migration from this source to other media, such as surface and subsurface soil, sediment, surface water, and groundwater, are discussed in the following sections.

Table 5-3
Analytical Test Summary, Site 35A, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests									
	VOCs	SVOCs	PAHs	Pesticides/ PCBs	Explosive Compounds	Dioxins/ Furans	Metals	TPH	Cyanide	Perchlorate
Phase I										
Sump Contents								1		
Surface Soils	10	10			6		10	2		
Subsurface soil	11	11			6		11	2		
Phase II										
Surface Soils	12	12			7		12	1		
Groundwater	7	7			7		7			
Phase III										
Surface Water	2	2		2	2		2		2	
Sediments	2	2		2	2	1	2		2	
Surface Soils	2	2	6	6	2	6	9*			
Subsurface Soils	4	4		11	4	8	11*			
Groundwater	12	12		2	12	2	12	1		
Additional Investigations										
Groundwater	14	14		2	2		14			2

*Seven samples were analyzed for beryllium, nickel, and vanadium only.

LHAAP = Longhorn Army Ammunition Plant
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
TPH = total petroleum hydrocarbon
VOC = volatile organic compound

5.4.2 Soil Results

Seven waste process sumps and one waste rack sump were investigated during the Phase I and Phase III investigations at Site 35A. Sixty-seven soil samples were analyzed for some or all of the following: VOCs, SVOCs, PAHs, pesticides/PCBs, dioxins/furans, explosive compounds, and metals. Table 5-4 summarizes the concentration of compounds detected in soil. The detected compound results by location are presented in Appendix C.

5.4.2.1 Organic compounds

Only one VOC, toluene, was detected in the surface soil sample (at location 35ASB05) located north of sump S-113. 2-Butanone [methyl ethyl ketone (MEK)], carbon disulfide, and TCE were detected at 1 foot bgs at the sump S-723 drain line (sample LHDL72301). All VOC concentrations were below the soil PCL values. No VOCs were detected in subsurface soil at Site 35A.

Low concentrations of SVOC constituents (phthalates) were detected at surface soil sample locations (LHS72301 and LHS72302) near sump S-723 and in the sample (LHDL72301) below the drain line. Phthalate compounds were detected in surface soil samples from LHSMW02, LHSMW04, LHSMW05, LHSMW06, and LHSMW07 and in the surface and subsurface soil at LHS12002 at concentrations below the PCLs. One higher concentration of bis(2-ethylhexyl) phthalate was detected (200,000 µg/kg) at location LHSSH05 in the southwestern portion of the site located southwest of sump S-113 and southeast of sump S-117. This concentration is above the PCL comparison criterion of 8200 µg/kg.

Several SVOCs classified as PAHs were detected in samples 35ASS01, 35ASS02, 35ASS06, LHS72301, LHS72302, LHSMW02, LHSMW06, LHSMW07, LHSSH04, and LHSSH05. The majority of the concentrations were detected at sample locations LHSMW06, LHSMW07, and LHSH04. PAH concentrations were detected only sporadically at other locations. All PAHs were detected at concentrations below the PCLs. No PAHs were detected in subsurface soil at Site 35A.

Low concentrations of TPH (ranging from 41 to 531 mg/kg) were detected in surface and subsurface soil at LHS11301 and in surface soil at LHS11701 and LHSMW07.

Low concentrations of pesticides were detected in surface samples collected adjacent to sumps S-112 and S-113 and in surface and subsurface soil adjacent to sump S-117. The pesticide concentrations were below the PCLs.

The PCB Aroclor-1254 was detected in surface soil samples from locations SUMP112 and 35ASB03 at 0–0.5 feet bgs. Aroclor-1254 was also detected at 0–0.5 and 1–3 feet bgs in a sample from location35ASB05. Sample concentrations ranged from 0.043 to 1.3 mg/kg. These concentrations are below the PCL of 5.3 mg/kg.

Table 5-4
Summary of Detected Constituents in Soil Samples, Site 35A, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	39/39	2,740	22,200	LH-S120-02 (1)	260,000	20,700
Antimony	3/39	3.4	8.5	LH-S112-01 (1)	2.7	ND
Arsenic	39/39	0.704	17.8	LH-S723-01 (1)	13	29.7
Barium	39/39	39	255	LH-S117-01 (1)	220	287
Beryllium	3/20	0.626	0.755 J	SUMP111 (1)	0.92	NA
Cadmium	7/39	1.1	18.5	LH-S723-01 (1)	0.75	ND
Calcium	39/39	360	18,000	35ASB05 (1)		1,090
Chromium, total	39/39	6	171	LH-DL723-01 (1)	1,200	22.8
Cobalt	32/39	1.73	19	LH-S119-01 (2)	2,000	19.1
Copper	39/39	2.7	829	LH-S117-01 (1)	520	6.7
Iron	39/39	4,380	72,800	LH-S723-01 (1)		31,000
Lead	39/39	4.1	259	LHS-MW-5 (1)	1.5	17.4
Magnesium	37/39	129	3,330	LH-S120-01 (1)		474
Manganese	39/39	9.4	1,030	LH-S120-02 (1)	5,100	2,330
Mercury	4/39	0.088	43.7	LHS-SH-05 (1)	1	ND
Nickel	17/20	5.2	18	SUMP117 (1)	230	6.3
Potassium	37/39	140	1,400	35ASB03 (1)		481
Selenium	17/39	0.16	4.27	35ASB05 (1)	1.1	ND
Silver	8/39	0.036	109	LH-DL723-01 (1)	0.71	2.3
Strontium	29/34	6	37	35ASB05 (1)		13.3
Vanadium	20/20	7.8 J	66 J	35ASB05 (1)	5,100	NA
Zinc	39/39	10.5	2,580	LHS-MW-2 (1)	3,500	16.2
Petroleum hydrocarbons (mg/kg)						
Total petroleum hydrocarbons	4/5	41	531	LHS-MW-7 (1)		
VOCs (µg/kg)						
Carbon disulfide	1/39	33	33	LH-DL723-01 (1)	20,000	
Methyl ethyl ketone (2-butanone)	1/39	64	64	LH-DL723-01 (1)	44,000	
Toluene	1/39	4.3	4.3	35ASB05 (1)	4,100	
Trichloroethene	1/39	2	2	LH-DL723-01 (1)	17	
SVOCs (µg/kg)						
Anthracene	1/39	270 J	270 J	LHS-SH-04 (1)	10,000,000	
Benzo(a)anthracene	4/39	51 J	1,600	LHS-SH-04 (1)	20,000	
Benzo(a)pyrene	3/39	150 J	1,900	LHS-SH-04 (1)	3,800	
Benzo(b)fluoranthene	5/39	88 J	3,100	LHS-SH-04 (1)	67,000	
Benzo(g,h,i)perylene	3/39	120 J	1,500	LHS-SH-04 (1)	69,000,000	
Benzo(k)fluoranthene	4/39	66 J	1,300	LHS-SH-04 (1)	690,000	
Chrysene	4/39	84 J	3,600	LHS-SH-04 (1)	1,700,000	
Di-n-butyl phthalate	3/39	92 J	120 J	LHS-MW-7 (1)	5,000,000	
Dibenz(a,h)anthracene	2/39	37 J	300 J	LHS-SH-04 (1)	11,000	
Diethyl phthalate	3/39	123 J	541 J	LH-S723-01 (1)	230,000	
Fluoranthene	5/39	77 J	3,700	LHS-SH-04 (1)	2,900,000	
Indeno(1,2,3-c,d)pyrene	2/39	120 J	1,500	LHS-SH-04 (1)	190,000	
Phenanthrene	1/39	1,200	1,200	LHS-SH-04 (1)	620,000	
Pyrene	5/39	56 J	5,200 J	LHS-SH-04 (1)	1,700,000	
bis(2-Ethylhexyl) phthalate	8/39	70 J	200,000	LHS-SH-05 (1)	82,000	

Table 5-4 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
PAHs (µg/kg)						
Acenaphthene	1/8	1,200	1,200	35ASS01 (1)	350,000	
Anthracene	1/8	86	86	35ASS02 (1)	10,000,000	
Benzo(a)anthracene	2/8	27	83	35ASS01 (1)	20,000	
Benzo(a)pyrene	1/8	75	75	35ASS01 (1)	3,800	
Chrysene	2/8	27	83	35ASS01 (1)	1,700,000	
Fluoranthene	1/8	120	120	35ASS06 (1)	2,900,000	
Naphthalene	1/8	350	350	35ASS06 (1)	47,000	
Phenanthrene	1/8	46	46	35ASS01 (1)	620,000	
Pesticides (µg/kg)						
Dieldrin	1/17	86 J	86 J	SUMP112 (1)	55	
p,p'-DDD	4/17	67 J	200 J	SUMP117 (1)	15,000	
p,p'-DDE	7/17	11 J	50	SUMP113 (1)	13,000	
p,p'-DDT	2/17	37	45	SUMP113 (1)	17,000	
PCBs (µg/kg)						
PCB-1254 (Aroclor-1254)	6/16	43	1,300	35ASB03 (3)	5,300	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	15/15	46.46	4,130.9	SUMP120 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	14/15	4.754	249.284	SUMP113 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	14/15	2.391	119.852	SUMP113 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	8/15	0.993	242.258	35ASB05 (1)		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	3/15	0.993	4.657	SUMP113 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1/15	0.175	0.175	35ASB05 (1)		
Pentachlorinated dibenzo-p-dioxins (total)	4/15	0.363	21.02	35ASB05 (1)		
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1/15	0.363	0.363	SUMP117 (1)		
Tetrachlorinated dibenzo-p-dioxins (total)	2/15	1.801	15.609	35ASB05 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	13/15	0.553	58.629	SUMP113 (1)		
Heptachlorinated dibenzofurans (total)	12/15	0.568	33.067	SUMP113 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	13/15	0.296	33.067	SUMP113 (1)		
Hexachlorinated dibenzofurans (total)	13/15	0.307	259.328	SUMP113 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	12/15	0.431	115.517	SUMP113 (1)		
1,2,3,6,7,8-Hexachlorodibenzofuran	6/15	0.248	6.359	SUMP113 (1)		
1,2,3,7,8,9-Hexachlorodibenzofuran	1/15	5.544 J	5.544 J	SUMP113 (1)		
2,3,4,6,7,8-Hexachlorodibenzofuran	4/15	0.476	21.897	SUMP113 (1)		
Pentachlorinated dibenzofurans (total)	12/15	0.262	277.643	SUMP113 (1)		
1,2,3,7,8-Pentachlorodibenzofuran	8/15	0.407	50.4	35ASB03 (1)		
2,3,4,7,8-Pentachlorodibenzofuran	2/15	0.742 J	5.168	35ASB03 (1)		
Tetrachlorinated dibenzofurans (total)	12/15	0.974	166.452	35ASB03 (1)		
2,3,7,8-Tetrachlorodibenzofuran	10/20	0.299	113.417	35ASB03 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not available (not analyzed)
ND = not detected
PAH = polynuclear aromatic hydrocarbon
PCB = polychlorinated biphenyl
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

Low concentrations of dioxins/furans were detected in surface soil samples collected adjacent to sumps S-112, S-113, S-117, and S-120 at 0–0.5 feet bgs. Dioxins/furans were also detected in surface and subsurface soil at locations 35ASB03 (located to the south of sump S-723) and 35ASB05 (located to the south of sump S-113). Dioxins/furans were also detected in subsurface soil at sumps S-112, S-113, S-117, and S-120. The highest concentration detected was for octachlorodibenzo-p-dioxin at 4.4 µg/kg at sump S-120. Ninety percent of LHAAP soil sampling results for this constituent were less than 4 µg/kg. There are no comparison criteria identified for dioxins/furans.

In summary, low levels of limited VOC constituents were detected at the sump S-723 drain line and location 35ASB05 at Site 35A. The VOC concentrations are below PCLs in soil at Site 35A. Additionally, VOCs were not detected in subsurface soils. Low concentrations of phthalates were detected in surface soil and samples collected throughout the site. No phthalates were detected in the sump S-723 drain line. Only one phthalate was detected in subsurface soil below the PCL value. Phthalate constituents may be attributed to sampling artifacts such as plastic containers and tapes used during sampling and laboratory analyses. One phthalate concentration was detected above the TRRP Tier 1 PCL comparison criterion for bis(2-ethylhexyl) phthalate at LHSSH05. This concentration appears to be an anomaly.

Low concentrations of pesticides were detected in soil samples at concentrations below the PCL values. One PCB, Aroclor-1254, was detected in the soil below the PCL value.

Dioxins/furans were detected in surface and subsurface soil. There are no comparison criteria identified for these compounds. However, the concentrations found at this site are equivalent to those found at most of the other sites, indicating no significant soil source of contamination.

5.4.2.2 Metals

Seventeen metals (antimony, beryllium, cadmium, calcium, chromium, copper, iron, lead, magnesium, mercury, nickel, potassium, selenium, silver, strontium, vanadium, and zinc) were detected in surface soil samples at concentrations that exceed the LHAAP soil background concentration. Seven of the metals (antimony, cadmium, copper, lead, mercury, selenium, and silver) were detected at concentrations that exceeded the PCL comparison criterion. There are no PCL comparison criteria for calcium, potassium, iron, and strontium.

Of metals found above background, antimony, copper, mercury, selenium, and silver were detected above the PCLs in only isolated (one to four) samples. Elevated selenium levels were found in surface soil samples at 35ASB03 and 35ASB05, located across the site from each other. Cadmium was detected above PCLs in five samples. Lead was detected above the PCLs in 15 samples, and it accounts for the majority of metal concentrations detected above the PCLs. There are two isolated areas of contamination: one around LHSMW07 and the other around LHSMW05 (near sump S-112). Lead at lower levels, yet above

background, was detected throughout the site and adjacent to sumps S-112, S-117, and S-723. Lead is present at Site 35A, but the levels are still below federal guidance levels for playgrounds (400 mg/kg) (EPA 1994, 1998 and 40 CFR 745.65).

In subsurface soil, nine metals (antimony, beryllium, cadmium, cobalt, lead, manganese, potassium, selenium, and vanadium) were detected at concentrations above the LHAAP background values. Of these metals, antimony, cadmium, lead, and selenium were detected above PCL values. Lead was detected in four samples (maximum of 24.9 mg/kg), antimony was detected in one sample (4.1 mg/kg), and cadmium (4.4 mg/kg) and selenium (2.6 mg/kg) were each detected in two samples with concentrations greater than PCLs. There is no obvious distribution of these contaminants. As in surface soil, lead is the predominant metal in subsurface soil and yet remains at fairly low levels.

Because all of the sampling efforts were focused on the immediate vicinity of the sumps and waste rack sumps, the extent of metals contamination found is localized. Metals concentrations do not show a distribution of metals that indicate sources other than the sumps.

5.4.3 Sediment Results

Two sediment samples were collected in a ditch located in the southwestern portion of Site 35A during Phase III field activities. Detected constituents are summarized in Table 5-5. Sediment results were compared to surface soil background levels and soil PCLs. No VOCs, SVOCs, explosive compounds, or pesticides were detected in sediment at Site 35A. One PCB compound, Aroclor-1254, was detected in one sediment sample (95 µg/kg at 35ASD01) at a concentration less than the PCL value. The only other detections of Aroclor-1254 at Site 35A occurred in surface soil near sump S-112 and at location 35ASB05, located south of sump S-113. These sample locations do not appear to be related and are separated by approximately 300 and 50 feet, respectively.

Dioxins/furans were detected in sample 35ASD01 at levels very similar to the soil concentrations; there are no comparison criteria identified for dioxins/furans.

Seven metals (copper, lead, magnesium, potassium, selenium, vanadium, and zinc) exceeded LHAAP background surface soil concentrations. Lead and selenium were detected at concentrations above the soil PCL, but the detected level of lead (18.7 mg/kg) is only slightly above background levels. Lead and selenium are also present in Site 35A surface and subsurface soil at similar levels. Lead is found in elevated concentrations throughout the site soil. The concentration of lead and selenium in ditch sediment could be from migration in surface runoff to the ditch. Selenium values in the downstream location 35ASD02 are higher than in the upstream location as are all metals found in sediments above background soil values.

Table 5-5
Summary of Detected Constituents in Sediment Samples, Site 35A, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	2/2	1,800	12,000	35ASD01 (1)	260,000	20,700
Arsenic	1/2	7.62	7.62	35ASD01 (1)	13	29.7
Barium	1/2	100	100	35ASD01 (1)	220	287
Calcium	1/2	1,000	1,000	35ASD01 (1)		1,090
Chromium, total	2/2	4.30	180	35ASD01 (1)	1,200	22.8
Copper	1/2	10.6	10.6	35ASD01 (1)	520	6.7
Iron	2/2	3,500	20,000	35ASD01 (1)		31,000
Lead	2/2	2.16	18.70	35ASD01 (1)	1.5	17.4
Magnesium	1/2	1,000	1,000	35ASD01 (1)		474
Manganese	2/2	17 J	180 J	35ASD01 (1)	5,100	2,330
Potassium	1/2	1,500 J	1,500 J	35ASD01 (1)		481
Selenium	1/2	3.37	3.37	35ASD01 (1)	1.1	ND
Vanadium	2/2	7	36	35ASD01 (1)	5,100	NA
Zinc	2/2	6.60	46	35ASD01 (1)	3,500	16.2
Physical properties (mg/kg)						
Total organic carbon	2/2	107,000	495,000	35ASD02 (1)		
PCBs (µg/kg)						
PCB-1254 (Aroclor-1254)	1/3	95	95	35ASD01 (1)	5,300	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	1/1	4,444.364	4,444.364	35ASD01 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	1/1	80.063	80.063	35ASD01 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1/1	39.176	39.176	35ASD01 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	1/1	2.008	2.008	35ASD01 (1)		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1/1	1.007	1.007	35ASD01 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1/1	1.001	1.001	35ASD01 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	1/1	8.289	8.289	35ASD01 (1)		
Heptachlorinated dibenzofurans (total)	1/1	2.922	2.922	35ASD01 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1/1	2.922	2.922	35ASD01 (1)		
Hexachlorinated dibenzofurans (total)	1/1	5.979	5.979	35ASD01 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	1/1	3.631	3.631	35ASD01 (1)		
Pentachlorinated dibenzofurans (total)	1/1	5.613	5.613	35ASD01 (1)		
Tetrachlorinated dibenzofurans (total)	1/1	0.762	0.762	35ASD01 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not available (not analyzed)
PCB = polychlorinated biphenyl
PCL = protective concentration level
RI = remedial investigation

5.4.4 Surface Water Results

During the Phase III field activities, two surface water samples were collected at Site 35A at the locations shown on Figure 5-1. No VOCs, SVOCs, explosive compounds, pesticides, or PCBs were detected in the two surface samples submitted for analysis. Eight metals (aluminum, iron, lead, manganese, sodium,

thallium, tin, and zinc) were detected in the surface water samples (see Table 5-6). Aluminum and lead exceeded the comparison criteria. The sample at location 35ASW01 had an aluminum concentration of 4600 µg/L exceeding the TWQS freshwater acute criterion of 991 µg/L. The maximum detected lead value of 4 µg/L just slightly exceeded the chronic TWQS of 2.5 µg/L. Lead levels may be slightly elevated, but these levels may also be naturally occurring. LHAAP groundwater background level for lead is 300 µg/L.

5.4.5 Groundwater Results

Three rounds of groundwater samples were collected from LHSMW01 through LHSMW07, and two rounds of groundwater samples were collected from 35AWW01 through 35AWW04. Nineteen groundwater samples were collected during the Phase II and Phase III investigations at Site 35A. In addition, 14 groundwater samples were collected from LHSMW01 through LHSMW07 in 1996. The groundwater samples were analyzed for VOCs, SVOCs, explosive compounds, and metals. Two monitoring wells (LHSMW01 and LHSMW05) were also analyzed for pesticides/PCBs and chlorinated herbicides in 1996. A well was analyzed in 2000 and 2001 for perchlorate. Table 5-7 summarizes the detected groundwater results. Figure 5-1 shows the locations of the 11 monitoring wells.

Seventeen VOCs were detected in the groundwater samples. The majority of the VOCs were chlorinated hydrocarbons. Five of the chlorinated VOCs [1,1,2-trichloroethane (TCA), 1,1-dichloroethene (DCE), PCE, TCE, and vinyl chloride] were detected at concentrations that exceeded the PCL values. The elevated concentrations were detected from LHSMW05 and LHSMW07. PCE and TCE were detected at LHSMW05 in 1994, 1996, and 1998. Detections of PCE in LHSMW05 showed increasing concentrations

Table 5-6
Summary of Detected Constituents in Surface Water Samples, Site 35A, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	TWQS[a]
Metals (µg/L)					
Aluminum	2/2	810	4,600	35ASW01 (1)	991
Iron	2/2	3,200 J	8,400 J	35ASW01 (1)	
Lead	1/2	4	4	35ASW01 (1)	2.52
Manganese	2/2	84	252	35ASW01 (1)	
Sodium	1/2	5,200	5,200	35ASW01 (1)	
Thallium	2/2	1.2 J	1.3 J	35ASW02 (1)	6.3
Tin	1/2	110	110	35ASW01 (1)	
Zinc	2/2	20	40	35ASW01 (1)	104
Physical Properties (mg/L)					
Hardness (as $CaCO_3$)	2/2	32	32	35ASW01 (2)	

[a] Lowest value of human health and aquatic life TWQS. Assumes hardness of 100 mg/L as $CaCO_3$.

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
RI = remedial investigation
TWQS = Texas Water Quality Standards

from 1994 to 1998 ranging from 870 µg/L in 1994 to 5400 µg/L in 1998. TCE detections in LHSMW05 showed similar increases (49 µg/L in 1994 to 160 µg/L in 1998). LHSMW07 had all five VOCs detected above the PCLs. Four of the five VOCs were detected at LHSMW07 (1,1,2-TCA, 1,1-DCE, TCE, and vinyl chloride). Only 1,1-DCE and TCE were detected in 1994, 1996, and 1998 at LHSMW07. TCE had the highest detections at LHSMW07 in 1998; the lowest concentrations were detected in 1996. 1,1,2-TCA and vinyl chloride were detected only in 1998. VOCs have contaminated the Site 35A groundwater. Figure 5-3 presents VOC distribution in the shallow wells in 1998.

Three SVOCs [phenol, diethyl phthalate, and bis(2-ethylhexyl) phthalate] were detected in the groundwater samples. One SVOC, bis(2-ethylhexyl) phthalate, was detected at locations 35AWW02 and LHSMW03 at concentrations (12J and 88 µg/L, respectively) that exceeded the PCL (6 µg/L). One other concentration of this compound was detected at location LHSMW07 at a concentration below the PCL. These elevated levels appear to be anomalous detections and were not detected in any other sample collected at any other time from these wells. Therefore, SVOCs are not considered site-related contaminants in Site 35A groundwater.

Four explosive compounds were detected at low concentrations that did not exceed the PCL values at LHSMW03, LHSMW04, and LHSMW06. Explosives may be present at the site but are at values unlikely to be of concern.

Twenty-one metals were detected above the LHAAP groundwater background levels. Of these, ten metals (aluminum, antimony, arsenic, barium, beryllium, chromium, lead, selenium, strontium, and thallium) were detected at concentrations above the PCL values. Concentrations above background of the majority of the metals (arsenic, barium, lead, and selenium) were detected in one field duplicate sample (35AWW02), but these detections were not confirmed with similar concentrations in the original sample (35AWW02). The only exceedance of PCLs by beryllium concentrations were also from that sample. Because arsenic, barium, lead, and selenium were not detected above background in any other sample at any other time, these detections may be anomalous detections introduced as sampling or laboratory artifacts. If these are anomalous data, chromium would be the only metal detected above PCLs in the deep and intermediate wells (35AWW01 and 35AWW02). Aluminum, antimony, beryllium, chromium, strontium, and thallium are the most likely metals present in Site 35A groundwater.

TPH was detected at LHSMW05 at a concentration below the PCL. Perchlorate was detected at LHSMW01 in 2000 and 2001, but at concentrations below the PCL. The maximum perchlorate value found in groundwater is 36.9 µg/L.

5.5 CONTAMINANT FATE AND TRANSPORT

The majority of the organic compound detections in soils were isolated and at low concentrations, less than the PCL values. Dioxins/furans were found frequently but at low concentrations. Among the metals, lead

Table 5-7
Summary of Detected Constituents in Groundwater Samples, Site 35A, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Metals (µg/L)						
Aluminum	29/32	256	98,200	LHSMW03 (1)	73,000	13,400
Antimony	3/34	10	462	35AWW02 (1)	6	ND
Arsenic	10/34	33	1,940	35AWW02 (1)	50	22
Barium	24/34	18	2,200	35AWW02 (1)	2,000	1,990
Beryllium	10/27	0.5	49.5	35AWW02 (1)	4	NA
Cadmium	3/34	0.9	49.7	35AWW02 (1)	5	55
Calcium	34/34	6,200	799,000	LHSMW07 (1)		308,000
Chromium, total	32/34	10	2,800	LHSMW05 (1)	100	110
Cobalt	11/34	3.1	510	35AWW02 (1)	4,400	53
Copper	15/34	6	296	35AWW02 (1)	1,300	43
Iron	34/34	240	167,000	LHSMW03 (1)		68,000
Lead	10/34	7	497	35AWW02 (1)	15	300
Magnesium	32/34	6,200	537,000	LHSMW07 (1)		277,000
Manganese	33/34	49	5,800	LHSMW05 (1)	10,000	11,800
Mercury	8/33	0.116	0.9	LHSMW05 (1)	2	1
Nickel	23/27	15	1,100 J	LHSMW05 (1)	1,500	60
Potassium	24/34	1,160 J	8,200	LHSMW03 (1)		4,300
Selenium	12/34	2	1,870	35AWW02 (1)	50	140
Silver	3/34	0.7	60	35AWW02 (1)	370	30
Sodium	13/13	23,000	1,200,000	LHSMW07 (1)		1,470,000
Strontium	34/34	150	23,000	LHSMW07 (1)	22,000	6,150
Thallium	7/34	1.1 J	50 J	35AWW02 (1)	2	ND
Tin	2/13	530	750	35AWW02 (1)		NA
Vanadium	4/27	30	490	35AWW02 (1)	510	NA
Zinc	23/26	20	570	35AWW02 (1)	22,000	230
VOCs (µg/L)						
1,1,1-Trichloroethane	1/35	8	8	LHSMW07 (1)	200	
1,1,2-Trichloroethane	3/35	1.6	7.1	LHSMW07 (1)	5	
1,1-Dichloroethane	10/35	0.27	144	LHSMW07 (1)	7,300	
1,1-Dichloroethene	8/36	1.3	1,341	LHSMW07 (1)	7	
1,2,4-Trichlorobenzene	1/28	0.73	0.73	LHSMW05 (1)	70	
1,2-Dichloroethane	3/35	0.51	3	LHSMW07 (1)	5	
Acetone	1/21	5.3	5.3	35AWW02 (1)	7,300	
Benzene	2/35	0.22	0.80	LHSMW07 (1)	5	
Carbon disulfide	1/21	0.54	0.54	35AWW03 (1)	7,300	
Chloroform	3/35	0.38	32	35AWW02 (1)	80	
Methylene chloride	1/35	0.97	0.97	35AWW02 (1)	5	
Tetrachloroethene	10/36	0.27	5,400	LHSMW05 (1)	5	
Total 1,2-dichloroethene	1/7	10	10	LHSMW07 (1)		
Trichloroethene	12/35	0.43	160	LHSMW05 (2)	5	
Vinyl chloride	4/28	0.62	10	LHSMW07 (1)	2	
cis-1,2-Dichloroethene	7/28	0.21	14	LHSMW07 (1)	70	
trans-1,2-Dichloroethene	2/28	0.73	2	LHSMW07 (1)	100	

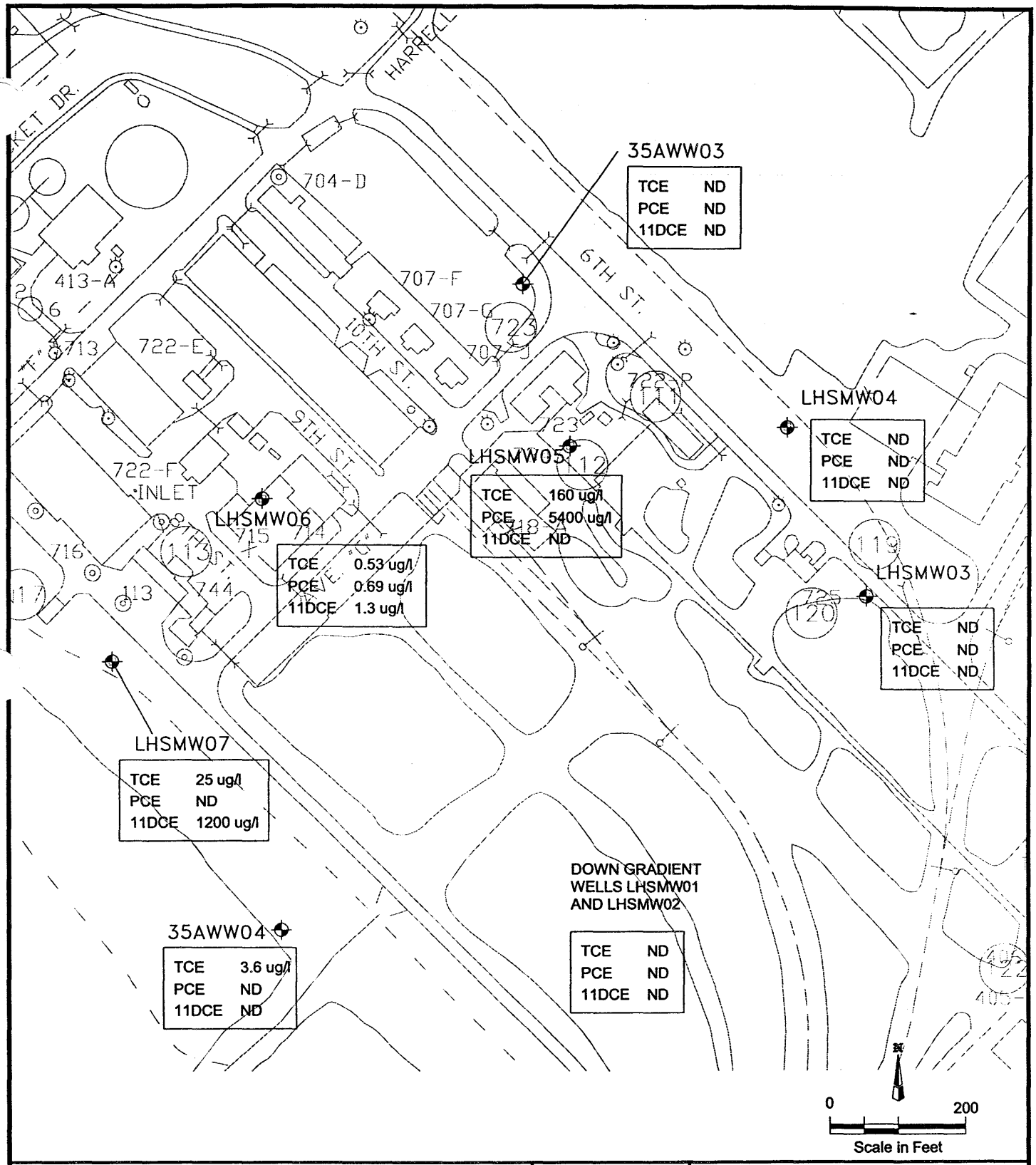
Table 5-7 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Anions (mg/L)						
Chloride (as Cl)	13/13	3.6	2,605	LHSMW07 (1)		1,416
Nitrogen, Nitrate (as N)	2/13	0.5	2	LHSMW05 (1)		NA
Perchlorate	2/2	0.369	0.081	LHSMW01 (1)		NA
Sulfate (as SO_4)	13/13	10	2,550	LHSMW07 (1)	300	3,475
Petroleum Hydrocarbons (mg/L)						
TPH as gasoline	1/2	96	96	LHSMW05 (1)		
SVOCs (µg/L)						
Diethyl phthalate	1/28	2 J	2 J	LHSMW02 (1)	58,000	
Phenol	1/28	6.8 J	6.8 J	35AWW02 (1)	44,000	
bis(2-Ethylhexyl) phthalate	3/28	2.30	88	LHSMW03 (1)	6	
Explosives (µg/L)						
3-Nitrotoluene	1/29	0.68	0.68	LHSMW04 (1)		
Hexahydro-1,3,5-trinitro-1,3,5-triazine	4/29	0.26	88.3	LHSMW03 (1)		
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1/29	5.60	5.60	LHSMW03 (1)		
Tetryl	2/29	0.19	4.80	LHSMW03 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not available (not analyzed)
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

is the most widespread inorganic constituent in surface and subsurface soil. There were also isolated but elevated concentrations of antimony, cadmium, copper, lead, mercury, selenium, and silver in surface soil. Three of these metals (antimony, cadmium, and selenium) were found in Site 35A subsurface soil, and lead and selenium were found in Site 35A sediment at levels above the PCLs. However, in all cases, there is no clear source of contamination and although the levels are above background, there is no clear definition of a problem. The groundwater conditions beneath the site do not indicate that these metals are migrating although a few metals are present in the groundwater. Typically metals are relatively immobile except via runoff. The surrounding ditches are not receiving significant concentrations of these metals, although they are present in the sediment. The surface water in the ditch is not contaminated with metals above TWQS.

Dioxin/furan compounds were found in soil near several sumps at Site 35A. Dioxins/furans may be formed during the chlorine bleaching process at pulp and paper mills, by waste and drinking water treatment plants, by burning carbonaceous materials, and by the production of some chlorinated chemical compounds. Limited burning of materials did occur at LHAAP at Group 2 sites. The majority of dioxins/furans are released into air from municipal solid waste and industrial incinerator emissions and from burning organic material such as forest fires, wood-burning stoves, and fireplaces. Off-site sources of dioxin/furan contamination are likely as the Group 2 sites are unlikely to have produced enough



Legend

- Shallow Monitoring Well
- TCE Trichloroethene
- PCE Tetrachloroethene
- 11DCE 1,1-Dichloroethene

US Army Corps of Engineers
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Site 35A VOC 1998 Concentrations
In Shallow Ground Water
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Karnack, Texas

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Figure 5-3

dioxins/furans to have such a widespread impact as LHAAP. The hexa-, hepta-, and octachlorodibenzo-p-dioxins are refractory to most chemical and biological degradation processes, are not volatile, and have relatively low solubilities; they will persist in the soils indefinitely. There is no indication that Site 35A is a source of dioxin/furan contamination.

The vast majority of the metals detected in groundwater were associated with one field duplicate sample from well 35AWW02. With the exception of chromium, these compounds were not detected in the associated original sample collected from the same well. Aluminum, antimony, beryllium, chromium, strontium, and thallium may be present in the groundwater above background levels.

Several chlorinated VOCs were detected in Site 35A groundwater. There is no remaining source evident from the soil data. However, the source could have been disposed by now or could have been a small spill that has not been found. The primary transport mechanism for groundwater is through the process of advection and dispersion where contaminants are transported in a solute phase downgradient in the direction of groundwater flow at or below the average groundwater velocity. The groundwater flow direction across Site 35A, based on piezometric surface measurements, is primarily to the east.

Most of the VOC contamination at Site 35A is in the shallow zone. Although some low levels of chloroform, acetone, and methylene chloride are detected at depth (at locations 35AWW01 and 35AWW02), the contaminants found in the shallow groundwater are 1,1,2-TCA, DCE, PCE, TCE, and vinyl chloride. The shallow contaminants are not found in the deeper wells, thus indicating that the limited shallow contamination is not migrating downward.

The wells most significantly impacted by VOCs are LHSMW05 and LHSMW07, both shallow wells. These wells are located hundreds of feet apart. A well located in between (LHSMW06) is comparatively free of VOCs (all levels below PCL), and the types of VOCs present are very different (see Figure 5-3). Therefore the groundwater contamination at Site 35A may have originated from more than one source. LHSMW05 appears to have increasing concentrations, but the wells underneath remain free of the same contaminants. Downgradient wells also are free of VOC contamination. Goose Prairie Creek, the nearest water body, does not appear to be affected by the groundwater contamination. Adjacent surface water sampling results showed no detections of organic compounds.

6.0 SITE 35B: CHEMICAL LABORATORY

This section presents the results of the RI activities performed at Site 35B (Chemical Laboratory). The purpose of the RI was to define the nature and extent and fate and transport of contamination in the soil and groundwater at the site. This section describes the site background, physical characteristics, and investigation activities and compiles the analytical data generated during the investigation to document the nature and extent of the contamination detected at Site 35B.

6.1 SITE BACKGROUND

6.1.1 Site Description

Site 35B is located in the north-central portion of LHAAP and covers an area of approximately 8 acres (Figure 6-1). The laboratory consists of Building 29-A and is located in the approximate center of the site with Avenue P forming its southwestern boundary (Figure 1-2).

6.1.2 Site History

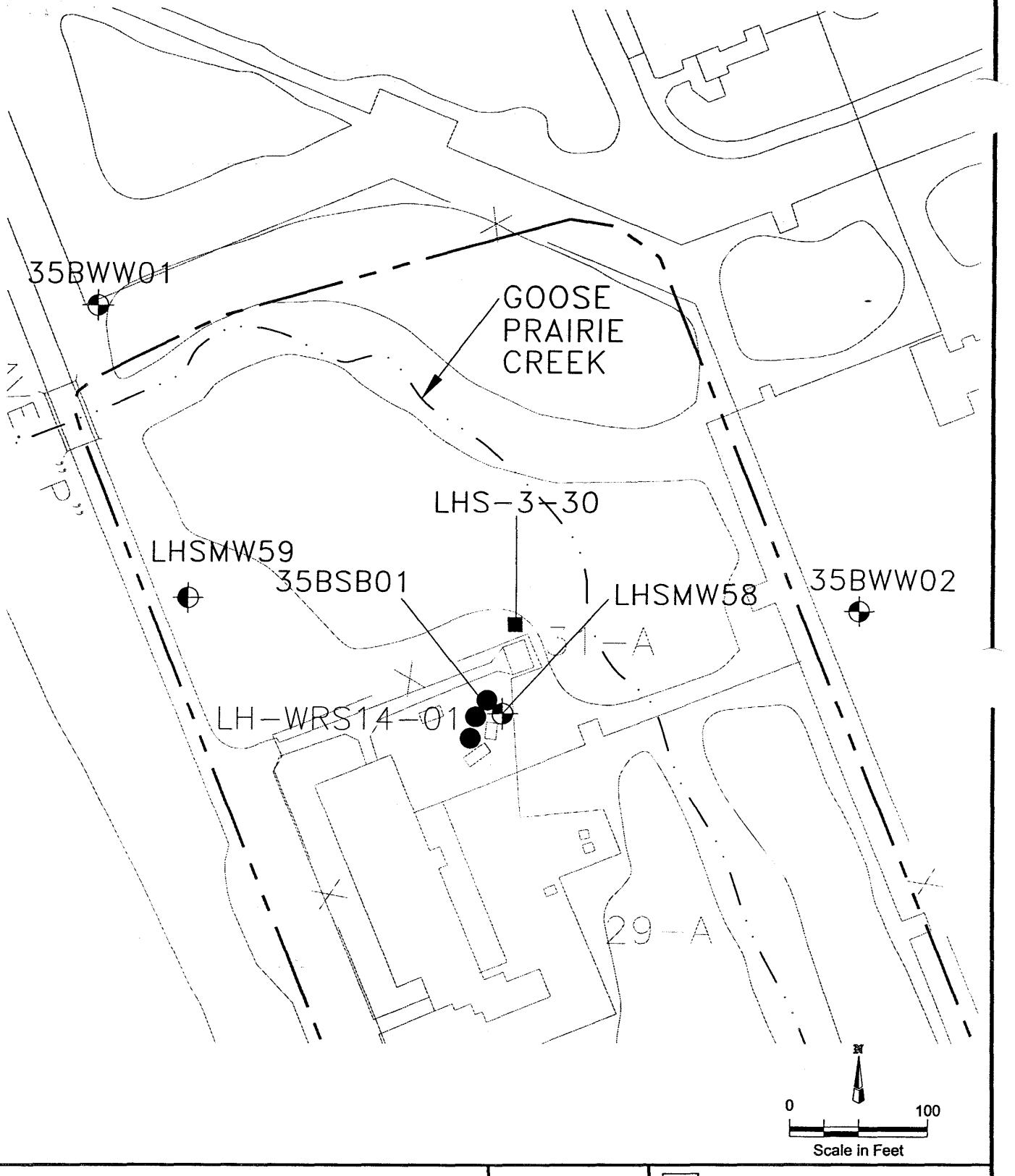
The Chemical Laboratory was built during the construction of Plant 3 (1953–1955) and was used to support the production activities at LHAAP. Activities included research and testing of materials used in the production processes as well as quality assurance testing. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. One waste rack sump is located at this site. In 1998 the site was used as a staging area in support of field activities associated with the Group 2 and Group 4 Phase III RI. The site was active through 1999; the current site layout is shown on Figure 6-1.

6.1.3 Pre-Phase I Investigations

Initial field investigative activities relative to the Group 4 sumps were begun in November 1991 when BCM Engineers was retained by the LHAAP Operating Contractor, Thiokol, to evaluate the integrity of the sumps system and the industrial wastewater treatment system at LHAAP (BCM 1992). Although the focus was to develop more efficient wastewater management alternatives, the locations of 125 sumps were surveyed and limited subsurface soil investigations were conducted at 12 sump locations. During this campaign, no subsurface investigations were conducted at the sump locations within Site 35B.

6.2 PHYSICAL CHARACTERISTICS OF SITE 35B

This section describes the physical conditions at Site 35B. Subjects addressed include surface features and surface hydrology, geology and soils, and hydrogeology. Information presented in this section is based on data obtained from the investigation activities and the summary reports documenting previous investigations.



Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Soil Boring Sampling Location
- Shallow Soil Sampling Location

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Tulsa District

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Site 35B Sampling Locations
Group 4 Remedial Investigatio

Longhorn Army Ammunition Plant
Kamack, Texas

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Figure 6-1

6.2.1 Surface Features and Surface Hydrology

Site 35B, the Chemical Laboratory, is located in the central portion of LHAAP and is south of the intersection of Avenue P and 59th Street (Figure 1-2). Figure 6-1 shows the site and sampling locations. Site 29 of Group 2 is located to the west of the Chemical Laboratory site. The surface features at Site 35B are a mixture of asphalt-paved roads and parking area, the former Chemical Laboratory building, and a mixture of wooded and grassy, vegetation-covered areas. The topography in this area is relatively flat with the surface drainage flowing north-northeast into Goose Prairie Creek. Goose Prairie Creek runs perpendicular and under Avenue P to the north of the site and then turns south through the east-central portion of the site.

6.2.2 Geology and Soils

The boring logs for the four wells installed at this site indicate that the surficial soils (0 to approximately 4 feet bgs) are a silty clay underlain by alternating layers of clayey sand, silty sand, and poorly sorted sand. These sand layers are relatively thick and are occasionally separated by thin silty clays. The sand becomes finer with depth and grades to silty sand that is underlain by lean clay at approximately 28 feet bgs. The shallow saturated zone is separated from the intermediate saturated zone by an approximately 4-foot-thick lean clay layer from 28 to 32 feet bgs. Below the lean clay is a silty sand unit that continues from 32 feet to approximately 48 feet bgs that is also underlain by lean clay.

6.2.3 Hydrogeology

Four monitoring wells have been installed at Site 35B. Three of the monitoring wells were completed in the first saturated zone, 14–34 feet bgs, and one monitoring well was completed in the intermediate saturated zone encountered at 49 feet bgs. Since Site 35B is a relatively small area, a potentiometric surface map was not prepared from the water level data from these monitoring wells. However, the LHAAP-wide potentiometric surface generated from the December 1998 sampling event (Figure 1-3) indicates that the groundwater gradient in the shallow saturated zone near Site 35B is to the east-northeast. 35BWW02 would be considered downgradient of the site while 35BWW01 would be upgradient.

Rising head hydraulic conductivity tests (slug tests) were performed on all of the shallow monitoring wells installed as part of the previous site investigation activities. Hydraulic conductivity values, calculated from the slug test data using the Bouwer-Rice method, are presented in Table 6-1. For the shallow saturated sand zone, hydraulic conductivity values were all relatively consistent and ranged from a maximum value of 7.7×10^{-4} cm/sec at well 35BWW01 to a minimum value of 4.3×10^{-4} cm/sec at monitoring well 35BWW02.

Table 6-1
Monitoring Well Construction Summary, Site 35B, Group 4 RI, LHAAP, Karnack Texas

Well Identification	Well Depth (feet)	Groundwater Zone	Surface Elevation	Measuring Point Elevation	Casing Diameter (inches)	Screen Interval (feet)	Hydraulic Conductivity (cm/sec)
35BWW01	19	Shallow	200.24	202.88	4	9–19	7.7×10^{-4}
35BWW02	14	Shallow	201.06	203.95	4	9–14	4.3×10^{-4}
LHSMW58	34	Shallow	200.2	203.56	4	21.4–31.4	6.4×10^{-4}
LHSMW59	49.3	Intermediate	201.07	204.18	4	27.5–47.5	---

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

6.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes activities completed during the investigations at Site 35B. Subjects addressed include contaminant source, soils, and groundwater investigations. Table 6-2 summarizes the field activities completed during each investigative phase.

6.3.1 Source Investigation

A source of potential contaminants at Site 35B was waste materials collected by the waste process sump. Sump content samples were not collected from the WRS-014 sump. To evaluate the soils immediately adjacent to the sump location, one soil boring was completed (LHWRS1401), and two soil samples collected from it during the Phase I investigation. Additionally, a second soil boring (WRSUMP14) was completed adjacent to this sump location during the Phase III investigation, and two soil samples collected from it (Figure 6-1). The location and results of these samples are discussed in Sections 6.3.2 and 6.4.2.

Table 6-2
Investigation Activities, Site 35B, Group 4 RI, LHAAP, Karnack, Texas

Phase I
• Completed 1 soil boring (LHWRS1401) at waste rack sump WRS-014 and collected 2 samples
Phase II
• Collected 3 shallow soil samples from 3 sample locations (LHSMW58, LHSMW59, and LHS330) • Installed 2 monitoring wells, LHSMW58 and LHSMW59, and collected 1 groundwater sample from each new well
Phase III
• Collected 2 sump soil samples at 1 sump location (WRSUMP14) • Collected 3 shallow soil samples (35BSB01) from 1 sample location • Installed 2 monitoring wells (35BWW01 and 35BWW02) and collected groundwater samples from each new well and 2 existing wells (LHSMW58 and LHSMW59)
Additional Investigations
• Collected groundwater samples from wells LHSMW58 and LHSMW59 in February and August 1996.

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

6.3.2 Surface and Subsurface Soil Investigation

Ten soil samples were collected from six locations throughout the site and submitted for chemical analysis during the Phases I, II, and III investigations. The locations are plotted on Figure 6-1. During the Phase I investigation one soil boring (LHWRS1401) was completed at waste rack sump 14 (WRS-014). Two samples were collected from the boring at 0.5–1.5 feet bgs and 3.0–4.5 feet bgs and analyzed for VOCs, SVOCs, metals, and explosive compounds. Three soil borings (LHSMW58, LHSMW59, and LHS330) were installed during the Phase II field investigation. One sample was collected at each boring from 0.0 to 0.5 feet, and each sample was analyzed for VOCs, SVOCs, metals, and explosive compounds. Two soil borings, WRSUMP14 and 35BSB01, were installed during the Phase III investigation. Two soil samples (0.0–0.5 feet and 3.0–5.0 feet) were collected from boring WRSUMP14 and analyzed for beryllium, nickel, vanadium, pesticides/PCBs, and dioxins/furans. Three samples were collected from boring 35BSB01 at depths of 0.0–0.5 feet, 1.0–3.0 feet, and 3.0–5.0 feet and analyzed for VOCs, SVOCs, metals, pesticides/PCBs, dioxins/furans, and explosive compounds.

6.3.3 Groundwater Investigation

Four groundwater monitoring wells were installed during the Phase II and Phase III field activities at Site 35B. One intermediate monitoring well was installed at 49.3 feet bgs (LHSMW59), and three shallow groundwater monitoring wells (LHSMW58, 35BWW01, and 35BWW02) were installed from 14 to 34 feet bgs. The monitoring well locations are shown in Figure 6-1. Shallow groundwater is the layer that would become contaminated from surface and sump activities. The intermediate well was installed to determine whether contamination was migrating deeper. However, the intermediate well may be too far upgradient to illustrate more than a large area of contamination from Site 35B or contamination migrating onto the site.

Recovered soil samples from each monitoring well boring were visually classified for lithologic characteristics using the USCS and recorded on the geologic boring logs presented in Appendix A. Soil samples were screened in the field with an ionization detector (PID or FID) to detect VOCs in the samples. Survey data for the soil borings and monitoring wells are provided in Appendix A.

Table 6-1 summarizes the well construction details of monitoring wells installed. Ten groundwater samples were collected from four wells during the Phase II, Phase III, and the additional investigations to assist in defining the shallow and intermediate groundwater condition. Wells LHSMW58 and LHSMW59 were sampled during all three campaigns. Wells 35BWW01 and 35BWW02 were only sampled duringPhase III.

The two groundwater samples collected from wells LHSMW58 and LHSMW59 during the Phase II investigation were submitted for laboratory analysis for VOCs, SVOCs, metals, and explosive compounds. Four groundwater samples, one each from wells LHSMW58, LHSMW59, 35BWW01 and 35BWW02,

collected during the Phase III investigation were submitted for laboratory analyses for VOCs, SVOCs, metals, and explosive compounds. The groundwater sample collected from LHSMW59 was analyzed for pesticides/PCBs and dioxins/furans. Four groundwater samples, two each from wells LHSMW58 and LHSMW59, were collected during the additional investigations and were submitted for laboratory analyses for VOCs, SVOCs, metals, and explosive compounds. The groundwater sample collected from LHSMW58 in February 1996 was also analyzed for pesticides/PCBs, herbicides, TPH, and cyanide.

6.4 NATURE AND EXTENT OF CONTAMINATION

The following sections summarize the detected compounds and associated concentrations for the sump-associated soil and groundwater samples. Table 6-3 summarizes the media tested and analyses performed during each investigation. A complete list of detected compounds is presented in Appendix C. Duplicate analyses are included in the evaluation.

The following subsections present the compounds identified and the concentrations detected for soil and groundwater sampled at Site 35B. Detected compounds are compared to background and/or PCL values.

6.4.1 Contaminant Source Results

No samples of the sump contents were collected from the WRS014 sump at Site 35B.

6.4.2 Soil Results

Table 6-4 presents summary results for detected constituents in soil at Site 35B.

6.4.2.1 Organic compounds

No VOCs were detected in any soil sample, except carbon disulfide in boring LHWRS1401 at 324 µg/kg, and this sample did not exceed the PCL. The SVOC bis(2-ethylhexyl) phthalate was detected (estimated) in the samples from all three Phase II locations, but it also did not exceed the PCL value. Nine SVOCs were detected in the surface sample from location 35BSB01, but all concentrations were less than PCLs. No SVOCs were detected in the samples from 1.0–3.0 or 3.0–5.0 feet bgs. No pesticides/PCBs were detected in either the surface (0–0.5 feet bgs) or subsurface (3.0–5.0 feet bgs) samples collected during Phase III.

Several dioxins/furans were detected in both the surface and subsurface samples but at low concentrations (less than µg/kg levels except for one octachlorodibenzo-p-dioxin maximum value of 2 µg/kg—this low concentration represents the 75th percentile of detected results for this constituent). The pesticide aldrin

Table 6-3
Analytical Test Summary, Site 35B, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests								
	VOCs	SVOCs	Pesticides/ PCBs	Explosive Compounds	Dioxins/ Furans	Metals	Herbicides	TPH	Cyanide
Phase I									
Surface Soils (0.5–1.5)	1	1		1		1			
Subsurface Soils (3.0–4.5)	1	1		1		1			
Phase II									
Soils (0.0–0.5)	3	3		3		3			
Groundwater	2	2		2		2			
Phase III									
Surface Soils	1	1	2	1	2	2*			
Subsurface Soils	2	2	3	2	3	3*			
Groundwater	4	4	1	4	1	4			
Additional Investigations									
Groundwater	4	4	1	4		4	1	1	1

*Beryllium, nickel, and vanadium analysis only

LHAAP = Longhorn Army Ammunition Plant
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
TPH = total petroleum hydrocarbon
VOC = volatile organic compound

was detected in the 0–0.5-foot sample at location 35BSB01 at a concentration above the PCL value.DE and/or DDT were detected in all three samples from location 35BSB01 but at concentrations below their PCL values.

6.4.2.2 Metals

In soil samples, the metals beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, mercury, nickel, potassium, selenium, strontium, vanadium, and zinc were detected at concentrations that exceeded background threshold levels. However, only cadmium (maximum of 7.5 mg/kg), lead (maximum of 40 mg/kg), and selenium (maximum of 4.1 mg/kg) exceeded their respective PCLs. Each contaminant exceeded the PCL more than once. Both surface and subsurface samples contained exceedances. The soil boring located next to the sump, however, did not have the maximum concentration. The maximum concentrations of cadmium and lead were found in LHS330, a surface soil sample, while the maximum concentration of selenium was found in the surface soil sample for 35BSB01.

6.4.3 Groundwater Results

Table 6-5 summarizes the detected results for groundwater samples collected at Site 35B.

Table 6-4
Summary of Detected Constituents in Soil Samples, Site 35B, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	8/8	3,300	18,600	LHWRS1401	260,000	20,700
Arsenic	8/8	1.60 J	7.5 J	LHS330 (1)	13	29.7
Barium	8/8	38.9	190	LHSMW59 (1)	220	287
Beryllium	3/5	0.593 J	0.630 J	35BSB01 (1)	0.92	NA
Cadmium	3/8	3.61	7.5	LHS330 (1)	0.75	ND
Calcium	8/8	598	3,500 J	35BSB01 (1)		1,090
Chromium, total	8/8	9.1	42.9 J	LHS330 (1)	1,200	22.8
Cobalt	7/8	2.46	24.1	LHSMW59 (1)	2,000	19.1
Copper	7/8	3.3	10.8	LHS330 (1)	520	6.7
Iron	8/8	6,200	47,000	LHS330 (1)		31,000
Lead	7/8	8.03	40.3	LHS330 (1)	1.5	17.4
Magnesium	7/8	175	1,100	35BSB01 (1)		474
Manganese	8/8	7.77	1,860	LHSMW59 (1)	5,100	2,330
Mercury	2/8	0.11	0.60	LHS-3-30 (1)	1	ND
Nickel	5/5	6.9 J	13	WRSUMP014 (1)	230	6.3
Potassium	7/8	199	810	35BSB01 (1)		481
Selenium	6/8	0.21	4.12	35BSB01 (1)	1.1	ND
Silver	1/8	0.09	0.09	LHWRS1401 (1)	0.71	2.3
Strontium	7/8	6.3	31.9	LHS330 (1)		13.3
Vanadium	5/5	25 J	48 J	35BSB01 (1)	5,100	NA
Zinc	8/8	11.8	1,100	LHS330 (1)	3,500	16.2
VOCs (µg/kg)						
Carbon disulfide	2/8	66	324	LH-WRS14-01 (1)	20,000	
Trichloroethene	1/8	6	6	LH-WRS14-01 (1)	17	
SVOCs (µg/kg)						
Benzo(a)anthracene	1/8	420	420	35BSB01 (1)	20,000	
Benzo(a)pyrene	1/8	390	390	35BSB01 (1)	3,800	
Benzo(b)fluoranthene	1/8	530	530	35BSB01 (1)	67,000	
Benzo(g,h,i)perylene	1/8	250	250	35BSB01 (1)	69,000,000	
Chrysene	1/8	450	450	35BSB01 (1)	1,700,000	
Fluoranthene	1/8	760	760	35BSB01 (1)	2,900,000	
Indeno(1,2,3-c,d)pyrene	1/8	350	350	35BSB01 (1)	190,000	
Phenanthrene	1/8	370	370	35BSB01 (1)	620,000	
Pyrene	1/8	560	560	35BSB01 (1)	1,700,000	
bis(2-Ethylhexyl) phthalate	3/8	49 J	560 J	LHS-3-30 (1)	82,000	
Pesticides (µg/kg)						
Aldrin	1/6	170	170	35BSB01 (1)	120	
p,p'-DDE	4/6	11	130 J	35BSB01 (2)	13,000	
p,p'-DDT	3/6	6.1 J	37 J	35BSB01 (1)	17,000	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	5/5	133.977	2,104.093 J	WRSUMP014		
Heptachlorinated dibenzo-p-dioxins (total)	5/5	3.553	69.33	35BSB01 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	5/5	2.063	33.263	35BSB01 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	3/5	0.574	11.141	35BSB01 (1)		

Table 6-4 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Furans (ng/kg)						
Octachlorodibenzofuran	4/5	0.626	15.485	35BSB01 (1)		
Heptachlorinated dibenzofurans (total)	4/5	0.584	5.765	35BSB01 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	5/5	0.236	5.765	35BSB01 (1)		
Hexachlorinated dibenzofurans (total)	4/5	0.234	5.299	35BSB01 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	2/5	0.219	0.373	35BSB01 (1)		
Pentachlorinated dibenzofurans (total)	2/5	1.017	6.501	35BSB01 (1)		
1,2,3,7,8-Pentachlorodibenzofuran	2/5	0.259	2.008	35BSB01 (1)		
Tetrachlorinated dibenzofurans (total)	3/5	0.506	2.56 J	35BSB01 (1)		
2,3,7,8-Tetrachlorodibenzofuran	3/7	0.273	0.506	35BSB01 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

6.4.3.1 Organic compounds

Thirteen different VOCs were detected in LHSMW58 during the December 1994, February 1996, August 1996, and May 1998 sampling events. PCE and 1,1-DCE were detected above PCL levels in well LHSMW58 during December 1994. The same two contaminants plus TCE were detected above PCL levels in 1996, and PCE and TCE were detected above PCLs in May 1998. Six different VOCs were detected in LHSMW59 during the four sampling events. PCE and TCE were the only VOCs with concentrations above PCLs during these sampling events; LHSMW59 had the highest TCE concentrations, up to 330 µg/L. Acetone was detected in well 35BWW02 in November 1998 at a concentration well below PCLs. No other VOCs were detected in well 35BWW01 or 35BWW02 during any sampling event. The SVOCs di-n-octylphthalate and the common laboratory and field contaminant bis(2-ethylhexyl) phthalate were detected in wells LHSMW58 and LHSMW59 but at very low concentrations (less than 4 µg/L). The explosive compound tetryl was detected in well LHSMW58, and tetryl and 1,3-dinitrobenzene were detected in well LHSMW59 during the February 1996 sampling event, but neither explosive compound exceeded comparison criteria.

There were no detectable concentrations of pesticides/PCBs in any of the two wells from the two rounds of samples. August 1998 samples from well LHSMW59 contained four different dioxins/furans but at very low concentrations. None were detected in well LHSMW58, the well located closest to the sump.

6.4.3.2 Metals

Table 6-5 summarizes the groundwater metals data. Of the metals detected above background values, only estimated concentrations of antimony and thallium exceeded PCLs in the August 1996 sample from well

Table 6-5
Summary of Detected Constituents in Groundwater Samples, Site 35B, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Metals (µg/L)						
Aluminum	7/9	106 J	4,700	LHSMW59 (1)	73,000	13,400
Antimony	2/10	55 J	80 J	LHSMW58 (1)	6	ND
Barium	6/10	70 J	299	LHSMW59 (1)	2,000	1,990
Cadmium	1/10	0.3	0.3	LHSMW58 (1)	5	55
Calcium	8/10	3,300	43,100 J	LHSMW59 (1)		308,000
Chromium, total	5/10	4.3	25	LHSMW58 (1)	100	110
Copper	4/10	3.3	23	LHSMW59 (1)	1,300	43
Iron	10/10	45 J	7,300	LHSMW58 (1)		68,000
Lead	2/10	3.7	3.9	LHSMW59 (1)	15	300
Magnesium	7/10	1,400	19,000	LHSMW59 (1)		277,000
Manganese	10/10	16	380	LHSMW59 (1)	10,000	11,800
Mercury	1/10	0.04 J	0.04 J	LHSMW58 (1)	2	1
Nickel	3/8	23 J	68	LHSMW59 (1)	1,500	60
Potassium	5/10	670	2,500	LHSMW59 (1)		4,300
Selenium	1/10	2.4	2.4	LHSMW59 (1)	50	140
Sodium	3/4	7,900	92,000	LHSMW59 (1)		1,470,000
Strontium	8/10	96	1,900	LHSMW59 (1)	22,000	6,150
Thallium	2/10	1.8 J	98 J	LHSMW58 (1)	2	ND
Vanadium	1/8	3.2	3.2	LHSMW58 (1)	510	NA
Zinc	7/10	21	40	LHSMW58 (1)	22,000	230
Anions (mg/L)						
Chloride (as Cl)	3/4	3	57	LHSMW59 (1)		1,416
Nitrogen, nitrate (as N)	1/4	2	2	LHSMW59 (1)		NA
Nitrogen, nitrite	1/4	0.6	0.6	LHSMW58 (1)		NA
Sulfate (as SO_4)	4/4	17	103	LHSMW59 (1)		3,475
VOCs (µg/L)						
1,1,1-Trichloroethane	5/11	0.96	37	LHSMW58 (1)	200	
1,1-Dichloroethane	1/11	2.1	2.1	LHSMW58 (1)	7,300	
1,1-Dichloroethene	5/11	2.2	58	LHSMW58 (1)	7	
1,2,4-Trichlorobenzene	1/9	1.5	1.5	LHSMW59 (1)	70	
Acetone	1/7	2.4	2.4	35BWW02 (1)	7,300	
Benzene	1/11	3 J	3 J	LHSMW58 (1)	5	
Chlorobenzene	2/11	2 J	2.6	LHSMW58 (1)	100	
Chloroform	1/11	0.38	0.38	LHSMW58 (1)	80	
Tetrachloroethene	9/11	6	21	LHSMW58 (1)	5	
Total 1,2-dichloroethene	1/2	7	7	LHSMW58 (1)		
Trichloroethene	7/9	9.4	330	LHSMW59 (1)	5	
Trichlorofluoromethane	2/9	2.3	2.7	LHSMW59 (1)	22,000	
cis-1,2-Dichloroethene	3/9	0.53	2.1	LHSMW58 (1)	70	
SVOCs (µg/L)						
Di-n-octylphthalate	3/10	1.6	3.6	LHSMW58 (1)	1,500	
bis(2-Ethylhexyl) phthalate	3/10	1 J	1.4	LHSMW59 (1)	6	

Table 6-5 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Furans (pg/L)						
Hexachlorinated dibenzofurans (total)	1/1	10.051	10.051	LHSMW59 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	1/1	5.225 J	5.225 J	LHSMW59 (1)		
Explosives (µg/L)						
1,3-Dinitrobenzene	1/11	0.1 J	0.1 J	LHSMW59 (1)		
Tetryl	2/11	0.072 J	0.41	LHSMW58 (1)		-

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

LHSMW58, and antimony only in the August 1996 sample from well LHSMW59. None of these metals were detected in samples from the wells taken in 1998. The groundwater at Site 35B is not considered to be contaminated with metals.

6.5 CONTAMINANT FATE AND TRANSPORT

With the exception of the pesticide aldrin in surface soil at location 35BSB01, the other organic compound detections in soils were isolated and were not high enough concentrations to exceed PCLs. Among the metals detected in soil above background, only cadmium, lead, and selenium concentrations exceeded PCLs. However, the metals that may be of concern in groundwater are antimony and thallium; neither of these is present in soils above background and neither was present during 1998 sampling. The low levels of metals in soil and groundwater and the lack of correlation between the metals present indicate that Site 35B probably does not have a metal problem.

The dioxins/furans detected in soils are refractory to most chemical and biological degradation processes, are not volatile, and have relatively low solubilities. They will persist in the soils indefinitely. The low VOC soil contaminants will be removed by evaporation into the atmosphere or migration via infiltrating precipitation to the water table. At this time VOC contamination is more prevalent in groundwater than in soil. The source of the contamination is unknown.

The three VOCs found in groundwater above PCLs are 1,1-DCE, PCE, and TCE. These compounds can be biologically degraded, but only under severely reducing conditions, and there is no evidence that the conditions at Site 35B are reducing. Thus, these compounds may travel to Goose Prairie Creek. However, current surface water data (LHSGPC10 and LHSGPC05—see Section 13) indicate that there is no current impact to surface water from this site. Additionally, the elevated VOC levels in LHSMW59, as well as LHSMW58 suggest the contamination may be moving onto the site. Site 35B may not be the only source

of the VOC contamination. The very low levels of VOCs in soil means Site 35B cannot be ruled out as contributing to the groundwater contamination; the source is unknown.

1,2,3,4,6,7,8-Heptachlorodibenzofuran, 1,2,3,4,7,8-hexachlorodibenzofuran, total hexachlorinated dibenzofurans, and octachlorodibenzo-p-dioxin were the members of the dioxin/furan family detected in Site 35B groundwater, some upgradient of the site. They are extremely refractive under oxidizing conditions and will follow the same fate as the other organic compounds. This site does not appear to be a source of dioxin/furan contamination in the groundwater.

7.0 SITE 35C: STATIC TEST AREA

This section presents the results of investigation activities performed at Site 35C (Static Test Area). The purpose of the RI was to define the nature and extent and fate and transport of contamination in soil and groundwater at the site. This section describes the site background, physical characteristics, and investigation activities, and it compiles the analytical data generated during the RI work to document the nature and extent of the contamination detected at Site 35C.

7.1 SITE BACKGROUND

7.1.1 Site Description

Site 35C is located in the east-central portion of LHAAP and covers an area of approximately 26 acres (Figure 1-2). The central portion of the site is located at the intersection of Tyler, Tucson, and Truman Avenues.

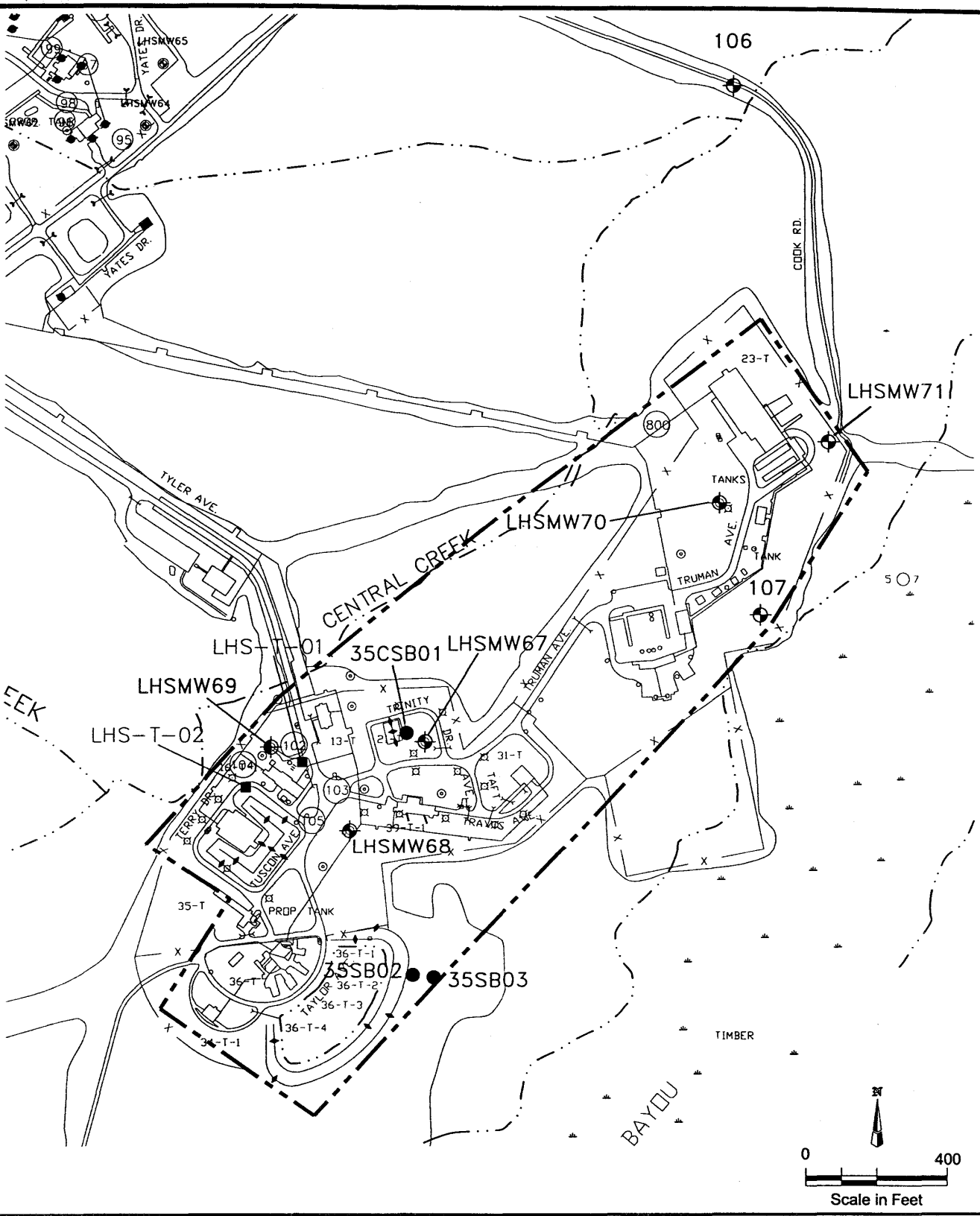
7.1.2 Site History

The Static Test Area was used for testing and evaluating products produced at LHAAP. Activities included testing of illumination devices and static test firing of rocket motors. Structures for these activities included a test tunnel and data acquisition system for flares, rocket motor test stands of earth and concrete, and conditioning facilities for reproducing arctic and tropical temperatures. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Four waste process sumps (S-102, S-103, S-104, and S-105) are located at Site 35C. Information on the capacity, dimensions, and operational status of these sumps in 1993 can be found in Section 4 of this report. The site was active through 1998; the current site layout is shown on Figure 7-1.

7.1.3 Pre-Phase I Investigations

In 1982, Environmental Protection Systems (EPS) investigated the site for USATHAMA and in June 1984 published a report documenting the investigation performed (EPS 1982). As part of this investigation, monitoring wells 106 and 107 were installed and sampled, and soil samples were collected at Site 35C. The data collected during this investigation are included in Appendix B.

The groundwater samples collected from monitoring wells 106 and 107 contained chloride concentrations of 137,000 µg/L and 145,000 µg/L, respectively, and sulfate concentrations of 73,300 µg/L and 54,650 µg/L, respectively. Analysis of the groundwater samples collected from monitoring wells 106 and 107 detected elevated concentrations of manganese at 652 µg/L and 187 µg/L, respectively. The



Legend

- Soil Boring Sampling Location
- Shallow Monitoring Well
- Intermediate Monitoring Well
- Shallow Soil Sampling Location

US Army Corps of Engineers
Tulsa District

JACOBS

Site 35C Sampling Locations
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Karnack, Texas

10Dec01 - Fig_7-1.DWG

Figure 7-1

pre-Phase I groundwater sample from monitoring well 106 contained the explosive compound 1,3,5-trinitrobenzene at 4.38 µg/L.

Three soil samples (601, 602, and 603) were collected from an area east of well 107. No organics or explosives were detected in these samples. Lead was detected in all three samples (27.0 mg/kg, 27.3 mg/kg, and 27.4 mg/kg) at concentrations above the LHAAP background level of 13.0 mg/kg established in 1995. Copper was detected in sample 601 at a concentration of 23.8 mg/kg, above the background level of 10.7 mg/kg.

Initial field investigative activities relative to the Group 4 sumps began in November 1991 when BCM Engineers was retained by the LHAAP Operating Contractor, Thiokol, to evaluate the integrity of the sump system and the industrial wastewater treatment system at LHAAP (BCM 1992). Although the focus was to develop more efficient wastewater management alternatives, the locations of all 125 sumps were surveyed and limited subsurface investigations were conducted at 12 sump locations.

Four of the sumps were located at Site 35C. Soil samples were collected at the 2-foot and 10-foot intervals from a soil boring drilled adjacent to sump S-104 located within Site 35C. Table 7-1 presents a summary of the concentration results for the soil samples.

7.2 PHYSICAL CHARACTERISTICS OF SITE

This section describes physical conditions at Site 35C. Subjects addressed include surface features and hydrology, geology and soils, and hydrogeology. Information presented in this section is based on data obtained from the investigation activities since and including Phase I and the reports documenting previous investigations.

7.2.1 Surface Features and Surface Hydrology

The Static Test Area, Group 4 Site 35C, is located on the east-central portion of LHAAP and is bounded approximately by Central Creek to the northwest and Harrison Bayou to the southeast. Site 35C is a mixture of asphalt-paved roads and parking areas around the former structures in the area. Surface drainage flows predominately toward the creeks.

7.2.2 Geology and Soils

The surface soils at Site 35C are clays and silty clays to approximately 12 feet bgs. A relatively thin (2–3-foot-thick) sand layer that is continuous across the site is below the silty clay. The sand layer is the top of the shallow saturated zone in this area. There is only one monitoring well completed in the intermediate saturated zone (LHSMW69) at Site 35C, and it is completed to approximately 51 feet bgs. The boring log for this well indicated that the silty clay confining layer below the shallow saturated zone is

Table 7-1
Summary of BCM Soil Boring Results, Site 35C, Group 4 RI, LHAAP, Karnack, Texas

Parameter	Units	Sump S-104	
		0–2 feet	8–10 feet
PH	---	7.4	5.6
Total Organic Carbon	---	20,900	8,470
Total Solids	%	83.0	82.1
Silver	mg/kg	ND	ND
Aluminum	mg/kg	11,400	13,200
Arsenic	mg/kg	2.17	0.743
Barium	mg/kg	73.0	34.0
Beryllium	mg/kg	1.800	0.369
Cadmium	mg/kg	ND	ND
Chromium	mg/kg	15.1	19.1
Mercury	mg/kg	ND	ND
Magnesium	mg/kg	876	778
Lead	mg/kg	18.2	14.3
Selenium	mg/kg	0.193	ND
Toluene	µg/kg	ND	6.09
1,1,1-Trichlorethane	µg/kg	ND	7.31
Trichloroethene	µg/kg	10.8	122

Analyzed purgeable organics not detected at any BCM soil boring location include: acrolein; acrylonitrile; benzene; bromoform; carbon tetrachloride; chlorobenzene; dibromochloromethane; bromochloromethane; chloroethane; 2-chloroethylvinylether; chloroform; 1,1-dichloroethane; 1,2 dichloroethane; 1,2-dichloropropane; cis-1,3-dichloropropene; trans-1,3-dichloropropene; ethylbenzene; bromomethane; chloromethane; methylene chloride; 1,1,2,2-tetrachloroethane; trans-1,2-dichloroethene; 1,1,2-trichloroethane; and vinyl chloride.

LHAAP = Longhorn Army Ammunition Plant
ND = not detected
% = percent
RI = remedial investigation

not present at this location. Silty sand and clayey sand were present in this boring from below the surficial clay layer at 11 feet and continued the full depth of this boring at 51 feet bgs.

7.2.3 Hydrogeology

Seven monitoring wells have been installed at Site 35C. Six of the monitoring wells were completed in the shallow saturated zone, while monitoring well LHSMW69 was completed in the intermediate saturated zone. Table 7-2 summarizes monitoring well construction details. Based on the facility wide potentiometric surface map for LHAAP (Figure 1-3), groundwater flow within the shallow saturated zone below Site 35C is to the north. Well 106 is located about 800 feet from the area of previous activity. It appears to be located downgradient of Site 35C and should represent the condition of the groundwater moving off site. The nearby presence of the surface water bodies can influence groundwater flow differently during different times of the year so well 106 may not capture infrequent or small areas of contamination.

Table 7-2
Monitoring Well Construction Summary, Site 35C, Group 4 RI, LHAAP, Karnack, Texas

Well Identification	Well Depth (feet)	Groundwater Zone	Surface Elevation	Measuring Point Elevation	Casing Diameter (inches)	Screen Interval (feet)	Hydraulic Conductivity (cm/sec)
106	25	Shallow	174.56	179.05	4	8.5–23.5	---
107	21	Shallow	175.73	178.32	2	4.5–19.5	---
LHSMW67	20	Shallow	182.64	185.57	4	9.4–19.4	---
LHSMW68	22	Shallow	186.69	189.65	4	11–21	2.8×10^{-4}
LHSMW69	51	Intermediate	180.16	183.27	4	27.9–47.9	---
LHSMW70	22	Shallow	180.54	183.62	4	11–21	---
LHSMW71	17.5	Shallow	181	183.73	4	5.9–15.9	1.1×10^{-3}

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

Rising head hydraulic conductivity tests (slug tests) were completed on two of the shallow monitoring wells (LHSMW68 and LHSMW71). Hydraulic conductivity values, calculated using the Bouwer-Rice method from the slug test data, are also presented in Table 7-2. For the shallow saturated zone, hydraulic conductivity values were calculated as 2.8×10^{-4} cm/sec at well LHSMW68 located to the south of Site 35C and 1.1×10^{-3} cm/sec at well LHSMW71, located in the northeastern portion of the site near Harrison Bayou.

7.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the soil and groundwater activities completed during the Phase I, II, III, and additional investigations at Site 35C. Table 7-3 summarizes the field activities completed during each investigation phase.

7.3.1 Source Investigation

A source of potential contaminants at Site 35C was waste materials historically collected in the waste process sumps. No sump content samples were collected from the Site 35C sumps.

7.3.2 Surface and Subsurface Soil Investigation

During the Phase I investigation, a total of 12 soil borings (LHS10201, LHS10202, LHDL10201, LHS10301, LHS10302, LHDL10301, LHS10401, LHS10402, LHDL10401, LHS10501, LHS10502, and LHDL10501) were completed near the four sumps located at Site 35C to evaluate the soils immediately adjacent to the sumps and drainage lines. At each sump, two soil borings were completed adjacent to the sump, and one soil boring was completed along the sump drainage line to determine whether the sumps or lines were sources of contamination. These locations are not shown on Figure 7-1 but are located near the sump locations that are shown. Twenty-two samples were submitted for laboratory analyses. Eight surface

Table 7-3
Investigation Activities, Site 35C, Group 4 RI, LHAAP, Karnack, Texas

Phase I
• Completed 12 soil borings (LHS10201, LHS10202, LHDL10201, LHS10301, LHS10302, LHDL10301, LHS10401, LHS10402, LHDL104-01, LHS10501, LHS10502, and LHDL10501) at sumps S-102, S-103, S-104, and S-105 at various depths and collected 22 soil samples (8 surface and 14 subsurface soil)
Phase II
• Collect 7 surface soil samples from 7 sample locations (LHST01, LHST02, and LHSMW67 through LHSMW71) • Installed 5 monitoring wells (LHSMW67 through LHSMW71) and collected 1 groundwater sample from each well
Phase III
• Collected 8 soil samples (4 surface and 4 subsurface) at 4 sump locations (S-102, S-103, S-104, and S-105) • Collected 3 soil samples (0–0.5, 1–3, and 3–5 feet bgs) from 1 sample location (35CSB01) • Collected groundwater samples from 7 existing wells (106, 107, and LHSMW67 through LHSMW71)
Additional Investigations
• February and August 1996 – Collected 2 rounds of groundwater samples from 7 monitoring wells (106, 107, and LHSMW67 through LHSMW71) • May 2000 – Collected groundwater samples from wells LHSMW67 and LHSMW68 for perchlorate analysis • June 2000 – Collected 4 soil samples (2 surface and 2 subsurface) from 2 sample locations (35CSB02 and 35CSB03) for perchlorate analysis • February 2001 – Collected 1 groundwater sample from well LHSMW67 for perchlorate analysis

bgs = below ground surface
LHAAP = Longhorn Army Ammunition Plant
RI = remedial investigation

soil samples were collected from 0.5 to 2 feet bgs and submitted for laboratory analyses for VOCs, SVOCs, and metals. Fourteen subsurface soil samples were collected from 2 to 11 feet bgs and submitted for laboratory analysis for VOCs, SVOCs, and metals. One subsurface soil sample collected along the sump S-103 drainage line (LHDL10301) was also analyzed for explosive compounds to determine whether the line was a source of contamination.

During the Phase II investigation, seven soil borings (LHST01 and LHST02, and LHSMW67 through LHSMW71) were completed with seven surface soil samples analyzed for VOCs, SVOCs, explosive compounds, and metals to provide information about the nature and extent of soil contamination.

During the Phase III investigation, a single soil boring was completed at each of the four sump locations (S-102, S-103, S-104, and S-105). One surface and one subsurface soil sample were collected from each sump boring and analyzed for beryllium, nickel, and vanadium as these analyses had not been performed. The samples collected at sump S-105 were also analyzed for pesticides/PCBs and dioxins/furans. The surface soil samples were all collected from 0–0.5 feet bgs, and the subsurface soil samples were collected from 3 to 10 feet bgs. Additionally, a single non-sump soil boring (35CSB01) was completed during the

Phase III investigation, and one surface soil sample (0–0.5 feet bgs) and two subsurface soil samples (1–3 and 3–5 feet bgs) were collected and analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides/PCBs, and dioxins/furans. In June 2000, two soil borings (35CSB02 and 35CSB03) were completed, and samples were collected from 0 to 0.5 and 1 to 2 feet bgs in each boring. The samples were submitted for perchlorate analysis. Perchlorate was identified as a potential contaminant of interest late in the investigation.

Soil samples from each monitoring well boring were classified for lithologic characteristics using the USCS and recorded on the geologic boring logs presented in Appendix A. Soil samples were screened in the field with an ionization detector (PID or FID) for VOCs in the samples. Survey data for the soil borings and monitoring wells are provided in Appendix A.

7.3.3 Groundwater Investigation

Five groundwater monitoring wells (LHSMW67 through LHSMW71) were installed during the Phase II field activities at Site 35C. Two existing monitoring wells (106 and 107) were installed at this site during the 1982 EPS (pre-Phase I) investigation. The Site 35C wells include one intermediate monitoring well (LHSMW69) installed at 51 feet bgs and six shallow groundwater monitoring wells installed from 20 to 25 feet bgs. The monitoring well locations are shown on Figure 7-1. Table 7-2 summarizes the well construction details for Site 35C monitoring wells. Well construction diagrams for each of the seven monitoring wells are provided in Appendix A of this report.

Five groundwater samples were collected in 1994 during the Phase II investigation from wells LHSMW67 through LHSMW71. The samples were submitted for laboratory analyses for VOCs, SVOCs, explosive compounds, and metals. Two rounds of seven groundwater samples were collected in February and August 1996 from wells LHSMW67 through LHSMW71, 106, and 107. The samples collected in February 1996 were all analyzed for common anions, metals, VOCs, SVOCs, and explosive compounds. The sample from LHSMW69 was also analyzed for TPH, pesticides/PCBs, chlorinated herbicides, and cyanide. The samples collected in August 1996 were all analyzed for common anions, metals, VOCs, SVOCs, and explosive compounds.

During the Phase III investigation, samples from all seven monitoring wells were submitted for VOC, SVOC, explosive compound, and metal analyses. A subsequent groundwater sample from monitoring well LHSMW67 collected in August 1998 was also submitted for pesticide/PCB and dioxin/furan analyses.

In May 2000, samples from monitoring wells LHSMW67 and LHSMW68 were collected and submitted for laboratory analysis for perchlorate. In February 2001, a sample was also collected from monitoring well LHSMW67 and analyzed for perchlorate.

7.4 NATURE AND EXTENT OF CONTAMINATION

Site investigations to delineate the extent of contamination resulting from site activities included the Phase I through Phase III RI activities as well as supplementary soil and groundwater sample collection and analyses. Appendix C provides tables of the detected compounds and associated concentrations for the surface soil, subsurface soil, and groundwater samples. Table 7-4 summarizes the media tested and analyses performed during each investigation.

The following subsections summarize the compounds detected for each medium sampled at Site 35C. Analytical results are compared and compounds that exceeded the TRRP Tier I PCLs and background values are identified, where applicable.

7.4.1 Contaminant Source Results

No sump content samples were collected from Site 35C sumps.

Table 7-4
Analytical Test Summary, Site 35C, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests										
	VOCs	SVOCs	TPH	Pesticides/ PCBs	Chlorinated Herbicides	Explosive Compounds	Dioxins/ Furans	Metals	Cyanide	Common Anions	Perchlorate
Phase I											
Surface Soil	8	8						8			
Subsurface Soil	14	14				1		14			
Phase II											
Surface Soil	7	7				7		7			
Groundwater	5	5				5		5			
Phase III											
Surface Soil	1	1		2		1	2	5*			
Subsurface Soil	2	2		3		2	3	6*			
Groundwater	7	7		1		7	1	7			
Additional Investigations											
2000 Surface Soil											2
2000 Subsurface Soil											2
1996 Groundwater	14	14	1	1	1	14		14	1	14	
2000 Groundwater											2
2001 Groundwater											1

*Four of the samples were analyzed for beryllium, nickel, and vanadium only

LHAAP = Longhorn Army Ammunition Plant
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
TPH = total petroleum hydrocarbon
VOC = volatile organic compound

7.4.2 Soil Results

Twenty-one surface and 28 subsurface soil samples were collected during the Phase I through Phase III and additional investigations at Site 35C. Soil samples were analyzed for some or all of the following: VOCs, SVOCs, pesticides/PCBs, explosive compounds, dioxins/furans, perchlorate, and metals. Table 7-5 summarizes detected results for soil samples.

7.4.2.1 Organic compounds

The common laboratory contaminant, acetone, was the only VOC detected in any of the Phase I, II, or III soil samples. Eleven different SVOCs were detected in the soil samples at estimated concentrations at very low levels (less than 500 µg/kg). The SVOC, bis(2-ethylhexyl) phthalate, was detected in the sump S-102 drainage line sample (LHDL10201) at a concentration of 580 µg/kg and was the only non-estimated SVOC detection in that sample. VOCs and SVOCs are not present at notable levels in the soils of Site 35C. Twenty-one dioxin/furan compounds were detected in the five soil samples submitted for analyses. Many of the dioxin/furan detections were low level and/or estimated concentrations. However, the 1–3-foot bgs sample from 35CSB01 and the 0–0.5-foot bgs sample from SUMP105 had slightly elevated levels of a number of dioxins/furans. The maximum octachlorodibenzo-p-dioxin value found in the surface soil next to sump S-105 was 17 µg/kg, which is higher than values found at other sites. 4,4'-DDE and 4,4'-DDT were detected in the 3–5-foot bgs sample from 35CSB01 at 3 µg/kg and 6.8J µg/kg, respectively. No explosive compounds or PCBs were detected in the samples submitted. Perchlorate was detected at a concentration of 60.9 µg/kg in the surface soil sample from location 35CSB03.

7.4.2.2 Metals

Of the 16 surface soil samples (0–2 feet bgs) collected, nine metals (aluminum, calcium, chromium, copper, lead, magnesium, potassium, strontium, and zinc) were detected in soil samples at concentrations that exceeded the LHAAP surface soil background concentration. Cadmium at a maximum concentration of 1.6 mg/kg versus 0.75 mg/kg PCL, lead at a maximum concentration of 29 mg/kg versus 1.5 mg/kg PCL, silver at a maximum concentration of 3.9 mg/kg versus 0.71 mg/kg PCL, beryllium at a maximum concentration of 1.02J mg/kg versus 0.92 mg/kg PCL, and selenium at a maximum concentration of 2.15 mg/kg versus 1.1 mg/kg PCL were found above background and PCL values.

Chromium values were above background levels but below PCLs. Lead was detected slightly above the surface soil background (17.4 mg/kg) and above the PCL (1.5 mg/kg) at three locations. These levels are not indicative of a source of metal contamination or secondary contamination.

Table 7-5
Summary of Detected Constituents in Soil Samples, Site 35C, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	25/32	4,600 J	23,800	LHS10202	260,000	20,700
Arsenic	32/32	1.4	16.2	LHSMW71 (1)	13	-297
Barium	32/32	38.6	150 J	35CSB01 (1)	220	287
Beryllium	5/12	0.624 J	1.02 J	35CSB01 (1)	0.92	NA
Cadmium	1/32	1.6	1.6	LHST02 (1)	0.75	ND
Calcium	30/32	257	53,200	LHST02 (1)		1,090
Chromium, total	32/32	7.3	49.8	LHSMW69 (1)	1,200	22.8
Cobalt	32/32	1.6	29.8	LHS10302 (1)	2,000	19.1
Copper	32/32	2.82 J	13.5	LHST02 (1)	520	6.7
Iron	25/32	7,410	50,700	LHSMW69 (1)		31,000
Lead	32/32	3.1	29	LHST02 (1)	1.5	17.4
Magnesium	32/32	299	2,380	LHDL10501		474
Manganese	32/32	45	513	LHDL10301 (1)	5,100	2,330
Mercury	1/32	0.24	0.24	LHSMW67 (1)	1	ND
Nickel	6/12	6.9	17	35CSB01 (1)	230	6.3
Potassium	32/32	289	1,860	LHS10302 (1)		481
Selenium	8/32	0.16	2.15	35CSB01 (1)	1.1	ND
Silver	5/32	0.81	3.9	LHST02 (1)	0.71	2.3
Strontium	29/32	6	82.5	LHST02 (1)		13.3
Vanadium	12/12	7.8	51	SUMP105 (1)	5,100	NA
Zinc	32/32	20.4	201 J	LHST02 (1)	3,500	16.2
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	5/5	141 J	17,492	SUMP105 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	5/5	8.236	2,218	35CSB01 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	5/5	3.147	1,453	35CSB01 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	4/5	2.773 J	187	35CSB01 (1)		
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2/5	0.348	10.6	35CSB01 (1)		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	4/5	0.654	52.8	35CSB01 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	4/5	0.203 J	21.8	35CSB01 (1)		
Pentachlorinated dibenzo-p-dioxins (total)	1/5	1.15	1.2	35CSB01 (1)		
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1/5	1.267	1.3	35CSB01 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	4/5	7.395	904.5	35CSB01 (1)		
Heptachlorinated dibenzofurans (total)	4/5	2.182	230.0	35CSB01 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	4/5	2.182	218	35CSB01 (1)		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	3/5	0.178 J	12.0	35CSB01 (1)		
Hexachlorinated dibenzofurans (total)	4/5	3.195	257	35CSB01 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	4/5	0.469	19.7	35CSB01 (1)		
1,2,3,6,7,8-Hexachlorodibenzofuran	2/5	0.203	4.1	35CSB01 (1)		
2,3,4,6,7,8-Hexachlorodibenzofuran	2/5	0.311	5.0	35CSB01 (1)		
Pentachlorinated dibenzofurans (total)	2/5	0.472	19.9	35CSB01 (1)		
2,3,4,7,8-Pentachlorodibenzofuran	1/5	0.139	0.14	35CSB01 (1)		
Tetrachlorinated dibenzofurans (total)	2/5	0.394	0.78	35CSB01 (1)		
2,3,7,8-Tetrachlorodibenzofuran	3/5	0.394	0.5	35CSB01 (1)		

Table 7-5 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Anions (µg/kg)						
Perchlorate	1/4	60.9	60.9	35CSB03 (1)	270	
VOCs (µg/kg)						
Acetone	1/32	5 J	5 J	LHSMW70 (1)	7,100	
SVOCs (µg/kg)						
Benzo(a)anthracene	1/32	140 J	140 J	LHST01 (1)	20,000	
Benzo(a)pyrene	1/32	110 J	110 J	LHST01 (1)	3,800	
Benzo(b)fluoranthene	1/32	280 J	280 J	LHST01 (1)	67,000	
Benzo(k)fluoranthene	1/32	110 J	110 J	LHST01 (1)	690,000	
Benzyl butyl phthalate	1/32	220 J	220 J	LHST01 (1)	4,000,000	
Chrysene	1/32	290 J	290 J	LHST01 (1)	1,700,000	
Di-n-butyl phthalate	5/32	66 J	81 J	LHSMW70 (1)	5,000,000	
Fluoranthene	4/32	39 J	420 J	LHST01 (1)	2,900,000	
Phenanthrene	2/32	41 J	49 J	LHSMW67 (1)	620,000	
Pyrene	1/32	320 J	320 J	LHST01 (1)	1,700,000	
bis(2-Ethylhexyl) phthalate	6/32	36 J	580	LHDL10201 (1)	82,000	
Pesticides (µg/kg)						
p,p'-DDE	1/5	3	3	35CSB01 (1)	13,000	
p,p'-DDT	1/5	6.8 J	6.8 J	35CSB01 (1)	17,000	

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

Of the 16 subsurface soil samples collected, 10 metals (barium, chromium, cobalt, copper, lead, magnesium, manganese, potassium, selenium, and strontium) were detected in soil samples at concentrations that exceeded the LHAAP subsurface soil background concentration. Lead was detected above subsurface soil background of 13.0 mg/kg at locations LHS10301, LHS10302, and LHDL10301 at concentrations of 13.7 mg/kg, 16.9 mg/kg, and 13.6 mg/kg, respectively, again not at levels representative of a source. Lead and selenium concentrations detected exceeded PCL values.

7.4.3 Groundwater Results

Twenty-nine groundwater samples were collected during the Phase I through Phase III and subsequent investigations at Site 35C. Groundwater samples were analyzed for some or all of the following: VOCs, SVOCs, TPH, pesticides/PCBs, chlorinated herbicides, explosive compounds, dioxins/furans, metals, cyanide, perchlorate, and common anions. The following sections discuss the presence and distribution of the organic compounds and metals detected in groundwater at Site 35C. Table 7-6 presents detected constituents in groundwater.

Table 7-6
Summary of Detected Constituents in Groundwater Samples, Site 35C, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Metals (µg/L)						
Aluminum	25/26	200	108,000	LHSMW71 (1)	73,000	13,400
Arsenic	10/26	3	16	LHSMW69 (1)	50	22
Barium	21/26	30	610	LHSMW68 (1)	2,000	1,990
Beryllium	4/21	0.7	1.6	106 (1)	4	NA
Calcium	23/26	542	37,400	LHSMW71 (1)		308,000
Chromium, total	19/26	5.5	43,000	LHSMW71 (1)	100	110
Cobalt	12/26	4.1	150	LHSMW71 (1)	4,400	53
Copper	14/26	5.5	244	LHSMW71 (1)	1,300	43
Iron	26/26	1120 J	170,000	LHSMW71 (1)		68,000
Lead	12/26	1.8	298	LHSMW69 (1)	15	300
Magnesium	23/26	489	39,900 J	LHSMW67 (1)		277,000
Manganese	26/26	21	1,400	LHSMW71 (1)	10,000	11,800
Mercury	4/26	0.2	0.6	LHSMW71 (1)	2	1
Nickel	9/21	19	2,500	LHSMW71 (1)	1,500	60
Potassium	19/26	479	7,800	LHSMW71 (1)		4,300
Selenium	2/26	5	7.6	LHSMW71 (1)	50	140
Silver	3/26	0.8	1,200	LHSMW71 (1)	370	30
Sodium	7/7	14,000	220,000	LHSMW71 (1)		1,470,000
Strontium	23/26	12	642	LHSMW71 (1)	22,000	6,150
Thallium	1/26	134	134	LHSMW71 (1)	2	ND
Vanadium	2/21	2.3	27	LHSMW67 (1)	510	NA
Zinc	24/26	20	560	LHSMW71 (1)	22,000	230
Anions (mg/L)						
Chloride (as Cl)	12/14	7	971	LHSMW71 (1)		1,416
Perchlorate	1/3	0.0028	0.0028	LHSMW67 (1)	66	NA
Sulfate (as SO_4)	13/14	7.88	173	LHSMW71 (1)		3,475
VOCs (µg/L)						
1,2-Dichloroethane	3/26	0.53	8	LHSMW67 (1)	5	
Trichloroethene	3/21	0.85	7	LHSMW67 (1)	5	
SVOCs (µg/L)						
Di-n-octylphthalate	2/26	0.6 J	2.7	LHSMW69 (1)	1,500	
Diethyl phthalate	1/26	0.57 J	0.57 J	LHSMW69 (1)	58,000	
Phenol	1/26	3.9	3.9	LHSMW69 (1)	44,000	
bis(2-Ethylhexyl) phthalate	6/26	0.62 J	21	LHSMW68 (1)	6	
Dioxins (pg/L)						
Octachlorodibenzo-p-dioxin	1/2	97.192	97.192	LHSMW67 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	1/2	7.304	7.304	LHSMW67 (1)		
Furans (pg/L)						
Heptachlorinated dibenzofurans (total)	1/2	17.367	17.367	LHSMW67 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1/2	17.367	17.367	LHSMW67 (1)		
1,2,3,6,7,8-Hexachlorodibenzofuran	1/2	4.007	4.007	LHSMW67 (1)		

Table 7-6 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Explosives (µg/L)						
2,6-Dinitrotoluene	1/26	0.62	0.62	LHSMW71 (1)	3	
2-Amino-4,6-dinitrotoluene	1/21	0.95	0.95	LHSMW71 (1)		
2-Nitrotoluene	1/26	0.28	0.28	LHSMW69 (1)		
3-Nitrotoluene	2/26	0.14 J	0.26 J	LHSMW71 (1)		
Hexahydro-1,3,5-trinitro-1,3,5-triazine	1/26	0.49	0.49	LHSMW69 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

7.4.3.1 Organic compounds

No pesticides or PCBs were detected in the groundwater samples submitted from Site 35C. Low levels of two VOCs, 1,2-dichloroethane (1,2-DCA) (8 µg/L) and TCE (7 µg/L), were detected above PCLs in 1996 groundwater samples. However, they were below PCLs in other sampling events. The common laboratory contaminant, bis(2-ethylhexyl) phthalate, was detected in one of the Phase II and two of the Phase III groundwater samples at concentrations that exceed the PCL value. The Phase II concentration was 21 µg/L at well LHSMW68, while the Phase III concentrations were 7.6 µg/L at well 106 and 8.7 µg/L at well LHSMW67. Five PAHs were detected at low levels in samples from wells LHSMW69, LHSMW71, and 107. Five dioxin/furan compounds (maximum value less than 100 pg/L) were detected in the groundwater sample from well LHSMW67. Perchlorate was detected in one sample at 2.8 µg/L, considerably below levels of concern.

7.4.3.2 Metals

Twelve metals were detected in the groundwater monitoring wells at concentrations that exceed LHAAP background concentrations for groundwater. Six of the metals (aluminum, chromium, iron, nickel, silver, and thallium) were detected at concentrations that exceed their respective PCL values. Samples that exceeded the PCL values were all collected from shallow groundwater monitoring wells. The highest detected concentrations of aluminum (108 mg/L), chromium (43 mg/L), iron (170 mg/L), nickel (2.5 mg/L), and thallium (0.134 mg/L) were all detected in samples collected from monitoring well LHSMW71. This well was sampled four times from 1994 to 1996. The chromium value appears to have increased from 560 µg/L in 1994 to 3630–7550 µg/L in 1996 to 43,000 µg/L in 1998. The iron results always exceeded the PCL; the nickel and thallium results were not consistent. This well is located in the downgradient direction. Low levels of explosives were also found in this well in 1996, but not in 1998.

7.5 CONTAMINANT FATE AND TRANSPORT

Soil sample results around the sump and pipeline indicate that they are not a source of ongoing or historical contamination. A number of VOCs, SVOCs, and dioxins/furans were detected in the soils, but all were low concentrations and most were estimated concentrations below the detection limit. Dioxin/furan results in surface soil next to the sump were elevated. No organic compounds exceeded their respective PCL values in soil sample analytical results. The dioxin/furan results may or may not be a result of LHAAP activities. The organic concentrations in the groundwater were very low, generally below levels of concern.

Beryllium, cadmium, lead, selenium, and silver exceeded both background and their respective PCLs in surface soil samples, but none of these had sufficient levels of contamination to indicate a residual source of contamination. The metal of most interest detected in groundwater was chromium, but the soil sampled from this well does not appear to be the source of this contamination as the surface soil levels are near background. Because chromium levels in this well have increased over time, it is possible that a source that has not been found still exists in the soil.

8.0 SITE 46: PLANT 2 AREA

This section presents the results of the RI activities performed at Site 46 (Plant 2 Area). The purpose of the RI was to define the nature and extent and the fate and transport of soil, sediment, surface water, and groundwater contamination at the site. This section describes the site background, physical characteristics, and investigation activities and compiles the field and analytical data generated during the RI work to document the nature and extent of the contamination detected at Site 46.

8.1 SITE BACKGROUND

8.1.1 Site Description

Site 46 is located in the northwestern portion of LHAAP and covers an area of approximately 190 acres, as shown on Figure 1-2. Site 46 is bounded by Avenue P to the south-southwest, 11th Street and Raymer Street to the southeast and east, the northern LHAAP property fence line to the north, and a heavily wooded area to the west.

8.1.2 Site History

Construction of Plant 2 began in November 1944; the plant was originally designed to produce JB-2 propellant fuel. Construction was halted in August 1945 with the ending of World War II. Plant 2 remained in a standby mode until February 1952, when it was reactivated for the production of pyrotechnic devices. Plant 2 was active from 1952 until 1956, when it was again placed in a standby mode. It was reactivated in 1964 with the initiation of the Vietnam War. Plant 2 produced pyrotechnic and illumination devices until approximately 1997; industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Forty-six waste process sumps and 13 waste rack sumps are located at this site. The physical characteristics of the sumps are provided in Table 4-2. The current site layout is shown on Figure 8-1.

8.1.3 Pre-Phase I Investigations

Initial field investigative activities relative to the Group 4 sumps began in November 1991 when BCM Engineers was retained by the LHAAP Operating Contractor, Thiokol, to evaluate the integrity of the sumps system and the industrial wastewater treatment system at LHAAP (BCM 1992). Although the focus was to develop more efficient wastewater management alternatives, the locations of all 125 sumps were surveyed and limited subsurface investigations were conducted.

Soil samples were collected from the 2-foot bgs and 10-foot bgs intervals from a soil boring drilled adjacent to sumps S-009, S-015, S-023, and S-034 within Site 46. Table 8-1 presents the detected analytes for the samples.

Table 8-1
Summary of BCM Soil Boring Results, Site 46, Group 4 RI, LHAAP, Karnack, Texas

Parameter	Units	Sump Number							
		009	015	023	034	009	015	023	034
		0–2 feet				8–10 feet			
pH	---	9.10	8.70	7.90	8.90	6.40	7.00	7.10	5.10
Total organic carbon	---	10,800	16,100	11,000	21,500	4,340	18,000	9,230	4,450
Total solids	%	79.8	90.1	87.4	84.1	86.9	76.8	83.2	82.7
Aluminum	mg/kg	10,400	6,050	7,730	17,400	6,430	7,510	5,810	16,100
Arsenic	mg/kg	4.76	1.6	2.14	8.56	1.13	0.547	2.280	2.16
Barium	mg/kg	65	357	61.9	486	121	43.5	38.9	40.3
Beryllium	mg/kg	0.346	ND	0.519	0.716	ND	0.626	0.861	0.417
Chromium	mg/kg	10.3	10.1	20.4	22.2	7.17	11.2	13	15.7
Magnesium	mg/kg	503	1,280	1,320	2,320	772	2,160	1,380	941
Lead	mg/kg	16.2	13	17	30	9.38	13.9	11.4	18.4
Selenium	mg/kg	0.163	ND	0.172	0.166	ND	ND	ND	0.145
Toluene	µg/kg	ND	ND	ND	8.32	ND	ND	ND	ND
Trichloroethene	µg/kg	ND	ND	ND	178	ND	ND	ND	48.4

Analyzed purgeable organics not detected at any location include: acrolein; acrylonitrile; benzene; bromoform; carbon tetrachloride; chlorobenzene; dibromochloromethane; bromochloromethane; chloroethane; 2-chloroethylvinyl ether; chloroform; 1,1-dichloroethane; 1,2-dichloroethane; 1,2-dichloropropane; cis-1,3-dichloropropene; trans-1,3-dichloropropene; ethylbenzene; bromomethane; chloromethane; 1,1,2,2-tetrachloroethane; trans-1,2-dichloroethene; 1,1,2-trichloroethane; methylene chloride; 1,1,1-trichloroethane; and vinyl chloride.

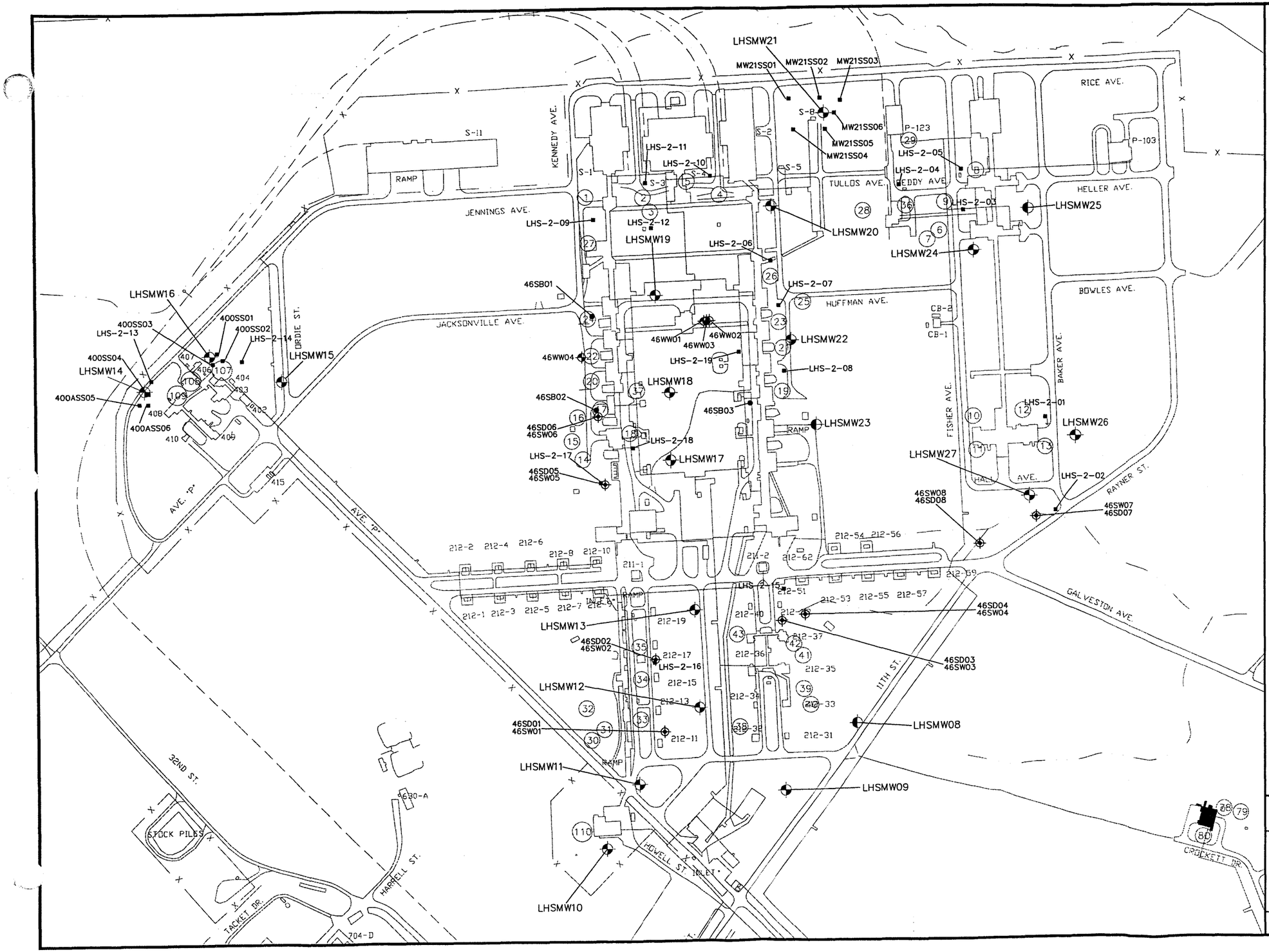
LHAAP = Longhorn Army Ammunition Plant
ND = not detected
% = percent
RI = remedial investigation

8.2 PHYSICAL CHARACTERISTICS OF SITE

This section describes the physical conditions at Site 46. Subjects addressed include surface topography and hydrology, soils and geology, and hydrogeology. Information presented in this section is based on data obtained from the investigation activities and the reports published from previous investigations.

8.2.1 Surface Features and Surface Hydrology

Site 46 (Plant 2 Area) is located in the northwestern portion of LHAAP. This area is a mixture of asphalt-paved streets and parking areas, former Plant 2 production buildings, and heavily wooded and grassy, vegetation-covered areas. The topography at the Site 46 area varies in elevation approximately 30 feet from west to east. Surface runoff follows the topography (west to east) and enters several tributaries located on the eastern side of the Site 46 area.



Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Soil Boring Sampling Location
- Shallow Soil Sampling Location
- Surface Water Sampling Location
- Sediment Sampling Location
- (32) Sump Locations

US Army Corps of Engineers
Tulsa District

JE JACOBS

Site 46 Sampling Locations
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Karnack, Texas

31Dec01 - Figure 8-1.DWG | Figure 8-1

8.2.2 Geology and Soils

Subsurface data from previous investigations indicate that the strata underlying the site are discontinuous across the site. A geologic cross section illustrates the discontinuous nature of the subsurface units (Figure 8-2). The soil is mainly a silty clay with relatively thin discontinuous sand lenses. The sand lenses are well-defined and are continuous from the central portion of Site 46 near LHSMW23 and extending to the south to LHSMW09 as shown on the north-south cross-section A-A' on Figure 8-2. The sand lens at this area begins approximately 10–15 feet bgs and appears to remain a nearly uniform thickness of 3–5 feet. This sand is not well-defined or even present in wells to the north of LHSMW23.

8.2.3 Hydrogeology

Groundwater generally begins at 10–15 feet bgs as observed in shallow monitoring wells. The groundwater is found in thin sand lenses between thicker silt layers. These confining layers were noted during the drilling of most borings at Site 46. Groundwater measurements, made after drilling, were found to be above the elevations at which saturated soils were first encountered, indicating confined to semi-confined conditions.

The site potentiometric surface contours for the shallow saturated zone are shown on Figure 1-3. The groundwater flow direction at Site 46 as depicted in this figure is to the east. Rising head slug tests were performed on selected shallow wells installed throughout the Site 46 area. Hydraulic conductivity values calculated from this data, using the Bouwer-Rice method, are presented in Table 8-2. Results for shallow wells range from 2.5×10^{-5} cm/sec at well 46WW04 to 1.9×10^{-3} cm/sec at well LHSMW10. Hydraulic conductivity values were calculated for all three intermediate wells and were 9.5×10^{-4} cm/sec in 46WW02, 5.6×10^{-4} cm/sec in LHSMW23 and 4.5×10^{-4} cm/sec in LHSMW25. Only one deep well (46WW03) was installed at Site 46, and a hydraulic conductivity value of 1.4×10^{-3} cm/sec was calculated for this well.

8.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the activities completed during the investigation at Site 46. Subjects addressed include contaminant source, surface water, sediment, soils, and groundwater investigations. Table 8-3 summarizes the field activities completed during each investigation phase.

8.3.1 Source Investigation

A source of potential contaminants at Site 46 was waste materials collected by the waste process sumps. Four liquid sump contents samples were collected from sumps S-004, S-031, S-033, and S-110,

Table 8-2
Monitoring Well Construction Summary, Site 46, Group 4 RI, LHAAP, Karnack, Texas

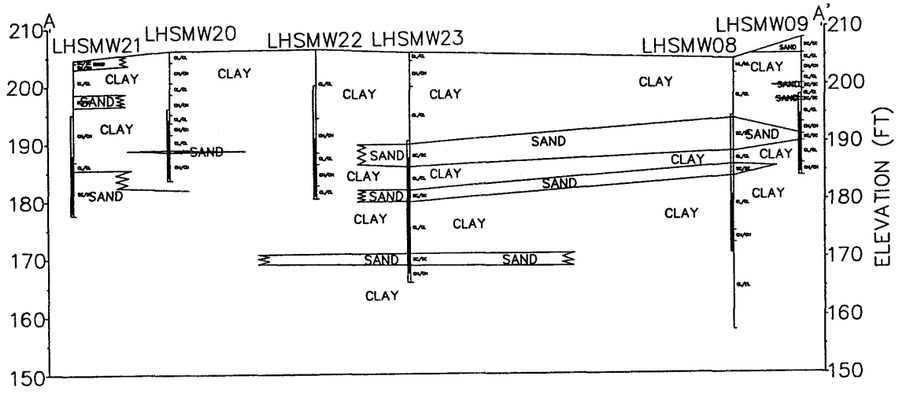
Well Identification	Well Depth (feet)	Groundwater Zone	Surface Elevation	Measuring Point Elevation	Casing Diameter (inches)	Screen Interval (feet)	Hydraulic Conductivity (cm/sec)
46WW01	24	Shallow	209.75	212.82	4	14–24	2.5×10^{-4}
46WW02	46	Intermediate	209.16	212.21	4	35–45	9.5×10^{-4}
46WW03	100.5	Deep	209.8	212.47	4	90–100	1.4×10^{-3}
46WW04	24	Shallow	212.47	215.39	4	14–24	2.5×10^{-5}
LHSMW08	33.8	Shallow	204.49	207.85	4	23.8–33.8	2.1×10^{-3}
LHSMW09	24	Shallow	208.01	210.68	4	13.3–23.3	---
LHSMW10	19	Shallow	211.33	214.58	4	8.5–18.5	1.9×10^{-3}
LHSMW11	27	Shallow	209.89	212.91	4	14–24	---
LHSMW12	14	Shallow	205.98	209.02	4	3.6–13.6	---
LHSMW13	15.4	Shallow	206.48	209.5	4	4.9–14.9	1.6×10^{-4}
LHSMW14	18	Shallow	241.67	244.78	4	7.4–17.4	---
LHSMW15	22	Shallow	223.68	226.65	4	11.6–21.6	1.8×10^{-4}
LHSMW16	22	Shallow	229.3	232.19	4	11.6–21.6	---
LHSMW17	24	Shallow	211.5	214.58	4	13.6–23.6	---
LHSMW18	25	Shallow	212.38	215.35	4	14.5–24.5	---
LHSMW19	27	Shallow	209.8	212.96	4	16.6–26.6	2.1×10^{-4}
LHSMW20	22.5	Shallow	206.21	209.29	4	12–22	---
LHSMW21	27	Shallow	204.66	207.67	4	16.6–26.6	2.1×10^{-4}
LHSMW22	26	Shallow	206.41	209.6	4	15.5–25.5	---
LHSMW23	40	Intermediate	205.8	208.82	4	18.4–38.4	5.6×10^{-4}
LHSMW24	26	Shallow	200.52	203.84	4	15.6–25.6	---
LHSMW25	39.6	Intermediate	199.07	201.97	4	19.2–39.2	4.5×10^{-4}
LHSMW26	34	Shallow	201.53	204.72	4	13.5–33.5	2.0×10^{-3}
LHSMW27	18.1	Shallow	199.2	202.1	4	7.6–17.6	---

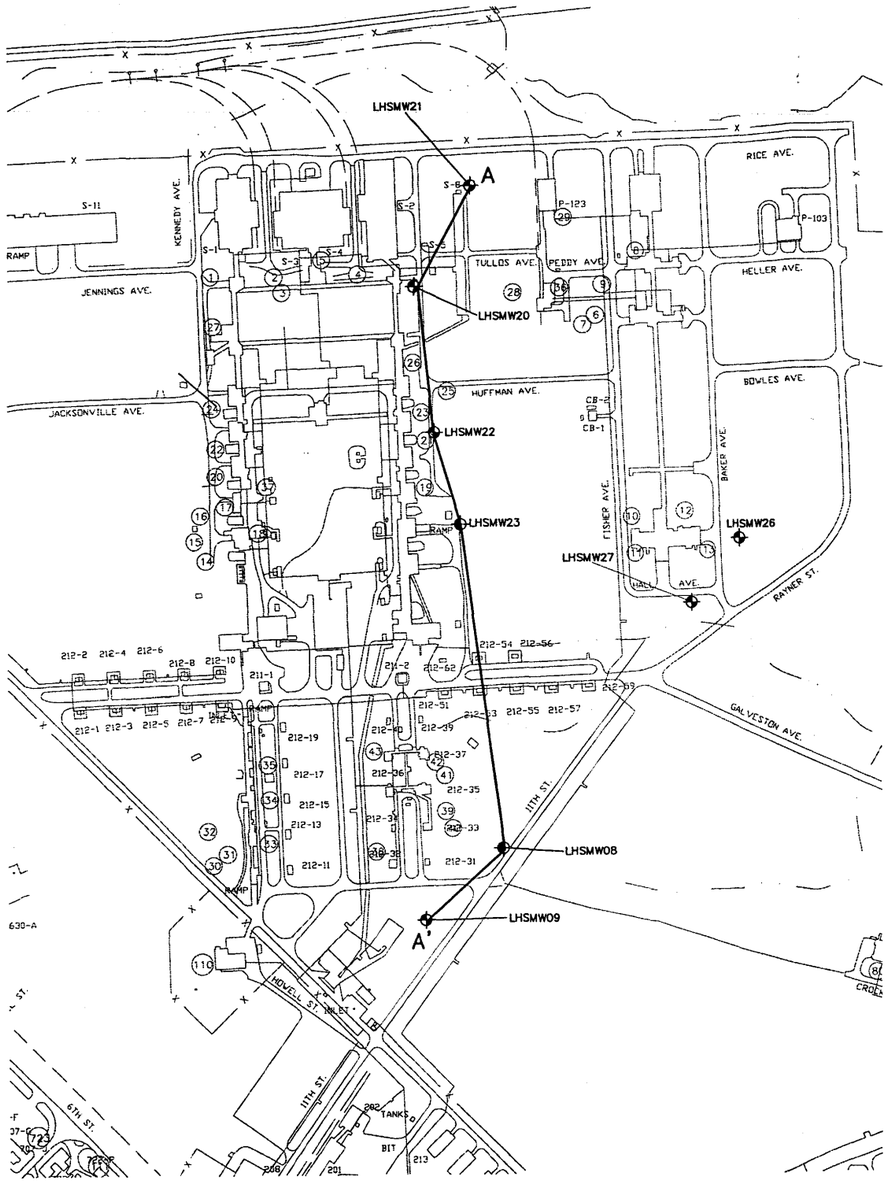
LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

and one sludge sample was collected from sump S-110. All samples were analyzed for VOCs, SVOCs, and metals to determine whether the sumps were a source of contamination to the environment.

8.3.2 Surface Water and Sediment Investigation

During the Phase III investigation, eight co-located sediment samples (46SD01 through 46SD08) and surface water samples (46SW01 through 46SW08) were collected at the locations shown on Figure 8-1. The areas targeted for investigation were ditches in the south central and southeastern portions of the site. Surface water and sediment samples were analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides, PCBs, and cyanides. Samples 46SW/SD02 and 46SW/SD05 were also analyzed for dioxins/furans.





Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well

0 500

Scale in Feet

US Army Corps
of Engineers
Tulsa District

JACOBS

Site 46 Cross Section
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Kamack, Texas

19Dec01 - Figure 8-2.DWG

Figure 8-2

Table 8-3
Investigation Activities, Site 46, Group 4 RI, LHAAP, Karnack, Texas

Phase I
• 5 sump content samples (4 liquid and 1 sludge) were collected from sumps S-004, S-031, S-033, and S-110 (LH\LQ-S004, S031, S033, S110 and LH\SS-S110) • Completed 87 soil borings at 60 sump locations (sumps 1–35, 37–43, 107–110, and waste rack sumps 4–13, 15, 16, 19, and 21) and collected 199 soil samples
Phase II
• Collected 39 shallow soil samples (LHS201 through LHS219 and LHSMW08 through LHSMW27) from 39 sample locations • Installed 20 monitoring wells (LHSMW08 through LHSMW27) and collected groundwater samples from each new well
Phase III
• Collected 122 sump soil samples at 61 sump locations (sumps 1–43, 107–110, and waste rack sumps 4–13, 15, 16, 19, and 21) • Collected 8 sediment and surface water samples (46SD01 through 46SD08 and 46SW01 through 46SW08) • Collected 21 soil samples (46SB01 through 46SB03, MW21SS01 through MW21SS06, and 400ASS01 through 400ASS06) from 15 sample locations • Installed 4 monitoring wells (46WW01 through 46WW04) and collected groundwater samples from each new well and 20 existing wells (LHSMW08 through LHSMW27)
Additional Investigations
• Collected 2 rounds of groundwater samples from wells LHSMW08 through LHSMW27 in February and August 1996. • Collected groundwater samples from wells 46WW01, LHSMW17, LHSMW18 and LHSMW22 in May 2000. • Collected groundwater samples from well 46WW04 in February 2001.

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

8.3.3 Surface and Subsurface Soil Investigation

To evaluate the soils immediately adjacent to the sump locations, 87 soil borings were completed at the 60 sumps at Site 46 during the Phase I investigation. The 199 soil samples were submitted for laboratory analyses for VOCs, SVOCs, and metals. During the Phase III investigation, a single soil boring was completed at each of 61 sump locations. Two soil samples were collected from each boring and analyzed for beryllium, nickel, and vanadium. Soil samples from 27 of the sump locations were also analyzed for pesticides/PCBs and dioxins/furans. The individual sample locations are located close to the sumps and waste rack sumps; the locations of the sumps and waste rack sumps are shown on Figure 4-1.

Sixty soil samples were collected at locations throughout the site and submitted for chemical analyses during the Phase II and Phase III investigations at the locations shown on Figure 8-1. Thirty-nine soil borings (LHS201 through LHS219 and LHSMW08 through LHSMW27) were completed during the Phase II field investigation with 39 shallow (0–0.5 feet) soil samples analyzed for VOCs, SVOCs, explosive compounds, and metals. Twenty-one soil borings (46SB01 through 46SB03, MW21SS01 through MW21SS06, and 400ASS01 through 400ASS06) were completed during the Phase III

investigation. The 12 soil samples collected in the area of monitoring well LHSMW21 and Building 400A were analyzed for PAHs. Nine soil samples from three soil borings (46SB01 through 46SB03) were analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides/PCBs, and dioxins/furans.

Twenty groundwater monitoring wells were installed during Phase II, and four wells were installed during Phase III field activities at Site 46. One deep monitoring well was installed at 100.5 feet bgs, three intermediate monitoring wells were installed from 39.6 to 46 feet bgs, and 20 shallow groundwater monitoring wells were installed at 14 to 34 feet bgs. The monitoring well locations are shown in Figure 8-1.

Recovered soil samples from each monitoring well boring were visually classified for lithologic characteristics using the USCS and recorded on the geologic boring logs presented in Appendix A. Soil samples were screened in the field with an ionization detector (PID or FID) to detect VOCs in the samples. A downhole geophysical survey (natural gamma ray and single-point resistivity) was performed at monitoring well bore hole location 46WW03 to provide additional stratigraphic data relative to the subsurface geology. Survey data for the soil borings and monitoring wells are provided in Appendix A.

8.3.4 Groundwater Investigation

Table 8-2 summarizes the well construction details of monitoring wells installed during the Phase II and Phase III RI. Well construction diagrams for each of the 24 monitoring wells are provided in Appendix A of this report. Forty-four groundwater samples were collected during the Phase II and Phase III investigations to define the shallow, intermediate, and deep groundwater conditions.

Twenty groundwater samples were collected during the Phase II investigation and were submitted for laboratory analyses for VOCs, SVOCs, explosive compounds, and metals. Twenty-five groundwater samples were collected during the Phase III investigation from the monitoring wells and were submitted for laboratory analyses for VOCs, SVOCs, explosive compounds, and metals. The groundwater sample collected from monitoring well LHSMW19 was also submitted for analyses for pesticides/PCBs and dioxins/furans. A single sample was collected from each monitoring well with the exception of 46WW01, which was sampled in October and November 1998.

Additional investigations on groundwater included two rounds of sampling in 1996 and sampling of five wells in 2000 and 2001 for perchlorate.

8.4 NATURE AND EXTENT OF CONTAMINATION

The following sections summarize the detected compounds and associated concentrations for the sump contents and associated soil, sediment, surface water, and groundwater samples. Table 8-4 summarizes the

Table 8-4
Analytical Test Summary, Site 46, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests								
	VOCs	SVOCs	PAHs	Pesticides /PCBs	Explosive Compounds	Dioxins/ Furans	Metals	Cyanide	Perchlorate
Phase I									
Sump Contents									
- Liquid	4	4					4		
- Sludge	1	1					1		
Sump Soils									
-Surface	99	99					99		
-Subsurface	100	100					100		
Phase II									
Soils - Surface	39	39			39		39		
Groundwater	20	20			20		20		
Phase III									
Sump Soils									
-Surface				27*		27*	61**		
-Subsurface				27*		27*	61**		
Soils									
-Surface	6	6	12	6	6	6	6		
-Subsurface	3	3		3	3	3	3		
Surface Water	8	8		8	8	2*	8	8	
Sediments	8	8		8	8	2*	8	8	
Groundwater	25	25		1*	25	1*	24		
Additional Investigations									
Groundwater	44	44			44		44		5

*A limited number of samples were submitted for this analysis.
** Beryllium, nickel, and vanadium analyses only

LHAAP = Longhorn Army Ammunition Plant
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

media tested and analyses performed during each investigation. Tables of detected compounds by media are presented in Appendix C.

8.4.1 Contaminant Source Results

During the Phase I investigation liquids from four sumps (S-004, S-031, S-033, S-110) (Figure 8-1) and a solid sample from S-110 were analyzed for VOCs, SVOCs, and metals. (All sumps were removed from the site in the mid-1990s). The results of these samples are compared to PCLs in Tables 8-5 and 8-6 to identify which contaminants could be present in the sumps. In the liquid sump content samples, seven VOCs were detected at concentrations that exceed the PCL values. One SVOC (hexachlorobenzene) was detected at a concentration that exceeds the PCL value. Nine metals (arsenic, barium, chromium, copper, lead, mercury, potassium, silver, and zinc) were detected in liquid sump content samples at concentrations that exceed the LHAAP background groundwater concentrations. Of the metals that exceeded background, six (antimony, arsenic, barium, chromium, lead, and mercury) were detected in the liquid sump samples at concentrations that exceed the PCL values. The liquid sample from sump S-110 was the most contaminated. S-110 is in the southernmost corner of Plant 2.

Table 8-5
Breakdown of Sump Content Liquid Samples That Exceed PCL Values, Site 46, Group 4 RI, LHAAP, Karnack, Texas

	PCL	Location	Value
VOC (µg/L)			
Benzene	5	LH/LQS110	114.5
Carbon Tetrachloride	5	LH/LQS110	105.5
Chloroform	100	LH/LQS110	1734
Methylene Chloride	5	LH/LQS110	8565.5
1,1-Dichloroethene	7	LH/LQS110	81
1,1,1-Trichloroethane	200	LH/LQS110	2502
Trichloroethene	5	LH/LQS110	1526.5
SVOC (µg/L)			
Hexachlorobenzene	1	LH/LQS110	45.7
Metals (mg/L)			
Antimony	0.006	LH/LQS110	0.0299 E
Arsenic	0.05	LH/LQS031	0.0577
		LH/LQS033	0.0935
Barium	2	LH/LQS004	6.6
		LH/LQS031	2.6
Chromium	0.1	LH/LQS110	0.22
Lead	0.015	LH/LQS110	0.398
Mercury	0.002	LH/LQS110	0.0151

E = result outside of instrument calibration range

LHAAP = Longhorn Army Ammunition Plant
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

Table 8-6
Sump 110 Content Sludge Samples That Exceed PCL Values, Site 46, Group 4 RI, LHAAP, Karnack, Texas

	PCL	Location	Value
VOC (µg/kg)			
Carbon Tetrachloride	31	LH/SSS110	610,000
Methylene Chloride	6.5	LH/SSS110	3,400,000
1,1,1-Trichloroethane	810	LH/SSS110	1,500,000
SVOC (µg/kg)			
Hexachlorobenzene	560	LH/SSS110	11,625
4-methylphenol	940	LH/SSS110	20,000J
Metals (mg/kg)			
Antimony	2.7	LH/SSS110	668
Barium	220	LH/SSS110	3,760
Copper	520	LH/SSS110	1,420
Lead	1.5	LH/SSS110	6,970
Mercury	1	LH/SSS110	373
Silver	0.71	LH/SSS110	111

J = value is estimated

LHAAP = Longhorn Army Ammunition Plant
PCL = protective concentration level
RI = remedial investigation
SVOC = volatile organic compound
VOC = volatile organic compound

One sump sludge sample was collected from sump S-110 with three VOCs and two SVOCs detected at concentrations that exceed the PCL values. Nine metals (antimony, barium, chromium, copper, lead, mercury, silver, strontium, and zinc) were detected in the sludge sump content sample at concentrations that exceed the LHAAP soil background concentrations. Six of those metals were at concentrations that exceed the PCL values. Table 8-6 summarizes the compounds that exceed the PCL values for the sludge sample. The water and sludge samples had almost the same contaminants present. S-110 was a significant, potential source of contamination when it was present.

8.4.2 Soil Results

Table 8-7 summarizes detected constituents in Site 46 soil.

8.4.2.1 Organic compounds

In the soil samples collected during Phases I and III near the waste process sumps and waste rack sumps, two VOCs (methylene chloride and PCE) were detected at concentrations that exceed the PCL values. Methylene chloride concentrations exceeded the PCL (6.7 µg/kg) in surface soil samples at locations LHS2001 (maximum of 27 µg/kg), LHS2002, and LHS2202 and in a subsurface soil sample at location LHS2902 (23 µg/kg). PCE exceeded PCLs in surface soil samples at locations LHWRS1001 and LHWRS1101 (maximum of 54 µg/kg) and in a subsurface soil sample at location LHWRS1001. Although SVOCs were detected in soil samples from these areas, they were not at concentrations above PCLs. For the most part, the sumps have not contaminated surrounding soils with organic compounds. The exceptions may be sumps S-010 and S-011 with slight levels of PCE in the soils. The contents from these sumps were not sampled. Despite the organic contamination present in S-110, nearby soil samples showed no organic contamination.

In the Phase II and Phase III investigations, surface soil samples were collected from 39 locations throughout Site 46, and there were no detections of VOCs, SVOCs, or explosive compounds above PCLs. In Phase III, subsurface soil samples collected at Site 46 had no detections above PCLs of VOCs, SVOCs, explosives, or PAHs. The pesticides gamma benzene hexachloride (BHC or lindane), heptachlor, heptachlor epoxide, dichloro diphenyl dichloro ethane (DDD), DDE, and DDT were detected sporadically in Site 46 surface and subsurface soil samples. However, only gamma BHC (lindane) in the surface soil sample from soil boring 46SB02 was detected at a concentration (8 µg/kg) exceeding PCLs. The PCB Aroclor-1254 was detected in a surface soil sample from sump S-006 but at a concentration below PCLs. Several dioxins/furans were detected in the samples; however, they were mostly detected at low concentrations. An exception was soils at sump S-043. The octachlorodibenzo-p-dioxin level was at 14 µg/kg (95 percent of the results for octachlorodibenzo-p-dioxin in LHAAP soils are below 7.5 µg/kg), and the heptachlorinated dibenzo-p-dioxins (total) level was about 2 µg/kg. These levels are slightly higher than found at other locations and other sites at LHAAP.

Table 8-7
Summary of Detected Constituents in Soil Samples, Site 46, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	234/241	36.1	39,200	LHS2202 (1)	260,000	20,700
Antimony	28/241	1.2	16.2	LHS2901 (1)	2.7	ND
Arsenic	201/241	0.5	16.8	LHS208 (1)	13	29.7
Barium	196/241	4.4	2,060	LHS212 (1)	220	287
Beryllium	36/138	0.2525	1.94	SUMP005 (1)	0.92	NA
Cadmium	22/241	1.1	37.5	LHS2401 (1)	0.75	ND
Calcium	237/241	5.6	26,000	46SB03 (1)		1,090
Chromium, total	210/241	1.3	131	LHS207 (1)	1,200	22.8
Cobalt	190/241	0.356	71.3	LHS0602 (1)	2,000	19.1
Copper	209/241	1.1	274	LHS206 (1)	520	6.7
Iron	233/241	844	120,000	LHS02502		31,000
Lead	234/241	1	950	LHS02602	1.5	17.4
Magnesium	238/241	48.7	5,080	LHS1601 (1)		474
Manganese	241/241	2.34	3,740	LHSMW25 (1)	5,100	2,330
Mercury	10/241	0.044	0.56	LHS216 (1)	1	ND
Nickel	97/138	4.7	47	SUMP015 (1)	230	6.3
Potassium	225/241	58.2	2,590	LHS2202 (1)		481
Selenium	46/241	0.18	2.75	46SB03 (1)	1.1	ND
Silver	4/241	1.03	1.6	46SB01 (1)	0.71	2.3
Strontium	186/241	1.4	8,360	LHS0201 (1)		13.3
Vanadium	130/138	6.2	77	SUMP001 (1)	5,100	NA
Zinc	237/241	2.8	4,120	LHS206 (1)	3,500	16.2
VOCs (µg/kg)						
1,1,1-Trichloroethane	4/243	11.7	14.4	LHWRS401 (1)	810	
Acetone	18/243	6.1	217	LHS2302 (1)	7,100	
Benzene	1/243	13	13	LHS2401 (1)	13	
Chlorobenzene	4/243	5	58.8	LHS1601 (1)	550	
Chloroform	5/243	6	167	LHS2901 (1)	210	
Dichlorodifluoromethane	1/50	100 J	100 J	46SB03 (1)		
Methyl ethyl ketone (2-butanone)	2/243	6	66.6	LHS1501 (1)	44,000	
Methyl isobutyl ketone (4-methyl-2-pentanone)	1/243	126	126	LHS2302 (1)	7,400	
Methylene chloride	5/243	5	27	LHS2001 (1)	6.5	
Tetrachloroethene	5/243	5	54	LHWRS1101 (1)	25	
Toluene	1/243	22.4	22.4	LHS1601 (1)	4,100	
Xylenes, total	1/243	99.7	99.7	LHS1601 (1)	61,000	
SVOCs (µg/kg)						
2-Methylphenol (o-cresol)	1/240	170 J	170 J	LHS207 (1)	11,000	
4-Methylphenol (p-cresol)	2/240	110 J	180 J	LHS207 (1)	940	
Acenaphthylene	2/240	190 J	500	LHSMW21 (1)	610,000	
Anthracene	2/240	140 J	430	LHSMW21 (1)	10,000,000	
Benzo(a)anthracene	5/240	72 J	2,300	LHSMW21 (1)	20,000	
Benzo(a)pyrene	9/240	77 J	2,100	LHSMW21 (1)	3,800	
Benzo(b)fluoranthene	12/240	75 J	4,500	LHSMW21 (1)	67,000	

Table 8-7 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
SVOCs (µg/kg) (continued)						
Benzo(g,h,i)perylene	4/240	190	1,300	LHSMW21 (1)	69,000,000	
Benzo(k)fluoranthene	6/240	65 J	1,200	LHSMW21 (1)	690,000	
Benzoic acid	1/216	290 J	290 J	LHS211 (1)	280,000	
Benzyl butyl phthalate	5/240	117 J	760	LHS218 (1)	4,000,000	
Chrysene	11/240	75 J	2,600	LHSMW21 (1)	1,700,000	
Di-n-butyl phthalate	38/240	73 J	7,462	LHS10801 (1)	5,000,000	
Di-n-octylphthalate	2/240	190	298	LHS2002 (1)	1,000,000,000	
Dibenz(a,h)anthracene	2/240	110 J	380	LHSMW21 (1)	11,000	
Diethyl phthalate	3/240	13 J	212	LHS0901 (1)	230,000	
Fluoranthene	13/240	110 J	2,700	LHSMW21 (1)	2,900,000	
Hexachlorobenzene	1/240	244	244	LHS2201 (1)	560	
Indeno(1,2,3-c,d)pyrene	4/240	290	1,600	LHSMW21 (1)	190,000	
Phenanthrene	8/240	130 J	490 J	LHS212 (2)	620,000	
Pyrene	13/240	97 J	2,800	LHSMW21 (1)	1,700,000	
bis(2-Ethylhexyl) phthalate	44/240	35 J	2,349	LHS10801 (1)	82,000	
Pesticides (µg/kg)						
alpha BHC (alpha hexachlorocyclohexane)	1/63	10	10	46SB02 (1)	8.9	
gamma BHC (lindane)	1/63	8 J	8 J	46SB02 (1)	4.6	
Heptachlor	1/63	2.2	2.2	SUMP010 (1)	94	
Heptachlor epoxide	2/63	16	19	SUMP036 (1)	29	
p,p'-DDD	3/63	3.9	28	WRSUMP008 (1)	15,000	
p,p'-DDE	5/63	3.3	30	WRSUMP019 (1)	13,000	
p,p'-DDT	4/63	2 J	12	WRSUMP019 (1)	17,000	
PCBs (µg/kg)						
PCB-1254 (Aroclor-1254)	2/64	380	540	SUMP016 (1)	5,300	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	69/69	10.182 J	13,978.165	SUMP043 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	63/69	0.885	1,956.481	SUMP043 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	64/69	0.676 J	1,158.49	SUMP043 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	33/69	0.647	345.749	SUMP020 (1)		
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	4/69	0.844	16.351	SUMP020 (1)		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	18/69	0.395	31.132	SUMP020 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	14/69	0.615	45.823	SUMP020 (1)		
Pentachlorinated dibenzo-p-dioxins (total)	2/69	1.041	11.516	SUMP020 (1)		
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	3/69	1.041	6.038	SUMP020 (1)		

Table 8-7 (continued)

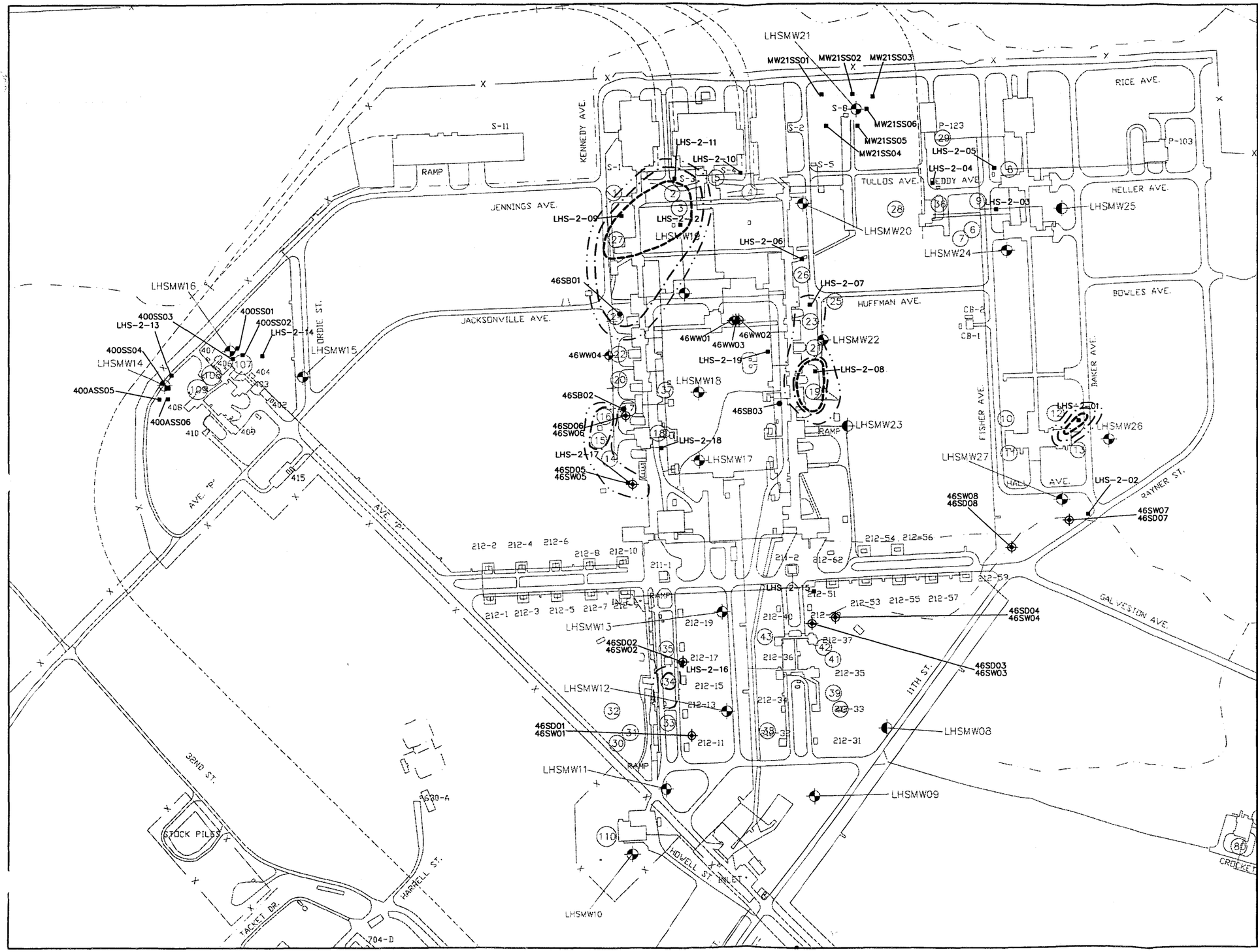
Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Furans (ng/kg)						
Octachlorodibenzofuran	39/69	0.649	637.759	SUMP043 (1)		
Heptachlorinated dibenzofurans (total)	31/69	0.543	142.996	SUMP043 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	40/69	0.328	143	SUMP043 (1)		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1/69	1.25 J	1.25 J	WRSUMP008 (1)		
Hexachlorinated dibenzofurans (total)	37/69	0.348	231.335	SUMP043 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	28/69	0.303	58.745	SUMP043 (1)		
1,2,3,6,7,8-Hexachlorodibenzofuran	2/69	6.676	7.807	SUMP020 (1)		
2,3,4,6,7,8-Hexachlorodibenzofuran	2/69	2.987	13.543	SUMP020 (1)		
Pentachlorinated dibenzofurans (total)	25/69	0.442	93.038	WRSUMP010 (1)		
1,2,3,7,8-Pentachlorodibenzofuran	5/69	0.737	15.63	WRSUMP010 (1)		
Tetrachlorinated dibenzofurans (total)	36/69	0.279	33.304	SUMP043 (1)		
2,3,7,8-Tetrachlorodibenzofuran	44/87	0.285	9.609 J	WRSUMP008 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCB = polychlorinated biphenyl
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

8.4.2.2 Metals

In the soil samples collected during Phases I and III near the waste process sumps and waste rack sumps, antimony, calcium, chromium, copper, iron, lead, magnesium, potassium, strontium, and zinc generally exceeded their background values, although barium and aluminum occasionally exceeded background values as well. Of the metals that were detected above background values, antimony, barium, beryllium, cadmium, lead, and selenium concentrations were detected above PCLs. Some contaminants (barium—over 2000 mg/kg and lead—near 1000 mg/kg) had notable concentrations near a few sumps. There were too few measurements of cadmium to calculate a meaningful background concentration, and beryllium was not analyzed for in the background samples. As with organic contaminant results the soil sample taken near sump S-110 was not notably contaminated with metals. Only lead (50 mg/kg) exceeded background levels.

In the Phase II surface soil samples and the Phase III surface and subsurface soil samples collected at Site 46, 17 different metals were detected at concentrations above background levels. Of those that exceeded background, barium, lead, selenium, and one zinc concentration in surface soil exceeded their respective PCL values. Selenium at locations 46SB01 and 46SB03 in subsurface soil exceeded its PCL value. Figure 8-3 shows the barium surface soil concentrations above background. This figure presents several areas of elevated concentrations. Some of these locations are related to sumps (S-019, S-002, S-003, and S-027) while other locations are not near sumps. Figure 8-4 illustrates two



Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Soil Boring Sampling Location
- Shallow Soil Sampling Location
- Surface Water Sampling Location
- Sediment Sampling Location
- (32) Sump Locations
- Ba > 1000 mg/kg
- Ba - 500-1000 mg/kg
- Ba - 287(bkgd)-500 mg/kg

N

0 350

Scale in Feet

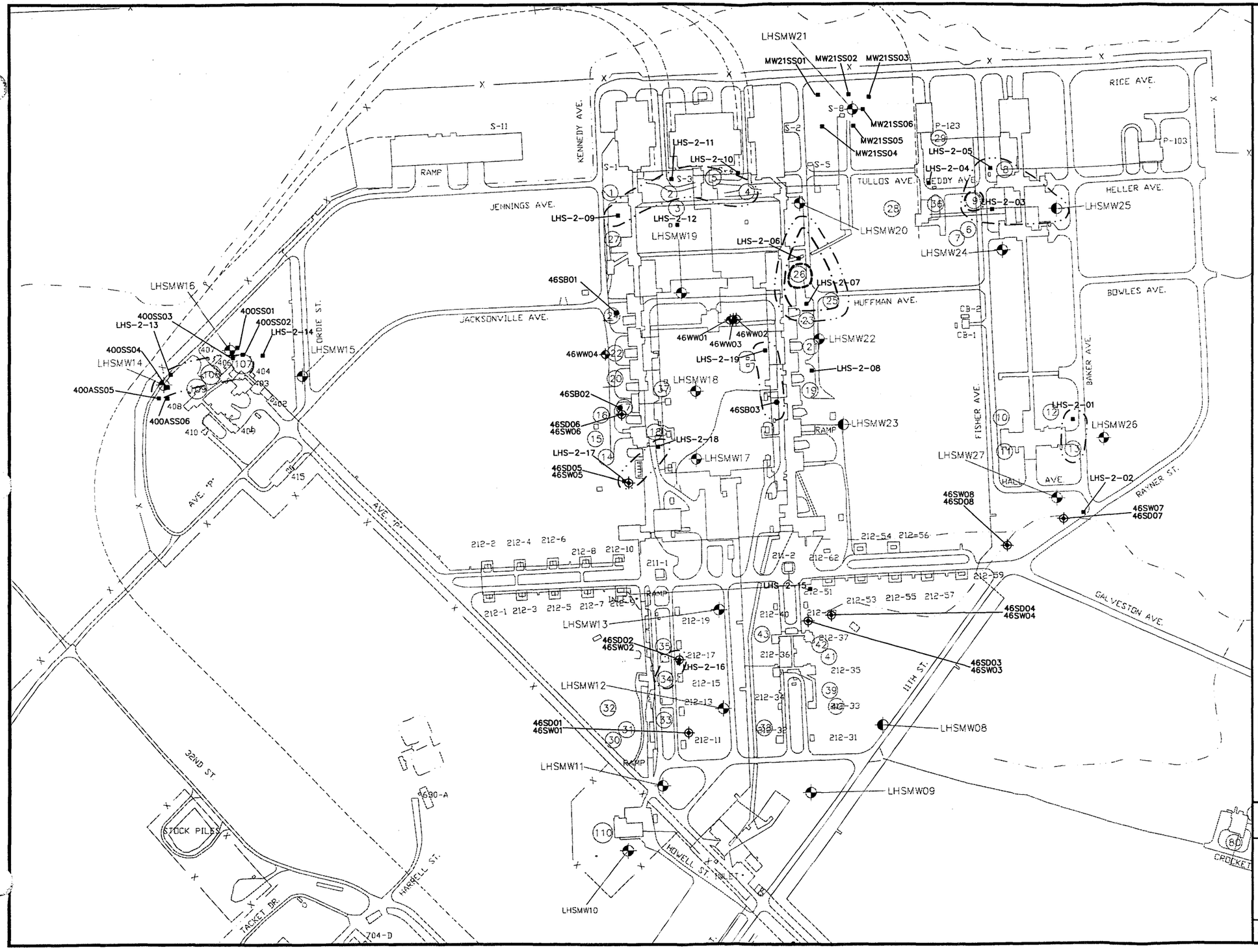
US Army Corps of Engineers
Tulsa District

JACOBS

Site 46 Barium Surface Soil Results Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Karnack, Texas

31Dec01 - Figure 8-3.DWG | Figure 8-3



Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Soil Boring Sampling Location
- Shallow Soil Sampling Location
- Surface Water Sampling Location
- Sediment Sampling Location
- (32) Sump Locations
- Pb > 500 mg/kg
- Pb - 100-500 mg/kg
- Pb - 17.4(bkgd)-100 mg/kg

N

0 350

Scale in Feet

US Army Corps of Engineers
Tulsa District

JACOBS

Site 46 Lead
Surface Soil Results
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas

31Dec01 - Figure 8-4.DWG | Figure 8-4

areas of elevated lead values, one near S-026 and another near S-009. The lead concentration detected near S-026 was 950 mg/kg. Several other areas on the site have lead levels above background.

8.4.3 Sediment Results

Sediment samples and collocated surface water samples were collected at eight locations during Phase III field activities at Site 46. The locations 46SD01 through 46SD08 are shown on Figure 8-1. The summary of detected constituents is presented in Table 8-8.

8.4.3.1 Organic compounds

One VOC, methylene chloride, was detected in samples 46SD03, 46SD04, 46SD05, 46SD06, and 46SD08, but only the concentration (8 µg/kg) in the sample from location 46SD03 exceeded the soil PCL of 6.5 µg/kg. The methylene chloride results are not indicative of site-related contamination. No detectable concentrations of SVOCs were identified in the samples. The explosive compound nitrobenzene was detected in sediment sample 46SD02 at a concentration that exceeded the PCL, but it was not detected in any other sample (including nearby sample 46SD01). Two pesticide/PCB compounds (DDT in sample 46SD06 and Aroclor-1254 in samples 46SD02, 46SD03, and 46SD04) were detected but at concentrations below the PCL values and below 1 mg/kg.

Dioxins/furans were detected in samples from locations 46SD02 and 46SD05 but at low concentrations. The maximum detection was 777 ng/kg of octachlorodibenzo-p-dioxin, a concentration that does not lead to a conclusion that dioxins are contaminating the ditches.

8.4.3.2 Metals

Eleven different metals in sediment samples exceeded background concentrations (barium, beryllium, calcium, chromium, copper, lead, magnesium, potassium, selenium, vanadium, and zinc). Of the metals detected above background only barium, lead, and selenium also exceeded their soil PCL. Lead values were above background, but the maximum was 50 mg/kg. No single sediment sample has greater metal concentrations than the others. The metal contamination, although present, is low and fairly ubiquitous. 46SD03 and 46SD08 had no PCL exceedances; however, nearby locations did have exceedances. No definable extent of contamination was possible to discern.

8.4.4 Surface Water Results

Surface water samples and colocated sediment samples were collected at eight locations during Phase III field activities at Site 46. The locations, 46SW01 through 46SW08, are shown on Figure 8-1, and the results are summarized in Table 8-9.

Table 8-8
Summary of Detected Constituents in Sediment Samples, Site 46, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	9/9	5,300	16,000	46SD02 (2)	260,000	20,700
Arsenic	9/9	3	17.6	46SD06 (1)	13	29.7
Barium	8/9	45	290	46SD06 (1)	220	287
Beryllium	2/9	0.836	0.853	46SD01 (1)	0.92	NA
Calcium	6/9	750	3,200	46SD02 (1)		1,090
Chromium, total	9/9	13	29	46SD04 (1)	1,200	22.8
Cobalt	2/9	7.2	13	46SD01 (1)	2,000	19.1
Copper	8/9	4.26	51.8	46SD06 (1)	520	6.7
Iron	9/9	8,400	29,000	46SD01 (1)		31,000
Lead	9/9	7.51	49.7	46SD02 (1)	1.5	17.4
Magnesium	1/9	1,100	1,100	46SD07 (1)		474
Manganese	9/9	38.8 J	649 J	46SD01 (1)	5,100	2,330
Potassium	5/9	720 J	1,500 J	46SD06 (1)		481
Selenium	4/9	2.94	5.69	46SD01 (1)	1.1	ND
Sodium	3/9	1,400	2,100	46SD02 (1)		NA
Strontium	1/9	7	7	46SD07 (1)		13.3
Vanadium	8/9	19	53	46SD05 (1)	5,100	NA
Zinc	9/9	78	770	46SD02 (1)	3,500	16.2
Physical properties (mg/kg)						
Total organic carbon	8/8	28,400	528,000 J	46SD05 (1)		
VOCs (µg/kg)						
Methylene chloride	7/11	1.5	8	46SD03 (1)	6.5	
Pesticides (µg/kg)						
p,p'-DDT	1/9	15	15	46SD06 (1)	17,000	
PCBs (µg/kg)						
PCB-1254 (Aroclor-1254)	3/9	24	690 J	46SD02 (1)	5,300	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	2/2	137.519	777.512	46SD02 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	2/2	15.867	105.51	46SD02 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2/2	7.174	49.095	46SD02 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	2/2	1.986	2.67	46SD05 (1)		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1/2	1.986	1.986	46SD02 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1/2	1.712	1.712	46SD02 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	2/2	1.509	16.593	46SD02 (1)		
Heptachlorinated dibenzofurans (total)	1/2	1.624	1.624	46SD05 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2/2	0.795	5.397	46SD02 (1)		
Hexachlorinated dibenzofurans (total)	2/2	1.145	8.713	46SD02 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	2/2	0.494	2.806	46SD02 (1)		
Pentachlorinated dibenzofurans (total)	1/2	2.105	2.105	46SD02 (1)		
Tetrachlorinated dibenzofurans (total)	1/2	4.329	4.329	46SD02 (1)		
2,3,7,8-Tetrachlorodibenzofuran	2/3	0.921	1.058	46SD02 (1)		

Table 8-8 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Explosives (µg/kg)						
Nitrobenzene	1/27	1,100	1,100	46SD02 (1)	130	
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1/27	3,000	3,000	LHS-2-14 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCB = polychlorinated biphenyl
PCL = protective concentration level
RI = remedial investigation
VOC = volatile organic compound

8.4.4.1 Organic compounds

No detectable concentrations of VOCs, SVOCs, or pesticides/PCBs were identified in the samples submitted. One explosive compound, m-nitrotoluene, was detected in the 46SW01 surface water sample at a concentration of 3.6 µg/L. Surface water comparison criterion for m-nitrotoluene is not available.

Three dioxin/furan compounds (1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin, total heptachlorodibenzo-p-dioxins, and octachlorodibenzo-p-dioxin) were detected in two of the surface water samples. Octachlorodibenzo-p-dioxin was the only compound detected in sample 46SW02, and all three compounds were detected in the 46SW05 sample. There are no available surface water comparison criteria for these compounds; however, they were detected at low concentrations (maximum of 185 pg/L).

8.4.4.2 Metals

Twenty-four different metals were detected in the surface water samples. Aluminum, arsenic, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc were detected at concentrations exceeding TWQS. TWQS are not an ARAR for the ditches, but they can be a useful comparison level. All of the exceedances are within the industrialized portion of the southern end of Site 46. The tributary samples (46SW07 and 46SW08) had no exceedances of TWQS. Aluminum, arsenic, cadmium, nickel, silver, and thallium were not detected above background in sediments, making sediments as a source of contamination to surface water unlikely.

8.4.5 Groundwater Results

Locations for the 24 monitoring wells are shown on Figure 8-1. Table 8-10 summarizes detected constituents in groundwater.

Table 8-9
Summary of Detected Constituents in Surface Water Samples, Site 46, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detection Location	TWQS[a]
Metals (µg/L)					
Aluminum	8/9	270	210,000	46SW01 (1)	991
Antimony	5/9	5	454	46SW02 (1)	4,300
Arsenic	2/9	66	1,880	46SW02 (1)	1.4
Barium	3/9	200	3,300	46SW01 (1)	
Beryllium	2/9	11.9	51.3	46SW02 (1)	
Cadmium	2/9	6.7	50	46SW02 (1)	1.03
Calcium	9/9	6,900	58,000	46SW01 (1)	
Chromium, total	2/9	200 J	230 J	46SW01 (1)	178
Cobalt	2/9	120	530	46SW02 (1)	
Copper	3/9	52	241	46SW02 (1)	12
Iron	9/9	390	220,000 J	46SW01 (1)	
Lead	6/9	3	511	46SW02 (1)	2.52
Magnesium	1/9	13,000	13,000	46SW01 (1)	
Manganese	9/9	38	11,800	46SW01 (1)	
Nickel	2/9	110	510	46SW02 (1)	157
Potassium	1/9	17,000	17,000	46SW01 (1)	
Selenium	1/9	1,960	1,960	46SW02 (1)	5
Silver	1/9	50	50	46SW02 (1)	0.8
Sodium	6/9	5,300	9,600	46SW01 (1)	
Strontium	4/9	50	290	46SW01 (1)	
Thallium	7/9	1.1	44.3 J	46SW02 (1)	6.3
Tin	1/9	590	590	46SW02 (1)	
Vanadium	2/9	480	490	46SW02 (1)	
Zinc	9/9	40	3,300	46SW01 (1)	104
Physical properties (mg/L)					
Hardness (as $CaCO_3$)	8/8	36	72	46SW02 (1)	
Dioxins (pg/L)					
Octachlorodibenzo-p-dioxin	4/4	41.673 J	185.432 J	46SW05 (1)	
Heptachlorinated dibenzo-p-dioxins (total)	2/4	4.717	14	46SW05 (1)	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2/4	4.717 J	6.258 J	46SW05 (1)	
Explosives (µg/L)					
3-Nitrotoluene	1/8	3.6	3.6	46SW01 (1)	

[a] Lowest value of human health and aquatic life TWQS. Assumes hardness of 100 mg/L as $CaCO_3$.

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
RI = remedial investigation
TWQS = Texas Water Quality Standards

Table 8-10
Summary of Detected Constituents in Groundwater Samples, Site 46, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Metals (µg/L)						
Aluminum	73/85	220	80,000	LHSMW16 (1)	73,000	13,400
Antimony	5/87	8	63 J	LHSMW27 (1)	6	ND
Arsenic	32/87	1.1 J	20	LHSMW17 (1)	50	22
Barium	65/87	20	3,730 J	LHSMW10 (1)	2,000	1,990
Beryllium	17/67	0.5	76 J	LHSMW27 (1)	4	NA
Cadmium	14/87	0.3	20 J	LHSMW27 (1)	5	55
Calcium	81/87	309	469,000	LHSMW24 (1)		308,000
Chromium, total	69/87	4.4	4,700	LHSMW15 (1)	100	110
Cobalt	33/87	10	134	LHSMW11 (1)	4,400	53
Copper	45/87	3.6	170	LHSMW17 (1)	1,300	43
Iron	87/87	199	320,000	LHSMW17 (1)		68,000
Lead	43/87	1.5	673	LHSMW23 (1)	15	300
Magnesium	80/87	1,610 J	352,000	LHSMW22 (1)		277,000
Manganese	86/87	49	6,500	LHSMW18 (1)	10,000	11,800
Mercury	18/87	0.041 J	1.6	LHSMW20 (1)	2	1
Nickel	49/67	17	1,600	LHSMW14 (1)	1,500	60
Potassium	58/87	390	14,000	LHSMW14 (1)		4,300
Selenium	20/87	1.1 J	33	LHSMW17 (1)	50	140
Silver	8/87	1.9	120	LHSMW15 (1)	370	30
Sodium	28/28	9,600	1,400,000	LHSMW19 (1)		1,470,000
Strontium	83/87	46	12,000	LHSMW25 (1)	22,000	6,150
Thallium	16/87	1.1 J	166	LHSMW21 (1)	2	ND
Vanadium	10/67	2.8	140	LHSMW17 (1)	510	NA
Zinc	53/67	6.5	240	LHSMW12 (1)	22,000	230
Anions (mg/L)						
Chloride (as Cl)	42/42	3.6	2,990	LHSMW19 (1)		1,416
Nitrogen, nitrate (as N)	3/39	0.5	4.9	LHSMW24 (1)		NA
Nitrogen, nitrate-nitrite	1/3	0.311	0.311	LHSMW14 (1)		0.18
Perchlorate	10/17	0.00444 J	0.55	LHSMW17 (1)	66	NA
Sulfate (as SO_4)	39/42	2	1,929	LHSMW22 (1)		3,475
VOCs (µg/L)						
1,1-Dichloroethane	2/98	1.7	4	LHSMW22 (1)	7,300	
1,1-Dichloroethene	7/98	0.58	3.8	LHSMW18 (1)	7	
1,2,4-Trichlorobenzene	2/78	0.23 J	0.61	LHSMW09 (1)	70	
1,2,4-Trimethylbenzene	1/78	0.31	0.31	LHSMW20 (1)	3,700	
Carbon disulfide	3/49	0.78	7	LHSMW09 (1)	7,300	
Chloroform	2/98	0.54	69	LHS46WW03 (1)	80	
Dichlorodifluoromethane	2/98	3.2	5.4	LHSMW09 (1)	15,000	
Isopropylbenzene (cumene)	1/78	3.3	3.3	LHSMW26 (1)		
Methylene chloride	4/98	0.88	13,000	LHSMW14 (1)	5	
Naphthalene	1/78	1.1 J	1.1 J	LHSMW26 (1)	1,500	
sec-Butylbenzene	1/78	1.9	1.9	LHSMW26 (1)		
Tetrachloroethene	5/98	1.1	2.4	LHSMW22 (1)	5	
Total 1,2-dichloroethene	1/20	4 J	4 J	LHSMW18 (1)		
Trichloroethene	18/84	0.71	1,400	LHSMW14 (1)	5	
Trichlorofluoromethane	3/78	2.1	2.1	LHSMW25 (3)	22,000	

Table 8-10 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Vinyl chloride	2/78	0.68	0.71	LHSMW18 (1)	2	
cis-1,2-Dichloroethene	11/78	0.54	320	LHSMW14 (1)	70	
n-Butylbenzene	1/78	1	1	LHSMW26 (1)		
n-Propylbenzene	1/78	4.4	4.4	LHSMW26 (1)		
t-Butylbenzene	1/78	0.29	0.29	LHSMW26 (1)		
trans-1,2-Dichloroethene	7/78	0.58	12	LHSMW18 (1)	100	
SVOCs (µg/L)						
Benzo(g,h,i)perylene	2/83	1 J	1 J	LHSMW16 (2)	2,200	
Di-n-butyl phthalate	1/83	1 J	1 J	LHSMW15 (1)	7,300	
Phenol	2/83	10	12	LHSMW14 (1)	44,000	
bis(2-Ethylhexyl) phthalate	32/83	0.47 J	27	46WW02 (1)	6	
Explosives (µg/L)						
2,4,6-Trinitrotoluene	1/87	0.35	0.35	LHSMW21 (1)		
2,4-Dinitrotoluene	2/87	0.067 J	0.073 J	LHSMW15 (1)	3	
2-Nitrotoluene	3/87	0.13 J	0.19 J	LHSMW26 (1)		
3-Nitrotoluene	4/87	0.13 J	0.15 J	LHSMW15 (3)		
4-Nitrotoluene	1/87	0.14 J	0.14 J	LHSMW27 (1)		
Hexahydro-1,3,5-trinitro-1,3,5-triazine	2/87	0.19 J	0.32	LHSMW14 (1)		
Nitrobenzene	1/87	0.21	0.21	LHSMW23 (1)	37	
Dioxins (pg/L)						
Octachlorodibenzo-p-dioxin	4/4	39.002	224.423	46WW01 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	3/4	4.428	15.32	46WW01 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1/4	6.54	6.54	46WW01 (1)		
Furans (pg/L)						
Octachlorodibenzofuran	1/4	5.247	5.247	LHSMW14 (1)		
Heptachlorinated dibenzofurans (total)	1/4	0.872	0.872	LHSMW14 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1/4	4.287	4.287	LHSMW14 (1)		
Hexachlorinated dibenzofurans (total)	1/4	2.419	2.419	LHSMW14 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	1/4	2.431	2.431	LHSMW14 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

8.4.5.1 Organic compounds

Twenty different VOCs were detected in the groundwater samples. All VOC concentrations detected were below PCL values except for methylene chloride, cis-1,2-DCE, and TCE. TCE levels exceeded PCLs in wells 46WW01 (6.6 µg/L), 46WW02 (24 µg/L), LHSMW18 (38 µg/L), and LHSMW19 (77 µg/L). Wells 46WW01, 46WW02, and 46WW03 are all located adjacent to each other in the central portion of the Plant 2 area. Well 46WW01 is completed in the shallow groundwater zone, well 46WW02 in the intermediate zone, and well 46WW03 in the deep zone. It should be noted that well LHSMW18 is located

approximately 150 feet southwest of the 46WW01, 46WW02, and 46WW03 well cluster and that LHSMW19 is located approximately 100 feet northwest of the cluster. An area of low levels of VOC contamination probably exists in the middle of the site.

TCE (770 µg/L) and cis-1,2-DCE (250 µg/L) were detected above PCLs in monitoring well LHSMW14 during the 1999 sampling event. Well LHSMW14 is located in the far western portion of Site 46 (Figure 8-1). This contamination was not present during 1996 and 1998 sampling. This result may represent another newer area of contamination.

The SVOCs—benzo(g,h,i)perylene, di-n-butyl phthalate, phenol and bis(2-ethylhexyl) phthalate—were detected in Site 46 groundwater samples. bis(2-Ethylhexyl) phthalate was detected slightly above PCLs in samples from ten different wells with the highest concentrations being 27 µg/L in well 46WW02 and 25 µg/L in well 46WW03.

Explosive compounds were detected in samples from wells LHSMW14, LHSMW15, LHSMW17, LHSMW23, LHSMW26, and LHSMW27. However, none of the detected compounds exceeded their respective PCLs. The monitoring wells where explosive compounds were detected are spread throughout Site 46, possibly indicating that these compounds have impacted groundwater sitewide. Pesticides/PCBs were not detected in any of the groundwater samples.

Dioxin/furan compounds were only analyzed for in samples from wells 46WW01, LHSMW14, and LHSMW19 during Phase III. Eight dioxin/furan compounds were detected in these wells with only octachlorodibenzo-p-dioxin detected in the well LHSMW19 sample. All of the dioxin/furan compounds were detected at low concentrations.

Groundwater samples were collected from select wells in May 2000 and January and February 2001. Perchlorate was detected in wells 46WW04, LHSMW17, LHSMW18, LHSMW19, and LHSMW20. The highest concentrations (500 µg/L) were found in LHSMW17, again in the middle of the plant.

8.4.5.2 Metals

Nineteen different metals were detected above background values. Eight of those (aluminum, antimony, barium, beryllium, chromium, lead, nickel, and thallium) were detected in the groundwater samples at concentrations greater than their respective PCLs. Samples that exceeded the PCL values were detected in 18 different wells at Site 46. Sixteen of these wells are completed in the shallow groundwater zone, and two wells are completed in the intermediate zone. In the two wells completed in the intermediate zone (LHSMW23 and LHSMW25), the only metals exceeding PCLs were chromium and lead in LHSMW23 and antimony and lead in LHSMW25. These metals were below detection levels in the last sampling round indicating the likelihood that the intermediate zone is not contaminated. The shallow wells with metals detected above PCLs are spread throughout the Plant 2 area, possibly indicating a widespread

slightly elevated metals condition in the groundwater rather than a localized source. Very few groundwater sampling locations had elevated barium or lead levels; these metals were present in the soils.

8.5 CONTAMINANT FATE AND TRANSPORT

With the exception of dioxins/furans, organic compound detections in soils were isolated and at low concentrations. Among the metals, barium and lead are the most widespread in surface soil. These contaminants are relatively immobile and are not causing a notable groundwater problem. Barium and lead levels in groundwater are elevated in a few areas so there may be a connection. The sump contents tested also had elevated barium and lead so the sumps may have been a source. However, general industrial activities can easily cause this low level of metals contamination. The surface soil may be causing ditch contamination because some sediment locations did have elevated lead levels.

At Site 46, PCE is present in the surface and shallow subsurface soils in concentrations that exceed PCLs. PCE is an ethane-based compound that is volatile and has a solubility of 150 mg/L. The soil concentrations of these compounds are relatively low. PCE does show up in the groundwater sample at monitoring well LHSMW18, which is near where it was detected in soil, but the levels are very low. PCE in soil is limited to samples near waste rack sump 10 and sump S-022.

TCE, methylene chloride, and cis-1,2-DCE were the only VOCs detected in concentrations greater than PCLs in Site 46 groundwater. With the exception of TCE, methylene chloride, and cis-1,2-DCE being detected in one well on the far western side of Site 46, the majority of the elevated TCE concentrations were in a relatively confined area in the central portion of the site. The contaminated areas are small and not near a surface water discharge point.

9.0 SITE 47: PLANT 3 AREA

This section presents the results of the RI activities performed at Site 47 (Plant 3). The purpose of the RI was to define the nature and extent and fate and transport of soil and groundwater contamination within the Plant 3 area. It compiles the analytical data generated during the investigation activities to document the nature and extent of the contamination detected at Site 47.

9.1 SITE BACKGROUND

9.1.1 Site Description

Site 47 is located in the north-central portion of LHAAP and covers an area of approximately 275 acres, as shown on Figures 1-2 and 9-1. Site 47 is bounded by Karnack Avenue on the east, Avenue P on the west, 51st Street on the south, and 62nd and 66th Streets on the north.

9.1.2 Site History

Construction of Plant 3 began in July 1953 and production of rocket motors began in December 1954. Rocket motor production continued until the early 1980s. Some of the rocket motor production facilities were converted to produce pyrotechnic and illumination devices and were active until approximately 1997. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Fifty waste process sumps and three waste rack sumps are located at this site. The current site layout is shown on Figure 9-1.

9.1.3 Pre-Phase I Investigations

In 1982, EPS investigated the site for USATHAMA and published a report documenting the investigation in June 1984 (EPS 1984). As part of this investigation, monitoring well 105 was installed at Site 47.

The groundwater sample collected from monitoring well 105 in 1982 had a chloride concentration of 820,000 µg/L, a sulfate concentration of 1,846,690 µg/L, a nitrite concentration of 24,000 µg/L, and a manganese concentration of 3340 µg/L.

Initial field investigative activities of the Group 4 sumps began in November 1991. BCM Engineers was retained by the LHAAP Operating Contractor, Thiokol, to evaluate the integrity of the sump and the industrial wastewater treatment systems at LHAAP (BCM 1992). Although the focus was to develop more efficient wastewater management alternatives, the locations of all 125 sumps were surveyed and limited soil investigations were conducted.

Soil samples were collected from the 0 to 2 feet and 8 to 10 feet intervals from soil borings adjacent to sumps S-057, S-061, S-068, S-070, S-081, and S-086 located within Site 47. Table 9-1 presents the results of the analyses conducted on these samples.

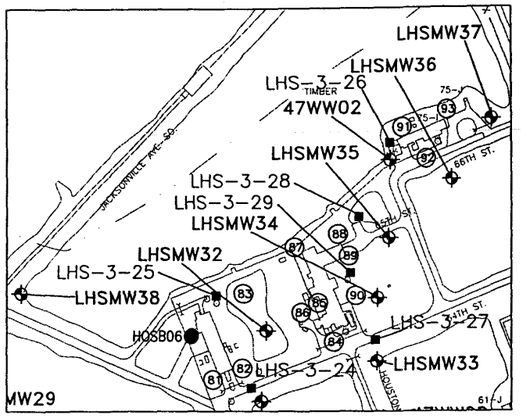
Two VOCs were detected in the soil samples—TCE and methylene chloride. One sample had a concentration of chromium greater than the background level. Lead was detected above background in two surface soil samples, and selenium was detected just above the background level in one surface soil sample.

Table 9-1
Summary of BCM Soil Boring Results, Site 47, Group 4 RI, LHAAP, Karnack, Texas

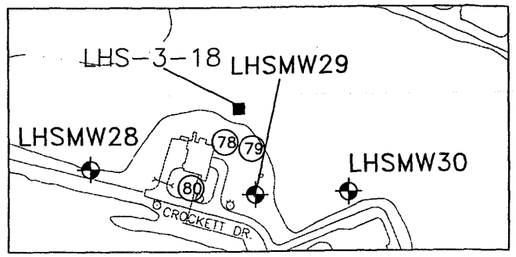
Parameter (Units)	Sump Number												
	S-057	S-061	S-068	S-070	S-081	S-086	S-057	S-061	S-068	S-070	S-081	S-086	Surface Soil Background Value
	0–2 feet						8–10 feet						
pH	5.30	8.30	6.90	8.50	8.00	5.60	6.20	7.40	6.00	7.30	7.10	6.70	-
Total organic carbon (mg/kg)	22,500	4,180	6,530	7,560	6,200	29,000	3,730	9,540	11,800	4,500	17,000	21,300	-
Total solids (%)	86.4	89.9	86.3	84.6	83.0	83.4	83.9	81.6	86.7	82.9	81.7	85.9	-
Silver (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3
Aluminum (mg/kg)	8,960	6,950	3,630	10,000	8,630	14,600	10,100	9,470	13,400	6,320	6,180	6,170	20,700
Arsenic (mg/kg)	1.900	6.860	0.533	ND	1.530	3.470	0.155	1.830	1.780	2.210	1.200	1.150	29.7
Barium (mg/kg)	25.1	51.9	35.2	62.5	64.2	200.0	112.0	190.0	72.7	42.9	64.6	78.3	287
Beryllium (mg/kg)	ND	0.529	ND	0.801	0.624	0.795	0.697	1.830	0.527	0.476	0.786	0.664	ND
Cadmium (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium (mg/kg)	11.20	25.6	10.70	9.95	15.40	18.20	10.40	13.50	13.50	8.19	9.52	9.20	22.8
Mercury (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04
Magnesium (mg/kg)	358	432	143	2,070	581	765	1,180	1,910	1,230	992	789	922	474
Lead (mg/kg)	14.00	24.00	9.98	15.60	20.40	46.40	15.50	14.10	16.50	8.21	8.08	9.53	17.4
Selenium (mg/kg)	0.150	0.267	ND	ND	ND	0.372	ND	ND	ND	ND	ND	ND	0.3
Methylene chloride (µg/kg)	ND	ND	10.4	ND	ND	6.0	ND	24.5	13.8	29.0	ND	ND	-
Trichloroethene (µg/kg)	ND	ND	42.9	ND	ND	25.2	ND	27.0	17.3	79.6	ND	ND	-

Purgeable organics not detected at any location include: acrolein; acrylonitrile; benzene; bromoform; carbon tetrachloride; chlorobenzene; dibromochloromethane; bromochloromethane; chloroethane; 2-chloroethylvinyl ether; chloroform; 1,1-dichloroethane; 1,2-dichloroethane; 1,2-dichloropropane; cis-1,3-dichloropropene; trans-1,3-dichloropropene; ethylbenzene; bromomethane; chloromethane; 1,1,2,2-tetrachloroethane; trans-1,2-dichloroethene; 1,1,2-trichloroethane; vinyl chloride; toluene; and 1,1,1-trichloroethane.

LHAAP = Longhorn Army Ammunition Plant
ND = not detected
% = percent
RI = remedial investigation



Area 1



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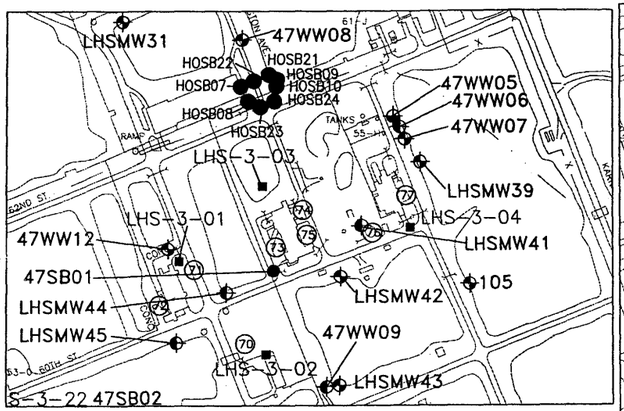

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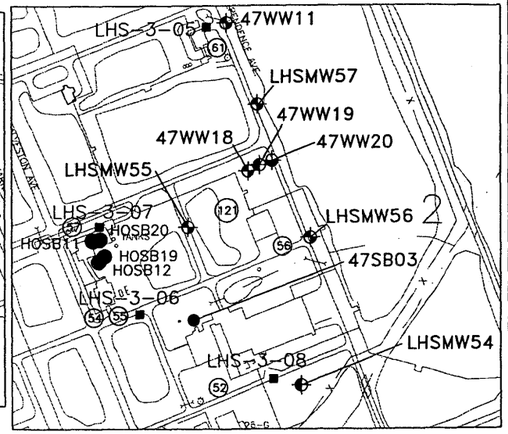

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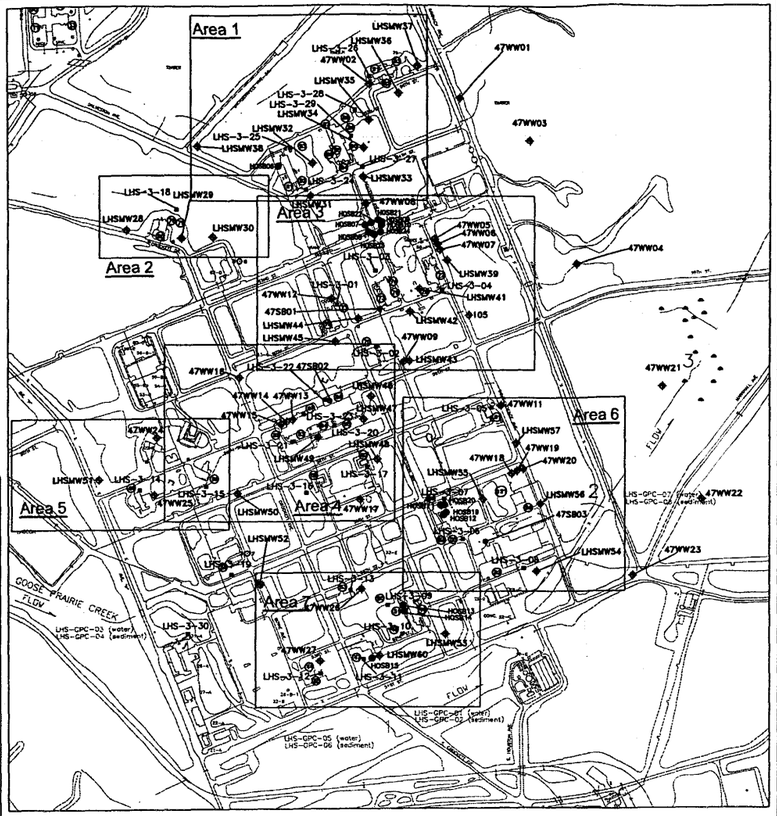
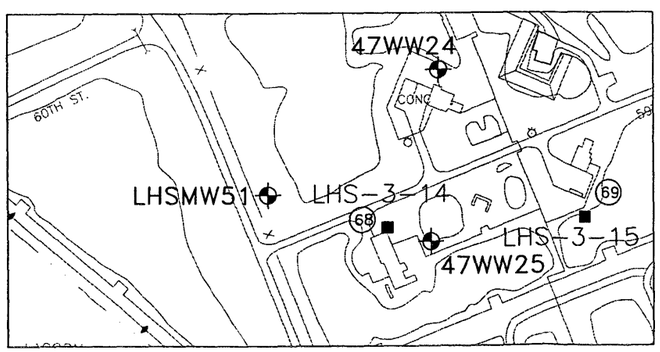
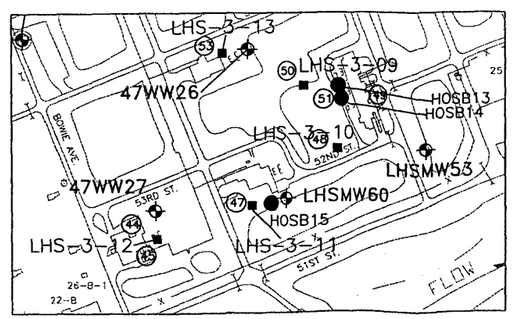


Key Plan



Area 5



Area 7

Area 4

Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Soil Boring Sampling Location
- (53) Sump Location
- Shallow Soil Sampling Location

Not to Scale

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Site 47 Sampling Locations
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Kamack, Texas

31Dec01 - Figure 9-1.DWG | Figure 9-1

9.2 PHYSICAL CHARACTERISTICS OF SITE

The physical characteristics section includes discussions of surface topography and hydrology, soils and geology, and hydrogeology. Information presented in this section is based on data obtained from the site investigations and the reports documenting previous investigations.

9.2.1 Surface Features and Surface Hydrology

Site 47, Plant 3 Area, is located in the north-central portion of LHAAP to the southeast of Site 46 (Plant 2 Area). The area is a combination of asphalt-paved roads and parking areas surrounding the Plant 3 buildings with heavy vegetation and wooded areas to the north and northeast. Goose Prairie Creek runs through the southwestern portion of Site 47 and then curves back through the southeastern portion of the site. The topography of Site 47 generally slopes to the east with surface drainage flowing to the east-southeast into Goose Prairie Creek.

9.2.2 Geology and Soils

Subsurface data collected from the investigations were reviewed to provide a representation of the subsurface conditions at Site 47. The subsurface at this portion of LHAAP appears to be characterized by layers of silty clay underlain by silty sand to clayey sands. These general soil types repeat throughout the subsurface but vary in thickness and continuity in the intermediate to deep subsurface zones, especially in the southern portion of Site 47. The shallow saturated zone is typically clay to silty clay at the surface underlain by a relatively thin (approximately 3-foot-thick) layer of silty to poorly sorted sand that is present across the site. The sand is underlain by a thick, silty clay layer that partially separate the shallow saturated zone from the underlying intermediate saturated zone.

The intermediate subsurface sediments below the silty clay are composed of silty sands, sandy clays, and poorly sorted sands that vary in thickness from 5 feet to 20 feet thick. These sands are thickest in the central and southeastern portions of Site 47. The intermediate zone is underlain by a thick, silty clay layer overlying the sandy clay of the deep saturated zone.

The information obtained from boring logs was used to create a series of geologic cross sections depicting the shallow, intermediate, and deep subsurface saturated zones at Site 47. Figure 9-2 is a map of the locations of the cross sections; the cross sections are plotted as Figures 9-3 through 9-6.

9.2.3 Hydrogeology

The shallow (10–35 feet bgs), intermediate (40–60 feet bgs), and deep (70–95 feet bgs) saturated zones are in the Wilcox Group and are separated by clay layers that vary in thickness but generally extend across the site. The shallow saturated zone includes several sand lenses that are of limited extent. However, in

general, the shallow saturated zone is considered to be continuous near the site. Forty-four monitoring wells have been installed in the shallow saturated zone at Site 47. There are eight monitoring wells screened in the intermediate saturated zone and three in the deep. The deep wells were terminated at the top of the Midway Group.

The potentiometric surface contours of the shallow saturated zone (Figure 1-3) indicate that the groundwater flow direction is toward the east-northeast. Rising head slug tests were performed on selected shallow wells in the Site 47 area. Hydraulic conductivity values (Table 9-2) for the shallow saturated zone were estimated using the Bouwer-Rice method and range from low values such as 5.4×10^{-6} cm/sec (well 47WW12) to 2.8×10^{-3} cm/sec (47WW23). Hydraulic conductivity values calculated for selected intermediate zone wells ranged from 8.1×10^{-6} cm/sec (47WW09) to 3.5×10^{-4} cm/sec (LHSMW44). Hydraulic conductivities calculated for the deep wells installed at Site 47 were 1.7×10^{-3} cm/sec at 47WW20, 2.8×10^{-4} cm/sec in 47WW15, and 4.2×10^{-5} cm/sec in 47WW07. Although surface water flow measurements are not sufficient to conclude whether groundwater is flowing into Goose Prairie Creek near Site 47, this report takes the conservative position that groundwater discharge is likely. This conclusion is supported by the fact that the site is not near the headwaters, a more typical location for surface water flow to the groundwater.

9.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the activities conducted during the investigations at Site 47 including additional data collected after Phase III. Subjects addressed include contaminant source (i.e., sumps), soils, and groundwater investigations. Table 9-3 summarizes the field activities completed during each investigation phase.

9.3.1 Source Investigation

A source of potential contaminants at Site 47 was waste materials collected by the waste process sumps. Liquid contents samples were collected from 14 sumps (S-056, S-060, S-068, S-069, S-071, S-072, S-081, S-082, S-083, S-086, S-091, S-092, S-093, and S-121), and sludge samples were collected from 5 sumps (S-081, S-082, S-083, S-086, and S-121). These samples were analyzed for VOCs, SVOCs, and metals. Table 4-2 describes the sump locations, associated buildings, sump sizes, and status as of 1992, and the sump locations are plotted on Figures 4-1 and 9-1.

9.3.2 Surface and Subsurface Soil Investigation

Phase I (1993) focused on the soils immediately adjacent to the sump locations, and 120 soil borings were installed proximal to the 52 sumps located at Site 47 (Figure 9-1). The Phase I boreholes are within a few feet of the sump locations and therefore, for readability, are not detailed on Figure 9-1. The 241 soil samples were collected and submitted for laboratory analyses for VOCs, SVOCs, and metals. In addition,

Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well

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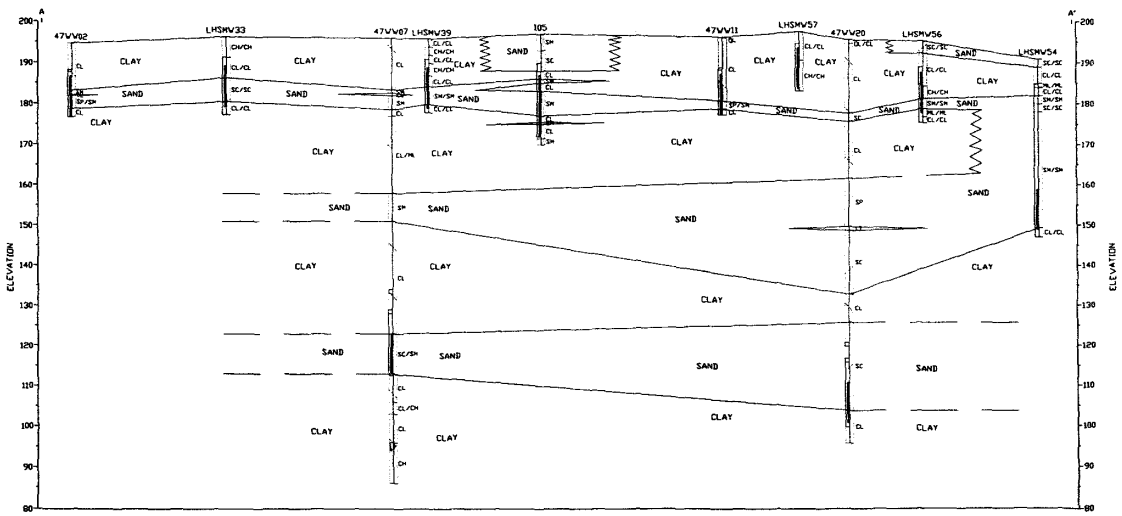
Site 47
Cross Section Location Map
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Kamack, Texas

31Dec01 - Fig_9-2.DWG

Figure 9-2



Cross Section A-A'

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Site 47
Geologic Cross Section A-A'
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas

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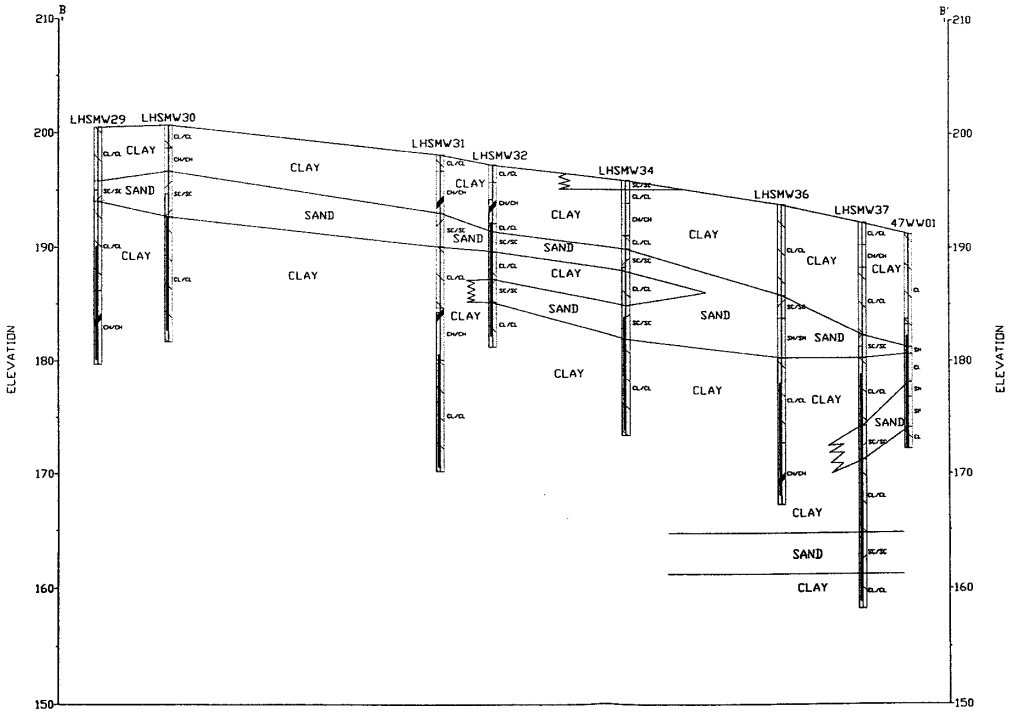
Figure 9-3



Cross Section B-B'

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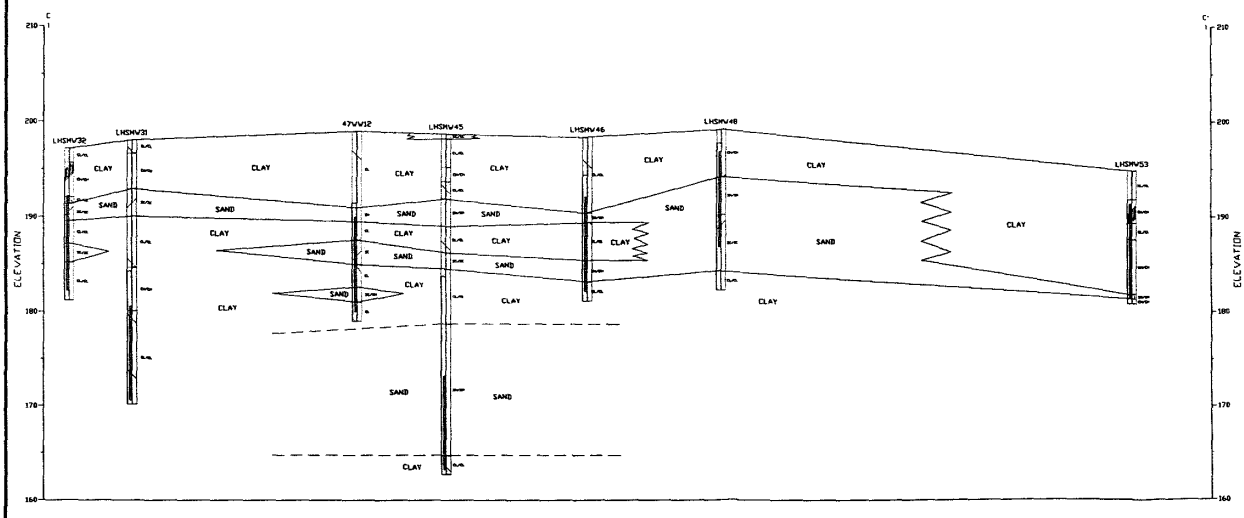
Site 47
Geologic Cross Section B-B'
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas

17Dec01 - Fig_9-4.DWG | Figure 9-4



Cross Section C-C'

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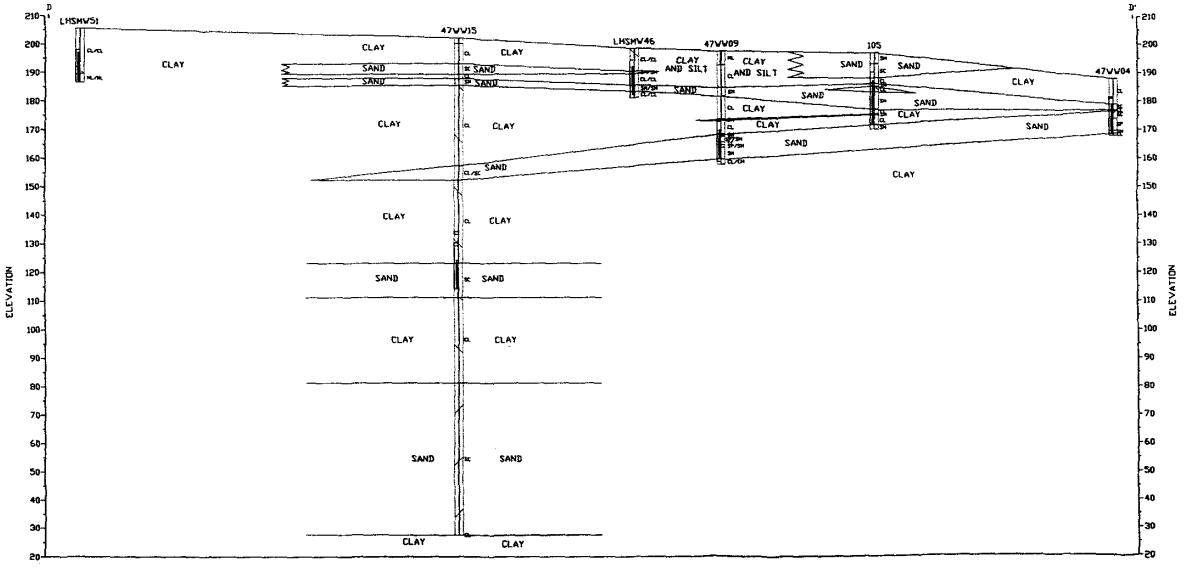
Site 47
Geologic Cross Section C-C'
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas

17Dec01 - Fig_9-5.DWG | Figure 9-5



Cross Section D-D'

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Site 47
Geologic Cross Section D-D'
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas

17Dec01 - Fig_9-6.DWG | Figure 9-6

Table 9-2
Monitoring Well Construction Summary, Site 47, Group 4 RI, LHAAP, Karnack, Texas

Well Identification	Well Depth (feet)	Groundwater Zone	Surface Elevation	Measuring Point Elevation	Casing Diameter (inches)	Screen Interval (feet)	Hydraulic Conductivity (cm/sec)
105	27	Shallow	196.97	199.41	2	10–25	---
47WW01	19	Shallow	191.21	194.4	4	9–19	---
47WW02	18	Shallow	194.7	197.23	4	8–18	2.0×10^{-5}
47WW03	24	Shallow	191.86	195.24	4	14–24	2.0×10^{-4}
47WW04	20	Shallow	187.83	190.9	4	9–19	1.1×10^{-3}
47WW05	19	Shallow	195.79	198.55	4	9–19	3.3×10^{-4}
47WW06	41	Intermediate	195.79	199.02	4	30–40	2.1×10^{-4}
47WW07	83.5	Deep	195.94	199.24	4	73–83	4.2×10^{-5}
47WW08	19	Shallow	196.43	199.45	4	9–19	1.3×10^{-5}
47WW09	39	Intermediate	197.72	201.04	4	28–38	8.1×10^{-6}
47WW11	19	Shallow	196.24	199.14	4	9–19	6.1×10^{-5}
47WW12	20	Shallow	199.02	202.27	4	9–19	5.4×10^{-6}
47WW13	18	Shallow	202.02	204.97	4	8–18	1.6×10^{-6}
47WW14	50	Intermediate	202.22	205	4	39–49	3.2×10^{-4}
47WW15	88	Deep	202.28	205.17	4	78–88	2.8×10^{-4}
47WW16	19	Shallow	200.62	203.73	4	9–19	---
47WW17	19	Shallow	198.44	201.76	4	9–19	2.8×10^{-6}
47WW18	21	Shallow	196.37	199.69	4	11–21	2.6×10^{-4}
47WW19	62	Intermediate	196.01	198.93	4	51.7–61.7	8.4×10^{-4}
47WW20	96	Deep	195.59	198.78	4	85–95	1.7×10^{-3}
47WW21	22	Shallow	184.44	187.59	4	11–21	7.5×10^{-4}
47WW22	20	Shallow	192.48	195.62	4	9.5–19.5	2.2×10^{-4}
47WW23	34	Shallow	194.76	197.86	4	22–32	2.8×10^{-3}
47WW24	22	Shallow	204.39	207.90	4	11–21	--
47WW25	26	Shallow	204.68	208.53	4	15–25	--
47WW26	20	Shallow	200.56	203.99	4	9–19	--
47WW27	20	Shallow	197.36	200.97	4	9–19	--
LHSMW28	17	Shallow	202.66	205.52	4	6.1–16.1	---
LHSMW29	20.8	Shallow	200.51	203.24	4	10.4–20.4	---
LHSMW30	19	Shallow	200.68	203.74	4	8–18	9.6×10^{-5}
LHSMW31	27.9	Shallow	198.09	201.03	4	17.5–27.5	2.1×10^{-3}
LHSMW32	16	Shallow	197.2	200.18	4	5–15	---
LHSMW33	19	Shallow	196.27	199.39	4	7–17	---
LHSMW34	22.5	Shallow	195.85	198.59	4	12–22	2.1×10^{-3}
LHSMW35	21	Shallow	195.4	198.37	4	10.6–20.6	---
LHSMW36	26.5	Shallow	193.74	196.53	4	15.7–25.7	7.0×10^{-4}
LHSMW37	34	Shallow	192.23	195.18	4	13.4–33.4	---

Table 9-2 (continued)

Well Identification	Well Depth (feet)	Groundwater Zone	Surface Elevation	Measuring Point Elevation	Casing Diameter (inches)	Screen Interval (feet)	Hydraulic Conductivity (cm/sec)
LHSMW38	25.4	Shallow	197.84	200.84	4	15–25	---
LHSMW39	18	Shallow	195.78	198.71	4	7–17	3.4×10^{-4}
LHSMW40	14	Shallow	196.9	199.99	4	3.5–13.5	---
LHSMW41	36.5	Intermediate	197.1	199.85	4	26–36	---
LHSMW42	19.8	Shallow	197.18	200.29	4	8.5–18.5	---
LHSMW43	19.5	Shallow	197.38	200.26	4	9–19	---
LHSMW44	38	Intermediate	197.45	200.36	4	15.5–35.5	3.5×10^{-4}
LHSMW45	36	Intermediate	198.74	201.39	4	25.5–35.5	---
LHSMW46	17.3	Shallow	198.46	201.72	4	6.3–16.3	4.1×10^{-5}
LHSMW47	16	Shallow	197.92	200.54	4	5.4–15.4	---
LHSMW48	17	Shallow	199.3	202.06	4	2.4–12.4	---
LHSMW49	16	Shallow	198.95	201.74	4	5.5–15.5	---
LHSMW50	28.5	Shallow	202.33	205.17	4	16.7–26.7	1.9×10^{-3}
LHSMW51	19	Shallow	205.6	208.5	4	8.5–18.5	---
LHSMW52	22	Shallow	202.6	205.91	4	11.7–21.7	---
LHSMW53	14	Shallow	194.84	197.61	4	3.5–13.5	6.5×10^{-5}
LHSMW54	44	Intermediate	191.08	193.71	4	32.2–42.2	---
LHSMW55	17.5	Shallow	196.47	199.76	4	6.8–16.8	---
LHSMW56	20	Shallow	195.36	198.59	4	7.7–17.7	1.1×10^{-4}
LHSMW57	14.5	Shallow	197.56	200.53	4	3.9–13.9	---
LHSMW60	27	Shallow	196.14	199.28	4	15.8–25.8	---
LHSMW61	26.5	Shallow	195.23	198.29	4	14.9–24.9	3.1×10^{-4}

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

soil samples collected at sumps S-061 through S-067 were analyzed for explosives. Soil samples collected at sumps S-054, S-055, and S-061 through S-067 were analyzed for cyanide.

The Phase II soil investigation consisted of sampling surface soils at locations more distant from the individual sumps and at the locations proposed for groundwater monitoring wells (Figure 9-1). Sixty-one samples were collected and analyzed for VOCs, SVOCs, metals, and explosive compounds. In addition, three soil samples from LHSMW47, LHSMW48, and LHSMW49 were analyzed for cyanide.

During the Phase III investigation, two soil samples were collected from a boring at each of the sumps and analyzed for beryllium, nickel, and vanadium. At 27 of the sump locations, soil samples were also analyzed for pesticides/PCBs and dioxins/furans. Three subsurface soil borings (47SB01–47SB03) were completed during the Phase III investigation with each of the nine samples collected analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides/PCBs, and dioxins/furans.

Table 9-3
Investigation Activities, Site 47, Group 4 RI, LHAAP, Karnack, Texas

Phase I
• Collected 19 sump content samples (14 liquid and 5 sludge) from sumps S-056, S-060, S-068, S-069, S-071, S-072, S-081, S-082, S-083, S-086, S-091, S-092, S-093, and S-121 • Completed 120 soil borings at 52 sumps (S-044, S-045, S-047–093, S-121, WRS-17 and WRS-18), and collected a total of 241 soil samples
Phase II
• Collected 61 shallow soil samples (LHS301–LHS329 and LHSMW28–LHSMW57, LHSMW60, and LHSMW61) from 61 sample locations • Installed 32 monitoring wells (LHSMW28–LHSMW57, LHSMW60, and LHSMW61), and collected groundwater samples from each new well
Phase III
• Collected 104 soil samples at 52 sump locations (044, 045, 047–093, 113, WRS-17 and WRS-18) • Collected 9 shallow subsurface soil samples from 3 soil boring locations (47SB01–47SB03) • Installed 22 monitoring wells (47WW01–47WW09 and 47WW11–47WW23) and collected groundwater samples from each new well and 32 existing wells (105, LHSMW28–LHSMW39, LHSMW41–LHSMW57, LHSMW60, and LHSMW61)
Additional Investigations
• Installed and sampled 4 monitoring wells in the shallow zone (47WW24–47WW27). The groundwater samples were analyzed for VOCs, explosive compounds, metals, and perchlorate. • Collected 132 soil samples from 62 locations near Building 25C for perchlorate analysis. • Collected 2 rounds of groundwater samples in 1996 from LHSMW28 through LHSMW61.

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation VOC = volatile organic compound

Perchlorate data were collected in 1998 from 132 samples collected at 62 locations adjacent to Building 25C. These sampling locations are presented with the sampling results discussion.

Soil samples recovered from each monitoring well boring were visually classified using the USCS and recorded on the geologic boring logs compiled in Appendix A. Soil samples were screened in the field with an ionization detector (PID or FID) to detect VOCs in the samples. A downhole geophysical survey (natural gamma ray and single-point resistivity) was performed at monitoring well borehole locations 47WW07, 47WW15, and 47WW20 to provide additional stratigraphic data. Survey data for the soil borings and monitoring wells are also provided in Appendix A.

9.3.3 Groundwater Investigation

Fifty-eight groundwater monitoring wells were installed during the Phase II and Phase III field activities at Site 47. Three deep monitoring wells were installed from 83.5 to 96 feet bgs, 8 intermediate monitoring wells were installed from 36 to 62 feet bgs, and 47 shallow groundwater monitoring wells were installed from 19 to 46 feet bgs. The monitoring well locations are depicted in Figure 9-1. Table 9-2 summarizes the well construction details of monitoring wells installed during the Phase II and Phase III RI. Well construction diagrams for each of the monitoring wells are provided in Appendix A of this report.

Eighty-six groundwater samples were collected during the Phase II and Phase III investigations to evaluate the quality of the shallow, intermediate, and deep groundwater zones.

Thirty-two groundwater samples were collected during the Phase II investigation and were submitted for laboratory analyses for VOCs, SVOCs, explosive compounds, and metals. Because of low groundwater volume, monitoring well LHSMW40 did not have a sample collected for analysis of explosive compounds. Groundwater samples collected from three monitoring wells (LHSMW47, LHSMW48, and LHSMW49) were also analyzed for cyanide, and samples from 24 wells were analyzed for perchlorate. Fifty-four groundwater samples were collected during the Phase III investigation from the monitoring wells and were submitted for laboratory analyses of VOCs, SVOCs, explosive compounds, and metals. During Phase III, a single sample was collected from each monitoring well with the exceptions of 47WW01, 47WW18, and 47WW23, which were sampled in September and November 1998. Three of the groundwater samples (at locations 47WW01, 47WW06, and 47WW20) were submitted for analyses for pesticides/PCBs and dioxins/furans. Thirty groundwater samples were collected for perchlorate analysis.

A second round of Phase III sampling was limited to four newly installed wells (47WW24–47WW27), and the samples were analyzed for VOCs, explosive compounds, metals, and perchlorate.

9.4 NATURE AND EXTENT OF CONTAMINATION

To delineate the nature and extent of contamination at Site 47, samples of the fluids and sludge were collected from the sumps, soil samples were collected from the surface and subsurface around the sumps, and groundwater and soil samples were collected across the site. The following sections summarize the detected compounds and their concentrations for the sump contents, soil, and groundwater samples. Table 9-4 summarizes the media tested and analyses performed during each investigation. Appendix C lists the specific chemical constituents detected.

9.4.1 Contaminant Source Results

The following sections discuss the contaminants and concentrations measured in the fluid and sludge samples from the sumps. These data are used for comparison with the contaminants found in the surrounding soils and underlying groundwater. The sumps were removed in the mid-1990s along with their sludges and fluids and no longer represent an active source.

9.4.1.1 Sump fluids

During the Phase I investigation, 14 liquid sump content samples were collected from Site 47 sumps and analyzed for VOCs, SVOCs, and metals. Of the seven VOCs with measured concentrations in excess of the groundwater PCL values in the liquid sump samples (Table 9-5), three were found in only one sample—carbon tetrachloride, chloroform, and vinyl chloride—and these were all found in different

Table 9-4
Analytical Test Summary, Site 47, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests								
	VOCs	SVOCs	Pesticides/ PCBs	Explosive Compounds	Dioxins/ Furans	Metals	TPH	Cyanide	Perchlorate
Phase I									
Sump Sludge	5	5				5			
Sump Fluids	14	14				14			
Soils	241	241		32		241	4	42	
Phase II									
Soils	61	61		61		61		3	
Groundwater	32	32		32		32			24
Phase III									
Surface Soils			52		52	113*			30
Subsurface Soils	9	9	9	9	9	9			26
Groundwater	54	54	3	54	3	54			32
Additional Investigation									
Groundwater	70	66		70		70			4
Soil									132

*Beryllium, nickel, and vanadium analyses only

LHAAP = Longhorn Army Ammunition Plant
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
TPH = total petroleum hydrocarbon
VOC = volatile organic compound

sumps. One VOC (1,1,1-TCA) was found in two different sumps that are widely separated (sumps S-082 and S-093). The most commonly detected VOCs were the chlorinated ethenes: PCE (seven sumps), TCE (four sumps), and 1,1-DCE (five sumps). All three VOCs were found in sump S-083, and two of the three were detected in sumps S-081, S-082, S-093, S-116, and S-121. The TCE level (4159 µg/L) in LH/LQS121 was considerably higher than the rest. Only one SVOC, [bis(2-ethylhexyl) phthalate], was detected at a concentration that exceeds the PCL value in two sumps.

Six metals (antimony, arsenic, barium, cadmium, chromium, and lead) were detected in the liquid sump samples at concentrations that exceed their respective PCL values (Table 9-5). None of the measured lead concentrations are greater than the LHAAP groundwater background level of 0.3 mg/L and the cadmium level is less than the background level of 0.055 mg/L. Both arsenic and chromium exceeded their PCLs in 4 of the 14 sumps, and antimony and barium in 5 sumps. Sump S-081 contained the most metal exceedances of PCLs above background with three metals: antimony, barium, and chromium.

The organic compounds and metals measured in the sump fluids become the primary evidence for demonstrating that the sumps have leaked into the surrounding soils.

Table 9-5
Sump Fluid Samples That Exceed PCL Values, Site 47, Group 4 RI, LHAAP, Karnack, Texas

Analyte	PCL	Location	Meas. Conc.	Location	Meas. Conc.
VOC (µg/L)					
Carbon tetrachloride	5	LH/LQS081	1455		
Chloroform	100	LH/LQS083	206.3		
1,1-Dichloroethene	7	LH/LQS081 LH/LQS082 LH/LQS083	26.5 14 18.9	LH/LQS093 LH/LQS121	19.4 16.5
Tetrachloroethene	5	LH/LQS060 LH/LQS071 LH/LQS081 LH/LQS082	13 5.2 7.5 67	LH/LQS083 LH/LQS093 LH/LQS116	14.9 150 15.8
1,1,1-Trichloroethane	200	LH/LQS082	250	LH/LQS093	324
Trichloroethene	5	LH/LQS060 LH/LQS083	31 42.8	LH/LQS116 LH/LQS121	12 4159
Vinyl chloride	2	LH/LQS121	80		
SVOC (µg/L)					
bis(2-Ethylhexyl) phthalate	6	LH/LQS060	20.2	LH/LQS072	13
Metals (mg/L)					
Antimony	0.006	LH/LQS068 LH/LQS081 LH/LQS083	0.022 0.0553 0.0209	LH/LQS091 LH/LQS092	0.0273 0.16
Arsenic	0.05	LH/ LQS056 LH/ LQS071	0.2 0.0664	LH/LQS086 LH/LQS093	0.398 0.21
Barium	2	LH/LQS060 LH/LQS081 LH/LQS091	3.5 22.7 2.63	LH/LQS092 LH/LQS093	4.98 9.83
Cadmium	0.005	LH/LQS093	0.024		
Chromium	0.1	LH/LQS060 LH/LQS081	0.21 1.37	LH/LQS086 LH/LQS093	0.154 0.21
Lead	0.015	LH/LQS081 LH/LQS086	0.1 0.0605	LH/LQS093	0.158

LHAAP = Longhorn Army Ammunition Plant
Meas. Conc. = measured concentration
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

9.4.1.2 Sump sludges

Five sludge samples were collected from sumps at Site 47. Six VOCs and six metals were detected at concentrations that exceed their respective soil PCL values (Table 9-6). Four of the VOCs (toluene; 1,1-DCA; ethylbenzene; and TCE) were only found in one sump. Sump S-083 contained five of the six VOCs (toluene; 1,1-DCA; ethylbenzene; PCE; and 1,1,1-TCA). PCE and 1,1,1-TCA were both found in the same three sumps (S-081, S-082, and S-083). Some of the volatile levels were very high (310,000 mg/kg for TCE).

Table 9-6
Sump Sludge Samples That Exceed PCL Values, Site 47, Group 4 RI, LHAAP, Karnack, Texas

Analyte	PCL	Location	Meas. Conc.	Location	Meas. Conc.
VOCs (µg/kg)					
Toluene	4,100	LH/SSS083	22,000		
1,1-Dichloroethane	1,400	LH/SSS083	38,000		
Ethylbenzene	3,800	LH/SSS083	16,000		
Tetrachloroethene	25	LH/SSS081 LH/SSS082	92,000 48,000	LH/SSS083	14,000
1,1,1-Trichloroethane	810	LH/SSS081 LH/SSS082	260,000 194,000	LH/SSS083	60,000
Trichloroethene	17	LH/SSS121	310,000,000		
Metals (mg/kg)					
Antimony	2.7	LH/SSS081 LH/SSS082	20.1 32.3	LH/SSS083 LH/SSS121	25.7 19
Arsenic	13	LH/SSS121	25.2		
Barium	220	LH/SSS081 LH/SSS082	35,300 48,500	LH/SSS083	28,000
Cadmium	0.75	LH/SSS081 LH/SSS082 LH/SSS083	5.62 8.45 6.42	LH/SSS086 LH/SSS121	3.35 6.79
Chromium	1,200	LH/SSS082	2,810		
Lead	1.5	LH/SSS081 LH/SSS082 LH/SSS083	266 322 370	LH/SSS086 LH/SSS121	13.4 1,820
Silver	0.71	LH/SSS082	1.28		

LHAAP = Longhorn Army Ammunition Plant
Meas. Conc. = measured concentration
PCL = protective concentration level
RI = remedial investigation
VOC = volatile organic compound

Chromium and arsenic were only detected in one sump sludge each (S-082 and S-121, respectively). Sumps S-081, S-082, and S-083 contained the widest variety of metals: antimony, barium, cadmium, and lead. Sump S-082 also contained silver. Sump S-086 contained cadmium and lead in excess of the PCLs, and S-121 contained antimony, arsenic, cadmium, and lead. However, all arsenic values were below the soil background level of 29.7 mg/kg, and the silver value was below the background level of 2.3 mg/kg. The presence of the same compounds and metals in both the fluids and sludges in the sumps indicates that these contaminants are good tracers for evaluating leakage from the sumps.

9.4.2 Soil Results

The following sections discuss the analytical data collected from 302 soil samples collected across Site 47 during the field activities. Soil samples were collected proximal to the sumps as well as further away. In addition, soil samples were collected from each of the boreholes that later became groundwater monitoring wells. Table 9-7 summarizes soil sampling results from all phases of work for every contaminant detected.

Table 9-7
Summary of Detected Constituents in Soil Samples, Site 47, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	276/307	1,960	40,800	LHS8802 (1)	260,000	20,700
Antimony	10/307	3	7.59 J	47SB03 (1)	2.7	ND
Arsenic	277/307	0.658	31.8 J	LHS317 (1)	13	29.7
Barium	246/307	6.7	4,170	LHS324 (1)	220	287
Beryllium	52/124	0.434	7.41 J	SUMP121 (1)	0.92	NA
Cadmium	32/307	1.5	8.88	LHS7701 (1)	0.75	ND
Calcium	306/307	100	60,000	LHS7501 (1)		1,090
Chromium, total	279/307	2.4	144 J	LHS324 (1)	1,200	22.8
Cobalt	291/307	1	54.4	LHS6101 (1)	2,000	19.1
Copper	268/307	1	194	LHS7901 (1)	520	6.7
Iron	276/307	3,490	89,100	LHS5901 (1)		31,000
Lead	303/307	1.8	182	47SB03 (1)	1.5	17.4
Magnesium	302/307	127	3,570	LHS5101 (1)		474
Manganese	306/307	8.7	2,620	LHSMW31 (1)	5,100	2,330
Mercury	16/306	0.069	5.78	LHS7301 (1)	1	ND
Nickel	90/124	4.4	73 J	SUMP121 (1)	230	6.3
Potassium	300/307	90.7	2,500	47SB03 (1)		481
Selenium	67/307	0.17	2.13	47SB01 (1)	1.1	ND
Silver	26/307	0.021	26.9	LHS302 (1)	0.71	2.3
Strontium	240/306	1.9	889	LHS324 (1)		13.3
Vanadium	116/124	6.7	120	SUMP068 (1)	5,100	NA
Zinc	306/307	5.4	2,330	LHS306 (1)	3,500	16.2
Anions (µg/kg)						
Cyanide	2/44	500	1,300	LHSMW47 (1)	20,000	NA
Perchlorate	72/188	19.6	190,000	25C-06	270	NA
VOCs (µg/kg)						
1,1,1-Trichloroethane	8/304	12	294	LHS4801 (1)	810	
1,1-Dichloroethane	2/304	9	27	LHS7602 (1)	14,000	
1,1-Dichloroethene	2/304	7.1	10	LHS7602 (1)	25	
Acetone	7/304	4.9	460	LHSMW48 (1)	7,100	
Benzene	2/304	8 J	11	LHS328 (1)	13	
Carbon disulfide	5/304	3	474	LHS7401 (1)	20,000	
Chloroform	1/304	6.2	6.2	LHS07201 (1)	210	
Methyl ethyl ketone (2-butanone)	2/304	30	67	LHS7401 (1)	44,000	
Methylene chloride	1/304	11.1	11.1	LHS06402 (1)	6.5	
Tetrachloroethene	3/304	3 J	58	LHS7602 (1)	25	
Total 1,2-dichloroethene	2/295	63	100	LHS321 (1)		
Trichloroethene	10/304	2	256	LHS06301 (1)	17	
SVOCs (µg/kg)						
2-Methylnaphthalene	1/309	230 J	230 J	LHSMW52 (1)	130,000	
Acenaphthene	2/309	360 J	380 J	LHS315 (1)	350,000	
Anthracene	1/309	850	850	LHS315 (1)	10,000,000	
Benzo(a)anthracene	5/309	140 J	2,300	LHS315 (1)	20,000	
Benzo(a)pyrene	6/309	57 J	2,100	LHS315 (1)	3,800	
Benzo(b)fluoranthene	16/309	47 J	2,900	LHS315 (1)	67,000	
Benzo(k)fluoranthene	9/309	69 J	1,400	LHS315 (1)	690,000	

Table 9-7 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Benzyl butyl phthalate	5/309	352	786	LHS5902 (1)	4,000,000	
Chrysene	10/309	49 J	2,700	LHS315 (1)	1,700,000	
Di-n-butyl phthalate	77/309	190 J	7,951	LHS7602 (1)	5,000,000	
Dibenzofuran	2/309	180 J	590	LHSMW52 (1)		
Diethyl phthalate	17/309	90 J	218 J	LHS7601 (1)	230,000	
Dimethyl phthalate	2/309	130 J	280 J	LHS304 (1)	93,000	-
Fluoranthene	15/309	65 J	4,900	LHS315 (1)	2,900,000	
Fluorene	2/309	130 J	400 J	LHS315 (1)	450,000	
Naphthalene	2/309	470	3,699	LHS7601 (1)	47,000	
Phenanthrene	10/309	79 J	4,600	LHSMW52 (1)	620,000	
Phenol	1/309	120 J	120 J	LHSMW29 (1)		
Pyrene	14/309	80 J	6,800	LHS315 (1)	1,700,000	
bis(2-Ethylhexyl) phthalate	61/309	36 J	1,120	LHS06301 (1)	82,000	
Pesticides (µg/kg)						
Dieldrin	1/67	18	18	SUMP065 (1)	55	
Heptachlor	1/67	24	24	SUMP056 (1)	94	
p,p'-DDD	2/67	17	24	SUMP075 (1)	15,000	
p,p'-DDE	15/67	2.4	490 J	SUMP056 (1)	13,000	
p,p'-DDT	15/67	2.8	950 J	SUMP056 (1)	17,000	
PCBs (µg/kg)						
PCB-1254 (Aroclor-1254)	5/63	72	530	SUMP067 (1)	5,300	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	64/64	9.809	5,586.265	SUMP067 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	56/64	0.508	856.545	SUMP076 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	57/64	0.393	226.336	SUMP059 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	34/64	0.382	159.96	SUMP076 (1)		
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3/64	0.522	2.709	WRSUMP017 (1)		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	15/64	0.201	6.7	SUMP059 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	9/64	0.528	5.25	WRSUMP017 (1)		
Pentachlorinated dibenzo-p-dioxins (total)	2/64	0.483	6.381	SUMP076 (1)		
Tetrachlorinated dibenzo-p-dioxins (total)	2/64	0.777	1.514	WRSUMP017 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	43/64	0.308	381.018	SUMP059 (1)		
Heptachlorinated dibenzofurans (total)	32/64	0.282	45.289	SUMP059 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	44/64	0.195	45.289	SUMP059 (1)		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1/64	0.391	0.391	SUMP053 (1)		
Hexachlorinated dibenzofurans (total)	29/64	0.255	40.149	SUMP059 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	25/64	0.152	19.279	SUMP059 (1)		
1,2,3,6,7,8-Hexachlorodibenzofuran	3/64	0.776	3.044	SUMP056 (1)		
Pentachlorinated dibenzofurans (total)	19/64	0.208	94.949	SUMP067 (1)		
1,2,3,7,8-Pentachlorodibenzofuran	12/64	0.461	8.979	SUMP067 (1)		
2,3,4,7,8-Pentachlorodibenzofuran	1/64	1.339	1.339	SUMP090 (1)		
Tetrachlorinated dibenzofurans (total)	39/64	0.211	92.976	SUMP067 (1)		
2,3,7,8-Tetrachlorodibenzofuran	50/91	0.284	12.47	SUMP067 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not available
ND = not detected
PCB = polychlorinated biphenyl
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

9.4.2.1 Organic compounds

During the Phase I investigation, 241 samples were collected from two depths at 48 sumps and 2 waste rack sumps (see Figure 9-1 for sump locations). These samples were analyzed for VOCs and SVOCs, and some of the samples were analyzed for explosive compounds (32 samples) and cyanide (42 samples). Results from these samples are most likely to represent conditions resulting from releases from the sumps. Three VOCs (methylene chloride, PCE, and TCE) were detected in the soil samples collected at Site 47 at concentrations that exceed the 30-acre PCL values (Table 9-8). Methylene chloride had concentrations greater than its PCL at sump S-064, boring 2. PCE had a measured concentration greater than its PCL in one sample near sump S-076, which also had two samples with elevated TCE. The other samples with elevated TCE were three from sump S-063. As shown by the sampling results, measured VOC concentrations in excess of the soil PCLs are isolated and limited to a very few sumps. The elevated VOC levels in the sump sludges do not appear to have affected surrounding soils, as the sumps with the highest levels (S-121, S-081, S-082, and S-083) do not have elevated soil VOC levels.

During the Phase II sampling campaign an additional 61 soil samples were collected and analyzed for VOCs. Only one sample (location LHS303) contained a VOC concentration greater than its PCL, and the VOC was TCE at 75 µg/kg. This surface soil sample came from the northeastern corner of Site 47, but it is not related to sumps S-063 and sump S-076, the sumps with soil detections of TCE. There were no detections of VOCs in the soil boring samples collected during Phase III.

There were only a few SVOCs detected in the soil samples collected during the Phase I sampling campaign, and none of them exceeded their PCLs. The vast majority of the detections were members of the phthalate family; the most common are di-n-butylphthalate and bis(2-ethylhexyl) phthalate. bis(2-Ethylhexyl) phthalate is used as a plasticiser and is a common field and laboratory contaminant. Di-n-butylphthalate is a component in nitrocellulose-based artillery propellants and thus may have originated from processes at LHAAP. The SVOC analyses of the Phases II and III soil samples showed the phthalates being joined by the majority of the PAHs. None of the measured PAH soil concentrations exceeded their PCLs.

Table 9-8
Phase I Soil Samples with VOC Concentrations Exceeding PCL Values, Site 47, Group 4 RI, LHAAP, Karnack, Texas

VOC (µg/kg)	PCL	Location (Depth in feet)	Values	Location (Depth in feet)	Values
Methylene chloride	6.5	LHS6402 (1–1.5)	11.1		
Tetrachloroethene	25	LHS7602 (5.5–6)	58		
Trichloroethene	17	LHS6301 (1.0–1.5)	83.5	LHS7602 (5.5–6)	240
		LHS6301 (2–2.5)	256	LHS7602 (7–7.5)	182
		LHS6301 (2.5–3)	235		

LHAAP = Longhorn Army Ammunition Plant
PCL = protective concentration level
RI = remedial investigation
VOC = volatile organic compound

During Phase III, 52 soil samples were analyzed for pesticides/PCBs and dioxins/furans. Among the pesticides/PCBs, there was a single detection each of dieldrin (sump S-065, 3 feet bgs), heptachlor (surface sample at sump S-056), and 4,4'-DDD (surface sample at sump S-075). There were 5 detections of Aroclor-1254, and 15 each of 4,4'-DDE and 4,4'-DDT. The maximum number of compounds in this class was four at one sump (S-065). Four sumps had three compounds (S-049, S-056, S-065, and S-075), and five had two compounds each (S-059, S-069, S-071, S-077, and S-078). All pesticide and PCB detections were below the PCLs.

At Site 47, as at others, octachlorodibenzo-p-dioxin was the most commonly encountered and the most highly concentrated dioxin in the soils. It had at least estimated concentrations in virtually every soil sample analyzed. Dioxins/furans are usually combustion products and are not unexpected at LHAAP, especially since there were two burning grounds. They are widespread across the site, but their distributions do not indicate an identifiable source. It is quite possible that the dioxins and furans have been deposited from the atmosphere from off-LHAAP sources. However, the measured concentrations in soil are sufficiently high that the source would have to be in the area. The concentration of octachlorodibenzo-p-dioxin ranges from a few tens of ng/kg to a maximum of 5586 ng/kg (sump S-067).

9.4.2.2 Metals and anions

There are no Phase I soil samples in which arsenic exceeded the LHAAP background concentrations of 30 mg/kg at the surface and 36.8 mg/kg at the subsurface. One Phase II sample (LHS317) contained an estimated 31.8 mg/kg of arsenic, which exceeded the soil PCL. Lead concentrations exceeded background in 39 of the soil samples collected at Site 47. Most of these samples are isolated; however, there are a few sumps where multiple soil samples around the sump are contaminated with lead. These sumps are S-069 (5 of 8 samples), S-075 (3 of 7 samples), S-076 (6 of 11 samples), S-077(6 of 9 samples), S-085 (3 of 5 samples), and WRS017 and WRS018 (both 2 of 4 samples). The highest reported lead concentration was 182 mg/kg from soil from 47SB03, not located near any sump. Cadmium has no established background and has a relatively low PCL (0.75 µg/kg). Cadmium exceeds this PCL at many of the same sumps as lead. However, there is much less variety in the cadmium results, suggesting a less obvious source of contamination.

Magnesium, strontium, and zinc have widespread soil concentrations in excess of the LHAAP background values, but either do not have a PCL (magnesium) or have sufficiently high PCLs (strontium and zinc) that they are not exceeded. There are isolated measurements of antimony (10 samples), barium (23 samples), mercury (1 sample), and silver (5 samples) that exceed their respective PCLs. During Phase III, 113 samples were analyzed for beryllium, nickel, and vanadium. There were no measured concentrations of beryllium, nickel, or vanadium in the soil that exceeded the background and their PCLs (0.92, 230, and 5,100 mg/kg, respectively).

A large sampling effort occurred around Building 25-C to determine the extent of perchlorate contamination in the soil. Table 9-9 presents all detected perchlorate concentrations from that sampling event. The extent of perchlorate concentration is presented in Figure 9-7.

9.4.3 Groundwater Results

The following sections discuss the nature and extent of groundwater contamination near Site 47. Groundwater samples were collected during the Phase II and Phase III investigations at Site 47. Samples were collected from 32 wells during Phase II and from those plus an additional 27 wells during Phase III. Table 9-4 summarizes the analyses performed on groundwater samples collected from the 48 shallow, 8 intermediate, and 3 deep groundwater monitoring wells installed during the field activities. Table 9-10 summarizes the constituents detected in groundwater at Site 47.

9.4.3.1 Organic compounds

Twenty-eight VOCs were detected in at least one groundwater sample collected at Site 47 (Table 9-10). Eight of those were detected at concentrations that exceed their respective PCLs. Ten SVOCs were detected in the groundwater samples with two compounds [bis(2-ethylhexyl) phthalate and pentachlorophenol] having measured concentrations that exceed their PCLs. No concentrations of pesticide/PCB compounds were detected in the groundwater samples submitted. Thirteen explosive compounds were detected at concentrations below the PCL values. These were isolated occurrences; any given explosive compound seldom occurred in more than two wells.

TCE was by far the most widespread contaminant with measurable concentrations in both the shallow and intermediate saturated zones. The most elevated concentrations of TCE were located along 59th Street near Buildings 45-E and 50-G. At these locations, the TCE contamination extends down into the intermediate zone and is accompanied by elevated concentrations of PCE, cis-1,2-DCE, and vinyl chloride. Most of the rest of the VOCs were present in the groundwater as isolated occurrences. Industrial grade TCE contains some PCE and several isomers of DCE as co-contaminants left during the synthesis process. This probably explains the presence of the 1,1-DCE, 1,2-DCE, and PCE. A plot of the TCE concentrations in groundwater does not indicate a defined source, and the areas of elevated concentrations are isolated and scattered (Figure 9-8). Only one VOC, chloroform, was detected in the deep zone at only one location (47WW20). Two dioxin/furan compounds, octachlorodibenzo-p-dioxin and total tetrachlorodibenzofuran, were detected in one of the three groundwater samples.

9.4.3.2 Metals

Nineteen metals were detected in at least one groundwater sample at concentrations that exceed LHAAP background values. These are aluminum, antimony, arsenic, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, magnesium, nickel, potassium, silver, strontium, thallium, tin, vanadium, and zinc. Of

Table 9-9
Soil Perchlorate Detected Results, Building 25-C, Group 4 RI, LHAAP, Karnack, Texas

Sample Location	Results (µg/kg)	Depth (ft)
25C-01	30,000	0–0.5
25C-01	29,000	4–5
25C-01	12,000	9–10
25C-02	95,000	0–0.5
25C-02	400	4–5
25C-02	6,800	9–10
25C-03	2,100	0–0.5
25C-03	26	4–5
25C-03	15,000	9–10
25C-04	1,600	0–0.5
25C-04	42,000	4–5
25C-04	4,100	9–10
25C-05	3,400	0–0.5
25C-05	57,000	4–5
25C-05	18,000	9–10
25C-06	7,000	0–0.5
25C-06	190,000	4–5
25C-06	140,000	9–10
25C-07	150,000	0–0.5
25C-07	4,400	4–5
25C-07	2,700	9–10
25C-08	1,700	0–0.5
25C-08	26,000	4–5
25C-08	17,000	9–10
25C-09	93,000	0–0.5
25C-09	96,000	4–5
25C-09	11,000	9–10
25C-21	2,390	0–0.5
25C-21	180,000	1.5–2
25C-24	21.1	1.5–2
25C-27	100	1.5–2
25C-28	4,860	0–0.5
25C-28	3,290	1.5–2
25C-30	76,600	1.5–2
25C-32	52.3	0–0.5
25C-32	42,100	1.5–2
25C-35	72.8	0–0.5
25C-35	259	1.5–2
25C-38	22.4	0–0.5
25C-39	54.4	0–0.5
25C-39	20.3	1.5–2
25C-45	10,000	1.15–1.67
25C-46	2,490	0.75–1.25
25C-47	2,500	0.8–1.8
25C-54	1,470	0.25–0.75
25C-54	962	1.2–1.79
25C-55	1,480	0–0.5
25C-55	6,500	1–1.8
25C-56	1,800	0–0.5

Table 9-9 (continued)

Sample Location	Results (µg/kg)	Depth (ft)
25C-56	39,000	1.1–1.67
25C-57	47	0.25–0.75
25C-57	100	1.1–1.63
25C-58	210	1–1.53
25C-59	100	0–0.5
25C-59	380	0.8–1.73
25C-60	59	1.1–1.57
25C-61	130	1.1–1.74

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

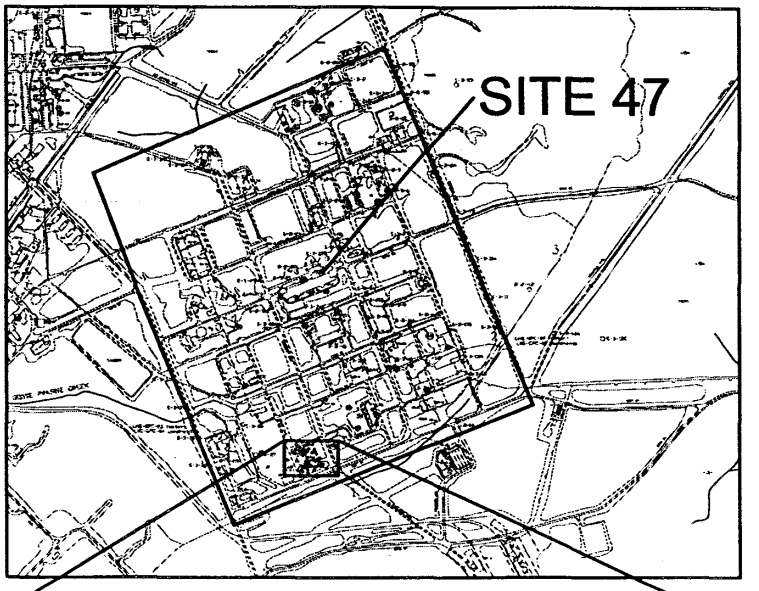
these, only seven (aluminum, antimony, arsenic, cadmium, chromium, nickel, and thallium) were measured in concentrations greater than background that also exceeded their respective PCLs. Arsenic and cadmium exceeded background and PCLs at only one well each (47WW06 and LHSMW57, respectively). Nickel exceeds background and PCL in six wells. Antimony is elevated in 13 wells distributed across the site. Antimony is found in five wells in common with chromium, but chromium is so common that is it found with most of the other metal contaminants.

Chromium has a background of 0.11 mg/L and a PCL of 0.1 mg/L. Chromium is the most widespread groundwater contaminant and is detected in all three groundwater zones. A plot of the chromium concentrations (Figure 9-9) in shallow groundwater indicates that the areas of chromium concentrations greater than background are not localized in any one area but are spread across the central and eastern portions of Site 47. At locations of well clusters with wells in each saturated zone, the elevated concentrations extend to the deep zone (e.g., 47WW05-07 and 47WW18-20).

Two of the four shallow wells installed at the end of Phase III produced samples that exceeded the PCL for perchlorate (66 µg/L) with concentrations of 871 µg/L at 47WW26 and 2620 µg/L at 47WW27. Earlier perchlorate results show a maximum value of 82,900 µg/L in LHSMW60, which is near buildings that used perchlorate. The soils in this area are quite contaminated with perchlorate.

9.5 CONTAMINANT FATE AND TRANSPORT

At Site 47, the VOCs methylene chloride, TCE, and PCE are present in the soils in concentrations that exceed PCLs. It appears that the sumps could have been sources of this contamination. The soil concentrations of these compounds are relatively low. These compounds will be removed by evaporation into the atmosphere or migration via infiltrating precipitation to the water table. Both PCE and TCE currently show up in groundwater samples. Even though some concentrations are quite high, indicating a source associated near Site 47, there is no well-defined plume, and the wells nearest Goose Prairie Creek have none to low levels of contamination. Section 13.0 illustrates that Goose Prairie Creek does have VOCs present in the surface water, but the levels are below ARARs and are usually even below drinking water levels. The groundwater is not impacting surface water.



N

0 100

Scale in Feet

Legend

- ○ Sample Point - Not Detected
- ⊗ Sample Point - Detected-1000 ug/kg
- ◐ Sample Point - 1000-10,000 ug/kg
- ● Sample Point - >10,000 ug/kg
- ✱ Deeper Sample Much More Concentrated

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Building 25-C
Perchlorate Surface Soil Sampling Results
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas

31Dec01 - Figure 9-7.DWG

Figure 9-7

Table 9-10
Summary of Detected Constituents in Groundwater Samples, Site 47, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Metals (µg/L)						
Aluminum	121/139	145 J	86,000	LHSMW48 (1)	73,000	13,400
Antimony	14/139	5	76 J	LHSMW60 (1)	6	ND
Arsenic	36/139	1.7 J	137 J	47WW06 (1)	50	22
Barium	84/139	30 J	930	LHSMW49 (1)	2,000	1,990
Beryllium	19/108	0.3	3.9	LHSMW48 (1)	4	NA
Cadmium	22/139	0.3	200.1	LHSMW57 (1)	5	55
Calcium	131/139	1,190 J	460,000	47WW17 (1)		308,000
Chromium, total	112/139	10 J	43,000 J	LHSMW51 (1)	100	110
Cobalt	42/139	8.8	311	LHSMW53 (1)	4,400	53
Copper	67/139	2.5	306	LHSMW51 (1)	1,300	43
Iron	139/139	113	128,000	LHSMW51 (1)		68,000
Lead	72/139	1.2	248 J	LHSMW29 (1)	15	300
Magnesium	125/139	902 J	310,000	47WW22 (1)		277,000
Manganese	138/139	22	7,750	47WW16 (1)	10,000	11,800
Mercury	19/136	0.02 J	0.51	LHSMW48 (1)	2	1
Nickel	91/108	18	8,000 J	LHSMW51 (1)	1,500	60
Potassium	89/139	525	45,000 J	47WW06 (1)		4,300
Selenium	19/139	1 J	17.5	47WW24 (1)	50	140
Silver	14/139	7 J	1,000	LHSMW51 (1)		30
Sodium	64/64	8,100	1,200,000	47WW16 (2)		1,470,000
Strontium	131/139	18.8 J	19,000	47WW17 (1)	22,000	6,150
Thallium	14/139	1.1	93	LHSMW47 (1)	2	ND
Tin	5/60	100	120,000	47WW02 (1)		NA
Vanadium	11/108	7.7	130	LHSMW48 (1)	510	NA
Zinc	106/126	11	330	LHSMW48 (1)	22,000	230
Anions (mg/L)						
Chloride (as Cl)	42/43	5	1,773 J	LHSMW53 (1)		1,416
Nitrogen, nitrate (as N)	5/43	0.6	1	LHSMW28 (3)		NA
Nitrogen, nitrite	2/43	1.9	2	LHSMW53 (1)		NA
Perchlorate	15/15	0.00097 J	82.9	LHSMW60 (1)	66	NA
Sulfate (as SO_4)	42/43	5.1	2,029	105 (1)		3,475
Petroleum hydrocarbons (mg/L)						
TPH as gasoline	3/6	0.54	14.7	LHSMW43 (1)		
VOCs (µg/L)						
1,1,1-Trichloroethane	6/177	1.45	10.8	LHSMW56 (1)	200	
1,1,2-Trichloroethane	2/177	2.6	4.9	LHSMW43 (1)	5	
1,1-Dichloroethane	20/173	0.51	74	LHSMW56 (1)	7,300	
1,1-Dichloroethene	28/177	0.41	40	LHSMW39 (1)	7	
1,2,3-Trichlorobenzene	1/142	0.56	0.56	LHSMW61 (1)		
1,2,4-Trichlorobenzene	3/142	0.49	0.63	LHSMW28 (1)	70	
1,2,4-Trimethylbenzene	2/142	0.25	4.4	47WW11 (1)	3,700	
1,2-Dichloroethane	3/177	0.33	5.7	LHSMW48 (1)	5	
1,2-Dichloropropane	1/173	0.46	0.46	LHSMW28 (1)		
Acetone	19/112	20	21,000	LHSMW35 (1)	7,300	
Benzene	8/177	0.41	2 J	LHSMW56 (1)	5	
Bromodichloromethane	5/177	0.72	27	47WW20 (1)	100	
Carbon disulfide	2/106	2 J	6	LHSMW48 (1)	7,300	

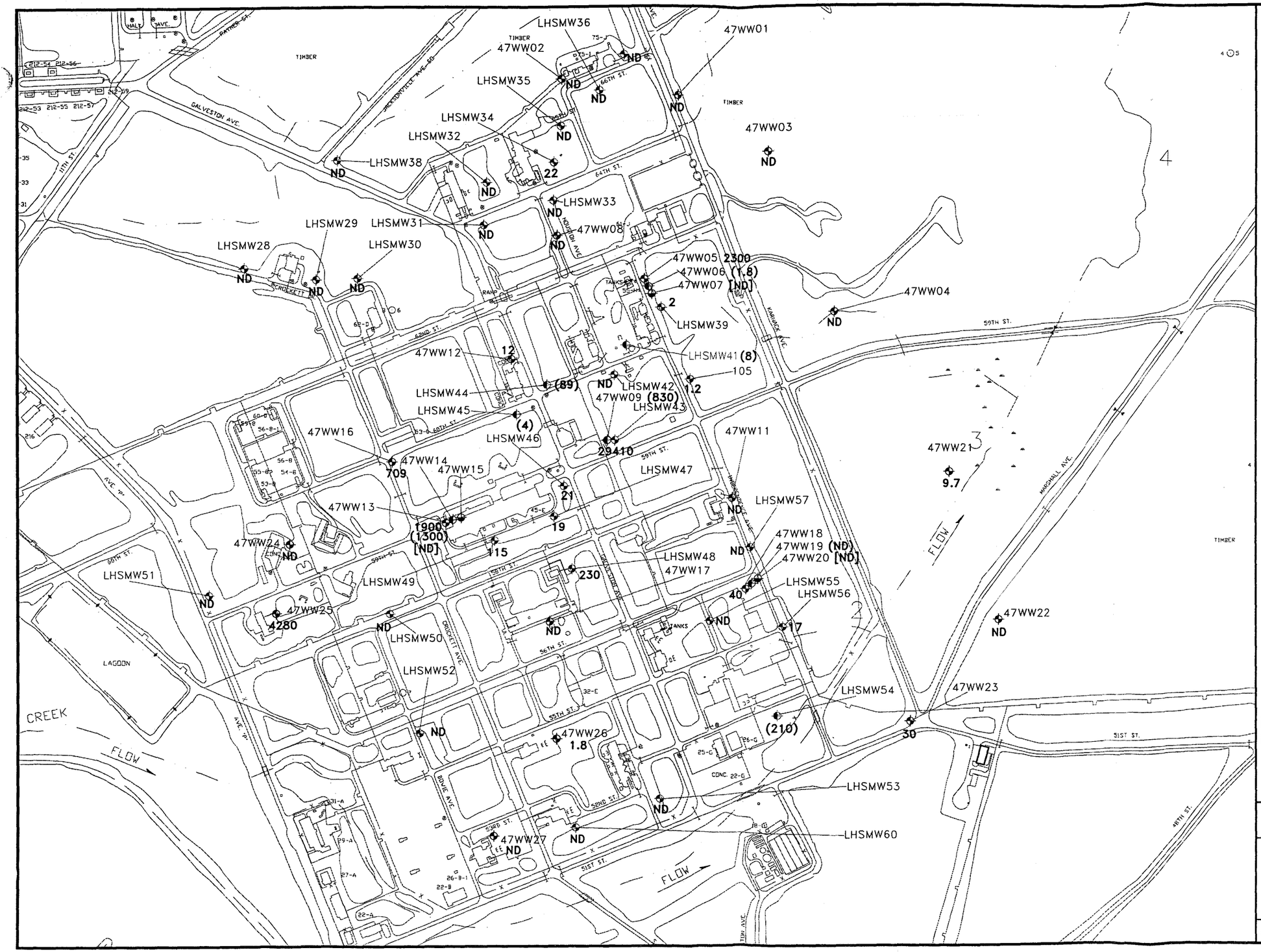
Table 9-10 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Chloroform	15/177	0.27	120	47WW20 (1)	80	
Dichlorodifluoromethane	11/173	5.8	150	LHSMW34 (1)	15,000	
m,p-Xylene (sum of isomers)	1/4	0.17 J	0.17 J	47WW25 (1)		
Methylene chloride	3/177	0.53	5	LHSMW35 (1)	5	
Naphthalene	6/109	0.75	190	47WW11 (1)	1,500	
o-Xylene (1,2-dimethylbenzene)	1/4	0.19 J	0.19 J	47WW25 (1)		
p-Cymene (p-isopropyltoluene)	1/109	0.67	0.67	47WW17 (1)		
Tetrachloroethene	17/177	0.39	168	LHSMW43 (1)	5	
Total 1,2-dichloroethene	12/34	4 J	1,400	LHSMW43 (1)		
Trichloroethene	70/161	0.64	20,410	LHSMW43 (1)	5	
Trichlorofluoromethane	10/146	2	9.8	LHSMW35 (1)	22,000	
Vinyl chloride	17/146	0.26	127	LHSMW56 (1)	2	
cis-1,2-Dichloroethene	53/146	0.7	2,020	LHSMW43 (1)	70	
n-Propylbenzene	1/142	0.24	0.24	LHSMW49 (1)		
trans-1,2-Dichloroethene	13/146	0.34	21	47WW13 (1)	100	
SVOCs (µg/L)						
2-Methylnaphthalene	1/137	31	31	47WW11 (1)	1,500	
4-Chloroaniline	1/137	18	18	47WW11 (1)	290	
Acenaphthene	1/137	24	24	47WW11 (1)	4,400	
Di-n-octylphthalate	8/137	0.74 J	6 J	LHSMW54 (1)		
Dibenzofuran	1/137	11	11	47WW11 (1)	290	
Diethyl phthalate	1/137	1 J	1 J	LHSMW42 (1)	58,000	
Fluorene	1/137	8.8	8.8	47WW11 (1)	2,900	
Naphthalene	3/137	0.39 J	47	47WW11 (1)	1,500	
Pentachlorophenol	4/137	4 J	7.9	LHSMW47 (1)	1	
bis(2-Ethylhexyl) phthalate	35/137	0.46 J	21	LHSMW45 (1)	6	
Furans (pg/L)						
Tetrachlorinated dibenzofurans (total)	1/6	1.256	1.256	47WW01 (1)		
Explosives (µg/L)						
1,3,5-Trinitrobenzene	1/163	0.21 J	0.21 J	LHSMW57 (1)		
2,4,6-Trinitrotoluene	2/163	0.82	6.8	LHSMW56 (1)		
2,4-Dinitrotoluene	3/163	0.1 J	1.4	47WW11 (1)	3	
2,6-Dinitrotoluene	3/163	0.2	1.4	47WW11 (1)	3	
2-Amino-4,6-dinitrotoluene	2/130	0.33	0.86	LHSMW55 (1)		
2-Nitrotoluene	5/163	0.16 J	2.9	LHSMW31 (1)		
3-Nitrotoluene	8/163	0.13 J	0.34	LHSMW35 (1)		
4-Amino-2,6-dinitrotoluene	3/163	0.11 J	0.94	LHSMW45 (1)		
4-Nitrotoluene	1/163	0.47	0.47	LHSMW39 (1)		
Hexahydro-1,3,5-trinitro-1,3,5-triazine	5/163	0.15 J	0.62	LHSMW34 (1)		
Nitrobenzene	1/163	0.2	0.2	LHSMW42 (1)	37	
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1/163	0.76	0.76	LHSMW49 (1)		
Tetryl	4/163	0.15	1.3	LHSMW49 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not available
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

The metal contaminants in the Site 47 soils are probably limited to cadmium and lead. These metals were found in significant concentrations in the sumps, and the measured soil concentrations are greater than background. These metals should be present in the soil as either low solubility minerals or adsorbed as metal ions on clays or iron and manganese oxyhydroxides. Shallow soil contamination could run off to adjacent ditches during storm events. Deeper soil contamination could slowly leach into the underlying groundwater. Chromium is found in the groundwater, but it is difficult to associate this contamination with a source. There are several areas of chromium contamination and some extend into the deeper zone. However, there is no evidence of significant migration of a large chromium plume.

There is an area of significant perchlorate contamination in the soil and groundwater near Building 25C. The surface soil contamination has migrated by runoff. The area is currently lined and vegetated, stopping continued migration by this pathway. Perchlorate is also present in the underlying groundwater. Perchlorate could migrate to Goose Prairie Creek by runoff or groundwater discharge.



Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Soil Boring Sampling Location
- 22 Shallow Zone Concentrations
- (22) Intermediate Zone Concentrations
- [22] Deep Zone Concentrations

0 500
Scale in Feet

US Army Corps
of Engineers
Tulsa District

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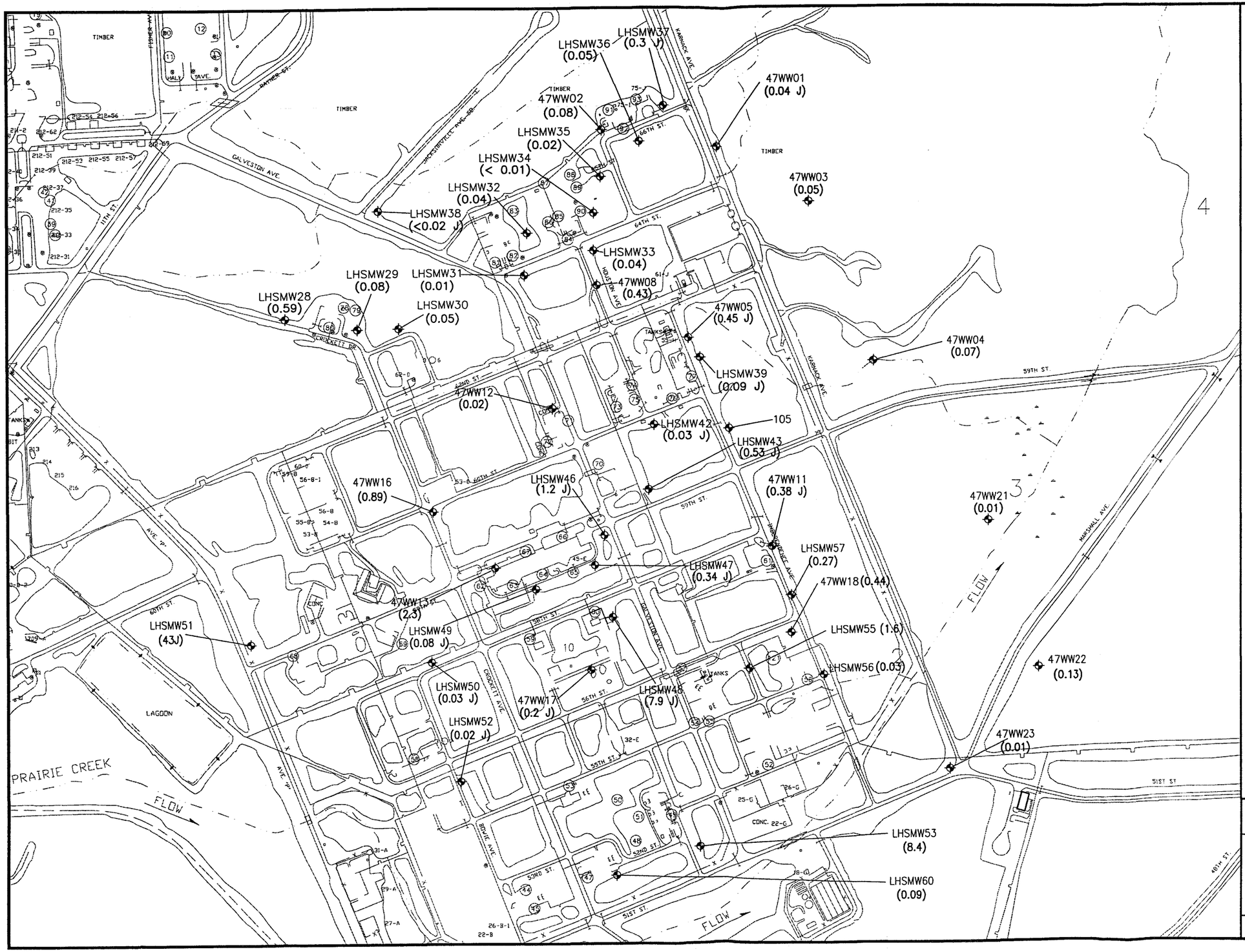
Site 47
TCE Concentrations
in Groundwater (ug/L)
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Kamack, Texas

31Dec01 - Fig_9-8.DWG | Figure 9-8



Legend

- Shallow Monitoring Well

0 500

Scale in Feet

US Army Corps of Engineers
Tulsa District

JACOBS

Site 47
Chromium Concentrations In Shallow Groundwater (mg/L)
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas

31Dec01 - Fig_9-9.DWG | Figure 9-9

10.0 SITE 48: Y-AREA

This section presents the results of the investigation activities performed at Site 48 (also known as the Y-Area or Igniter Area). The purpose of the RI was to define the nature and extent and fate and transport of soil and groundwater contamination at Site 48. This section describes the site background, physical characteristics, and investigations completed. It compiles the analytical data generated during the RI field campaigns to document the nature and extent of the contamination at Site 48.

10.1 SITE BACKGROUND

10.1.1 Site Description

Site 48 is located in the east-central portion of LHAAP and covers an area of approximately 16 acres (Figure 1-2). The center of the site is located at the intersection of Yoakum Drive and Starr Ranch Road.

10.1.2 Site History

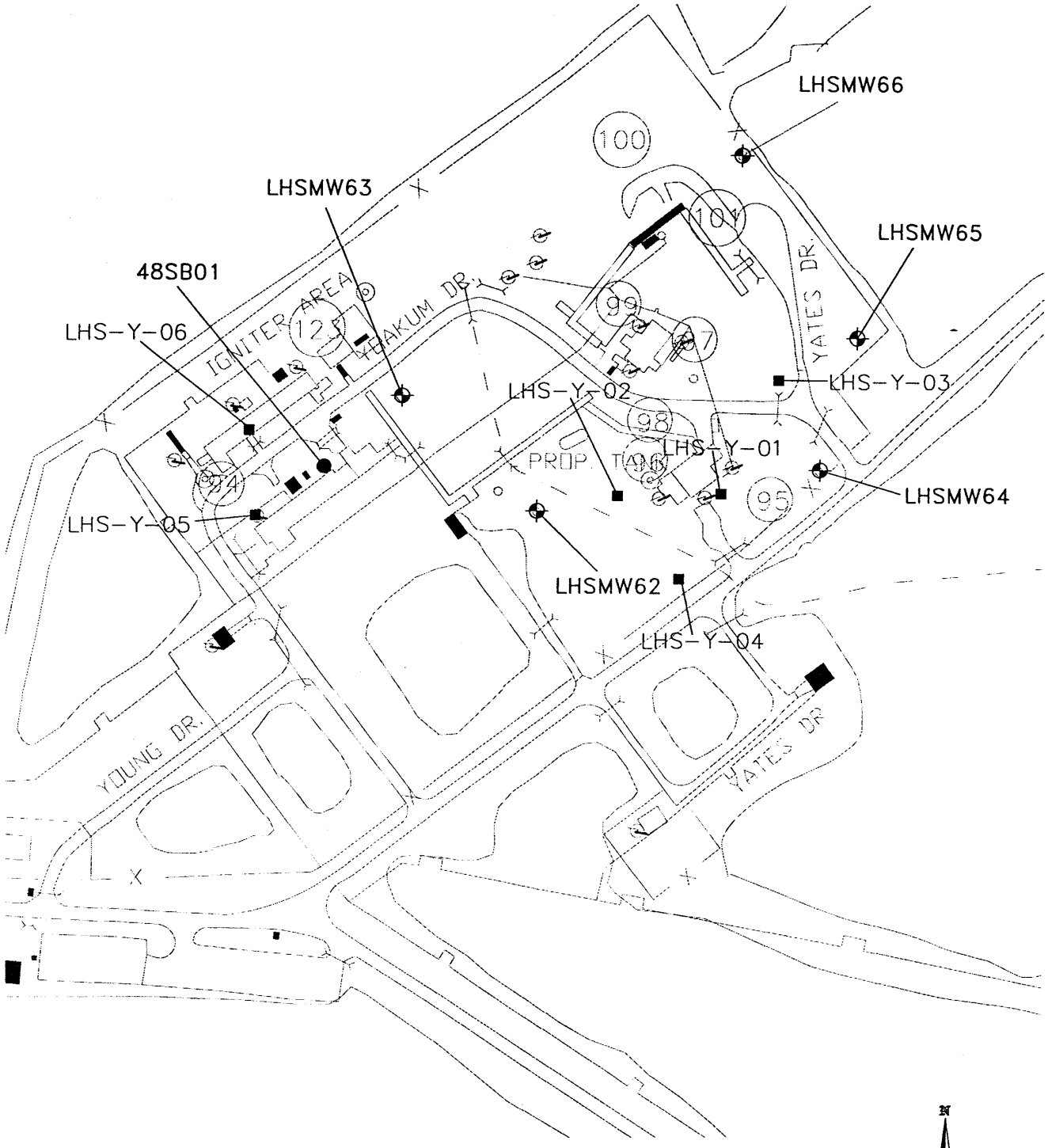
The Y-Area was built during the construction of Plant 3 (1953–1955). The Y-Area was used for the production of igniters for use in pyrotechnic and illuminating devices. In addition, the Y-Area was used for the production of some illuminating devices. The Y-Area was active until approximately 1997. Industrial solid wastes and possibly hazardous wastes have been generated by these activities. Nine waste process sumps and three waste rack sumps are located at this site. The current site layout is shown on Figure 10-1.

10.1.3 Pre-Phase I Investigations

Initial field investigative activities relative to the Group 4 sumps began in November 1991 when BCM Engineers was retained by the LHAAP Operating Contractor, Thiokol, to evaluate the integrity of the sumps and the industrial wastewater treatment system at LHAAP (BCM 1992). Although the focus was to develop more efficient wastewater management alternatives, the locations of 125 sumps were surveyed and limited subsurface investigations were conducted. Descriptions of the sump locations, associated buildings, sump sizes, and status as of 1992 are compiled in Table 4-2, and the sump locations are plotted on Figures 4-1 and 10-1. No sampling of sumps or adjacent soils occurred during this investigation.

10.2 PHYSICAL CHARACTERISTICS OF SITE

This section describes the physical conditions at Site 48. Subjects addressed include surface topography and hydrology, soils and geology, and hydrogeology. Information presented in this section is based on data obtained from the site investigations and the reports documenting previous investigations.



Legend

- Soil Boring Sampling Location
- Shallow Soil Sampling Location
- Shallow Monitoring Well
- 123 Sump

US Army Corps of Engineers
Tulsa District

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Site 48 Sampling Locations
Group 4 Remedial Investigatic

Longhorn Army Ammunition Plant
Karnack, Texas

31Dec01 - Fig_10-1.DWG

Figure 10-1

10.2.1 Surface Features and Surface Hydrology

Site 48, the Y-Area, is located in the eastern portion of LHAAP and northwest of Site 35C, the Static Test Area. Surface features at the site include asphalt-paved roads and parking areas around the buildings. The perimeter of Site 48 is a mixture of heavily wooded areas and grasslands. The topography slopes gently to the southeast, and surface runoff from the northern part of Site 48 enters an unnamed creek to the south. Runoff from the southern portion of Site 48 eventually enters Central Creek to the southeast and on to Caddo Lake.

10.2.2 Geology and Soils

Five soil borings were completed at Site 48 to approximately 18–28 feet bgs. Silty clay at the surface is underlain by clay at locations LHSMW62, LHSMW63, and LHSMW66 to approximately 7–8 feet bgs. Below several feet of the clay is a silty clay with some silty sand to clayey sand layers that make up the shallow saturated zone. The sand layers are not continuous across the site and were not present at location LHSMW62. Another clay layer lies below the sand.

10.2.3 Hydrogeology

Five monitoring wells have been installed in the shallow subsurface at Site 48. These range from 18 to 28 feet bgs. There are no wells completed in the intermediate or deep saturated zones. Based on the facility-wide potentiometric surface map for LHAAP, the groundwater flow direction in the shallow saturated zone below Site 48 is to the southeast toward Central Creek.

A rising head slug test was performed on well LHSMW65 at Site 48 for calculating a hydraulic conductivity value using the Bouwer-Rice method (Table 10-1). The hydraulic conductivity value for the shallow saturated zone from well LHSMW65 was estimated at 3.8×10^{-5} cm/sec.

Table 10-1
Monitoring Well Construction Summary, Site 48, Group 4 RI, LHAAP, Karnack, Texas

Well Identification	Well Depth (feet)	Groundwater Zone	Surface Elevation	Measuring Point Elevation	Casing Diameter (inches)	Screen Interval (feet)	Hydraulic Conductivity (cm/sec)
LHSMW62	27.6	Shallow	189.06	192.2	4	15.7–25.7	---
LHSMW63	20	Shallow	191.01	194.06	4	8.5–18.5	---
LHSMW64	25	Shallow	188.23	191.42	4	14.1–24.1	---
LHSMW65	18	Shallow	191.8	194.31	4	6.8–16.8	3.8×10^{-5}
LHSMW66	18	Shallow	192.23	195.11	4	6.9–16.9	---

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

10.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the activities completed during the investigations at Site 48. Subjects addressed include soils and groundwater investigations. Table 10-2 summarizes the field activities completed during each investigation phase.

10.3.1 Source Investigation

A source of potential contaminants at Site 48 was waste materials collected by the waste process sumps. There were no solid or liquid samples collected from any of the sumps at Site 48 during any of the sampling campaigns. Table 4-2 summarizes the associated buildings, sizes, and status of the sumps located within Site 48 as of 1993.

10.3.2 Surface and Subsurface Soil Investigation

To evaluate the soils immediately adjacent to the Site 48 sump locations, 14 soil borings were completed at the 12 sumps during the Phase I investigation. Surface soil samples were collected from 0.5 to 1.5 feet bgs. One or more subsurface samples were collected from each borehole at depths ranging up to 12.8 feet bgs. The 34 soil samples were submitted for laboratory analyses for VOCs, SVOCs, and metals. A single additional soil boring was installed at each of the sump locations during the Phase III

Table 10-2
Investigation Activities, Site 48, Group 4 RI, LHAAP, Karnack, Texas

Phase I
• Completed 14 soil borings (LHS9401, LHS9501, LHS9502, LHDL9501, LHS9601, LHS9701, LHS9801, LHS9901, LHS10001, LHS10101, LHS12301, LHWRS101, LHWRS201, and LHWRS301) at 12 sumps (S-94–101, S-123, WRS1–WRS3) and collected a total of 34 soil samples
Phase II
• Collected 11 shallow soil samples (LHSY01–LHSY06 and LHSMW62–LHSMW66) from 11 sample locations • Installed 5 monitoring wells (LHSMW62–LHSMW66) and collected a groundwater sample from each new well
Phase III
• Collected 24 soil samples at 12 sump locations (Sumps 94–101, and 123, WRS1–WRS3) • Collected 3 shallow subsurface soil samples (0–0.5, 1–3, and 3–5 feet) from sample location 48SB01 • Collected groundwater samples from 5 existing wells (LHSMW62–LHSMW66)
Additional Investigations
• Collected 2 rounds of groundwater samples from LHSMW62–LHSMW66

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

investigation. Two Phase III soil samples were collected from each boring and analyzed for beryllium, nickel, and vanadium. At six of the sump locations, soil samples were also analyzed for pesticides/PCBs and dioxins/furans. During the Phase II field investigation 11 soil borings (LHSY01–LHSY06 and LHSMW62–LHSMW66) were completed with a total of 11 soil samples analyzed for VOCs, SVOCs, explosive compounds, and metals. The sampling locations not directly associated with a sump are plotted on Figure 10-1. One soil boring, 48SB01, was completed during the Phase III investigation and generated three subsurface soil samples that were analyzed for VOCs, SVOCs, explosive compounds, metals, pesticides/PCBs and dioxins/furans.

Five groundwater monitoring wells were installed in Phase II soil borings. These wells ranged from 18 to 27.6 feet bgs. The monitoring well locations are plotted in Figure 10-1.

Soil samples from each monitoring well boring were classified for lithologic characteristics using the USCS and recorded on the geologic boring logs presented in Appendix A. Soil samples were screened in the field with an ionization detector (PID or FID) for VOCs in the samples. Survey data for the soil borings and monitoring wells are also provided in Appendix A.

10.3.3 Groundwater Investigation

Table 10-1 summarizes the well construction details of monitoring wells installed during the Phase II RI. Well construction diagrams for each of the five monitoring wells are provided in Appendix A of this report. A total of ten groundwater samples were collected during the Phase II and Phase III investigations.

The groundwater samples collected during the Phases II and III investigations were submitted for laboratory analyses for VOCs, SVOCs, explosive compounds, and metals. A single groundwater sample collected from LHSMW62 during Phase III was also submitted for analyses for pesticides/PCBs and dioxins/furans. Groundwater samples collected in 1996 during additional investigations were analyzed for VOCs, SVOCs, explosives, and metals.

10.4 NATURE AND EXTENT OF CONTAMINATION

The following section summarizes the detected compounds and associated concentrations for the soil and groundwater samples. Table 10-3 summarizes the media tested and analyses performed during each investigation. Appendix C presents the result of the specific chemical constituent analyses.

10.4.1 Contaminant Source Results

No solid or fluid samples were collected from any of the sumps at Site 48.

Table 10-3
Analytical Test Summary, Site 48, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests					
	VOCs	SVOCs	Pesticides/ PCBs	Explosive Compounds	Dioxins/ Furans	Metals
Phase I						
Surface Soils (0.5–1.5 feet)	13	13				13
Subsurface Soils	21	21				21
Phase II						
Soils	11	11		11		11
Groundwater	5	5		5		5
Phase III						
Soils			6		6	24*
Subsurface Soils	3	3	3	3	3	3
Groundwater	5	5	1	5	1	5
Additional Investigations						
Groundwater	12	12		12		12

* Beryllium, nickel, and vanadium analyses only

LHAAP = Longhorn Army Ammunition Plant
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

10.4.2 Soil Results

Table 10-4 summarizes detected constituent results.

10.4.2.1 Organic compounds

The sample from boring 2 at sump S-095 contained TCE (20 µg/kg) in excess of the PCL, while the sample from sump S-099 had TCE at 87 µg/kg. The samples from borehole LHS9901 also contained PCE and vinyl chloride in concentrations greater than their respective PCLs. These compounds were detected in the upper two samples at 0.1–1.5 feet and 2.0–2.8 feet bgs. During Phases I and II, there were no measured soil concentrations of SVOCs or explosive residues greater than their respective PCLs.

Among the samples analyzed for pesticides/PCBs, only sump S-098 (3–5 feet bgs) and WRSUMP003 contained detectable pesticide and PCBs. Sump S-098 (3–5 feet bgs) contained 6.5 µg/kg 4,4'-DDD and WRSUMP003 contained 12 µg/kg 4,4'-DDE, 24 µg/kg 4,4'-DDT, and 190 µg/kg Aroclor-1254. The most common dioxin detected in these soil samples is octachlorodibenzo-p-dioxin. It was detected in all of the samples tested and was present at the highest concentrations measured (maximum 34.5 µg/kg). This level is higher than found at most LHAAP sites. The greatest concentration was found at sump S-100. An attempt was made to determine whether the distribution of the organic compound contamination suggested a localized source. Because the distribution of soil samples was limited to the immediate vicinity of the individual sumps, it was not possible to determine a sitewide extent of contamination.

Table 10-4
Summary of Detected Constituents in Soil Samples, Site 48, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	49/49	1,420	19,300	LHSY02 (1)	260,000	20,700
Antimony	3/49	5.12	11	LHS9501 (1)	2.7	ND
Arsenic	47/49	0.337	10.7	LHS9801 (1)	13	29.7
Barium	48/49	6.59	2,510	LHSY06 (1)	220	287
Beryllium	15/30	0.5413	3.32 J	SUMP123 (1)	0.92	NA
Cadmium	29/49	1.46	11.4	LHS9801 (1)	0.75	ND
Calcium	48/49	226	2,360	LHS9901 (1)		1,090
Chromium, total	48/49	3.9	41.5	LHWRS201 (1)	1,200	22.8
Cobalt	47/49	0.29	84.6	LHWRS301 (1)	2,000	19.1
Copper	46/49	2.6	102	LHSY01 (1)	520	6.7
Iron	49/49	4,280	51,800	LHS9801 (1)		31,000
Lead	43/49	9.45	151	LHWRS201 (1)	1.5	17.4
Magnesium	48/49	65.3	1,830	LHSY02 (1)		474
Manganese	49/49	8.56	1,420	LHSMW64 (1)	5,100	2,330
Mercury	9/48	0.034	0.312	LHWRS201 (1)	1	ND
Nickel	23/30	5 J	51 J	SUMP123 (1)	230	6.3
Potassium	48/49	92.2	1,100	48SB01 (1)		481
Selenium	14/49	0.2	1.65	48SB01 (1)	1.1	ND
Silver	14/49	0.031	1.2	LHS9401 (1)	0.71	2.3
Strontium	43/49	5.73	514	LHS12301 (1)		13.3
Vanadium	28/30	5.8 J	49 J	SUMP100 (1)	5,100	NA
Zinc	49/49	6.4	207	LHS9401 (1)	3,500	16.2
VOCs (µg/kg)						
1,1-Dichloroethene	1/48	2	2	LHS9901 (1)	25	
Acetone	1/48	5.1	5.1	48SB01 (1)	7,100	
Carbon disulfide	8/48	1	145	LHS9502 (1)	20,000	
Ethylbenzene	1/48	2	2	LHS9901 (1)	3,800	
Methyl ethyl ketone (2-butanone)	3/48	9	36	LHWRS201 (1)	44,000	
Styrene	1/48	3	3	LHDL9501 (1)	1,600	
Tetrachloroethene	3/48	9	204	LHS9901 (1)	25	
Toluene	1/48	2	2	LHS9901 (1)	4,100	
Trichloroethene	6/48	1 J	87	LHS9901 (1)	17	
Vinyl chloride	1/48	497	497	LHS9901 (1)	11	
Xylenes, total	1/48	18	18	LHS9901 (1)	61,000	
trans-1,3-Dichloropropene	2/48	3	10	LHS9901 (1)	40	
SVOCs (µg/kg)						
2-Methylnaphthalene	3/48	1,635	1,835	LHS9601 (1)	130,000	
Acenaphthene	1/48	300 J	300 J	LHSY06 (1)	350,000	
Anthracene	1/48	590	590	LHSY06 (1)	10,000,000	
Benzo(a)anthracene	3/48	75 J	1,900	LHSY06 (1)	20,000	
Benzo(a)pyrene	2/48	87 J	1,600	LHSY06 (1)	3,800	
Benzo(b)fluoranthene	4/48	190 J	2,900	LHSY06 (1)	67,000	
Benzo(g,h,i)perylene	1/48	670	670	LHSY06 (1)	69,000,000	
Benzo(k)fluoranthene	2/48	98 J	1,100	LHSY06 (1)	690,000	
Benzoic acid	1/14	340 J	340 J	LHSY06 (1)	280,000	
Benzyl butyl phthalate	3/48	162	290 J	LHSY06 (1)	4,000,000	

Table 10-4 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Chrysene	3/48	180 J	2,200	LHSY06 (1)	1,700,000	
Di-n-butyl phthalate	3/48	67 J	83 J	LHSMW63 (1)	5,000,000	
Dibenzo(a,h)anthracene	1/48	230 J	230 J	LHSY06 (1)	11,000	
Dibenzofuran	1/48	170 J	170 J	LHSY06 (1)		
Diethyl phthalate	9/48	100 J	1,833	LHWRS101 (1)	230,000	
Dimethyl phthalate	5/48	460	975	LHS9601 (1)	93,000	
Fluoranthene	6/48	110 J	3,600	LHSY06 (1)	2,900,000	
Fluorene	1/48	250 J	250 J	LHSY06 (1)	450,000	
Indeno(1,2,3-c,d)pyrene	2/48	200	750	LHSY06 (1)	190,000	
Naphthalene	4/48	110 J	4,392	LHS9601 (1)	47,000	
Phenanthrene	5/48	97 J	2,900	LHSY06 (1)	620,000	
Pyrene	6/48	80 J	2,400	LHSY06 (1)	1,700,000	
bis(2-Ethylhexyl) phthalate	8/48	42 J	450	LHSMW62 (1)	82,000	
Pesticides (µg/kg)						
p,p'-DDD	1/15	6.5	6.5	SUMP098 (1)	15,000	
p,p'-DDE	1/15	12	12	WRSUMP003 (1)	13,000	
p,p'-DDT	1/15	24	24	WRSUMP003 (1)	17,000	
PCBs (µg/kg)						
PCB-1254 (Aroclor-1254)	2/15	66	190	WRSUMP003 (1)	5,300	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	15/15	20.392	34,472	SUMP100 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	14/15	0.666	1,140	SUMP094 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	14/15	0.666	504.751	SUMP094 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	9/15	1.127	141	SUMP094 (1)		
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2/15	0.405	5.042	48SB01 (1)		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	7/15	1.03	15.399	SUMP094 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	4/15	0.749	10.442	SUMP095 (1)		
Pentachlorinated dibenzo-p-dioxins (total)	1/15	2.248	2.248	SUMP095 (1)		
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1/15	0.815	0.815	48SB01 (1)		
Tetrachlorinated dibenzo-p-dioxins (total)	2/15	0.856	1.431	SUMP094 (1)		
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1/15	0.393	0.393	48SB01 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	11/15	1.461	607	SUMP095 (1)		
Heptachlorinated dibenzofurans (total)	8/15	4.061	119	SUMP098 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	12/15	0.362	118.977	SUMP098 (1)		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	3/15	1.61	1.703	WRSUMP001 (1)		
Hexachlorinated dibenzofurans (total)	9/15	0.537	210	SUMP098 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	7/15	0.508	22.923	SUMP094 (1)		
1,2,3,6,7,8-Hexachlorodibenzofuran	6/15	0.278	4.603	48SB01 (1)		
2,3,4,6,7,8-Hexachlorodibenzofuran	2/15	1.75	3.765	48SB01 (1)		
Pentachlorinated dibenzofurans (total)	7/15	0.7	37.393	SUMP094 (1)		
1,2,3,7,8-Pentachlorodibenzofuran	4/15	2.026	11.341	SUMP094 (1)		
2,3,4,7,8-Pentachlorodibenzofuran	1/15	0.556	0.556	48SB01 (1)		
Tetrachlorinated dibenzofurans (total)	10/15	1.36	27.082	SUMP094 (1)		
2,3,7,8-Tetrachlorodibenzofuran	10/16	0.284	4.933	WRSUMP003 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCB = polychlorinated biphenyl
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

10.4.2.2 Metals

Among the near-surface soil samples (0.5–1.5 feet bgs), there were 18 metals with concentrations in excess of their respective background values. Of these antimony, barium, beryllium, cadmium, lead, and selenium exceeded their PCLs. Cadmium (maximum of 11.4 mg/kg) and lead (maximum of 151 mg/kg) were the metals most commonly found in excess of their PCLs. This trend continued into the subsurface. Barium concentrations (2510 mg/kg) were also notably elevated.

Because all of the sampling efforts were focused on the immediate vicinity of the sumps and waste rack sumps, the extent of metals contamination is localized. Attempts to plot metals distribution maps were unsuccessful and did not show a distribution of metals that indicated sources other than the sumps.

10.4.3 Groundwater Results

Five groundwater monitoring wells within Site 48 yielded two rounds of samples that were analyzed for VOCs, SVOCs, explosive compounds, and metals with one sample (location LHSMW62) also analyzed for pesticides/PCBs and dioxins/furans. Table 10-5 summarizes the detected results for groundwater.

10.4.3.1 Organic compounds

There were no detectable concentrations of pesticides/PCBs in either round of groundwater samples. There were no detections of VOCs or SVOCs in the second round (May 1998) of groundwater samples. Five VOCs (chloroform, sec-butylbenzene, tert-butylbenzene, PCE, and TCE) were each detected in different individual samples during the first round (December 1994). Four VOCs (chloroform, TCE, 1,1,1-trichloroethane, and tert-butyl benzene) were detected in 1996. All levels were very low; only TCE (9 µg/L) exceeded the PCL in 1996. Six SVOCs [the common contaminant bis(2-ethylhexyl) phthalate and 2-methylnaphthalene, acenaphthene, benzoic acid, dibenzofuran, and fluorene] were detected at concentrations between 1 µg/L and 7.7 µg/L. LHSMW64 contained five of the six detected contaminants. LHSMW62 contained four of the six detected explosive compounds as well as 73.9 pg/L of octachlorodibenzo-p-dioxin. All organic compound detections were very low and isolated. Only one analysis of bis(2-ethylhexyl) phthalate exceeded the PCL of 6 µg/L with a result of 7.7 µg/L.

10.4.3.2 Metals

Twelve metals from the two sampling rounds exceeded their background levels. Of those aluminum, antimony, chromium, nickel, and thallium exceeded the PCLs. Antimony was only detected once in one well (not detected in other sampling round). Thallium was only detected three times. There are some elevated metals concentrations in the initial sampling round that indicate that the samples were from newly developed wells and contained some suspended solids. For example, the aluminum concentrations of virtually all of the wells are greater in the first sampling round than in the second. By the second round of sampling in 1998, the wells had been further developed and the concentrations of aluminum and iron had

Table 10-5
Summary of Detected Metals in Groundwater Samples, Site 48, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Metals (µg/L)						
Aluminum	19/20	532	161,000	LHSMW62 (1)	73,000	13,400
Antimony	1/20	51 J	51 J	LHSMW63 (1)	6	ND
Arsenic	8/20	2	12	LHSMW64 (1)	50	22
Barium	17/20	35	1,600	LHSMW62 (1)	2,000	1,990
Cadmium	1/20	0.4	0.4	LHSMW63 (1)	5	55
Calcium	17/20	1,780 J	60,400	LHSMW62 (1)		308,000
Chromium, total	18/20	10	54,000	LHSMW63 (1)	100	110
Cobalt	8/20	4	120	LHSMW62 (1)	4,400	53
Copper	15/20	14	484	LHSMW63 (1)	1,300	43
Iron	20/20	2,200	370,000	LHSMW63 (1)		68,000
Lead	10/20	1.6	267	LHSMW66 (1)	15	300
Magnesium	17/20	1,230 J	55,200	LHSMW62 (1)		277,000
Manganese	20/20	38	1,900	LHSMW62 (1)	10,000	11,800
Mercury	5/20	0.132	1.5	LHSMW62 (1)	2	1
Nickel	12/15	23	3,200	LHSMW63 (1)	1,500	60
Potassium	15/20	361	10,600	LHSMW62 (2)		4,300
Selenium	3/20	2.9	35	LHSMW63 (1)	50	140
Silver	3/20	1.2	1,400	LHSMW63 (1)	370	30
Sodium	5/5	10,000	150,000	LHSMW62 (1)		1,470,000
Strontium	15/20	28	980	LHSMW62 (1)	22,000	6,150
Thallium	3/20	92	205	LHSMW64 (1)	2	ND
Vanadium	5/15	2.7	25	LHSMW66 (2)	510	NA
Zinc	17/20	18	940	LHSMW62 (1)	22,000	230
Anions (mg/L)						
Chloride (as Cl)	10/10	5	130	LHSMW62 (1)		1,416
Nitrogen, nitrate (as N)	1/10	0.74	0.74	LHSMW63 (1)		NA
Perchlorate	1/10	0.16	0.16	LHSMW62 (1)	66	NA
Sulfate (as SO_4)	10/10	1.750 J	160	LHSMW62 (1)		3,475
VOCs (µg/L)						
1,1,1-Trichloroethane	1/19	2	2	LHSMW62 (1)	200	
Chloroform	4/19	0.81	5	LHSMW63 (1)	80	
sec-Butylbenzene	2/16	0.52	0.55	LHSMW64 (1)		
Tetrachloroethene	1/19	2 J	2 J	LHSMW66 (1)	5	
Trichloroethene	2/16	0.91	9	LHSMW63 (1)	5	
tert-Butylbenzene	4/16	1.2	2	LHSMW64 (1)		
SVOCs (µg/L)						
2-Methylnaphthalene	1/20	0.77	0.77	LHSMW64 (1)	1,500	
Acenaphthene	1/20	0.92	0.92	LHSMW64 (1)	4,400	
Benzoic acid	1/10	7.2	7.2	LHSMW64 (1)		
Dibenzofuran	1/20	2	2	LHSMW64 (1)	290	
Fluorene	2/20	2.7	2.9	LHSMW64 (1)	2,900	
bis(2-Ethylhexyl) phthalate	4/20	0.64 J	7.7	LHSMW66 (1)	6	
Dioxins (pg/L)						
Octachlorodibenzo-p-dioxin	2/2	41.856	73.945	LHSMW62 (1)		

Table 10-5 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Furans (pg/L)						
Heptachlorinated dibenzofurans (total)	1/2	12.468	12.468	LHSMW62 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1/2	12.468	12.468	LHSMW62 (1)		
Hexachlorinated dibenzofurans (total)	1/2	13.675	13.675	LHSMW62 (1)		
Explosives (µg/L)						
2,4-Dinitrotoluene	1/21	0.094 J	0.094 J	LHSMW62 (1)	3	-
2,6-Dinitrotoluene	2/21	0.089 J	0.26	LHSMW62 (1)	3	
2-Amino-4,6-dinitrotoluene	2/16	0.44	0.64	LHSMW65 (1)		
3-Nitrotoluene	3/21	0.15 J	0.7	LHSMW62 (1)		
4-Amino-2,6-dinitrotoluene	1/21	0.13 J	0.13 J	LHSMW65 (1)		
Tetryl	1/21	1	1	LHSMW63 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

fallen to less than 20 percent of the 1994 values. Chromium was by far the most frequent metal found above PCL values with a maximum concentration of 54 mg/L (versus a PCL of 0.1 mg/L). The levels increased between 1994 and 1998 in wells LHSMW62, LHSMW63, and LHSMW65.

10.5 CONTAMINANT FATE AND TRANSPORT

The soils at some sump locations had some elevated levels of organic contaminants. Notably sump S-100 had 34.5 µg/kg of octachlorodibenzo-p-dioxin. Sumps S-095 and S-099 had low levels of TCE. The sumps may have been a limited source of a variety of contamination. However, there is no widespread soil contamination nor significantly organic-contaminated groundwater, which indicates that the sources are probably small and isolated and have not contributed to significant migration of contaminants. The VOC contamination will likely volatilize while the dioxins will persist in the soil indefinitely.

The low levels of metals contaminants in the Site 48 soils are mostly barium, cadmium, and lead. These metals were found in soils at concentrations greater than background. These metals should be present in the soil as either low solubility minerals or adsorbed as metal ions on clays or iron and manganese oxyhydroxides. The soil metals may migrate slowly via infiltrating precipitation. The low metals levels of these metals in groundwater suggest no significant leaching. However, the presence of elevated chromium levels in groundwater suggests an unidentified or no longer remaining source in the soils at Site 48.

11.0 SITE 50: FORMER SUMP WATER TANK

This section presents the results of the investigation activities performed at Site 50 (Former Sump Water Tank). The purpose of the RI was to define the nature and extent and fate and transport of soil, sediment, surface water, and groundwater contamination at the site. This section describes the site background, physical characteristics, and investigations that occurred. It compiles analytical data generated during the Group 5 Site Investigation and Phase III RI work plus additional investigations to document the nature and extent of the contamination detected at Site 50.

11.1 SITE BACKGROUND

11.1.1 Site Description

Site 50 is located in the north-central portion of LHAAP and covers an area of approximately 1 acre, as shown on Figure 1-2. The site is bound by Goose Prairie Creek to the north and Crockett Avenue to northeast.

11.1.2 Site History

Site 50 was identified through historical records as containing an aboveground storage tank for industrial wastewater collected from industrial waste production sumps located at various sites throughout LHAAP. As described in the Longhorn Missile publication dated 15 September 1966, all operating buildings at the LHAAP installation were provided with individual concrete sumps to collect industrial wastewater. If the nature of the operations was such that contamination was considered negligible, the sump was permitted to overflow and drain into the drainage ditches. All other sumps were emptied and their wastewater transported by truck to a 47,000-gallon aboveground storage tank located at Site 50. Discharges from this storage tank were made upstream of the bridge on Crockett Avenue, which crosses Goose Prairie Creek just south of 51st Street. Contents from this storage tank were emptied into Goose Prairie Creek after all solids were filtered out and the natural flow in the creek was sufficient to "dilute the waste to a level that is safe for fish and other aquatic life." If natural flow in the creek was considered insufficient, clean water was apparently pumped into the creek to dilute the contents. Because the storage tank was described as holding industrial wastewater, it is possible hazardous wastes may have been released by these activities.

11.2 PHYSICAL CHARACTERISTICS OF SITE

This section describes physical conditions at Site 50. Subjects addressed include surface features and hydrology, geology and soils, and hydrogeology. Information presented in this section is based on data obtained from the investigation activities and the reports documenting previous investigations.

11.2.1 Surface Features and Hydrology

Site 50 is located in the central portion of LHAAP and encompasses approximately one acre as shown on Figure 11-1. The northeastern half of Site 50 is an open area of grass and brush that is bounded by South Crockett Avenue to the northeast. The southwestern half of the site is an area of heavy timber bounded by a drainage ditch to the west, a railroad spur to the south, and Goose Prairie Creek to the north. Two gravel access lanes connect Site 50 to South Crockett Avenue.

Runoff from the northeastern half of the site is generally toward the northeast. Runoff is collected by a drainage ditch to the northeast that runs parallel to South Crockett Avenue and eventually joins Goose Prairie Creek. Runoff from the remainder of the site is toward the north directly into Goose Prairie Creek. Runoff is collected to the west by a drainage ditch that carries the runoff north into Goose Prairie Creek.

11.2.2 Geology and Soils

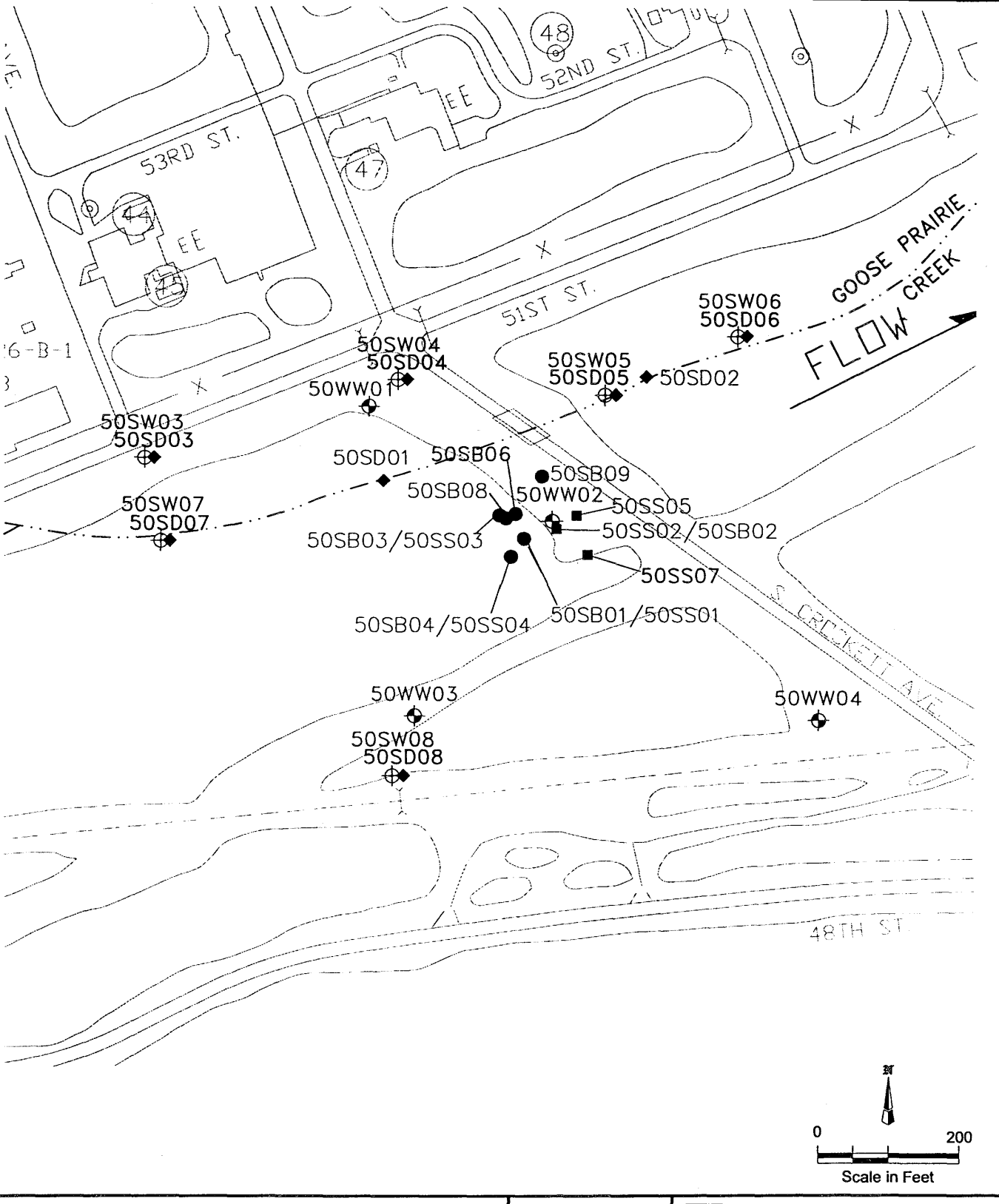
General soil and geologic maps indicate that the site is situated on the outcrop of the Wilcox Group. The Wilcox Group materials at the site generally consist of a few feet of residually derived soils overlying silts and clays.

Surficial soils range from 0 to 2 feet thick and are composed of brown, silty sand grading into gray silt. This material is underlain by yellowish-brown to gray silt and clay with alternating layers of sandy clays and silty clays. The alternating layers are present from 8 to 11 feet bgs in borings to the south and up to 18 feet bgs at boring 50WW01 to the north.

11.2.3 Hydrogeology

Four monitoring wells have been installed at Site 50, all at a depth of approximately 20 feet below grade. There are no wells completed in the intermediate or deep saturated zone; monitoring well construction details are summarized in Table 11-1. Based on the facility-wide potentiometric surface map for LHAAP (Figure 1-3), the groundwater flow direction in the shallow saturated zone below Site 50 is to the northeast.

Rising head slug tests were performed on all wells at Site 50 to calculate hydraulic conductivity values using the Bouwer-Rice method. These data are summarized in Table 11-1. The hydraulic conductivity values for the shallow saturated zone at Site 50 ranged from 5.5×10^{-5} cm/sec at well 50WW04 to 1.9×10^{-4} cm/sec at well 50WW03.



Legend

- Shallow Monitoring Well
- Soil Boring Sampling Location
- Shallow Soil Sampling Location
- Surface Water Sampling Location
- Sediment Sampling Location

US Army Corps of Engineers
Tulsa District

JACOBS

Site 50 Sampling Locations
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Karnack, Texas

31Dec01 - Fig_11-1.DWG

Figure 11-1

Table 11-1
Monitoring Well Construction Summary, Site 50, Group 4 RI, LHAAP, Karnack, Texas

Well Identification	Well Depth (feet)	Groundwater Zone	Surface Elevation	Measuring Point Elevation	Casing Diameter (inches)	Screen Interval (feet)	Hydraulic Conductivity (cm/sec)
50WW01	20	Shallow	195.29	198.5	4	10–20	1.7×10^{-4}
50WW02	19	Shallow	197.4	200.74	4	9–19	8.8×10^{-5}
50WW03	20	Shallow	199.88	202.94	4	10–20	1.9×10^{-4}
50WW04	20	Shallow	201.64	204.51	4	10–20	5.5×10^{-5}

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

11.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the activities completed during the investigations at Site 50. Subjects addressed include contaminant source, surface water, sediment, soils, and groundwater investigations. Table 11-2 summarizes the field activities completed during each investigation phase.

Table 11-2
Investigation Activities, Site 50, Group 4 RI, LHAAP, Karnack, Texas

Group 5 Site Investigation
• Collected 2 sediment samples (50SD01 and 50SD02) from Goose Prairie Creek • Collected 5 surface soil samples (50SS01–50SS05) and a resampling of each of the 5 locations 4 months later (explosive analysis only) • Collected 12 soil samples from 4 soil boring locations (50SB01–50SB04)
Phase III
• 6 sediment and 6 surface water samples were collected (50SD03 through 50SD08 and 50SW03 through 50SW08) • Collected 4 soil samples [50SB06 (0–0.5 feet), (1–3 feet), (3–5 feet) and 50SS07 (0–0.5 feet)] from 2 sample locations • Installed 4 monitoring wells (50WW01–50WW04) and collected groundwater samples from each well, and resampled wells 50WW01, 50WW02, and 50WW04 one month later
Additional Investigations
• May 2000—Collected 4 soil samples from 2 soil borings (50SB08 and 50SB09) for perchlorate analysis • May 2000—Collected groundwater samples from wells 50WW01–50WW04 for perchlorate analysis • February 2001—Collected groundwater samples from wells 50WW01–50WW03 for perchlorate analysis

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

11.3.1 Source Investigation

The primary source of potential contaminants at Site 50 is industrial wastewater that was stored in an aboveground storage tank and discharged to Goose Prairie Creek. A media sampling and analysis program was developed for Site 50 to assist in determining whether a release of potential contaminants from previous operations has impacted the area sediment, surface water, soils, and groundwater. No original sources could be sampled as the source is no longer present.

11.3.2 Surface Water and Sediment Investigation

During the Group 5 SI and Phase III investigations, eight sediment samples (50SD01 through 50SD08) and six surface water samples (50SW03 through 50SW08) were collected at the locations shown on Figure 11-1. The area targeted for investigation was Goose Prairie Creek, which flows through the site to the northeast. Surface water and sediment samples were analyzed for VOCs, SVOCs, explosive compounds, and metals. Additionally, surface water samples were analyzed for hardness, and the Phase III sediment samples were analyzed for cyanide and TOC. Two of the samples were also analyzed for pesticides/PCBs and dioxins/furans as noted on Table 11-3.

Table 11-3
Analytical Test Summary, Site 50, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests								
	VOCs	SVOCs	Pesticide /PCBs	Explosive Compounds	Dioxins/ Furans	Metals	Cyanide	Total Organic Carbon	Common Anions/ Perchlorate
Group 5 SI									
Sediment	2	2		2		2			
Surface Soil	5	5		10		5			
Subsurface Soil	12	12		12		12			
Phase III									
Surface Water	6	6	2	6	2	6	6		
Sediment	6	6	2	6	2	6	6	6	
Surface Soil	3	3	3	3	3	3			
Subsurface Soil	1	1	1	1	1	1			
Groundwater	4	4	1	4	1	4			3
Additional Investigations									
2000 Surface Soil									4
2000 Groundwater	2								4
2001 Groundwater									3

LHAAP = Longhorn Army Ammunition Plant
PCB = polychlorinated biphenyl
RI = remedial investigation
SI = site investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

11.3.3 Surface and Subsurface Soil Investigation

Thirty soil samples were collected at locations throughout the site and submitted for chemical analyses during the Group 5 SI, Phase III RI, and additional investigations at the locations shown on Figure 11-1. Five surface soil borings (50SS01 through 50SS05) and five subsurface soil borings (50SB01 through 50SB04) that shared common locations were completed during the Group 5 SI with 5 surface soil and 12 subsurface soil samples analyzed for VOCs, SVOCs, explosive compounds, and metals. Each of the shallow soil sample locations were resampled 4 months later, and the samples were analyzed for explosive compounds only. Two soil borings (50SB06 and 50SS07) were completed during the Phase III investigation with three surface soil and one subsurface soil sample analyzed for VOCs, SVOCs, pesticides/PCBs, explosive compounds, dioxins/furans, and metals. During an additional investigation in May 2000, four surface soil samples were collected from two soil borings (50SB08 and 50SB09); the samples were analyzed for perchlorate only.

Recovered soil samples from each monitoring well boring were visually classified for lithologic characteristics using the USCS and recorded on the geologic boring logs presented in Appendix A. Soil samples were screened in the field with an ionization detector (PID or FID) to qualify the presence of VOCs in the samples.

11.3.4 Groundwater Investigation

Four groundwater monitoring wells were installed during the Phase III field activities at Site 50 from 19 to 20 feet bgs. The monitoring well locations are depicted in Figure 11-1.

Table 11-1 summarizes the well construction details of monitoring wells installed during the Phase III RI. Well construction diagrams for each of the four monitoring wells are provided in Appendix A of this report.

Groundwater samples were collected from each well during the Phase III investigation and were submitted for laboratory analyses of VOCs, SVOCs, explosive compounds, and metals. The sample collected from monitoring well 50WW01 was also submitted for analyses for pesticides/PCBs and dioxins/furans. Additional groundwater sampling was conducted in 2000 and 2001 for perchlorate analysis.

11.4 NATURE AND EXTENT OF CONTAMINATION

Site investigations to delineate the extent of contamination resulting from past activities at Site 50 included the Group 5 site investigation performed in 1995, the Group 4 Phase III RI conducted in 1998, and additional investigations in 2000 and 2001. The following sections summarize the detected compounds for the soil, sediment, surface water, and groundwater samples. The media tested and analyses performed during each investigation are summarized in Table 11-3.

11.4.1 Soil Results

During the Group 5 site investigation, Phase III RI, and additional investigations, 17 surface soil and 13 subsurface soil samples were collected at Site 50. Table 11-4 summarizes detected constituent results.

11.4.1.1 Organic compounds

A number of VOCs and SVOCs were detected in surface and subsurface soil samples. No SVOCs were detected above the PCL value. TCE at a concentration of 519 µg/kg, was the only VOC exceeding a PCL (17 µg/kg). No explosive compounds were detected in the samples collected. A number of pesticides, PCBs, dioxins/furans, and common anions were detected in surface and subsurface soil samples; however, none exceeded their respective PCL values. The maximum dioxin/furan value found was 3 µg/kg of octachlorodibenzo-p-dioxin, a fairly consistent value found at other LHAAP sites (85th percentile of detected results). Organic compounds have not contaminated the soil at Site 50 as a result of past activities at the site.

11.4.1.2 Metals

Fifteen metals were detected in concentrations greater than background in soil samples collected from Site 50. Four of the metals (barium, beryllium, lead, and selenium) were detected at concentrations that exceed site PCL values. None of the exceedences were extensive. Barium maximum detected levels were 871 mg/kg versus a PCL of 220 mg/kg; beryllium maximum levels were 2.7 mg/kg versus a PCL of 0.92 mg/kg; lead maximum levels were 33 mg/kg versus a PCL of 1.5 mg/kg and a background value of 17.4 mg/kg; and selenium maximum value of 3 mg/kg versus a PCL of 1.1 mg/kg. There is no evidence of significant metals contamination in the soils at Site 50.

11.4.2 Sediment Data

During the Group 5 site investigation and Phase III RI, eight sediment samples were collected at Site 50. The detected results found in sediment is presented in Table 11-5.

11.4.2.1 Organic compounds

Six VOCs (acetone, methyl ethyl ketone, methylene chloride, cis-1,2-DCE, p-cymene, and TCE) were detected in the sediment samples. The concentration detected for TCE in sample 50SD02 (33 µg/kg) exceeded the soil PCL of 17 µg/kg. The remaining VOCs detected were either below their respective PCLs, or in the case of p-cymene, no PCL exists. No SVOCs were detected in the sediment samples submitted for analyses. Ten dioxin/furan compounds were detected at low levels in the two sediment samples analyzed. No comparison values were used for dioxin/furan concentrations. The maximum

Table 11-4
Summary of Detected Constituents in Soil Samples, Site 50, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	21/21	290	11,400	50SB04 (1)	260,000	20,700
Arsenic	17/21	0.59	6.53	50SS07 (1)	13	29.7
Barium	21/21	4.1	871	50SB02 (1)	220	287
Beryllium	12/21	0.57	2.7	50SB02 (1)	0.92	NA
Calcium	20/21	960	3,100	50SB06 (1)		1,090
Chromium, total	21/21	2.5	38	50SS07 (1)	1,200	22.8
Cobalt	18/21	3.1	45.1	50SB02 (1)	2,000	19.1
Copper	19/21	4.3	26.5	50SB02 (1)	520	6.7
Iron	21/21	1,050	47,800	50SB02 (1)		31,000
Lead	21/21	3.1 J	33 J	50SB02 (1)	1.5	17.4
Magnesium	18/21	310	2,590	50SB03 (1)		474
Manganese	21/21	3.3	562	50SB06 (1)	5,100	2,330
Nickel	21/21	1.1	59.5	50SB02 (1)	230	6.3
Potassium	13/21	540	1,000	50SB06 (1)		481
Selenium	4/21	1.45	2.92	50SS07 (1)	1.1	ND
Sodium	12/21	130	780	50SB02 (1)		NA
Strontium	3/4	6.1	12	50SB06 (1)		13.3
Vanadium	21/21	3.3	60	50SS07 (1)	5,100	NA
Zinc	20/21	13	103	50SB02 (1)	3,500	16.2
Anions (µg/kg)						
Perchlorate	3/4	30	36.1	50SB09 (1)	270	
VOCs (µg/kg)						
1,2,3-Trichlorobenzene	1/21	4	4	50SB01 (1)	39,000	
Acetone	1/21	6.3	6.3	50SB06 (1)	7,100	
Naphthalene	1/21	9	9	50SB01 (1)	47,000	
Trichloroethene	6/21	3 J	519	50SB02 (1)	17	
cis-1,2-Dichloroethene	1/21	156 J	156 J	50SB02 (1)	120	
n-Butylbenzene	1/21	4	4	50SB01 (1)		
SVOCs (µg/kg)						
Benzoic acid	1/21	388	388	50SS05 (1)	280,000	
Benzyl butyl phthalate	8/21	200	949	50SS04 (1)	4,000,000	
bis(2-Ethylhexyl) phthalate	9/21	195	398	50SB01 (1)	82,000	
Pesticides (µg/kg)						
p,p'-DDD	3/6	7.1	18	50SB06 (1)	15,000	
p,p'-DDE	4/6	10	45	50SB06 (1)	13,000	
p,p'-DDT	4/6	9	41	50SB06 (1)	17,000	
PCBs (µg/kg)						
PCB-1254 (Aroclor-1254)	3/4	79	430	50SB06 (1)	5,300	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	5/5	437.213	3,177.87	50SB06 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	5/5	10.885	432.18	50SB06 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	5/5	10.885	174.64	50SB06 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	3/5	4.625	53.46	50SB06 (1)		
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1/5	1.362	1.36	50SB06 (1)		

Table 11-4 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	3/5	1.32	5.61	50SB06 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1/5	3.097	3.1	50SB06 (1)		
Pentachlorinated dibenzo-p-dioxins (total)	1/5	1.102	1.1	50SB06 (1)		
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1/5	0.758	0.76	50SB06 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	5/5	2.927	78.89	50SB06 (1)		-
Heptachlorinated dibenzofurans (total)	5/5	1.393	27	50SB06 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	5/5	1.393	25.69	50SB06 (1)		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1/5	1.313	1.31	50SB06 (1)		
Hexachlorinated dibenzofurans (total)	5/5	1.434	48.37	50SB06 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	5/5	0.622	23.44	50SB06 (1)		
1,2,3,6,7,8-Hexachlorodibenzofuran	1/5	2.131	2.13	50SB06 (1)		
1,2,3,7,8,9-Hexachlorodibenzofuran	1/5	0.507	0.51	50SB06 (1)		
2,3,4,6,7,8-Hexachlorodibenzofuran	1/5	3.112	3.11	50SB06 (1)		
Pentachlorinated dibenzofurans (total)	4/5	1.524	32.7	50SB06 (1)		
1,2,3,7,8-Pentachlorodibenzofuran	1/5	10.89 J	10.89 J	50SB06 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCB = polychlorinated biphenyl
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

dioxin sediment result was an order of magnitude less than the soil results. The sediments are not contaminated with organics from Site 50.

11.4.2.2 Metals

Fourteen metals were detected above background in the sediment samples. Five metals (barium, beryllium, cadmium, lead, and selenium) were also detected at concentrations exceeding their respective PCLs.

Barium, with a PCL of 220 mg/kg, was detected above the PCL in one sample (50SD05) at a concentration of 310 mg/kg. Beryllium, with a PCL of 0.92 mg/kg, was detected above the PCL in five samples (50SD01, 50SD04, 50SD05, 50SD07, and 50SD08) at a maximum concentration of 2.66 mg/kg. Cadmium, with a PCL of 0.75 mg/kg, was detected above the PCL in one sample (50SD04) at a concentration of 0.923 mg/kg. Lead, with a PCL of 1.5 mg/kg, was detected above the PCL in four sample locations (50SD03, 50SD04, 50SD05, and 50SD08) at a maximum concentration of 71.7 mg/kg. Selenium, with a PCL of 1.1 mg/kg, was detected above the PCL in four samples (50SD03, 50SD04, 50SD05, and 50SD08) at a maximum concentration of 3.44 mg/kg. Sediment sample locations 50SD04 and 50SD05 each had four analytes exceeding both the background and PCL. These levels do not indicate significant contamination but are slightly elevated. Goose Prairie Creek sampling location 50SD06 is downstream of the site and did not have contamination above PCL levels. The upstream sampling location

Table 11-5
Summary of Detected Constituents in Sediment Samples, Site 50, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	9/9	2,600	9,200	50SD04 (1)	260,000	20,700
Arsenic	9/9	1.2	19.3	50SD08 (1)	13	29.7
Barium	9/9	19.8	310	50SD05 (1)	220	287
Beryllium	5/9	0.938	2.66	50SD08 (1)	0.92	NA
Cadmium	1/9	0.923	0.923	50SD04 (1)	0.75	ND
Calcium	9/9	480	5,600	50SD08 (1)		1,090
Chromium, total	9/9	8.2	59	50SD05 (1)	1,200	22.8
Cobalt	7/9	4.1	31	50SD05 (1)	2,000	19.1
Copper	8/9	3.8	24.2	50SD04 (1)	520	6.7
Iron	9/9	10,000	40,000	50SD05 (1)		31,000
Lead	9/9	7.74 J	71.7	50SD05 (1)	1.5	17.4
Magnesium	6/9	450	5,000	50SD07 (1)		474
Manganese	9/9	72.8 J	1,120	50SD05 (1)	5,100	2,330
Nickel	6/9	6.4	37	50SD07 (1)	230	6.3
Potassium	6/9	950	2,900	50SD05 (1)		481
Selenium	4/9	1.5	3.44	50SD04 (1)	1.1	ND
Sodium	3/9	230	900	50SD04 (1)		NA
Strontium	4/7	12	82	50SD07 (1)		13.3
Vanadium	9/9	19	81	50SD08 (1)	5,100	NA
Zinc	9/9	30	570	50SD04 (1)	3,500	16.2
Anions (µg/kg)						
Cyanide	1/6	947.9	947.9	50SD05 (1)	20,000	
Physical properties (mg/kg)						
Total organic carbon	6/6	201,000	785,000	50SD05 (1)		
VOCs (µg/kg)						
Acetone	3/8	1.7	11	50SD08 (1)	7,100	
Methyl ethyl ketone (2-butanone)	1/6	2.4	2.4	50SD08 (1)	44,000	
Methylene chloride	3/8	4.4	5.7	50SD08 (1)	6.5	
p-Cymene (p-isopropyltoluene)	1/8	14	14	50SD05 (1)		
Trichloroethene (TCE)	2/8	0.77	33	50SD02 (1)	17	
cis-1,2-Dichloroethene	1/8	115	115	50SD02 (1)	120	
Pesticides (µg/kg)						
p,p'-DDD	1/2	2.7	2.7	50SD08 (1)	15,000	
p,p'-DDT	1/2	3	3	50SD08 (1)	17,000	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	2/2	44.351	114.239	50SD06 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	2/2	4.568	6.63	50SD08 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2/2	2.015	2.141	50SD06 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	1/2	0.73	0.73	50SD08 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	2/2	0.391	0.752	50SD06 (1)		
Heptachlorinated dibenzofurans (total)	1/2	0.75	0.75	50SD06 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1/2	0.31	0.31	50SD06 (1)		
Hexachlorinated dibenzofurans (total)	1/2	0.74	0.74	50SD06 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	2/2	0.22	0.53	50SD06 (1)		
2,3,7,8-Tetrachlorodibenzofuran	2/3	0.299	0.386	50SD08 (1)		

J = value is estimated

LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
VOC = volatile organic compound

50SD05 had beryllium and lead concentrations above PCLs. Site 50 does not appear to be contributing to Goose Prairie Creek sediment contamination.

11.4.3 Surface Water Results

During the Phase III RI, six surface water samples were collected at Site 50 as shown on Figure 11-1. Table 11-6 presents detected constituent concentrations in surface water.

11.4.3.1 Organic compounds

Three VOCs (acetone, cis-1,2-DCE, and TCE) and two SVOCs [2,6-dinitrotoluene and bis(2-ethylhexyl) phthalate] were detected in surface water samples at concentrations below their TWQS and even drinking water standards.

Three dioxin/furan compounds (1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin, total heptachlorodibenzo-p-dioxin, and octachlorodibenzo-p-dioxin) were detected in surface water samples. There are no comparison criteria for dioxin/furan compounds. The maximum detected value was 3.70 µg/L for octachlorodibenzo-p-dioxin.

11.4.3.2 Metals

Fifteen metals were detected in the surface water samples. Aluminum, arsenic, copper, lead, thallium and zinc were detected at concentrations exceeding TWQS values. Aluminum was detected at six sample locations at concentrations ranging from 1.1 mg/L to 11 mg/L. Aluminum TWQS was exceeded in the Goose Prairie Creek samples, both upgradient and downgradient of Site 50. Copper was detected at 29 µg/L upstream of the site. Lead was detected between 3 and 6 µg/L throughout Goose Prairie Creek (compared to TWQS of 2.52 µg/L).

11.4.4 Groundwater Results

During the Phase III RI and additional investigations, eight groundwater samples were collected at Site 50. Monitoring well locations are presented on Figure 11-1. The Phase III groundwater samples were analyzed for VOCs, SVOCs, explosive compounds, and metals. One sample (50WW01) was also analyzed for pesticides/PCBs and dioxin/furan compounds. Three of the wells were later sampled for common anions only. Table 11-7 summarizes metal and VOC detected constituents in groundwater at Site 50.

11.4.4.1 Organic compounds

Six VOCs (1,1-DCE, 1,2-DCA, cis-1,2-DCE, PCE, TCE, and vinyl chloride) were detected in the groundwater samples from well 50WW02 at concentrations exceeding their respective PCLs. The TCE

Table 11-6
Summary of Detected Constituents in Surface Water Samples, Site 50, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	TWQS[a]
Metals (µg/L)					
Aluminum	7/7	1,100	11,000	50SW03 (1)	991
Antimony	6/7	5	57	50SW08 (1)	4,300
Arsenic	1/7	13	13	50SW03 (1)	1.4
Barium	1/7	290	290	50SW03 (1)	
Beryllium	1/7	1.4	1.4	50SW03 (1)	
Calcium	6/7	7,200	15,000	50SW08 (1)	
Chromium, total	1/7	10	10	50SW03 (1)	178
Copper	2/7	29	44	50SW03 (1)	12.3
Iron	7/7	1,500	12,000	50SW03 (1)	
Lead	7/7	3	69	50SW03 (1)	2.52
Manganese	6/7	19	1,200	50SW03 (1)	
Sodium	3/7	7,600	9,000	50SW07 (1)	
Strontium	3/7	60	80	50SW05 (2)	
Thallium	4/7	1.6	46	50SW08 (1)	6.3
Zinc	5/7	20	470	50SW04 (1)	104
Anions (µg/L)					
Cyanide	1/6	11	11	50SW05 (1)	10.7
Physical properties (mg/L)					
Hardness (as $CaCO_3$)	6/6	36	68	50SW08 (1)	
VOCs (µg/L)					
Acetone	1/6	2.9	2.9	50SW03 (1)	
Trichloroethene	2/6	4.4	12	50SW05 (1)	612
cis-1,2-Dichloroethene	1/6	3.3	3.3	50SW05 (1)	
SVOCs (µg/L)					
2,6-Dinitrotoluene	1/6	11	11	50SW05 (1)	
bis(2-Ethylhexyl) phthalate	1/6	7.3	7.3	50SW03 (1)	59
Dioxins (pg/L)					
Octachlorodibenzo-p-dioxin	4/4	63.162	369.214	50SW06 (1)	
Heptachlorinated dibenzo-p-dioxins (total)	3/4	2.691	17.74 J	50SW06 (1)	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2/4	8.043 J	9.8	50SW06 (1)	

[a]Lowest value of human health and aquatic life TWQS. Assumes hardness of 100 mg/L as $CaCO_3$.

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
RI = remedial investigation
SVOC = semivolatile organic compound
TWQS = Texas Water Quality Standards
VOC = volatile organic compound

level detected was 22 mg/L. TCE was also detected in monitoring well 50WW04 at a concentration that exceeded the PCL value. Also detected in groundwater samples collected from well 50WW02 was cis-1,2-DCE.

Three dioxin/furan compounds (1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin, total heptachlorodibenzo-p-dioxin and octachlorodibenzo-p-dioxin) were detected in the two groundwater samples at low concentrations (maximum of 275 pg/L).

Table 11-7
Summary of Detected Constituents in Groundwater Samples, Site 50, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Groundwater Background Value
Metals (µg/L)						
Aluminum	4/4	2,400 J	9,600 J	50WW01 (1)	73,000	13,400
Antimony	3/4	9	14	50WW02 (1)	6	ND
Beryllium	1/4	0.8	0.8	50WW01 (1)	4	NA
Calcium	4/4	12,000	200,000	50WW04 (1)		308,000
Chromium, total	4/4	30 J	200	50WW03 (1)	100	110
Copper	1/4	41	41	50WW03 (1)	1,300	43
Iron	4/4	3,600	11,000	50WW01 (1)		68,000
Lead	3/4	7	8	50WW01 (1)	15	300
Magnesium	4/4	9,600	100,000	50WW04 (1)		277,000
Manganese	4/4	98 J	1,110	50WW03 (1)	10,000	11,800
Nickel	3/4	60	690	50WW03 (1)	1,500	60
Sodium	4/4	140,000	790,000	50WW04 (1)		1,470,000
Strontium	4/4	250	3,400	50WW04 (1)	22,000	6,150
Zinc	4/4	30	50	50WW01 (1)	22,000	230
Anions (µg/L)						
Perchlorate	6/11	1.6	18,000	50WW02 (1)	66	
VOCs (µg/L)						
1,1,2-Trichloroethane	1/8	3.6	3.6	50WW02 (1)	5	
1,1-Dichloroethane	1/8	32	32	50WW02 (1)	7,300	
1,1-Dichloroethene	1/8	50	50	50WW02 (1)	7	
1,2-Dichlorobenzene	1/8	8.5	8.5	50WW02 (1)	600	
1,2-Dichloroethane	1/8	98	98	50WW02 (1)	5	
1,4-Dichlorobenzene	1/8	1.2	1.2	50WW02 (1)	75	
Benzene	1/8	2.2	2.2	50WW02 (1)	5	
Chloroform	2/8	0.63	25	50WW02 (1)	80	
Isopropylbenzene (cumene)	1/8	0.9	0.9	50WW02 (1)		
Methyl ethyl ketone (2-butanone)	1/9	440 J	440 J	50WW02 (1)	44,000	
Methylene chloride	1/8	1	1	50WW02 (1)	5	
Naphthalene	1/8	1.3	1.3	50WW02 (1)	1,500	
Tetrachloroethene	1/8	35	35	50WW02 (1)	5	
Toluene	1/8	0.69	0.69	50WW02 (1)	1,000	
Trichloroethene	8/9	0.57	22,000	50WW02 (1)	5	
Vinyl chloride	1/8	100	100	50WW02 (1)	2	
cis-1,2-Dichloroethene	7/9	0.64	4,400	50WW02 (1)	70	
trans-1,2-Dichloroethene	1/8	15	15	50WW02 (1)	100	
Dioxins (pg/L)						
Octachlorodibenzo-p-dioxin	1/1	275.671	275.671	50WW01 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	1/1	63.387	63.387	50WW01 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1/1	25.672	25.672	50WW01 (1)		
Explosives (µg/L)						
Tetryl	1/5	5.4 J	5.4 J	50WW02 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
VOC = volatile organic compound

11.4.4.2 Metals and anions

Four metals were detected in the groundwater samples at concentrations exceeding background with two of the metals (antimony and chromium) detected at concentrations that exceed PCL values. Antimony exceeded the PCL (0.006 mg/L) for groundwater in wells 50WW02 (0.014 mg/L), 50WW03 (0.011 mg/L), and 50WW04 (0.009 mg/L), while chromium exceeded background and the PCL (0.1 mg/L) for groundwater in well 50WW03 (0.2 mg/L). These are relatively low levels of groundwater contamination.

However, perchlorate levels were quite high (18,000 µg/L) in well 50WW02. Well 50WW03 also had elevated levels of perchlorate. Just on the other side of 51st Street from the site is a significant source of perchlorate—the soil near Building 25C. This is the likely source of the groundwater perchlorate contamination.

11.5 CONTAMINANT FATE AND TRANSPORT

There was no significant contamination in the soil that could act as a source of contaminant migration. Likewise, due to the very low levels (and consistent levels between upstream and downstream locations) in sediment and surface water, there is no evidence of impact on these media from Site 50. The groundwater does have elevated VOC levels, primarily in the center of the site, and yet the source is unknown. The release of collected sump water is unlikely to have caused such high levels of VOCs in 50WW02. The high perchlorate levels in the groundwater are most likely from another source such as soils around Building 25C.

The chlorinated hydrocarbon compounds in groundwater at Site 50—1,1-DCE; 1,2-DCA; cis-1,2-DCE; PCE; TCE; and vinyl chloride—can be biologically degraded, but only under severely reducing conditions. There is no evidence that the conditions at Site 50 are reducing. Thus, these compounds will travel with the groundwater until they either enter a reducing environment, or are diluted and dispersed to less than their respective detection limits. Perchlorate and VOCs may be entering Goose Prairie Creek although current monitoring results show little current impacts.

12.0 SITE 60: PESTICIDE STORAGE BUILDINGS

This section presents the results of the investigation activities performed at Site 60 (Pesticide Storage Buildings). The purpose of the RI was to define the nature and extent and fate and transport of soil, sediment, and surface water contamination at the site. This section describes the site background, physical characteristics, and investigations activities. It compiles the analytical data generated during the Group 5 site investigation, and Phase I and Phase III work to document the nature and extent of the contamination detected at Site 60.

12.1 SITE BACKGROUND

12.1.1 Site Description

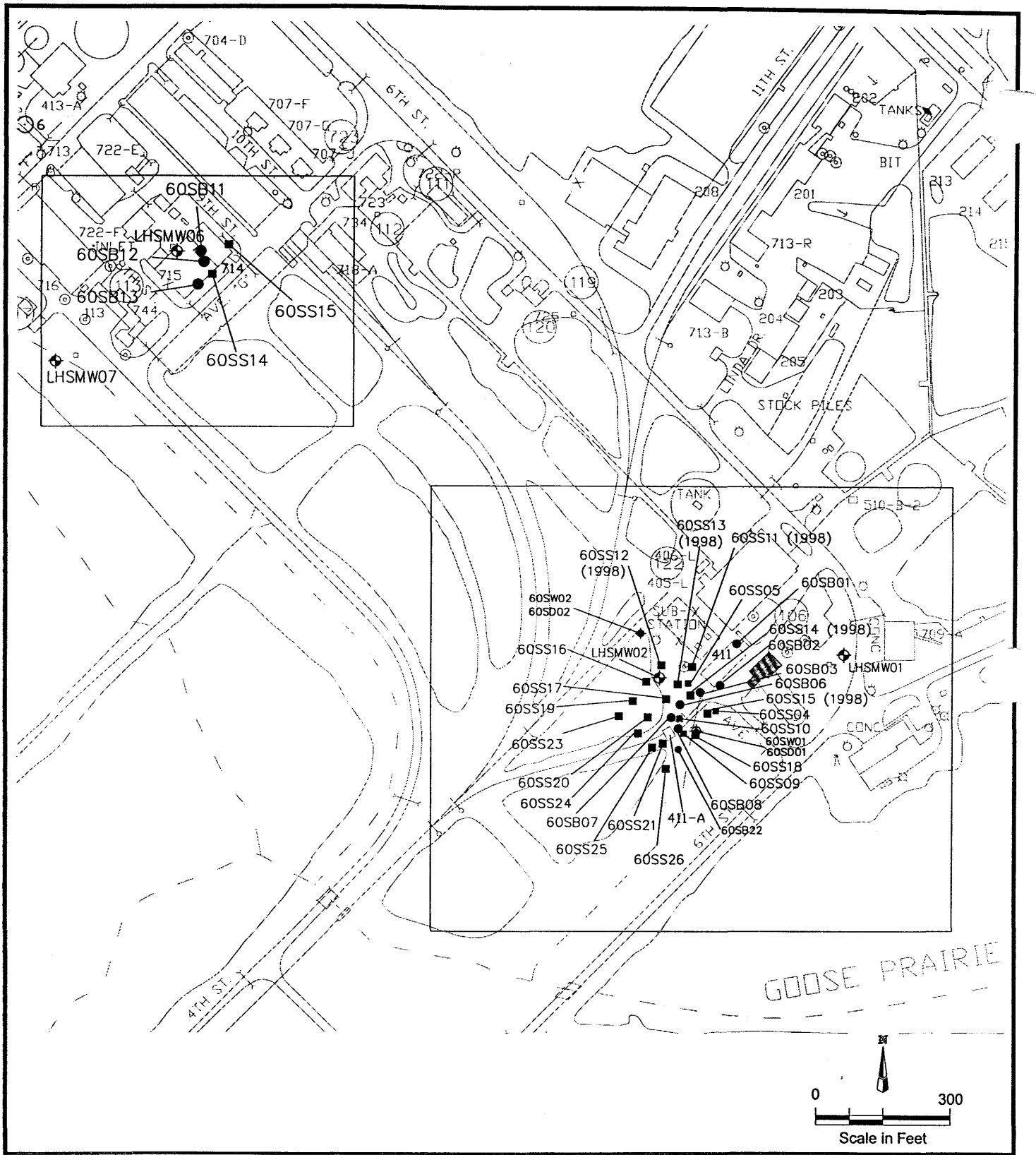
Site 60 consists of three buildings (411, 411A and 714) and a shed (TS-80). These buildings were reportedly used for the storage of pesticides and herbicides. Buildings 411 and 411A and shed TS-80 were located on the west side of Avenue T (Figure 12-1). Building 714 was located on 9th Street, northwest of Avenue G. Building 714 was located approximately 500 feet northwest of the area encompassing Buildings 411 and 411A, and Shed TS-80. The three buildings had concrete floors with no curbs at entryways, and the shed had an earthen floor.

12.1.2 Site History

Records indicated that pesticides and herbicides were originally stored in Building 714 and that, in 1970, the stock was moved to Building 411. A site visit and communications with LHAAP personnel indicated Building 411A and Shed TS-80, not Building 411, may have been used as a pesticide and herbicide storage area. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Two sumps (S-106 and S-122) are located near Buildings 411 and 411A and Shed TS-80; one sump (S-113) is located near Building 714. Sump S-113 is included in the Site 35A discussion. Information on the capacity, dimensions, and operational status of these sumps can be found in Section 4.0 of this report. The current site layout is shown on Figure 12-1.

12.2 PHYSICAL CHARACTERISTICS OF SITE

This section describes physical conditions at Site 60. Subjects addressed include surface features and hydrology, geology and soils, and hydrogeology. Information presented in this section is based on data obtained from the investigation activities and the reports documenting previous investigations.



Legend

- ■ Shallow Soil Sampling Location
- ● Soil Boring Sampling Location
- ◆ Sediment Sampling Location
- ⊕ Surface Water Sampling Location
- ✦ Shallow Monitoring Well

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Site 60 Sampling Locations
Group 4 Remedial Investigatic

Longhorn Army Ammunition Plant
Karnack, Texas

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Figure 12-1

12.2.1 Surface Features and Hydrology

Site 60 is located in the northwestern portion of LHAAP near the steam plant and shops area within Site 35A. Surface features at the site include asphalt paved roads and parking areas around the buildings. Buildings 411 and 411A and Shed TS-80 encompasses approximately 1 acre as shown on Figure 12-1. Building 714 encompasses approximately 0.25 acres. The area around the buildings is open with grass-lined drainage ditches and a graveled, fenced-in storage area.

Runoff from the area of Building 411 is generally into grated culverts around the building. Runoff from the area of Building 411A and Shed TS-80 is generally toward the southeast. Runoff and culvert discharge are collected by a drainage ditch that arcs between areas of Buildings 411 and 411A and eventually empties into Goose Prairie Creek.

Runoff from the area of Building 714 is generally into a grass-lined drainage ditch parallel to 9th Street and Avenue G. This drainage ditch carries runoff southwest, parallel to Avenue G, into a tributary of Goose Prairie Creek.

12.2.2 Geology and Soils

General soil and geologic maps indicate that the site is situated on the outcrop of the Wilcox Group. The Wilcox Group materials at the site generally consist of a few feet of residually derived soils and fill material overlying silts, clays, and sands of the Wilcox Group.

Surficial soils in the area of Buildings 411 and 411A range in thickness from 0 to 1.9 feet and consist of brown, silty sand grading into a gray-to-brown silt and clay. This material is underlain by gray clay, silt, and silty sand layers to a depth greater than 9 feet. The soils encountered in the soil borings were generally moist with some thin saturated zones.

Surficial soils in the area of Building 714 range in thickness from 0 to 1 foot and consist of brown, silty sand grading into gray clay. This material is underlain by a gray clay layer with a few silty sand zones to a depth greater than 9 feet.

12.2.3 Hydrogeology

No monitoring wells have been installed as part of a Site 60 investigation activity. However, several exist in the area and are discussed in detail in Section 5.0, Site 35A. The general groundwater flow direction in the shallow saturated zone, based on the site-wide LHAAP potentiometric surface map (Figure 1-3), is to the northeast.

12.3 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the activities completed during the Phase I RI, 1995 Group 5 site investigation, and Phase III RI at Site 60. Subjects addressed include surface water, sediment, and soil investigations. Results from groundwater investigation at Site 35A that are relevant are reiterated here. Table 12-1 summarizes the field activities completed during each investigation phase.

12.3.1 Source Investigation

The primary sources of potential contaminants at Site 60 are the pesticides and herbicide storage within the buildings as well as the material that may have been spilled during operations. A media sampling and analysis program was developed for Site 60 to assist in determining whether a release of potential contaminants from previous operations has impacted the area sediments, surface water, and soils. No source material remains to be sampled.

12.3.2 Surface Water and Sediment Investigation

During the Phase III RI, two sediment samples (60SD01 and 60SD02) and two surface water samples (60SW01 and 60SW02) were collected at the locations shown on Figure 12-1. The areas targeted for investigation were in drainage ways along the northwestern and southeastern areas of the site. Surface water and sediment samples were analyzed for pesticides and herbicides.

12.3.3 Surface and Subsurface Soil Investigation

During the Phase I investigation, two soil borings (LHS12201 and LHS12202) were completed near sump S-122. These are not shown on Figure 9-1 but are located near the sump. A 0.5-foot bgs surface and a

Table 12-1
Investigation Activities, Site 60, Group 4 RI, LHAAP, Karnack, Texas

Phase I
• Completed 2 soil borings (LHS12201 and LHS12202) at sump S-122
Group 5 SI
• Collected 15 surface soil samples (60SS01 through 60SS15) • Collected 27 soil samples (60SB01 through 60SB03, 60SB06 through 60SB08, 60SB11 through 60SB13) at intervals of 1–3, 3–5, and 5–7 feet from 9 soil boring locations
Phase III
• 2 sediment and 2 surface water samples were collected (60SD01 and 60SD02 and 60SW01 and 60SW02) • Collected 18 soil samples (60SS11 through 60SS21, 60SB22, and 60SS23 through 60SS26) from 16 sample locations • Collected 1 surface and 1 subsurface soil sample near sump S-122

LHAAP = Longhorn Army Ammunition Plant
RI = remedial investigation
SI = site investigation

4-foot bgs subsurface soil sample were collected from each boring. A second subsurface soil sample was also collected from boring LHS12202 at 5.4 feet bgs. All five soil samples were submitted for laboratory analyses for VOCs, SVOCs, and metals.

During the Group 5 site investigation, 42 soil samples were collected from 24 locations (60SS01 through 60SS15, 60SB01 through 60SB03, 60SB06 through 60SB08, and 60SB11 through 60SB13) and analyzed for pesticides and herbicides. Samples collected from locations 60SS01 through 60SS15 were surface soil samples, while samples from locations 60SB01 through 60SB03, 60SB06 through 60SB08, and 60SB11 through 60SB13 were collected from 1 to 3, 3 to 5, and 7 to 9 feet bgs.

During the Phase III RI, 18 soil samples were collected from 16 locations (60SS11 through 60SS21, 60SB22, and 60SS23 through 60SS26) and analyzed for pesticides and herbicides. The three samples collected from soil boring 60SB22 were also analyzed for VOCs, SVOCs, PCBs, explosive compounds, metals, and dioxins/furans. There was an error in location identification during the Phase III RI that used sample location numbers 60SS11 through 60SS14 in the area of Buildings 411 and 411A. These location identifications were already used during the site investigation field activities in the area of Building 714. However, since unique sample numbers were used at each location, the results for each location are discernable from the others.

Additionally, during the Phase III RI, surface (0 to 0.5 feet) and subsurface (3 to 5 feet) soil samples were collected near sump S-122 and analyzed for pesticides, PCBs, dioxins/furans, and metals.

Recovered soil samples from each soil boring were visually classified for lithologic characteristics using the USCS and recorded on the geologic boring logs presented in Appendix A. Soil samples were screened in the field with an ionization detector (PID or FID) to detect the presence of VOCs in the samples.

12.3.4 Groundwater Investigation

Wells LHSMW06 and LHSMW02, part of Site 35A investigations, are located adjacent to the pesticide buildings. Three rounds of sampling for VOC, SVOC, explosive, and metals analyses have been conducted. Pesticide analysis has not been conducted on samples from these wells. Results from these wells will be used in the fate and transport section. See Section 5.0 for a nature and extent discussion.

12.4 NATURE AND EXTENT OF CONTAMINATION

Site investigations to delineate the extent of contamination resulting from past activities at Site 60 included the Phase I RI in 1993, the Group 5 site investigation performed in 1995, and the Group 4 Phase III RI conducted in 1998. The following sections summarize the detected compounds and associated concentrations for the soil, sediment, and surface water samples. The media tested and analyses performed during each investigation are summarized in Table 12-2.

Table 12-2
Analytical Test Summary, Site 60, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests							
	VOCs	SVOCs	Pesticides	PCBs	Herbicides	Dioxins/ Furans	Metals	Explosive Compounds
Phase I								
Surface Soil	2	2					2	
Subsurface Soil	3	3					3	
Group 5 SI								
Surface Soil			15		15			-
Subsurface Soil			27		27			
Phase III								
Surface Water			2		2			
Sediment			2		2			
Surface Soil	1	1	17	2	16	2	2	2
Subsurface Soil	2	2	3	3		3	3	3

LHAAP = Longhorn Army Ammunition Plant
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
SI = site investigation
VOC = volatile organic compound

The following subsections summarize the compounds detected for each medium sampled at Site 60. The analytical results are compared and compounds that exceeded the TRRP Tier I PCLs and LHAAP background values, where applicable, are identified.

12.4.1 Soil Results

A total of 34 surface and 33 subsurface soil samples were collected during the Phase I RI, Group 5 site investigation, and Phase III RI sampling at Site 60. Soil samples were analyzed for some or all of the following: VOCs, SVOCs, pesticides/PCBs, herbicides, explosive compounds, dioxins/furans, and metals. Table 12-3 summarizes detected results.

12.4.1.1 Organic compounds

Five soil samples were collected from two soil borings located near sump S-122 during the Phase I RI. No VOCs or explosive compounds were detected. Di-n-butylphthalate was detected at a concentration of 347 µg/kg in the sample collected from 0.5 to 1.0 feet bgs.

During the Group 5 site investigation and Phase III RI, five pesticide compounds (aldrin, dieldrin, endosulfan sulfate, 4,4'-DDE, and 4-4'-DDT) were detected in the soil samples collected at Site 60. Aldrin was detected in one sample at an estimated concentration of 2.4J µg/kg, dieldrin was detected in three samples at a maximum concentration of 25,404 µg/kg, endosulfan sulfate was detected in one sample at an estimated concentration of 0.7J µg/kg, 4,4'-DDE was detected in six samples with a maximum concentration of 203 µg/kg, and 4-4'-DDT was detected in three samples at a maximum

Table 12-3
Summary of Detected Constituents in Soil Samples, Site 60, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	8/8	2,900	17,800	LHS12201 (1)	260,000	20,700
Arsenic	8/8	1.54	4.6	LHS12202 (1)	13	29.7
Barium	8/8	46	169	LHS12202 (1)	220	287
Calcium	6/8	540	1,520	LHS12202 (1)		1,090
Chromium, total	8/8	5.9	20.6	LHS12201 (1)	1,200	22.8
Cobalt	5/8	5.8	10.2	LHS12201 (1)	2,000	19.1
Copper	6/8	3.8	7.2	LHS12201 (1)	520	6.7
Iron	8/8	4,700	18,000	LHS12201 (1)		31,000
Lead	8/8	5.25	14.1	LHS12202 (1)	1.5	17.4
Magnesium	5/8	951	1,290	LHS12201 (1)		474
Manganese	8/8	173	610	LHS12202 (1)	5,100	2,330
Nickel	3/5	4.8	13	SUMP122 (1)	230	6.3
Potassium	6/8	590	1,910	LHS12201 (1)		481
Selenium	1/8	1.78	1.78	60SB22 (1)	1.1	ND
Strontium	5/8	18.5	40.1	LHS12201 (1)		13.3
Vanadium	5/5	10	37	SUMP122 (1)	5,100	NA
Zinc	8/8	6.4	33.9	LHS12201 (1)	3,500	16.2
SVOCs (µg/kg)						
Di-n-butyl phthalate	1/8	347	347	LH-S122-02 (1)	5,000,000	
Pesticides (µg/kg)						
Aldrin	1/62	2.4 J	2.4 J	60SB13 (1)	120	
Dieldrin	3/62	6.3	25,404	60SS03 (1)	55	
Endosulfan sulfate	1/62	0.7 J	0.7 J	60SB13 (1)	7,000,000	
p,p'-DDE	6/62	18.73	203	60SS12 (1)	13,000	
p,p'-DDT	3/62	16.07 J	458 J	60SS01 (1)	17,000	
Herbicides (µg/kg)						
Silvex (2,4,5-TP)	2/58	4.18	6.02	60SS07 (1)	2,600	
Dioxins (ng/kg)						
Octachlorodibenzo-p-dioxin	5/5	225.256	13,645.17	SUMP122 (1)		
Heptachlorinated dibenzo-p-dioxins (total)	5/5	6.596	132.396	SUMP122 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	5/5	2.622	62.824	SUMP122 (1)		
Hexachlorinated dibenzo-p-dioxins (total)	4/5	1.026 J	3.661	60SB22 (1)		
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1/5	1.442	1.442	SUMP122 (1)		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1/5	1.904	1.904	SUMP122 (1)		
Furans (ng/kg)						
Octachlorodibenzofuran	3/5	2.048	26.55	SUMP122 (1)		
Heptachlorinated dibenzofurans (total)	1/5	9.686	9.686	SUMP122 (1)		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3/5	0.877 J	9.686	SUMP122 (1)		
Hexachlorinated dibenzofurans (total)	2/5	2.729	21.008	SUMP122 (1)		
1,2,3,4,7,8-Hexachlorodibenzofuran	3/5	0.695	18.717	SUMP122 (1)		
Pentachlorinated dibenzofurans (total)	1/5	12.124	12.124	SUMP122 (1)		
1,2,3,7,8-Pentachlorodibenzofuran	1/5	2.002	2.002	SUMP122 (1)		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound

estimated concentration of 458Jμg/kg. The dieldrin concentration of 25,404 μg/kg from surface soil sample LH60SS03 far exceeded the PCL value of 55 μg/kg. One herbicide, silvex, was detected twice at concentrations of 4.18 μg/kg and 6.02 μg/kg. Thirteen dioxins/furans were detected in soil samples; however, these were at low levels similar to those found throughout LHAAP. The maximum octachlorodibenzo-p-dioxin result was 1.4 μg/kg; roughly 40 percent of the detected results at LHAAP were greater.

12.4.1.2 Metals

In the two surface soil samples collected during the Phase I RI, five metals (copper, magnesium, potassium, strontium, and zinc) were detected at concentrations exceeding the LHAAP background levels for surface soil, however none of these results exceeded their respective PCL. In the three subsurface soil samples, three metals (barium, lead, and manganese) were detected at concentrations exceeding the LHAAP background levels for subsurface soil. Lead was detected at 14.1 mg/kg in the sample from 5.4 to 5.9 feet bgs at location LH12202, which is higher than both the PCL (1.5 mg/kg) and subsurface background (13.0 mg/kg).

During Phase III, three metals (potassium, selenium, and vanadium) were detected at concentrations exceeding the LHAAP background. Selenium was detected at a concentration of 1.78 mg/kg, exceeding both the background (0.3 mg/kg) and PCL (1.1 mg/kg). Nickel and vanadium were detected at concentrations greater than the LHAAP background in samples collected near sump S-122 during the Phase III work but neither exceeded their respective PCL value. These metal levels are not indicative of a nearby source of contamination.

12.4.2 Sediment and Surface Water Results

Two sediment and two surface water samples were collected during Phase III at Site 60 and analyzed for pesticides and herbicides. No detectable concentrations of pesticides or herbicides were identified.

12.5 CONTAMINANT FATE AND TRANSPORT

Five pesticides (aldrin, dieldrin, endosulfan sulfate, 4,4'-DDE, and 4-4'-DDT) and one herbicide (silvex) were detected in the soil samples collected at Site 60. Many were estimated concentrations below the detection limit or low level detections. However, the high concentration of dieldrin (25,404 μg/kg) at sample location 60SS03 far exceeded the PCL value of 55 μg/kg. Dieldrin has a very limited solubility (0.2 mg/L) and a low vapor pressure. The compound will remain in the soil. Estimated degradation rates in humid soils indicate that the half-life of dieldrin will be many years.

Since groundwater pesticide samples have not been collected at Site 60, it is unclear whether dieldrin has migrated to groundwater. Groundwater in LHSMW06 has very low levels (<2 μg/L) of VOCs; however,

no VOCs are present in the overlying soils. No VOCs were detected in LHSMW02. Except for 260 µg/L of chromium in LHSMW06, metals in samples from these wells were detected below PCLs. Existing information shows no impact to underlying groundwater. However, dieldrin could have migrated to the underlying groundwater.

13.0 GOOSE PRAIRIE CREEK AND WETLAND

This section presents the results of the sampling activities performed at Goose Prairie Creek and Goose Prairie Wetland. The purpose of this sampling was to define the condition of sediments and surface water at locations within the LHAAP facility and at the wetland area near Caddo Lake. It includes results of the sediment sampling conducted in 2000 at the north and south portion of Goose Prairie Creek Cove and at the three other drainages at LHAAP. This section describes the analytical data generated during the Phase II and Phase III RI work, the 2000 sediment sampling, and periodic surface water sampling in Goose Prairie Creek. These results document the condition of the Goose Prairie Creek at various locations at the facility.

Goose Prairie Creek is one of four major drainage systems on the LHAAP facility. The three other drainages include Saunder's Branch, Harrison Bayou, and Central Creek. The headwaters of Goose Prairie Creek are located near the northwest corner of the plant and consist of one larger creek and several smaller tributaries. Goose Prairie Creek flows across the northern edge of the installation and drains approximately 30 percent of LHAAP. Goose Prairie eventually empties into Caddo Lake on the eastern side of the facility. A wetlands area is formed at the confluence of Goose Prairie Creek and Caddo Lake.

13.1 REMEDIAL INVESTIGATION ACTIVITIES

This section describes the activities completed during the Phase II and Phase III investigations associated with Goose Prairie Creek and the wetland. It also discusses sediment samples collected in Caddo Lake as well as the results from quarterly sampling of Goose Prairie Creek. Subjects addressed include surface water, sediment, and shallow groundwater investigations. Table 13-1 summarizes the field activities completed during each investigation phase. The sediment and surface water sampling locations for the RI and quarterly sampling locations are shown on Figure 13-1.

13.1.1 Source Investigation

One of the potential sources of contaminants for Goose Prairie Creek is the migration of contaminated shallow groundwater from Plant 3 Area, Site 47. To determine the condition of the shallow groundwater in the area east-southeast of Site 47 and along the creek adjacent to Marshall Avenue, 30 shallow groundwater samples (47PB01 through 47PB30) were collected at the locations shown on Figure 13-2 and were analyzed for VOCs.

Table 13-1
Goose Prairie Creek and Wetland Investigation Activities, Group 4 RI, LHAAP, Karnack, Texas

Phase II
• Collected 4 surface water samples (LHS-GPC-01, LHS-GPC-03, LHS-GPC-05, and LHS-GPC-07) and 4 sediment samples (LHS-GPC-02, LHS-GPC-04, LHS-GPC-06, and LHS-GPC-08)
Phase III
• Collected 30 shallow groundwater using geoprobe sampler • Collected 10 sediment and 10 surface water samples (GPCSD01 through GPCSD10) and (GPCSW01 through GPCSW10) along Goose Prairie Creek • Collected 4 sediment samples (GPWSD01 through GPWSD04) and 4 surface water samples (GPWSW01 through GPWSW04) in the wetland area of Goose Prairie Creek at Caddo Lake
Additional Investigations
• Collected 8 lake sediment samples (4 in the North Cove and 4 in the South Cove) at Goose Prairie Creek Cove in 2000 • Collected 6 sediment samples at 2 locations from Caddo Lake at Saunder's Branch in 2000 • Collected 12 sediment samples at 3 locations from Caddo Lake at Harrison Bayou in 2000 • Collected 6 sediment samples at 2 locations from Caddo Lake at Central Creek in 2000 • Collected surface water samples at 10 sampling locations on Goose Prairie Creek between 1996 and December 2000

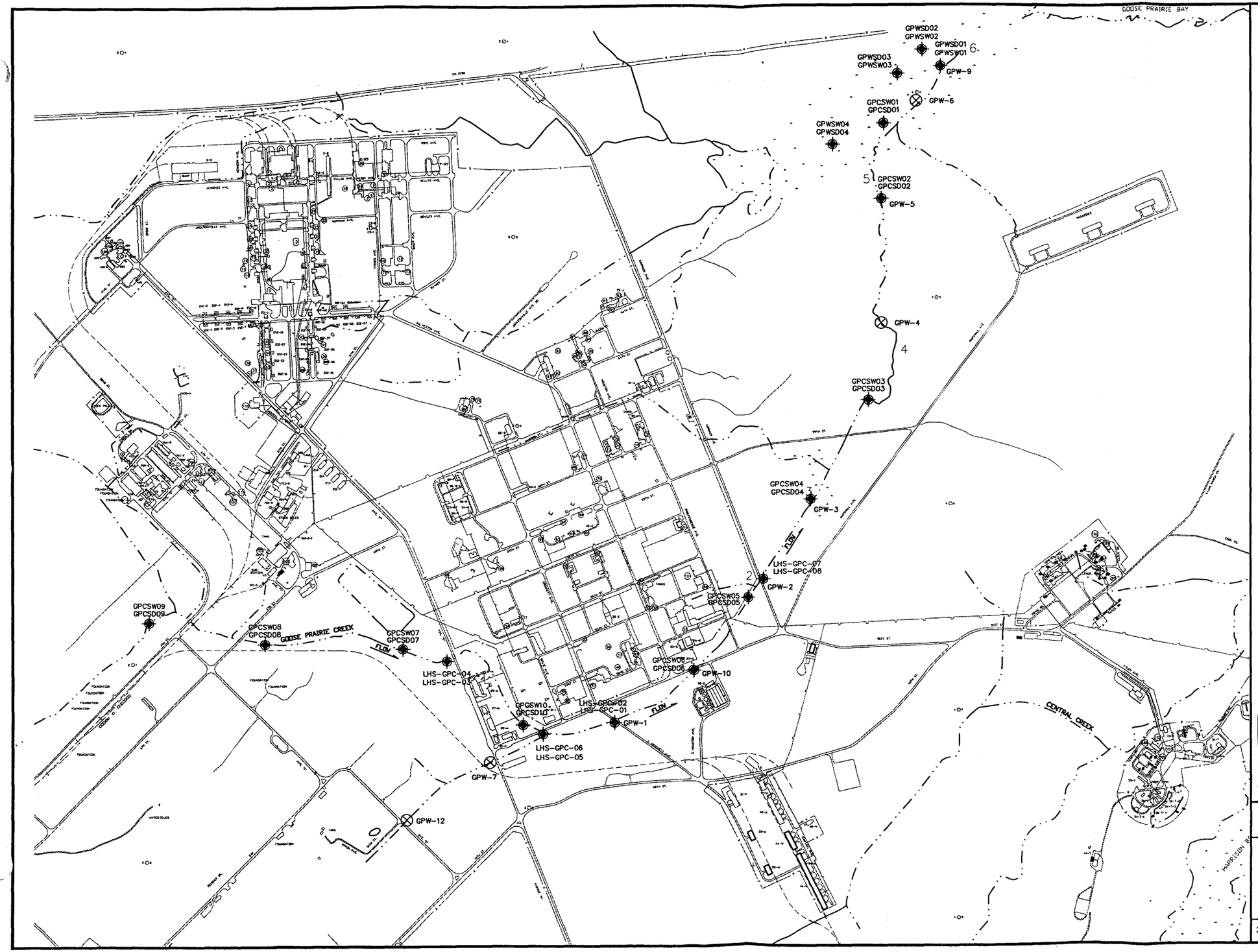
LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

13.1.2 Surface Water and Sediment Investigation

During the Phase II investigation four sediment samples (LHS-GPC-02, LHS-GPC-04, LHS-GPC-06 and LHS-GPC-08) and four surface water samples (LHS-GPC-01, LHS-GPC-03, LHS-GPC-05, and LHS-GPC-07) were collected at the locations shown on Figure 13-1. The areas targeted for investigation were creek locations west, south, and east of Plant 3 Area, Site 47. Surface water and sediment samples were analyzed for VOCs, SVOCs, and metals. Sediment samples were also analyzed for explosive compounds.

Ten sediment and ten surface water samples were collected during the Phase III investigations (GPCSD01 through GPCSD10 and GPCSW01 through GPCSW10). Sample locations were spaced along Goose Prairie Creek from upstream of Site 47 to Caddo Lake. Surface water and sediment samples were analyzed for VOCs, SVOCs, explosive compounds, pesticides/PCBs, cyanide, and metals. The samples collected from GPCSD/SW03, GPCSD/SW06, and GPCSD/SW08 were also analyzed for dioxins/furans. Surface water samples were also analyzed for hardness, and sediment samples were analyzed for grain size distribution and TOC.

During the Phase III investigation, four sediment and four surface water samples (GPWSD01 through GPWSD04 and GPWSW01 through GPWSW04) were collected in the wetland area where Goose Prairie Creek drains into Caddo Lake. The wetland surface water and sediment samples were analyzed for VOCs, SVOCs, explosive compounds, pesticides/PCBs, cyanides, and metals. The samples collected



Legend

- RI Surface Water Sampling Location
- RI Sediment Sampling Location
- COE Surface Water Sampling Location

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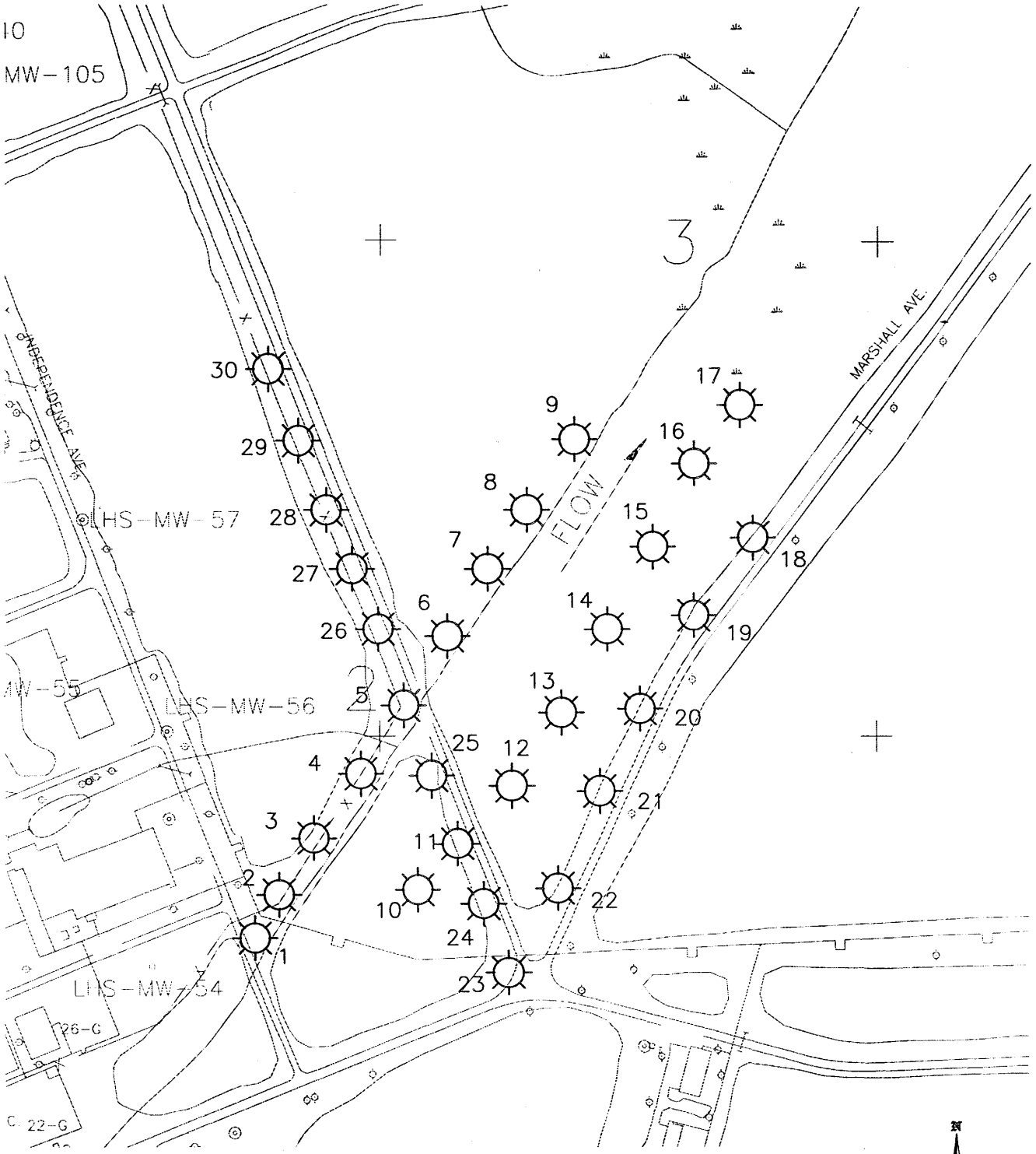
Goose Prairie Creek
Sampling Locations
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Kamack, Texas

31Dec01 - Figure 13-1.DWG | Figure 13-1



NOTE: GEOPROBE SITE-ID PREFIX "47PB" NOT SHOWN FOR CLARITY

Legend

GEOPROBE LOCATIONS

US Army Corps of Engineers Tulsa District

JACOBS

Goose Prairie Creek
Geoprobe Location
Group 4 Remedial Investigation

Longhorn Army Ammunition Plant
Karnack, Texas

08Oct01 - Fig_13-2.DWG

Figure 13-2

from GPWSD01/SW01 and GPWSD04/SW04 were also analyzed for dioxins/furans. Wetland surface water samples were also analyzed for hardness and sediment samples were analyzed for grain size distribution and TOC.

In 2000, the USACE collected sediment samples from the three other LHAAP surface water drainage systems at their discharge points into Caddo Lake and from the wetlands area in Goose Prairie Creek Cove (Figure 13-3). The drainage systems included Saunder's Branch, Harrison Bayou, and Central Creek.

Six sediment samples were collected at three depths from two sample locations (CL-SBS-1 and CL-SBS-2) near Saunder's Branch. Twelve sediment samples were collected at three depths from four sample locations (CL-HBS-1 through CL-HBS-4) near Harrison Bayou. Six sediment samples were collected at three depths from two sample locations (CL-CCS-1 and CL-CCS-2) near Central Creek. All sediment samples were analyzed for VOCs, SVOCs, explosive compounds, chlorinated and organophosphorus pesticides, herbicides, PCBs, and metals. One sample each from Saunder's Branch (CL-SBS-2) and Central Creek (LC-CCS-1) and two samples from Harrison Bayou (CL-HBS-2 and CL-HBS-4) were also analyzed for dioxins/furans.

Eight sediment samples were collected from Goose Prairie Creek Cove: four from the North Cove and four from the South Cove. Sediment samples were analyzed for VOCs, SVOCs, explosive compounds, chlorinated and organophosphorus pesticides, herbicides, PCBs, metals, dioxins/furans, perchlorate, and TOC.

Ten times between August 1996 and December 2000 USACE collected samples of surface water at up to ten locations on Goose Prairie Creek. The locations are shown on Figure 13-1. In general, the samples were analyzed for VOCs and explosives. In 1996, metal analyses were also conducted.

13.2 NATURE AND EXTENT OF CONTAMINATION

Investigations to delineate the extent of contamination in Goose Prairie Creek resulting from past LHAAP facility operations included sampling events during the Phase II and Phase III RI and sediment sampling in 2000. The following sections summarize the detected compounds and associated concentrations for the groundwater, sediments, and surface water. In general, the media tested and analyses performed during each investigation are summarized in Table 13-2. Appendix C contains tables of detected compounds by media.

The following subsections summarize the compounds detected for each medium sampled at Goose Prairie Creek. The analytical results are compared to comparison criteria. For surface water, TWQS are

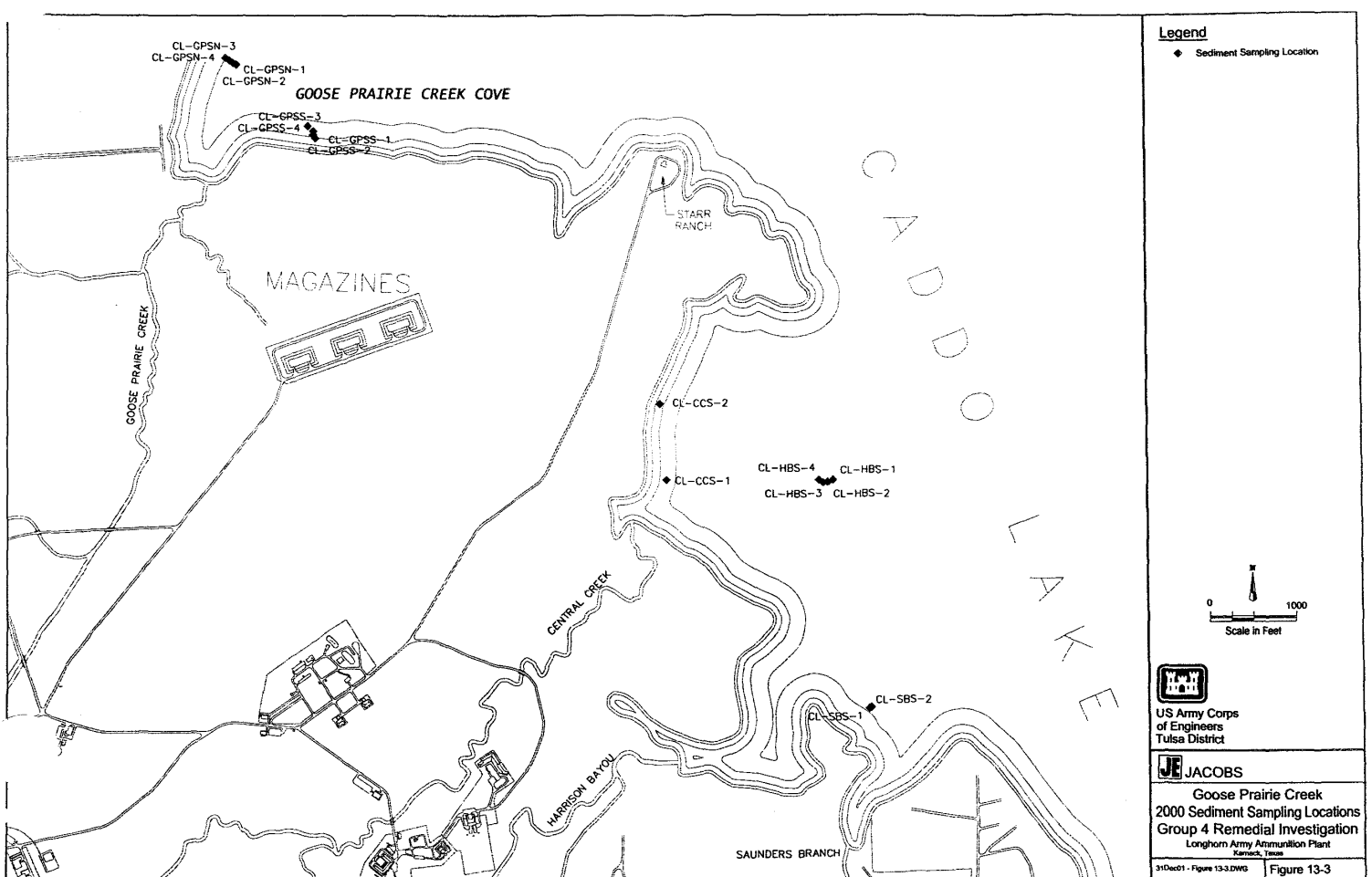

CL-GPSN-3
CL-GPSN-4
CL-GPSN-1
CL-GPSN-2
GOOSE PRAIRIE CREEK COVE
CL-GPSS-3
CL-GPSS-4
CL-GPSS-1
CL-GPSS-2
STARR RANCH
MAGAZINES
GOOSE PRAIRIE CREEK
CADDO LAKE
CL-CCS-2
CL-CCS-1
CL-HBS-4
CL-HBS-1
CL-HBS-3
CL-HBS-2
CENTRAL CREEK
CL-SBS-2
CL-SBS-1
HARRISON BAYOU
SAUNDERS BRANCH
Legend
Sediment Sampling Location
N
0
1000
Scale in Feet
US Army Corps
of Engineers
Tulsa District
JACOBS
Goose Prairie Creek
2000 Sediment Sampling Locations
Group 4 Remedial Investigation
Longhorn Army Ammunition Plant
Karnack, Texas
31Dec01 - Figure 13-3.DWG
Figure 13-3

Table 13-2
Analytical Test Summary for Goose Prairie Creek and Wetland, Group 4 RI, LHAAP, Karnack, Texas

Investigation/ Medium	Analytical Tests							
	VOCs	SVOCs	PCBs/ Pesticides	Explosive Compounds	Dioxins/ Furans	Metals	Cyanide	Perchlorate
Phase II								
Sediment	4	4		4		4		
Surface Water	4	4				4		
Phase III								
Sediment	14	14	14	14	5	14	14	
Surface Water	14	14	14	14	5	14		
Groundwater	30							
Additional Investigations								
Sediment	32	32	32*	32	12	32		8
Surface Water	10 rounds					1 round		2 rounds

* Samples were analyzed for chlorinated and organophosphorus pesticides and PCBs.

LHAAP = Longhorn Army Ammunition Plant
PCB = polychlorinated biphenyl
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

used for comparison. Groundwater comparisons are to the TNRCC groundwater PCLs while sediment is compared to TNRCC soil PCLs.

13.2.1 Source Results

Thirty geoprobe borings were advanced to collect shallow groundwater adjacent to Goose Prairie Creek south and east of Site 47 during the Phase II field activities (Figure 13-2). Sixteen VOCs were detected in the shallow groundwater samples as indicated in Table 13-3. Twelve of the 16 VOCs were chlorinated compounds. The other four VOCs were benzene, naphthalene, toluene, and xylene. Benzene was detected in only one sample (47PB16). TCE was detected at concentrations ranging from 1.75 µg/L to 43,000 µg/L in the shallow groundwater at each location except 47PB22. The PCL for TCE in groundwater is 5 µg/L. 1,1-DCE (maximum of 183 µg/L), cis-1,2-DCE (maximum of 14,000 µg/L) and vinyl chloride (maximum of 169 µg/L) were also notable detections. Nine of the 30 sample locations (47PB7, 47PB8, 47PB9, 47PB11, 47PB15, 47PB16, 47PB17, 47PB26, and 47PB27) had seven or more VOC constituents detected. The highest TCE concentrations (>10,000 µg/L) were found in 47PB7, 47PB8 along Goose Prairie Creek and 47PB13, 47PB15, 47PB26, and 47PB27, set back 150–300 feet from the creek. Because lower levels of TCE were also found at interspersed locations, a clear extent of TCE contamination cannot be identified.

Table 13-3
Groundwater Detection Summary, Group 4 RI, Goose Prairie Creek/Site 47, LHAAP, Karnack, Texas

Volatile Organic Compound (µg/L)	Frequency of Detects	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL
Xylene	9/30	1.07 J	10.69 J	47PB27	10,000
Benzene	1/30	1.54 J	1.5 J	47PB16	5
1,1-Dichloroethene	15/30	2.81 J	169	47PB07	7
1,1-Dichloroethane	11/30	1.03 J	27.4	47PB26	7,300
1,2-Dichloroethane	2/30	1.74 J	10.1	47PB06	- 5
cis-1,2-Dichloroethene	25/30	8.89	14,000	47PB15	70
trans-1,2-Dichloroethene	10/30	1.33 J	6.82	47PB27	100
Tetrachloroethene	3/30	2.08 J	3.88 J	47PB27	5
Trichloroethene	29/30	3.76 J	43,000	47PB13	5
Toluene	8/30	1.19 J	3.79 J	47PB27	1,000
1,1,2-Trichloroethane	8/30	2.78 J	26.8	47PB27	5
Napthalene	9/30	1.04 J	2.35 J	47PB08	1,500
1,1,1-Trichloroethane	7/30	9.56	19.6	47PB07	200
Vinyl chloride	17/30	4.85 J	183	47PB26	2
1,2,3-Trichlorobenzene	2/30	1.11 J	1.55 J	47PB17	
1,2,4-Trichlorobenzene	2/30	1.57 J	1.75 J	47PB04	

J = estimated value
LHAAP = Longhorn Army Ammunition Plant
PCL = protective concentration level
RI = remedial investigation

13.2.2 Goose Prairie Creek Sediment Results

During the Phase II and Phase III field activities, 14 sediment samples were collected along Goose Prairie Creek. No detectable concentrations of SVOCs or explosive compounds were identified in the samples submitted for analyses.

Six VOCs (acetone, carbon disulfide, methyl ethyl ketone, methylene chloride, p-isopropyltoluene, and TCE) were detected at low concentrations at sample locations GPCSD01, GPCSD02, GPCSD04, GPCSD05, GPCSD06, GPCSD09, and GPCSD10. Acetone was the most widely detected VOC; it was detected in six sample locations from levels of 3.6 to 21 µg/kg. All other VOCs were detected sporadically. All VOCs were detected at concentrations below the PCLs.

Three pesticides (dieldrin, p,p'-DDD, and p,p'-DDT) were detected at GPCSD06 at concentrations below the PCLs. DDT was only detected at GPCSD07. All pesticide concentrations were below the PCLs.

One PCB (Aroclor-1254) was detected in one sample (GPCSD04) at a concentration of 39 µg/kg (below the PCL value). The PCB was not detected in any other Goose Prairie Creek sediment sample.

Dioxins/furans were detected at each of the four sediment locations (GPCSD01, GPCSD03, GPCSD06, and GPCSD08) where it was analyzed. There are no comparison criteria identified for dioxin/furan

compounds. However, the maximum level detected (324 µg/kg of octachlorodibenzo-p-dioxin) is comparable to other sites at LHAAP.

Seventeen metals (barium, beryllium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, strontium, vanadium, and zinc) were detected in the sediment samples above the LHAAP surface soil background values. Six (barium, beryllium, lead, manganese, selenium, and silver) of the 17 metals were detected at concentrations above the respective PCL levels. Table 13-4 summarizes the results of metals detected in Goose Prairie Creek sediments. Beryllium and manganese were detected just slightly above their PCLs; lead (20.7 mg/kg) was detected just slightly above background; selenium was detected at levels five times the PCL while barium was found up to 10 times the PCL, and silver was detected at the background level. There is no widespread metals contamination of Goose Prairie Creek although the metals levels (especially barium) may be elevated.

Table 13-4
Summary of Metals Detected in Sediment Samples, Goose Prairie Creek, Group 4 RI, LHAAP, Karnack, Texas

Metal (mg/kg)	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Aluminum	17/17	750	11,000	GPCSD08 (1)	260,000	20,700
Arsenic	12/17	0.36	5.86	GPCSD02 (1)	13	29.7
Barium	14/17	14.7	2,400	GPCSD08 (1)	220	287
Beryllium	5/13	0.694	1.59	GPCSD08 (1)	0.92	NA
Calcium	12/17	162	6,300	GPCSD08 (1)	--	1,090
Chromium, total	16/17	2.8	47	GPCSD03 (1)	1,200	22.8
Cobalt	7/17	3.2	18	GPCSD08 (1)	2,000	19.1
Copper	10/17	3.2	17.8	GPCSD08 (1)	520	6.7
Iron	17/17	1,950	37,000	GPCSD08 (1)	--	31,000
Lead	17/17	2.7	20.7	GPCSD08 (1)	1.5	17.4
Magnesium	7/17	111	6,400	GPCSD08 (1)	--	474
Manganese	17/17	22.2	6,940	GPCSD08 (1)	5,100	2,330
Mercury	1/15	0.13	0.13	GPCSD03 (1)	1	ND
Nickel	4/13	6	49	GPCSD08 (1)	230	6.3
Potassium	4/17	750	1,400	GPCSD08 (1)	--	481
Selenium	6/17	0.28	4.97	GPCSD06 (1)	1.1	ND
Silver	3/17	1.30	2.40	GPCSD01 (1)	0.71	2.3
Strontium	4/17	7.6	73	GPCSD08 (1)	--	13.3
Thallium	1/17	5.52	5.52	GPCSD01 (1)	0.87	14.1
Vanadium	11/13	8.1	43	GPCSD02 (1)	5,100	NA
Zinc	16/17	5.6	93	GPCSD08 (1)	3,500	16.2

LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation

13.2.3 Goose Prairie Creek Surface Water Results

During the Phase II and Phase III field activities, 14 surface water samples were collected at Goose Prairie Creek at the locations shown on Figure 13-1.

Four VOCs (acetone, toluene, cis-1,2-DCE, and TCE) were detected in more than one surface water sample. TCE was the most widely detected VOC; it was detected in five samples, yet its maximum value was 2.8 µg/L—one-half the drinking water level and orders of magnitude below the TWQS of 612 µg/L for the protection of human health. All other VOCs were detected sporadically at low concentrations. All detections were considerably below the TWQS values. Although VOCs were detected in elevated concentrations in Site 47 shallow groundwater and may be migrating to Goose Prairie Creek surface water, they are not present at concentrations of concern today.

One of the detected concentrations for bis(2-ethylhexyl) phthalate (530 µg/L) was detected above the federal AWQC (59 µg/L) at LHS-GPC-03, and bis(2-ethylhexyl) phthalate was also detected at LHS-GPC-01 at a concentration below the PCL. The elevated concentration of bis(2-ethylhexyl) phthalate is considered to be an anomaly because it was not detected in any other sample as would have been expected.

Three dioxins/furans were detected at GPCSW01, GPCSW03, GPCSW06, and GPCSW08. There are no comparison criteria identified for dioxin/furan compounds. The maximum dioxin value detected was 858 ng/L of octachlorodibenzo-p-dioxin.

Sixteen metals were detected in the surface water samples. Six of the metals (aluminum, arsenic, lead, selenium, thallium, and zinc) were detected at concentrations above TWQS values. TWQS dependent on hardness were calculated assuming a default hardness of 100 mg/L. These metals are potentially contaminating Goose Prairie Creek surface water. Selenium and lead were present (albeit at low concentrations) in the equivalent sediment samples.

Ten rounds of quarterly sampling were conducted between August 1996 and December 2000 (more recent rounds not yet available). No sampling was conducted in 1999. The detected results can be found in Appendix C. The data imply that Plant 2 is having some limited impact on Goose Prairie Creek. The only metals samples were taken in 1996 while activities were still ongoing. Only aluminum, arsenic, and silver exceeded the TWQS. VOCs were detected consistently in all locations except GPW-7, at the upgradient corner of the plant, and GPW-9, just prior to discharge into Caddo Lake. However, the VOC detections were always below TWQS ARARs and, except for a few vinyl chloride results (as high as 5 µg/L) and TCE results (as high as 12 µg/L), were even below drinking water standards. The slightly elevated VOC results were found in sampling locations immediately adjacent to the plant or immediately downgradient of the plant.

Explosive compounds were also found in the surface water. Those with a TWQS have results consistently below the ARAR. The most prevalent compounds found were 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, and 2,4,6-trinitrotoluene. The highest concentrations found were at GPW-12 (7.1, 12.9, and 41.2 µg/L, respectively). This sampling location is upstream of the plant. The compounds were found in many sampling rounds although the concentrations were down to 3.5 µg/L, 5.3 µg/L and non-detect, respectively, in December 2000. Shutting off activities at the plant appears to have had a positive affect on surface water quality. Cyclonite (or RDX) and homocyclonite (or HMX), both explosives, were also found routinely at most sampling locations.

Perchlorate was not analyzed as often. Analysis for perchlorate began in 2000. Perchlorate has been found at several of the locations. Notably perchlorate was found at GPW-1 at 4 µg/L or non-detect, GPW-2 at 17 µg/L both times, GPW-3 at 17 µg/L and 8 µg/L, GPW-4 at 11 µg/L and 23 µg/L, GPW-5 at 11 µg/L, GPW-6 (far downstream) at 12 µg/L and 10 µg/L, and GPW-9 (most downstream location) at 11 µg/L and 7 µg/L. It appears that Goose Prairie Creek is impacted by perchlorate discharge past sampling point 1 and that the perchlorate levels remain constant throughout the surface water migration to Caddo Lake. The source of perchlorate could be surface runoff or groundwater discharge, most notably from Site 47.

13.2.4 Goose Prairie Wetland Sediment Results

During the Phase III field activities, four sediment samples were collected at the Goose Prairie Wetland area.

No detectable concentrations of SVOCs, explosive compounds, pesticides or PCBs were identified in the samples submitted. No VOCs were detected in the samples yet a single QC sample for GPWSD01QC had acetone, methyl ethyl ketone, and TCE at concentrations below the soil PCL value. The evidence is weak that VOCs are present in the sediment.

Fifteen dioxin/furan compounds were detected in the two sediment samples (GPWSD01 and GPWSD04) submitted for analysis. There are no comparison criteria identified for dioxin/furan compounds. However, again, the values are comparable to those found in soil throughout LHAAP; octachlorodibenzo-p-dioxin was detected at 1.3 µg/kg.

Fourteen metals (beryllium, calcium, chromium, cobalt, copper, lead, magnesium, mercury, nickel, potassium, silver, strontium, vanadium, and zinc) were detected in the sediment samples with concentrations above the LHAAP surface soil background values. Of these, beryllium, lead, and silver were detected above the respective PCL values. Beryllium was detected in two samples (GPWSD02 and GPWSD04) with a maximum of 1.1 mg/kg compared to a PCL of 0.92 mg/kg; lead was detected in three samples (GPWSD02, GPWSD03, and GPWSD04) with a maximum of 97 mg/kg; and silver was detected

in all four sediment samples with a maximum of 15 mg/kg compared to a background of 2.3 mg/kg and PCL of 0.7 mg/kg. Lead and silver concentrations may be slightly elevated and of interest.

13.2.5 Goose Prairie Wetland Surface Water Results

During the Phase III field activities, four surface water samples were collected at Goose Prairie Wetland area at the locations shown on Figure 13-1.

No detectable concentrations of VOCs, SVOCs, explosive compounds, pesticides, or PCBs were identified in the samples submitted. Three dioxin/furan compounds (1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin, heptachlorodibenzo-p-dioxin, and octachlorodibenzo-p-dioxin) were detected in the two surface water samples (GPWSW01 and GPWSW04) where it was analyzed. The maximum concentration of 600 pg/L of octachlorodibenzo-p-dioxin is similar to other levels found at LHAAP.

Eleven metals (aluminum, antimony, arsenic, calcium, iron, lead, manganese, sodium, strontium, thallium, and zinc) were detected in the surface water samples. Of these 11 metals, three (aluminum, arsenic, and thallium) were detected above the TWQS criteria. Aluminum was slightly detected above TWQS at GPWSW01, GPWSW02, and GPWSW03. Arsenic was detected an order of magnitude above TWQS at GPWSW04, and thallium was detected almost an order of magnitude above TWQS at GPWSW01. Arsenic and thallium results may indicate isolated impacts of metals on surface water quality, but there is no widespread metals contamination.

13.2.6 Goose Prairie Creek Cove Sediment Results

The detected data used to evaluate the sediment conditions in Goose Prairie Creek Cove can be found in Appendix C. All Caddo Lake sediment data are summarized in Table 13-5 (including that from Goose Prairie Creek Cove).

13.2.6.1 North Cove

No detectable concentrations of explosive compounds, pesticides, herbicides, perchlorate, or PCBs were identified in the samples submitted for analyses. Four VOCs (acetone, ethylbenzene, carbon disulfide, and trichlorofluoromethane) were detected at concentrations below the PCL values. Ethylbenzene was detected as an estimated value of 3.53 µg/kg in one sample [CL-GPSN-1 (1)]. Acetone and carbon disulfide were detected in various samples at all of the sample locations (CL-GPSN-1 through CL-GPSN-4). Trichlorofluoromethane was detected in sample CL-GPSN-4 (3).

Table 13-5
Summary of Detected Constituents in Sediment Samples, Caddo Lake, Group 4 RI, LHAAP, Karnack, Texas

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Metals (mg/kg)						
Aluminum	48/48	2,130	30,400	CL-GPSN-2	260,000	20,700
Arsenic	48/48	1.02	9.15	CL-GPSN-4	13	29.7
Barium	48/48	37.8	451	CL-GPSN-4	220	287
Beryllium	48/48	0.252	2.01	CL-CCS-2	0.92	NA
Cadmium	37/48	0.027	0.989	CL-GPSN-4	0.75	ND
Calcium	48/48	411	3,400	CL-GPSN-4	-	1,090
Chromium	48/48	3.09	59.1	CL-GPSN-2	1,200	22.8
Cobalt	48/48	1.55	27.8	CL-HBS-2	2,000	19.1
Copper	48/48	2.89	38.7	CL-GPSS-1	520	6.7
Iron	48/48	2,720	31,400	CL-GPSN-4		31,000
Lead	48/48	6.86	542	CL-GPSN-1	1.5	17.4
Magnesium	48/48	212	1,790	CL-GPSN-2	-	474
Manganese	48/48	39.3	611	CL-GPSN-4	5,100	2,330
Mercury	48/48	0.016 J	1.66	CL-GPSN-4	1	ND
Nickel	48/48	2.21	25.3	CL-GPSN-4	230	6.3
Potassium	48/48	151	2,100	CL-GPSN-2	-	481
Selenium	43/48	0.263	2.31	CL-CCS-1	1.1	ND
Silver	16/48	0.0575	17.6	CL-GPSN-2	0.71	2.3
Strontium	48/48	8.65	54.2	CL-GPSN-4	-	13.3
Thallium	17/48	0.529 J	2.69	CL-GPSN-4	0.87	14.1
Vanadium	48/48	8.14	43.1	CL-GPSN-2	5,100	NA
Zinc	48/48	10.1	201	CL-GPSN-4	3,500	16.2
VOCs (µg/kg)						
Acetone	43/48	50	1,350	CL-GPSN-4	7,100	
Carbon disulfide	41/48	1.88 J	177	CL-SBS-1	20,000	
Ethylbenzene	1/48	3.53 J	3.53 J	CL-GPSN-1	3,800	
Trichlorofluoromethane	3/48	3.21	10.7	CL-GPSN-4	190,000	
2-Butanone	1/48	62	62	CL-HBS-4	44,000	
SVOCs (µg/kg)						
3-Methylphenol	2/48	83.2 J	189 J	CL-HBS-4	-	
4-Methylphenol	2/48	83.2 J	189 J	CL-HBS-4	940	
Acenaphthylene	1/48	94.3 J	94.3 J	CL-GPSS-4	610,000	
Anthracene	1/48	1,440	1,440	CL-GPSS-4	10,000,000	
Benzo(a)anthracene	1/48	2,980	2,980	CL-GPSS-4	20,000	
Benzo(a)pyrene	1/48	2,590	2,590	CL-GPSS-4	3,800	
Benzo(b)fluoranthene	1/48	3,020	3,020	CL-GPSS-4	67,000	
Benzo(g,h,i)perylene	1/48	2,720	2,720	CL-GPSS-4	69,000,000	
Benzo(k)fluoranthene	1/48	1,090	1,090	CL-GPSS-4	690,000	
Chrysene	1/48	2,870	2,870	CL-GPSS-4	1,700,000	
Dibenzo(a,h)anthrene	1/48	885	885	CL-GPSS-4	11,000	
Dibenzofuran	1/48	78.1 J	78.1 J	CL-GPSS-4	50,000	
Fluoranthene	1/48	5,930	5,930	CL-GPSS-4	2,900,000	
Fluorene	1/48	453	453	CL-GPSS-4	450,000	
Phenanthrene	2/48	38.7 J	4,670	CL-GPSS-4	620,000	
Phenol	5/48	31 J	66.8 J	CL-GPSN-2	57,000	
Di-n-butylphthalate	1/48	930	930	CL-HBS-2	5,000,000	

Table 13-5 (continued)

Analyte	Frequency of Detections	Minimum Detected Value	Maximum Detected Value	Maximum Detected Location	PCL	LHAAP Surface Soil Background Value
Dioxins (pg/g)						
Octachlorodibenzo-p-dioxin	7/13	5,600	20,000	CL-HBS-2		
Heptachlorinated dibenzo-p-dioxin	7/13	500	2,400	CL-HBS-2		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	7/13	210	600	CL-HBS-2		
Hexachlorinated dibenzo-p-dioxin	7/13	53	630	CL-HBS-3		
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	5/13	8.4 J	21 J	CL-HBS-2		
Pentachlorinated dibenzo-p-dioxin	3/13	22	60	CL-HBS-2		
Tetrachlorinated dibenzo -p-dioxin	6/13	5.2	48	CL-HBS-2		
Furans (pg/g)						
Octachlorodibenzofuran	4/13	25 J	46	CL-GPSN-3		
Heptachlorinated dibenzofuran	4/13	28	48	CL-GPSN-3		
1,2,3,4,6,7,8-Heptachlorodibenzofuran	4/13	9.4 J	17 J	CL-HBS-2		
Hexachlorinated dibenzofuran	2/13	22	26	CL-GPSN-3		
Pentachlorinated dibenzofuran	2/13	27	33	CL-GPSN-2		
Tetrachlorinated dibenzofuran	2/13	22	53	CL-GPSN-2		
2,3,7,8-Tetrachlorodibenzofuran	1/13	4.2	4.2	CL-GPSN-2		

J = value is estimated
LHAAP = Longhorn Army Ammunition Plant
NA = not analyzed
ND = not detected
PCL = protective concentration level
RI = remedial investigation
SVOC = semivolatile organic compound
VOC = volatile organic compound

The SVOC phenol was detected at estimated concentrations below the PCL value in various samples at sample locations CL-GPSN-2 through CL-GPSN-4. Phenanthrene was detected in sample CL-GPSN-3 (2) at concentrations below the PCL value. There is no consistent VOC or SVOC contamination in North Cove sediment, and what limited contamination may be present does not appear to be at levels of concern.

Eleven dioxins/furans were detected in only one sample [CL-GPSN-3 (1)] of four samples collected. There are no comparison criteria identified for dioxin/furan compounds, but the level detected of octachlorodibenzo-p-dioxin (6.9 ng/kg) is frequently found in soil and sediment across LHAAP.

Seventeen metals (aluminum, barium, beryllium, cadmium, calcium, chromium, copper, lead, magnesium, mercury, nickel, potassium, selenium, silver, strontium, vanadium, and zinc) were detected at concentrations above the LHAAP surface soil background concentrations. Of these metals, barium, beryllium, cadmium, lead, mercury, selenium, silver, and strontium were detected at concentrations that

exceed the PCLs. Barium had one sample (342 mg/kg) above the background level of 287 mg/kg. The beryllium maximum detection was 1.47 mg/kg compared to a PCL of 0.92 mg/kg. Lead levels were quite elevated with all four samples above 100 mg/kg; one sample at 542 mg/kg. Maximum mercury levels were at the PCL of 1 mg/kg as were maximum selenium levels (1.1 mg/kg). Silver results appear to be elevated with three samples near or above 10 mg/kg compared to a background of 2.3 mg/kg. Lead and silver appear to have contaminated sediments potentially at levels of concern in North Cove.

Perchlorate was not detected in Goose Prairie Creek North Cove sediment samples.

13.2.6.2 South Cove

No detectable concentrations of explosive compounds, pesticides, herbicides, perchlorate, or PCBs were identified in the samples submitted. Three VOCs (acetone, carbon disulfide, and trichlorofluoromethane) were detected at concentrations below the PCL values, similar to North Cove. Acetone and carbon disulfide were detected at all sample locations (CL-GPSS-1 through CL-GPSS-4). Trichlorofluoromethane was detected at sample locations CL-GPSS-3 and CL-GPSS-4.

SVOCs were also detected in a limited amount of samples. Phenol and 15 PAHs were detected at concentrations below the PCL values. Phenol was detected at estimated concentrations in samples CL-GPSS-1 (2) and (3). The PAHs were detected exclusively in sample CL-GPSS-4 (1).

Twelve dioxins/furans were detected in only one sample [CL-GPSS-3 (1)] of four samples collected. The maximum value of 5.6 μg/kg is similar to other levels on LHAAP.

Sixteen metals (aluminum, beryllium, cadmium, calcium, chromium, copper, lead, magnesium, mercury, nickel, potassium, selenium, silver, strontium, vanadium, and zinc) were detected at concentrations above the LHAAP surface soil background concentrations. Of these metals, beryllium, lead, and silver were detected at concentrations that exceed the PCLs. Much like North Cove results, the beryllium concentrations were found at PCL levels while the lead levels were elevated (maximum of 145 mg/kg). Unlike North Cove results, silver was present just above background levels. More than likely, lead levels are the only ones indicative of contamination.

Perchlorate was not detected in Goose Prairie Creek South Cove sediment samples.

13.2.7 Caddo Lake at Saunder's Branch Results

No detectable concentrations of SVOCs, explosive compounds, pesticides, herbicides, or PCBs were identified in the samples submitted. As with North Cove and South Cove samples, two VOCs (acetone and carbon disulfide) were detected at concentrations below the PCL value. Acetone and carbon disulfide were detected in samples collected at two of the sample locations (CL-SBS-1 and CL-SBS-2).

Eight dioxins/furans were detected in the only sample [CL-SBS-2 (1)] collected for this analysis. The octachlorodibenzo-p-dioxin result of 9.4 ng/kg was a little higher than the maximum levels found in the cove samples.

Thirteen metals (beryllium, cadmium, calcium, copper, lead, magnesium, mercury, nickel, potassium, selenium, strontium, vanadium, and zinc) were detected at concentrations above the LHAAP surface soil background concentrations. Of these metals, beryllium, lead, and selenium were detected at concentrations that exceeded the PCLs. Beryllium levels detected were consistently near the PCL of 0.92 mg/kg. The levels varied from 0.85 to 1.33 mg/kg—not indicative of contamination. The maximum lead levels were just above the background levels (27.6 mg/kg versus 17.4 mg/kg). Selenium levels were similar to the beryllium levels.

13.2.8 Caddo Lake at Harrison Bayou Results

No detectable concentrations of explosive compounds, pesticides, herbicides, perchlorate, or PCBs were identified in the samples submitted. Three VOCs [acetone, methyl ethyl ketone, and carbon disulfide] and the SVOC di-n-butyl phthalate were detected at concentrations below the PCL values. Acetone and carbon disulfide were detected at samples collected from all sample locations CL-HBS-1 through CL-HBS-4. Methyl ethyl ketone was detected in one sample [CL-HBS-4 (3)]. Di-n-butyl phthalate was detected in sample CL-HBS-2 (1).

Seven dioxins/furans were detected in samples [CL-HBS-1 (2) and CL-HBS-4 (1)] collected at Harrison Bayou. The maximum octachlorodibenzo-p-dioxin results are 20 ng/kg—higher than those found in the coves.

Fifteen metals (barium, beryllium, cadmium, calcium, cobalt, copper, lead, magnesium, mercury, nickel, potassium, selenium, strontium, vanadium, and zinc) were detected at concentrations above the LHAAP surface soil background concentrations. Of these metals, barium, beryllium, lead, and selenium were detected at concentrations that exceeded the PCLs. One barium sample at 367 mg/kg exceeded the background level of 287 mg/kg. The beryllium levels varied from 0.94 to 1.47 mg/kg compared to a PCL of 0.92 mg/kg. The lead samples varied from 13 to 20.8 mg/kg compared to a background of 17.4 mg/kg. The selenium levels of 0.96–1.3 mg/kg compared to a PCL of 1.1 mg/kg. None of these results indicate widespread sediment contamination.

13.2.9 Caddo Lake at Central Creek Results

No detectable concentrations of SVOCs, explosive compounds, pesticides, herbicides, perchlorate, or PCBs were identified in the samples submitted. As with the other sediment results, two VOCs (acetone and carbon disulfide) were detected at concentrations below the PCL values. Acetone and carbon disulfide were detected at samples collected from both sample locations, CL-CCS-1 and CL-CCS-2.

Nine dioxins/furans were detected at the only sample location where it was analyzed. The octachlorodibenzo-p-dioxin result was 12 ng/kg.

Thirteen metals (beryllium, cadmium, calcium, copper, lead, magnesium, mercury, nickel, potassium, selenium, strontium, vanadium, and zinc) were detected at concentrations above the LHAAP surface soil background concentrations. Of these metals, beryllium, lead, and selenium were detected at concentrations that exceeded the PCLs. The ranges of detections of all three metals are similar to samples from Caddo Lake at Central Creek and are not indicative of significant contamination.

13.3 CONTAMINANT FATE AND TRANSPORT

Only limited VOCs, one SVOC, and one PCB were detected in sediment samples collected throughout Goose Prairie Creek and the associated drainages. The detected concentrations were below the PCLs.

Dioxins/furans were detected in most sediment samples that were analyzed. Dioxins/furans were detected in all three sediment samples in Goose Prairie Creek; both sediment samples from Goose Prairie Creek wetlands; once in each of the four sediment samples collected in Goose Prairie Creek Cove; and at all sample locations where it was analyzed at Saunder's Branch, Harrison Bayou, and Central Creek. Dioxin/furan concentrations appear to be distributed ubiquitously within the drainages. There are slightly elevated levels from samples at Caddo Lake at Harrison Bayou and at Central Creek.

Dioxins/furans may be formed during the chlorine bleaching process at pulp and paper mills, by waste and drinking water treatment plants, and by the production of some chlorinated chemical compounds. None of these processes were conducted at LHAAP. However dioxins/furans may also be released into air from burning of organic material such as forest fires, wood-burning stoves, and activities at the LHAAP burning grounds. When released into the air, some dioxins/furans may be transported over long distances. When released into water, some may be broken down by sunlight, but most attach to soil and settle to the bottom in sediment. The slightly elevated dioxin results may have resulted from soil runoff from other areas of the installation. Some of those dioxins may not be from LHAAP activities. Dioxins/furans may bioaccumulate in the environment.

The metals lead and silver in sediment in Goose Prairie Creek wetlands and North Cove were the most widely detected metals with concentrations greater than background surface soil values and the corresponding PCL values. The lead values in North Cove were as high as 542 mg/kg. Lead was found in all drainages and the Goose Prairie Creek wetland sediment. Barium, beryllium, cadmium, mercury, selenium, and strontium were also detected periodically above the background and PCL values.

These metals should be present in the soil as either low solubility minerals or adsorbed as metal ions on clays or iron and manganese oxyhydroxides. The soil metals are subject to migration via infiltrating precipitation and the concentration in these fluids will be a function of the distribution coefficient for the

adsorbed metals or of the solubility of the individual minerals. Soils in a relatively humid environment such as east Texas are continually leached of their metal contents until only high aluminum and iron oxides are left (laterites). The surface water quality in Goose Prairie Creek may indicate that the slightly elevated lead levels in sediments are causing surface water impacts. Lead in Goose Prairie Creek surface water at times exceeds the TWQS. Aluminum, arsenic, selenium, and thallium surface water levels have also exceeded TWQS in most sampling rounds. A sampling event in 1995 did not have exceedances. The sampling locations of these samples were slightly different than subsequent sampling locations. Perchlorate is also detected in the creek on the other side of Crockett Avenue, suggesting a source that discharges nearby. The perchlorate travels with the surface water due to its high solubility and eventually discharges into Caddo Lake.

Metals remaining bound to the sediments may be transported in the suspended and/or bed load of Goose Prairie Creek into Caddo Lake. Contaminants in surface water originating from within the Goose Prairie watershed area may migrate off site via Goose Prairie Creek, eventually reaching Caddo Lake, its primary receptor, on the eastern side of the plant at Goose Prairie Bay.

14.0 SUMMARY

This section summarizes the nature and extent and fate and transport of contamination at the Group 4 sites in the sumps, soil, sediment, surface water, and groundwater. This summary is based on a comparison of the analytical results for samples collected from these media to TNRCC soil and groundwater PCLs and surface water TWQS (Section 3.0). These comparison criteria are used for a general evaluation of contaminant concentrations detected at the various Group 4 sites against a set of established values and to focus attention on the most significant contamination. All detected data will be evaluated in the baseline risk assessment, which will be published as a separate document. Conclusions as to the relevance of the discussed contamination will be drawn after the baseline risk assessment is complete.

14.1 INDEPENDENT WASTE PROCESS SUMPS

Two general classes of waste sumps exist at LHAAP: (1) process waste sumps specific to buildings in production areas and (2) related facilities and sumps associated with waste racks in central locations throughout production areas. Process waste sumps consisted of rectangular, square, or circular concrete sumps constructed with the top at or slightly above grade. Drain lines leading from the process facilities to waste sumps were typically covered concrete and/or tile troughs constructed at grade level. Waste rack sumps were outdoor waste racks that consisted of a covered metal grate suspended above a shallow, ground level concrete catch basin.

The waste sumps were removed by OHM Remediation Services Corp. in 1996 and 1997. All removal and closure activities are documented in the report *Removal and Closure of Wastewater Sumps, Longhorn Army Ammunition Plant, Karnack, Texas*, April 1997.

The independent waste process sumps covered in Section 4.0 (S-114, S-115, S-116, and S-118) are associated with Sites 18 and 29.

14.1.1 Nature and Extent of Contamination

Samples of sump liquid contents and soil were taken at the independent waste process sumps. Table 14-1 summarizes the compounds with concentrations that exceed the PCLs. Contaminants above groundwater PCLs and above background were two VOCs and three metals. Similar metals were found in adjacent soils; however, the soils were not contaminated with VOCs except for acetone, which was just above the PCL.

Dioxins/furans were detected in the soils at levels found prevalently across LHAAP.

Table 14-1
Waste Process Sumps Summary of Contaminants with Concentrations Greater than Comparison Values, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Matrix	
	Liquid Sump Contents	Soil
Volatile Organic Compounds		
Acetone		X
Tetrachloroethene	X	
Trichloroethene	X	
Semivolatile Organic Compounds		
None		
Metals		
Antimony	X	X
Barium	X	X
Chromium	X	
Lead		X

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

14.1.2 Fate and Transport

The sumps and their contents were removed in 1996, thus, mitigating the potential for continued migration of sump contents contamination. Soils samples collected near the sumps contained one VOC and three metals at concentrations exceeding PCL values. Contaminants within the soils could be transported through infiltration of water and subsequent migration into groundwater beneath the former sump locations and/or through surface water runoff into the surrounding drainage paths. However, the levels found did not indicate sufficient extent or mass of contamination to have much impact on either underlying groundwater or adjacent surface water.

14.2 SITE 35A: SHOP AREA

The Shop Area was established in 1942 as part of the facility's initial construction. A plant-operated laundry and automotive, woodworking, metalworking, painting, refrigeration, and electrical shops served the needs of the facility's 440 production and administration buildings, utility systems, and network of streets, roads, and railroad tracks. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. The current site layout is shown on Figure 5-1.

14.2.1 Nature and Extent of Contamination

Sampling performed at Site 35A included sump contents (sump S-113 for TPH analysis only), soils, sediments, surface water, and groundwater. Table 14-2 summarizes the compounds that were identified at concentrations that exceed the comparison criteria identified in Section 3.0.

Table 14-2
Summary of Contaminants with Concentrations Greater than Comparison Values, Site 35A, Group 4 RI, LHAAP, Karnack, Texas

Parameters	Matrix			
	Soil	Sediment	Surface Water	Groundwater
Volatile Organic Compounds				
1,1,2-Trichloroethane				X
1,1-Dichloroethene				X
Tetrachloroethene				X
Trichloroethene				X
Vinyl chloride				X
Semivolatile Organic Compounds				
bis(2-Ethylhexyl) phthalate	X			X
Metals				
Aluminum			X	X
Antimony	X			X
Arsenic				X
Barium				X
Beryllium				X
Cadmium	X			
Chromium				X
Copper	X			
Lead	X	X		X
Mercury	X			
Selenium	X	X		X
Silver	X			
Strontium				X
Thallium				X

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

Dioxins/furans were detected ubiquitously throughout Site 35A at levels common to other sites at LHAAP. The source of the dioxin/furan contamination is not known. A small source from the two burning ground at LHAAP could have contributed to low levels of dioxin/furan contamination at LHAAP; however, off-site sources are also likely to have contributed.

Metals are present in soil, sediment, surface water, and groundwater; VOCs are also present in groundwater at Site 35A. Metals contamination is found at low levels throughout the site. The elevated metals concentrations are primarily attributed to the areas where the sumps and waste rack sumps were located. Lead levels are the most significant in the surface soil, declining by an order of magnitude in the subsurface soils.

Most of the VOC contamination at Site 35A is in the shallow zone. It appears there may be more than one area of contamination.

14.2.2 Fate and Transport

The sumps and their contents were removed in 1996, thus mitigating the potential for continued migration of sump contents contamination. Soils samples collected from the vicinity of the sumps contained VOCs and metals at concentrations exceeding PCL values. The VOCs can be transported via evaporation into the atmosphere or dissolution into infiltrating rainwater. Metals within the soils could be transported through infiltration of water and subsequent dissolution and migration into groundwater beneath the former sump locations and/or through surface water runoff into the surrounding drainage paths. However, the surrounding drainage paths do not show evidence of contamination migrating via runoff. The underlying groundwater is more significantly contaminated with VOCs. However, the areas of contamination are isolated, suggesting more than one undefined source.

The VOC contamination in the groundwater does not appear to be moving downward or migrating toward surface water bodies.

14.3 SITE 35B: CHEMICAL LABORATORY

The Chemical Laboratory was built during the construction of Plant 3 (1953–1955). The Chemical Laboratory was used to support the production activities at LHAAP. Activities included research and testing of materials used in the production processes and QA testing. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities.

14.3.1 Nature and Extent of Contamination

Table 14-3 summarizes the compounds that were identified during the RI work at concentrations that exceed the values identified in Section 3.0 (comparison criteria).

Table 14-3
Summary of Contaminants with Concentrations Greater than Comparison Values, Site 35B, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Matrix	
	Soil	Groundwater
Volatile Organic Compounds		
1,1-Dichloroethene		X
Tetrachloroethene		X
Trichloroethene		X
Pesticides		
Aldrin	X	
Metals		
Antimony		X
Cadmium	X	
Lead	X	
Selenium	X	
Thallium		X

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

Dioxins/furans are ubiquitous in soils throughout Site 35B but at lower levels than found at other sites. The source of the dioxin/furan contamination is not known.

Metals above background levels are present in soil and groundwater; VOCs are also found in groundwater at Site 35B. However, the maximum soil contamination levels are not found next to the sump. The soils contamination is isolated. The groundwater contaminants in Site 35B wells were not found in the soils at the site. The source of groundwater contamination is unknown.

14.3.2 Fate and Transport

Soils samples collected near the sumps contained one pesticide and three metals at concentrations exceeding PCL values. The pesticide and metal contaminants within the soils could be transported through infiltration of water and subsequent dissolution and migration into groundwater beneath the former sump locations and/or through surface water runoff into the surrounding drainage paths. However, the levels are low and it is unlikely that the soil contamination will impact the drainage paths or groundwater. The groundwater contained VOCs and only two metal contaminants above PCLs and do not appear to be related to the contamination found in the soils. These will migrate with the groundwater until dilution and dispersion reduce their concentrations to less than detection limits, or until they encounter a reducing environment and the metals are precipitated and the VOCs are degraded by microbes.

14.4 SITE 35C: STATIC TEST AREA

The Static Test Area was used for testing and evaluating products produced at LHAAP, including testing of illumination devices and static test firing of rocket motors. Structures for these activities include a test tunnel and data acquisition system for flares, rocket motor test stands of earth and concrete, and conditioning facilities for reproducing arctic and tropical temperatures. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Four waste process sumps are located at this site. The site was active through 1998.

14.4.1 Nature and Extent of Contamination

Samples were taken from soils and groundwater at Site 35C. Table 14-4 summarizes the compounds that were identified at concentrations that exceed comparison criteria.

Dioxins/furans were found in a soil sample next to the sump at levels higher than typically found at LHAAP.

Table 14-4
Summary of Contaminants with Concentrations Greater than Comparison Values, Site 35C, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Matrix	
	Soil	Groundwater
Metals		
Aluminum		X
Beryllium	X	
Cadmium	X	
Chromium		X
Iron		X
Lead	X	
Nickel		X
Selenium	X	
Silver	X	X
Thallium		X
Volatile Organic Compounds		
Trichloroethene		X
1,2-Dichloroethane		X
Semivolatile Organic Compounds		
bis(2-Ethylhexyl) phthalate		X

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

The contamination is limited to metals and potentially dioxins. Soils contained five metals (beryllium, cadmium, lead, selenium, and silver) above comparison criteria while groundwater contained six different metals (aluminum, chromium, iron, nickel, silver, and thallium) above comparison criteria. Very low levels of VOCs were found in 1996 in the groundwater, but the 1998 levels found were below PCLs.

14.4.2 Fate and Transport

Four of these metals form simple cations in vadose zone waters—beryllium, cadmium, lead, and silver. The fifth, selenium, forms oxyanions. These metals probably reside as adsorbed species on the fine-grained soil particles such as clays and iron oxyhydroxides. These metals will be slowly leached from the soil and will be carried down to the water table. However, as evidenced by current groundwater contamination levels, the soil contamination is unlikely to impact the underlying groundwater. Additional migration could occur through overland flow during a rainstorm.

The metals dissolved in groundwater will migrate through the aquifer until dilution and dispersion reduce their concentrations to less than detection limits, or until they encounter a reducing environment and the metals are precipitated.

14.5 SITE 46: PLANT 2 AREA

Plant 2 was originally designed to produce JB-2 propellant fuel and was reactivated to produce pyrotechnic devices. Plant 2 produced pyrotechnic and illumination devices until approximately 1997. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Forty-six waste process sumps and 13 waste rack sumps are located at this site.

14.5.1 Nature and Extent of Contamination

Table 14-5 summarizes the compounds that were identified at concentrations that exceed the values identified in Section 3.0 (comparison criteria).

Dioxins/furans are ubiquitous throughout Site 46 in all media; however, they were found at slightly higher levels near sump S-043. The specific source of the dioxin/furan contamination is not known.

VOCs were found in soil and groundwater and, to a much lesser extent, in sediment at Site 46. A small area of VOC groundwater contamination appears to exist in the middle of the plant. One SVOC—bis(2-ethylhexyl) phthalate, a common laboratory contaminant—was found in groundwater at ten different wells.

Metals are present in soil, sediment, surface water, and groundwater. The lead and barium levels were elevated near several sumps. Some sediment samples also had elevated lead and barium levels, but there was no distribution of the contamination in sediment and the levels were considerably lower than in the soils. The surface water samples from the tributaries had no exceedances of TWQS although some ditch samples had elevated aluminum, arsenic, and lead levels.

14.5.2 Fate and Transport

With the exception of dioxins/furans, organic compound detections in soils were isolated and at low concentrations. Among the metals, barium and lead are the most widespread in surface soil. These contaminants are relatively immobile and are not causing a notable groundwater problem. Barium and lead levels in groundwater are elevated in a few areas, so there may be a connection. The sump contents also had elevated barium and lead so the sumps may have been a source. However, general industrial activities could easily cause this low level of metals contamination. The surface soil may be causing ditch contamination because some sediment locations did have elevated lead levels. The sediment levels remain low.

VOCs in the surface and shallow subsurface soils were detected at concentrations that exceed PCLs. The soil concentrations of these compounds are relatively low. PCE is present in the groundwater near the soil sample area. (PCE is an ethane-based compound that is volatile and has a high solubility of

Table 14-5
Summary of Contaminants with Concentrations Greater than Comparison Values, Site 46, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Matrix					
	Sump Contents		Soil	Sediment	Surface Water	Groundwater
	Liquid	Sludge				
Volatile Organic Compounds						
Benzene	X					
Carbon Tetrachloride	X	X				
Chloroform	X					
cis-1,2-Dichloroethene	X					X
Methylene Chloride	X	X	X	X		X
1,1,1-Trichloroethane	X	X				
Trichloroethene	X					X
Tetrachloroethene			X			
Semivolatile Organic Compounds						
bis(2-Ethylhexyl) phthalate						X
Hexachlorobenzene	X	X				
4-Methylphenol		X				
Explosives						
Nitrobenzene				X		
Pesticides						
Lindane			X			
Metals						
Aluminum					X	X
Antimony	X	X	X			X
Arsenic	X				X	
Barium	X	X	X	X		X
Beryllium			X			X
Cadmium			X		X	
Chromium	X				X	X
Copper		X			X	
Lead	X	X	X	X	X	X
Mercury	X	X				
Nickel					X	X
Selenium			X	X	X	
Silver		X			X	
Thallium					X	X
Zinc			X		X	

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

150 mg/L.) Again, the concentrations are quite low. Contaminants in the groundwater will migrate with the groundwater until dilution and dispersion reduce their concentrations to less than the detection limits, or until they encounter a reducing environment and the VOCs are degraded by microbes.

14.6 SITE 47: PLANT 3 AREA

Plant 3 was designed for the production of rocket motors. Some of the rocket motor production facilities were converted to the production of pyrotechnic and illumination devices and were active until approximately 1997. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Fifty waste process sumps and three waste rack sumps are located at this site.

14.6.1 Nature and Extent of Contamination

Samples were taken of sump contents, soils, sediments, and groundwater at Site 47. Table 14-6 summarizes the compounds that were identified at concentrations that exceed the comparison criteria identified in Section 3.0.

Dioxins/furans are ubiquitous throughout Site 47 in all media but their concentrations do not appear to be elevated compared to other sites at LHAAP.

The elevated VOC levels in the soil are isolated and adjacent to sumps. However, the sumps with the elevated VOC levels (S-121, S-081, S-082, and S-083) do not show corresponding VOC contamination in adjacent soils. There are elevated shallow groundwater VOC levels, and this contamination has spread into the intermediate zone.

The soil does have elevated levels of cadmium and lead while the groundwater shows chromium contamination. There is no strong connection between soil and groundwater contamination and no generalized areas of greater concentrations. This leads to the conclusion that there are no major metals sources; there may be several smaller sources.

14.6.2 Fate and Transport

The sumps and their contents were removed in 1996. The VOCs in soils can be transported via evaporation into the atmosphere or dissolution into infiltrating rainwater. The metals within the soils can be transported through infiltration of water and subsequent dissolution and migration into groundwater beneath the former sump locations and/or through surface water runoff into the surrounding drainage paths. There is evidence to suggest that the infiltration path to groundwater has caused groundwater contamination. The groundwater contains VOCs and metals that will migrate with the groundwater until dilution and dispersion reduce their concentrations to less than detection limits, or until they encounter a reducing environment and the metals are precipitated and the VOCs are degraded by microbes. Goose Prairie Creek is still relatively unaffected by VOC contamination yet the geoprobes placed during the Goose Prairie Creek investigation (see Section 13.0) did show elevated VOCs in groundwater near the creek.

Table 14-6
Summary of Contaminants with Concentrations Greater Than Comparison Values, Site 47, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Matrix			
	Sump Contents		Soil	Groundwater
	Liquid	Sludge		
Volatile Organic Compounds				
Acetone				X
Carbon Tetrachloride	X			
Chloroform	X			X
cis-1,2-Dichloroethene				X
1,1-Dichloroethene	X			X
1,1-Dichloroethane		X		
1,2-Dichloroethene				X
Ethylbenzene		X		
Methylene Chloride			X	
Tetrachloroethene	X	X	X	X
Toluene		X		
1,1,1-Trichloroethane	X	X		
Trichloroethene	X	X	X	X
Vinyl Chloride	X			X
Semivolatile Organic Compounds				
bis(2-Ethylhexyl) phthalate	X			X
Pentachlorophenol				X
Metals				
Aluminum				X
Antimony	X	X	X	X
Arsenic	X	X	X	X
Barium	X	X	X	
Cadmium	X	X	X	X
Chromium	X	X		X
Lead	X	X	X	
Mercury			X	
Nickel				X
Silver		X	X	
Thallium				X
Anions				
Perchlorate			X	X

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

14.7 SITE 48: Y-AREA

The Y-Area was built during construction of Plant 3 (1953–1955) and was used for production of igniter parts for use in pyrotechnic and illuminating devices. The Y-Area was also used for the production of some illuminating devices. Industrial solid wastes and possibly hazardous wastes may have been generated by these activities. Nine waste process sumps and three waste rack sumps are located at this site.

14.7.1 Nature and Extent of Contamination

Samples were taken at Site 48 of sump soils, soils, and groundwater. Table 14-7 summarizes the compounds that were identified as exceeding PCLs.

Dioxin/furan concentrations in soils at sump S-100 were some of the highest detected at LHAAP. No source has been defined. The VOCs in soil were found near sumps S-095 and S-099. The sumps may have been a source of organic contamination to surrounding soils. Cadmium, lead, and barium levels in soils adjacent to sumps indicate that the sumps may also have been a source of inorganic contamination.

Except for chromium, there is very little groundwater contamination. The source for the chromium is unknown.

14.7.2 Fate and Transport

Groundwater quality indicates that the soil contaminants have not migrated to the groundwater. The VOCs in soils can be transported via evaporation into the atmosphere or dissolution into infiltrating rainwater. The metals within the soils can be transported through surface water runoff into the surrounding drainage paths. However, the impact is likely to be small.

Table 14-7
Summary of Contaminants with Concentrations Greater than Comparison Values, Site 48, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Matrix	
	Soil	Groundwater
Volatile Organic Compounds		
Tetrachloroethene	X	
Trichloroethene	X	X
Vinyl chloride	X	
Semivolatile Organic Compounds		
bis(2-Ethylhexyl) phthalate		X
Metals		
Aluminum		X
Antimony	X	X
Barium	X	
Beryllium	X	
Cadmium	X	
Chromium		X
Lead	X	
Nickel		X
Selenium	X	
Thallium		X

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

14.8 SITE 50: FORMER SUMP WATER TANK

Site 50 was identified through historical records as an aboveground storage tank for industrial wastewater collected from industrial waste production sumps located at various sites throughout LHAAP. Each operating building at the LHAAP installation was provided with individual concrete sumps to collect industrial wastewater. Sumps with clean water were allowed to empty into the local drainages while the other sumps were emptied and their wastewater transported by truck to a 47,000-gallon aboveground storage tank at Site 50. Because the storage tank was described as holding industrial wastewater, it is possible that hazardous wastes may have been released by these activities.

14.8.1 Nature and Extent of Contamination

Samples were taken of Site 50 soils, sediments, surface water, and groundwater. Table 14-8 summarizes the compounds identified at concentrations that exceed the comparison criteria.

Table 14-8
Summary of Contaminants with Concentrations Greater than Comparison Criteria, Site 50, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Matrix			
	Soil	Sediment	Surface Water	Groundwater
Volatile Organic Compounds				
1,1-Dichloroethene				X
1,2-Dichloroethane				X
cis-1,2-Dichloroethene				X
Tetrachloroethene				X
Trichloroethene	X	X		X
Vinyl chloride				X
Metals				
Aluminum			X	
Arsenic			X	
Antimony				X
Barium	X	X		
Beryllium	X	X		
Cadmium		X		
Chromium				X
Copper			X	
Lead	X	X	X	
Selenium	X	X		
Thallium			X	
Zinc			X	
Anions				
Perchlorate				X

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

Dioxin/furan results were typical of those of other LHAAP sites. None of the soil exceedances were extensive. There is no evidence of significant soil contamination at Site 50, although some contamination is present. Likewise, the sediment contamination was similar—low, but present. The downstream sample of Goose Prairie Creek had no sediment PCL exceedances and only aluminum TWQS exceedances in surface water samples (both upstream and downstream).

Groundwater contamination is more extensive. There are high TCE levels (22 mg/L) and high perchlorate levels (18 mg/L) in the Site 50 wells.

14.8.2 Fate and Transport

The primary contamination at Site 50 is the underlying VOC- and perchlorate-contaminated groundwater. The source of the VOC contamination is unknown. The adjacent surface water body, Goose Prairie Creek, does not appear to be impacted by Site 50 contamination so the groundwater is not currently affecting the quality of the creek. The VOC contamination appears to be fairly isolated. Either a lack of a continuing source or low groundwater flow through that area is limiting the migration potential of the VOCs. The perchlorate contamination is likely from Building 25C.

14.9 SITE 60: PESTICIDE STORAGE BUILDINGS

Records indicated that pesticides and herbicides were originally stored in Building 714 and that, in 1970, the stock was moved to Building 411. A site visit and communications with LHAAP personnel indicated that Building 411A and shed TS-80, not Building 411, may have been used as a pesticide and herbicide storage area. Industrial solid wastes and hazardous wastes may have been generated by these activities.

14.9.1 Nature and Extent of Contamination

Samples of soil, sediment, and surface water were taken at Site 60. Table 14-9 summarizes the compounds that were identified at concentrations that exceed the comparison criteria.

Table 14-9
Summary of Contaminants with Concentrations Greater than Comparison Values, Site 60, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Matrix		
	Soil	Surface Water	Sediment
Pesticides			
Dieldrin	X		
Metals			
Lead	X		
Selenium	X		

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

Among the soil samples collected at Site 60 near the buildings, one pesticide (dieldrin) significantly exceeded its PCL. However, dieldrin was only found at the elevated levels at one location, indicating a very isolated area of contamination. Lead and selenium in soils exceeded their respective PCLs, but the range of detections is small, indicating no significant contamination by metals.

14.9.2 Fate and Transport

Dieldrin has a very limited solubility (0.2 mg/L) and a low vapor pressure. The compound will remain in the soil. Estimated degradation rates in humid soils indicate that the half-life of dieldrin will be several years. Since groundwater samples have not been collected at Site 60, it is not known whether dieldrin has migrated to groundwater. However, the low solubility and the high distribution coefficient (estimated K_{oc}: 10,000–30,000) would indicate that this compound probably has not reached the groundwater.

14.10 GOOSE PRAIRIE CREEK AND WETLANDS

Goose Prairie Creek is one of four major drainage systems on the LHAAP facility; the other three are Saunder's Branch, Harrison Bayou, and Central Creek. The headwaters of Goose Prairie Creek are located near the northwestern corner of the plant and consist of one larger creek and several smaller tributaries. Goose Prairie Creek flows across the northern edge of the installation and drains approximately 30 percent of LHAAP. Goose Prairie eventually empties into Caddo Lake on the eastern side of the facility. A wetlands area is formed at the confluence of Goose Prairie Creek and Caddo Lake.

14.10.1 Nature and Extent of Contamination

Sediment and surface water samples were taken along Goose Prairie Creek and adjacent wetlands area. Sediment samples were also collected at the Goose Prairie Creek North and South Cove and the three other major drainages, Saunder's Branch, Harrison Bayou, and Central Creek. Table 14-10 summarizes the compounds that were identified at concentrations that exceed the comparison criteria identified in Section 3.0 for the Goose Prairie Creek samples. Table 14-11 contains similar information for the other major drainages.

Dioxins/furans are ubiquitous throughout Goose Prairie Creek and the other drainages. The source of the dioxin/furan contamination cannot be specifically identified.

Metals are present in surface water and sediments at Goose Prairie Creek drainages and wetlands. Although all of the metals listed in Tables 14-10 and 14-11 were detected above comparison levels, only lead results in sediments were notably elevated. The elevated metals in surface water and sediment do not appear to originate from one source but rather reflects the culmination of contaminants that have migrated into the LHAAP drainages over time.

Table 14-10
Summary of Contaminants with Concentrations Greater than Comparison Values, Goose Prairie Creek, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Goose Prairie Creek		Goose Prairie Wetlands	
	Matrix			
	Sediment	Surface Water	Sediment	Surface Water
Metals				
Aluminum		X		X
Arsenic		X		X
Barium	X			
Beryllium	X		X	
Lead	X	X	X	
Manganese	X			
Selenium	X	X		
Silver	X		X	
Thallium		X		X
Zinc		X		

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

Table 14-11
Summary of Contaminants with Concentrations Greater than Comparison Values, Other Major Drainages and Wetlands, Group 4 RI, LHAAP, Karnack, Texas

Compounds	Saunder's Branch	Harrison Bayou	Central Creek	North Cove	South Cove
	Matrix				
	Sediment	Sediment	Sediment	Sediment	Sediment
Metals					
Barium		X		X	
Beryllium	X	X	X	X	X
Cadmium				X	
Lead	X	X	X	X	X
Mercury				X	
Selenium	X	X	X	X	
Silver				X	X
Strontium				X	

LHAAP = Longhorn Army Ammunition Plant RI = remedial investigation

Perchlorate is present in Goose Prairie Creek surface water. It appears to originate at Plant 2 and is present throughout the creek. No perchlorate was found in North Cove sediment samples.

14.10.2 Fate and Transport

The metals in the surface water samples are a combination of dissolved and suspended species. These will continue to be transported via the advection of surface water until they reach the local hydrologic base at Caddo Lake. The suspended solids will settle out and the dissolved metals will be diluted. The metals in the sediments are probably reasonably stable. An influx of clean water during a rainstorm will

cause some of them to dissolve or desorb from the sediment particulate material and to go into solution in the surface water. Increased flow in the creeks caused by the rainstorm will also cause some of the sediments to become suspended in the fluid. During these events, the metals will follow the same pathways described for the metals currently dissolved or suspended in surface water.

Perchlorate is soluble and is present at all downstream sampling locations. Perchlorate will migrate with the water to Caddo Lake.

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Final
REMEDIAL INVESTIGATION REPORT
Volume 2: Appendices

for the

GROUP 4 SITES
Sites 35A, 35B, 35C, 46, 47, 48, 50, 60, and Goose Prairie Creek

Longhorn Army Ammunition Plant
Karnack, Texas

Submitted to
U.S. Army Corps of Engineers
Tulsa District
Contract No. DACA56-97-D-0001

January 2002

Jacobs Engineering Group Inc.
Oak Ridge, Tennessee

027522

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Appendix A

Well Location Summary
Soil Boring Logs
Well Construction Diagrams

Location Information of Group 4 Sample Sites

SITE	X	Y	Z	BORE TOTAL DEPTH
105	3310068.4	6960331.5	196.97	27
106	3316569.12	6959209.57	174.56	25
107	3316648.96	6957716.5	175.73	21.5
35ASB03	3304973.93	6960243.21	218.2	0
35ASB05	3304465.77	6959828.78	218.8	0
35ASS01	3305068.9	6960305.3	215.9	0
35ASS02	3305063.5	6960196.88	215.5	0
35ASS04	3304385.34	6959900.67	220.2	0
35ASS06	3304368.56	6959800.16	217.5	0
35AWW01	3305092.61	6960170.97	214.96	71
35AWW02	3305087.22	6960165.53	215.06	140
35AWW03	3305010.72	6960396.75	216.73	19
35AWW04	3304656.3	6959446.59	217.15	24
35BSB01	3308098	6958046.02	200.1	0
35BWW01	3307815.51	6958331	200.24	19
35BWW02	3308367.35	6958110.46	201.06	47
35CSB01	3315655	6957385.7	0	0
400ASS05	3303916.55	6962549.99	0	0
400ASS06	3303948.9	6962549.99	0	0
400SS01	3304209	6962738.2	0	0
400SS02	3304228.4	6962713.3	0	0
400SS03	3304192.7	6962699.6	0	0
400SS04	3303950.81	6962589.93	0	0
46SB01	3305625.44	6962863.83	211.6	0
46SB02	3305639.36	6962509.41	211.2	0
46SB03	3306222	6962530.04	206.4	0
46WW01	3306046.3	6962839.74	209.75	24
46WW02	3306068.17	6962842.6	209.16	46
46WW03	3306057.06	6962841.67	209.8	101
46WW04	3305584.77	6962709.27	212.47	24
47SB01	3309450	6960372.6	197.7	5
47SB02	3309103	6959730.93	200.6	5
47SB03	3310193	6958745.3	192.6	5
47WW01	3310000.12	6961843.18	191.21	19
47WW02	3309378.17	6961934.03	194.7	18
47WW03	3310493.93	6961546.93	191.86	26
47WW04	3310838.47	6960690.1	187.83	20
47WW05	3309848.45	6960821.11	195.79	19
47WW06	3309845.61	6960826.26	195.79	41
47WW07	3309841.54	6960836.07	195.94	110
47WW08	3309353.97	6961102.58	196.43	19
47WW09	3309623.61	6960006.04	197.72	40
47WW11	3310298.06	6959699.09	196.24	19
47WW12	3309114.13	6960442.63	199.02	20
47WW13	3308809.1	6959590.22	202.02	18
47WW14	3308802.09	6959587.31	202.22	50
47WW15	3308794.06	6959583.27	202.28	175
47WW16	3308477.27	6959895.12	200.62	19
47WW17	3309316.44	6959040.27	198.44	19

Location Information of Group 4 Sample Sites

SITE	X	Y	Z	BORE TOTAL DEPTH
47WW18	3310398	6959236	196.37	21
47WW19	3310406	6959241	196.01	62
47WW20	3310414	6959245	195.59	100
47WW21	3311452	6959832	184.44	22
47WW22	3311719	6959044	192.48	20
47WW23	3311243	6958504	194.76	34
48SB01	3314264	6959093	0	0
50SB01	3309530	6957412	0	16.8
50SB03	3309496	6957445	0	17
50SB04	3309512	6957386	0	17
50SB06	3309518	6957447	0	0
50SS02	3309576	6957426	0	0
50SS05	3309604	6957445	0	0
50SS07	3309620	6957389	0	0
50WW01	3309311	6957600	195.29	20
50WW02	3309569	6957437	197.4	19
50WW03	3309376	6957163	199.88	20
50WW04	3309947	6957157	201.64	20
60SB01	3305877	6959210	0	8
60SB02	3305841	6959117	0	9
60SB03	3305796	6959101	0	9
60SB06	3305751	6959074	0	7.9
60SB07	3305731	6959046	0	9
60SB08	3305747	6959021	0	8.1
60SB11	3304682	6960081	0	8.9
60SB12	3304690	6960057	0	8.8
60SB13	3304676	6960007	0	8.6
60SB22	3305747	6958975	0	0
60SS04	3305831	6959060	0	0
60SS05	3305769	6959122	0	0
60SS09	3305759	6959010	0	0
60SS10	3305750	6959044	0	0
60SS11	3305778	6959159	0	0
60SS12	3305709	6959163	0	0
60SS13	3305746	6959120	0	0
60SS14	3304708	6960030	0	0
60SS15	3304744	6960095	0	0
60SS16	3305675	6959125	0	0
60SS17	3305720	6959086	0	0
60SS18	3305786	6959007	0	0
60SS19	3305645	6959082	0	0
60SS20	3305678	6959046	0	0
60SS21	3305712	6958988	0	0
60SS23	3305614	6959048	0	0
60SS24	3305656	6959010	0	0
60SS25	3305688	6958979	0	0
60SS26	3305719	6958932	0	0
LHS-2-01	3307323	6962469	0	0
LHS-2-02	3307361	6962120	0	0

Location Information of Group 4 Sample Sites				
SITE	X	Y	Z	BORE TOTAL DEPTH
LHS-2-03	3307019.17	6963250.38	0	0
LHS-2-04	3306781.66	6963347.7	0	0
LHS-2-05	3307011.79	6963403.51	0	0
LHS-2-06	3306302.03	6963067.55	0	0
LHS-2-07	3306331.53	6962898.68	0	0
LHS-2-08	3306351.38	6962649.8	0	0
LHS-2-09	3305630.81	6963226.4	0	0
LHS-2-10	3306073.37	6963388.11	0	0
LHS-2-11	3305825.54	6963362.35	0	0
LHS-2-12	3305847.67	6963193.48	0	0
LHS-2-13	3303961.72	6962638.86	0	0
LHS-2-14	3304302.81	6962708.45	0	0
LHS-2-15	3306346.73	6961831.99	0	0
LHS-2-16	3305854.01	6961557.22	0	0
LHS-2-17	3305655.08	6962236.21	0	0
LHS-2-18	3305777.52	6962363.58	0	0
LHS-2-19	3306178.78	6962724.22	0	0
LHS-3-01	3309149.89	6960400.08	0	0
LHS-3-02	3309426.69	6960106.68	0	0
LHS-3-03	3309416.91	6960636.9	0	0
LHS-3-04	3309877.8	6960506.18	0	0
LHS-3-05	3310234.86	6959682.71	0	0
LHS-3-06	3310020.15	6958761.21	0	0
LHS-3-07	3309892.27	6959041.84	0	0
LHS-3-08	3310451.18	6958553.2	0	0
LHS-3-09	3309506.97	6958296.53	0	0
LHS-3-10	3309609.06	6958097.2	0	0
LHS-3-11	3309340.54	6957920.45	0	0
LHS-3-12	3309043.22	6957817.68	0	0
LHS-3-13	3309249.76	6958399.44	0	0
LHS-3-14	3307778.4	6959106.12	0	0
LHS-3-15	3308246.58	6959129.32	0	0
LHS-3-16	3308942.47	6959086.54	0	0
LHS-3-17	3309367.51	6959264.33	0	0
LHS-3-18	3308034.29	6961067.89	0	0
LHS-3-19	3308420.69	6958512.26	0	0
LHS-3-20	3309135.17	6959554.58	0	0
LHS-3-21	3308844.68	6959446	0	0
LHS-3-22	3309073.23	6959734.43	0	0
LHS-3-23	3308921.58	6959636.63	0	0
LHS-3-24	3308934.82	6961200.16	0	0
LHS-3-25	3308822.81	6961496.69	0	0
LHS-3-26	3309377.19	6961986.61	0	0
LHS-3-27	3309329.73	6961354.87	0	0
LHS-3-28	3309276.57	6961750.86	0	0
LHS-3-29	3309249.99	6961570.36	0	0
LHS-3-30	3308118.23	6958099.51	0	0
LHSMW01	3306087.69	6959159.79	211.19	16
LHSMW02	3305705.23	6959133.73	213.75	16

Location Information of Group 4 Sample Sites				
SITE	X	Y	Z	BOF TOT DEP
LHSMW03	3305514	6959938	214.24	32
LHSMW04	3305398	6960186	214.04	30
LHSMW05	3305079	6960158	215.17	32
LHSMW06	3304629	6960080	219.86	22
LHSMW07	3304408	6959841	218.54	27.9
LHSMW08	3306617	6961325	204.49	47
LHSMW09	3306349	6961075	208.01	24
LHSMW10	3305667	6960861	211.33	19
LHSMW11	3305793	6961101	209.89	27
LHSMW12	3306022	6961387	205.98	14
LHSMW13	3306006	6961755	206.48	15.4
LHSMW14	3303936	6962601	241.67	18
LHSMW15	3304452	6962631	223.68	22
LHSMW16	3304181	6962729	229.3	22
LHSMW17	3305921	6962318	211.5	24
LHSMW18	3305918	6962573	212.38	25
LHSMW19	3305863	6962940	209.8	27
LHSMW20	3306305	6963273	206.21	22.5
LHSMW21	3306500	6963621	204.66	27
LHSMW22	3306378	6962767	206.41	26
LHSMW23	3306469	6962447	205.8	[illegible]
LHSMW24	3307057	6963099	200.52	[illegible]
LHSMW25	3307260	6963256	199.07	39.6
LHSMW26	3307440	6962398	201.53	37.2
LHSMW27	3307263	6962174	199.2	18.1
LHSMW28	3307688	6960930	202.66	17
LHSMW29	3308072	6960870	200.51	20.8
LHSMW30	3308292	6960875	200.68	19
LHSMW31	3308967	6961160	198.09	27.9
LHSMW32	3308982	6961387	197.2	16
LHSMW33	3309335	6961290	196.27	19
LHSMW34	3309337	6961493	195.85	22.5
LHSMW35	3309373	6961685	195.4	21
LHSMW36	3309579	6961872	193.74	26.5
LHSMW37	3309709	6962064	192.23	34
LHSMW38	3308184	6961506	197.84	28
LHSMW39	3309910	6960715	195.78	18
LHSMW40	3309953	6960415	196.9	14
LHSMW41	3309725	6960515	197.1	38
LHSMW42	3309660	6960355	197.18	19.8
LHSMW43	3309633	6960010	197.38	19.5
LHSMW44	3309302	6960305	197.45	38
LHSMW45	3309141	6960146	198.74	36
LHSMW46	3309392	6959763	198.46	17.3
LHSMW47	3309340	6959603	197.92	[illegible]
LHSMW48	3309436	6959323	199.3	[illegible]
LHSMW49	3309025	6959476	198.95	[illegible]
LHSMW50	3308464	6959085	202.33	28.5
LHSMW51	3307497	6959185	205.6	19

Location Information of Group 4 Sample Sites

SITE	X	Y	Z	BORE TOTAL DEPTH
LHSMW52	3308621.6	6958448.8	202.6	22
LHSMW53	3309903.12	6958096.73	194.84	14
LHSMW54	3310541.19	6958535.21	191.08	44
LHSMW55	3310174.99	6959043.13	196.47	17.5
LHSMW56	3310570.56	6959009.13	195.36	20
LHSMW57	3310398.96	6959436.18	197.56	14.5
LHSMW58	3308108.48	6958036.44	200.2	34
LHSMW59	3307881.45	6958119.71	201.07	49.3
LHSMW60	3309451.7	6957945.07	196.14	27
LHSMW61	3313184.94	6958547.74	195.23	26.5
LHSMW62	3314544.51	6959033.38	189.06	27.6
LHSMW63	3314367.07	6959186.88	191.01	20
LHSMW64	3314918.24	6959088.76	188.23	25
LHSMW65	3314968.03	6959265.02	191.8	18
LHSMW66	3314814.41	6959503.12	192.23	18
LHSMW67	3315706.92	6957361.09	182.64	20
LHSMW68	3315493.34	6957111.64	186.69	22
LHSMW69	3315271.77	6957346.18	180.16	51
LHSMW70	3316533.17	6958033.52	180.54	22
LHSMW71	3316839.63	6958207.89	181	17.5
LHS-SH-01	3305950.07	6959049.75	0	0
LHS-SH-02	3305363.23	6959930.37	0	0
LHS-SH-03	3305163.32	6960087.84	0	0
LHS-SH-04	3305021.57	6960276.47	0	0
LHS-SH-05	3304399.86	6959794.49	0	0
LHS-T-01	3315359.32	6957301.07	0	0
LHS-T-02	3315200.37	6957230.74	0	0
LHS-Y-01	3314788.42	6959055.41	0	0
LHS-Y-02	3314651.78	6959052.71	0	0
LHS-Y-03	3314863.71	6959206.9	0	0
LHS-Y-04	3314732.65	6958941.8	0	0
LHS-Y-05	3314172.15	6959025.66	0	0
LHS-Y-06	3314163.78	6959139.27	0	0
MW21SS01	3306372	6963675	0	0
MW21SS02	3306486	6963677.2	0	0
MW21SS03	3306562	6963667.4	0	0
MW21SS04	3306388	6963558.5	0	0
MW21SS05	3306504	6963559.7	0	0
MW21SS06	3306539	6963621.3	0	0
SUMP001	3305660	6963271.3	0	5
SUMP002	3305918	6963332.6	0	10
SUMP003	3305906	6963306.1	0	10
SUMP004	3306009	6963290.8	0	5
SUMP005	3305998	6963333.7	0	10
SUMP006	3307022	6963177.5	0	5
SUMP007	3307026	6963140.4	0	7
SUMP008	3307014	6963357.9	0	10
SUMP009	3307003	6963324.6	0	3
SUMP010	3307055	6962430.5	0	5

Location Information of Group 4 Sample Sites

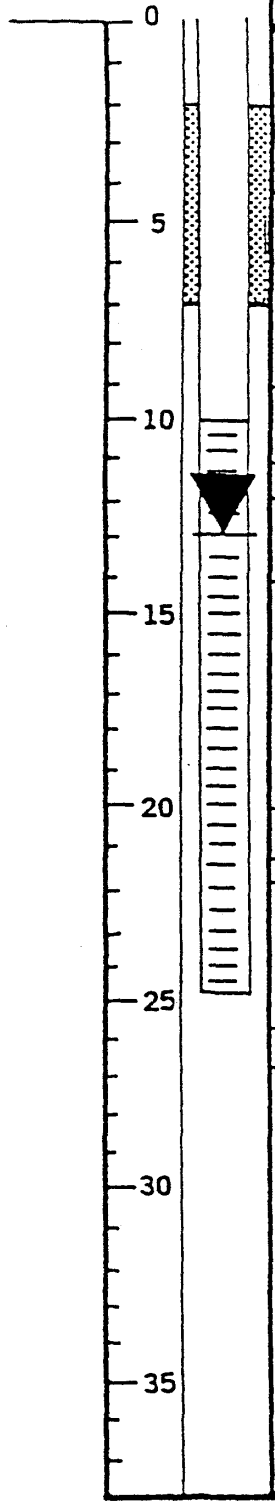
SITE	X	Y	Z	BORE TOTAL DEPTH
SUMP011	3307053	6962355	0	6.5
SUMP012	3307302	6962439	0	10
SUMP013	3307304	6962370	0	10
SUMP014	3305677	6962283	0	10
SUMP015	3305660	6962405	0	10
SUMP016	3305651	6962434	0	5
SUMP017	3305664	6962528	0	10
SUMP018	3305742	6962467	0	10
SUMP019	3306332	6962560	0	5
SUMP020	3305653	6962645	0	5
SUMP021	3306316	6962692	0	10
SUMP022	3305654	6962775	0	7
SUMP023	3306311	6962810	0	5
SUMP024	3305644	6962891	0	5
SUMP025	3306318	6962925	0	6.25
SUMP026	3306299	6962984	0	5
SUMP027	3305635	6963123	0	5
SUMP028	3306808	6963171	0	10
SUMP029	3306767	6963455	0	5
SUMP030	3305722	6961255	0	5
SUMP031	3305728	6961273	0	10
SUMP032	3305725	6961408	0	10
SUMP033	3305765	6961358	0	10
SUMP034	3305755	6961496	0	5
SUMP035	3305753	6961652	0	6
SUMP036	3306799	6963213	0	5
SUMP037	3305775	6962515	0	5
SUMP038	3306217	6961283	0	7.5
SUMP039	3306377	6961418	0	3.5
SUMP040	3306377	6961393	0	5
SUMP041	3306366	6961536	0	7
SUMP042	3306345	6961627	0	10
SUMP043	3306197	6961662	0	5
SUMP044	3308961	6957854	0	5.5
SUMP045	3309000	6957748	0	5
SUMP047	3309271	6957946	0	5
SUMP048	3309726	6958137	0	10
SUMP049	3309759	6958232	0	5
SUMP050	3309609	6958382	0	8.5
SUMP051	3309647	6958295	0	10
SUMP052	3310425	6958579	0	5
SUMP053	3309227	6958441	0	5
SUMP054	3309903	6958742	0	10
SUMP055	3309937	6958769	0	5
SUMP056	3310440	6958998	0	5
SUMP057	3309811	6959025	0	5
SUMP058	3308448	6958541	0	5
SUMP059	3308972	6959235	0	5
SUMP060	3309353	6959392	0	10

Location Information of Group 4 Sample Sites

SITE	X	Y	Z	BORE TOTAL DEPTH
SUMP061	3310237	6959647.9	0	5
SUMP062	3308753	6959484.6	0	10
SUMP063	3308907	6959461	0	10
SUMP064	3309044	6959513.6	0	10
SUMP065	3309092	6959575	0	5
SUMP066	3309082	6959699.1	0	10
SUMP067	3309002	6959693	0	5
SUMP068	3307741	6959101.2	0	5
SUMP069	3308258	6959223.1	0	5
SUMP070	3309449	6960124	0	5
SUMP071	3309133	6960412.1	0	5
SUMP072	3309105	6960247.2	0	5
SUMP073	3309438	6960478.6	0	8
SUMP074	3309538	6960557.8	0	10
SUMP075	3309576	6960472.4	0	5
SUMP076	3309822	6960486.8	0	5
SUMP077	3309871	6960612.8	0	5
SUMP078	3307985	6960967.9	0	5
SUMP079	3308004	6960965.9	0	10
SUMP080	3307922	6960908	0	10
SUMP081	3308837	6961204.3	0	10
SUMP082	3308899	6961231.9	0	5
SUMP083	3308795	6961493.3	0	10
SUMP084	3309216	6961370.5	0	10
SUMP085	3309118	6961472.3	0	10
SUMP086	3309123	6961430	0	10
SUMP087	3309180	6961664.8	0	10
SUMP088	3309255	6961680.4	0	5
SUMP089	3309275	6961633.3	0	10
SUMP090	3309255	6961480.7	0	5
SUMP091	3309375	6961997	0	10
SUMP092	3309448	6961946	0	5
SUMP093	3309581	6962071.9	0	10
SUMP094	3314201	6959077.1	0	5
SUMP095	3314773	6959043.2	0	5
SUMP096	3314695	6959072	0	10
SUMP097	3314745	6959194.6	0	10
SUMP098	3314675	6959214.7	0	5
SUMP099	3314687	6959291.8	0	10
SUMP100	3314684	6959424.4	0	5
SUMP101	3314769	6959424.6	0	10
SUMP102	3315331	6957302.8	0	10
SUMP103	3315376	6957244.9	0	10
SUMP104	3315261	6957234.4	0	10
SUMP105	3315334	6957178.6	0	5
SUMP107	3304220	6962625.3	0	3.5
SUMP108	3304167	6962665.8	0	5
SUMP109	3304038	6962574.3	0	10
SUMP110	3305605	6960922.4	0	5

Location Information of Group 4 Sample Sites

SITE	X	Y	Z	BOR TOT, DEPTH
SUMP111	3305272	6960172	0	10
SUMP112	3305238	6960122	0	5
SUMP113	3304486	6960042	0	5
SUMP114	3316477	6953152	191	5
SUMP116	3316083	6953677	178.3	10
SUMP117	3304290	6959901	0	5
SUMP118	3304549	6953716	0	5
SUMP119	3305443	6959997	0	8
SUMP120	3305384	6959963	0	5
SUMP121	3310365	6959022	0	10
SUMP122	3305919	6959108	0	5
SUMP123	3314190	6959128	0	10
WRSUMP001	3314758	6959019	0	5
WRSUMP002	3314644	6959230	0	10
WRSUMP003	3314290	6959162	0	5
WRSUMP004	3305644	6963266	0	4.5
WRSUMP005	3307018	6963385	0	10
WRSUMP006	3307324	6962431	0	10
WRSUMP007	3306818	6963325	0	0.5
WRSUMP008	3306214	6962695	0	5
WRSUMP009	3306197	6962456	0	10
WRSUMP010	3305783	6962467	0	5
WRSUMP011	3305777	6962727	0	5
WRSUMP012	3307198	6963323	0	10
WRSUMP013	3306286	6961489	0	10
WRSUMP014	3308086	6958019	0	5
WRSUMP015	3305793	6961426	0	5
WRSUMP016	3304087	6962711	0	5
WRSUMP017	3309119	6961380	0	5
WRSUMP018	3309897	6960526	0	10
WRSUMP019	3305781	6961747	0	5
WRSUMP021	3306316	6963081	0	5
WRSUMP24X	3316596	6953200	192.3	6.5
WRSUMP744A	3304330	6959905	0	3.5



VISUAL U/S	BLOW COUNT*	MATERIAL CLASSIFICATION	% FINES	AQUIFER PERMEABILITY
SM	6/7 7/12	Silty sand Very pale grown mottled with brownish yellow	15	
SC	2/10 17/20	Clayey sand Very pale brown and yellowish brown	40	
CL	7/8	Slightly sandy clay 10% fine sand Very pale brown w/brownish yellow		
SM	11/12	Silty fine sand seam		
CL		Slightly sandy clay Very pale brown w/ brownish yellow		
SM	6/23 32/35	Silty sand Light brownish grey mottled w/yellowish brown	15	
CL	6/8	Sandy clay 30% fine sand Very pale brown w/brownish yellow		
SM	12/23	Silty sand seam		
CL	3/7	Sandy clay Very pale brown w/brownish yellow		
SM	20/18	Silty sand	30	

*BLOWS PER 6 INCH USING 18, 24 or 36 SPLITSPOON

VERTICAL SCALE 1" = 5.0'

WELL 105 DATE DRILLED 6/30/83

STUDY AREA Rocket Motor Production Area

ELEVATION TOP OF STEEL CASING = 199.25 ft

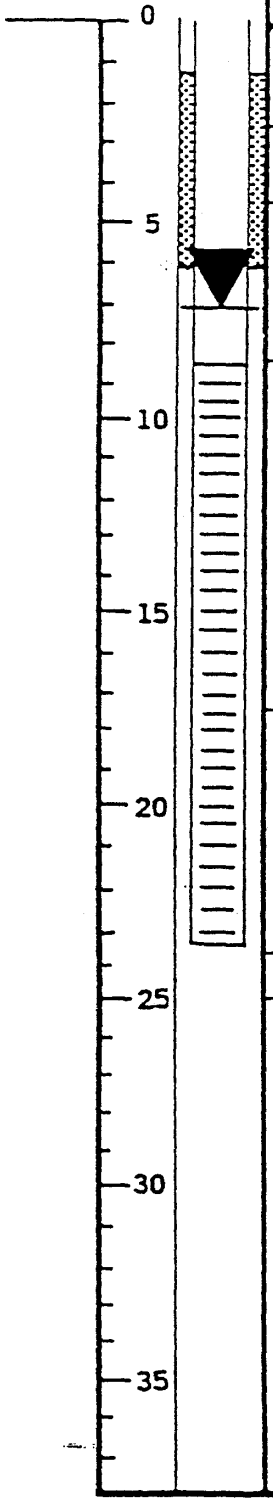
ELEVATION TOP OF PVC RISER = 198.76 ft

ELEVATION OF GROUND SURFACE = 196.32 ft

SOURCE: ENVIRONMENTAL PROTECTION SYSTEMS, INC. - 1983

CONTAMINATION SURVEY
LONGHORN ARMY AMMUNITION PLANT
MARSHALL, TEXAS

U. S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
ABERDEEN PROVING GROUND, MARYLAND



VISUAL U/S	BLOW COUNT*	MATERIAL CLASSIFICATION	% FINES	AQUIFER PERMEABILITY
CL	8/9 /10	Sandy clay 30% fine sand Yellowish red		
CL	2/5 /5	Sandy clay 40% fine sand Yellowish red		
CL-ML	3/5 /6	Silty clay 35% silt Light grey mottled w/yellowish red		
SM	5/6 /6	Silty sand Pinkish grey	20	
	3/6 /7			
SM	6/19 24/20 23/23	Slightly silty sand Pinkish grey mottled w/yellowish red	15	
CL	3/4 /5	Clay Grey		

*BLOWS PER 6 INCH USING 18, 24, or 36 SPLITSPOON

VERTICAL SCALE 1" = 5.0'

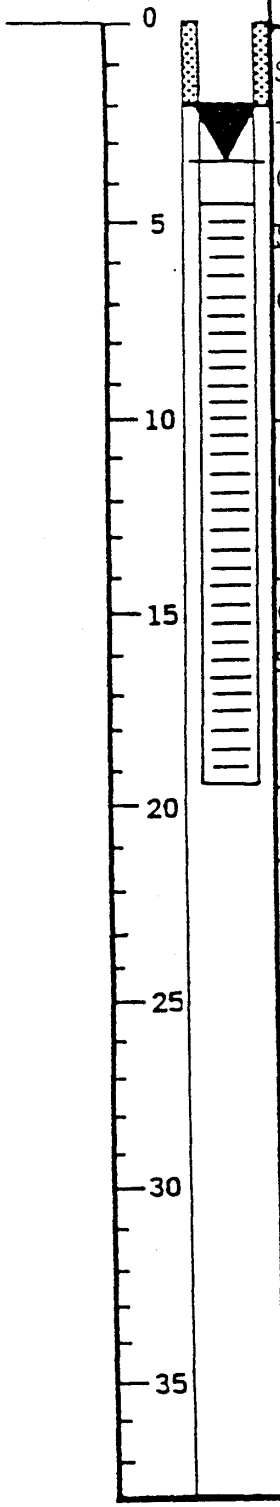
WELL 106 DATE DRILLED 5/14/82
STUDY AREA Static Test Area

ELEVATION TOP OF STEEL CASING = 178.72 ft
ELEVATION TOP OF PVC RISER = 177.91 ft
ELEVATION OF GROUND SURFACE = 174.56 ft

SOURCE: ENVIRONMENTAL PROTECTION SYSTEMS, INC. - 1983

CONTAMINATION SURVEY
LONGHORN ARMY AMMUNITION PLANT
MARSHALL, TEXAS

U. S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
ABERDEEN PROVING GROUND, MARYLAND



VISUAL U/S	BLOW COUNT*	MATERIAL CLASSIFICATION	% FINES	AQUIFER PERMEABILITY
SP-SM	9/7 10/5 6/8	Slightly silty sand Yellowish red	5-10	
CL		Sandy clay 20% fine sand Gray and red		
SP-SM	3	Silty sand		
CL	4/5 5/6 /10	Sandy clay 20% fine sand Gray and red		
CL	3/3 4/5 6/7	Slightly sandy clay 5% fine sand Light olive gray		
CL		Sandy clay 15% fine sand Lt. olive grey w/reddish yellow		
SP-SM	2/11 6/8 /7	Silty sand-light grey	29.0 34.4	1.1 x 10^{-3} ft/min
SM		Silty sand Light grey mottled w/reddish yellow		
SM	4/5 /7	Silty sand Yellowish brown	24.6 28.1	

*BLOWS PER 6 INCH USING 18, 24, or 36 SPLITSPOON

VERTICAL SCALE 1" = 5.0'

WELL 107 DATE DRILLED 5/16/82

STUDY AREA Static Test Area

ELEVATION TOP OF STEEL CASING = 178.11 ft

ELEVATION TOP OF PVC RISER = 177.56 ft

ELEVATION OF GROUND SURFACE = 174.97 ft

SOURCE: ENVIRONMENTAL PROTECTION SYSTEMS, INC. - 1983

CONTAMINATION SURVEY
LONGHORN ARMY AMMUNITION PLANT
MARSHALL, TEXAS

U. S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
ABERDEEN PROVING GROUND, MARYLAND

HOLE NO. LHS-MW1

DRILLING LOG	DIVISION: SOUTHWEST	INSTALLATION: LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT: LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT: 8" AUGER	
2. LOCATION (Coordinates or Station): 695957.90 3306087.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL: CME .75	
4. HOLE NO. (As shown on drawing title and file number): LHS-MW1		13. OVERBURDEN SAMPLES: DISTURBED 7	UNDISTURBED 0
5. NAME OF DRILLER: TOM BEAVERS		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE REMARKS	
		16. DATE HOLE: STARTED 08/19/1994	COMPLETED 08/19/1994
7. THICKNESS OF OVERBURDEN: 16.0		17. ELEVATION TOP OF HOLE: 211.2	
8. DEPTH DRILLED INTO ROCK: 0.0		18. TOTAL CORE RECOVERY FOR BORING: 0.0 %	
9. TOTAL DEPTH OF HOLE: 16.0		MERLIN DEAN	

ELEVATION 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
206.7	2, 4		LEAN CLAY (CL) (0.0 – 4.5) WITH SAND, LIGHT YELLOWISH BROWN, MOIST.		J-1	WATER ENCOUNTERED @ 11.7' SAMPLE TYPE ZONE AUGER 0.0– 10.0 SPLITSPOON 10.0– 16.0 SAMPLE DEPTH J-1 0.0– 4.5 J-2 4.5– 7.2 J-3 7.2– 11.7 J-4 11.7– 12.7 J-5 13.0– 14.0 J-6 14.0– 15.0 J-7 15.0– 16.0
199.5	6, 8, 10		FAT CLAY (CH) (4.5 – 11.7) WITH SAND, LIGHT BROWNISH GRAY MOIST.		J-2, J-3	
195.2	12, 14, 16		FAT CLAY (CH) (11.7 – 16.0) DARK GRAY TO OLIVE BROWN, MOIST. 12.8–14.0 VERY MOIST.		J-4, J-5, J-6, J-7	
	18, 20					

PROJECT: LHAAP-WASTE SUMPS | HOLE NO. LHS-MW1

HOLE NO. LHS-MW2

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959135.90 3305704.50		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW2		13. OVERBURDEN SAMPLES DISTURBED 0	UNDISTURBED 11
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/19/1994	COMPLETED 08/20/1994
7. THICKNESS OF OVERBURDEN 16.0		17. ELEVATION TOP OF HOLE 211.7	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 16.0		MERLIN DEAN	

ELEVATION 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
211.2			LEAN CLAY (CL) (0.0 – 1.5) SANDY, BROWN, MOIST, VERY STIFF NUMEROUS ROOTS IN TOP, FEW SCATTERED GRAVELS TO 3/4", MORE SAND IN BOTTOM 0.3'.		ST-1	SAMPLE TYPE SHELBY ZONE 0.0– 16.0 SAMPLE DEPTH ST-1 0.0– 1.5 ST-2 1.5– 3.0 ST-3 3.0– 4.5 ST-4 4.5– 6.0 ST-5 6.0– 7.5 ST-6 7.5– 9.0 ST-7 9.0– 10.5 ST-8 10.5– 12.0 ST-9 12.0– 13.5 ST-10 13.5– 15.0 ST-11 15.0– 16.0
208.7	2		LEAN CLAY (CL) (1.5 – 3.0) GRAYISH BROWN, MOIST, STIFF TO VERY STIFF, VERY FRIABLE, VERY SANDY IN TOP 0.4'.		ST-2	
205.7	4		LEAN CLAY (CL) (3.0 – 6.0) WITH SAND, BROWNISH GRAY AND YELLOW, MOIST, STIFF, VERY FRIABLE, VERY SANDY IN TOP 0.4'		ST-3	
	6				ST-4	
	8		FAT CLAY (CH) (6.0 – 13.5) OLIVE AND GRAY WITH YELLOW, MOIST, STIFF TO VERY STIFF, FRIABLE, LAMINATIONS OF VERY FINE SAND AND SILT, CALCAREOUS TO SLIGHTLY CACLAREOUS, FRIABLE FISSILITY, 10.5–12.0 VERY WET.		ST-5	
					ST-6	
	10				ST-7	
					ST-8	
	12				ST-9	
198.2						
196.7	14		FAT CLAY (CH) (13.5 – 15.0) DARK OLIVE GRAY, MOIST, HARD, FISSILITY, SLIGHTLY SLICKEN-SIDED, LAMINATIONS OF SILT.		ST-10	
195.7	16		FAT CLAY (CH) (15.0 – 16.0) DARK OLIVE GRAY, MOIST, VERY STIFF, FRIABLE, FISSILITY, LAMINATIONS OF VERY FINE SAND AND SILT. TOP 0.2' VERY WET.		ST-11	
	18					
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW2

HOLE NO. LHS-MW3

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959939.80 3305514.20		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW3		13. OVERBURDEN SAMPLES DISTURBED 4	UNDISTURBED 13
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/20/1994	COMPLETED 08/20/1994
7. THICKNESS OF OVERBURDEN 32.0		17. ELEVATION TOP OF HOLE 214.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 32.0		MERLIN DEAN	

ELEVATION 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
212.0	2		LEAN CLAY (CL) (0.0 - 2.0) SANDY, BROWN, MOIST, VERY STIFF, FEW GRAVELS TO 3/8",TOP 0.5' SILTY SAND (SM) DARK BROWN, CALCAREOUS, ROOTS.		ST-1	SAMPLE TYPE ZONE SHELBY 0.0- 22.8 SPLITSPOON 22.8- 32.0 SAMPLE DEPTH ST-1 0.0- 2.0 ST-2 2.0- 4.0 ST-3 4.0- 4.4 ST-4 6.0- 8.0 ST-5 8.0- 9.7 ST-6 9.7- 10.2 ST-7 10.2- 12.0 ST-8 12.0- 13.8 ST-9 13.8- 15.6 ST-10 15.6- 17.4 ST-11 17.4- 18.9 ST-12 18.9- 21.0 ST-13 21.0- 22.8 J-1 22.8- 23.4 J-2 24.2- 24.8 J-3 24.8- 26.6 J-4 31.5- 32.0
210.0	4		LEAN CLAY (CL) (2.0 - 4.0) SANDY, BROWNISH YELLOW WITH GRAY, VERY MOIST, VERY STIFF, FEW GRAVELS TO 3/8", FEW BLACK IRON-OXIDE STAINS.		ST-2	
209.6			LEAN CLAY (CL) (4.0 - 4.4) SANDY, GRAY AND YELLOW WITH RED, MOIST, HARD.		ST-3	
208.0	6		FAT CLAY (CH) (4.4 - 6.0) SANDY, RED WITH GRAY, MOIST, VERY STIFF.			
206.6			LEAN CLAY (CL) (6.0 - 7.4) WITH SAND, YELLOW WITH GRAY, MOIST, HARD.		ST-4	
206.0	8		FAT CLAY (CH) (7.4 - 8.0) GRAY WITH YELLOW, MOIST, HARD.			
205.4			CLAY SAND (SC) (8.0 - 8.6) WITH GRAVEL, BROWN, MOIST, GRAVELS TO 3/4".		ST-5	
204.6			LEAN CLAY (CL) (8.6 - 9.4) SANDY, GRAY WITH YELLOW AND BROWN, MOIST, HARD.			
204.3	10		CLAY SAND (SC) (9.4 - 9.7) WITH GRAVEL, MOIST, GRAVEL TO 1/2".		ST-6	
			LEAN CLAY (CL) (9.7 - 13.8) WITH SAND, GRAY AND YELLOW, MOIST, HARD, POCKETS OF SAND THROUGHOUT, 12.0-13.8 VERY STIFF TO HARD.		ST-7	
200.2	12				ST-8	
	14		LEAN CLAY (CL) (13.8 - 17.4) YELLOW WITH GRAY, MOIST, VERY STIFF.		ST-9	
196.6	16				ST-10	
	18		LEAN CLAY (CL) (17.4 - 21.0) YELLOW WITH GRAY, VERY MOIST TO WET, STIFF.		ST-11	
194.1	20				ST-12	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW3

HOLE NO. LHS-MW3

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959939.80 3305514.20		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW3		13. OVERBURDEN SAMPLES DISTURBED 4	UNDISTURBED 13
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/20/1994	COMPLETED 08/20/1994
7. THICKNESS OF OVERBURDEN 32.0		17. ELEVATION TOP OF HOLE 214.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 32.0		MERLIN DEAN	

ELEVATION 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
193.0			LEAN CLAY (CL) (17.4 - 21.0) YELLOW WITH GRAY, VERY MOIST TO WET, STIFF.		ST-12	
191.2	22		LEAN CLAY (CL) (21.0 - 22.8) WITH SAND, YELLOW WITH GRAY VERY MOIST, STIFF, SCATTERED BLACK IRON-OXIDE STAINS, BOTTON 0.4' SANDY LEAN CLAY.		ST-13	
189.8	24		LEAN CLAY (CL) (22.8 - 24.2) WITH SAND, LIGHT OLIVE BROWN, MOIST.		J-1	
189.2			LEAN CLAY (CL) (24.2 - 24.8) OLIVE YELLOW, MOIST.		J-2	
182.5	26 28 30		LEAN CLAY (CL) (24.8 - 31.5) WITH SAND, LIGHT OLIVE BROWN, MOIST.		J-3	
182.1	32		LEAN CLAY (CL) (31.5 - 32.0) LIGHT OLIVE BROWN, MOIST		J-4	
	34 36 38 40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW3

HOLE NO. LHS-MW4

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960183.80	3305398.40	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW4		13. OVERBURDEN SAMPLES DISTURBED 12	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/22/1994	COMPLETED 08/23/1994
7. THICKNESS OF OVERBURDEN 30.0		17. ELEVATION TOP OF HOLE 214.0	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 30.0		STEVE BREWER	

ELEVATION 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
205.0	9		LEAN CLAY (CL) (0.0 – 9.0) SANDY, OLIVE BROWN TO BROWNISH GRAY, MOIST, ROOTS TO 3.4'.		J-1 J-2 J-3	WATER ENCOUNTERED @ 13.2' SAMPLE TYPE ZONE SPLITSPOON 0.0– 30.0 SAMPLE DEPTH J-1 0.3– 1.2 J-2 1.2– 3.4 J-3 3.4– 9.0 J-4 9.0– 13.2 J-5 13.2– 16.0 J-6 16.0– 18.9 J-7 18.9– 23.8 J-8 23.8– 25.2 J-9 25.2– 27.2 J-10 27.2– 28.1 J-11 28.1– 29.0 J-12 29.0– 30.0
198.0	15		LEAN CLAY (CL) (9.0 – 16.0) OLIVE YELLOW, MOIST.		J-4 J-5	
195.1	18		LEAN CLAY (CL) (16.0 – 18.9) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-6	
190.2	21		LEAN CLAY (CL) (18.9 – 23.8) WITH SAND, YELLOWISH BROWN, MOIST, SILTY.		J-7	
188.8	24		CLAY SAND (SC) (23.8 – 25.2) WITH GRAVEL, REDDISH BROWN, MOIST, GRAVELS TO 1/2".		J-8	
186.8	27		CLAY SAND (SC) (25.2 – 27.2) PALE BROWN, MOIST, ROOTS.		J-9	
185.9			LEAN CLAY (CL) (27.2 – 28.1) SANDY, REDDISH BROWN, MOIST, GRAVELS TO 1/2".		J-10	
185.0			FAT CLAY (CH) (28.1 – 29.0) SANDY, REDDISH BROWN, MOIST, GRAVEL TO 1/2".		J-11	
184.0	30		FAT CLAY (CH) (29.0 – 30.0) WITH SAND, LIGHT BROWNISH GRAY MOIST.		J-12	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW4

HOLE NO. LHS-MW5

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960159.80 3305079.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW5		13. OVERBURDEN SAMPLES DISTURBED 9	UNDISTURBED 13
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/22/1994	COMPLETED 08/22/1994
7. THICKNESS OF OVERBURDEN 32.0		17. ELEVATION TOP OF HOLE 215.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 32.0		STEVE BREWER	

ELEVATION 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
213.6			LEAN CLAY (CL) (0.0 – 1.5) SANDY, BROWNISH GRAY, MOIST, VERY STIFF, NUMEROUS ROOTS IN TOP, BLACK IRON-OXIDE STAINS, ASPHALTIC MATERIAL FROM 0.7'-0.8',GRAYISH BROWN FAT CLAY IN BOTTOM 0.7'.		ST-1	SAMPLE TYPE ZONE SHELBY 0.0– 19.5 SPLITSPOON 19.5– 32.0 SAMPLE DEPTH ST-1 0.0– 1.5 ST-2 1.5– 3.0 ST-3 3.0– 4.5 ST-4 4.5– 6.0 ST-5 6.0– 7.5 ST-6 7.5– 9.0 ST-7 9.0– 10.5 ST-8 10.5– 12.0 ST-9 12.0– 13.5 ST-10 13.5– 14.7 ST-11 15.0– 16.5 ST-12 16.5– 18.0 ST-13 18.0– 19.5 J-1 19.5– 21.0 J-2 21.0– 22.5 J-3 23.0– 24.5 J-4 24.5– 26.0 J-5 26.0– 27.0 J-6 27.0– 28.0 J-7 28.0– 28.4 J-8 28.4– 30.0 J-9 30.0– 32.0
212.1	2		FAT CLAY (CH) (1.5 – 3.0) WITH SAND, BROWNISH GRAY WITH RED, VERY MOIST, STIFF.		ST-2	
210.6	4		FAT CLAY (CH) (3.0 – 4.5) WITH SAND, RED ANDY GRAY, MOIST, STIFF TO VERY STIFF,FEW NODULES.		ST-3	
209.1	6		LEAN CLAY (CL) (4.5 – 6.0) WITH SAND,GRAY WITH YELLOW AND RED, HARD, SCATTERED BLACK IRON-OXIDE STAINS, TOP 0.5'.		ST-4	
206.1	8		LEAN CLAY (CL) (6.0 – 9.0) SANDY, GRAY WITH YELLOW, MOIST HARD TO VERY STIFF.		ST-5 ST-6	
204.6	10		LEAN CLAY (CL) (9.0 – 10.5) WITH SAND, LIGHT GRAY WITH YELLOW, MOIST, HARD, BECOMING SANDY WITH DEPTH.		ST-7	
203.1	12		SILTY SAND (SM) (10.5 – 12.0) LIGHT GRAY WITH YELLOW, VERY MOIST.		ST-8	
201.6			CLAY SAND (SC) (12.0 – 13.5) SILTY, YELLOW WITH LIGHT GRAY, VERY MOIST.		ST-9	
200.1	14		CLAY SAND (SC) (13.5 – 15.0) YELLOW WITH LIGHT GRAY, VERY MOIST, VERY STIFF, TOP 0.9' SILTY SAND (SM), VERY SOFT.		ST-10	
198.6	16		LEAN CLAY (CL) (15.0 – 16.5) SANDY, DARK YELLOW WITH LIGHT GRAY, MOIST, VERY STIFF, SMALL POCKET OF GRAVEL AT 15.9'.		ST-11	
197.1	18		FAT CLAY (CH) (16.5 – 18.0) WITH SAND, YELLOW AND LIGHT GRAY, MOIST,VERY STIFF TO HARD SCATTERED BLACK IRON-OXIDE STAINS, TOP 0.6' SANDY LEAN CLAY, VERY MOIST		ST-12	
195.6			LEAN CLAY (CL) (18.0 – 19.5) WITH SAND, YELLOW AND LIGHT GRAY, MOIST, VERY STIFF.		ST-13	
195.1	20		FAT CLAY (CH) (19.5 – 23.0) LIGHT BROWNISH GRAY, MOIST		J-1	

HOLE NO. LHS-MW5

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960159.80 3305079.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW5		13. OVERBURDEN SAMPLES DISTURBED 9	UNDISTURBED 13
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/22/1994	COMPLETED 08/22/1994
7. THICKNESS OF OVERBURDEN 32.0		17. ELEVATION TOP OF HOLE 215.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 32.0		STEVE BREWER	

ELEVATION 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
			FAT CLAY (CH) (19.5 - 23.0) LIGHT BROWNISH GRAY, MOIST.		J-1	
	22				J-2	
192.1						
			FAT CLAY (CH) (23.0 - 24.5) WITH SAND, LIGHT YELLOWISH BROWN, MOIST.		J-3	
190.6	24					
			FAT CLAY (CH) (24.5 - 27.0) LIGHT YELLOWISH BROWN TO GRAY, MOIST.		J-4	
	26				J-5	
188.1						
			LEAN CLAY (CL) (27.0 - 28.4) GRAY TO DARK GRAY, MOIST.		J-6	
	28				J-7	
186.7						
			FAT CLAY (CH) (28.4 - 32.0) GRAY TO LIGHT BROWNISH GRAY, MOIST.		J-8	
	30				J-9	
183.1	32					
	34					
	36					
	38					
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW5

HOLE NO. LHS-MW6

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960080.10 3304630.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW6		13. OVERBURDEN SAMPLES DISTURBED 10	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/23/1994	COMPLETED 08/24/1994
7. THICKNESS OF OVERBURDEN 22.0		17. ELEVATION TOP OF HOLE 219.9	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 22.0		STEVE BREWER	

ELEVATION 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
219.0			LEAN CLAY (CL) (0.0 – 0.9) WITH SAND, DARK YELLOWISH BROWN, MOIST.		J-1	WATER ENCOUNTERED @ 13.8'
217.8			LEAN CLAY (CL) (0.9 – 2.1) SANDY, DARK REDDISH BROWN, MOIST, ROOTS.		J-2	OVERNIGHT WATER LEVEL @ 10.0'
	3		LEAN CLAY (CL) (2.1 – 6.3) WITH SAND, DARK YELLOWISH BROWN, MOIST.		J-3	SAMPLE TYPE ZONE SPLITSPOON 0.0– 22.0
					J-4	SAMPLE DEPTH J-1 0.2– 0.9 J-2 0.9– 2.1 J-3 2.1– 2.8 J-4 2.8– 6.3 J-5 6.3– 10.1 J-6 10.1– 11.6 J-7 11.6– 13.8 J-8 13.8– 19.9 J-9 19.9– 20.3 J-10 20.3– 22.0
213.6	6					
			FAT CLAY (CH) (6.3 – 11.6) WITH SAND, DARK YELLOWISH BROWN TO OLIVE, MOIST.		J-5	
	9					
					J-6	
208.3						
	12		LEAN CLAY (CL) (11.6 – 13.8) SANDY, OLIVE, MOIST.		J-7	
206.1						
			CLAY SAND (SC) (13.8 – 19.9) OLIVE, MOIST.		J-8	
	15					
	18					
200.0						
199.6			LEAN CLAY (CL) (19.9 – 20.3) WITH SAND, OLIVE, MOIST.		J-9	
	21		FAT CLAY (CH) (20.3 – 22.0) LIGHT OLIVE GRAY, MOIST.		J-10	
197.9						
	24					
	27					
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW6

HOLE NO. LHS-MW7

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959841.50 3304410.30		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW7		13. OVERBURDEN SAMPLES DISTURBED 3	UNDISTURBED 17
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/20/1994	COMPLETED 08/20/1994
7. THICKNESS OF OVERBURDEN 27.9		17. ELEVATION TOP OF HOLE 218.6	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 27.9		STEVE BREWER	

ELEVATION 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
217.1			LEAN CLAY (CL) (0.0 - 1.5) SANDY, GRAYISH BROWN WITH RED, MOIST, VERY STIFF, NUMEROUS THIN ROOTS IN TOP 0.5'.		ST-1	WATER ENCOUNTERED @ 17.0'
215.6	2		LEAN CLAY (CL) (1.5 - 3.0) WITH SAND, BROWN WITH GRAY AND RED, MOIST, VERY STIFF, SCATTERED POCKETS OF FINE SAND		ST-2	TYPE ZONE SHELBY 0.0- 26.9 SAMPLE DEPTH ST-1 0.0- 1.5 ST-2 1.5- 3.0 ST-3 3.0- 4.5 ST-4 4.5- 6.0 ST-5 6.0- 6.8 J-1 6.8- 7.5 ST-6 7.5- 8.3 J-2 8.3- 9.0 ST-7 9.0- 10.5 ST-8 10.5- 12.0 ST-9 12.0- 13.5 ST-10 13.5- 14.7 ST-11 14.7- 16.4 ST-12 17.0- 17.7 ST-13 17.7- 19.0 ST-14 19.0- 19.8 ST-15 22.4- 23.9 ST-16 23.9- 24.6 ST-17 24.6- 25.6 J-3 26.8- 26.9
214.1	4		FAT CLAY (CH) (3.0 - 4.5) WITH SAND, GRAY AND RED MOIST, VERY STIFF.		ST-3	
212.6	6		LEAN CLAY (CL) (4.5 - 6.0) WITH SAND, GRAY AND YELLOW AND RED, MOIST, VERY STIFF.		ST-4	
211.8			LEAN CLAY (CL) (6.0 - 6.8) SANDY, GRAY AND YELLOW WITH RED, MOIST, VERY STIFF.		ST-5	
210.3	8		LEAN CLAY (CL) (6.8 - 8.3) WITH SAND, OLIVE AND YELLOW AND GRAY, MOIST, VERY STIFF TO HARD SEVERAL BLACK IRON-OXIDE STAIN		J-1 ST-6	
208.1	10		FAT CLAY (CH) (8.3 - 10.5) OLIVE YELLOW AND GRAY, MOIST, VERY STIFF, SLIGHTLY SLICKEN-SIDED, BLACK IRON-OXIDE STAINS THROUGHOUT.		J-2 ST-7	
205.1	12		LEAN CLAY (CL) (10.5 - 13.5) OLIVE GRAY AND YELLOW, MOIST, STIFF TO VERY STIFF, IRON-OXIDE STAINS, THIN SAND LENSES THROUGHOUT, FRIABLE.		ST-8 ST-9	
203.9	14		FAT CLAY (CH) (13.5 - 14.7) OLIVE WITH GRAY, MOIST, VERY STIFF, SEVERAL THIN SAND AND SILT LENSES, FRIABLE.		ST-10	
201.6	16		LEAN CLAY (CL) (14.7 - 17.0) OLIVE WITH GRAY, MOIST, VERY STIFF, VERY THIN FINE SAND AND SILT LENSES IN TOP HALF OF SAMPLE, FRIABLE.		ST-11	
198.6	18 20		FAT CLAY (CH) (17.0 - 22.4) LIGHT OLIVE GRAY, MOIST, HARD, SLIGHTLY SLICKENSIDED, FRIABLE		ST-12 ST-13 ST-14	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW7

027540

HOLE NO. LHS-MW7

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959841.50 3304410.30		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW7		13. OVERBURDEN SAMPLES DISTURBED 3	UNDISTURBED 17
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/20/1994	COMPLETED 08/20/1994
7. THICKNESS OF OVERBURDEN 26.9		17. ELEVATION TOP OF HOLE 218.6	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 26.9		STEVE BREWER	

ELEVATION 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
	22		FAT CLAY (CH) (17.0 – 22.4) LIGHT OLIVE GRAY, MOIST, HARD, SLIGHTLY SLICKENSIDED, FRIABLE			
196.2			LEAN CLAY (CL) (22.4 – 23.9) WITH SAND, OLIVE, MOIST, HARD, FRIABLE, LAMINATION OF VERY FINE SAND AND SILT.		ST-15	
194.7	24		CLAY SAND (SC) (23.9 – 24.6) OLIVE, MOIST, STIFF, SILTY, FRIABLE, CRUMBLES EASILY, TOP 1.0' DISTURBED WITH FALL-IN MATERIAL		ST-16	
194.0			CLAY SAND (SC) (24.6 – 26.8) OLIVE, VERY MOIST, FRIABLE, CRUMBLES EASILY.		ST-17	
	26					
191.8			LEAN CLAY (CL) (26.8 – 26.9) WITH SAND, LIGHT OLIVE BROWN, MOIST, CALCAREOUS.		J-3	
	28					
	30					
	32					
	34					
	36					
	38					
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW7

000017

HOLE NO. LHS-MW8

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961323.20 3306617.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW8		13. OVERBURDEN SAMPLES DISTURBED 18	UNDISTURBED
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/24/1994	COMPLETED 08/25/1994
7. THICKNESS OF OVERBURDEN 47.0		17. ELEVATION TOP OF HOLE 204.3	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 47.0		MERLIN DEAN	

ELEVATION 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
201.8			SILTY CLAY (ML) (0.0 – 2.5) SANDY, DARK YELLOWISH BROWN, MOIST, ROOTS.		J-1	WATER ENCOUNTERED @ 15.0' UPON COMPLETION OF DRILLING, OFFSET 5' WEST OF HOLE AND DRILLED DOWN TO 33.8' WITH 10" HOLLOW STEM AUGER TO SET WELL. SAMPLE TYPE ZONE SPLITSPOON 0.0– 33.8 SAMPLE DEPTH J-1 0.0– 2.5 J-2 2.5– 3.5 J-3 3.5– 5.5 J-4 5.5– 7.0 J-5 7.0– 9.0 J-6 9.0– 10.5 J-7 10.5– 12.5 J-8 12.5– 14.5 J-9 14.5– 16.2 J-10 16.2– 16.5 J-11 16.5– 18.5 J-12 18.5– 20.5 J-13 20.5– 22.5 J-14 22.5– 24.5 J-15 30.0– 32.0 J-16 32.0– 34.8 J-17 37.0– 42.0 J-18 42.0– 47.0
	3		LEAN CLAY (CL) (2.5 – 9.0) WITH SAND, YELLOWISH BROWN TO PALE BROWN, MOIST.		J-2	
					J-3	
	6				J-4	
195.3	9				J-5	
193.8			LEAN CLAY (CL) (9.0 – 10.5) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-6	
			CLAY SAND (SC) (10.5 – 16.2) YELLOWISH BROWN, FREE WATER, SILTY.		J-7	
	12				J-8	
	15				J-9	
188.1			LEAN CLAY (CL) (16.2 – 16.5) SANDY, YELLOWISH BROWN, MOIST,		J-10	
187.8			SILTY.			
			LEAN CLAY (CL) (16.5 – 18.5) SANDY, LIGHT YELLOWISH BROWN, FREE WATER, SILTY.		J-11	
	18					
185.8			CLAY SAND (SC) (18.5 – 20.5) LIGHT YELLOWISH BROWN, FREE WATER, SILTY.		J-12	
183.8						
	21		LEAN CLAY (CL) (20.5 – 22.5) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-13	
181.8						
			LEAN CLAY (CL) (22.5 – 30.0) SANDY, LIGHT YELLOWISH BROWN, FREE WATER, SILTY.		J-14	
	24					
	27					
174.3	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW8

HOLE NO. LHS-MW8

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961323.20 3306617.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW8		13. OVERBURDEN SAMPLES DISTURBED 18	UNDISTURBED
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/24/1994	COMPLETED 08/25/1994
7. THICKNESS OF OVERBURDEN 47.0		17. ELEVATION TOP OF HOLE 204.3	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 47.0		MERLIN DEAN	

ELEVATION	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
174.3			FAT CLAY (CH) (30.0 - 32.0) LIGHT YELLOWISH BROWN, MOIST. FREE WATER, SILTY.		J-15	
172.3			LEAN CLAY (CL) (32.0 - 47.0) WITH SAND, GRAY TO DARK GRAY, MOIST.		J-16	
	33					
	36					
	39				J-17	
	42					
	45				J-18	
157.3						
	48					
	51					
	54					
	57					
	60					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW8

HOLE NO. LHS-MW9

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 696107.70 3306346.30		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW9		13. OVERBURDEN SAMPLES DISTURBED 13	UNDISTURBED 1
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/30/1994	COMPLETED 08/31/1994
7. THICKNESS OF OVERBURDEN 24.0		17. ELEVATION TOP OF HOLE 207.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 24.0		STEVE BREWER	

ELEVATION 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
204.7			CLAY SAND (SC) (0.0 – 2.7) YELLOWISH BROWN, DAMP, CRUMBLES EASILY, FEW ROOTS AT TOP, FEW GRAVELS TO 3/4".		ST-1	SAMPLE TYPE / ZONE: SHEBLY 0.0– 1.8; SPLITSPOON 1.8– 24.0
203.7	3		LEAN CLAY (CL) (2.7 – 3.7) SANDY, LIGHT YELLOWISH BROWN, DAMP.		J-1	SAMPLE / DEPTH: ST-1 0.0– 2.7; J-1 2.7– 3.7; J-2 3.7– 4.3; J-3 4.3– 6.2; J-4 6.2– 8.0; J-5 8.0– 9.0; J-6 9.0– 10.6; J-7 10.6– 11.1; J-8 11.1– 12.1; J-9 12.6– 14.7; J-10 14.7– 16.8; J-11 16.8– 17.9; J-12 18.0– 21.8; J-13 21.8– 24.0
203.1			LEAN CLAY (CL) (3.7 – 4.3) SANDY, STRONG BROWN, DRY.		J-2	
201.2	6		FAT CLAY (CH) (4.3 – 6.2) WITH SAND, LIGHT BROWNISH GRAY DRY.		J-3	
199.4			LEAN CLAY (CL) (6.2 – 8.0) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-4	
198.4	9		CLAY SAND (SC) (8.0 – 9.0) LIGHT YELLOWISH BROWN, MOIST.		J-5	
196.8			LEAN CLAY (CL) (9.0 – 10.6) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-6	
196.1			CLAY SAND (SC) (10.6 – 11.1) LIGHT YELLOWISH BROWN, MOIST.		J-7	
192.7	12		LEAN CLAY (CL) (11.1 – 14.7) SANDY, LIGHT BROWNISH GRAY, MOIST.		J-8 J-9	
190.6	15		FAT CLAY (CH) (14.7 – 16.8) WITH SAND, LIGHT YELLOWISH BROWN, MOIST.		J-10	
189.4	18		CLAY SAND (SC) (16.8 – 18.0) LIGHT OLIVE BROWN, MOIST.		J-11	
185.6	21		LEAN CLAY (CL) (18.0 – 21.8) SANDY, LIGHT OLIVE BROWN, MOIST.		J-12	
183.4	24		FAT CLAY (CH) (21.8 – 24.0) LIGHT OLIVE BROWN, MOIST.		J-13	
	27					
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW9

027544

HOLE NO. LHS-MW10

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960859.90 3305669.20		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW10		13. OVERBURDEN SAMPLES DISTURBED 11	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/27/1994	COMPLETED 08/27/1994
7. THICKNESS OF OVERBURDEN 19.0		17. ELEVATION TOP OF HOLE 211.3	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 19.0		MERLIN DEAN	

ELEVATION 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
207.8	2		LEAN CLAY (CL) (0.0 - 3.5) WITH SAND, OLIVE BROWN TO BROWNISH GRAY, MOIST.		J-1 J-2	SAMPLE TYPE ZONE SPLITSPOON 0.0- 19.0 SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 3.5 J-3 3.5- 5.5 J-4 5.5- 7.0 J-5 7.0- 9.0 J-6 9.0- 10.3 J-7 10.3- 12.0 J-8 13.0- 14.0 J-9 14.0- 15.0 J-10 15.0- 17.0 J-11 17.0- 19.0
204.3	4 6		LEAN CLAY (CL) (3.5 - 7.0) SANDY, LIGHT BROWNISH GRAY, MOIST.		J-3 J-4	
202.3	8		LEAN CLAY (CL) (7.0 - 9.0) WITH SAND, YELLOWISH BROWN, MOIST.		J-5	
197.3	10 12 14		LEAN CLAY (CL) (9.0 - 14.0) SANDY, YELLOWISH BROWN, MOIST.		J-6 J-7 J-8	
196.3			CLAY SAND (SC) (14.0 - 15.0) YELLOWISH BROWN, MOIST.		J-9	
194.3	16		CLAY SAND (SC) (15.0 - 17.0) GRAY, MOIST, SILTY.		J-10	
192.3	18		LEAN CLAY (CL) (17.0 - 19.0) WITH SAND, YELLOWISH BROWN, MOIST.		J-11	
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW10

000021

HOLE NO. LHS-MW11

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961102.90 3305794.30		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW11		13. OVERBURDEN SAMPLES DISTURBED 0	UNDISTURBED 14
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/26/1994	COMPLETED 08/26/1994
7. THICKNESS OF OVERBURDEN 27.0		17. ELEVATION TOP OF HOLE 209.9	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 x	
9. TOTAL DEPTH OF HOLE 27.0		MERLIN DEAN	

ELEVATION 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
207.9			LEAN CLAY (CL) (0.0 – 2.0) SANDY, LIGHT OLIVE BROWN, DAMP TO MOIST.		ST-1	WATER ENCOUNTERED ⊙ 16.5'
205.9	3		FAT CLAY (CH) (2.0 – 4.0) WITH SAND, RED AND GRAY, VERY STIFF, MOIST, TOP 1.0' SANDY LEAN CLAY, CRUMBLED.		ST-2	SAMPLE TYPE ZONE SHELBY 0.0– 27.0 SAMPLE DEPTH ST-1 0.0– 2.0 ST-2 2.0– 4.0 ST-3 4.0– 6.0 ST-4 6.0– 7.7 ST-5 7.7– 10.0 ST-6 10.0– 11.9 ST-7 12.0– 14.0 ST-8 14.0– 16.0 ST-9 16.0– 18.0 ST-10 18.0– 20.0 ST-11 20.0– 21.9 ST-12 21.9– 24.0 ST-13 24.0– 25.3 ST-14 25.3– 27.0
203.9	6		LEAN CLAY (CL) (4.0 – 6.0) SANDY, YELLOWISH GRAY WITH RED MOIST, HARD, TOP 0.8' REDDISH GRAY FAT CLAY WITH SAND.		ST-3	
202.2			CLAY SAND (SC) (6.0 – 7.7) GRAY AND YELLOW, MOIST.		ST-4	
	9		LEAN CLAY (CL) (7.7 – 18.0) SANDY, GRAY AND YELLOW, MOIST, HARD TO VERY STIFF, 14.0' SILTY		ST-5	
					ST-6	
	12				ST-7	
	15				ST-8	
					ST-9	
191.9	18		CLAY SAND (SC) (18.0 – 20.0) LIGHT GRAY WITH YELLOW, MOIST.		ST-10	
189.9	21		LEAN CLAY (CL) (20.0 – 21.9) SANDY, LIGHT GRAY WITH YELLOW, MOIST, STIFF TO VERY STIFF, SMALL POCKET OF GRAVEL AT 20.8 TO 3/8", BOTTOM 0.7'(SC) YELLOW AND GRAY.		ST-11	
188.0			CLAY SAND (SC) (21.9 – 24.0) YELLOW AND GRAY, VERY MOIST, STIFF, POCKET OF GRAVEL TO 3/8" AT 22.4', BOTTOM 0.7'(CL)		ST-12	
185.9	24		FAT CLAY (CH) (24.0 – 25.3) OLIVE WITH GRAY AND YELLOW, MOIST, VERY STIFF, FRIABLE, LAMINATIONS OF FINE SAND THROUGHOUT.		ST-13	
184.6			CLAY SAND (SC) (25.3 – 27.0) GRAY AND OLIVE, VERY MOIST TO WET, STIFF, VERY SILTY IN BOTTOM 1.0'.		ST-14	
182.9	27					
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW11

027546

HOLE NO. LHS-MW12

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961386.30 3306023.60		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW12		13. OVERBURDEN SAMPLES DISTURBED 0	UNDISTURBED 7
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/29/1994	COMPLETED 08/29/1994
7. THICKNESS OF OVERBURDEN 14.0		17. ELEVATION TOP OF HOLE 206.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0	%
9. TOTAL DEPTH OF HOLE 14.0		MERLIN DEAN	

ELEVATION 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
204.1	2		FAT CLAY (CH) (0.0 – 2.0) WITH SAND, RED AND GRAY, MOIST HARD, TOP 0.6' CLAYEY SAND(SC) WITH GRASS AND ROOTS.		ST-1	WATER ENCOUNTERED ⊙ 6.5'
202.1	4		LEAN CLAY (CL) (2.0 – 4.0) SANDY, GRAY WITH YELLOW, MOIST HARD, TOP 0.7' FAT CLAY WITH SAND(CH).		ST-2	SAMPLE TYPE ZONE SHELBY 0.0– 14.0 SAMPLE DEPTH ST-1 0.0– 2.0 ST-2 2.0– 4.0 ST-3 4.0– 6.0 ST-4 6.0– 8.0 ST-5 8.0– 10.0 ST-6 10.0– 12.0 ST-7 12.0– 14.0
200.1	6		LEAN CLAY (CL) (4.0 – 6.0) WITH SAND, GRAY WITH YELLOW, MOIST, VERY STIFF TO HARD.		ST-3	
198.1	8		LEAN CLAY (CL) (6.0 – 8.0) WITH SAND, YELLOW AND GRAY, MOIST, VERY STIFF, LAMINATIONS OF FINE SAND THROUGHOUT.		ST-4	
196.1	10		FAT CLAY (CH) (8.0 – 10.0) YELLOW AND GRAY, MOIST.		ST-5	
194.1	12		LEAN CLAY (CL) (10.0 – 12.0) SANDY, YELLOW AND GRAY, MOIST, VERY STIFF, VERY FRIABLE, FINE SAND.		ST-6	
192.1	14		FAT CLAY (CH) (12.0 – 14.0) OLIVE WITH YELLOW AND GRAY, MOIST, HARD, LAMINATIONS OF FINE SAND THROUGHOUT.		ST-7	
	16					
	18					
	20					

HOLE NO. LHS-MW13

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961753.80	3306007.40	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW13		13. OVERBURDEN SAMPLES DISTURBED 0	UNDISTURBED 7
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/29/1994	COMPLETED 08/30/1994
7. THICKNESS OF OVERBURDEN 15.4		17. ELEVATION TOP OF HOLE 206.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 15.4		STEVE BREWER	

ELEVATION 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
205.9			CLAY SAND (SC) (0.0 – 0.5) BROWN, GRASS AND ROOTS, VERY STIFF.			WATER ENCOUNTERED ⊙ 2.0'
			FAT CLAY (CH) (0.5 – 2.0) WITH SAND, RED WITH GRAY, MOIST, HARD, SAND SEAMS TO 1.0		ST-1	SAMPLE TYPE SHELBY ZONE 0.0– 15.4
204.4	2		LEAN CLAY (CL) (2.0 – 4.0) WITH SAND, GRAY WITH YELLOW AND RED, MOIST, HARD.		ST-2	SAMPLE DEPTH ST-1 0.0– 2.0 ST-2 2.0– 4.0 ST-3 4.0– 6.0 ST-4 6.0– 8.0 ST-5 8.0– 10.0 ST-6 10.0– 12.0 ST-7 13.0– 15.0
202.4	4		FAT CLAY (CH) (4.0 – 6.0) WITH SAND, GRAY WITH RED AND YELLOW, MOIST VERY STIFF.		ST-3	
200.4	6		FAT CLAY (CH) (6.0 – 8.0) YELLOW WITH GRAY, MOIST, VERY STIFF, LAMINATIONS OF FINE SAND AND SILT THROUGHOUT, FRIABLE.		ST-4	
198.4	8		LEAN CLAY (CL) (8.0 – 10.0) WITH SAND, YELLOW AND GRAY, VERY MOIST, STIFF TO VERY STIFF, FISSILITY, LAMINATIONS OF VERY FINE SAND AND SILT THROUGHOUT, FRIABLE.		ST-5	
196.4	10		FAT CLAY (CH) (10.0 – 13.0) YELLOW AND GRAY, MOIST, VERY STIFF, FISSILITY, LAMINATIONS OF FINE SAND AND SILT THROUGHOUT, FRIABLE, IRON-OXIDE STAINS IN BOTTOM HALF.		ST-6	
193.4	12		FAT CLAY (CH) (13.0 – 15.4) OLIVE AND YELLOW AND GRAY, MOIST, STIFF TO HARD, FRIABLE, LAMINATIONS OF FINE SAND AND SILT THROUGHOUT, IRON-OXIDE STAINS THROUGHOUT.		ST-7	
191.0	14					
	16					
	18					
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW13

HOLE NO. LHS-MW14

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962600.80	3303933.50	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW14		13. OVERBURDEN SAMPLES DISTURBED 0	UNDISTURBED 9
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/27/1994	COMPLETED 08/27/1994
7. THICKNESS OF OVERBURDEN 18.0		17. ELEVATION TOP OF HOLE 241.3	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 18.0		BERNICE PEREZ	

ELEVATION 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
239.9			LEAN CLAY (CL) (0.0 - 1.4) SANDY, BROWNISH RED WITH YELLOW, DAMP TO MOIST, HARD, ROOT AT TOP, GRAVELS TO 1" MORE NUMEROUS IN TOP 0.5'.		ST-1	WATER ENCOUNTERED @ 10.0' USED 10" HOLLOW STEM AUGER TO SET WELL SAMPLE TYPE ZONE SHELBY 0.0- 18.0 SHELBY 0.0- 16.0 AUGER 16.0- 18.0 SAMPLE DEPTH ST-1 0.0- 2.1 ST-2 2.1- 4.1 ST-3 4.1- 5.8 ST-4 6.0- 8.0 ST-5 8.0- 10.0 ST-6 10.0- 12.0 ST-7 12.0- 14.0 ST-8 14.0- 16.0 ST-9 16.0- 18.0
239.2	2		FAT CLAY (CH) (1.4 - 2.1) SANDY, RED WITH YELLOW TRACES, MOIST, HARD.			
237.2	4		SILT (ML) (2.1 - 4.1) SANDY, VERY PALE BROWN, DAMP, HARD.		ST-2	
236.5			GRAVEL (GM) (4.1 - 4.8) GM-GC, SILTY CLAYEY GRAVEL - LIGHT BROWN.		ST-3	
235.3	6		FAT CLAY (CH) (4.8 - 6.0) SANDY, YELLOW AND GRAY WITH RED TRACES, MOIST, HARD.			
234.8			LEAN CLAY (CL) (6.0 - 6.5) WITH SAND, FALL-IN MATERIAL.		ST-4	
233.3	8		CLAY SAND (SC) (6.5 - 8.0) OLIVE GRAY WITH YELLOW, MOIST, VERY STIFF.			
231.3	10		CLAY SAND (SC) (8.0 - 10.0) LIGHT OLIVE WITH BROWN, VERY MOIST, MEDIUM CONSISTENCY TO STIFF, LARGE BROWN SAND POCKETS.		ST-5	
230.3			LEAN CLAY (CL) (10.0 - 11.0) SANDY, VERY WET, MUSHY, VERY SOFT.		ST-6	
229.3	12		CLAY SAND (SC) (11.0 - 12.0) LIGHT OLIVE AND BROWN, VERY WET, MEDIUM CONSISTENCY.			
227.3	14		LEAN CLAY (CL) (12.0 - 14.0) SANDY, LIGHT OLIVE AND BROWN, VERY WET, MEDIUM CONSISTENCY.		ST-7	
224.1	16		CLAY SAND (SC) (14.0 - 17.2) BROWN AND LIGHT OLIVE, VERY WET, MUSHY, VERY SOFT TO MEDIUM CONSISTENCY.		ST-8	
223.3	18		LEAN CLAY (CL) (17.2 - 18.0) LIGHT OLIVE GRAY WITH YELLOW TRACES, MOIST, VERY STIFF, FINE SAND AND SILT LAMINATIONS THROUGHOUT.		ST-9	
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW14

HOLE NO. LHS-MW15

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962632.40	3304453.60	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW15		13. OVERBURDEN SAMPLES DISTURBED 13	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 08/31/1994	COMPLETED 08/31/1994
7. THICKNESS OF OVERBURDEN 22.0		17. ELEVATION TOP OF HOLE 223.8	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 x	
9. TOTAL DEPTH OF HOLE 22.0		STEVE BREWER	

ELEVATION 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
222.8			SILT SAND (SM) (0.0 – 1.0) REDDISH BROWN, MOIST, FEW CLAY BALL, CALCAREOUS.		J-1	WATER ENCOUNTERED ⊙ 17.9'
221.1			FAT CLAY (CH) (1.0 – 2.7) WITH SAND, REDDISH BROWN, MOIST, ROOT.		J-2	SAMPLE TYPE AUGER ZONE 0.0– 22.0
219.5	3		LEAN CLAY (CL) (2.7 – 4.3) WITH SAND, DARK REDDISH GRAY, MOIST.		J-3	SAMPLE DEPTH J-1 0.3– 1.0 J-2 1.0– 2.7 J-3 2.7– 4.3 J-4 4.3– 6.0 J-5 6.4– 8.4 J-6 8.4– 9.6 J-7 9.6– 12.1 J-8 12.1– 15.8 J-9 15.8– 16.7 J-10 16.7– 17.9 J-11 17.9– 19.8 J-12 19.8– 21.3 J-13 21.3– 22.0
217.6	6		LEAN CLAY (CL) (4.3 – 6.2) SANDY, LIGHT OLIVE BROWN, MOIST.		J-4	
215.4			CLAY GRAVL (GC) (6.2 – 8.4) WITH SAND, OLIVE BROWN, MOIST.		J-5	
214.2	9		LEAN CLAY (CL) (8.4 – 9.6) WITH SAND, LIGHT OLIVE BROWN, MOIST.		J-6	
211.7	12		FAT CLAY (CH) (9.6 – 12.1) LIGHT OLIVE BROWN, MOIST.		J-7	
208.0	15		LEAN CLAY (CL) (12.1 – 15.8) LIGHT BROWNISH GRAY, MOIST.		J-8	
205.9	18		FAT CLAY (CH) (15.8 – 17.9) LIGHT BROWNISH GRAY, MOIST.		J-9 J-10	
204.0			CLAY SAND (SC) (17.9 – 19.8) OLIVE BROWN, MOIST.		J-11	
201.8	21		FAT CLAY (CH) (19.8 – 22.0) LIGHT OLIVE BROWN TO VERY DARK GRAYISH BROWN, MOIST.		J-12 J-13	
	24					
	27					
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW15

HOLE NO. LHS-MW16

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962728.40 3304179.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW16		13. OVERBURDEN SAMPLES DISTURBED 0	UNDISTURBED 11
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/09/1994	COMPLETED 09/09/1994
7. THICKNESS OF OVERBURDEN 22.0		17. ELEVATION TOP OF HOLE 229.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 22.0		R. PETERSON	

ELEVATION 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
228.8			LEAN CLAY (CL) (0.0 - 0.6) WITH SAND, GRAYISH OLIVE, MOIST HARD, ROOTS.		ST-1	
			CLAY SAND (SC) (0.6 - 2.6)			
226.8						
	3		LEAN CLAY (CL) (2.6 - 4.0) WITH SAND, BROWNISH GRAY, MOIST VERY STIFF TO HARD, BLACK IRON-OXIDE STAINS.		ST-2	
225.4						
			CLAY SAND (SC) (4.0 - 8.0) OLIVE GRAY WITH YELLOW, MOIST. VERY STIFF, SILTY, SAND (SP) POCKET FROM 7.0'.		ST-3	
	6				ST-4	
221.4						
220.6			CLAY SAND (SC) (8.0 - 8.8) STIFF, SOME SILT.		ST-5	
	9		LEAN CLAY (CL) (8.8 - 10.0) SANDY, OLIVE GRAY WITH YELLOW AND REDDISH BROWN, MOIST, VERY STIFF TO HARD.			
219.4						
			LEAN CLAY (CL) (10.0 - 12.0) WITH SAND, OLIVE GRAY WITH YELLOW, MOIST, HARD, BLACK IRON OXIDE STAINS.		ST-6	
217.4	12					
216.9						
			LEAN CLAY (CL) (12.0 - 12.5) WITH SAND, APPEARS LIKE FALL-IN MATERIAL, LARGE 1 1/2" SANDSTONE GRAVEL, SAMPLE CONSISTS OF CHUNKS.		ST-7	
	15		FAT CLAY (CH) (12.5 - 22.0) LIGHT OLIVE GRAY WITH YELLOW, MOIST, VERY STIFF TO HARD, SCATTERED IRON-OXIDE STAINS.		ST-8	
					ST-9	
	18				ST-10	
	21				ST-11	
207.4						
	24					
	27					
	30					

SAMPLE TYPE ZONE
SHELBY 0.0- 22.0
SHELBY 0.0- 22.0

SAMPLE	DEPTH
ST-1	0.0- 1.0
ST-2	2.0- 4.0
ST-3	4.0- 6.0
ST-4	6.0- 8.0
ST-5	8.0- 10.0
ST-6	10.0- 12.0
ST-7	12.0- 14.0
ST-8	14.0- 16.0
ST-9	16.0- 18.0
ST-10	18.0- 20.0
ST-11	20.0- 22.0

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW16

HOLE NO. LHS-MW17

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962320.00 3305922.20		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW17		13. OVERBURDEN SAMPLES DISTURBED 2	UNDISTURBED 11
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
7. THICKNESS OF OVERBURDEN 24.0		16. DATE HOLE STARTED 08/29/1994	COMPLETED 08/30/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 211.4	
9. TOTAL DEPTH OF HOLE 24.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		MERLIN DEAN	

ELEVATION 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
			LEAN CLAY (CL) (0.0 - 3.5) SANDY, YELLOWISH BROWN WITH GRAY, MOIST, HARD TO VERY STIFF GRASS AND ROOTS AT TOP. SCATTERED IRON-OXIDE STAINS. VERY SILTY FROM 2.0'.		ST-1	WATER ENCOUNTERED @ 15.8'
					ST-2	SAMPLE TYPE ZONE SHELBY 0.0- 22.0 SHELBY 0.0- 22.0 SPLITSPOON 22.0- 24.0 SPLITSPOON 22.0- 24.0
	3		LEAN CLAY (CL) (3.5 - 4.0) WITH SAND, VERY MOIST, MEDIUM CONSISTENCY.			
207.9						
207.4			LEAN CLAY (CL) (4.0 - 6.2) WITH SAND, YELLOWISH BROWN WITH GRAY TO GRAY AND RED WITH DEPTH, MOIST, STIFF TO VERY STIFF.		ST-3	SAMPLE DEPTH ST-1 0.0- 2.0 ST-2 2.0- 4.0 ST-3 4.0- 6.0 ST-4 6.0- 8.0 ST-5 8.0- 10.0 ST-6 10.0- 11.7 ST-7 11.7- 14.0 ST-8 14.0- 15.2 ST-9 15.2- 18.0 ST-10 18.0- 20.0 ST-11 20.0- 22.0 J-2 22.0- 23.7 J-1 23.7- 24.0
	6					
205.2			FAT CLAY (CH) (6.2 - 8.0) SANDY, RED AND GRAY, MOIST, VERY STIFF.		ST-4	
203.4						
	9		LEAN CLAY (CL) (8.0 - 10.0) SANDY, RED AND YELLOW WITH GRAY, MOIST, HARD.		ST-5	
201.4						
			FAT CLAY (CH) (10.0 - 11.7) LIGHT YELLOWISH BROWN WITH GRAY, MOIST, HARD, LAMINATIONS OF FINE SAND THROUGHOUT.		ST-6	
199.7						
	12		LEAN CLAY (CL) (11.7 - 14.0) SANDY, YELLOWISH BROWN WITH GRAY, MOIST, STIFF, NUMEROUS LAMINATIONS OF SAND, FEW IRON-OXIDE STAINS.		ST-7	
197.4						
			LEAN CLAY (CL) (14.0 - 15.2) YELLOWISH AND LIGHT GRAY, MOIST, VERY STIFF, SCATTERED IRON-OXIDE STAINS.		ST-8	
196.2	15					
			FAT CLAY (CH) (15.2 - 24.0) YELLOW AND LIGHT GRAY TO LIGHT OLIVE BROWN, VERY STIFF, MOIST, SCATTERED IRON-OXIDE STAINS, (19.1-19.4) LAYER OF FINE SAND AND SILT, (20.7-20.9) LAYER OF CLAYEY SAND (SC).		ST-9	
	18				ST-10	
	21				ST-11	
					J-2	
187.4	24				J-1	
	27					
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW17

HOLE NO. LHS-MW18

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962571.90	3305919.90	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW18		13. OVERBURDEN SAMPLES DISTURBED 7	UNDISTURBED 5
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/30/1994	COMPLETED 08/30/1994
7. THICKNESS OF OVERBURDEN 25.0		17. ELEVATION TOP OF HOLE 212.3	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 25.0		MERLIN DEAN	

ELEVATION 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
210.3			LEAN CLAY (CL) (0.0 – 2.0) SANDY, RED WITH GRAY, MOIST, HARD, GRASS AND ROOTS AT TOP, SCATTERED IRON-OXIDE STAINS.		ST-1	SAMPLE TYPE ZONE SHELBY 0.0– 10.0 SHELBY 0.0– 8.0 SPUTSPOON 8.0– 25.0 SPUTSPOON 10.0– 25.0 SAMPLE DEPTH ST-1 0.0– 2.0 ST-2 2.0– 4.0 ST-3 4.0– 6.0 ST-4 6.0– 8.0 ST-5 8.0– 10.0 J-1 11.3– 12.0 J-2 12.0– 13.5 J-3 14.5– 15.5 J-4 16.1– 17.0 J-5 18.1– 19.0 J-6 21.0– 23.0 J-7 23.0– 25.0
208.3	3		SILT CLAY (CL) (2.0 – 4.0) CL-ML, SANDY, BROWN, MOIST.		ST-2	
206.3	6		LEAN CLAY (CL) (4.0 – 6.0) SANDY, BROWNISH GRAY WITH RED TRACES, MOIST, VERY STIFF, SCATTERED, IRON-OXIDE STAINS.		ST-3	
204.3			FAT CLAY (CH) (6.0 – 8.0) WITH SAND, RED AND GRAY, MOIST VERY STIFF TO HARD, ACTUAL		ST-4	
201.7	9		CLAY SAND (SC) (8.0 – 10.6) YELLOW AND GRAY WITH RED, MOIST, HARD.		ST-5	
198.3	12		FAT CLAY (CH) (10.6 – 14.0) LIGHT OLIVE GRAY, MOIST.		J-1 J-2	
194.8	15		LEAN CLAY (CL) (14.0 – 17.5) SANDY, LIGHT OLIVE BROWN TO LIGHT BROWNISH GRAY, MOIST.		J-3 J-4	
192.3	18		CLAY SAND (SC) (17.5 – 20.0) LIGHT OLIVE BROWN, MOIST.		J-5	
187.3	21 24		FAT CLAY (CH) (20.0 – 25.0) LIGHT YELLOWISH BROWN TO LIGHT OLIVE BROWN, MOIST.		J-6 J-7	
	27 30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW18

HOLE NO. LHS-MW19

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962938.20 3305862.50		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW19		13. OVERBURDEN SAMPLES DISTURBED 5	UNDISTURBED 9
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/07/1994	COMPLETED 09/07/1994
7. THICKNESS OF OVERBURDEN 27.0		17. ELEVATION TOP OF HOLE 209.7	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 27.0		R. PETERSON	

ELEVATION 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
206.8	3		LEAN CLAY (CL) (0.0 - 2.9) SANDY,BROWN TO YELLOWISH BROWN MOIST, VERY STIFF TO STIFF.		ST-1	
204.1	6		LEAN CLAY (CL) (2.9 - 5.6) RED AND GRAY, MOIST VERY STIFF		ST-2	
200.4	9		CLAY SAND (SC) (5.6 - 9.3) YELLOW AND GRAY, MOIST, HARD TO VERY STIFF, SAND POCKETS AND SEAMS, SCATTERED IRON-OXIDE STAINS.		ST-3	
197.2	12		LEAN CLAY (CL) (9.3 - 12.5) SANDY, DARK YELLOWISH BROWN, MOIST, HARD.		ST-4	
195.7			LEAN CLAY (CL) (12.5 - 14.0) WITH SAND, YELLOW WITH GRAY, MOIST, VERY STIFF.		ST-5	
193.7	15		LEAN CLAY (CL) (14.0 - 16.0) YELLOW WITH GRAY, MOIST, VERY STIFF, SCATTERED IRON-OXIDE STAINS.		ST-6	
191.7	18		LEAN CLAY (CL) (16.0 - 18.0) WITH SAND, YELLOW WITH RED AND GRAY, VERY MOIST, STIFF TO VERY STIFF, SCATTERED SAND POCKETS.		ST-7	
189.7			LEAN CLAY (CL) (18.0 - 20.0) SANDY, YELLOWISH BROWN, MOIST.		ST-8	
187.3	21		FAT CLAY (CH) (20.0 - 22.4) WITH SAND, YELLOWISH BROWN, MOIST.		ST-9	
185.7	24		CLAY SAND (SC) (22.4 - 24.0) LIGHT BROWNISH GRAY, MOIST.		J-1	
182.7	27		FAT CLAY (CH) (24.0 - 27.0) LIGHT BROWNISH GRAY, MOIST.		J-2	
	30				J-3	
					J-4	
					J-5	

SAMPLE TYPE ZONE
SHELBY 0.0- 18.0
SHELBY 0.0- 18.0
SPLITSPOON 18.0- 27.0
SPLITSPOON 18.0- 27.0

SAMPLE	DEPTH
ST-1	0.0- 1.5
ST-2	2.0- 3.5
ST-3	4.0- 5.3
ST-4	6.0- 8.0
ST-5	8.0- 10.0
ST-6	10.0- 12.5
ST-7	12.5- 14.0
ST-8	14.0- 16.0
ST-9	16.0- 18.0
J-1	18.0- 20.0
J-2	20.0- 22.4
J-3	22.4- 24.0
J-4	24.0- 25.7
J-5	25.7- 27.0

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW19

027554

HOLE NO. LHS-MW20

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 696327.4.80 3306306.30		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW20		13. OVERBURDEN SAMPLES DISTURBED 14	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 08/31/1994	COMPLETED 08/31/1994
7. THICKNESS OF OVERBURDEN 22.5		17. ELEVATION TOP OF HOLE 206.0	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 22.5		MERLIN DEAN	

ELEVATION 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
204.0			LEAN CLAY (CL) (0.0 - 2.0) SANDY, OLIVE BROWN, MOIST, GRAVELS TO 1/2".		J-1	SAMPLE TYPE ZONE SPLITSPOON 0.0- 22.5 AUGER 0.0- 22.5 SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 4.0 J-3 4.0- 5.5 J-4 5.5- 7.5 J-5 7.5- 9.0 J-6 9.0- 11.0 J-7 11.0- 12.5 J-8 12.5- 14.5 J-9 14.5- 16.0 J-10 16.0- 17.0 J-11 17.3- 17.6 J-12 17.6- 18.5 J-13 18.5- 20.5 J-14 20.5- 22.5
200.5	3		FAT CLAY (CH) (2.0 - 5.5) WITH SAND, DARK GRAYISH BROWN TO YELLOWISH BROWN, MOIST.		J-2	
198.5	6		LEAN CLAY (CL) (5.5 - 7.5) SANDY, YELLOWISH BROWN, MOIST.		J-3	
195.0	9		FAT CLAY (CH) (7.5 - 11.0) LIGHT BROWNISH GRAY, MOIST, ROOTS.		J-4	
193.5	12		LEAN CLAY (CL) (11.0 - 12.5) LIGHT BROWNISH GRAY, MOIST, ROOTS.		J-5	
191.5			FAT CLAY (CH) (12.5 - 14.5) LIGHT BROWNISH GRAY, MOIST, ROOTS.		J-6	
188.8	15		LEAN CLAY (CL) (14.5 - 17.2) GRAYISH BROWN, MOIST.		J-7	
188.4			SILT (MH) (17.2 - 17.6) DARK REDDISH GRAY, MOIST.		J-8	
183.5	18		FAT CLAY (CH) (17.6 - 22.5) LIGHT BROWNISH GRAY TO DARK GRAYISH BROWN, MOIST.		J-9	
	21				J-10	
	24				J-11	
	27				J-12	
	30				J-13	
					J-14	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW20

000031

HOLE NO. LHS-MW21

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6963620.10 3306501.60		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW21		13. OVERBURDEN SAMPLES DISTURBED 6	UNDISTURBED 9
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/07/1994	COMPLETED 09/07/1994
7. THICKNESS OF OVERBURDEN 27.0		17. ELEVATION TOP OF HOLE 204.5	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 27.0		R. PETERSON	

ELEVATION 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
204.0			CLAY SAND (SC) (0.0 - 0.5) RED AND BROWN, ROOTS, FEW GRAVELS TO 3/8" WITH TWO GRAVELS TO 1 3/4".		ST-1	SAMPLE TYPE / ZONE SHELBY 0.0 - 8.0 SPLITSPOON 8.5- 10.0 SHELBY 10.0-19.2 SHELBY 19.2-27.0
202.9			SILT SAND (SM) (0.5 - 1.6) GRAYISH BROWN, MOIST.			
201.1	2		SILT CLAY (CL) (1.6 - 3.4) CL-ML, SANDY, BROWN AND GRAYSIH BROWN, DAMP, FEW IRON OXIDE STAINS.		ST-2	SAMPLE / DEPTH ST-1 0.0- 1.2 ST-2 2.0- 4.0 ST-3 4.0- 4.5 ST-4 6.0- 8.0 J-1 8.5- 10.0 ST-5 10.0- 10.7 ST-6 12.0- 13.2 ST-7 14.0- 16.0 ST-8 16.0- 17.4 ST-9 18.0- 19.2 J-2 19.0- 19.3 J-3 19.2- 20.5 J-4 20.5- 21.2 J-5 25.5- 26.0 J-6 26.4- 27.0
200.5	4		LEAN CLAY (CL) (3.4 - 4.0) SANDY, GRAYISH BROWN WITH YELLOW, MOIST, HARD.		ST-3	
198.5	6		LEAN CLAY (CL) (4.0 - 6.0) SANDY, RED AND LIGHT GRAY, DRY TO DAMP, HARD, SCATTERED IRON-OXIDE STAINS.			
196.3	8		CLAY SAND (SC) (6.0 - 8.2) YELLOW WITH LIGHT GRAY, MOIST, HARD.		ST-4	
	10		FAT CLAY (CH) (8.2 - 17.7) PALE BROWN TO OLIVE BROWN WITH GRAY, DAMP TO MOIST, HARD, NUMEROUS FRACTURES,(16.0-17.4) THIN SAND LAMINATIONS THROUGH-OUT.		J-1	
	12				ST-5	
	14				ST-6	
	16				ST-7	
186.8					ST-8	
	18		LEAN CLAY (CL) (17.7 - 19.2) SANDY, BROWNISH OLIVE, MOIST, HARD, THIN SAND LAMINATIONS THROUGHOUT, 3 LARGE GRAVELS.		ST-9	
185.3					J-2	
184.5	20		CLAY SAND (SC) (19.2 - 20.5) LIGHT OLIVE BROWN, VERY MOIST.		J-3	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW21

HOLE NO. LHS-MW22

DRILLING LOG	DIVISION: SOUTHWEST	INSTALLATION: LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT: LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT: 8" AUGER	
2. LOCATION (Coordinates or Station): 6962765.30 3306376.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75	
4. HOLE NO. (As shown on drawing title and file number): LHS-MW22		13. OVERBURDEN SAMPLES: DISTURBED 1	UNDISTURBED 12
5. NAME OF DRILLER: TOM BEAVERS		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: SEE REMARKS	
		16. DATE HOLE: STARTED 09/08/1994	COMPLETED 09/09/1994
7. THICKNESS OF OVERBURDEN: 26.0		17. ELEVATION TOP OF HOLE: 206.2	
8. DEPTH DRILLED INTO ROCK: 0.0		18. TOTAL CORE RECOVERY FOR BORING: 0.0 %	
9. TOTAL DEPTH OF HOLE: 26.0		MERLIN DEAN	

ELEVATION 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
204.2			LEAN CLAY (CL) (0.0 - 2.0) SANDY, BROWN WITH RED AND GRAY MOIST, VERY STIFF TO HARD, SOME GRASS AND ROOTS.		ST-1	WATER ENCOUNTERED @ 17.4'
202.2	3		LEAN CLAY (CL) (2.0 - 4.0) WITH SAND, GRAY WITH BROWN, MOIST, VERY STIFF.		ST-2	SAMPLE TYPE ZONE SHELBY 0.0- 20.0 SHELBY 0.0- 20.0 SPLITSPOON 20.0- 26.0 SPLITSPOON 20.0- 26.0
200.2	6		LEAN CLAY (CL) (4.0 - 6.0) SANDY, BROWN AND GRAY WITH RED TRACES, MOIST, VERY STIFF.		ST-3	SAMPLE DEPTH ST-1 0.0- 2.0 ST-2 2.0- 4.0 ST-3 4.0- 6.0 ST-4 6.0- 8.0 ST-5 8.0- 10.0 ST-6 10.0- 12.0 ST-7 12.0- 14.0 ST-8 14.0- 16.0 ST-9 16.0- 18.0 ST-10 18.0- 20.0 ST-11 20.0- 22.0 ST-12 22.0- 23.4 J-1 24.0- 25.4
198.7			LEAN CLAY (CL) (6.0 - 7.5) SANDY, YELLOW WITH GRAY, MOIST HARD.		ST-4	
198.2			LEAN CLAY (CL) (7.5 - 8.0) YELLOW WITH GRAY, MOIST, HARD.			
194.2	9 12		LEAN CLAY (CL) (8.0 - 12.0) SANDY, RED WITH GRAY, MOIST, VERY STIFF TO HARD, SAND SEAMS AND LAMINATIONS THROUGHOUT.		ST-5 ST-6	
192.2			FAT CLAY (CH) (12.0 - 14.0) LIGHT GRAY WITH YELLOW, SOME FALL-IN MATERIAL		ST-7	
188.2	15 18		FAT CLAY (CH) (14.0 - 18.0) LIGHT OLIVE GRAY WITH YELLOW, MOIST VERY STIFF TO HARD, THIN SAND LAMINATIONS FROM 16.0'-18.0'.		ST-8 ST-9	
186.2			LEAN CLAY (CL) (18.0 - 20.0) LIGHT OLIVE GRAY WITH YELLOW TRACES, MOIST, HARD, TOP 0.6' SLIGHTLY SLICKENSIDED AND VERY STIFF.		ST-10	
182.5	21 24		FAT CLAY (CH) (20.0 - 23.7) OLIVE GRAY WITH YELLOW TRACES, MOIST, VERY STIFF TO HARD, SCATTERED IRON-OXIDE STAINS FROM 22.0'.		ST-11 ST-12	
180.2			LEAN CLAY (CL) (23.7 - 26.0) DARK GRAYISH BROWN, MOIST.		J-1	
	27 30					

PROJECT: LHAAP-WASTE SUMPS | HOLE NO. LHS-MW22

HOLE NO. LHS-MW23

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 696245.50 3306468.20		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500/CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW23		13. OVERBURDEN SAMPLES DISTURBED 19	UNDISTURBED 0
5. NAME OF DRILLER R. VOILS/T. BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/01/1994	COMPLETED 09/07/1994
7. THICKNESS OF OVERBURDEN 40.0		17. ELEVATION TOP OF HOLE 205.7	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 40.0		MERLIN DEAN	

ELEVATION 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
204.2			LEAN CLAY (CL) (0.0 – 1.5) SANDY, STRONG BROWN, MOIST, GRAVELS TO 1/2".		J-1	WATER ENCOUNTERED @ 17.0' SET WELL THROUGH 10" HOLLOWSTEM AUGER.
201.7	2		FAT CLAY (CH) (1.5 – 4.0) WITH SAND, REDDISH BROWN, MOIST.		J-2	SAMPLE TYPE ZONE SPLITSPOON 0.0– 40.0 AUGER 0.0– 40.0 SAMPLE DEPTH J-1 0.0– 1.5 J-2 1.5– 4.0 J-3 4.0– 6.0 J-4 6.0– 8.0 J-5 8.0– 10.0 J-6 10.0– 12.0 J-7 12.0– 14.0 J-8 14.0– 16.0 J-9 16.0– 18.0 J-10 18.0– 20.0 J-11 20.0– 22.0 J-12 22.0– 24.0 J-13 24.0– 26.0 J-14 26.0– 28.0 J-15 28.0– 30.0 J-16 30.0– 32.0 J-17 32.0– 35.0 J-18 35.0– 37.0 J-19 37.0– 40.0
199.7	4		FAT CLAY (CH) (4.0 – 6.0) REDDISH BROWN, MOIST.		J-3	
197.7	6		LEAN CLAY (CL) (6.0 – 8.0) WITH SAND, LIGHT YELLOWISH BROWN, MOIST.		J-4	
193.7	8		LEAN CLAY (CL) (8.0 – 12.0) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-5	
	10				J-6	
191.7	12		LEAN CLAY (CL) (12.0 – 14.0) WITH SAND, LIGHT YELLOWISH BROWN, MOIST.		J-7	
189.7	14		LEAN CLAY (CL) (14.0 – 16.0) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-8	
	16		CLAY SAND (SC) (16.0 – 20.0) REDDISH BROWN, FREE WATER, GRAVELS TO 1/2" AT 18.0'.		J-9	
	18				J-10	
185.7	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW23

HOLE NO. LHS-MW23

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962445.50 3306468.20		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500/CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW23		13. OVERBURDEN SAMPLES DISTURBED 19	UNDISTURBED 0
5. NAME OF DRILLER R. VOILS/T. BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
7. THICKNESS OF OVERBURDEN 40.0		16. DATE HOLE STARTED 09/01/1994	COMPLETED 09/07/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 205.7	
9. TOTAL DEPTH OF HOLE 40.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		MERLIN DEAN	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
185.3	b	c	d	e	J-10	g
			LEAN CLAY (CL) (20.0 - 24.0) SANDY, LIGHT YELLOWISH BROWN TO LIGHT GRAY, MOIST.		J-11	
	22				J-12	
181.7	24					
			CLAY SAND (SC) (24.0 - 26.0) GRAYISH BROWN, MOIST.		J-13	
179.7	26					
			LEAN CLAY (CL) (26.0 - 35.0) SANDY, GRAYISH BROWN TO LIGHT YELLOWISH BROWN, MOIST.		J-14	
	28				J-15	
	30				J-16	
	32				J-17	
	34					
170.7						
			CLAY SAND (SC) (35.0 - 37.0) LIGHT YELLOWISH BROWN, MOIST.		J-18	
	36					
168.7						
			FAT CLAY (CH) (37.0 - 40.0) DARK GRAYISH BROWN, MOIST.		J-19	
	38					
165.7	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW23

HOLE NO. LHS-MW24

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6963097.90	3307056.20	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW24		13. OVERBURDEN SAMPLES DISTURBED 0	UNDISTURBED 13
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/08/1994	COMPLETED 09/08/1994
7. THICKNESS OF OVERBURDEN 26.0		17. ELEVATION TOP OF HOLE 200.5	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 26.0		R. PETERSON	

ELEVATION 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
198.1			LEAN CLAY (CL) (0.0 – 2.4) SANDY, LIGHT BROWN AND GRAY WITH YELLOW TRACES, DAMP TO MOIST, HARD, VERY SILTY, IRON-OXIDE STAINS THROUGHOUT.		ST-1	SAMPLE TYPE ZONE SHELBY 0.0– 22.0 SPLITSPOON 22.0– 24.0 SHELBY 24.0– 26.0
196.5	3		FAT CLAY (CH) (2.4 – 4.0) RED AND GRAY, VERY MOIST, STIFF SCATTERED IRON-OXIDE STAINS.		ST-2	
192.5	6		FAT CLAY (CH) (4.0 – 8.0) WITH SAND, RED AND GRAY, MOIST VERY STIFF TO HARD, SCATTERED IRON-OXIDE STAINS FROM 6.0'.		ST-3 ST-4	SAMPLE DEPTH ST-1 0.0– 2.0 ST-2 2.0– 3.4 ST-3 4.0– 6.0 ST-4 6.0– 8.0 ST-5 8.0– 9.0 ST-6 10.0– 12.0 ST-7 12.0– 13.7 ST-8 14.0– 16.0 ST-9 16.0– 18.0 ST-10 18.0– 19.7 ST-11 20.0– 22.0 ST-12 22.0– 24.0 ST-13 24.0– 26.0
188.5	9 12		FAT CLAY (CH) (8.0 – 12.0) PALE OLIVE GRAY WITH RED AND YELLOW TRACES, MOIST, HARD, SCATTERED IRON-OXIDE STAINS FROM 10.0'.		ST-5 ST-6	
186.7			LEAN CLAY (CL) (12.0 – 13.8) YELLOW WITH LIGHT GRAY, MOIST HARD, FEW IRON-OXIDE STAINS.		ST-7	
174.5	15 18 21 24		FAT CLAY (CH) (13.8 – 26.0) YELLOW WITH LIGHT GRAY TO LIGHT OLIVE WITH YELLOW, MOIST HARD, FEW THIN SAND LAMINATION AND IRON-OXIDE STAINS.		ST-8 ST-9 ST-10 ST-11 ST-12 ST-13	
	27 30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW24

HOLE NO. LHS-MW25

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6963257.10 3307260.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW25		13. OVERBURDEN SAMPLES DISTURBED 7	UNDISTURBED 10
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/08/1994	COMPLETED 09/08/1994
7. THICKNESS OF OVERBURDEN 39.6		17. ELEVATION TOP OF HOLE 199.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 39.6		R. PETERSON	

ELEVATION 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
197.5			LEAN CLAY (CL) (0.0 - 1.6) WITH SAND, LIGHT YELLOWISH BROWN RED TRACES, MOIST, HARD, FEW ROOTS AND GRASS AT TOP, FEW IRON-OXIDE STAINS.		ST-1	SAMPLE TYPE ZONE SHELBY 0.0- 20.0 SPLITSPOON 20.0- 39.6 SAMPLE DEPTH ST-1 0.0- 1.3 ST-2 2.0- 3.6 ST-3 4.0- 5.4 ST-4 6.0- 8.0 ST-5 8.0- 10.0 ST-6 10.0- 12.0 ST-7 12.0- 14.0 ST-8 14.0- 15.5 ST-9 16.0- 18.0 ST-10 18.0- 20.0 J-1 20.3- 20.7 J-2 22.0- 22.6 J-3 25.0- 26.0 J-4 26.0- 26.6 J-5 26.6- 30.0 J-6 30.0- 32.0 J-7 32.0- 37.0
	2		FAT CLAY (CH) (1.6 - 4.6) WITH SAND, RED AND GRAY, MOIST HARD, LEAN CLAY WITH SAND FROM 2.3'-2.9'.		ST-2	
194.5	4					
			CLAY SAND (SC) (4.6 - 5.7) YELLOW WITH GRAY TRACES, MOIST.		ST-3	
193.4	6		LEAN CLAY (CL) (5.7 - 8.0) WITH SAND, YELLOW AND LIGHT GRAY, MOIST, HARD.		ST-4	
191.1	8					
	10		FAT CLAY (CH) (8.0 - 12.0) OLIVE WITH YELLOW TRACES, MOIST, HARD, SCATTERED IRON-OXIDE STAINS.		ST-5	
					ST-6	
187.1	12					
185.1	14		LEAN CLAY (CL) (12.0 - 14.0) OLIVE GRAY WITH YELLOW, MOIST, VERY STIFF, SCATTERED IRON-OXIDE STAINS, THIN FINE SAND LAMINATIONS WITH SAND LAYER 0.2' THICK AT 13.6-13.8.		ST-7	
	16		FAT CLAY (CH) (14.0 - 17.0) OLIVE WITH GRAY, MOIST, HARD, THIN FINE SAND LAMINATIONS.		ST-8	
182.1					ST-9	
181.1	18		LEAN CLAY (CL) (17.0 - 18.0) WITH SAND, LIGHT OLIVE, MOIST, VERY STIFF, MIXTURE OF FINE SAND AND SILT			
			LEAN CLAY (CL) (18.0 - 20.1) LIGHT OLIVE WITH GRAY, MOIST, VERY STIFF, THIN FINE SAND LAMINATIONS.		ST-10	
179.1	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW25

027561

HOLE NO. LHS-MW25

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6963257.10 3307260.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW25		13. OVERBURDEN SAMPLES DISTURBED 7	UNDISTURBED 10
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
7. THICKNESS OF OVERBURDEN 39.6		16. DATE HOLE STARTED 09/08/1994	COMPLETED 09/08/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 199.1	
9. TOTAL DEPTH OF HOLE 39.6		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		R. PETERSON	

ELEVATION	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. ST-10	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
179.6			LEAN CLAY (CL) (18.0 - 20.1)		J-1	
			LEAN CLAY (CL) (20.1 - 30.0) WITH SAND, LIGHT BROWNISH GRAY TO DARK GRAY, MOIST.			
	22				J-2	
	24					
					J-3	
	26				J-4	
	28				J-5	
169.1	30		LEAN CLAY (CL) (30.0 - 39.6) SANDY, DARK GRAY, MOIST.		J-6	
	32					
	34				J-7	
	36					
	38					
159.5	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW25

000028

027562

HOLE NO. LHS-MW26

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 4 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962396.00 3307440.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW26		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 10
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/09/1994	COMPLETED 09/09/1994
7. THICKNESS OF OVERBURDEN 37.2		17. ELEVATION TOP OF HOLE 201.6	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 37.2		MERLIN DEAN	

ELEVATION 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
201.1			LEAN CLAY (CL) (0.0 - 0.5) SANDY, RED WITH BROWN, DAMP TO MOIST.			SAMPLE TYPE ZONE SHELBY 0.0- 20.0 SPLITSPOON 20.0- 37.2
200.4	1		SILT SAND (SM) (0.5 - 1.2) WITH FEW GRAVELS TO 1", DRY TO DAMP.		ST-1	SAMPLE DEPTH ST-1 0.0- 2.0 ST-2 2.0- 4.0 ST-3 4.0- 6.0 ST-4 6.0- 8.0 ST-5 8.0- 10.0 ST-6 10.0- 12.0 ST-7 12.0- 14.0 ST-8 14.0- 16.0 ST-9 16.0- 18.0 ST-10 18.0- 20.0 J-1 20.0- 22.0 J-2 22.0- 23.5 J-3 23.5- 25.5 J-4 25.5- 27.0 J-5 27.0- 29.0 J-6 32.5- 34.5 J-7 35.6- 36.0 J-8 36.2- 37.2
199.6	2		SILT CLAY (CL) (1.2 - 2.0) CL-ML, WITH SAND, BROWNISH GRAY, DAMP TO MOIST, HARD.			
198.6	3		SILT CLAY (CL) (2.0 - 3.0) CL-ML, SANDY, GRAYISH BROWN, MOIST.		ST-2	
198.2			LEAN CLAY (CL) (3.0 - 3.4) SANDY, BROWNISH OLIVE, MOIST.			
197.6	4		LEAN CLAY (CL) (3.4 - 4.0) WITH SAND, REDDISH BROWN WITH GRAY, MOIST.			
195.6	5 6		FAT CLAY (CH) (4.0 - 6.0) RED WITH GRAY, MOIST, VERY STIFF.		ST-3	
195.2			FAT CLAY (CH) (6.0 - 6.4) BECOMING MORE SANDY WITH DEPTH.			
194.9			LEAN CLAY (CL) (6.4 - 6.7) WITH SAND, RED AND GRAY.			
192.6	7 8 9		LEAN CLAY (CL) (6.7 - 9.0) SANDY, YELLOW AND GRAY WITH RED TRACES, MOIST, VERY STIFF.		ST-4 ST-5	
191.6	10		LEAN CLAY (CL) (9.0 - 12.0) YELLOW WITH GRAY, MOIST, VERY STIFF.			

000039

027563

HOLE NO. LHS-MW26

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 4 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6982396.00 3307440.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW26		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 10
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/09/1994	COMPLETED 09/09/1994
7. THICKNESS OF OVERBURDEN 37.2		17. ELEVATION TOP OF HOLE 201.6	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 37.2		MERLIN DEAN	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. ST-#5	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
189.6	12		LEAN CLAY (CL) (9.0 - 12.0) YELLOW WITH GRAY, MOIST, VERY STIFF.		ST-6	
188.1	13		FAT CLAY (CH) (12.0 - 13.5) YELLOW WITH GRAY, MOIST, VERY STIFF.		ST-7	
187.6	14		LEAN CLAY (CL) (13.5 - 14.0)			
187.1			LEAN CLAY (CL) (14.0 - 14.5) SANDY, YELLOW WITH GRAY, WET, STIFF.			
185.6	15 16		CLAY SAND (SC) (14.5 - 16.0) YELLOW WITH GRAY TRACES, VERY MOIST, STIFF.		ST-8	
183.6	17 18		LEAN CLAY (CL) (16.0 - 18.0) SANDY, YELLOW WITH GRAY TRACES MOIST, ALTERNATION LAYERS OF SILTY SAND AND CLAY.		ST-9	
181.6	19 20		CLAY SAND (SC) (18.0 - 20.0) YELLOW WITH GRAY, VERY MOIST, STIFF TO VERY STIFF.		ST-10	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW26

000040

027564

HOLE NO. LHS-MW26

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 3 OF 4 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962396.00 3307440.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW26		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 10
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/09/1994	COMPLETED 09/09/1994
7. THICKNESS OF OVERBURDEN 37.2		17. ELEVATION TOP OF HOLE 201.6	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 37.2		MERLIN DEAN	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. ST-10	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
181.6						
	21		LEAN CLAY (CL) (20.0 - 22.0) YELLOW WITH GRAY, VERY MOIST, STIFF TO VERY STIFF.		J-1	
179.6	22					
			LEAN CLAY (CL) (22.0 - 23.5) SANDY, LIGHT YELLOWISH BROWN, FREE WATER.		J-2	
	23					
178.1						
	24		LEAN CLAY (CL) (23.5 - 25.5) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-3	
	25					
176.1						
	26		CLAY SAND (SC) (25.5 - 27.0) LIGHT YELLOWISH BROWN, MOIST.		J-4	
174.6	27					
			LEAN CLAY (CL) (27.0 - 31.5) SANDY, LIGHT BROWNISH GRAY, MOIST.		J-5	
	28					
	29					
171.6	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW26

000041

HOLE NO. LHS-MW26

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 4 OF 4 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962396.00 3307440.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW26		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 10
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/09/1994	COMPLETED 09/09/1994
7. THICKNESS OF OVERBURDEN 37.2		17. ELEVATION TOP OF HOLE 201.6	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 37.2		MERLIN DEAN	

ELEVATION 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
170.1	31		LEAN CLAY (CL) (27.0 – 31.5) SANDY, LIGHT BROWNISH GRAY, MOIST.			
	32		CLAY SAND (SC) (31.5 – 35.0) SC-SM, SILTY, GRAYISH BROWN, FREE WATER.			
	33				J-6	
	34					
166.6	35					
	36		LEAN CLAY (CL) (35.0 – 36.1) SANDY, GRAYISH BROWN, MOIST, GRAVELS TO 1/2".		J-7	
165.5						
	37		LEAN CLAY (CL) (36.1 – 37.2) DARK GRAYISH BROWN, MOIST.		J-8	
164.4						
	38					
	39					
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW26

HOLE NO. LHS-MW27

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962175.30 3307261.40		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW27		13. OVERBURDEN SAMPLES DISTURBED 2.	UNDISTURBED 7
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/08/1994	COMPLETED 09/08/1994
7. THICKNESS OF OVERBURDEN 18.1		17. ELEVATION TOP OF HOLE 199.2	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 18.1		MERLIN DEAN	

ELEVATION 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
197.2	2		LEAN CLAY (CL) (0.0 - 2.0) SANDY, GRAYISH BROWN WITH YELLOW TRACES, MOIST, HARD, GRASS AND ROOTS TO 0.7' IN DEPTH.		ST-1	WATER ENCOUNTERED @ 15.0' SAMPLE TYPE ZONE SHELBY 0.0- 16.0 SPLITSPOON 16.0- 18.1
195.2	4		FAT CLAY (CH) (2.0 - 4.0) WITH SAND, RED AND GRAY, MOIST VERY STIFF, FINE SAND.		ST-2	SAMPLE DEPTH ST-1 0.0- 2.0 ST-2 2.0- 4.0 ST-3 4.0- 6.0 ST-4 6.0- 8.0 ST-5 8.0- 10.0 ST-6 10.0- 12.0 ST-7 12.0- 14.0 J-1 16.0- 17.6 J-2 17.6- 18.0
192.7	6		LEAN CLAY (CL) (4.0 - 6.5) SANDY, YELLOW AND GRAY, MOIST, VERY STIFF, SCATTERED IRON-OXIDE STAINS.		ST-3	
187.2	8 10 12		LEAN CLAY (CL) (6.5 - 12.0) YELLOW WITH GRAY, MOIST, HARD TO VERY STIFF.		ST-4 ST-5 ST-6	
184.2	14		LEAN CLAY (CL) (12.0 - 15.0) SANDY, BROWNISH YELLOW WITH GRAY, MOIST, VERY STIFF.		ST-7	
181.1	16 18		LEAN CLAY (CL) (15.0 - 18.1) LIGHT BROWNISH GRAY, MOIST.		J-1 J-2	
	20					

HOLE NO. LHS-MW28

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960928.30 3307686.30		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW28		13. OVERBURDEN SAMPLES DISTURBED 10	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 17.0		17. ELEVATION TOP OF HOLE 201.8	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 17.0		R. PETERSON	

ELEVATION 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
198.8	2		LEAN CLAY (CL) (0.0 - 3.0) SANDY, DARK YELLOWISH BROWN, MOIST.		J-1	SAMPLE TYPE ZONE AUGER 0.0- 17.0 SAMPLE DEPTH J-1 0.0- 3.0 J-2 3.0- 5.0 J-3 5.0- 7.0 J-4 7.0- 9.0 J-5 9.0- 10.5 J-6 10.5- 12.5 J-7 12.5- 13.5 J-8 13.5- 14.5 J-9 14.5- 15.0 J-10 15.0- 17.0
196.8	4		FAT CLAY (CH) (3.0 - 5.0) WITH SAND, REDDISH BROWN, MOIST.		J-2	
194.8	6		LEAN CLAY (CL) (5.0 - 7.0) WITH SAND, YELLOWISH BROWN, MOIST.		J-3	
189.3	8 10 12		LEAN CLAY (CL) (7.0 - 12.5) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-4 J-5 J-6	
188.3			LEAN CLAY (CL) (12.5 - 13.5) WITH SAND, LIGHT YELLOWISH BROWN, MOIST.		J-7	
187.3	14		SILT (ML) (13.5 - 14.5) WITH SAND, DARK GRAYISH BROWN, MOIST.		J-8	
186.8			SILT (ML) (14.5 - 15.0) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-9	
184.8	16		FAT CLAY (CH) (15.0 - 17.0) GRAYISH BROWN, MOIST.		J-10	
	18 20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW28

027568

HOLE NO. LHS-MW29

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960869.30 3308070.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW29		13. OVERBURDEN SAMPLES DISTURBED 3	UNDISTURBED 6
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/13/1994	COMPLETED 09/13/1994
7. THICKNESS OF OVERBURDEN 20.8		17. ELEVATION TOP OF HOLE 200.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 20.8		R. PETERSON	

ELEVATION 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
			LEAN CLAY (CL) (0.0 – 4.7) WITH SAND, LIGHT BROWNISH GRAY, MOIST, HARD, GRASS AND ROOTS TO 0.9' IN DEPTH.		ST-1	SAMPLE TYPE ZONE SHELBY 0.0– 12.0 SPLITSPOON 12.0– 20.8
	3				ST-2	SAMPLE DEPTH ST-1 0.0– 1.3 ST-2 2.0– 3.6 ST-3 4.0– 6.0 ST-4 6.0– 7.8 ST-5 8.0– 10.0 ST-6 10.0– 12.0 J-1 12.5– 14.3 J-2 14.3– 19.4 J-3 19.4– 20.8
195.7			CLAY SAND (SC) (4.7 – 6.5) YELLOW WITH GRAY TRACES, VERY MOIST, ONE CHUNK 0.3' IN LENGHT, STIFF.		ST-3	
193.9	6					
192.5			LEAN CLAY (CL) (6.5 – 7.9) WITH SAND, YELLOW AND GRAY, MOIST, VERY STIFF, SCATTERED IRON-OXIDE STAINS.		ST-4	
190.4	9		LEAN CLAY (CL) (7.9 – 10.0) SANDY, YELLOW AND GRAY, MOIST, VERY STIFF, THIN FINE SAND LAMINATIONS THROUGHOUT.		ST-5	
188.2	12		LEAN CLAY (CL) (10.0 – 12.2) WITH SAND, LIGHT GRAY WITH YELLOW, MOIST, VERY STIFF.		ST-6	
186.1			SILT CLAY (CL) (12.2 – 14.3) CL-ML SANDY, GRAYISH BROWN, MOIST.		J-1	
	15		FAT CLAY (CH) (14.3 – 20.8) LIGHT BROWNISH GRAY TO GRAYISH BROWN, MOIST.		J-2	
	18					
179.6					J-3	
	21					
	24					
	27					
	30					

PROJECT: LHAAP-WASTE SUMPS | HOLE NO. LHS-MW29

000045

HOLE NO. LHS-MW30

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960874.50	3308290.80	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW30		13. OVERBURDEN SAMPLES DISTURBED 9	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 19.0		17. ELEVATION TOP OF HOLE 200.2	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 19.0		R. PETERSON	

ELEVATION 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
198.2	2		LEAN CLAY (CL) (0.0 - 2.0) WITH SAND, YELLOWISH BROWN, MOIST, ROOTS.		J-1	TYPE AUGER ZONE 0.0- 19.0 SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 4.0 J-3 4.0- 8.0 J-4 8.0- 10.5 J-5 10.5- 11.5 J-6 11.5- 14.5 J-7 14.5- 16.0 J-8 16.0- 16.6 J-9 16.6- 19.0
196.2	4		FAT CLAY (CH) (2.0 - 4.0) DARK YELLOWISH BROWN, MOIST, ROOTS.		J-2	
192.2	6 8		CLAY SAND (SC) (4.0 - 8.0) LIGHT YELLOWISH BROWN, MOIST.		- J-3	
189.7	10		LEAN CLAY (CL) (8.0 - 10.5) SANDY, LIGHT YELLOWISH BROWN, MOIST.		J-4	
185.7	12 14		LEAN CLAY (CL) (10.5 - 14.5) WITH SAND, GRAYISH BROWN, MOIST.		J-5 J-6	
183.6	16		LEAN CLAY (CL) (14.5 - 16.6) SANDY, LIGHT TO DARK YELLOWISH BROWN, MOIST.		J-7 J-8	
181.2	18		LEAN CLAY (CL) (16.6 - 19.0) YELLOWISH BROWN, MOIST.		J-9	
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW30

027570

HOLE NO. LHS-MW31

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961161.50 3308968.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW31		13. OVERBURDEN SAMPLES DISTURBED 6	UNDISTURBED 8
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/11/1994	COMPLETED 09/11/1994
7. THICKNESS OF OVERBURDEN 27.9		17. ELEVATION TOP OF HOLE 197.8	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 27.9		MERLIN DEAN	

ELEVATION 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
196.4			LEAN CLAY (CL) (0.0 - 1.4) WITH SAND, LIGHT BROWNISH GRAY, DAMP, SMALL AMOUNTS OF GRASS AND ROOTS AT TOP.		ST-1	SAMPLE TYPE ZONE SHELBY 0.0- 16.0 SPLITSPOON 16.0- 27.9
192.7	3		FAT CLAY (CH) (1.4 - 5.1) WITH SAND, GRAYISH BROWN WITH RED, MOIST, HARD.		ST-2	SAMPLE DEPTH ST-1 0.0- 1.4 ST-2 2.0- 4.0 ST-3 4.0- 6.0 ST-4 6.0- 8.0 ST-5 8.0- 10.0 ST-6 10.0- 12.0 ST-7 12.0- 14.0 ST-8 14.0- 16.0 J-1 16.0- 18.0 J-2 18.0- 20.0 J-3 20.0- 22.0 J-4 22.0- 24.0 J-5 24.0- 26.0 J-6 26.0- 27.9
191.8	6		CLAY (SC) (5.1 - 6.0) YELLOWISH BROWN WITH RED TRACES, MOIST, HARD.		ST-3	
189.8			CLAY, SAND (SC) (6.0 - 8.0) SC-SM, SILTY, YELLOW WITH GRAY MOIST, VERY STIFF TO HARD.		ST-4	
187.8	9		LEAN CLAY (CL) (8.0 - 10.0) SANDY, LIGHT YELLOW WITH GRAY, MOIST, VERY STIFF, SCATTERED IRON-OXIDE STAINS, VERY SILTY.		ST-5	
184.4	12		LEAN CLAY (CL) (10.0 - 13.4) WITH SAND, LIGHT GRAY WITH YELLOW, SCATTERED IRON-OXIDE STAINS.		ST-6	
					ST-7	
179.8	15 18		FAT CLAY (CH) (13.4 - 18.0) YELLOW AND GRAY, MOIST, HARD, SCATTERED IRON-OXIDE STAINS.		ST-8	
					J-1	
177.8			LEAN CLAY (CL) (18.0 - 20.0) GRAYISH BROWN, MOIST.		J-2	
173.8	21 24		LEAN CLAY (CL) (20.0 - 24.0) SANDY, LIGHT BROWNISH GRAY, MOIST.		J-3	
					J-4	
169.9	27		LEAN CLAY (CL) (24.0 - 27.9) WITH SAND, BROWNISH YELLOW, MOIST.		J-5	
					J-6	
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW31

000047

HOLE NO. LHS-MW32

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961384.80	3308981.20	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW32		13. OVERBURDEN SAMPLES DISTURBED 1	UNDISTURBED 7
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/11/1994	COMPLETED 09/11/1994
7. THICKNESS OF OVERBURDEN 16.0		17. ELEVATION TOP OF HOLE 196.9	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 16.0		MERLIN DEAN	

ELEVATION 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
196.4	0		LEAN CLAY (CL) (0.0 – 1.5) SANDY, PALE BROWNISH GRAY, HARD, BOTTOM 0.4' CRUMBLED, ROOTS THROUGHOUT.		ST-1	WATER ENCOUNTERED @ 12.0'
191.8	2 4		FAT CLAY (CH) (1.5 – 5.1) RED AND GRAY, MOIST, HARD.		ST-2 ST-3	SAMPLE TYPE ZONE SHELBY 0.0– 14.0 SPLITSPOON 14.0– 16.0 SAMPLE DEPTH ST-1 0.0– 0.7 ST-2 2.0– 4.0 ST-3 4.0– 5.6 ST-4 6.0– 7.2 ST-5 8.0– 10.0 ST-6 10.0– 12.0 ST-7 12.0– 14.0 J-1 14.0– 16.0
191.1	6		LEAN CLAY, (CL) (5.1 – 5.8) SANDY, BROWNISH YELLOW WITH GRAY TRACES, DAMP.			
189.3			CLAY SAND (SC) (5.8 – 7.6) YELLOW WITH GRAY, MOIST, HARD, TOP PART OF SAMPLE IS FALL-IN MATERIAL.		ST-4	
186.9	8 10		LEAN CLAY (CL) (7.6 – 10.0) SANDY, LIGHT OLIVE AND GRAY, MOIST, VERY STIFF.		ST-5	
184.9	12		CLAY SAND (SC) (10.0 – 12.0) SC-SM, SILTY, YELLOW AND LIGHT GRAY, MOIST, STIFF TO VERY STIFF, LAYER OF SANDY LEAN CLAY 0.2' THICK AT 10.9'.		ST-6	
182.9	14		LEAN CLAY (CL) (12.0 – 14.0) WITH SAND, LIGHT YELLOW WITH GRAY, MOIST, STIFF.		ST-7	
180.9	16		LEAN CLAY (CL) (14.0 – 16.0) BROWNISH YELLOW, MOIST.		J-1	
	18 20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW32

HOLE NO. LHS-MW33

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961289.30 3309333.20		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW33		13. OVERBURDEN SAMPLES DISTURBED 5	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/14/1994	COMPLETED 09/14/1994
7. THICKNESS OF OVERBURDEN 19.0		17. ELEVATION TOP OF HOLE 196.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 19.0		MERLIN DEAN	

ELEVATION 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
			FAT CLAY (CH) (0.0 – 5.0) REDDISH BROWN, MOIST, ROOTS.			WATER ENCOUNTERED @ 11.0'
	2					SAMPLE TYPE ZONE
						AUGER 0.0– 15.0
						SPLITSPOON 15.0– 19.0
					J-1	SAMPLE DEPTH
	4					J-1 0.0– 5.0
191.4						J-2 5.0– 10.0
			LEAN CLAY (CL) (5.0 – 10.0) WITH SAND, PALE BROWN, MOIST.			J-3 10.0– 15.0
	6					J-4 16.7– 17.0
						J-5 17.5– 18.0
					J-2	
	8					
186.4	10		CLAY SAND (SC) (10.0 – 15.8) SC-SM, SILTY, LIGHT YELLOWISH BROWN, FREE WATER.			
	12				J-3	
	14					
180.6						
	16		LEAN CLAY (CL) (15.8 – 17.2) LIGHT YELLOWISH BROWN, MOIST.		J-4	
179.2						
			LEAN CLAY (CL) (17.2 – 19.0) WITH SAND, LIGHT YELLOWISH BROWN, MOIST.		J-5	
	18					
177.4						
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW33

HOLE NO. LHS-MW34

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961493.50	3309336.00	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW34		13. OVERBURDEN SAMPLES DISTURBED 5	UNDISTURBED 6
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/13/1995	COMPLETED 09/18/1994
7. THICKNESS OF OVERBURDEN 22.5		17. ELEVATION TOP OF HOLE 195.8	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 22.5		MERLIN DEAN	

ELEVATION 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
195.0			CLAY SAND (SC) (0.0 – 0.8) GRAYISH BROWN WITH ROOTS AND IRON-OXIDE STAINS.		ST-1	WATER ENCOUNTERED @ 11.0'
193.8			LEAN CLAY (CL) (0.8 – 2.0) WITH SAND, OLIVE BROWN TO RED WITH OLIVE, MOIST, VERY STIFF TO HARD.			SAMPLE TYPE ZONE
	3		FAT CLAY (CH) (2.0 – 4.8) WITH SAND, RED WITH GRAY, MOIST, VERY STIFF.		ST-2	SHELBY 0.0– 12.0 SPLITSPOON 12.0– 22.5
191.0			LEAN CLAY (CL) (4.8 – 6.0) SANDY, YELLOW WITH GRAY, MOIST VERY STIFF TO HARD.		ST-3	SAMPLE DEPTH ST-1 0.0– 2.0 ST-2 2.0– 4.0 ST-3 4.0– 6.0 ST-4 6.0– 8.0 ST-5 8.0– 10.0 ST-6 10.0– 12.0 J-1 12.0– 14.0 J-2 14.0– 16.0 J-3 17.5– 19.0 J-4 19.0– 20.5 J-5 20.5– 22.5
189.8	6		CLAY SAND (SC) (6.0 – 8.0) BROWNISH YELLOW WITH GRAY, MOIST, VERY STIFF.		ST-4	
187.8			LEAN CLAY (CL) (8.0 – 10.0) WITH SAND, LIGHT YELLOW AND GRAY, MOIST, STIFF TO VERY STIFF, SOME IRON-OXIDE STAINS.		ST-5	
185.8	9		LEAN CLAY (CL) (10.0 – 11.0) SANDY, LIGHT GRAY WITH YELLOW, VERY MOIST, STIFF, VERY SILTY.		ST-6	
184.8			CLAY SAND (SC) (11.0 – 12.0) YELLOW WITH LIGHT GRAY, VERY MOIST, STIFF, SILTY.			
183.8	12		CLAY SAND (SC) (12.0 – 14.0) SC-SM, SILTY, LIGHT YELLOWISH BROWN, FREE WATER.		J-1	
181.8	15		LEAN CLAY (CL) (14.0 – 16.6) SANDY, LIGHT YELLOWISH BROWN, WET.		J-2	
179.2	18		LEAN CLAY (CL) (16.6 – 20.5) SANDY, BROWNISH YELLOW, MOIST TO FREE WATER.		J-3	
175.3					J-4	
173.3	21		LEAN CLAY (CL) (20.5 – 22.5) WITH SAND, PALE BROWN, MOIST.		J-5	
	24					
	27					
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW34

027574

HOLE NO. LHS-MW35

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961686.10 3309371.20		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW35		13. OVERBURDEN SAMPLES DISTURBED 2	UNDISTURBED 7
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/09/1994	COMPLETED 09/10/1994
7. THICKNESS OF OVERBURDEN 21.0		17. ELEVATION TOP OF HOLE 195.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 21.0		R. PETERSON	

ELEVATION 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
194.0			LEAN CLAY (CL) (0.0 - 1.4) SANDY, DARK BROWN AND RED TO BROWNISH OLIVE, MOIST, HARD, GRAVELS TO 3/4", FEW ROOTS, IRON-OXIDE STAINS.		ST-1	SAMPLE TYPE ZONE SHELBY 0.0- 15.0 SPLITSPOON 15.0- 21.0 SAMPLE DEPTH ST-1 0.0- 2.0 ST-2 2.0- 3.3 ST-3 4.0- 5.0 ST-4 6.0- 8.0 ST-5 8.0- 10.0 ST-6 10.0- 12.0 ST-7 13.0- 15.0 J-1 17.0- 18.5 J-2 18.5- 21.0
192.2	3		LEAN CLAY (CL) (1.4 - 3.2) WITH SAND, BROWNISH OLIVE WITH RED TRACES, VERY STIFF.		ST-2	
189.9			FAT CLAY (CH) (3.2 - 5.5) WITH SAND, RED AND GRAY WITH YELLOW, MOIST, VERY STIFF.		ST-3	
187.4	6		LEAN CLAY (CL) (5.5 - 8.0) SANDY, YELLOW AND GRAY, MOIST, VERY STIFF.		ST-4	
185.4	9		LEAN CLAY (CL) (8.0 - 10.0) OLIVE GRAY WITH YELLOW, MOIST, VERY STIFF, SCATTERED IRON-OXIDE STAINS.		ST-5	
179.4	12		LEAN CLAY (CL) (10.0 - 16.0) SANDY, YELLOW WITH LIGHT GRAY VERY MOIST TO WET, SILTY, VERY SOFT TO VERY STIFF, SCATTERED IRON-OXIDE STAINS.		ST-6	
	15				ST-7	
176.9	18		LEAN CLAY (CL) (16.0 - 18.5) SANDY, BROWNISH YELLOW, MOIST.		J-1	
174.4	21		FAT CLAY (CH) (18.5 - 21.0) YELLOWISH BROWN, MOIST.		J-2	
	24					
	27					
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW35

000051

HOLE NO. LHS-MW36

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961873.30 3309577.50		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW36		13. OVERBURDEN SAMPLES DISTURBED 10	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
7. THICKNESS OF OVERBURDEN 25.5		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 193.7	
9. TOTAL DEPTH OF HOLE 25.5		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		R. PETERSON	

ELEVATION 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
189.2	3		LEAN CLAY (CL) (0.0 – 3.0) WITH SAND, PALE BROWN, DRY TO DAMP, ROOTS.		J-1	TYPE AUGER ZONE 0.0– 25.5 SAMPLE DEPTH J-1 0.0– 3.0 J-2 3.0– 4.5 J-3 4.5– 5.5 J-4 5.5– 8.0 J-5 8.0– 10.0 J-6 10.0– 13.5 J-7 13.5– 18.0 J-8 18.0– 21.0 J-9 21.0– 23.8 J-10 23.8– 25.5
189.2			LEAN CLAY (CL) (3.0 – 4.5) SANDY, PALE BROWN, DAMP.		J-2	
188.2			LEAN CLAY (CL) (4.5 – 5.5) WITH SAND, BROWNISH YELLOW, DAMP.		J-3	
185.7	6		LEAN CLAY (CL) (5.5 – 8.0) WITH SAND, GRAY, MOIST.		J-4	
182.2	9		CLAY SAND (SC) (8.0 – 10.0) SC-SM, YELLOWISH BROWN, MOIST.		J-5	
180.2	12		SILT SAND (SM) (10.0 – 13.5) BROWNISH YELLOW, FREE WATER.		J-6	
172.7	15 18 21		LEAN CLAY (CL) (13.5 – 21.0) SANDY, YELLOWISH BROWN, MOIST.		J-7 J-8	
168.2	24		FAT CLAY (CH) (21.0 – 25.5) BROWNISH YELLOW TO DARK YELLOWISH BROWN, MOIST.		J-9 J-10	
	27 30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW36

HOLE NO. LHS-MW37

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6962062.50 3309707.60		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW37		13. OVERBURDEN SAMPLES DISTURBED 12	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
7. THICKNESS OF OVERBURDEN 34.0		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 192.2	
9. TOTAL DEPTH OF HOLE 34.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		R. PETERSON	

ELEVATION 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
190.2			LEAN CLAY (CL) (0.0 – 2.0) WITH SAND, DARK YELLOWISH BROWN, MOIST.		J-1	TYPE AUGER ZONE 0.0– 34.0
188.2	4		FAT CLAY (CH) (2.0 – 4.0) WITH SAND, LIGHT BROWNISH GRAY, MOIST.		J-2	SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.0 J-3 4.0– 6.0 J-4 6.0– 8.0 J-5 8.0– 10.0 J-6 10.0– 12.0 J-7 12.0– 14.0 J-8 14.0– 18.0 J-9 18.0– 21.0 J-10 21.0– 27.5 J-11 27.5– 31.0 J-12 31.0– 34.0
182.2	8		LEAN CLAY (CL) (4.0 – 10.0) WITH SAND, BROWNISH YELLOW TO LIGHT YELLOWISH BROWN, MOIST.		J-3 J-4 J-5	
180.2	12		CLAY SAND (SC) (10.0 – 12.0) SC-SM, LIGHT BROWNISH GRAY, MOIST.		J-6	
178.2			LEAN CLAY (CL) (12.0 – 14.0) LIGHT BROWNISH GRAY, MOIST.		J-7	
174.2	16		LEAN CLAY (CL) (14.0 – 18.0) CL-ML, SANDY, GRAY, MOIST.		J-8	
171.2	20		CLAY SAND (SC) (18.0 – 21.0) BROWNISH YELLOW, MOIST.		J-9	
164.7	24		LEAN CLAY (CL) (21.0 – 27.5) WITH SAND, LIGHT BROWNISH GRAY, MOIST.		J-10	
161.2	28		CLAY SAND (SC) (27.5 – 31.0) DARK GRAY, FREE WATER.		J-11	
158.2	32		LEAN CLAY (CL) (31.0 – 34.0) WITH SAND, DARK GRAY, MOIST.		J-12	
	36					
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW37

HOLE NO. LHS-MW38

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6961506.30 3308185.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500/CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW38		13. OVERBURDEN SAMPLES DISTURBED 4	UNDISTURBED 8
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/12/1994	COMPLETED 09/12/1994
7. THICKNESS OF OVERBURDEN 28.0		17. ELEVATION TOP OF HOLE 197.7	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 28.0		R. PETERSON	

ELEVATION 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
196.0			LEAN CLAY (CL) (0.0 - 1.7) SANDY, BROWN AND RED, DAMP, HARD, TWIGS AND ROOTS IN TOP 0.8', NUMEROUS LARGE IRON-OXIDE STAINS.		ST-1	WATER ENCOUNTERED @ 13.0'
194.1	3		FAT CLAY (CH) (1.7 - 3.6) WITH SAND, RED WITH OLIVE GRAY DAMP TO MOIST, HARD, FINE SAND.		ST-2	TYPE ZONE SHELBY 0.0- 16.0 SHELBY 0.0- 16.0 SPLITSPOON 16.0- 25.4 SPLITSPOON 16.0- 25.4
192.1			CLAY SAND (SC) (3.6 - 5.6) LIGHT YELLOWISH BROWN, MOIST, HARD, TOP 0.3' RED IN COLOR.		ST-3	SAMPLE DEPTH ST-1 0.0- 1.4 ST-2 2.0- 3.2 ST-3 4.0- 5.3 ST-4 6.0- 7.6 ST-5 8.0- 9.6 ST-6 10.0- 12.0 ST-7 12.0- 14.0 ST-8 14.0- 16.0 J-1 16.0- 18.5 J-2 18.5- 20.0 J-3 20.0- 25.5 J-4 25.5- 28.0
187.7	6 9		LEAN CLAY (CL) (5.6 - 10.0) SANDY, LIGHT YELLOW WITH LIGHT GRAY TO BROWNISH YELLOW, MOIST VERY STIFF TO HARD.		ST-4 ST-5	
185.7	12		FAT CLAY (CH) (10.0 - 12.0) YELLOW WITH LIGHT GRAY, MOIST, VERY STIFF.		ST-6	
184.5			LEAN CLAY (CL) (12.0 - 13.2) SANDY, YELLOW WITH LIGHT GRAY, MOIST, VERY STIFF.		ST-7	
184.2			CLAY SAND (SC) (13.2 - 13.5)			
181.7	15		LEAN CLAY (CL) (13.5 - 16.0) SANDY, YELLOW WITH LIGHT GRAY, MOIST, STIFF TO VERY STIFF, THIN FINE SAND AND SILT LAMINATIONS THROUGHOUT.		ST-8	
179.2	18		LEAN CLAY (CL) (16.0 - 18.5) WITH SAND, YELLOWISH BROWN, MOIST.		J-1	
172.2	21 24		CLAY SAND (SC) (18.5 - 25.5) SC-SM, SILTY, LIGHT YELLOWISH BROWN TO DARK BROWN, FREE WATER FEW CLAY BALLS.		J-2 J-3	
169.7	27		LEAN CLAY (CL) (25.5 - 28.0) LIGHT YELLOWISH BROWN, MOIST.		J-4	
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW38

HOLE NO. LHS-MW39

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960713.40 3309909.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW39		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
7. THICKNESS OF OVERBURDEN 18.0		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 195.7	
9. TOTAL DEPTH OF HOLE 18.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		R. PETERSON	

ELEVATION 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
193.7	2		LEAN CLAY (CL) (0.0 – 2.0) WITH SAND, BROWN, DAMP.		J-1	TYPE AUGER ZONE 0.0– 18.0 SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.0 J-3 4.0– 6.0 J-4 6.0– 9.0 J-5 9.0– 11.2 J-6 11.2– 11.7 J-7 11.7– 16.0 J-8 16.0– 18.0
191.7	4		FAT CLAY (CH) (2.0 – 4.0) WITH SAND, BROWN, DAMP.		J-2	
189.7	6		LEAN CLAY (CL) (4.0 – 6.0) WITH SAND, BROWN AND GRAY, MOIST.		J-3	
186.7	8		FAT CLAY (CH) (6.0 – 9.0) BROWN, MOIST.		J-4	
184.5	10		LEAN CLAY (CL) (9.0 – 11.2) BROWN AND GRAY, MOIST.		J-5	
184.0			LEAN CLAY (CL) (11.2 – 11.7) WITH SAND GRAYISH BROWN MOIST		J-6	
179.7	12 14 16		SILT SAND (SM) (11.7 – 16.0) BROWN, FREE WATER.		J-7	
177.7	18		LEAN CLAY (CL) (16.0 – 18.0) BROWN AND GRAY, MOIST.		J-8	
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW39

HOLE NO. LHS-MW40

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960414.30 3309954.40		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW40		13. OVERBURDEN SAMPLES DISTURBED 3	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/16/1994	COMPLETED 09/16/1994
7. THICKNESS OF OVERBURDEN 14.0		17. ELEVATION TOP OF HOLE 197.0	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 14.0		MERLIN DEAN	

ELEVATION 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
192.0	0		FAT CLAY (CH) (0.0 – 5.0) WITH SAND, BROWN, MOIST.		J-1	WATER ENCOUNTERED @ 7.0' SAMPLE TYPE ZONE AUGER 0.0– 14.0 SAMPLE DEPTH J-1 0.0– 5.0 J-2 5.0– 10.0 J-3 10.0– 14.0
187.0	10		LEAN CLAY (CL) (5.0 – 10.0) BROWN, MOIST.		J-2	
183.0	14		FAT CLAY (CH) (10.0 – 14.0) BROWN AND GRAY, MOIST.		J-3	
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW40

HOLE NO. LHS-MW41

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960512.70 3309723.60		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW41		13. OVERBURDEN SAMPLES DISTURBED 15	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/18/1994	COMPLETED 09/19/1994
7. THICKNESS OF OVERBURDEN 38.0		17. ELEVATION TOP OF HOLE 197.0	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 38.0		M.C. MURRAY	

ELEVATION 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
192.5	4		LEAN CLAY (CL) (0.0 - 4.5) WITH SAND, BROWN, MOIST.		J-1	WATER ENCOUNTERED ● 13.5'
190.0			LEAN CLAY (CL) (4.5 - 7.0) SANDY, RED AND BROWN, MOIST.		J-2	TYPE ZONE AUGER 0.0- 14.0 SPLITSPOON 14.0- 26.0 AUGER 26.0- 36.5
186.5	8		LEAN CLAY (CL) (7.0 - 10.5) WITH SAND, BROWN, MOIST.		J-3 J-4	SAMPLE DEPTH J-1 0.0- 4.5 J-2 4.5- 7.0 J-3 7.0- 8.5 J-4 8.5- 10.5 J-5 10.5- 11.0 J-6 11.0- 13.3 J-7 13.3- 14.0 J-8 14.0- 17.2 J-9 17.2- 21.0 J-10 21.0- 24.0 J-11 24.0- 28.0 J-12 28.0- 32.0 J-13 32.0- 34.0 J-14 34.0- 36.0 J-15 36.0- 38.0
186.0			LEAN CLAY (CL) (10.5 - 11.0) SANDY, BROWN, WET.		J-5	
183.7	12		LEAN CLAY (CL) (11.0 - 13.3) WITH SAND, BROWN, MOIST.		J-6 J-7	
179.8	16		SILT SAND (SM) (13.3 - 17.2) LIGHT BROWN, FREE WATER.		J-8	
176.0	20		SAND SILT (ML) (17.2 - 21.0) BROWN AND GRAY, FREE WATER.		J-9	
173.0	24		SILTY SAND (SM) (21.0 - 24.0) LIGHT BROWN, FREE WATER.		J-10	
169.0	28		CLAY SAND (SC) (24.0 - 28.0) CLAYEY SAND, GRAYISH BROWN, WET.		J-11	
163.0	32		SILT SAND (SM) (28.0 - 34.0) GRAYISH BROWN TO BROWN, FREE WATER.		J-12 J-13	
161.0	36		LEAN CLAY (CL) (34.0 - 36.0) CL-ML, SANDY, SILTY, GRAYISH BROWN, VERY MOIST.		J-14	
159.0			LEAN CLAY (CL) (36.0 - 38.0) SANDY, GRAYISH BROWN, VERY MOIST.		J-15	
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW41

HOLE NO. LHS-MW42

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960355.60 3309657.90		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW42		13. OVERBURDEN SAMPLES DISTURBED 10	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 19.8		17. ELEVATION TOP OF HOLE 197.2	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 19.8		R. PETERSON	

ELEVATION 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
195.2	2		LEAN CLAY (CL) (0.0 – 2.0) SANDY, GRAYISH BROWN, MOIST.		J-1	TYPE AUGER ZONE 0.0– 19.8 SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 5.0 J-3 5.0– 7.0 J-4 7.0– 9.0 J-5 9.0– 11.0 J-6 11.0– 12.0 J-7 12.0– 14.0 J-8 14.0– 17.0 J-9 17.0– 18.5 J-10 18.5– 19.8
	4		LEAN CLAY (CL) (2.0 – 12.0) WITH SAND, BROWN, MOIST TO VERY MOIST, 5.0'–7.0' GRAYISH BROWN.		J-2	
	6				J-3	
	8				J-4	
	10				J-5	
185.2	12				J-6	
183.2	14		CLAY SAND (SC) (12.0 – 14.0) GRAY, VERY MOIST.		J-7	
	16		SILT (ML) (14.0 – 17.0) SANDY, BROWNISH GRAY, WET.		J-8	
180.2	18		LEAN CLAY (CL) (17.0 – 18.5) WITH SAND, BROWN AND GRAY, WET		J-9	
178.7			LEAN CLAY (CL) (18.5 – 19.8) SANDY, BROWN AND GRAY, WET.		J-10	
177.4	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW42

HOLE NO. LHS-MW43

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960008.30 3309634.60		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW43		13. OVERBURDEN SAMPLES DISTURBED 9	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 19.5		17. ELEVATION TOP OF HOLE 197.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 19.5		R. PETERSON	

ELEVATION 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
192.4	2, 4		SILT (ML) (0.0 – 5.0) WITH SAND, BROWN, MOIST.		J-1	TYPE AUGER ZONE 0.0– 19.5 SAMPLE DEPTH J-1 0.0– 5.0 J-2 5.0– 7.0 J-3 7.0– 9.0 J-4 9.0– 11.0 J-5 11.0– 12.0 J-6 12.0– 13.0 J-7 13.0– 14.5 J-8 14.5– 16.0 J-9 16.0– 19.5
190.4	6		LEAN CLAY (CL) (5.0 – 7.0) GRAYISH BROWN, DAMP TO MOIST.		J-2	
188.4	8		LEAN CLAY (CL) (7.0 – 9.0) WITH SAND, BROWN, DAMP.		J-3	
186.4	10		LEAN CLAY (CL) (9.0 – 11.0) GRAY, MOIST.		J-4	
184.4	12		LEAN CLAY (CL) (11.0 – 13.0) WITH SAND, BROWN TO GRAY, MOIST TO VERY MOIST.		J-5 J-6	
181.4	14, 16		SILT SAND (SM) (13.0 – 16.0) BROWN, WET TO FREE WATER.		J-7 J-8	
177.9	18, 20		LEAN CLAY (CL) (16.0 – 19.5) WITH SAND, BROWN, MOIST.		J-9	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW43

HOLE NO. LHS-MW44

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6960305.60	3309300.20	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW44		13. OVERBURDEN SAMPLES DISTURBED 12	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
7. THICKNESS OF OVERBURDEN 38.0		16. DATE HOLE STARTED 09/14/1994	COMPLETED 09/14/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 197.5	
9. TOTAL DEPTH OF HOLE 38.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		MERLIN DEAN	

ELEVATION 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
192.5	4		LEAN CLAY (CL) (0.0 – 5.0) WITH SAND, BROWN, MOIST.		J-1	WATER ENCOUNTERED ⊙ 6.0' AND 20.0'. SAMPLE TYPE ZONE AUGER 0.0– 15.0 SPLITSPOON 15.0– 30.0 AUGER 30.0– 38.0 SAMPLE DEPTH J-1 0.0– 5.0 J-2 5.0– 10.0 J-3 10.0– 15.0 J-4 15.0– 20.0 J-5 20.0– 22.0 J-6 22.0– 24.0 J-7 24.0– 26.0 J-8 26.0– 28.0 J-9 28.0– 30.0 J-11 34.0– 36.0 J-12 37.2– 38.0
187.5	8		LEAN CLAY (CL) (5.0 – 10.0) SANDY, BROWN, MOIST.		J-2	
182.5	12		LEAN CLAY (CL) (10.0 – 15.0) SANDY, BROWNISH GRAY, VERY MOIST.		J-3	
	16		SILT SAND (SM) (15.0 – 28.0) BROWN TO LIGHT BROWN, WET.		J-4	
	20				J-5	
					J-6	
	24				J-7	
					J-8	
169.5	28					
			SILT SAND (SM) (28.0 – 32.0) LIGHT BROWN, FREE WATER.		J-9	
165.5	32					
			LEAN CLAY (CL) (32.0 – 38.0) SANDY, BROWN, VERY MOIST.		J-11	
	36					
159.5					J-12	
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW44

HOLE NO. LHS-MW45

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 696014 7.10 3309141.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW45		13. OVERBURDEN SAMPLES DISTURBED 14	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 36.0		17. ELEVATION TOP OF HOLE 198.8	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 36.0		R. PETERSON	

ELEVATION 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
198.3			GRAVEL (GC) (0.0 – 0.5) WITH SAND, DARK BROWN, MOIST.		J-1	
			LEAN CLAY (CL) (0.5 – 3.5) SANDY WITH GRAVEL, DARK BROWN, MOIST, ROOTLETS.		J-2	TYPE AUGER ZONE 0.0– 36.0
195.3	4		FAT CLAY (CH) (3.5 – 5.0) WITH SAND, DARK BROWN, DAMP TO MOIST.		J-3	SAMPLE DEPTH J-1 0.0– 0.5 J-2 0.5– 3.5 J-3 3.5– 5.0 J-4 5.0– 6.8 J-5 6.8– 8.5 J-6 8.5– 9.7 J-7 9.7– 12.5 J-8 12.5– 14.2 J-9 14.2– 15.7 J-10 15.7– 20.0 J-11 20.0– 24.0 J-12 24.0– 28.0 J-13 28.0– 34.0 J-14 34.0– 36.0
193.8			LEAN CLAY (CL) (5.0 – 6.8) SANDY, BROWN, MOIST.		J-4	
192.0	8		SILT SAND (SM) (6.8 – 9.7) BROWN TO ORGANISH BROWN, VERY MOIST TO WET.		J-5	
189.1					J-6	
	12		LEAN CLAY (CL) (9.7 – 12.5) SANDY, LIGHT BROWN, VERY MOIST.		J-7	
186.3			CLAY SAND (SC) (12.5 – 14.2) ORGANISH BROWN, VERY MOIST.		J-8	
184.6			SILT (ML) (14.2 – 20.0) SANDY, GRAYISH BROWN, WET.		J-9	
	16				J-10	
178.8	20		SILT SAND (SM) (20.0 – 24.0) GRAYISH BROWN, WET.		J-11	
174.8	24		SILT SAND (SM) (24.0 – 34.0) BROWN TO LIGHT BROWN, FREE WATER.		J-12	
	28				J-13	
164.8	32		LEAN CLAY (CL) (34.0 – 36.0) BROWN, VERY MOIST.		J-14	
162.8	36					
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW45

HOLE NO. LHS-MW46

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959761.00 3309391.40		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW46		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 17.3		17. ELEVATION TOP OF HOLE 198.5	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 17.3		R. PETERSON	

ELEVATION 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
196.5	2		LEAN CLAY (CL) (0.0 - 2.0) WITH SAND, BROWN, MOIST.		J-1	TYPE AUGER ZONE 0.0- 17.3 SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 5.0 J-3 5.0- 7.0 J-4 7.0- 8.0 J-5 8.0- 9.0 J-6 9.0- 13.0 J-7 13.0- 15.3 J-8 15.3- 17.3
191.5	4 6		LEAN CLAY (CL) (2.0 - 7.0) WITH SAND, ORGANISH BROWN AND GRAY, MOIST TO VERY MOIST.		J-2 J-3	
190.5	8		LEAN CLAY (CL) (7.0 - 8.0) SANDY, GRAYISH BROWN, MOIST.		J-4	
189.5			SILT SAND (SM) (8.0 - 9.0) BROWN AND GRAY, MOIST.		J-5	
185.5	10 12		LEAN CLAY (CL) (9.0 - 13.0) WITH SAND, BROWN AND GRAY, MOIST.		J-6	
183.2	14		SILT SAND (SM) (13.0 - 15.3) BROWN, WET.		J-7	
181.2	16		LEAN CLAY (CL) (15.3 - 17.3) SANDY, BROWN, MOIST.		J-8	
	18 20					

PROJECT: LHAAP-WASTE SUMPS HOLE NO. LHS-MW46

HOLE NO. LHS-MW47

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959603.80	3309336.60	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW47		13. OVERBURDEN SAMPLES DISTURBED 9	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 16.0		17. ELEVATION TOP OF HOLE 197.9	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 16.0		R. PETERSON	

ELEVATION 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
193.9	4		FAT CLAY (CH) (0.0 – 4.0) WITH SAND, BROWN, MOIST.		J-1 J-2	TYPE AUGER ZONE 0.0– 16.0 SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.0 J-3 4.0– 6.0 J-4 6.0– 8.0 J-5 8.0– 10.0 J-6 10.0– 11.6 J-7 11.6– 13.3 J-8 13.3– 14.0 J-9 14.0– 16.0
189.9	8		LEAN CLAY (CL) (4.0 – 8.0) SANDY, BROWN, MOIST.		J-3 J-4	
187.9	10		LEAN CLAY (CL) (8.0 – 10.0) BROWN, MOIST.		J-5	
186.3			LEAN CLAY (CL) (10.0 – 11.6) SANDY, GRAY, MOIST.		J-6	
184.6	12		SILT SAND (SM) (11.6 – 13.3) BROWN, FREE WATER.		J-7	
181.9	14 16		LEAN CLAY (CL) (13.3 – 16.0) WITH SAND, BROWN, MOIST.		J-8 J-9	
	18 20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW47

HOLE NO. LHS-MW48

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959350.30 3309442.30		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW48		13. OVERBURDEN SAMPLES DISTURBED 4	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 17.0		17. ELEVATION TOP OF HOLE 199.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 17.0		R. PETERSON	

ELEVATION 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
199.1	0		FAT CLAY (CH) (0.0 – 5.0) BROWN, MOIST.			TYPE AUGER ZONE 0.0– 17.0 SAMPLE DEPTH J-1 4.0– 5.0 J-2 8.0– 9.0 J-3 14.0– 15.0 J-4 15.0– 17.0
	2					
	4				J-1	
194.1	6		SILT SAND (SM) (5.0 – 9.0) GRAY, WET.			
	8				J-2	
190.1	10		CLAY SAND (SC) (9.0 – 15.0) BROWN, MOIST.			
	12					
	14				J-3	
184.1	16		LEAN CLAY (CL) (15.0 – 17.0) WITH SAND, BROWN AND GRAY, MOIST.		J-4	
182.1	18					
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW48

HOLE NO. LHS-MW49

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959476.90 3309023.40		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW49		13. OVERBURDEN SAMPLES DISTURBED 5	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/19/1994	COMPLETED 09/19/1994
7. THICKNESS OF OVERBURDEN 16.0		17. ELEVATION TOP OF HOLE 198.7	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 16.0		JO CAMRUD	

ELEVATION 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
	2		LEAN CLAY (CL) (0.0 - 7.5) WITH SAND, BROWNISH GRAY, MOIST.			SAMPLE TYPE ZONE AUGER 0.0- 10.0 SPLITSPOON 10.0- 16.0 SAMPLE DEPTH J-1 2.0- 7.5 J-2 7.5- 10.0 J-3 10.0- 12.0 J-4 12.0- 14.0 J-5 14.0- 16.0
	4					
	6				J-1	
191.2	8		SILT SAND (SM) (7.5 - 10.0) BROWN, WET.		J-2	
188.7	10		CLAY SAND (SC) (10.0 - 12.0) BROWN AND GRAY, WET.		J-3	
186.7	12		SILT SAND (SM) (12.0 - 14.0) LIGHT BROWN, WET.		J-4	
184.7	14		LEAN CLAY (CL) (14.0 - 16.0) WITH SAND, BROWN, MOIST.		J-5	
182.7	16					
	18					
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW49

HOLE NO. LHS-MW50

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959084.40 3308465.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW50		13. OVERBURDEN SAMPLES DISTURBED 14	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 28.5		17. ELEVATION TOP OF HOLE 201.9	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 28.5		R. PETERSON	

ELEVATION 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
199.9			LEAN CLAY (CL) (0.0 – 2.0) WITH SAND, BROWN, VERY MOIST.		J-1	TYPE AUGER ZONE 0.0– 28.5
197.9	3		LEAN CLAY (CL) (2.0 – 4.0) SANDY, BROWN, VERY MOIST.		J-2	SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.0 J-3 4.0– 6.0 J-4 6.0– 7.0 J-5 7.0– 12.0 J-6 12.0– 13.5 J-7 13.5– 16.0 J-8 16.0– 17.0 J-9 17.0– 18.0 J-10 18.0– 19.0 J-11 19.0– 23.3 J-12 23.3– 24.3 J-13 24.3– 26.5 J-14 26.5– 28.5
195.9	5		LEAN CLAY (CL) (4.0 – 6.0) WITH SAND, BROWN, MOIST.		J-3	
194.9			LEAN CLAY (CL) (6.0 – 7.0) SANDY, BROWN, VERY MOIST.		J-4	
189.9	9 12		SILT SAND (SM) (7.0 – 12.0) BROWN, WET.		J-5	
188.4			LEAN CLAY (CL) (12.0 – 13.5) WITH SAND, ORGANISH BROWN, MOIST.		J-6	
185.9	15		FAT CLAY (CH) (13.5 – 16.0) ORGANISH BROWN, MOIST.		J-7	
184.9			LEAN CLAY (CL) (16.0 – 17.0) SANDY, BROWN, WET.		J-8	
183.9	18		LEAN CLAY (CL) (17.0 – 18.0) LIGHT BROWN, MOIST.		J-9	
182.9			SILT (ML) (18.0 – 19.0) SANDY, LIGHT BROWN, WET.		J-10	
178.6	21		SILT SAND (SM) (19.0 – 23.3) YELLOWISH BROWN, WET.		J-11	
177.6	24		LEAN CLAY (CL) (23.3 – 24.3) SANDY, YELLOWISH BROWN, VERY MOIST.		J-12	
175.4			LEAN CLAY (CL) (24.3 – 26.5) SANDY, BROWN AND GRAY, WET.		J-13	
173.4	27		LEAN CLAY (CL) (26.5 – 28.5) WITH SAND, YELLOWISH BROWN AND GRAY, VERY MOIST.		J-14	
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW50

027590

HOLE NO. LHS-MW51

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959187.60 3307497.40		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW51		13. OVERBURDEN SAMPLES DISTURBED 4	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/20/1994	COMPLETED 09/20/1994
7. THICKNESS OF OVERBURDEN 19.0		17. ELEVATION TOP OF HOLE 205.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 19.0		JO CAMRUD	

ELEVATION 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		LEAN CLAY (CL) (0.0 - 13.0) WITH SAND, BROWN, MOIST.			OVERDRILLED HOLE WITH 10" HOLLOWSTEM AUGER TO SET WELL.
	2					SAMPLE TYPE ZONE AUGER 0.0- 15.5 SPLITSPOON 15.5- 19.0
	4				J-1	SAMPLE DEPTH J-1 4.0- 5.0 J-2 8.0- 10.0 J-3 13.0- 15.0 J-4 17.0- 19.0
	6					
	8				J-2	
	10					
	12					
192.4						
	14		LEAN CLAY (CL) (13.0 - 16.0) SANDY, YELLOWISH BROWN AND GRAY, MOIST.		J-3	
189.4	16					
			SILT (ML) (16.0 - 19.0) SANDY, BROWN, VERY MOIST.			
	18				J-4	
186.4						
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW51

000067

HOLE NO. LHS-MW52

DRILLING LOG	DIVISION: SOUTHWEST	INSTALLATION: LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT: LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT: 8" AUGER	
2. LOCATION (Coordinates or Station): 6958449.80 / 3308619.60		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number): LHS-MW52		13. OVERBURDEN SAMPLES: DISTURBED 8 / UNDISTURBED 0	
5. NAME OF DRILLER: RAY VOILS		14. TOTAL NUMBER CORE BOXES: 0	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: NOT DETERMINED	
7. THICKNESS OF OVERBURDEN: 22.0		16. DATE HOLE: STARTED 09/00/1994 / COMPLETED 09/00/1994	
8. DEPTH DRILLED INTO ROCK: 0.0		17. ELEVATION TOP OF HOLE: 202.5	
9. TOTAL DEPTH OF HOLE: 22.0		18. TOTAL CORE RECOVERY FOR BORING: 0.0 %	
		R. PETERSON	

ELEVATION 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
200.5			LEAN CLAY (CL) (0.0 – 2.0) CL-ML, SANDY SILTY CLAY, BROWN, WET.		J-1	TYPE AUGER ZONE 0.0– 22.0 SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.0 J-3 4.0– 7.5 J-4 7.5– 10.5 J-5 10.5– 13.0 J-6 13.0– 17.0 J-7 17.0– 20.5 J-8 20.5– 22.0
198.5	3		LEAN CLAY (CL) (2.0 – 4.0) WITH SAND, REDDISH BROWN, MOIST.		J-2	
195.0	6		FAT CLAY (CH) (4.0 – 7.5) WITH SAND, REDDISH BROWN, MOIST		J-3	
192.0	9		LEAN CLAY (CL) (7.5 – 10.5) SANDY, REDDISH BROWN, MOIST.		J-4	
	12		LEAN CLAY (CL) (10.5 – 20.5) WITH SAND, BROWN TO YELLOWISH BROWN, MOIST.		J-5	
	15				J-6	
	18				J-7	
182.0	21		FAT CLAY (CH) (20.5 – 22.0) YELLOWISH BROWN, MOIST.		J-8	
180.5	24					
	27					
	30					

PROJECT: LHAAP-WASTE SUMPS | HOLE NO.: LHS-MW52

HOLE NO. LHS-MW53

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6958095.80 3309905.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW53		13. OVERBURDEN SAMPLES DISTURBED 7	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/20/1994	COMPLETED 09/20/1994
7. THICKNESS OF OVERBURDEN 14.0		17. ELEVATION TOP OF HOLE 195.0	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0	%
9. TOTAL DEPTH OF HOLE 14.0		JO CAMRUD	

ELEVATION 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
192.0	2		SILT (ML) (0.0 – 3.0) SANDY, BROWN.			SAMPLE TYPE / ZONE AUGER 0.0– 8.0 SPUTSPOON 8.0– 14.0 SAMPLE / DEPTH J-1 3.0– 5.0 J-2 6.0– 6.5 J-3 8.0– 10.0 J-4 10.0– 12.0 J-5 12.0– 13.0 J-6 13.0– 13.5 J-7 13.5– 14.0
189.5	4		FAT CLAY (CH) (3.0 – 5.5) WITH SAND, BROWN, MOIST.		J-1	
187.8	6		LEAN CLAY (CL) (5.5 – 7.2) WITH SAND, GRAYISH BROWN, VERY MOIST.		J-2	
182.0	8		FAT CLAY (CH) (7.2 – 13.0) BROWN AND GRAY, MOIST TO VERY MOIST.		J-3	
	10				J-4	
	12				J-5	
181.5			SILT SAND (SM) (13.0 – 13.5) BROWN AND GRAY WET		J-6	
181.0	14		FAT CLAY (CH) (13.5 – 14.0) GRAY AND BROWN, MOIST		J-7	
	16					
	18					
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW53

HOLE NO. LHS-MW54

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6958536.00 3310539.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW54		13. OVERBURDEN SAMPLES DISTURBED 15	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/22/1994	COMPLETED 09/24/1994
7. THICKNESS OF OVERBURDEN 44.0		17. ELEVATION TOP OF HOLE 191.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 44.0		JO CAMRUD	

ELEVATION 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
189.1			CLAY SAND (SC) (0.0 – 2.0) BROWN.			SET WELL WITH 10" HOLLOW STEM AUGER.
	3		LEAN CLAY (CL) (2.0 – 6.0) WITH SAND, BROWN, VERY MOIST.		J-1	SAMPLE TYPE ZONE AUGER 0.0– 5.0 SPLITSPOON 5.0– 22.0 AUGER 22.0– 44.0
185.1	6				J-2	SAMPLE DEPTH J-1 2.0– 3.0 J-2 4.0– 5.0 J-3 6.0– 7.0 J-4 7.0– 8.0 J-5 8.0– 9.0 J-6 9.0– 11.0 J-7 11.0– 13.0 J-8 13.0– 15.0 J-9 16.0– 17.0 J-10 19.0– 21.0 J-11 24.0– 26.0 J-12 30.0– 32.0 J-13 34.0– 36.0 J-14 38.0– 40.0 J-15 43.5– 44.0
184.1			SILT (ML) (6.0 – 7.0) WITH SAND, GRAY, MOIST.		J-3	
183.1			LEAN CLAY (CL) (7.0 – 8.0) SANDY, BROWN AND GRAY, VERY MOIST.		J-4	
182.1	9		LEAN CLAY (CL) (8.0 – 9.0) WITH SAND, BROWN AND GRAY, VERY MOIST.		J-5	
180.1			SILT SAND (SM) (9.0 – 11.0) GRAY, VERY MOIST.		J-6	
178.1	12		CLAY SAND (SC) (11.0 – 13.0) BROWN, WET.		J-7	
	15		SILT SAND (SM) (13.0 – 28.0) BROWN AND GRAY, WET		J-8	
	18				J-9	
	21				J-10	
	24				J-11	
163.1	27					
161.1	30		SILT SAND (SM) (28.0 – 33.0) BROWN, FREE WATER.			

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW54

HOLE NO. LHS-MW54

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6958536.00	3310539.00	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW54		13. OVERBURDEN SAMPLES	DISTURBED 15 / UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
7. THICKNESS OF OVERBURDEN 44.0		16. DATE HOLE	STARTED 09/22/1994 / COMPLETED 09/24/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 191.1	
9. TOTAL DEPTH OF HOLE 44.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		JO CAMRUD	

ELEVATION 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
			SILT SAND (SM) (28.0 – 33.0) BROWN, FREE WATER.		J-12	
158.1	33		SILT SAND (SM) (33.0 – 41.7) BROWN, WET.		J-13	
	36					
	39				J-14	
149.4	42		LEAN CLAY (CL) (41.7 – 44.0) WITH SAND, GRAY, VERY MOIST.		J-15	
147.1	45					
	48					
	51					
	54					
	57					
	60					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW54

HOLE NO. LHS-MW55

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959043.60 3310173.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW55		13. OVERBURDEN SAMPLES DISTURBED 7	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 17.5		17. ELEVATION TOP OF HOLE 196.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 17.5		R. PETERSON	

ELEVATION 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
194.4	2		CLAY SAND (SC) (0.0 – 2.0) REDDISH BROWN, MOIST.		J-1	TYPE AUGER ZONE 0.0– 17.5 SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.5 J-3 4.5– 9.3 J-4 9.3– 11.0 J-5 11.0– 13.0 J-6 13.0– 16.3 J-7 16.3– 17.5
191.9	4		LEAN CLAY (CL) (2.0 – 4.5) SANDY, BROWN, VERY MOIST.		J-2	
187.1	6 8		FAT CLAY (CH) (4.5 – 9.3) GRAYISH BROWN, MOIST.		J-3	
185.4	10		LEAN CLAY (CL) (9.3 – 11.0) GRAYISH BROWN, MOIST.		J-4	
183.4	12		FAT CLAY (CH) (11.0 – 13.0) GRAYISH BROWN, MOIST.		J-5	
180.1	14 16		SILT SAND (SM) (13.0 – 16.3) LIGHT GRAY, FREE WATER.		J-6	
178.9	18		LEAN CLAY (CL) (16.3 – 17.5) WITH SAND, GRAYISH BROWN, VERY MOIST.		J-7	
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW55

HOLE NO. LHS-MW56

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959009.90 3310568.50		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW56		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/22/1994	COMPLETED 09/22/1994
7. THICKNESS OF OVERBURDEN 20.0		17. ELEVATION TOP OF HOLE 195.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 20.0		CHARLIE TRANSUE	

ELEVATION 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
192.4	2		CLAY SAND (SC) (0.0 – 3.0) REDDISH BROWN, MOIST.		J-1	WATER ENCOUNTERED @ 14.0' OVERDRILLED HOLE WITH 10" HOLLOWSTEM AUGER TO SET WELL.
189.7	4		LEAN CLAY (CL) (3.0 – 5.7) CL-ML, SILTY WITH SAND, BROWN MOIST.		J-2	SAMPLE TYPE / ZONE AUGER 0.0– 16.0 SPLITSPOON 16.0– 16.9 AUGER 16.9– 18.0 SPLITSPOON 18.0– 20.0
184.4	6 8 10		LEAN CLAY (CL) (5.7 – 11.0) WITH SAND, BROWN TO GRAYISH BROWN, MOIST.		J-3 J-4	SAMPLE / DEPTH J-1 1.5– 2.0 J-2 4.0– 5.0 J-3 6.5– 7.0 J-4 9.0– 10.0 J-5 12.0– 13.0 J-6 15.0– 16.0 J-7 17.0– 18.0 J-8 18.5– 19.5
181.4	12 14		FAT CLAY (CH) (11.0 – 14.0) BROWN, MOIST.		J-5	
178.9	16		SILT SAND (SM) (14.0 – 16.5) BROWN, FREE WATER.		J-6	
176.9	18		SAND SILT (ML) (16.5 – 18.5) BROWN, WET.		J-7	
175.4	20		LEAN CLAY (CL) (18.5 – 20.0) GRAYISH BROWN, VERY MOIST.		J-8	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW56

HOLE NO. LHS-MW57

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959434.20	3310398.60	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW57		13. OVERBURDEN SAMPLES DISTURBED 6	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 14.5		17. ELEVATION TOP OF HOLE 197.7	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 14.5		R. PETERSON	

ELEVATION 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
195.7	2		LEAN CLAY (CL) (0.0 - 2.0) SANDY, REDDISH BROWN, MOIST.		J-1	TYPE AUGER ZONE 0.0- 14.5 SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 3.0 J-3 3.0- 5.0 J-4 5.0- 7.0 J-5 7.0- 12.0 J-6 12.0- 14.5
	4		LEAN CLAY (CL) (2.0 - 7.0) WITH SAND, BROWN TO BROWN AND GRAY, VERY MOIST TO MOIST.		J-2	
	6				J-3	
190.7					J-4	
	8		FAT CLAY (CH) (7.0 - 14.5) BROWN, MOIST.		J-5	
	10					
	12					
					J-6	
183.2	14					
	16					
	18					
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW57

HOLE NO. LHS-MW58

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 695803 4.80	3308107.20	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW58		13. OVERBURDEN SAMPLES DISTURBED 11	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 34.0		17. ELEVATION TOP OF HOLE 200.2	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 34.0		R. PETERSON	

ELEVATION 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
198.2			SILT (ML) (0.0 – 2.0) SANDY, BROWN, MOIST.		J-1	TYPE AUGER ZONE 0.0– 34.0
193.2	4		LEAN CLAY (CL) (2.0 – 7.0) SANDY, BROWN, MOIST.		J-2 J-3	SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.0 J-3 4.0– 7.0 J-4 7.0– 9.0 J-5 9.0– 11.5 J-6 11.5– 14.5 J-7 14.5– 17.0 J-8 17.0– 22.0 J-9 22.0– 27.0 J-10 27.0– 33.0 J-11 33.0– 34.0
188.7	8		LEAN CLAY (CL) (7.0 – 11.5) WITH SAND, BROWN TO BROWN AND GRAY, MOIST.		J-4 J-5	
185.7	12		LEAN CLAY (CL) (11.5 – 14.5) SANDY, BROWN, VERY MOIST.		J-6	
183.2	16		LEAN CLAY (CL) (14.5 – 17.0) WITH SAND, BROWN AND GRAY, VERY MOIST.		J-7	
	20		SILT SAND (SM) (17.0 – 33.0) BROWN, WET TO FREE WATER.		J-8	
	24				J-9	
	28				J-10	
167.2	32					
166.2			LEAN CLAY (CL) (33.0 – 34.0) WITH SAND, BROWN AND GRAY, VERY MOIST.		J-11	
	36					
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW58

HOLE NO. LHS-MW59

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6958118.90 3307883.40		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW59		13. OVERBURDEN SAMPLES DISTURBED 20	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/25/1994	COMPLETED 09/25/1994
7. THICKNESS OF OVERBURDEN 49.3		17. ELEVATION TOP OF HOLE 201.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 49.3		CHARLIE TRANSUE	

ELEVATION 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
192.1	3 6 9		LEAN CLAY (CL) (0.0 – 9.0) SANDY, BROWN AND GRAY, VERY MOIST.		J-1 J-2	WATER ENCOUNTERED ⊙ 6.0' USED 10" HOLLOWSTEM AUGER TO SET WELL SAMPLE TYPE ZONE AUGER 0.0– 17.0 SPLITSPOON 17.0– 42.4 AUGER 42.4– 49.3 SAMPLE DEPTH J-1 4.0– 5.0 J-2 7.0– 8.0 J-3 10.0– 11.0 J-4 13.0– 14.0 J-5 15.0– 17.0 J-6 17.5– 18.0 J-7 18.5– 19.0 J-8 20.0– 20.5 J-9 24.5– 25.0 J-10 26.0– 27.0 J-11 29.4– 29.8 J-12 29.5– 31.0 J-13 33.5– 34.0 J-14 37.0– 37.5 J-15 38.0– 39.0 J-16 40.0– 41.0 J-17 42.0– 42.4 J-18 46.0– 47.0 J-19 47.0– 48.3 J-20 48.3– 49.3
189.1	12		LEAN CLAY (CL) (9.0 – 12.0) WITH SAND, BROWN AND GRAY, VERY MOIST.		J-3	
186.6	15		LEAN CLAY (CL) (12.0 – 14.5) BROWN AND GRAY, VERY MOIST.		J-4	
183.9	18		LEAN CLAY (CL) (14.5 – 17.2) SANDY, BROWN AND GRAY, WET.		J-5	
182.9			LEAN CLAY (CL) (17.2 – 18.2) WITH SAND, GRAY AND BROWN, VERY MOIST.		J-6	
	21		SILT SAND (SM) (18.2 – 22.5) BROWN AND GRAY, WET.		J-7 J-8	
178.6	24 27		CLAY SAND (SC) (22.5 – 28.2) GRAY AND BROWN, WET.		J-9 J-10	
172.9	30		LEAN CLAY (CL) (28.2 – 32.2) WITH SAND, BROWN AND GRAY, VERY MOIST.		J-12	
171.1						

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW59

HOLE NO. LHS-MW59

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6958118.90	3307883.40	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW59		13. OVERBURDEN SAMPLES DISTURBED 20	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/25/1994	COMPLETED 09/25/1994
7. THICKNESS OF OVERBURDEN 49.3		17. ELEVATION TOP OF HOLE 201.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 49.3		CHARLIE TRANSUE	

ELEVATION 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
168.9			LEAN CLAY (CL) (28.2 - 32.2) WITH SAND, BROWN AND GRAY, VERY MOIST.		J-12	
	33		SILT SAND (SM) (32.2 - 41.5) BROWN TO REDDISH BROWN, FREE WATER. 40.0'-41.0' WITH GRAVEL		J-13	
	36				J-14	
	39				J-15	
159.6					J-16	
	42		SILT (ML) (41.5 - 44.7) SANDY, DARK GRAY, FREE WATER.		J-17	
156.4						
	45		SILT SAND (SM) (44.7 - 47.0) DARK GRAY AND BROWN, FREE WATER.		J-18	
154.1						
	48		SILT SAND (SM) (47.0 - 48.3) DARK GRAY, WET.		J-19	
152.8						
151.8			LEAN CLAY (CL) (48.3 - 49.3) WITH SAND, DARK GRAY, MOIST.		J-20	
	51					
	54					
	57					
	60					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW59

HOLE NO. LHS-MW60

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6957946.00 3309450.00		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW60		13. OVERBURDEN SAMPLES DISTURBED 12	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 27.0		17. ELEVATION TOP OF HOLE 195.6	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 27.0		R. PETERSON	

ELEVATION 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
			SILT (ML) (0.0 – 4.0) SANDY, DARK YELLOWISH BROWN, MOIST.		J-1	TYPE AUGER ZONE 0.0– 27.0
191.6	3				J-2	SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.0 J-3 4.0– 7.5 J-4 7.5– 8.3 J-5 8.3– 11.5 J-6 11.5– 12.3 J-7 12.3– 16.0 J-8 16.0– 19.5 J-9 19.5– 20.2 J-10 20.2– 22.3 J-11 22.3– 25.4 J-12 25.4– 27.0
188.1	6		SILT SAND (SM) (4.0 – 7.5) YELLOWISH BROWN, MOIST.		J-3	
187.3			LEAN CLAY (CL) (7.5 – 8.3) SANDY, MOIST, LIGHT GRAY AND YELLOWISH BROWN WITH BROWN.		J-4	
184.1	9		LEAN CLAY (CL) (8.3 – 11.5) WITH SAND, LIGHT GRAY AND BROWNISH YELLOW, MOIST, IRON-OXIDE STAINS.		J-5	
183.3	12		CLAY SAND (SC) (11.5 – 12.3) DARK YELLOWISH BROWN AND YELLOWISH BROWN AND LIGHT GRAY MOIST, ANGULAR ROCK.		J-6	
179.6	15		LEAN CLAY (CL) (12.3 – 16.0) WITH SAND, LIGHT GRAY AND YELLOWISH BROWN, MOIST.		J-7	
176.1	18		FAT CLAY (CH) (16.0 – 19.5) LIGHT GRAY AND DARK YELLOWISH BROWN, MOIST.		J-8	
175.4			CLAY SAND (SC) (19.5 – 20.2) LIGHT GRAY AND YELLOWISH BROWN, WET, SMALL AMOUNT OF BLACK STRINGERS.		J-9	
173.3	21		CLAY SAND (SC) (20.2 – 22.3) SC-SM, SILTY CLAYEY SAND, YELLOWISH BROWN, WET.		J-10	
170.2	24		CLAY SAND (SC) (22.3 – 25.4) LIGHT GRAY AND YELLOWISH BROWN, WET, SILTY.		J-11	
168.6	27		FAT CLAY (CH) (25.4 – 27.0) WITH SAND, YELLOWISH RED AND LIGHT GRAY, DAMP.		J-12	
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW60

HOLE NO. LHS-MW61

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6958548.30	3313186.20	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW61		13. OVERBURDEN SAMPLES DISTURBED 15	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
7. THICKNESS OF OVERBURDEN 26.5		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 195.4	
9. TOTAL DEPTH OF HOLE 26.5		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		R. PETERSON	

ELEVATION 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
186.4	3 6 9		LEAN CLAY (CL) (0.0 – 9.0) WITH SAND, STRONG BROWN WITH BROWNISH YELLOW TO LIGHT GRAY, MOIST.		J-1 J-2 J-3	TYPE AUGER ZONE 0.0– 26.5 SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 5.0 J-3 5.0– 9.0 J-4 9.0– 11.0 J-5 11.0– 14.0 J-6 14.0– 16.5 J-7 16.5– 19.0 J-8 19.0– 20.0 J-9 20.0– 21.3 J-10 21.3– 22.0 J-11 22.0– 22.6 J-12 22.6– 23.7 J-13 23.7– 24.9 J-14 24.9– 25.5 J-15 25.5– 26.5
184.4			FAT CLAY (CH) (9.0 – 11.0) WITH SAND, STRONG BROWN AND LIGHT GRAY, MOIST.		J-4	
181.4	12		FAT CLAY (CH) (11.0 – 14.0) GRAY AND STRONG BROWN, MOIST, SOME BLACK ORGANICS.		J-5	
176.4	15 18		LEAN CLAY (CL) (14.0 – 19.0) LIGHT GRAY AND YELLOWISH BROWN MOIST TO VERY MOIST, TRACE OF BLACK ORGANICS.		J-6	
			CLAY SAND (SC) (19.0 – 20.0) SC-SM, SILTY CLAYEY SAND, YELLOWISH BROWN AND LIGHT GRAY WET, CLAY LENSES, TRACE OF BLACK ORGANICS.		J-7	
175.4			CLAY SAND (SC) (20.0 – 21.3) YELLOWISH BROWN, FREE WATER, SMALL LIGHT GRAY CLAY LENSE.		J-8	
174.1	21		LEAN CLAY (CL) (21.3 – 22.0) WITH SAND, YELLOWISH BROWN AND GRAY, VERY MOIST.		J-9	
173.4			LEAN CLAY (CL) (22.0 – 22.6) SANDY, YELLOWISH BROWN AND GRAY, WET.		J-10 J-11	
172.8			LEAN CLAY (CL) (22.6 – 23.7) YELLOWISH BROWN WITH GRAY, MOIST.		J-12	
171.7	24		LEAN CLAY (CL) (23.7 – 24.9) SANDY, YELLOWISH BROWN, WET, LIGHT GRAY CLAY LENSES.		J-13	
170.5			LEAN CLAY (CL) (24.9 – 26.5) DARK YELLOWISH BROWN WITH GRAY TO YELLOWISH BROWN, VERY MOIST TO MOIST.		J-14 J-15	
168.9	27 30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW61

HOLE NO. LHS-MW62

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959033.70 3314542.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW62		13. OVERBURDEN SAMPLES DISTURBED 21	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
7. THICKNESS OF OVERBURDEN 27.6		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 189.0	
9. TOTAL DEPTH OF HOLE 27.6		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		R. PETERSON	

ELEVATION 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
187.0	2		FAT CLAY (CH) (0.0 – 2.0) WITH SAND, YELLOWISH RED, MOIST, SOME GRASS.		J-1	TYPE AUGER ZONE 0.0– 27.6
185.0	4		FAT CLAY (CH) (2.0 – 4.0) DARK YELLOWISH BROWN WITH YELLOWISH RED AND GRAY, THIN LAMINATES, MOIST, SOME GRASS.		J-2	SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 4.0 J-3 4.0– 7.0 J-4 7.0– 8.3 J-5 8.3– 9.7 J-6 9.7– 12.0 J-7 12.0– 13.0 J-8 13.0– 14.5 J-9 14.5– 16.0 J-10 16.0– 16.7 J-11 16.7– 18.0 J-12 18.0– 19.2 J-13 19.2– 19.6 J-14 19.6– 20.4 J-15 20.4– 21.3 J-16 21.3– 22.3 J-17 22.3– 23.1 J-18 23.4– 23.8 J-19 23.8– 24.7 J-20 24.7– 26.4 J-21 26.4– 27.6
182.0	6		FAT CLAY (CH) (4.0 – 7.0) WITH SAND, LIGHT GRAY AND YELLOWISH RED, MOIST, LAMINATED		J-3	
180.7	8		LEAN CLAY (CL) (7.0 – 8.3) WITH SAND, LIGHT GRAY AND GRAY, MOIST.		J-4	
179.3			LEAN CLAY (CL) (8.3 – 9.7) YELLOWISH BROWN WITH GRAY, WET VERY SILTY.		J-5	
177.0	10 12		LEAN CLAY (CL) (9.7 – 12.0) SANDY, YELLOWISH RED WITH BROWN, WET, VERY SILTY.		J-6	
176.0			LEAN CLAY (CL) (12.0 – 13.0) LIGHT OLIVE BROWN AND LIGHT BROWNISH GRAY, WET, VERY SILTY		J-7	
174.5	14		LEAN CLAY (CL) (13.0 – 14.5) YELLOWISH BROWN AND LIGHT GRAY WITH DARK YELLOWISH BROWN VERY MOIST.		J-8	
173.0	16		LEAN CLAY (CL) (14.5 – 16.0) SANDY, YELLOWISH BROWN WITH TRACE OF GRAY, WET.		J-9	
172.3			LEAN CLAY (CL) (16.0 – 16.7) WITH SAND, YELLOWISH BROWN WITH DARK BROWN, MOIST.		J-10	
169.8	18		LEAN CLAY (CL) (16.7 – 19.2) BROWN AND LIGHT GRAY AND DARK YELLOWISH BROWN, VERY MOIST TO MOIST.		J-11	
169.4			LEAN CLAY (CL) (19.2 – 19.6) LIGHT YELLOWISH BROWN, FREE WATER, VERY SILTY.		J-12	
169.0	20		LEAN CLAY (CL) (19.6 – 20.4) YELLOW AND LIGHT GRAY, VERY MOIST.		J-13 J-14	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW62

HOLE NO. LHS-MW62

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959033.70 3314542.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW62		13. OVERBURDEN SAMPLES DISTURBED 21	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 27.6		17. ELEVATION TOP OF HOLE 189.0	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 27.6		R. PETERSON	

ELEVATION 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
168.6			LEAN CLAY (CL) (19.6 - 20.4) YELLOW AND LIGHT GRAY, VERY MOIST.		J-14	
			LEAN CLAY (CL) (20.4 - 21.3) CL-ML, SILTY CLAY WITH SAND, YELLOWISH BROWN AND LIGHT GRAY, WET.		J-15	
167.7	22		LEAN CLAY (CL) (21.3 - 22.3) YELLOWISH BROWN WITH DARK YELLOWISH BROWN, VERY MOIST.		J-16	
166.7			LEAN CLAY (CL) (22.3 - 23.1) CL-ML, SILTY CLAY WITH SAND, YELLOWISH BROWN WITH LIGHT GRAY, FREE WATER.		J-17	
165.9			LEAN CLAY (CL) (23.1 - 23.8) SANDY SILTY CLAY, YELLOWISH BROWN WITH DARK YELLOW, WET.		J-18	
165.2	24		LEAN CLAY (CL) (23.8 - 24.7) WITH SAND, LIGHT OLIVE BROWN AND LIGHT GRAY, VERY MOIST.		J-19	
164.3			LEAN CLAY (CL) (24.7 - 26.4) CL-ML, SILTY CLAY WITH SAND, YELLOWISH BROWN WITH LIGHT GRAY AND DARK YELLOWISH BROWN, WET.		J-20	
162.6	26		LEAN CLAY (CL) (26.4 - 27.6) LIGHT GRAY AND LIGHT BROWNISH GRAY, VERY MOIST.		J-21	
161.4						
	28					
	30					
	32					
	34					
	36					
	38					
	40					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW62

HOLE NO. LHS-MW63

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959185.00 3314366.40		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW63		13. OVERBURDEN SAMPLES DISTURBED 12	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 20.0		17. ELEVATION TOP OF HOLE 190.9	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 20.0		R. PETERSON	

ELEVATION 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
188.9	2		LEAN CLAY (CL) (0.0 - 2.0) YELLOWISH BROWN AND STRONG BROWN, DAMP.		J-1	TYPE AUGER ZONE 0.0- 20.0 SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 4.0 J-3 4.0- 6.5 J-4 6.5- 7.8 J-5 7.8- 11.0 J-6 11.0- 13.2 J-7 13.2- 14.5 J-8 14.5- 15.2 J-9 15.2- 16.5 J-10 16.5- 17.5 J-11 17.5- 18.2 J-12 18.2- 20.0
186.9	4		LEAN CLAY (CL) (2.0 - 4.0) STRONG BROWN AND DARK YELLOWISH BROWN WITH GRAY, MOIST.		J-2	
184.4	6		FAT CLAY (CH) (4.0 - 6.5) YELLOWISH BROWN, MOIST.		J-3	
183.1			LEAN CLAY (CL) (6.5 - 7.8) WITH SAND, DARK BROWN AND LIGHT GRAY, MOIST, LAMINATED.		J-4	
179.9	8 10		LEAN CLAY (CL) (7.8 - 11.0) SANDY, YELLOWISH BROWN AND LIGHT GRAY, MOIST, LAMINATED.		J-5	
177.7	12		LEAN CLAY (CL) (11.0 - 13.2) WITH SAND, YELLOWISH BROWN WITH LIGHT GRAY, VERY MOIST.		J-6	
176.4	14		SILT SAND (SM) (13.2 - 14.5) STRONG BROWN WITH YELLOWISH BROWN AND GRAY, FREE WATER.		J-7	
174.4	16		FAT CLAY (CH) (14.5 - 16.5) YELLOWISH RED WITH YELLOWISH BROWN AND GRAY TO LIGHT GRAY AND DARK YELLOWISH BROWN MOTTLED, MOIST.		J-8 J-9	
173.4			CLAY SAND (SC) (16.5 - 17.5) SC-SM, SILTY CLAYEY SAND, LIGHT GRAY AND YELLOWISH BROWN WET		J-10	
170.9	18 20		LEAN CLAY (CL) (17.5 - 20.0) DARK YELLOWISH BROWN WITH LIGHT GRAY TO LIGHT GRAY WITH BLACK AND DARK YELLOWISH BROWN VERY MOIST TO MOIST.		J-11 J-12	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW63

HOLE NO. LHS-MW64

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959088.90	3314916.70	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW64		13. OVERBURDEN SAMPLES DISTURBED 16	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 25.0		17. ELEVATION TOP OF HOLE 188.2	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 25.0		R. PETERSON	

ELEVATION 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
185.7	2		LEAN CLAY (CL) (0.0 – 2.5) SANDY, STRON BROWN AND YELLOWISH BROWN, VERY MOIST, SOME GRASS, VERY SILTY.		J-1	TYPE AUGER ZONE 0.0– 25.0 SAMPLE DEPTH J-1 0.0– 2.5 J-2 2.5– 4.0 J-3 4.0– 7.5 J-4 7.5– 9.6 J-5 9.6– 10.4 J-6 10.4– 11.7 J-7 11.7– 12.5 J-8 12.5– 15.0 J-9 15.0– 16.4 J-10 16.4– 17.6 J-11 17.6– 18.3 J-12 18.3– 19.0 J-13 19.0– 20.4 J-14 20.4– 21.3 J-15 21.3– 23.2 J-16 23.2– 25.0
184.2	4		LEAN CLAY (CL) (2.5 – 4.0) YELLOWISH RED AND LIGHT GRAY, MOIST, LAMINATED, SILTY BROWN LAYERS.		J-2	
180.7	6		LEAN CLAY (CL) (4.0 – 7.5) WITH SAND, LIGHT GRAY AND YELLOWISH BROWN, MOIST.		J-3	
178.6	8		LEAN CLAY (CL) (7.5 – 9.6) DARK YELLOWISH BROWN WITH GRAY, VERY MOIST.		J-4	
177.8	10		CLAY SAND (SC) (9.6 – 10.4) DARK YELLOWISH BROWN AND GRAY, VERY MOIST.		J-5	
176.5			CLAY SAND (SC) (10.4 – 11.7) SC-SM, SILTY CLAYEY SAND, DARK YELLOWISH BROWN AND BROWN WET.		J-6	
175.7	12		LEAN CLAY (CL) (11.7 – 12.5) WITH SAND, LIGHT GRAY WITH DARK YELLOWISH BROWN, MOIST.		J-7	
173.2	14		FAT CLAY (CH) (12.5 – 15.0) YELLOWISH BROWN AND GRAY, MOIST.		J-8	
171.8	16		LEAN CLAY (CL) (15.0 – 16.4) WITH SAND, YELLOWISH BROWN, VERY MOIST, LIGHT GRAY CLAY LENSES.		J-9	
170.6			LEAN CLAY (CL) (16.4 – 17.6) LIGHT GRAY AND YELLOWISH BROWN, MOIST, SOME BLACK STREAKS.		J-10	
169.9	18		LEAN CLAY (CL) (17.6 – 18.3) SANDY, DARK YELLOWISH BROWN, WET, SOME LIGHT GRAY LENSES.		J-11	
169.2			LEAN CLAY (CL) (18.3 – 19.0) YELLOWISH BROWN AND LIGHT GRAY, VERY MOIST.		J-12	
168.2	20		SILT SAND (SM) (19.0 – 20.4) YELLOWISH BROWN, FREE WATER.		J-13	

HOLE NO. LHS-MW64

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959088.90	3314916.70	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW64		13. OVERBURDEN SAMPLES DISTURBED 16	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 25.0		17. ELEVATION TOP OF HOLE 188.2	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 25.0		R. PETERSON	

ELEVATION 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
167.8			SILT SAND (SM) (19.0 - 20.4) YELLOWISH BROWN, FREE WATER.		J-13	
166.9			LEAN CLAY (CL) (20.4 - 21.3) WITH SAND, DARK YELLOWISH BROWN, WET, LIGHT GRAY LENSES.		J-14	
	22		LEAN CLAY (CL) (21.3 - 23.2) DARK YELLOWISH BROWN AND BROWN, VERY MOIST.		J-15	
165.0						
	24		FAT CLAY (CH) (23.2 - 25.0) GRAYISH BROWN, MOIST, SOME IRON-OXIDE STAINS.		J-16	
163.2						
	26					
	28					
	30					
	32					
	34					
	36					
	38					
	40					

HOLE NO. LHS-MW65

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959263.20 3314967.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW65		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 18.0		17. ELEVATION TOP OF HOLE 191.7	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 18.0		R. PETERSON	

ELEVATION 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
187.7	2		LEAN CLAY (CL) (0.0 - 4.0) WITH SAND, DARK YELLOWISH BROWN WITH YELLOWISH RED, LIGHT GRAY AND RED LAMINATIONS AND CLAY CLUMPS IN BOTTOM HALF OF SAMPLE, MOIST, SILTY IN UPPER HALF OF SAMPLE.		J-1	TYPE AUGER ZONE 0.0- 18.0 SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 4.0 J-3 4.0- 9.5 J-4 9.5- 10.3 J-5 10.3- 12.7 J-6 12.7- 15.3 J-7 15.3- 17.0 J-8 17.0- 18.0
	4				J-2	
182.2	6		LEAN CLAY (CL) (4.0 - 9.5) YELLOWISH BROWN AND LIGHT BROWNISH GRAY, MOIST.		J-3	
	8					
181.4	10		LEAN CLAY (CL) (9.5 - 10.3) WITH SAND, YELLOWISH BROWN AND LIGHT GRAY, MOIST, LAMINATED SILTY CLAY.		J-4	
	12		SILT SAND (SM) (10.3 - 15.3) YELLOWISH BROWN TO DARK YELLOWISH BROWN AND RED AND LIGHT BROWN, DAMP TO VERY MOIST.		J-5	
176.4	14				J-6	
	16		FAT CLAY (CH) (15.3 - 18.0) YELLOWISH BROWN AND LIGHT GRAY TO LIGHT BROWNISH GRAY WITH YELLOWISH BROWN, MOIST.		J-7	
173.7	18				J-8	
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW65

HOLE NO. LHS-MW66

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6959501.40	3314813.50	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW66		13. OVERBURDEN SAMPLES DISTURBED 7	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 18.0		17. ELEVATION TOP OF HOLE 192.1	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 18.0		R. PETERSON	

ELEVATION 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
190.1	2		LEAN CLAY (CL) (0.0 - 2.0) SANDY, YELLOWISH BROWN WITH STRONG BROWN, DAMP, SOME GRASS.		J-1	TYPE AUGER ZONE 0.0- 18.0 SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 4.0 J-3 4.0- 9.0 J-4 9.0- 10.5 J-5 10.5- 12.5 J-6 12.5- 16.5 J-7 16.5- 18.0
188.1	4		LEAN CLAY (CL) (2.0 - 4.0) WITH SAND,DARK YELLOWISH BROWN DAMP, SOME LIGHT GRAY AND RED LAMINATED CLAY CLUMPS.		J-2	
183.1	6 8		FAT CLAY (CH) (4.0 - 9.0) YELLOWISH BROWN WITH LIGHT GRAY, MOIST.		J-3	
179.6	10 12		LEAN CLAY (CL) (9.0 - 12.5) WITH SAND, LIGHT GRAY WITH BROWN WITH BLACK TO DARK YELLOWISH BROWN AND LIGHT GRAY, MOIST, SILTY IN BOTTOM HALF OF SAMPLE.		J-4 J-5	
175.6	14 16		CLAY SAND (SC) (12.5 - 16.5) DARK YELLOWISH BROWN WITH BROWN, WET.		J-6	
174.1	18		FAT CLAY (CH) (16.5 - 18.0) LIGHT GRAY WITH YELLOWISH BROWN, MOIST.		J-7	
	20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW66

HOLE NO. LHS-MW67

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6957359.20 3315705.60		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500/CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW67		13. OVERBURDEN SAMPLES DISTURBED 8	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/23/1994	COMPLETED 09/23/1994
7. THICKNESS OF OVERBURDEN 20.0		17. ELEVATION TOP OF HOLE 182.6	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 20.0		CHARLIE TRANSUE	

ELEVATION 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
179.1	2		LEAN CLAY (CL) (0.0 – 3.5) YELLOWISH BROWN, MOIST.		J-1	WATER ENCOUNTERED @ 11.5' USED 10" HOLLOWSTEM AUGER TO SET WELL. SAMPLE TYPE ZONE AUGER 0.0– 11.0 SPLITSPOON 11.0– 16.0 AUGER 16.0– 20.0 SAMPLE DEPTH J-1 2.0– 3.0 J-2 4.0– 5.0 J-3 7.0– 8.0 J-4 10.5– 11.0 J-5 13.0– 13.4 J-6 13.4– 14.0 J-7 15.0– 16.0 J-8 18.0– 20.0
173.6	4 6 8		LEAN CLAY (CL) (3.5 – 9.0) SANDY, DARK YELLOWISH BROWN TO LIGHT BROWN, MOIST TO VERY MOIST.		J-2 J-3	
169.2	10 12		LEAN CLAY (CL) (9.0 – 13.4) DARK YELLOWISH BROWN WITH LIGHT GRAY, MOIST TO VERY MOIST.		J-4 J-5	
168.1	14		SILT SAND (SM) (13.4 – 14.5) DARK YELLOWISH BROWN, WET.		J-6	
165.6	16		CLAY SAND (SC) (14.5 – 17.0) MOTTLED LIGHT BROWNISH GRAY AND YELLOWISH BROWN, WET.		J-7	
162.6	18 20		LEAN CLAY (CL) (17.0 – 20.0) MOTTLED LIGHT GRAY AND DARK YELLOWISH BROWN, VERY MOIST.		J-8	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW67

HOLE NO. LHS-MW68

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6957113.20 3315492.40		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW68		13. OVERBURDEN SAMPLES DISTURBED 13	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 22.0		17. ELEVATION TOP OF HOLE 186.5	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 22.0		R. PETERSON	

ELEVATION 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
184.5			LEAN CLAY (CL) (0.0 - 2.0) WITH SAND, DARK YELLOWISH BROWN, DAMP.		J-1	TYPE AUGER ZONE 0.0- 22.0
182.5	3		LEAN CLAY (CL) (2.0 - 4.0) SANDY, STRONG BROWN, DAMP.		J-2	SAMPLE DEPTH J-1 0.0- 2.0 J-2 2.0- 4.0 J-3 4.0- 7.0 J-4 7.0- 9.0 J-5 9.0- 11.0 J-6 11.0- 13.0 J-7 13.0- 13.7 J-8 13.7- 15.1 J-9 15.1- 15.7 J-10 15.7- 17.4 J-11 17.4- 18.0 J-12 18.0- 20.5 J-13 20.5- 22.0
177.5	6 9		LEAN CLAY (CL) (4.0 - 9.0) WITH SAND, YELLOWISH RED WITH DARK RED TO YELLOWISH BROWN WITH LIGHT GRAY AND YELLOWISH RED, MOIST.		J-3 J-4	
175.5			CLAY SAND (SC) (9.0 - 11.0) SC-SM, SILTY CLAYEY SAND, YELLOWISH BROWN WITH STRONG BROWN, MOIST.		J-5	
173.5	12		SILT SAND (SM) (11.0 - 13.0) YELLOWISH BROWN, WET.		J-6	
172.8			LEAN CLAY (CL) (13.0 - 13.7) YELLOWISH BROWN WITH DARK YELLOWISH BROWN AND GRAY, MOIST.		J-7	
171.4	15		SILT SAND (SM) (13.7 - 15.1) YELLOWISH BROWN, FREE WATER.		J-8	
170.8			LEAN CLAY (CL) (15.1 - 15.7) WITH SAND, MOTTLED DARK YELLOWISH BROWN AND GRAY, MOIST		J-9	
169.1			SILT SAND (SM) (15.7 - 17.4) YELLOWISH BROWN, FREE WATER.		J-10	
168.5	18		LEAN CLAY (CL) (17.4 - 18.0) WITH SAND, YELLOWISH BROWN, MOIST.		J-11	
166.0			SILT SAND (SM) (18.0 - 20.5) YELLOWISH BROWN, FREE WATER.		J-12	
164.5	21		FAT CLAY (CH) (20.5 - 22.0) LIGHT BROWNISH GRAY WITH RUST, MOIST.		J-13	
	24 27 30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW68

HOLE NO. LHS-MW69

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6957345.30 3315272.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW69		13. OVERBURDEN SAMPLES DISTURBED 13	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
		16. DATE HOLE STARTED 09/27/1994	COMPLETED 09/28/1994
7. THICKNESS OF OVERBURDEN 51.0		17. ELEVATION TOP OF HOLE 180.4	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 51.0		CHARLIE TRANSUE	

ELEVATION 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
176.9	3		LEAN CLAY (CL) (0.0 – 3.5) REDDISH BROWN, MOIST.			WATER ENCOUNTERED ⊙ 5.0' USED 10" HOLLOWSTEM AUGER TO SET WELL SAMPLE TYPE ZONE AUGER 0.0– 8.0 SPLITSPOON 8.0– 25.0 AUGER 25.0– 51.0 SAMPLE DEPTH J-1 4.0– 5.0 J-2 5.5– 6.0 J-3 7.0– 8.0 J-4 9.0– 10.0 J-5 10.5– 11.5 J-6 15.0– 16.0 J-7 19.5– 20.0 J-8 22.6– 23.1 J-9 27.0– 28.0 J-10 33.5– 34.0 J-11 40.5– 41.0 J-12 48.0– 49.0 J-13 49.0– 51.0
173.9	6		LEAN CLAY (CL) (3.5 – 6.5) WITH SAND, DARK YELLOWISH BROWN, MOIST TO WET, 5.5'–6.0': GRAY CLAY LENSES.		J-1 J-2	
170.2	9		LEAN CLAY (CL) (6.5 – 10.2) MOTTLED YELLOWISH BROWN AND GRAY WITH BLACK AND RED, MOIST.		J-3	
167.2	12		SILT (ML) (10.2 – 13.2) SANDY, MOTTLED YELLOWISH BROWN AND LIGHT GRAY WITH GRAY CLAY LENSES, MOIST.		J-4 J-5	
159.1	15 18 21		SILT SAND (SM) (13.2 – 21.3) GRAY, WET TO FREE WATER.		J-6 J-7	
155.4	24		CLAY SAND (SC) (21.3 – 25.0) SC-SM, SILTY, MOTTLED YELLOWISH BROWN AND GRAY, WET.		J-8	
150.4	27 30		SILT SAND (SM) (25.0 – 30.7) MOTTLED BROWNISH YELLOW AND GRAY, FREE WATER.		J-9	

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW69

HOLE NO. LHS-MW69

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 2 OF 2 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6957345.30 3315272.10		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW69		13. OVERBURDEN SAMPLES DISTURBED 13	UNDISTURBED 0
5. NAME OF DRILLER TOM BEAVERS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER SEE REMARKS	
7. THICKNESS OF OVERBURDEN 51.0		16. DATE HOLE STARTED 09/27/1994	COMPLETED 09/28/1994
8. DEPTH DRILLED INTO ROCK 0.0		17. ELEVATION TOP OF HOLE 180.4	
9. TOTAL DEPTH OF HOLE 51.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
		CHARLIE TRANSUE	

ELEVATION 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
149.7			SILT SAND (SM) (25.0 - 30.7)			
			SAND (SP) (30.7 - 44.0) SP-SM, WITH SILT, YELLOW TO YELLOWISH BROWN, FREE WATER.			
	33				J-10	
	36					
	39				J-11	
	42					
136.4			CLAY SAND (SC) (44.0 - 51.0) ZONED DARK YELLOWISH BROWN AND LIGHT GRAY, VERY MOIST.			
	45					
	48				J-12	
					J-13	
129.4	51					
	54					
	57					
	60					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW69

027614

HOLE NO. LHS-MW70

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6958032.10 3316534.70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW70		13. OVERBURDEN SAMPLES DISTURBED 9	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 22.0		17. ELEVATION TOP OF HOLE 180.5	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 22.0		R. PETERSON	

ELEVATION 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
178.5			LEAN CLAY (CL) (0.0 – 2.0) WITH SAND, YELLOWISH BROWN, DAMP, FRIABLE.		J-1	TYPE AUGER ZONE 0.0– 22.0
175.0	3		LEAN CLAY (CL) (2.0 – 5.5) SANDY, YELLOWISH BROWN, DAMP, FRIABLE.		J-2	SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 5.5 J-3 5.5– 7.0 J-4 7.0– 9.0 J-5 9.0– 13.0 J-6 13.0– 17.3 J-7 17.3– 18.8 J-8 18.8– 20.3 J-9 20.3– 22.0
173.5	6		LEAN CLAY (CL) (5.5 – 7.0) WITH SAND, GRAY AND YELLOWISH BROWN, DAMP, FRIABLE.		J-3	
171.5	9		SILT (ML) (7.0 – 9.0) SILTY CLAY WITH SAND, DARK BROWN, MOIST.		J-4	
167.5	12		LEAN CLAY (CL) (9.0 – 13.0) WITH SAND, YELLOWISH BROWN WITH GRAY AND RUST, MOIST, SILTY, SOME ORGANICS.		J-5	
163.2	15		CLAY SAND (SC) (13.0 – 17.3) YELLOWISH BROWN AND GRAY, MOIST, SILTY.		J-6	
161.7	18		FAT CLAY (CH) (17.3 – 18.8) GRAY WITH YELLOWISH BROWN, DAMP.		J-7	
160.2			LEAN CLAY (CL) (18.8 – 20.3) SANDY, YELLOWISH BROWN WITH RUST AND GRAY, WET, SOME CLAY CLUMPS		J-8	
158.5	21		FAT CLAY (CH) (20.3 – 22.0) LIGHT GRAY, MOIST, SMALL AMOUNT OF SILT.		J-9	
	24					
	27					
	30					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW70

000091

HOLE NO. LHS-MW71

DRILLING LOG	DIVISION SOUTHWEST	INSTALLATION LHAAP	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP-WASTE SUMPS		10. SIZE AND TYPE OF BIT 8" AUGER	
2. LOCATION (Coordinates or Station) 6958209.80	3316838.80	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY TULSA DISTRICT COE		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) LHS-MW71		13. OVERBURDEN SAMPLES DISTURBED 9	UNDISTURBED 0
5. NAME OF DRILLER RAY VOILS		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT DETERMINED	
		16. DATE HOLE STARTED 09/00/1994	COMPLETED 09/00/1994
7. THICKNESS OF OVERBURDEN 17.5		17. ELEVATION TOP OF HOLE 180.9	
8. DEPTH DRILLED INTO ROCK 0.0		18. TOTAL CORE RECOVERY FOR BORING 0.0 %	
9. TOTAL DEPTH OF HOLE 17.5		R. PETERSON	

ELEVATION 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
178.9	2		LEAN CLAY (CL) (0.0 – 2.0) STRONG BROWN, DAMP.		J-1	TYPE AUGER ZONE 0.0– 17.5 SAMPLE DEPTH J-1 0.0– 2.0 J-2 2.0– 5.0 J-3 5.0– 6.0 J-4 6.0– 8.0 J-5 8.0– 13.5 J-6 13.5– 14.3 J-7 14.3– 14.7 J-8 14.7– 15.7 J-9 15.7– 17.5
175.9	4		LEAN CLAY (CL) (2.0 – 5.0) YELLOWISH RED, MOIST, SOME GRASS.		J-2	
174.9	6		SILT (ML) (5.0 – 6.0) SILTY CLAY WITH SAND, OLIVE BROWN, DAMP.		J-3	
172.9	8		LEAN CLAY (CL) (6.0 – 8.0) DARK YELLOWISH BROWN AND BROWN, MOIST.		J-4	
167.4	10 12		FAT CLAY (CH) (8.0 – 13.5) LIGHT GRAY AND YELLOWISH BROWN WITH RUST, MOIST.		J-5	
166.2	14		LEAN CLAY (CL) (13.5 – 14.7) WITH SAND, YELLOWISH BROWN AND GRAY TO BROWN AND LIGHT GRAY, MOIST TO VERY MOIST.		J-6 J-7	
165.2			SILT SAND (SM) (14.7 – 15.7) BROWN AND YELLOWISH BROWN, FREE WATER.		J-8	
163.4	16		FAT CLAY (CH) (15.7 – 17.5) YELLOWISH BROWN AND GRAY, MOIST.		J-9	
	18 20					

PROJECT LHAAP-WASTE SUMPS | HOLE NO. LHS-MW71

027616

Hole No. 35AWW02

DRILLING LOG | DIVISION | INSTALLATION: LHAAP, Karnack, TX | SHEET 1 OF 5 SHEETS

1. PROJECT: LHAAP, Phase III Groundwater RI
2. LOCATION (Coordinates or Station): Site 35 - Shallow Boring
3. DRILLING AGENCY: GEO Projects
HOLE NO. (As shown on drawing title and file number): 35AWW02 Pilot Hole
5. NAME OF DRILLER: Amador Hinojosa
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 140'
10. SIZE AND TYPE OF BIT: 6" Tricone
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61 Mud Rotary
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED 9-22-98 (worked) COMPLETED 9-23-98
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: David W. Cooper

ELEVATION 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
			8" ∅ Surface Casing set at 28'. Drilling w/ 6" Mud rotary bit			Pilot Hole
	30		Clay, Brown, stiff			* Descriptions based on cuttings in strainer Generally on 5' intervals unless change in drilling rate is noted.
	31					
	32					
	33		Clay, Brown, tr gray silty clay becomes slightly softer			
	34		Increased gray silty clay content in strainer			
	35		Clay, gray-brown, tr. silt Stiff			
	36		Driller noted materials become softer - Clay, med. brown @ 36'			
	37		Driller noted materials become more dense @ 37'			
	39		Changes to gray clay w/ tr. sand, tr silt Med-dark @ 38.5'			stiff
	39					
	40		As Above Becomes darker gray + slightly softer @ 40.6' Dup 41.5'			
	41		Drilling rate increases, materials are softer			
	42					
	43					
	44		Drilling becomes softer Dark gray silty clay ~~Sand~~ increasing sand			
	45					
	46					

000093

PROJECT | HOLE NO. 35AWW02

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 35AWL002

PROJECT LHAAP - Karnack, TX | INSTALLATION Site 35 | SHEET 2 OF SHEETS 5

ELEVATION 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
	47		Dark gray silty clay, tr. sand			
	48					
	49					
→	50		As Above w/ increased sand silty clay to sandy clay @ 50' med. stiff to soft			
	51					
	52					
→	53		Dark gray silty clay, w/ sand traces of Lignite in cuttings, soft Drilling w/ weight of rod			Lignite from ≈ 53' to 53.5'
	54					
→	55		Dark Gray silty clay, some sand, soft			
	56					
	57					
	58		As Above			
	59					
→	60		As Above			
	61					
→	62		Silty Sand, med gray soft, some clay	Drilling with weight of Rod.		
	63					
	64		As Above			
	65		sand content increasing			
	66					
	67					
	68					
	69		As Above			

027618

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 35AWW02

PROJECT LHAAP - Karnack, TX. | INSTALLATION Site 35 | SHEET 5 OF SHEETS 5

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY / Blow Counts	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		Silty Sand, little clay, med-gray, soft			
	71					
→	72		Dark Brown, increased silt & clay, & decreasing Sand & lignite			
	73					
	74					
	75					
→	76		As Above, slight sand increase increased lignite			
	77					
	78					Drilling 70'-80' was ≈ 20 min.
→	79		Med Gray Sandy Silt, some clay			
	80		Thin hard dry zone @ 80.5 - 81 med gray fr sand - Clay Shale			
→	81		Med Gray Sandy Silt some clay			
→	82		Dark Brown clay; silt clay sand			
	83		[illegible]			
	84					
	85					Drilling 80'-90' was ≈ 10 min
→	86		Gray Silty clay, some Sand Soft			
	87					
→	88		Gray Silty Sand, some clay Soft			
	89					
	90		SM-SP, Fine-Med Sand, fr. silt, med gray	22 4.7 90	SS-1	Collect 2' split spoon @ 90'-92.5' @ 1431
	91					
	92					

000095

HOLE NO.

027619

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 35AWW02

PROJECT LHAAP-Karnack, TX | INSTALLATION Site 35 | SHEET 4 OF SHEETS 5

ELEVATION 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
	93		SM-SP, Fine-Med Sand, tr. Silt			
	94		med Gray			
	95					
	96		As Above			
	97					
	98		Med Gray, Shale-Clay @ 98.5'-98.8'			
	99		Med Gray Sandy Silt, some clay			
	100		As Above.			
	101		increasing sand, clay soft.			
	102					
	103					
	104					
	105		As Above, decreasing sand, increasing clay			
	106					
	107					
	108					
	109					
	110		As Above, sand decreasing and finer grained, incr. Clay, soft			
	111		drilling on weight of rod			
	112					1540 @ 112'
	113					
	114					
	115		Dark Brown-Black lignite @ 115'			

000096

027620

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 35AWW02

PROJECT LHAAP Karnack, TX | INSTALLATION Site 35 | SHEET 2 OF SHEETS 5

ELEVATION 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) Time g
	116		Dark Brown Clay, + lignite, tr. Sand			
	117		softer drilling			
	118					
	119		Dark Brown-Black Lignite @ 119'			
	120		Gray Brown ~~Silty~~ Clay, tr. lignite? @ 120.5			1625
	121		Stiff. Drill rate much slower Hand Drilling from 120→121 and			
	122					much Slower Drilling Since 120' Depth
	123					
	124		Dark brown & Black clay and Lignite Fragments in strainer (Only when ½" size fragments crumbled)			1705 → 124'
	125					
	126					20 min/4' = 5 min/ft.
	127					
	128		Same as above with some DK gray cuttings			1726 → 128'
	129		Drill break (soft material) @ 129'			- DK gray clay @ 129'
	130	CL/CH	DK gray silty clay/clay cuttings return			1734 → 130' Circ hole and trip out for today
	131		(Midway begins @ ≈ 129')			1750 → Drill string out of hole
	132		Will drill 10' into Midway + then perform			Preliminary MW
	133		down hole log of boring.			
	134		Drillers flush cuttings out of boring + thin mud			
	135		before conducting log.			
	136		Boring will be grouted at conclusion of log test.			to surface & completed @
	137		T.D. @ 140' 9-23-98			Grouting 1200 9-23-98
	138					
	139					

C60097

HOLE NO. 35AWW02

Hole No. 35AWN03 027621

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAD - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAD		10. SIZE AND TYPE OF BIT Auger Bit	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼" I.D. 7" O.D. HSA / CME Sampler / 11" OD HSA	
4. HOLE NO. (As shown on drawing title and file number) 35AWN03		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4	UNDISTURBED 0
5. NAME OF DRILLER Steve Lavelgy		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Pennsylvanian 19ft		16. DATE HOLE STARTED 8-22-98	COMPLETED 8-22-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 19.0 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR Brian Bohn	

ELEVATION a	DEPTH (Ft) b	USC 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
	1	fill	Asphalt gravel fill - Apparent end of Fill @ 1.0 ft.	4' of 4'	SS#1 0.0' to 4.0'	Commenced pilot hole drilling @ 1445
	2	CL	- clayey silt - greenish gray to dark gray clayey silt - soft to very soft - some dark gray to black staining (Damp)			
	3					
	4	CL				
	5		silty sandy clay greenish gray to lt brown clay w/ high silt and sand content (very soft) (wet)	5.0' of 5.0'	SS#2 4.0' to 9.0'	
	6	SC	some orange red staining			
	7	CL	silty clay - lt gray to greenish gray clay w/ red-brown and orange brown staining (mottled) and stiff to soft staining becomes more laminated bottom (moist)			
	8					
	9					
	10		silty clay - greenish gray silty clay w/ orange brown staining (more staining from 13' to 14')	5.0' of 5.0'	SS#3 9.0' to 14.0'	
	11	CL	med soft to stiff clay some sand in last foot to 1.5'.			
	12					
	13					
	14		SAND - poorly graded lt gray-white clayey lt brown (mottled) some very soft to loose (free water saturated)	5.0' of 5.0'	SS#4 14.0' to 19.0'	
	15	SP	≈16' grades into SC			
	16		silty sand - lt brown sand w/ fines very soft to loose (moist)			
	17	SC				
	18	CL	- silty clay - green gray clay and brown (mottled) clay w/ some sand at top very stiff (moist)			
	19		T.D.C 19 Below grade in Deep Silty clay			

PROJECT | HOLE NO.

000038

027622

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 35 AUW03

PROJECT | INSTALLATION / HAAP - Kornack TV | SHEET 2 OF 2 SHEETS

ELEVATION 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
						1345 Commenced dry drilling pilot hole for 35AUW03 ± 11" HSA for Mon. well installation
						35AUW03 well Completion Detail ↘
						- Bent) cement Grout
						- bent. seal 7.5 to 4.5
						- Sugar sand (30-70) 9 to 7.5
						- Primary Filterpack (16-30) 19-8)
						- 10' 4" #10 slot screen 19 to 9
						T.D. - 19 below grade in silty clay

PROJECT | HOLE NO.

000099

Hole No. 35AWW04

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP		10. SIZE AND TYPE OF BIT Auger Bit	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc. Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75 / 3¼" ID HSA / CME Split Spoon / 11"6 OD HSA	
4. HOLE NO. (As shown on drawing title and title number) 35AWW04		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7	UNDISTURBED —
5. NAME OF DRILLER Jose Landros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated 24 ft.		16. DATE HOLE STARTED 8-23-98	COMPLETED 8-23-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 24 ft. Below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR Brian Nolan / Dave Cilke	

ELEVATION a	DEPTH (ft) b	USC 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	SM	Sandy silt - Lt. brown, tan, and Lt. gray, fine grained sand, poorly sorted, some roots - Dry to Sl. Damp (loose)	4'/4'	SS #1 0.0' to 4.0'	1000 Commenced HSA 35AWW04 2 7" O.D. HSA HNu Reading in sampler = 0 ppm
	3	CL	- Silty clay - med. gray and dark reddish brown (mottled), trace roots and fine sand, v. plastic - Damp (V. stiff)			
	4				SS #2	
	5		- Silty clay - Lt. gray, Lt. green-gray, tan, yellowish-orange, and med. brown mottled, streaked, and stained, trace to some fine sand, some apparent V. thin layering, trace roots - Damp (stiff to V. stiff)	5'/5'	4.0' to 9.0'	HNu Reading in sampler: Off-A
	9				SS #3	
	10		- Silty clay - Lt. gray, Lt. greenish-gray, yellowish-orange and tan (mottled) abundant black v. thin "root-like" structures throughout, some fine sand, plastic - Damp to Moist @ 13' (stiff)	5'/5'	9.0' to 14.0'	HNu Reading in Sampler = 0 ppm
	13		V. L. Moisture content inc. (sticking to sampler)			
	14	SC CL	- Sandy clay - Lt. gray and greenish gray (mottled) layers in silty clay, fine grained sand - Wet/Saturated (soft)		SS #4	Water @ 14' W.A
	15	SC CL		5'/5'	14.0' to 19.0'	HNu Reading in sampler = 0 ppm
	16					
	17	SC	- Clayey sand - Lt. blue, gray, tan (mottled) - some silty, fine grained sand, trace med. gravel - Wet/Saturated (med. dense to loose)			
	18					
	19	CL SP	- Sand/silty sand - med. gray, tan, and brown, fine to med. grained, some coarse, subangular subrounded, poorly sorted, trace clayey zones - Wet/Saturated (loose)	1'/1'	SS #5 19' to 20'	HNu Reading in Sample = 10 ppm

PROJECT

HOLE NO.

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 3SAWW04

PROJECT | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION 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
	21	SP	- Sand - Med brown and reddish-brown, fine to coarse grained, trace gravel, poorly sorted - Wet / Saturated	1'/1'	SS#6 20' to 21'	
	22	SP-GP	- Sand and Gravel - Dark "rust" brown fine to coarse sandy gravel; some cobble - wet - Saturated	3'/3'	SS#7 21' to 24'	HNu Reading in Sample = 11 ppm
	23	SP				
		CL	Silty clay - L-I gray, greenish gray-med tan, Med Pl, trace to some fine sand - Damp (V. stiff)			
	24		T.D. @ 24.0 ft below grade in Silty clay - Damp to moist			Overdrilled pilot hole with 11" O.D. HSA plugged augers to T.D. of 23 ft. below grade. Completion details for mon. installation of 3SAWW04 Bent/cement grout 7' to grade Bent seal 10' to 7' Sugar sand (30-70) 11' to 10' Primary filter-pack 23' to 11' (16-30) 4" 10' #10 slot screen 23' to 13' T.D. -23.0' below grade

000101

PROJECT | HOLE NO.

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 358WW01

PROJECT | INSTALLATION | SHEET OF SHEETS

ELEVATION 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
						ovrd-ill of well 358WW01 w/ 11" OD HSA cmncd at 1000
						Complt'd at 1015
						Bent/cmt grout 3' to grade.
						Bentonite seal 6' to 3'
						sugar sand 7' to 6'
						filter pack 19' to 7'
						4" sch 40 screen 19' to 9'

PROJECT | HOLE NO. 358WW01

Hole No. 358WW01 027626

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LAAAP - Kansas City TX	SHEET 1 OF 2 SHEETS
1. PROJECT: LHAAP Site 355		10. SIZE AND TYPE OF BIT: Hyd. 13.5"	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY: GPI, Inc - Austin TX		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 3 1/4" ID HSA / CME's sampler / 11" OD ABA	
4. HOLE NO. (As shown on drawing title or title number): 358WW01		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5	UNDISTURBED 0
5. NAME OF DRILLER: Jose Landeros		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN: Penetrated Alt.		16. DATE HOLE: STARTED 8-31-98	COMPLETED 5-31-98
8. DEPTH DRILLED INTO ROCK: N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE: Penetrated bottom		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: Birtan Beton	

ELEVATION 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
	1				SS#1 0.0' to 4.0'	D. Hit pilot hole and commenced at 8:30 Completed @ 855 Hnu Reading Augers Sample 1 = 0 ppm
	4	CL	silt - lt brn/dark brn silt (Roots) w/ lots of organic matter (Dry)			
	5	CL	clayey silt - yellowish orange to off white clayey silt (mottled) soft to friable some ltgy to blk silt staining (Dry)	1.5'/3.0'	SS#2 4.0' to 7.0'	Hnu Reading Augers Sample = 3+ ppm
	7	CL	- silty clay - brown to ltgray (mottled) w/ orange brown staining throughout (mod soft) some m. sand content from 8.5' to 9.0' (moist)	2.0' of 2.0'	SS#3 7.0' to 9.0'	
	9	SC / SM	clayey sand - ltgry to grey clayey sand which grades into silty and at end 10' (very soft) (wet)	3.0' of 5.0'	SS#4 9.0' to 14.0'	Hnu Reading Augers - Sample = 20+ ppm water at 13' while drilling
	11	SM	silty sand - poorly sorted silty sand - ltgry in color w/ some ltbrown staining (moist at top to free water at bottom)			
	13					
	14	SC	clayey silty sand - grey to green grey - sand w/ lots of fine brown ltgry to old brown fine around 15' grading into coarse toward bottom (soft to very soft) (free water) (wet to wet/bottom)	3.5' of 5.0'	SS#5 14.0' to 19.0'	Hnu Reading Augers Sample = 5+ ppm
	17					
	18	CL	silty clay - ltgry to ltbrown (mottled) some sand but very plastic. Stiff to medium stiff (Moist)			
	19		Δ bottom at 19'	Δ bottom		

009103

Hole No. 35BWW02(3) 027627

DRILLING LOG	DIVISION: USACE Tulsa	INSTALLATION: LHAAP Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT: LHAAP Site 35		10. SIZE AND TYPE OF BIT: Hyd. K-55	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY: GPI, Inc Houston, TX		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 3 1/4" ID HSA / 3 Lam Sampler / 11" OD HSA	
4. HOLE NO. (As shown on drawing title and title number): 35BWW02		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 12	UNDISTURBED
5. NAME OF DRILLER: José Landeros		14. TOTAL NUMBER CORE BOXES: NA	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: —	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE: STARTED 8-31-98	COMPLETED 8-31-98
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE: —	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING: NA %	
		19. SIGNATURE OF INSPECTOR: BB	

ELEVATION 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
	1	CL	silty clay - dark brown grading reddish brown (mottled) stiff loose slight (Dry)	3.5' of 4.0'	SS#1 0.0' to 4.0'	Commenced 1325 Hour Reading Sampler = Upper
	2					
	3					
	4	CL	silty clay - light tan brown w/ some orange staining (mottled) (stiff + friable) (Dry)			
	5		silty sand - light gray sand w/ high silt content low plasticity	5.6' of 5.0'	SS#2 4.0' to 9.0'	Sampler =
	6	SM	soft and friable throughout (Dry)			
	7		high fines content from 7' to 8' fines decrease again from 8' down to			
	8		grades into CL at 10.5'			
	9					
	10					
	11	CL	silty clay - gray tilly w/ orange staining (mottled) moderate plasticity (moist)	5.0' of 5.0'	SS#3 9.0' to 14.0'	Sampler = Upper
	12					
	13	SM	silty sand/sandy silt - gray to dark gray silty sand/ non plasticity soft to very soft (free water) grades into CL around 14 to 14.1'			
	14					
	15	CL	silty sandy clay - medium to light gray w/ orange staining (moist) thin layer of hard shale like clay about 2" thick	2.5' of 5.0'	SS#4 14.0' to 19.0'	
	16	SP	poorly sorted sand - light gray to gray sand w/ some silt non plasticity very soft + some orange staining. (free water)			
	17					
	18					
	19			2.0' 4.0'	SS#5 (4.0' to 21.0')	

HOLE NO.

000104

027628

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 35B

PROJECT | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION 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
	20	SM	silty sand - orange-brown to lt gy-yl (mottled) silty sand w/some gravel a.a. 20.2' (soft to stiff) w plasticity (wet)	7.0' of 2.0'	SS#5 19.0' to 21.0'	
	21					
	22	SM/SC	silty clayey sand - lt gray to orange brown - sand with lots of fines. (some plasticity) soft to very soft (free water)	2.0' to 2.0'	SS#6 21.0' to 23.0'	
	23					
	24	SM	silty sand - lt gy to lt brown s. silty sand no plasticity v. soft (free wat E)	5.0' of 2.0'	SS#7 23.0 to 25.0	
	25					
	26	SM	as above	2.0' of 2.0'	SS#8 25.0 to 27.0	
	27					
	28			2.0' of 2.0'	SS#9 27.0 to 29.0'	
	29	SM	As above			
	30					
	31			5.0' of 5.0'	SS#10 29.0' to 34.0'	
	32					
	33					
	34	SM/SC	silty clayey sand - lt gy to lt brown w/a purple tint soft (free wat)			clayey sandy - gravel w/appreciable amt of sandy silt and clayey "shale" SP -68 Dk brown to gy-orange (wet) stiff but friable
	35	SM	silty sand lt brown m. sand w/some fines, increase towards bottom (soft free wat)	5.0' of 5.0'	SS#11 34.0' to 35.0'	
	36					
	37					
	38					
	39	SM	As above			
	40		free wat	5.0' of 5.0'	SS#12 35.0' to 44.0	
	41					
	42					
		CL	lt-m gy clayey loam - (mod stiff to stiff) w/gy clay (wet)			
	44	SM	lt gy silty sand - soft free wat			w/o plasticity

44 45 46 47

PROJECT | HOLE NO.

000105

Hole No. G4SB01 (West of Amoco Well) 027629

DRILLING LOG	DIVISION USACE-Tulsa	INSTALLATION LHAAP-Karnack, TX	SHEET 1 OF 1 SHEETS

1. PROJECT LHAAP	10. SIZE AND TYPE OF BIT Auger Bit
2. LOCATION (Coordinates or Station) (West of Amoco Well) (sec field Book Page 77 for stick)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY GPI, Austin, TX	12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 7 1/8" O.D. HSA / CME 5' Cont. Sampler
4. HOLE NO. (As shown on drawing title and title number) G4SB01	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED — UNDISTURBED 0
5. NAME OF DRILLER Jose Londeros	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER —
7. THICKNESS OF OVERBURDEN Penetrated 19.0 ft	16. DATE HOLE STARTED 11-8-98 COMPLETED 11-9-98
8. DEPTH DRILLED INTO ROCK N/A	17. ELEVATION TOP OF HOLE —
9. TOTAL DEPTH OF HOLE 19.0 ft. below grade	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR [signature]

ELEVATION a	DEPTH (Ft.) b	USC 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	FILL	6" of DK brown topsoil, abundant fine sand, gravel, and roots (Approximate bot of fill 0.6' below grade)		SS #1 0.0 to 4.0	1610 Commenced HSA (7 3/8" O.D. HSA & CME 5' Sampler)
	1	CL	- Silty clay - med. brown, tan & yellowish-orange (mottled), some fine sand - Moist	4.0'		HNU Reading in sample = 0 ppm (10.2 eV PID calibrated to isobutylene)
	2					
	3		- Silty clay - med. gray and brown-gray (mottled), trace to some fine sand, trace roots - moist (Stiff) (plastic)			
	4		- Silty clay - med gray-brown with some "rust" colored brown mottling and staining, some black colored "root-like" structures, trace to some fine sand, plastic - Moist (Med. stiff)		SS #2 4.0' to 9.0'	HNU Reading in Sampler = 0 ppm
	5					
	6			5.0'		
	7		- Silty clay - Lt tan-med. gray-tan, yellowish-orange, and dark rust colored brown mottled, streaked stained and laminated, trace to some fine sand. V. plastic - Damp (Hard)			
	8					
	9		- Silty clay Lt. to med. gray-tan, yellowish-orange mottled. Streaked and stained, occ small (1/2") black colored "root-like structures", some fine sand throughout, plastic - Moist (V. stiff to Hard)		SS #3 9.0' to 14.0'	HNU Reading in sampler 0 ppm
	10			5.0'		
	11					
	12					
	13		- Some with some V. thin fine yellowish-orange sandy silt lenses - Moist			
	14					
	15	SP	- Sand - Lt. tan, some Lt. gray, fine grained, some sl. Silty, unconsol, subang to subround, occ. poorly sorted - Moist to sl. wet (Soft)		SS #4 14.0' to 19.0	HNU Reading @ Auger = 0 ppm " " in Sampler = 0 ppm
	16			5.0'		
	17					
	18					
	19		sl. clayey sand @ 18.8' to 18.9'			
	20		T.D. @ 19.0' Dry @ T.D.			T.D. @ 1640 - pulled up augers 2 ft. let stabilize 11-9-98 - Sampled out thru augers @ 0815 hrs

000106

EXC FORM 1836

PROJECT

HOLE NO.

Hole No. G4WW01

027630

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP - Group IV		10. SIZE AND TYPE OF BIT Auger - Bit	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (FSM or MSL)	
3. DRILLING AGENCY GPI Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 7 1/8" O.D. HSA / 5' CME cont. Sampler / 11" O.D. HSA	
4. HOLE NO. (As shown on drawing title and title number) G4WW01		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED 0
5. NAME OF DRILLER Amadore Hinahosa		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated 23.0'		16. DATE HOLE STARTED 12-2-98	COMPLETED 12-2-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 23.0 ft. below Grade		18. TOTAL CORE RECOVERY FOR BORING N/A	%
		19. SIGNATURE OF INSPECTOR W. A. C. K. P.G.	

ELEVATION 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) Time g
	1–20					5' offset Drill hole (HSA) for Drilling/Sampling installing 4" SS monitoring well (G4WW01)
						* NOTE: See Drilling Log for G4SB01 for Lithologic Descrip. of soils from grade to 8.0' below grade
			Sand - Lt. tan, some Lt. gray & greenish-gray (mottled) fine grained, some sl. silty, poorly sorted - wet/saturated (6ft.)			
		SP / CL	silty clay - Lt. tomed. gray, tan & yellowish-orange (mottled) plastic, some fine sand & moist - (8ft.)		SS# 1	0930

PROJECT | HOLE NO.

000107

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. G4WW01

PROJECT: Group III | INSTALLATION: LHAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
	20 21 22 23	CL	- Silty clay - Lt. gray, (some blue-gray, tan and yellowish-orange mottled, streaked and stained, some v. thin black "root-like" structures, plastic, trace to some fine grained sand - no. st (st M)		19.0 to 23.0'	HNu Reading in Sample = 2 ppm
			T.D.@ 23.0 below grade in silty clay @ 0940			Overdrilled hole 2 11" HSA for G4WW01 (5 offset hole from G4SB01) to 22' below grade for GW monitoring well installation

Monitoring well completion for G4WW01 ↓

Bent. Grout	5' to grade
Sump Sand	6' - 5'
Bent. Seal	9' to 6'
Sump Sand	10' to 9'
Primary Sand (16-30)	22' to 10'
10'-4" SS screen	22' to 12'

T.D.@ 22.0' below grade in silty clay

PROJECT | HOLE NO.

Hole No. G45B02 (Asphalt Rd. - NW corner site)

027632

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP Karnack, TX	SHEET 1 OF 1 SHEETS
1. PROJECT LHAAP - Group II		10. SIZE AND TYPE OF BIT Argue - 6¼	
2. LOCATION (Coordinates or Station) "N of G45B01"		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 7¼" O.D. HSA / CME 5' Cont. Sampler	
4. HOLE NO. (As shown on drawing title and title number) G45B02		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4	UNDISTURBED 0
5. NAME OF DRILLER Jose Londeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER —	
7. THICKNESS OF OVERBURDEN Penetrated 19.0'		16. DATE HOLE: STARTED 11-9-98	COMPLETED 11-9-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE —	
9. TOTAL DEPTH OF HOLE 19.0 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR [signature] CIFA PC	

ELEVATION a	DEPTH (Ft.) b	USC 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	F:11	0.75 ft. of Fill - DK brown-reddish-brown topsoil, some sanded gravel - wet		SS #1	1345 Commenced HSA
	1	CL	(Apparent end of Fill @ 0.75')	4.0'	0.0' to 4.0'	
	2		- Silty clay - Lt. gray, tan, reddish-brown, and yellowish-orange mottled, streaked and stained, some fine sand, trace roots - Moist (plastic) (Med. stiff)			HNU Reading in Sampler = 9ppm
	3					
	4					
	5		- Silty clay - Lt. to med. gray with abundant tan to reddish-brown and "rust" colored brown mottling, plastic, trace to some fine sand, some apparent layering - Damp to Moist (V. stiff)	5.0'	SS #2 4.0' to 9.0'	HNU Reading in Sampler: 0ppm
	6					
	7					
	8					
	9	SP	- Sand - Lt to Med. gray and tan (mottled), fine grained, Sl. silty, poorly sorted - Moist to wet (soft)		SS #3	
	10	CL			9.0' to 14.0'	HNU Reading in Sampler: ±2ppm (windy)
	11		- Silty clay - Lt. gray to Sl. greenish-gray, tan, and Lt. brown (mottled), plastic, trace to some fine sand - Moist (V. stiff)	5.0'		
	12					
	13		(fine sand content inc.)			
	14	SM	- Sandy silt - Lt. gray with some "rust" colored staining and nodules, fine grained sand, some clayey layers (thin) - Moist to wet (soft)		SS #4 14.0' to 19.0'	HNU Reading in Sampler: ±2ppm (windy)
	15					
	16		(silt content decreasing)	5.0'		
	17	SP	- Sand - Lt gray and tan (mottled), fine grained, some as fine silty sand, poorly sorted - wet/saturated (soft)			T.D. @ 1420
	18					
	19		T.D. @ 19.0' below grade in SP sand (saturated)			Installed temp. hand slotted 2" PVC ftn to collect GW grab sample / Back filled hole with Bent. / Cement grout

PROJECT | HOLE NO.

000109

Hole No. G4WW02 027633

DRILLING LOG	DIVISION USACE-Tulsa	INSTALLATION LHAAP-Kurnock, TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP - Group IV		10. SIZE AND TYPE OF BIT Auger Bit	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
DRILLING AGENCY GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-15/7 7/8" O.D. HSA / 4 1/2" O.D. HSA	
4. HOLE NO. (As shown on drawing title and file number) G4WW02		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED 0
5. NAME OF DRILLER Amadore Hinojosa		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE STARTED 12-1-98	COMPLETED 12-1-98
7. THICKNESS OF OVERBURDEN 25.0' ft.		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK N/A		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE Penetrated 25' bgs		19. SIGNATURE OF INSPECTOR [signature] CHIEF DC	

ELEVATION a	DEPTH (Ft) b	USC 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
						Time
	1					5' Offset Drill hole (HSA) for Drilling/ Sampling/ installing 4" SS monitoring well (G4WW02)
	2					
	3					
	4					*NOTE: See Drilling Log for G4SB02 for Lithologic description of soils from grade to 18' below grade.
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18	SP	- Sand Lt. grayish tan (mottled) fine grained sand, some sl. silty, poorly sorted - Wet Saturated (soft)		SS# 1	0730
	19			4.8'	18.0' to 23.0'	
	20					

000110

027634

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. G4WW02

PROJECT: LHAAP - Group IV | INSTALLATION: LHAAP | SHEET 2 OF 2 SHEETS

ELEVATION 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
	21	SP	- Sand - Lt gray/greenish-gray and tan (mottled), fine grained, occ sl silty			Hnu Reading in Sampler = 3+ ppm
	22					
	23				SS# 2, 23.0 to 26.0	
	24	CL	- silty clay - Lt. gray, Lt. blue-gray, brown, yellowish-orange and tan mottled, streaked, and stained plastic, trace to some fine sand - Moist (med. stiff)	3.0'		Hnu Reading in Sampler = 0 ppm
	25					
	26		T.D. 5' offset hole for G4WW02 @ 26.0' below grade in silty clay @ 0955			Overdrilled 11" HSA for G4WW02 (5' offset hole from G4SB02) to 25' below grade for GW. Mon. Well Install.

Monitoring well Completion for G4WW02

Bent. grout	8' to grade
Sugar Sand	9' to 8'
Bent Seal (Hyd)	12' to 9'
Sugar Sand	13' to 12'
Primary Sand (16-30)	25' to 13'
10' SS 4" Screen	25' to 15'

T.D. @ 25' in silty clay

000111

PROJECT LHAAP | HOLE NO.

Hole No. G45B03 (G45B01)

027635

DRILLING LOG | DIVISION USACE - TWSD | INSTALLATION LHAAP - Karnack, TX | SHEET 1 OF 1 SHEETS

1. PROJECT: LHAAP - Group IV Tank Farm Site
2. LOCATION (Coordinates or Station): East of G45B01
3. DRILLING AGENCY: GRI, Inc - Austin, TX
   OLE NO. (As shown on drawing title and file number): G45B03
5. NAME OF DRILLER: José Lenderos
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: Penetrated 17.0 ft.
8. DEPTH DRILLED INTO ROCK: N/A
9. TOTAL DEPTH OF HOLE: 17.0 ft. Below grade
10. SIZE AND TYPE OF BIT: Auger Bit
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75 / 7 1/8" O.D. HSA / CME 5' Cont. Samples
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 | UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 11-9-98 | COMPLETED 11-9-98
17. ELEVATION TOP OF HOLE: —
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: C.K. PG

ELEVATION a	DEPTH (Ft.) b	USC 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	FILL	0.8' of DK gray and DK Reddish brown topsoil with sand, gravel, and roots		SS#1	1030 Commenced HSA
	1	CL	- Silty clay Med. brown, and yellowish-orange with some DK brown and "rust" colored brown mottling, trace to some fine c. sand, plastic - Moist (med. stiff	4.0'	0.0 to 4.0	HNu Reading in Sampler = 0 ppm
	2					
	3					
	4		- Silty clay - Lt. gray, Lt. brown, tan, and Lt. blue-gray (mottled) some small (¼") black "root-like" structures, some f. c. sand (occ clayey silt zone) plastic - Damp to Sl. moist (Med. stiff to stiff		SS#2	
	5			5.0'	4.0' to 9.0'	HNu Reading in Sampler: 3 ppm
	6					
	7					
	8					
	9	SM	- Sandy silt - Lt. gray, some tan, with some rust colored brown mottling and staining, fine grained sand, occ sl. Clayey, non-plastic overall, Moist to wet @ 13.5' (soft)		SS#3	
	10			5.0'	9.0' to 14.0'	HNu Reading in Sampler = 5 ppm
	11					
	12					
	13	SP	- Sand Lt. gray and tan (mottled) some brown staining, fine grained sand, trace to some silt - Wet/Saturated (Soft)			
	14					
	15	SM	- Silty Sand Lt. gray and tan (mottled) fine grained sand - Wet/Saturated (Soft)	3.0'	SS#4 14.0 to 17.0	HNu Reading in Sampler = ±2 ppm
	16	SP	- Sand - Lt. to med gray and tan (mottled), fine grained trace to some silt - Wet/Saturated (Soft)			
	17		T.D. @ 17.0' below grade in SP sand (saturated			Installed temp. hand slotted 2" PVC pipe to collect GW grab sample / Backfilled hole with Bent./cement grout
	18					
	19					
	20					

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE | PROJECT LHAAP | HOLE NO.

000112

Hole No. G4WW03

027636

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LHAAP - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT: LHAAP - Group II		10. SIZE AND TYPE OF BIT: Auger Bit	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY: GPI - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 7 1/4" O.D. HSA / 5' CME cont. Sampler / 11" O.D. HSA	
4. HOLE NO. (As shown on drawing title and title number): G4WW03		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2; UNDISTURBED 0	
5. NAME OF DRILLER: Amador Landeros		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE: STARTED 12-1-98; COMPLETED 12-1-98	
7. THICKNESS OF OVERBURDEN: Penetrated 24.0'		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK: N/A		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
9. TOTAL DEPTH OF HOLE: 24.0' Below Grade		19. SIGNATURE OF INSPECTOR: David W. [illegible] C.K. P.G.	

ELEVATION (a)	DEPTH (ft.) (b)	USC 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)
	1–13					5' offset Drill hole (HSA) for Drilling / Sampling / installing 4" SS monitoring well (G4WW03)
						* Note = See Drilling Log for G4SB03 for Lithologic Descrip. of soils from grade to 14.0' below grade
	14	SP	- Sand - Lt. gray and tan (mottled) Some brown staining, fine grained sand, trace to some silt - wet/saturated (soft)		SS# 1 14.0 to 19.0'	1435
	15	SM				
	16	SP	- silty sand Lt. gray and tan (mottled), fine grained sand - wet/saturated (soft)	5.0'		
	17–18		- Sand - Lt. to med. gray and tan (mottled), fine grained, trace to some silt zones - wet/saturated (soft)			
	19				SS# 2	
	20					

000113

027637

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. G4WW03

PROJECT Group II | INSTALLATION LHAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH (Ft.) b	USC 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
	21	SP	- Sand - Lt. to med. gray, some greenish-gray and tan (mottled), fine grained sand, trace to some silt - wet/saturated (Soft)	5.0'	19.0 to 24.0'	#No Reading in sample = 0ppm
	22					
	23	CL	- silty clay - Lt. to med. gray, some blue gray, tan, rusty brown, orange (mottled), plastic, trace to some fine grained sand - moist (V. stiff)			
	24		T.D.@ 24.0' Below grade in silty clay			Overdrilled hole ≥ 11" HSA for G4WW03 (5' offset hole from G4SB03) to 24' below grade for GW monitoring well installation
	25					Monitoring well completion for G4WW03 ↓
						Bent. Grout 7' to grade Sugar sand 8' to 7' Bent. seal (Hyd.) 11' to 8' Sugar Sand 12' to 11' Primary Sand (16-30) 24' to 12' 10' ss 4" screen 24' to 14' T.D.@24.0' in silty clay

000114

HOLE NO

Hole No. 46WW02

027638

DRILLING LOG | DIVISION

INSTALLATION: LHAAP: Karnack, TX | SHEET 1 OF 7 SHEETS

1. PROJECT: LHAAP - Group III Phase III RI
2. LOCATION (Coordinates or Station): Site 46 Pilot Boring
3. DRILLING AGENCY: GEO Projects
4. HOLE NO. (As shown on drawing title and file number): 46WW02-Pilot Boring
5. NAME OF DRILLER: Amador Hinohosa
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 168'
8. DEPTH DRILLED INTO ROCK: N/A
9. TOTAL DEPTH OF HOLE: 168' Ft. Below Grade
10. SIZE AND TYPE OF BIT: 6" Tricone
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61 Mud Rotary
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 1 @ 90' UNDISTURBED:
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 9-23-98 COMPLETED/Grouted 9-25-98
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: David W. Fuqua

ELEVATION 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
			8" ø Steel casing is set @ ≈ 24'			PILOT Boring Begin drilling @ [redacted] 9-25 via Mud Rotary (Bamid Mud Gel)
		CH	Clay, some silt, Lite Brown, stiff		1625	24' * Soil descriptions based on cuttings in strainer
	25					
	26		Clay, silt, lite gray, plastic stiff		1655	26.5 500 psi
→	27		Plastic shavings - golden brown @ 27 Ant Paste + white			Plug Material from 8" ø steel casing
→	28		Clay Silt, lite gray, plastic, stiff			
	29					
					1798	~~30'~~ 30' 500 psi
→	30		As Above			
	31					
	32		As Above		1750	32'
	33					
			As Above		1800	34' Stop drilling @ 34' on 9-23-98 @ 1800
	34					
						Begin drilling @ 0715 on 9-24-98 @ 34'
→	35		Clay, silt, med Brown, less stiff soften drill w/ weight of rod, & stem			
	36					
	37					
	38					
	39					
→	40	SP/SM	Clay, some sand (fine grain) & silt, med stiff - drill w/ med. ~~Brown~~ Gray soft	weight rod 1.5'	SS#1 40' to 41.5'	SS Log - ~~Sand & silty~~ Sand, Med to Dark Gray, fine grained, some silty, poorly sorted (soft) (For Intermediate use E-Log Confirmation)
	41					

ENG FORM ... PROJECT HOLE NO. ...

000115

027639

Pilot Boring

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 46WL002

PROJECT LHAAP - Karnack, TX | INSTALLATION LHAAP - Karnack, TX | SHEET 2 OF 7 SHEETS

ELEVATION 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
	42					E-log Results Zone Screen 35'-45' PRECIP Sand to = 30'
	43				PRECIP plug	
	44					SS Log - Silty clay/clay
→	45		Clay, some Sand (v.fine) to silt, med shift, drilling weight of rod med. gray, plastic, soft	1'	SS#2 45' to 46'	med to Dark gray.. trace to some fine sand, (some v. thin fine grained sand/silt lenses) occ rust colored staining/mottling - Damp to sl. Moist
	46					
	47					
	48		As Above			(For Intermediate well E-Log confirmation)
	49					
→	50		As Above		0830	50'
	51					
	52					
→	53		As Above, slightly harder drilling, drier layered sand in cuttings			
	54					
→	55		As Above		0820	55'
	56					
	57					
	58					
	59				0835	60' shut down rig to repair seal on pump
→	60		As Above			Resume drilling @ 0420 0430
	61					
	62					
	63					
	64		As Above w/tr. of lignite			

PROJECT | HOLE NO. ..107

000116

Pilot Boring

0276401

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 46WL02

PROJECT LHAAP - Karnack, TX | INSTALLATION Site 46 | SHEET 3 OF 7 SHEETS

ELEVATION 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
→	65	CH, CL	Clay, some sand (v. fine) silt, med. stiff, med. gray. tr. lignite	drilling w/		weight of rod
	66					
	67					
	68					
	69		As Above, decr. in sand		0950	62.5
→	70		As Above - soft			
	71					
→	72		Becomes stiffer			
	73					
	74		Less lignite, traces of brown clay			
	75			INTERBEDDED LATER BY		
→	76		As Above w/ some brown clay in cuttings		1010	76'
	77	CL GC	Incr sand in gray cuttings some brown clay			
	78		Becomes drier			
	79					
→	80		increase in sand (v. fine)		1025	80'
	81		tr. dark brown ~~sandy clay~~ Clayey Sand			
	82		very hard @ 82' - 82.5			
	83		increased sand (becoming slightly coarser) tr. white hard material			
	84					
	85					
	86					
	87	SM, SC	Sand increasing			

000117

PROJECT | HOLE NO.

S[illegible]ST 1-1 Light Skamateleater Pilot Bor. ng 1

027641

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE [illegible] | Hole No. 46WW02

PROJECT LHAAP - Karnack, TX | INSTALLATION Site 46 | SHEET 4 OF 7 SHEETS

ELEVATION 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
	89	SM	Silty Sand, tr. clay, med. gray soft			
	90	SP	Sand, poorly sorted, med. gray, v. fine grain		1045	90'
	91				SS-1	27, 54, 100 > Blow Counts
	92					
	93					
	94					
	95		As Above			Drilling = wt of Drill string only!
	96					
	97					
	98					
	99					↓
	100	SP/SM	Sand, med. to Dk gray and some Dk green/gray, V. fine to fine grained, some v. silty, poorly sorted			1138 @ 100 ft
	101					
	102		tr. clay in cuttings @ 101 + tr. lignite med-gray plastic; shale layer @ 101.5' to 102.5' med-brick gray			1158 102'
	103		CL-ML @ 102 med to Dk Gray plastic med stiff tr. Sand (v. fine)			
	104					
	105					
	106					
	107					
	108		As Above			1210 108'
	109					
	110				1214	110'

PROJECT | HOLE NO.

000118

V. lot Boring 027642

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 464W02

PROJECT LHAAP - Karnack, TX | INSTALLATION Site 46 | SHEET 5 OF 7 SHEETS

ELEVATION 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
	111		Lignite			
→	112		Med-Dk Gray Clay tr. lignite			
	113					
	114		Med Dk Gray Clay slower		1342	114' Drilling Rate @ 114.2'
	115					
→	116		Brown Gray clay w/ lignite		1348	116'
	117		Predominately lignite			
→	118	DK	Brown Clay, lignite		1354	118'
	119					
→	120		As Above			
	121					
	122		As Above			
	123		color changing to Gray-brown clay			
→	124		Med Gray Clay, tr sand		1420	124'
	125					
	126					
	127					
→	128		Med gray Dk Brown-Gray Clay, tr sand some brown clay, drier		1424	128'
	129		Med Gray Brown Clay, some very fine sand, some silt			
	130				1431	130'
	131					
→	132		As Above tr. lignite			
	133					

000119

PROJECT | HOLE NO.

Pilot Boring 027643

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 46WW02

PROJECT LHAAP- Karnack, TX | INSTALLATION Site 46 | SHEET 6 OF 7 SHEETS

ELEVATION 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
						drilling = 6 min/ft
	134		Gray Brown clay, some very fine sand, silt, drier more stiff, tr. lignite		1445	134'
	135					
	136					
	137					
→	138		As Above - tr lignite		1455	138'
	139					
→	140		As Above, tr. lignite			
	141					
	142					
	143					
→	144		As Above, no lignite		1512	144'
	145					
	146				1519	146'
→	147		As Abv, tr. Shale			
	148					
	149					
→	150		As Above, no shale		1535	Begin drill 150' Flush Circulate in boring clay swelling on drill bit
	151					
	152		As Above, tr lignite		1540	152'
	153					
	154					
	155		Gray Clay w/fine sand tr. lignite			Drilling w/ weight of rod
	156					

000120

HOLE NO.

Pilot boring 027644

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 46WW02

PROJECT: LHAAP - Karnack, TX | INSTALLATION: Site 46 | SHEET 1 OF 7 SHEETS

ELEVATION 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
	157		Gray clay w/ fine sand & lignite			(Cont. Sl. Loss of Drill fluid) (<3 gal./min)
	158				1550	158'
	159		DK Gray clay, with fine sand/silt & lignite fragments (interlaminated)			Drilling 2 wt of Drill string on 1'
	160		As Above, sand decreases		1600	160'
→	161		DK Gray clay, plastic, No sand in clay			Top of Medway @ 161'?
	162		~~DK Gray clay, b sand, silt~~		1605	162'
			~~sand decreasing~~		1625	162
	163		~~INCR~~ O			Drilling w/ full down pressure @ 162'
	164		As Above		1646	164'
	165					
	166				1702	166'
	167		As Above		1718	168'
	168					
	169		T.D. @ 168' 9-24-98 @ 1730			
	170					
	175		9-25-98 @ 0730 Drillers circulate drill mud in boring & thin out fluid to facilitate downhole E-log & Gamma tests.			
	174					
	177		Boring will be grouted at conclusion of tests via tremie pipe from bottom to top.			
	178					
	179		Begin E-log @ 0840			
	180					E-Log As Bottom of Screen 160'
						Deep Prelim. MW

PROJECT | HOLE NO. 000121

Hole No. 46WW05 027645

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP Site 46		10. SIZE AND TYPE OF BIT Auger Bit	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 7¼" I.D. 10" O.D. HSA / CME Sampler / 11" O.D. HSA	
4. HOLE NO. (As shown on drawing title and file number)	46WW03	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5 / UNDISTURBED —	
5. NAME OF DRILLER José Landeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated 24' Ft		16. DATE HOLE STARTED 8-27-98 / COMPLETED 8-28-98	
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 24 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR [signature] <i Ka CAG	

ELEVATION a	DEPTH (Ft.) b	USCS 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	SM	Lt. brown, gray, mottled Sandy silt - fine grained sand, some roots - Dry to Damp	4'/4'	SS #1 0.0' to 4.0'	1409 commenced HSA pilot hole for 46WW03 HNu Reading in sample = ppm HNu Reading @ Auger = 0 ppm
	4		- Sandy silt/some silt, clayey - Lt. brown, yellowish-orange and dark reddish brown (mottled), fine grained sand - moist (med. dense)	5'/5'	SS #2 4.0' to 9.0'	HNu Reading in Sample = 0 ppm
	5	CL	- Silty clay - Lt. gray and Lt. greenish-gray mottled with abundant dk reddish brown mottling, streaking, and staining, some black "root-like" structures U. plastic - moist (U. stiff)			HNu Read @ Augers = 0 ppm
	9		- Silty clay - Lt. gray and Lt. greenish-gray with abundant Lt. brown, yellowish-orange and tan mottling, some streaking and staining, trace fine sand, U. plastic - moist (U. stiff) (moving H₂O)	5'/5'	SS #3 9.0' to 14.0'	HNu Reading in Sample = 0 ppm HNu Reading @ Augers = 0 ppm
	14		- Silty clay - Lt. gray and yellowish orange (mottled) trace to some fine sand, plastic - moist (stiff)			
			- Silty clay - Lt gray, Lt. greenish-gray, tan, and yellowish-orange (mottled) some black streaking, some fine sand, plastic - moist (stiff)	5'/5'	SS #4 14.0' to 19.0'	HNu Reading in Sample = ppm
	19		- Becoming wetter, W.D. in sample - fine sand content increasing, (becoming silty - wet @ 17' - some U. thin irregular fine sand and silt lenses - wet			HNu Readings @ Augers = ppm
	24	SC			SS #5	

PROJECT | HOLE NO.

000122

Dkt 027646

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 46WW01

PROJECT | INSTALLATION: I HAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH (Ft) b	USC 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
	21	CL	- Silty clay - Lt. gray - green gray - mottled - rusty olivish-orange - some to abundant fine sand - sl. plastic - Moist to Wet	5/5	17' to 24'	HNu Reading in sample: 2ppm
	22	SC CL	- Sandy Clay - wet with trace to some fine to coarse sand, trace gravel			HNu Reading @ Auger: 0ppm
	23	SC	- sandy clay - Lt. gray, tan, brown and yellowish orange fine grained sand - some V. clayey - Wet (soft)			
	24	CL	T.D. @ 24.0' below ground in silty and sl. sandy clay - moist to sl. wet - @ 1430			Pulled up auger 8' after T.D. @ 1434 to monitor for W.L. in open hole (inside augers)
						Overdrilled Hole with 11" O.D. plugged HSA for 46WW01 (shallow well) monitoring well completion
						46 WW01 Completion
						Bentonite cement Grout 7' to grade
						Bent. seal 10' to 7'
						Sugar Sand (30-10) 11' to 10'
						Primary filterpack (16-30) 24' to 11'
						4" SS #10 slot screen 24'-14'
						T.D. Mon. Well Drill hole @ 24' below existing grade

PROJECT | HOLE NO.

0001283

Hole No. 46WW04

027647

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP		10. SIZE AND TYPE OF BIT Auger Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (MSL or MSL)	
3. DRILLING AGENCY GPI Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 (3½" I.D. 7" O.D. Hollow Stem Auger)	11" OD HSA
4. HOLE NO. (As shown on drawing title and title number) 46WW04		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5	UNDISTURBED —
5. NAME OF DRILLER Josie Landeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated 24 Ft.		16. DATE HOLE STARTED 8-23-95	COMPLETED 8-24-95
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 24.0 ft Below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR Dan Cita / Brian Bohn	

ELEVATION a	DEPTH (Ft.) b	USC 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
	1	SM	- Sandy silt (some asbestos(?)) Lt. brown-gray, fine grained sand Dry to Damp	3/4'	SS #1 0.0' to 4.0'	Commenced drilling pilot hole via 7" O.D. HSA @
	2		silt content decreasing			HNu Reading in sample =
	3	CL				
	4		- Silty clay Lt. gray, Lt. greenish-gray, & Dk reddish-brown mottled streaked and stained, some fine sand plastic trace to some roots - Damp to moist @ 7 ft. (St.Stf)		SS #2	
	5			5/6'	4.0' to 9.0'	HNu Reading in Sample =
	6					
	7					
	8		- Silty clay Lt. brown, tan and Lt. gray and Lt. greenish-gray (mottled), some v. thin black "root-like" structures, trace to some fine sand - moist (St.Stf)		SS #3	
	9					
	10					
	11		- Silty clay - Lt. gray, tan yellowish-orange, and Lt. greenish-gray (mottled and stained) with abundant black stained "root-like" structures, trace to some fine sand, plastic - moist (V. Stf) ND V.O. H_2O W.D	4.5'/5'	9.0' to 14.0'	HNu Reading in Sample =
	12					
	13					
	14					
	15		- Silty clay - Lt. gray, Lt. greenish-gray, and yellowish-orange (mottled) - trace to some fine sand - moist (St.Stf)		SS #4	No VOs H_2O in samples
	16		- fine sand content increasing ND VOs H_2O W.D	5/5'	14.0' to 19.0'	HNu Reading in Sample =
	17		- Silty clay / Some silty clayey silt - Med. gray, brown, and yellowish-orange with some V. thin silt and fine sand irregular leases - moist to Sl. wet			
	18					
	19					
	20				SS #5	

PROJECT | HOLE NO.

000124

027648

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 46WW04

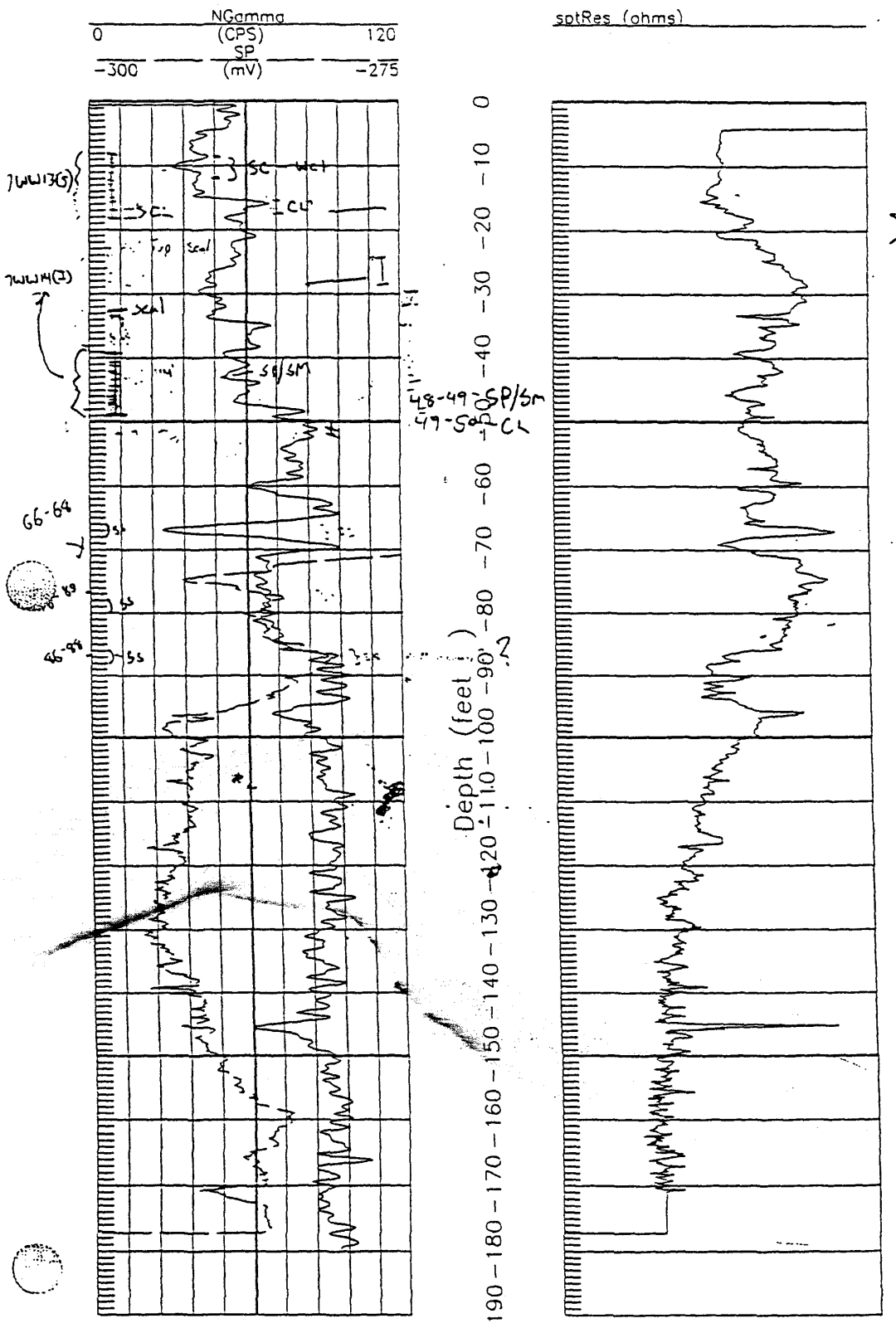
PROJECT | INSTALLATION / HAAP | SHEET 2 OF 2 SHEETS

ELEVATION 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
		CL		4'/5'	19 to 24'	
	21	SC	Clayey sand - Mod to dark yellowish brown, some sl. clayey, abundant V. thin horiz. silt and fine sand layers - moist			HNu Reading in sample
	22					
	23	CL	- silty clay - Mod. gray and yellowish orange (mottled), trace to some fine sand, plastic - moist			
	24		T.D. @ 24' below grade in silty clay Hole Dry @ T.D. @ 1534			Overdrilled pilot hole with plugged 11" O.D. HSA to 24.0' below grade for shallow mon. well installation
			pulled up augers & off bottom and let hole sit open for H.L. monitoring			46WW04 well Completion ↓
						Bent/cement grout 7' to grade
						Bent. seal 10'-7'
						Sugar sand (20-40) 11' to 10'
						Primary filterpack (16-30) 24'-11'
						4" #10 slot SS screen 24' to 14'
						T.D. of 11" hole for well installation 24' below grade

000125

47WW15(D) 027649

Well Name:
File Name: 47WW15A
Location:
Elevation: 0 Reference: Ground Surface



47WW15 (D) Completion

*

47WW15 12" casing to 19'
(to seal off shallow)

8" casing to 52'
(to seal off intermediate)

000126

Hole No. 47WW15

027650

DRILLING LOG	DIVISION	INSTALLATION: LHAAP	SHEET: of 1 SHEETS

1. PROJECT: Phase III Group 4 Sites	10. SIZE AND TYPE OF BIT: 6" tri cone
2. LOCATION (Coordinates or Station): 47WW13, 14, 15	11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
3. DRILLING AGENCY: GeoProjects Int.	12. MANUFACTURER'S DESIGNATION OF DRILL: Mobil Drill B-61
HOLE NO. (As shown on drawing title and file number): 47WW15	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE: STARTED 9-10-92 / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR: Jon B. Niffenegger, PG

ELEVATION 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
	1					8" ϕ steel casing set to 18' BGL
	2					1310 Start drilling w/ 6" tri-cone bit mud rotary.
	3					- drilling fluid = bentonite powder + potable water
	4					
	5					
	6					
	7					
	8					
	9		See boring log for well 47WW13			
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18	CL	Silty, sandy, clayey [illegible]			
	19					
	20					

PROJECT | HOLE NO.

000127

027651

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW15

PROJECT: Phase II, Group 4 | INSTALLATION: LHAAP | SHEET 2 OF 2 SHEETS

ELEVATION 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
	21					lithologic descriptions derived from cuttings
	22					1345 Drill to 35' and collect sample of cuttings
	23					
	24					1347 Drill to 39.5' and collect cutting sample
	25	CL	Silt, CLAY, w/ some fine sand, lt. gray, plastic			
	26					note: solid drilling - alot of sand collecting in bottom of mw pit
	27					
	28					
	29		Silty, CLAY w/ fine sand lt. gray/Reddish brown, plastic			
	30					
	31					
	32					
	33					
	34					
1714	35		same as above			
	36					
	37					* Intermediate Well
	38					Well completion
	39		Silty CLAY w/ some coarse sand, reddish brown angular			[47 WW 14] on 7-30-98 (see Log Book)
1701.5	40					Bent/cement Grout 27' to ground
	41					Sugar Sand 30' to 27'
	42					Seal 33' to 30'
	43					Sugar Sand 34' to 33'
	44					primary Sand 50' to 34'
						10-4" #10 slot screen 49' to 39'
						T.D Hole (8") @ 50'

000128

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW15

PROJECT | INSTALLATION: LHAAP | SHEET: of 3 SHEETS

ELEVATION 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
	45		Silty Sandy CLAY w/ mod to coarse sand lt grayish brown / reddish brown			1355 drill to 50' and collect cuttings sample
	46					
	47					1402 drill to 55' and collect cuttings sample
	48					- mix additional drilling mud to account for increased bore hole vol.
	49					
1351	50		Sandy clay w/ lignite - grayish brown			note: harder drilling starting @ 55' BGL
	51		- increasing lignite content			1434 Drill to 59 ft
	52		- no sand observed			1440 collect cuttings sample @ 60'
	53					1452 [illegible] to 62', mix additional water to mud pit along w/ bentonite powder
	54					
1402	55		Silty CLAY w/ fine sand dark gray			1512 Drill to 65' and collect cuttings sample
	56					
	57					
	58					
1442	59					
	60		Silty CLAY w/ trace fine sand, dark gray, plastic			
	61					
	62					
	63					
	64					
1512	65		Silty CLAY, dark gray/ black, w/ high organic content, low plastic			
1501	66					
	67					
	68					

000129

HOLE NO.

027653

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW15

PROJECT | INSTALLATION: LHAAP | SHEET: OF 4 SHEETS

ELEVATION 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
	68					
	69		clay CLAY, dark gray/black, no organic content, low plastic, trace fine sand			1537 Drilled to 69' - hard drilling
	70					1554 Drilled to 74' and collect cutting sample
	71					- drilling not as hard at ~ 71.5 ft
	72					- becoming hard again at ~ 72 ft
	73					Penetration rate = 33 min/ft
	74					Soft spot at ~ 74 ft
	75		Sandy CLAY w/ fine sand, dark gray,			1622 collect cutting sample @ 74'
	76					- softer formation
	77					1629 Drill to 79' and collect cutting sample
	78					1642 Drilled to 85' and collect cutting sample
	79					1651 Drilled to 89' and collect cutting sample
	80		clayey fine SAND, lt gray			- mix additional mud to compensate for additional borehole vol.
	81					Hard boring at ~ 81 ft
	82					1712 Drill to 92 ft and collect cutting sample
	83					
	84					
	85					
	86					
	87					
	88					
	89					
	90		clayey fine SAND, lt gray, occ. clay filled w/ fine sand			
	91					
	92		Sandy CLAY, dark gray plastic			

000130

ITEM NO.

027654

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW15

PROJECT | INSTALLATION: LHAAP | SHEET: OF 5 SHEETS

ELEVATION 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
	93		Sandy CLAY, dark gray plastic			1725 Drill to 95 ft and collect cutting sample
	94					1752 Drill to 99 ft and collect cutting sample
	95		Silt, CLAY w/ little fine sand, dark gray			- pull drill rods and Break for the day
	96					9-11-92
	97					0740 resume drilling at 99 ft
	98		[illegible] CLAY w/ trace fine sand [illegible]			0755 Drill to 100 ft collect cutting sample
	99					note water bearing zone [illegible]
	100		[illegible]			[illegible] cutting sample
	101					[illegible] Drill to 104 ft collect [illegible] sample
	102					0905 [illegible] to 115 ft [illegible] cutting sample
	103					
	104					
	105		[illegible]			
	106					
	107					
	108					
	109					
	110					
	111					
	112					
	113					
	114					
	115		[illegible]			
	116					

000121

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW15

PROJECT | INSTALLATION: LHAAP | SHEET: OF 6 SHEETS

ELEVATION 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
	116					0929 Drill to 117' and collect cutting samples
	117					
	118					
	119					1026
	120					
	121					1031
	122					
	123					
	124					1104
	125					
	126					
	127					1132 Drill to 140' and collect cutting samples
	128					
	129					
	130					
	131					
	132					
	133					
	134					
	135					
	136					
	137					
	138					
	139					
	140					

PROJECT | HOLE NO.

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 17WW15

PROJECT | INSTALLATION | SHEET 2 OF 7 SHEETS

ELEVATION 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
	140		[illegible]			[illegible] Drill to 145' and collect cutting sample (Note cutting recovery in [illegible] Log)
	141					
	142					
	143					Drill to 149' and collect cutting sample
	144					- Pump all mud pit and replace w/ fresh mud (Bentonite flushing)
	145		[illegible] SAND w/ [illegible]			1731 Drill to 155' and collect cutting sample
	146					[illegible] to 155' and collect cutting sample
	147					[illegible]
	148		[illegible]			
	149					
	150					
	151					
	152					
	153					
	154					
	155					
	156					
	157					
	158					
	159					
	160					
	161		clayey SAND			

PROJECT | HOLE NO.

027657

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW15

PROJECT | INSTALLATION | SHEET 2 OF 2 SHEETS

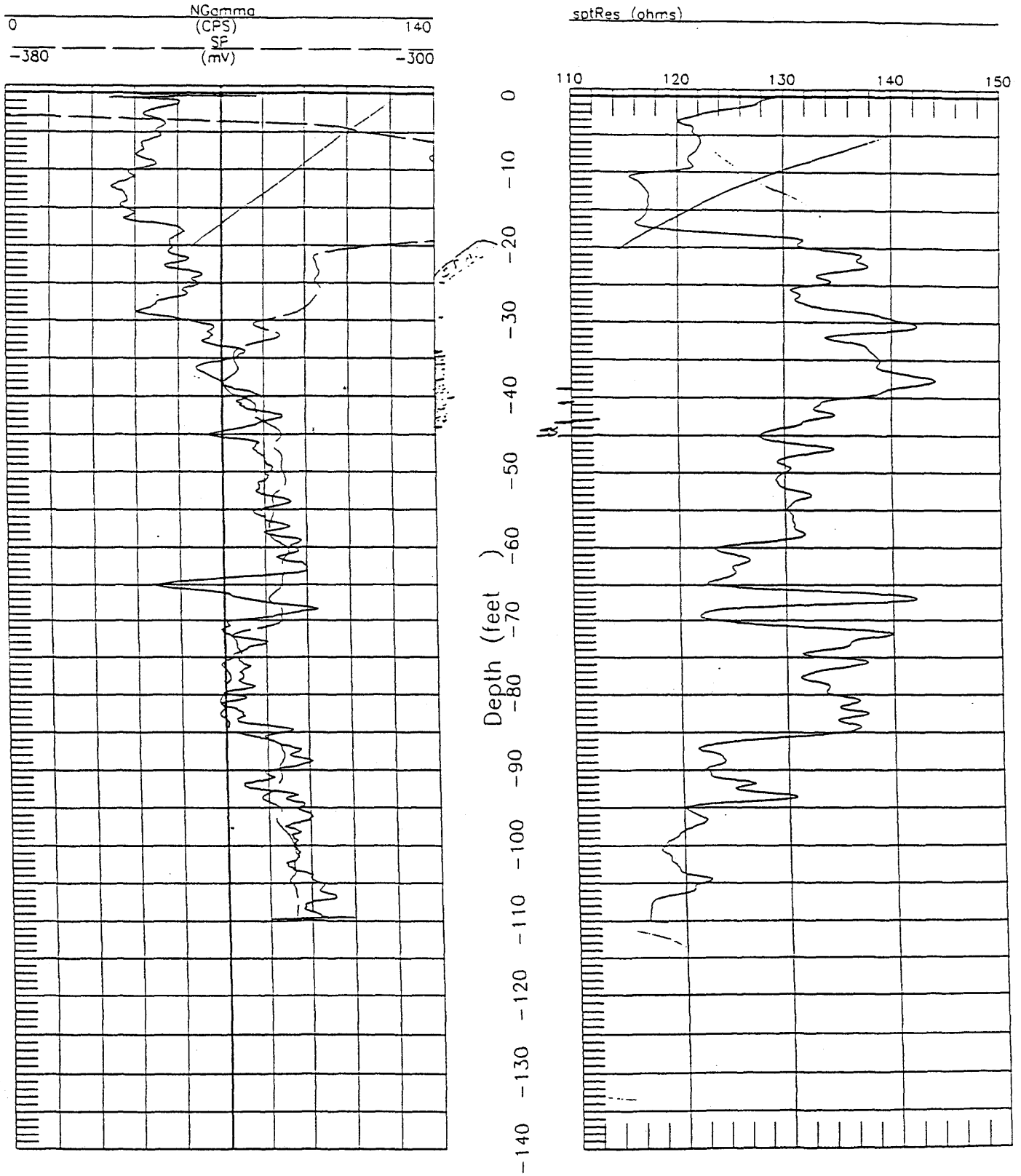
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			clayey SAND			1554 Drill ...
						1615 Drill ... (increase in cutting return)
1574			SILTY SAND			Groundwater ... 129'
1617			SILTY CLAY ...			
1611			SILTY CLAY ...			

PROJECT | HOLE NO.

000134

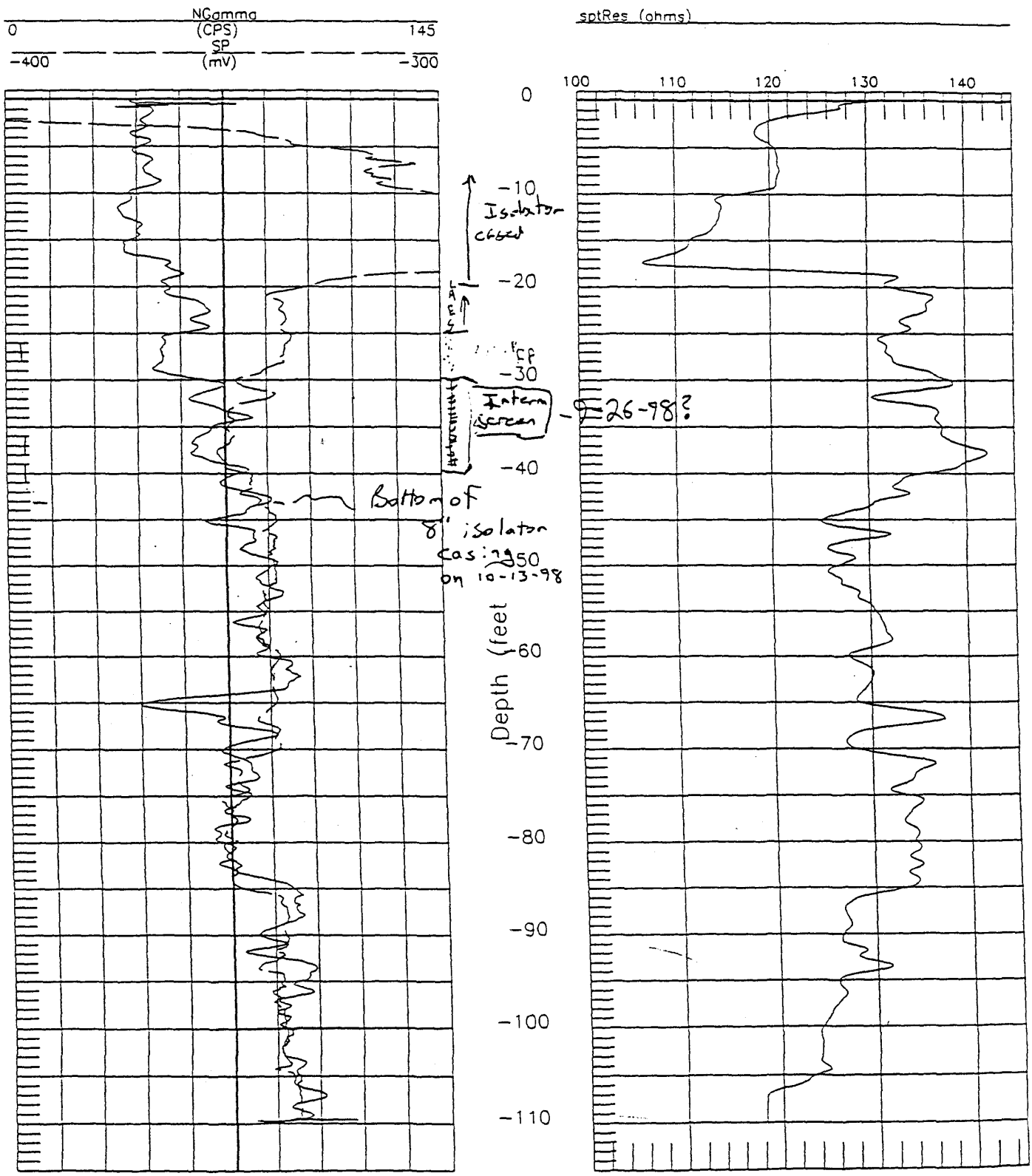
027658

Well Name: 47WW06
File Name: 47WW06
Location: Group 4, Site 47, Longhorn Army Ammuntion Plant, Texas
Elevation: 0 Reference: Ground Surface



47WW07 (D)
027659
(47WW06 (I))

Well Name: 47WW06
File Name: 47WW06U
Location: Group 4, Site 47, Longhorn Army Ammuntion Plant, Texas
Elevation: 0 Reference: Ground Surface



Hole No. 47WW07

027660

DRILLING LOG | DIVISION

INSTALLATION: LHAAP-Karnack, TX | SHEET 1 OF 5 SHEETS

1. PROJECT: LHAAP Group A Phase III RI
2. LOCATION (Coordinates or Station): SITE 47 - Pilot Boring
3. DRILLING AGENCY: GEO Projects
4. HOLE NO. (As shown on drawing title and file number)
5. NAME OF DRILLER: Armador Hinojosa
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 110'
10. SIZE AND TYPE OF BIT: 6" Tricone
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL: Mobile Drill B-61 Mud Rotary
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE STARTED: 9-25-95 COMPLETED: 9-26-95 (Grouted)
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR: David Lee Burge

ELEVATION 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
			8" ø steel casing set at 19'			PILOT BORING Begin Drilling @ 1525
	20	CL/ML	Lite Golden Brown Silty Clay, soft Low Plasticity			Soil descriptions based on cuttings in strainer
	21					
	22					
	23					
	24					
	25		As Above w/ traces of Gray Silty Clay			
	26					
	27					
	28		As Above & Sticky		1544	28'
	29					
	30		Predominately Lite Golden Silty Clay Soft, low plasticity w/ traces of Lite Gray Silty Clay w/ tr. fine sand w/ mod. Red		1548	30'
	31					
	32					
	33		As Above, incr. gray silty Clay w/ v fine Sand			
	34					Interbedded Zones
	35					mixture of Cuttings in strainer ---1557 @ 36'
	36		Predominately lite Gray Silty Clay, little fine sand + some gold brown silty clay and traces of dark brown Sandy clay			
	37					

000137

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. | PROJECT | HOLE NO. LHAAP-47WW07

027661

Pilot Boring

DRILLING LOG (Cont. Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW07

PROJECT: LHAAP - Karnack, TX | INSTALLATION: SITE 47 | SHEET 2 OF 5 SHEETS

ELEVATION 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
	38		Lt. Gray Silty Clay, tr. sand with tr. Gold Brown Silty Clay		1602	Drill by weight of Rod @ 38' 1155 4/28/98 38-40' fine silty sand, ~~brown~~ Dark brownish Gray to dark gray w/olive inclusions. Fine grain, poorly graded, medium dense, little clay, wet, some iron stained inclusions
	39		Med Gray ~~Brown~~ Silty Clay, tr. fine sand med. Plastic, med soft			
→	40		As Above w/ traces Dk Brown Sandy Clay		1606	40 (SP) ~ 2 ft Recov.
	41					
	42		Mostly Med Gray Silty Clay w/tr. fine sand little Brown clay w/ tr. sand		1616	42'
	43					1230 43-45 fine silty sand, Dark gray, fine grain, Medium dense to dense, wet to saturated, some clay lenses (see below)
	44					
	45		As Above			44.8-45 Clay, dark gray, Hard, medium plastic, slightly moist
→	46		Red Gray Silty Clay, med plas, med soft			
	47		Shale zone @ 47.5'-47.7'			
	48		Med Gray Silty Clay, less sand med. Plastic, med soft ~~Lignite zone @ 48.5'~~		1624	48'
	49				1630	50'
→	50		As Above			
	51					
	52					
	53				1645	54'
→	54		As Above, trace very fine sand			
	55					
	56					
	57					
→	58		As Above, slightly drier		1654	58'
	59					
→	60		As Above		1700	60'

000138

Dist Hwy 027662

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WJ02

PROJECT: LHAAP-Karnack, TX | INSTALLATION: Site 47 | SHEET 3 OF 5 SHEETS

ELEVATION 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
	60		DK Brown ~~Sandy~~ Clay, Med plastic, tr sand med. stiff, tr. lignite	Sand	60-5	Cuttings Slower drilling rate
	61					
	62					
	63					
	64		As Above, No lignite		1715	64'
	65					
	66		As Above		1721	66'
	67					
	68		As Above		1727	68'
	69		lignite seam @ 69.3' starts			
	70		~~Dark~~ Gray clay, w/ lignite med plastic, med stiff		1733	70' 9-25-98 9:45 End drilling for day @ 70' 17 Begin Drilling on 9-26-98 @ 0730
	71					
	72		As Above			
	73		Like brn clay w/ fine sand/silt tr. lignite			
	74					
	75					
	76					
	77					
	78		As Above		0750	78'
	79					
	80		As Above			
	81					
	82					
	83		Less Sand, Incr. clay tr. lignite			

ENG FORM 1836 4 (ER 1110-1-1801) GPO 1988 OF - 526 - 403 PROJECT HOLE NO. 47WJ02

000139

Pilot Boring 027663

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47L-JB07

PROJECT: LHAAP - Karnack, TX | INSTALLATION: Site 47 | SHEET 4 OF 5 SHEETS

ELEVATION 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
	84	CL	Lt gray clay, tr. sand, tr. lignite plastic, med. stiff			
	85					
	86					
→	87		As Above			
	88					
	89					
→	90	CL-CH	Dark Gray Clay, plastic, stiff, tr. Lignite Becoming softer, drier			90.5
	91					
	92					
→	93		Lignite seam = 1"-2"		INTERLAYERED	thin Seams alternating
→	94	CL	Brown Clay, Plastic, tr. lignite stiff - med. stiff		Clay, sand	94.5
→	95		Materials softer @ 94-5'		Lignite	95.5
→	96		Brown clay - As Above w/ Gray fine sand			
	97					
	98	CL-CH	Med Gray Clay, plastic, med stiff tr. lignite			
	99					
	100	CH	Dk Gray clay, High plasticity, tr. lignite, drier,			
	101					
	102				09115	102.5' possible Midway?
→	103	LH	As Above, no lignite very stiff, plastic			Drilling w/ 300 psi down pressure
→	104		As Above, slow drilling rate using 300 psi down pressure			
	105					
	106					

000150

ENG FORM 1836-A (ER 1110-1-1801) GPO 1980 OP-626-603 | PROJECT | HOLE NO.

Pilot Boring

027664

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47 MW 04

PROJECT: LHAAP - Karnack, TX | INSTALLATION: Site 47 | SHEET 5 OF SHEETS

ELEVATION 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
	107	CH	Dk Gray Clay, Plastic			
	108					
	109					
→	110		A. Above		1020	110'
	111					Remove drill string to insert bit for reaming
	112		TDC - 110' 9-26-98			Flush cuttings out of boring + thin mud
	113					Performed E-Log + Gamma down and up boring complete at 1300
	114					
	115					
	116					Drillers Hired grout boring via tremie pipe
	117					
	118					
	119					Preliminary MW 14 based on E-Log/Gamma
	120					
	121					Intermediate
	122					screen 30' - 40'
	123					sand to 27 + Sugar seal 25
	124					Deep
	125					Bottom Screen 102 up to ±30' screen
	126					
	127					
	128					
	129					

PROJECT | HOLE NO.

000141

Hole No. 47WLW09(I)

027665

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LHAAP - Karnack TX	SHEET 1 OF 2 SHEETS
1. PROJECT: Stc 47 LHAAP		10. SIZE AND TYPE OF BIT: 7 7/8" Sandvik Tricone Mud Rotary	
2. LOCATION (Coordinates or Station): (Next to LHS-MW 43?)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL):	
3. DRILLING AGENCY: GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 7 7/8" Mud Rotary Sandvik Tricone Bit	3"-2 3/4" Hyd. Push
4. HOLE NO. (As shown on drawing title and title number): 47WLW09(I)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9 / UNDISTURBED —	
5. NAME OF DRILLER: Jose Londeros		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: —	
7. THICKNESS OF OVERBURDEN: Penetrated 40' ft.		16. DATE HOLE: STARTED 9-29-98 / COMPLETED 9-29-98	
8. DEPTH DRILLED INTO ROCK: N/A		17. ELEVATION TOP OF HOLE:	
9. TOTAL DEPTH OF HOLE: 39.0 ft. below casing		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: Dave Cox C.E.G. P.G. SUE	

ELEVATION a	DEPTH (Ft) b	USC 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) Time g
GR	21	CL	- Silty clay / sandy thin clayey Silt layers, plastic, some fine grained sand - Moist (stiff)	Logged cuttings for strainer	Logged cuttings	8" steel casing from grade to 20 ft. (Intermediate well next to LHS-MW43)
	22		- Silty clay / clayey Silt - red gray, some greenish-gray with some yellowish-orange and rust brown mottling - moist (STIFF)	20'	SS #1 22.0' to 24.0'	1020 Drilling From 20' with 7 7/8" Tricone Bit - Mud Rotary (Bored Mud Gel) HNu Reading in Sample = 0 ppm (10.2 eV Lamp)
	23					
	24					1024
	25	SM CL	- Sandy Silt - Med gray to sl. greenish gray - fine grained sand, some sl. clayey - moist (med. dense)	2.0'	SS #2 24.0' to 26.0'	HNu Reading in Sample = 0 ppm
	26		- Silty clay - Med. gray, yellowish orange, tan and Lt. brown mottled, streaked and stained. Some V. thin fine grained sandy Silt irregular layers, trace to some fine grained sand throughout, plastic - moist (stiff)			1033 No appreciable Fluid Loss w.o.
	27			2.0'	SS #3 26.0' to 28.0'	HNu Reading in sample = 0 ppm
	28					1042
	29		- Sandy Silt (sl. clayey) Lt. gray-yellowish-orange, tan and rust colored brown mottled, streaked, and stained, fine grained sand - moist to sl. wet (soft to med. Dense)	2.0'	SS #4 28.0' to 30.0'	HNu Reading in sample = 2 ppm
	30	SM CL SP/SM				1049
	31		- Sand / Silty Sand, Lt. gray, tan w/ yellowish orang mottled, streaked, and stained, fine grained sand, poorly sorted, trace clayey zones - wet/saturated	2.0'	SS #5 30.0' to 32.0'	HNu Reading in sample = 5 ppm
	32	SC				1059
	33		- clayey Sand - Med. brown and med. gray - mottled, fine grained sand - wet	2.0'	SS #6 32.0' to 34.0'	HNu Reading in sample = 2 ppm
	34	SP/SM SM	- Sand Silty Sand - med. to Lt. gray, tan, and yellowish orange - mottled and streaked, fine grained sand - wet/saturated (soft to med. dense)			1126
	35			2.0'	SS #7 34.0' to 36.0'	HNu Reading in Sample = 0 ppm
	36		- Sandy Silt - Lt. gray to greenish-gray, tan, yellowish-orange, and rust-brown (mottled), fine grained sand, some sl. clayey - wet/saturated (soft)			1201
	37		- Sandy Silt, Med. gray, yellowish-orange, and rust-brown (mottled), some sl. clayey, fine grained sand, poorly sorted - wet/saturated (soft)	2.0'	SS #8 36.0' to 38.0'	HNu Reading in Sample = 0 ppm
	38	CL/CH	- Silty clay (mottled) gray / greenish gray, yellowish orange, tan, and rust brown (mottled), trace to some fine sand, v. plastic - Damp to slt. moist (v. stiff) (Hole)	2.0'	SS #9 38.0' to 40.0'	HNu Reading in Sample = 0 ppm
	39		T.D. Sample @ 40.0' below grade			
	40					

000142

NG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT HOLE NO.

027666

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW09(I)

PROJECT Group TO | INSTALLATION LHAAP | SHEET 2 OF 2 SHEETS

ELEVATION 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
						47WW09(I) was completed as a 4" CS #10 slot Inter. Monitoring well (Adjacent to shallow well LHS-MW-43) 20' of 8" steel casing was cemented from grade to 20' below ground surface via solid flight augers. Drill hole was then advanced from 20' (at bottom of plaster of paris plug at base of casing) to 38.0', 3" O.D. split spoons were collected from 22.0' to 40.0'. Drill hole was advanced with 7 7/8" tricone saw tooth bit and mud rotary Drilling (Baroid Mud Gel) out of casing to 38' during sampling and then to 39.0' for circulating hole, prior to well install.

Monitoring well 47WW09(I) completion

Bent/Cement Grout 12' up into casing

Sugar sand 22.5' to 22.0'

Bent. Seal 25.5' to 22.5'

Sugar Sand (30-70) 26' to 25.5'

Primary filterpack 39' to 26' (16-30)

#10 slot 4" SS screen 38' to 28'

T.D. Drill hole 39.0

000143

ENG FORM 1836-A (ER 1110-1-1801) GPO 1990 OF-628-603 | PROJECT LHAAP Network TX | HOLE NO. MW09(I)

Hole No. 47WW20 (SB)

027667

DRILLING LOG	DIVISION	INSTALLATION: LHAAP	SHEET OF SHEETS

1. PROJECT: Phase III, Group 4, Site 47
2. LOCATION (Coordinates or Station): Site 47
3. DRILLING AGENCY: Geo Projects Int.
4. HOLE NO. (As shown on drawing title and file number): 47WW20 (SB)
5. NAME OF DRILLER: Amadeo
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT: 6" tricone
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL: Mobil Drill B-61
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED 9-14-98 / COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR: Jon P. Niffenegger, PG

ELEVATION 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
	5		See boring log for well 47WW18			8"ø steel casing to 21' BGL
	10					1030 start drilling w/ 6" tricone, mud rotary @ 21 ft.
	15					drilling fluid = fresh water
	20					@ 22' soft formation
1020						formation rate = 1½"/0.5m
	25	CL	Sandy, CLAY, yellowish brown plastic			1120 Drill to 60 ft
						fresh ice dry, but ice rain
	30					9-15-98
						0730 hole caved to 40', redrill to 60'
	35		silty fine SAND, w/ little clay, yellowish brown to 11 gray			- thin fresh beds of mud (boundary of fresh water)
		SP				
	40					- harder drilling @ 42'
						Penetration rate = 1 ft/1.35 m
	45		lignite seam, black			0930 - recovered split spoon from 70'-72'
	50		Sandy, fine SAND w/ little clay, lt. gray			softer formation from 21 - 85 ft
	55					1200 collect split spoon from 90-92 ft
1110	60					softer formation from 91-94 ft
	65		Sandy, CLAY w/ fine sand, lt. gray, plastic			heavy mud from 9-1-95
	70		lignite seam, black	20	SS-1	
			clayey SAND, lt gray			
	75					
	80		- increasing clay content			
			clayey fine SAND, gray			
	85					
	90		clayey fine SAND w/ clay lenses, gray, micaceous clay, hard lt gray to white	20	SS-2	
	95					
	100		increasing clay content			

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT | HOLE NO.

000144

027668

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WL12CP1

PROJECT | INSTALLATION | SHEET OF SHEETS

ELEVATION 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
	100				SS-3	collect 2-foot split spoon
	105					in hole 2nd time
	110					
	115					
	120					
	125					
	130					
	135					
	140					
	145					
	150					
	155					
	160					
	165					
	170					
	175					
	180					
	185					
	190					
	200					

000145

ENG FORM 1836-A (ER 1110-1-1801) GPO 1980 OF-628-603 | PROJECT | HOLE NO.

027669

Hole No. 47WW13

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP Group III site 47		10. SIZE AND TYPE OF BIT Auger Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼" I.D. / 7" O.D. HSA / CME ES: Cont. Sampler / 11" OD HSA	
4. HOLE NO. (As shown on drawing title and file number)	47WW13	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 / UNDISTURBED —	
5. NAME OF DRILLER José Landeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER —	
7. THICKNESS OF OVERBURDEN Penetrated 18'		16. DATE HOLE: STARTED 7-27-98 / COMPLETED 7-28-98	
8. DEPTH DRILLED INTO ROCK NM ~~Penetrated~~ FT		17. ELEVATION TOP OF HOLE —	
9. TOTAL DEPTH OF HOLE 18 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR [signature] CPG	

ELEVATION a	DEPTH (Ft.) b	USCS 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
	1	FILL	- Fill - Reddish-brown and orange-brown silty clay with some gravel and roots - Dry to Damp	4.0'	SS #1 0.0' to 4.0'	Commenced HSA @ 1420 HNu Reading in Sample = 0 to 1 ppm
	2	CL	- Silty clay - Med. gray and tan (mottled) with some reddish-brown and yellowish brown occ staining, some fine sand - Moist (Med. stiff to soft)			HNu Reading @ Auger = 0 ppm
	4				SS #2 4.0' to 9.0'	
	5		- Silty clay - Lt. to med. gray mix greenish gray, some tan, with abundant yellowish orange and rust-brown staining. Some apparent layering (v. thin), some fine sand from to some black root-like structures - Damp To Sl. Moist (Stiff)	5.0'		HNu Reading in Sample = HNu Reading @ Auger = 3 ppm
	8					
	9	SC	Sandy Clay - Lt. brown, Lt. gray, and tan (Mottled) Fine grained Sand, V. Silty, Sl. plastic (clayey Portions) Poorly sorted - Moist to Sl. Wet No U.S. H_2O W.D. and Sampling (soft - Loose)	5.0'	SS #3 9.0' to 14.0'	HNu Reading in Sample = 10 ppm HNu Reading @ Auger = 5 ppm
	12					
	13	CL	- Silty clay - Lt. gray, greenish gray, yellowish-orange, and tan mottled, streaked, and stained, some fine sand throughout, plastic - Damp to Moist (Med stiff)			
	14					
	15	SM	Sandy silt - Lt. gray mix green gray with yellowish-brown mottling & staining, fine grained sand, occ sl. plastic in some clayey Zones - Moist	4.0'	SS #4 14.0' to 19.0'	HNu Reading @ Auger = 2 ppm HNu Reading in Sample = 10 ppm
	16					
	17	CL	Silty Clay - Lt. gray and green-ish gray with some yellowish-brown staining and black roots throughout, Some fine grained sand, plastic - Damp to (Stiff) Damp silty clay			
	18					
	19				SS #5 18.0' to 18.0'	- Overdrilled hole with 11" O.D. plugged auger to 18.0' @ 1550. Knocked out plug and let sit overnite
	20		T.D. @ 18' in			

000146

027670

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW13

PROJECT | INSTALLATION LHAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
						1-28-98 – 0700 W.L. inside 11" Augers @ 17.8' below grade 0715 Commenced installing 4" SS #10 slot Well inside 11" Auger 47WW13 Mon. Well completion Bent/cement Grout 3.5' to grade Bent. Seal 6.5' - 3.5' Sugar Sand (30-70) 7'-6.5' Primary Sand Filterpack (16-30) 18'-7' 4" SS #10 slot screen 18'-8' T.D. hole - 18' below grade

000147

ENG FORM 1836 A (ER 1110-1-1801) GPO 1990 OF - 628 - 603 | PROJECT | HOLE NO. 47WW13

Hole No. 47WU01

027671

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP Group IV Phase III		10. SIZE AND TYPE OF BIT Auger Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (MSH or MSL)	
3. DRILLING AGENCY GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼" I.D. 7" O.D. HSA / CME 5' cont. Sampler	11" O.D HSA
4. HOLE NO. (As shown on drawing title and file number) 47WU01		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4	UNDISTURBED
5. NAME OF DRILLER José Landeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated 19.0 ft.		16. DATE HOLE: STARTED 8-7-98	COMPLETED 8-7-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 19.0 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR [signature] for CJK CPG	

ELEVATION a	DEPTH (Ft) b	USCS 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
	0–4	CL	Clayey silt - Med. brown with some med. gray and tan mottling, some fine sand. Moist @ grade to Dry @ 0.5 ft. (Soft to med. stiff)	3.7'	SS #1 0.0' to 4.0'	Commenced HSA drilling of Pilot hole for 47WU01 @ 1518 HNu Reading in sampler = 0 ppm HNu Reading @ Auger = 0 ppm
			Clay content increasing and Dry @ 4.0'			
	4–9		- Silty clay - Lt. to med. gray, Lt. to Dark brown, tan, and yellowish-orange mottled, streaked, and stained, some occ black "rootlike" structures throughout, trace to some fine sand - Damp to Sl. moist (U. stiff)	5.0' / 5.0'	SS #2 4.0' to 9.0'	HNu Reading in sampler = 0 ppm HNu Reading @ Augers = 0 ppm
			- Fine sand content increasing with depth			
	7		- Clayey silt, some fine sand, mottled, Sl. plastic @ 8.7' (Moist)			
	10	SM	- Silty sand - Lt. gray, tan, and yellowish-orange mottled, fine grained sand, some Sl. clayey - poorly sorted - Moist to Wet (Trace to Dis water while molding)	5.0'	SS #3 7.0' to 14.0'	HNu Reading in Sampler = 0 ppm HNu Reading @ Augers = 0 ppm
	11	CL	- Silty clay - Lt. gray, tan, and yellowish-orange (mottled), Sl. plastic, some fine sand - Moist (Sat. #)			
	13	SM	- Moist to wet @ 13.2 ft. W.D.			
	14		- Silty sand - Lt. gray, some green-gray tan, and yellowish-orange (mottled), fine grained sand, poorly sorted - wet/saturated (loose)			Water @ 14.0' on Rods and in augers W.D.
	15	SP	- Sand - Lt. gray, Lt. brown, and tan (mottled) fine grained, some silt, Sl. clayey thin zones, poorly sorted - Wet/Saturated - (V. loose to loose)	4.8'	SS #4 14.0' to 17.0'	HNu Reading in Sample = 0 ppm HNu Reading @ Augers = 0 ppm
	17	CL	- Silty clay - Lt. gray, brown, tan (mottled) with some yellowish-orange streaking and staining, V. plastic, trace to some fine sand - Damp to moist			
	19		T.D. @ 19.0 in plastic Damp to moist silty clay @ 1545			
	20					

027672

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW01

PROJECT | INSTALLATION: LHAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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) Time g
						1605 - Commenced auger drilling 47WW01 pilot hole with 11" O.D. HSA for 4" monitor well installation.
						47WW01 Monitor Well Completion ↕
						- Bent./Cement 2.5' to grnd Grout
						- Bent. seal 7.5' to 4.5'
						- Sand Sand (20-40) 8'-7.5'
						- Primary filterpack 19' to 8' (16-30)
						- 4" SS #10 slot screen 19' to 9'
						T.D. @ 19.0' below grade in silty clay

000149

PROJECT | HOLE NO.

027673

Hole No. 47WW02

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP Phase III, Group IV		10. SIZE AND TYPE OF BIT Auger 8"	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼" ID HSA 7" O.D.	CME 6" cont. Sampler / 11" O.D. HSA
4. HOLE NO. (As shown on drawing title and file number)	47WW02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 4 / UNDISTURBED —
5. NAME OF DRILLER Jose Canderos		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER —	
7. THICKNESS OF OVERBURDEN Penetrated 18.0 ft.		16. DATE HOLE STARTED 8-5-94	COMPLETED 8-5-94
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE —	
9. TOTAL DEPTH OF HOLE 10.0 Ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR Brian Bolton / Dan Gika	

ELEVATION a	DEPTH (Ft.) b	USC 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
	1	CL	Silty clay Brown to light Brn w/some roots and occasional gravel. found bottom some orange staining (dry)	Bit. of 3ft	SS#1 0 to 3ft	Comercial HSA pilot hole for 47WW @ 0935 Hrm @ Augers = 3ppm 10.7 N to @ Sample = 7pp
	2					
	3					
	4	CL	silty clay grey to light grey w/ Darkred to orang staining wet/moisty. (moist)	5ft of 5ft	SS#2 3 to 8ft	Hrm reading @ Augers = 1ppm @ Sample = 3ppm
	5					
	6	CC	~silty clay grey to light with brown staing (Damp)			
	7					
	8					
	9	CL	Silty clay grey to light grey w/ brown and orange staining (Damp to moist toward bottom)	5ft of 5ft	SS#3 8 to 13ft	Hrm Reading @ Augers = 1ppm @ Sample - 1ppm
	10					
	11					
	12	SM	Silty Sand light grey with brown staining some silt and clay. (moist)			
	13	CL	~~sandy clay~~ to grey to light gray w/ some sand (~~Non plastic~~)	5ft of 4ft	SS#4 13 to 18	Hrm Reading @ 15' while Drilling @ Augers @ Sample
	14	SP	SAND orange to brown sand w/ 13 peg-gravel subangular to subround (moist)			
	15	SM	Silty sand - light grey with some staing (black) (freewater) which grades into the silty clay below			
	16	CL	silty clay - light grey with some sand and silt no staing moist.			
	17					
	18		Total Depth 18'			
	19					
	20					

000150

ENG FORM 1836 — PREVIOUS EDITIONS ARE OBSOLETE — PROJECT — HOLE NO.

027674

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47-MW-02

PROJECT | INSTALLATION | SHEET OF 7 SHEETS 7

ELEVATION 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
						well DRILL complete @ wet @ 15' while drilling Bent/cont grout 3.5'-0' Bent 6.5-3.5' Sump seal 7'-6.5' Primg filtpack 18' to 7' 4" SSS Screen 18' to 8' #10slot TD @ 18.0' below grade in silty clay

ENG FORM [illegible] (ER 1110-1-1801) [illegible] PROJECT HOLE NO. 47-MW-02

000151

Hole No. 47WW03

027675

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LHAAP - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT: LHAAP Group IV Phase II		10. SIZE AND TYPE OF BIT: Auger, B.T.	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY: GPI, Inc Austin, Tx		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 3¼" ID HSA / Cont Sampler / 11" HSA	
4. HOLE NO. (As shown on drawing title and file number): 47WW03		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED	UNDISTURBED
5. NAME OF DRILLER: José Landros		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE: STARTED 8-20-98	COMPLETED 8-20-98
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
9. TOTAL DEPTH OF HOLE: 24'		19. SIGNATURE OF INSPECTOR: Barry Bah	

ELEVATION 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
	1	CL	Clayey silt - yellowish brown clayey silt with orange staining and high organics (mostly roots) (Dry)	3.0' of 4.0'	SS#1 1:0' to 4.0'	Commenced Hand Auguring of Pilot hole for 47WW03 @ 1052 Complete 1207
	2					
	3	CL	silty clay - Dark grey with red-brown staining (mottled) some Roots (Damp) becom dark brown towards bottom (Damp)			
	4					
	5				SS#2 4.0' to 9.0'	
	6	CL	silty clay - medium brown to lt. grey mottled silty clay some black and red-orange staining around roots. (Damp)	5.0' of 5.0'		
	7					
	8	CL	silty clay - light grey w/ orange-brown staining (mottled) occasional black staining (Damp)			
	9					
	10	CL	silty clay - lt. grey with some orange brown and black staining towards bottom more SAND mixed in with Clay (Damp)	5.0' of 5.0'	SS#3 9.0' to 14.0'	
	11					
	12					
	13	SC	Sandy clay - lt grey to brown towards bottom clay with high sand content. Some black staining (moist)			
	14	SM/SC	silty clayey sand - Brown sand w/ high fine content poorly sorted w/ interbedded CL layer		SS#4 14.0' to 19.0'	
	15	CL	CL - are high in sand w/ brown (Dark) staining (wet)	2.5' of 5.0'		
	16	CL				
	17	SM/SC	(freewater)			
	18	SP	poorly sorted sand lt brown sand with few fines. (freewater)			
	19		gradesinto clayey silty sand @ about 21' (freewater)		SS#5	

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: LHAAP

HOLE NO. 47WW03

000152

027676

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47UW03

PROJECT | INSTALLATION | SHEET 4 OF 2 SHEETS

ELEVATION 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
	20	SP		4'of 5'	SS5 A' to 24'	
	21	SP/SC	silty clayey sand - lt brown to gray sand with high fines, grades back into SP			
	22		poorly sorted sand - lt brown to brown sand w/ sometimes (free water)			
	23	SP				
	24		silty clay			Δ Drilled to 24' pushed to 26' to find clay.
	25	CL	- Dark grey to grey clay with some silt, white stains along vertical fracture (moist) (DAMP)	2.1')	SS6 24' to 26'	
	26					

Comm & overdrilling w/ 11" OD HSA @ well 47UW03 @ 1415

completed @ 15

Bent/cmt grout 8' to grnd.

Bentonite plug 11' to 8'

Sump sand 12' to 11'

Prem filter pack 24' to 12'

4" SS screen 24' to 14'
#10 slot

ENG FORM [illegible] (IRR 1110-1-1801) GPO 1980 OF-628-603 | PROJECT | HOLE NO.

000453

Hole No. 47WW04

027677

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LHAAP - Karnack, Tx	SHEET 1 OF 2 SHEETS
1. PROJECT: LHAAP Group III Phase III		10. SIZE AND TYPE OF BIT: Auger 13.5	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY: GPI, Inc. - Austin, Tx		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 3½" ID 7" OD HSA / cont. sampler / 11" O.D. HSA	
4. HOLE NO. (As shown on drawing title and file number): 47WW04		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5	UNDISTURBED —
5. NAME OF DRILLER: Joe Landeros		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE: STARTED 8-20-98 COMPLETED 8-20-98	
8. DEPTH DRILLED INTO ROCK: ~N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE: 20'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: R. Bolen	

ELEVATION 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
	1	CL	silty clay - lt brown to grey silty clay with some orange brown staining, high organics (Dry)	1.0' of 4.0'	SS#1 0.0' to 4.0'	Commenced HSA drilling at AS.A.P. at Hole No. 47WW04 @ 0800 Hnu Reading Augers = 2+ Sampler = 0
	2					
	3					
	4					
	5	CL	silty clay - lt grey to yellow orange silty clay (medium) w/ minor red-brown staining (Dry)	5.0' of 5.0'	SS#2 4.0' to 9.0'	Hnu Reading Augers = 4+ Sampler = 3+
	6	CL	silty clay - lt grey w/ some orange brown color (medium) w/ some black and red brown stain (moist)			
	7					
	8	CL	silty clay - light to medium grey w/ orange brown staining (moist)			
	9					
	10	SC	clayey silty sand - lt brown to grey sand w/ lots of clay and silt (some plasticity) (free water) grades to higher sand content	1.5' of 5.0'	SS#3 9.0' to 14.0'	free water @ 9.0' while drilling Hnu Reading Augers = 5+
	11	CL	silty clay - thin clay layer lt grey to brown w/ some staining some sand (moist)			Sampler = 20+
	12					
	13	SC				
	14					
	15	SP	poorly sorted sand - lt brown sand w/ some fines grading to more fines toward bottom (free water)	3.0' of 5.0'	SS#4 14.0' to 19.0'	Hnu Reading Augers = 5+
	16					
	17					Sampler = 10+
	18	SM	silty sand - lt grey to brown silty clayey sand w/ some clay staining (wet)			
	19					
	20	CL	silty clay - light grey to brown (moist) silty clay w/ some sandy (moist)	1.0' of 1.0'	SS#5 19.0' to 20.0'	total depth drilled 20'

ENG FORM 1836 — PREVIOUS EDITIONS ARE OBSOLETE — PROJECT — HOLE NO.

027678

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW04

PROJECT | INSTALLATION | SHEET OF SHEETS

ELEVATION 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
						Overdrill w/ 11" auger commenced at 0500 Completed at
						Bent/cement grout 3.5' to surface Bent 6.5 to 3.5' Sugar sand 10' to 6.5' Prem. filter pack 15' to 7.0' 4" SS Screen #10 slot 19' to 9' TD 20.0' below Grades to silty clay

000155

PROJECT 47AP | HOLE NO. 47WW04

Hole No. 47WW04 (Abandoned)

027679

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LHAAP, Karnack, TX	SHEET 1 of 2 SHEETS
1. PROJECT: Phase III Group IV		10. SIZE AND TYPE OF BIT: Auger, 13, ES	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY: GPI, Inc Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 3 1/4 ID HSA / Core 5 / 11" OD HSA	
4. HOLE NO. (As shown on drawing title and file number): 47WW04		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5 / UNDISTURBED —	
5. NAME OF DRILLER: José Landeros		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER:	
7. THICKNESS OF OVERBURDEN: penetrated 21.0 ft.		16. DATE HOLE: STARTED 8-8-98 / COMPLETED 8-8-98	
8. DEPTH DRILLED INTO ROCK: N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE: 21.0 ft below grade		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: Baker Bolen	

ELEVATION 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
	1	CL	Silty clay - Dark grey and light brown (mottled) with orange staining and organic matter including roots (Dry)	2.5' of 4ft	SS#1 0-4ft	Comment HSA pilot hole for 47WW04@12#:25
	2	CL	Silty clay - Dark grey silty clay w/ some SAND - orange staining organic matter including roots (Dry)			Hand Augers = 2ppm 10.2eV lamp Headspace = 1 ppm
	3					
	4	CL	silty clay - Dark to light grey with orange brown staining (mottled) some fine sand and organic matter (Dry)	3' of 5ft	SS#2 4-9 ft	Hand Augers = 2ppm Headspace = 1
	5					
	6					
	7	CL	clayey silt - lt grey to orange brown (mottled) w/ some black staining and sand grains toward the bottom (Damp)			(Abandoned hole
	8					
	9					
	10	CL	silty clay - light grey w/ orange staining (mottled) - black staining around organic matter w/ occasional SAND. (DAMP)	5 of 5ft	SS#3 9-14ft	Move "new" hole South)
	11					
	12	CL	silty-clay - light grey with occas. orange-brown staining high plasticity (moist)			
	13					
	14	SP	clayey SAND - yellowish orange clayey sand - poorly sorted slightly plastic when wetted (moist) ?? grades into (SP) below.	1½ of 5ft	SS#4 14-19ft	
	15	SP/SM	SAND - poorly sorted yellowish orange to light brown SAND w/ very few fines. (free water)			Water at 17' ch'g Drilling
	16					
	17		grades down to a SM around 19 to 19.5'			
	18					
	19	SM	clayey SAND - light grey clayey sand w/ lots of fines. some orange staining (free water)	Avg 0.5ft	SS#5 19-21ft	

027680

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW04

PROJECT | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION 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
	20	CL	silty clay - lt grey clay high plasticity w/some "Ironstone" sand/sand (moist) and orange staining	2ft of 2ft	SS#5	Hole was pulled back and abandoned (via tremie pipe and backconcrete grout) on 8-8-94 in lieu of new location for 47WW04 to the South of this pilot hole
	21					
	22		Bottom of hole @ 21ft @ 1455			Hole Abandoned

ENG FORM [illegible] A (ER 1110-1-1801) GPO 1990 OF-626-603 | PROJECT | HOLE NO.

000157

Hole No. 47WW05

027681

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LHAAP - Karnack, Tx	SHEET 1 OF 2 SHEETS
1. PROJECT: LHAAP Group IV Phase III		10. SIZE AND TYPE OF BIT: Auger 8.75	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY: GPI, Inc Austin, Tx		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 3¼"ID 7"OD HSA / CME 5' Ent. Sampler	
4. HOLE NO. (As shown on drawing title and file number): 47WW05		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED — UNDISTURBED —	
5. NAME OF DRILLER: José Landeros		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN: Penetrated 19 ft		16. DATE HOLE: STARTED 7-28-98 COMPLETED 7-30-98	
8. DEPTH DRILLED INTO ROCK: N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE: 19 ft. bls auger refusal		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: [signature]	

ELEVATION (a)	DEPTH (ft) (b)	USC 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	CL	silty clay Brown with some grey clay with some roots (Dry)	2ft / 4ft	SS#1 0.0' to 4.0'	Commenced HSA @ Hnu Reading in Sample (10.2 ppm) = 0ppm Hnu Reading @ Augers = 4ppm
	4	CL	silty clay light to medium grey w/ some orange brown staining (Dry)		SS#2 4.0' to 9.0'	Hnu Reading in sample = 0ppm
	6	CL	silty clay grey with frequent orange brown staining (molted) (Damp)	5'/5'		Hnu Reading @ Augers = 5ppm
	8	CL	silty clay orange brown with grey molting some black staining (damp)			
	10	CL	silty clay medium grey w/ orange brown and black molting and staining (Damp)	5'/5'	SS. #3 9.0' to 14.0'	Hnu Reading in Sampler = 0ppm Hnu Reading @ Augers = 3ppm
	12	CL	silty clay medium grey - some orangish brown staining and some SAND (moist)			
	13	SM	Sandy silty - medium grey silt with fine grained SAND			
	14	CL	some plasticity and orangish staining (moist)			
	15	SM	silty clay - medium grey silty clay with some SAND and brown staining (moist)	5'/5'	SS. #4 14.0' to 19.0'	Hnu Reading in Sampler = 2ppm
	16	SM	silty Sand - medium grey to brown turns to sandy silt @ ≈ 16.5 ft (wet)			Hnu Reading @ Auger = 5ppm
	18	CL	silty clay - medium grey to brown w/ some orange staining (moist)			
	19		TD @ 19 without 18 at sampler while Drilling			

000158

ENG FORM [illegible] PROJECT HOLE NO.

027682

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47UW05

PROJECT Group III Phase III | INSTALLATION LHAAP-Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
						Overdrilled 47UW05 Shallow pilot hole 2 plugged 11" O.D. HSA to 19.0' below grade (T.D. - 19.0')
						47UW05 Mon. Well Completion ↓
						- Bent./cement 4.5' to grade Grout
						- Bent. seal 7.5' - 4.5'
						- Sugar Sand (30-70) 8' - 7.5'
						- primary Fl Harpock (16-30) 19' - 8'
						- 4" SS #10 slot screen 19' - 9'
						- T.D.: 19' below grade in silty clay

000179
HOLE NO.

Hole No. 47WW08

027683

DRILLING LOG	DIVISION: USACE-Tulsa	INSTALLATION: LHAAP-Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT: LHAAP, Phase III, Group III		10. SIZE AND TYPE OF BIT: Mud auger Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (USGS or MSL)	
3. DRILLING AGENCY: GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 3¼" I.D. 7" O.D. HSA / CME-5 Cont Sampler / 11" O.D. HSA	
4. HOLE NO. (As shown on drawing title and file number): 47WW08		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4	UNDISTURBED —
5. NAME OF DRILLER: Jose Lunderos		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN: Penetrated 19.0 ft.		16. DATE HOLE: STARTED 8-5-98	COMPLETED 8-5-98
8. DEPTH DRILLED INTO ROCK: N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE: 19.0 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: C. Kin / Bohn	

ELEVATION a	DEPTH (Ft.) b	USC 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	OL / CL	0.2' of brown silty and sandy topsoil, abundant roots - DRY		SS #1 0.0 to 4.0'	Commenced HSA pilot hole for 47WW08 @ 1410
	1–3		- Silty clay, some as clayey silt, Lt. gray, tan, yellowish orange, brown, and "rust" brown mottled, streaked, and stained, some v. thin to thin layering, some fine sand - Dry to sl. Damp (Usthfa) (some c: th some roots)	4'/4'		HNu Reading in Sampler: 0ppm (10.2 eV. PID) HNu Reading @ Augers = 0ppm
	4–7		- Silty sand - Lt. brown, tan, and gray (mottled), fine grained sand, some sl. clayey, poorly sorted - Moist (Loose)	5'/5'	SS #2 4.0' to 9.0'	HNu Reading in Sampler: 0ppm HNu Reading @ Augers = 0ppm
	8	SM				
	8–9	CL	- Silty clay - Med. gray, greenish gray, tan, and yellowish orange mottled, streaked, and stained, some black colored "root like" structures throughout, some fine sand - Moist (stiff)		SS #3 9.0' to 14.0'	
	10–11		(Clayey silt - wet from 11' to 11.6')	5'/5'		HNu Reading in Sampler: 0ppm
	12		- Silty clay - Med. to dk gray, rust brown, reddish brown and black mottled, streaked and stained, abundant roots, some fine sand - Damp to Moist (stiff)			HNu Reading @ Augers = 0ppm
	13	SM				
	14		- Sandy silt - Lt. gray, greenish gray, and tan mottled, some layering - fine grained sand - Wet / Saturated (loose)		SS #4 14.0' to 19.0'	
	15–16	SP	- Sand - Lt. gray, tan and yellowish brown mottled, fine grained, some silt poorly sorted - Wet / Saturated (loose)	5'/5'		HNu Reading in Sampler: 0ppm HNu Reading @ Augers = 0ppm
	17	SM	- Sandy silt - Lt. gray and tan (v. thin to thin layering and mottling) fine grained sand - Wet (stiff)			
	18	CL	- Silty clay - Lt. gray, greenish gray, tan, and yellowish orange mottled and stained, some fine sand - Moist (Stiff)			
	19		T.D. @ 19.0' below grade @ 1435 in moist silty clay			
	20					

PROJECT | HOLE NO.

000180

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW08

PROJECT: LHAAP | INSTALLATION: LHAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
						Commenced overdrilling pilot hole for 47WW08 with 11" O.D plugged HSA.
						47WW08 Mon. well completion
						- Bent/cement Grout 4.5' to grade
						- Bent. seal 7.5'-4.5'
						- Sugar Sand (30-70) 8' to 7.5'
						- Primary filter-pack (16-30) 19' to 8'
						- 4" SS #10 slot screen 19' to 9'
						- T.D. @ 19.0' below grade in silty clay for

PROJECT LHAAP | HOLE NO.

Hole No. 47WW11

027685

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP-1 Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT Group III Phase III		10. SIZE AND TYPE OF BIT Auger Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼" I.D. 7" O.D. HSA / CME's Cont. Sampler	11" O.D. HSA
4. HOLE NO. (As shown on drawing title and file number)	47WW11	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9	UNDISTURBED —
5. NAME OF DRILLER José Londeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated 19.0 ft.		16. DATE HOLE STARTED 8-4-98	COMPLETED 8-4-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 19.0 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR Dawn C. Kia CPG	

ELEVATION a	DEPTH (Ft.) b	USC 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	OL / CL	2+ inches of dry sandy and silty topsoil, abundant roots, overlying		SS #1	Commenced HSA pilot hole for 47WW11 @ 1335
	1		- Silty clay / clayey silt - Lt. brown, reddish-brown, orange-brown and yellowish-orange (mottled/stained), trace to some fine sand, Dry to Sl. Damp (stiff)	3.5 / 4.0'	0.0' to 4.0'	HNu Reading in sampler = 0 ppm
	2					
	3					HNu Reading @ Auger = 2 ppm
	4		- Silty clay Lt. gray, tan, brown, and yellowish-orange mottled, streaked, and stained, trace black "root-like" structures, trace to some fine sand - Damp to Moist (V. stiff) (No vis. water in sample)	5' / 5'	SS #2 4.0' to 9.0'	
	5					
	6					HNu Reading: Sample = 2 ppm
	7					
	8					HNu Reading @ Auger = 2 ppm
	9		- Silty clay - Lt. gray, greenish-gray, tan, brown, yellowish-orange, w/ "rust" brown mottled and stained, within horiz. layering, trace to some fine sand throughout, V. plastic - Moist (V. stiff to stiff)		SS #3	
	10			5' / 5'		
	11				9.0' to 14.0'	HNu Reading in sample: 0 ppm
	12					
	13		- Moisture content increasing with depth			HNu Reading @ Auger: 5 ppm
	14		(Water @ 14' below grade inside of auger after collecting Sample #4			
	15		Sand (coarse silty sand) Lt. gray, tan, and yellowish-orange (mottled) and stained) fine grained sand, trace to some silt, poorly graded - Wet (loose)		SS #4	HNu Reading in sample: 0 ppm
	16	SP		5' / 5'	14.0' to 19.0'	
	17	SM	- Silty sand - Lt. gray and tan (mottled), fine grained sand - Moist to Wet (loose)			HNu Reading @ Auger: 0 ppm
	18	CL	- Silty clay - Lt. gray, greenish gray and tan (mottled) trace to some fine sand - Moist (Stiff)			
	19		T.D. @ 19.0 ft. below grade in silty clay (moist)			T.D. @ 19.0 ft. below grade
	20					

000182

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. PROJECT / LHAAP HOLE NO. 47WW11

027686

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW11

PROJECT: Phase II, Group IV | INSTALLATION: CHAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV. e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						Commenced overdrilling 47WW11 pilot hole with plugged 11" O.D. HSA @ 1450
						47WW11 Mon. Well Completion
						Bent/cement grout 4.5 to grade
						Bent. seal. 7.5 to 4.5
						Sugar sand (30-70) 8' to 7.5'
						Primary filterpack (16-30) 19' to 8'
						4" SS #10 slot screen 19' to 9'
						T.D.C 19.0' ft. below grade in silty clay

000163

ENG FORM 1836-A (ER 1110-1-1801) GPO 1990 OF-626-603 | PROJECT | HOLE NO.

Hole No. 47WW12

027687

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT Phase III, Grp IV, LHAAP		10. SIZE AND TYPE OF BIT Auger 8"	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼" I.D. HSA / CME Cont. Sampler / 11" O.D. HSA	
4. HOLE NO. (As shown on drawing title or file number) 47WW12		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5 / UNDISTURBED —	
5. NAME OF DRILLER Jose Landeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE STARTED 8-6-98 / COMPLETED 8-6-98	
7. THICKNESS OF OVERBURDEN Penetrated 20.0 ft		17. ELEVATION TOP OF HOLE —	
8. DEPTH DRILLED INTO ROCK N/A		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 20.0 ft. below grade		19. SIGNATURE OF INSPECTOR Brian Bohn	

ELEVATION a	DEPTH (Ft.) b	USX 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
	1	CL	Silty clay - Brown to Red Brown w/ Root & another Org. matter (Dry)		SS #1	Commenced HSA pilot for 47WW12 @ 0820
	2	CL	Silty clay - Light Brn to Yellow orange w/ Black and Red staining (Dry)	4 of 4'	0.0 to 4.0'	HNu reading in Sampler = (10.2 eV PID Lamp) 5 ppm
	3	CL	Silty clay - greenish grey to grey w/ white staining or mottling sand some small gravel (Dry at top to Damp/Moist some organic matter in bottom 6")			HNu Reading @ Auger =
	4	CL	Silty clay - greenish grey w/ organic matter in top 1 ft. some orange/red black mottled staining (Damp)		SS #2	HNu Reading in Sampler = 2ppm
	5			5/5	4.0' to 9.0	HNu Reading @ Auger =
	6					
	7	CL	silty clay greenish grey w/ orange staining and black mottling. (Damp)			
	8	SM	Silty SANDS - grey to orange poorly sorted sand with some silt and organic matter (wet)			
	9					
	10	CL	Silty clay - light grey silty clay with orange staining, mottled w/ some SAND. (Moist)		SS #3	Auger = 4 ppm
	11			5/5	9.0' to 14.0'	Samples = 2 ppm
	12	SC	clayey sand - greenish grey silty clayey SAND very poorly sorted w/ some orange staining and organic matter (wet)			
	13					
	14	CL	- Silty clay - LT. grey with orange-brown staining and mottling - some clayey silt, some black mat structures, some fine sand - Moist to wet @ 16.2 ft (Med. stiff)		SS #4	Sample Zone
	15					H2O @ 16' while Drilling
	16			5/5	14.0' to 19.0	HNu & Augers = 4 ppm
	17	SC-SM	- Sandy Clay and silty sand - LT grey and grey ish-grey, some orange brown staining, fine grained sand (poorly sorted) - Wet saturated (SOFT)			
	18	CL	- Silty clay - LT. grey and greenish grey, abundant yellowish-brown and rust-brown mottling and staining, some fine sand - plastic - Moist (Med. stiff)			
	19			1"/1'	SS #5 19' to 20'	
	20					

027688

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW12

PROJECT | INSTALLATION CHAAP | SHEET 2 OF 2 SHEETS

ELEVATION 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
			T.D @ 20.0 ft. below grade in moist silty clay			0950 Commenced overdrilling 47WW12 pilot hole with 11" O.D. plugged HSA for 4" mon. well installation 47WW12 monitoring well completion - Bent./cement Grout 4.5' to grade - Bent. seal 7.5' to 4.5' - Sand (30-70) 8' to 7.5' - Primary filterpack (K-30) 20' to 8' - 4" SS #10 slot well screen 19' to 9' T.D. @ 20.0' below grade in silty clay

000185

EM 1110-1-1801 | PROJECT CHAAP | HOLE NO. 47WW12

Hole No. 47WW16 027688

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP Group IV Phase III		10. SIZE AND TYPE OF BIT Auger Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM & MSL)	
3. DRILLING AGENCY GPI, Inc, Austin TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3½" I.D. 0.D HSA / CME 5 cnt. Sampler	
4. HOLE NO. (As shown on drawing title and title number) 47WW16		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5	UNDISTURBED —
5. NAME OF DRILLER José Landeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated ft.		16. DATE HOLE: STARTED 7-28-98	COMPLETED 7-28-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 19 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR David W. Ahn / Brian Bohn	

ELEVATION a	DEPTH (Ft) b	USC 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
	1	SM	Brown to Reddish Brown silty clay w/ some roots Dry	1.5ft / 4.0ft	SS #1 0.0' to 4.0'	Commenced HSA @ 08:15
	2	CL	silty clay Light Brown w/ o. ... staining and ... molting. Dry			HNu Reading in sampler = (10.2eV Lamp) Oppm
	3					HNu Reading @ Augers = Oppm
	4					
	5		Silty clay gray to reddish Brown (mottled) with brown, o... yellowish brown staining (Damp)	4.5 / 5.0ft	SS #2 4.0' to 9.0'	HNu Reading in sampler = 4ppm
	6					
	7					HNu Reading @ Augers = 2ppm
	8					
	9					
	10	CL	clayey silt - gray with brownish mottling with some sand (moist) mixed throughout	5.0 / ft	SS #3 9.0' to 14.0'	HNu Reading in sampler = 2ppm
	11					
	12		silty clay - gray w/ brownish orange and reddish brown molting (moist)			HNu Reading @ Augers = 15ppm
	13					
	14					
	15		Silty Sand light gray with brown orange staining and pink streaks (wet) poorly sorted	2½ / 4ft	SS #4 14.0' to 18.0'	HNu Reading in sampler =
	16	SM				HNu Reading @ Augers =
	17					water at 17' below ground while drilling
	18	CL	silty clay light gray brown mottled brown with sand staining throughout	1 Ct.	4th SS 18.0' to 19.0'	10 to 15 gpm water flow 16' bgs
	19	SM	silty sand fine grained poorly sorted gray with orange brown staining (moist)			pilothole
	20	CL	silty clay / clayey silt gray with orange brown staining (moist)			TD @ 0955 @ 19.0 BEG.
			T.D. @ 19.0ft. in silty clay (Damp)			

ENG FORM 1836 | PROJECT | HOLE NO.

027690

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW16

PROJECT: Group IV, Phase III | INSTALLATION: LHAAP-Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
						Overdrilled 47W.W16 Shallow pilot hole plugged 11" O.D. HSA to 19.0' below grade (T.D. 19.0') 47WW16 Mon. well comp. - Bentonite grout 4.5 to grade - Bentonite seal 7.5'-4.5' - Sand (30-70) 8'-7.5' - Primary Filter pack (16-30) 19'-8' - 4" ss #10 slot screen @ 19' to 9' - T.D. = 19' below grade in silty clay

000167

PROJECT: LHAAP | HOLE NO.: 47WW16

Hole No. 47WW17

027691

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT Phase III Group IV		10. SIZE AND TYPE OF BIT Auger 8.25	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3½" I.D. 4¼" O.D. HSA / CME's cont. sampler	11" QA HSA
4. HOLE NO. (As shown on drawing title or file number) 47WW17		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED	UNDISTURBED –
5. NAME OF DRILLER Jose Londeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER –	
7. THICKNESS OF OVERBURDEN Penetrated ft		16. DATE HOLE STARTED 8-7-98	COMPLETED 8-7-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR C.M. CPG	

ELEVATION a	DEPTH (ft) 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) Time g
	1	CL	- Clayey silt - Lt. brown/gray with some reddish-brown layering and mottling, some fine sand, some roots, plastic, moist to Dry @ 1.5' (Med. stiff) Clay content inc. with depth	4/4'	SS #1 0.0' to 4.0'	Commenced HSA pilot for 47WW17 @ 0800
	2					HNu Reading in sampler = 0 ppm
	3		- Silty clay - Lt. gray and tan mottled and stained, some fine sand, plastic when wetted - Dry/Damp (V. stiff - Low moisture)			HNu Reading @ Auger = 0 ppm
	4					
	5		- Silty clay, same as clayey silt, Med. to Lt. gray and brown, some greenish-gray, abundant yellowish-orange and tan mottling, staining and staining, plastic, trace to some fine sand - Damp (V. stiff)		SS #2	
	6			5/5'	4.0' to 9.0'	HNu Reading in Sampler = 2 ppm
	7					HNu Reading @ Auger = 0 ppm
	8					
	9	SP-SM	- Sand and silty sand, Lt. fine. gray, tan, and yellowish-orange - mottled, streaked and stained, fine grained sand, poorly sorted - moist (No U.S. H_2O W.D.) (Soft/loose)			0817
	10				SS #3	HNu Reading in sampler = 1 ppm
	11	CL		5/5'	9.0' to 14.0'	
	12		- Clayey silt - Lt. gray to greenish-gray and some Lt. brown and tan with yellowish-orange mottling and staining throughout, some roots, some fine sand plastic - moist (stiff)			HNu Reading @ Auger = 2 ppm
	13					
	14	SM	- Sandy silt - Lt. gray, fine grained sand, poorly sorted, some clayey - moist to wet			0825
	15	CL			SS #4	HNu Reading in Sampler = 0 ppm
	16		- Silty clay - Lt. gray, med. greenish-gray, yellowish-orange, and tan mottled, streaked and stained, trace to some fine sand (some V. thin silt/sandy lenses - moist, plastic - Damp to moist	5/5'	14.0' to 19.0'	HNu Reading @ Auger = 0 ppm
	17					
	18					
	19					0858 - 1" to 2" of muddy water @ base of hole (inside augers)
	20		Dry hole @ T.D. of 19.0' @ 0835 in silty clay			

000168

027692

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 41UW17

PROJECT | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION 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

000169

EPIC FORM ... PROJECT ... HOLE NO. ...

Hole No. 47WW18

027693

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP	SHEET 1 OF 2 SHEETS

1. PROJECT: Group IV - Phase III
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY: GPI, Inc. - Austin, TX
4. HOLE NO. (As shown on drawing title and file number): 47WW18
5. NAME OF DRILLER: José Loureiros
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: Penetrated 210 ft.
8. DEPTH DRILLED INTO ROCK: N/A
9. TOTAL DEPTH OF HOLE: 210 ft. below grade
10. SIZE AND TYPE OF BIT: Auger Bit
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 3¼" I.D. HSA / CME S Cont. Sampler / # of O.D. HSA
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5 / UNDISTURBED –
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED 8-4-98 / COMPLETED 8-4-98
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: Dave Rudolph / Brian Bohn

ELEVATION a	DEPTH (Ft.) b	USC 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	OL-CL	1' of silty and sandy topsoil, abundant roots - Dry, crumbling		SS #1 0.0' to 4.0'	Commenced HSA @ 3¼" I.D. Augers @ 0800
	1	CL	- clayey silt, Lt. brown, some orange-brown mottling. Sl. plastic (when wetted), some fine sand - Dry to Damp (mod. stiff)	2.8'/4.0'		HNu Reading in sample = (10.2 eV Lamp) 1 to 2 ppm
	2					
	3		- Silty clay, Lt. gray, tan brown, yellowish-orange and reddish-brown mottled, streaked, and stained, some block "root-like" structures mixed throughout. Some fine sand, plastic - Moist (stiff)			HNu Reading @ Augers = 2 to 3 ppm
	4				SS #2 4.0' to 9.0'	
	5			6/5'		
	6					HNu Reading in Sample = 0 ppm
	7		(no Vis. water in sample)			
	8					HNu Reading @ Augers = 15+ ppm
	9		- Silty clay, Lt. gray, greenish-gray, brown, yellowish-orange and "rust" brown mottled, and streaked, some abundant "rust" brown and reddish-brown mottling, some apparent V. thin to thin layering, trace to some fine sand - Moist (V. stiff) (plastic) (No Vis. water in sample)		SS #3 9.0' to 14.0'	
	10					
	11			5/5'		HNu Reading in Sample = 0 ppm
	12					
	13		- Silty clay - Lt. gray; greenish-gray with some tan, yellowish-orange, and black staining/staining, some rust" brown mottling throughout, plastic, trace to some fine sand throughout - Moist (stiff to very stiff)			HNu Reading @ Augers = 3+ ppm
	14					
	15				SS #4 14.0' to 19.0'	
	16			5/5'		HNu Reading in Sample = 7 ppm @ 18'
	17		(Wet @ 18' in Sample #4)			
	18	SC	- Sandy clay / clayey sand - Lt. gray, tan, and yellowish-orange (mottled), fine grained sand, Sl. plastic (thin) zones; Wet (NO free water W.D.) (loose - soft) (Free water / Saturated @ 19 ft.)			HNu Reading @ Augers = 0 ppm
	19					
	20	CL			SS #5 19.0'	HNu Reading in Sample = 2 ppm

PROJECT | HOLE NO.

000170

027694

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW18

PROJECT | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION 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
	20	CL	- Silty Clay - Lt. gray, greenish-gray, tan, and yellowish-brn. or mx mottled, stiff, and striped, trace to some fine sand - Moist	2' / 2'	To 21.0	T.D.@ 0855 with 7" pilot hole
	21		T.D. @ 21. ft. below grade @ 0855 in silty clay Moist			- Water @ 16.5' below grade @ 0900 inside 7" O.D. auger
	22					47WW#5 Monitoring well Completion ↓ Bent./cement grout 6.5' to grade; Bent. seal 9.5' to 6.5'; sagon sand (30-70) 10' to 9.5'; Primary filterpack (16-30) 21' to 10'; 4" SS Screen .# to slot 21' to 11'
						T.D.@ 21.0 ft. below grade in silty clay

000171

PROJECT | HOLE NO.

Hole No. 47WW21

027695

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP-Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT Phase III Grp III		10. SIZE AND TYPE OF BIT Auger Bit	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc. - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 2¼" I.D. HSA / CME 5' Cont. Sampler / 11" O.D. HSA	
4. HOLE NO. (As shown on drawing title or title number) 47WW21		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6	UNDISTURBED —
5. NAME OF DRILLER José Landeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated Ft.		16. DATE HOLE: STARTED 8-8-98	COMPLETED 8-8-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE Ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR Chris CDP	

ELEVATION a	DEPTH (Ft.) b	USC 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
		OL CL	0.3 of Dark brown silty sand topsoil (silty clay), moist, organics		SS #1	Commenced HSA pilot hole for 47WW21 @ 0930
	1		- Clayey silt - med. to dark brown w/gray (mottled), some roots, some fine sand, sl. plastic	4/4'	0.0' to 4.0'	
	2		Damp (Soft)			HNu Reading in sample = 1 ppm (10.2 eV Lamp)
	3		- Silty clay - Lt. tan w/ gray/brown some DK gray w/ DK brown mottling, some roots, some fine sand, plastic - Damp to moist (med. stiff)			HNu Reading @ Augers = 0 ppm
	4				SS #2	
	5		- Silty clay - Lt. gray w/ brown with some Dark brown w/ black Mottling - some fine sand, plastic - moist (Soft)	5/5'	4.0' to 9.0'	
	6		- Clayey silt - Lt. gray w/ tan with some red gray, med. brown and yellowish-orange mottling w/ staining - sl. plastic when wetted, some to abundant fine sand - Moist (soft)			HNu Reading in Sample = 2 ppm
	7		- fine sand content increasing with depth			HNu Reading @ Augers = 0 ppm
	8	SM	- Silty Sand - Lt. gray w/ Lt. brown with yellowish orange mottling, fine grained sand, trace fine to med. gravel, poorly sorted - Moist to sl. wet (No vis. H_2O in sample)			
	9				SS #3	
	10		- Sandy silt			HNu Reading in Sample = 0 ppm
	11		- Silty sand - Lt. gray w/ Lt. green/gray with DK gray w/ brown mottling, fine grained sand, v. thin to thin layering, some sl. clayey, poorly sorted - Moist to wet/saturated @ 13' (Loose)	5/5'	9.0' to 14.0'	HNu Reading @ Augers = 0 ppm
	12					Free Water @ 13' in wet Sample (Saturated)
	13		- clay content increasing			
	14	CL	Silty clay/Clayey silt - Lt. gray w/ tan, some yellowish brown/ tan mottling in layers (Horiz.) some black specks, some fine sand, plastic - Damp to moist		SS #4	
	15			5/6'		HNu Reading in Sample = 0 ppm
	16	SM	- Silty sand - Lt. gray w/ tan fine grained, poorly sorted - wet/saturated		14.0' to 19.0'	HNu Reading @ Augers = 0 ppm
	17	CL	- Silty clay - Lt. gray, trace to some reddish-brown mottling w/ streaking, trace fine sand, v. plastic - Damp to moist			
	18		- Fine sand content increasing with depth			
	19	SM	- Silty sand/Sand - Lt. to med. gray w/ tan with some brown mottling, fine grained sand, poorly sorted wet/saturated (loose)	1/1'	SS #5 19.0' to 20.0	HNu Reading in Sample = 0 ppm
		SP-SM				

000172

ENG FORM 1836 — PROJECT LHAAP — HOLE NO. 47WW21

027696

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47WW21

PROJECT | INSTALLATION LHAAP - Kumack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
	21	SP SW-SM	- Sand - Lt. brown/gray, fine grained, some silt, trace gravel, poorly sorted - wet/saturated	2½'	SS #6 20.0 to 22.0'	HNU Reading in sample: 0ppm
	22	CL	- Silty clay/clayey silt - Lt. gray, greenish gray with some yellowish orange staining & mottling, plastic, some fine sand, damp to moist			
	23		*T.D. @ 22.0' @ 1018 in silty clay/clay silt (Damp to moist)			T.D. @ 22.0'
	24		*Water @ 13.3' below grade inside augers @ T.D.			Overdrilled 47WW21 pilot hole to 22' with 11" O.D. HSA
	25					47WW21 Mon. Well completion - bent/cement Grout 5' to grade - bent. seal 8' to 5' - Sugar Sand (30-40) 9' to 8' - Primary Filtrpack (16-30) 22' to 9' - 4" SS #10 slot screen 21' to 11' T.D. @ 22' below grade in silty clay

PROJECT | HOLE NO.

000178

Hole No. 47WW22

027697

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP Group IV Phase III		10. SIZE AND TYPE OF BIT Auger Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI, Inc Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼" ID HSA / Cont. Sample / 11" OD HSA	
4. HOLE NO. (As shown on drawing title or file number)	47WW22	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED	UNDISTURBED
5. NAME OF DRILLER José Landeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE STARTED 8-21-98	COMPLETED 8-21-98
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 20		19. SIGNATURE OF INSPECTOR R. Bolin	

ELEVATION 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
	1	CL	clayey s.lt - yellowish orange clayey silt w/ roots and black staining (Dry)	4' of 4ft	SS#1 0.0' to 4.0'	HSA drilling of pilot hole for 47WW22 Commenced at: 0900 Completed at: 1005
	2	CL	silty clay - Red brown to grey silty clay (mottled) grades to red-brown color towards top grading to grey at bottom some black staining and organic matter (dry at top to damp at bottom)			Hnu Reading Augers = 3ppm Samples
	4					
	5	CL	silty clay - lt grey silty clay w/ some orange brown staining and occ. black staining (Damp) grades into clayey sand around 6.5' to 7'	5' of 5'	SS#2 4.0' to 9.0'	Hnu Reading Aug-s = 0 Sampler = 1ppm
	6					
	7	SC	clayey sand - lt grey to brown (mottled) clayey sand, higher fine content towards top. grades down to sandy s.lt at about 8.5' (Damp)			
	8					
	9					
	10	SC	Sandy silt - lt. grey and brown sandy s.lt grades to (cL) Silty sand at 10.5' (Damp)	5' of 5'	SS#3 9.0' to 14.0'	Hnu Reading Aug-s = 0 Sampler = 2ppm
	11	CL	silty clay - lt grey silty clay with some brown red and black staining. (moist)			
	12					
	13		some minor sand content from 13.5' to 14.0'			
	14	CL	silty clay - yellowish orange to lt Brown - silty clay w/ some black staining grades into sandy silt at 16' (moist)	4' of 5'	SS#4 14.0' to 19.0'	Hnu Reading Augers = 1+ Sampler 1ppm
	15					
	16	SC	Silty Sand - lt brown silty sand with some clay and black staining (wet)			
	17					
	18	SC	Sandy silt - lt tan silty sand w/ some brown staining grades into silty clay around 16.5'			Groundwater at 19' while drilling
	19	CL	silty clay - lt grey w/ brown staining (moist) some sand.		SS#5 4.0 Hand	
		SC	silty sand - brown silty sand poorly sorted (free water)			
		CL				

PROJECT LHAAP HOLE NO.

000174

027698

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47UU22

PROJECT | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION 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
	19			1ft/1ft	#5 19' to 20'	
		CL	silty clay - lt grey - silty clay w/ some brown staining and occasion sand.			
	20	▽ bottom of hole				Ream drilling w/ 11" OD HSA Commenced @ 10:20
						Complete hole @ 1126
						Bent/cement grout 3.5' to grade
						Bentonite seal 6.5' to 3.5'
						Silica-sand 7.5' to 6.5'
						#2 silica filter pack 19.5' to 7.5'
						4" SS Screen 19.5' to 9.5'

000175

ENG FORM ... (FB 1110-1-1401) ... PROJECT ... HOLE NO.

Hole No. 47WW23

027699

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP Karnack, Tx	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP Group III Phase III		10. SIZE AND TYPE OF BIT Hollow Stem	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GDI Inc. Austin, Tx		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼" ID HSA / Cont Sample / 11" HSA	OW
4. HOLE NO. (As shown on drawing title and file number)	47WW23	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9	UNDISTURBED —
5. NAME OF DRILLER Jose Landros		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED 8-21-98 COMPLETED 8-22-98	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 34'		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR Brian Bahr	

ELEVATION 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
	1	CL	silty clay. dk. grey silty clay w/ some brown staining and occasional black staining roots and other organics. (Dry at top to damp at 4') soft to friable	4.0'	SS #1 0.0'	Drilling of pilot hole to 47' commenced at 1340
	2			& 4.0'	W 4.0'	
	3					
	4					
	5	CL	silty clay - dk. to med grey with some brown (mottled) stiff	5.0'	SS #2 4.0'	
	6		dk. brown staining and occasional black staining (smears) (Dry to damp)	& 5.0'	W 9.0'	
	7	CL	silty clay med grey to brown (mottled) w/ lots of black staining (Damp) stiff			
	8					
	9					
	10	SC	sandy silty clay - lt. grey to greenish grey clay with high sand content (Damp) med stiff	5.0'	SS #3 9.0'	
	11	CL	silty clay - light grey clay w/ some silt and brownish staining. (Damp) stiff	& 5.0'	W 14.0'	
	12		silty sand - lt. grey at top to brown at bottom silty sand (moist)			
	13	CL	silty clay - light to mottled grey clay w/ some brown (mottled) some orange brown staining (Damp) stiff			
	14					
	15			5.0'	SS #4 14.0'	
	16			& 5.0'	W 19.0'	
	17	SC	silty clay sand lt. grey and brown sand w/ fines some orange black staining grades into sandy - layer at 18.7' (free water) soft			
	18					
	19	SC	silty clay lt. grey to lt. brown silty w/ some sand (moist) some broken cal. (med stiff)	1.0' of 1.0'	SS #5, 19.0' to 20'	Completed at 1545

000176

027700

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 47wcw23

PROJECT | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION 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
	20					
	21	SM	silty sand - greenish grey sand w/some fines. Some brown organic staining, soft, some lignite in top 1" and bottom 2" (freewater)	1' of 1'	#6 20' to 21'	
	22	SM	silty sand - dark grey silty sand w/occasional clay leases soft consistency (freewater)	1.5' of 3'	#7 21" to 24'	Free water while drilling
	23	SC				
	24					
	25	SC	silty sand light grey and brown laminated sand w/silt occasion clay layer w/ greenish grey color (latter brown "oxidation" staining in sand and silt) medium stiff at top to soft at bottom (moist to wet)	5' of 5'	#8 24' to 29'	
	27		soft			
	28		- Curved lines of oxidation across sample			
	29		med. stiff soft			
	30	SC	silty sand - medium grey sand w/ brown "oxidation" laminae, top 6" soft w/ root hairs and soft to grading into more firm toward 32' (wet to water)	5' of 5'	#9 29' to 34'	overdrilling of well 47wcw23 commenced at 1620 completed at
	32					
	33	CL	silty clay - Reddish brown clay with some silt stiff clay with some silt (moist) grades into a silty sand at ~33.3'			
	34		▽ bottom of pilot hole			Bentonite grout 14' to ground Bentonite seal 17' to 14' sand pack 18' to 17' Primary filter pack 32' to 18' 4" SS screen 32' to 22' #10 slot

000177

PROJECT | HOLE NO.

Hole No. SOWW01(S)

027701

DRILLING LOG	DIVISION USACE - Tulsa	INSTALLATION LHAAP - Karnack TX	SHEET 1 OF 2 SHEETS
1. PROJECT LHAAP Group IV Phase III		10. SIZE AND TYPE OF BIT Auger Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
DRILLING AGENCY GPI, Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3½" I.D. / 5' CME Cont. Sampler / 1" o.d. HSA	
HOLE NO. (As shown on drawing title and file number) SOWW01		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5	UNDISTURBED –
5. NAME OF DRILLER Jose Lomeros		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER –	
7. THICKNESS OF OVERBURDEN Penetrated 20 ft.		16. DATE HOLE STARTED 7-27-98	COMPLETED 7-27-98
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 20.0 ft. below grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR W. A. CPG	

ELEVATION a	DEPTH (ft.) b	USC 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	OL SM	- 0.2' of topsoil, sandy silt with abundant roots - Dry overlying -		SS #1 0.0' to 4.0'	Commenced HSA @ 0835
	1		- Sandy silt - Lt. brown, gray tan, w/ yellowish-brown, fine grained sand, trace to some roots - Dry (loose)	3.2'		HNu Reading in sampler = 0 ppm
	2					
	3					HNu Reading @ Augers = 0 ppm
	4		- Sandy silt - Lt. gray, Lt. brown and tan, fine grained sand, poorly graded - Dry (stiff to loose)		SS #2 4.0' to 9.0'	
	5					
	6			4.6'		HNu Reading in Sampler = 0 ppm
	7					
	8	CL	- Silty clay Lt. gray and greenish-gray, some tan with abundant reddish-brown and yellowish orange staining and mottling, trace and irregular layering (v. thin) trace fine sand throughout - Damp (v. stiff)			HNu Reading @ Augers = 0 ppm
	9					
	10				SS #3 9.0' to 14.0'	
	11					
	12	SC CL	- Sandy Clay Lt. gray and Light brown, fine grained sand, some Sl. plastic, silty, poorly sorted sand - Wet to saturated @ 12.4'	5.0'		HNu Reading in Sampler = 0 ppm
	13	SC				HNu Reading @ Augers = 0 ppm
	14	CL	- Silty clay - Lt. gray and greenish-gray, some tan, with abundant yellowish-brown mottling and staining, plastic, some fine sand - Damp (stiff)		SS #4 14.0' to 19.0'	
	15					
	16					HNu Reading in Sampler = 0 ppm
	17	SC CL SC	- Clayey sand - Lt. brown and gray - some tan (mottled) fine grained sand, some U. Silt, poorly sorted, some Sl. plastic - saturated (loose)	5.0'		HNu Reading Augers = 0 ppm
	18					
	19	CL	- Silty clay - Lt. to med. gray, brown, tan, orange-brown and rust colored mottled, streaked, stained and layered (U. thin) trace to some fine sand, U. plastic - Damp (v. stiff)			
	20			1.0'	SS #5 19.0'-20.0'	HNu Reading in Sampler = 0 ppm HNu Reading Augers = 0 ppm

000178

027702

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. 50WW01(S)

PROJECT | INSTALLATION LHAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
			T.D. @ 20.0 ft. below grade in Damp silty clay @ 0910			T.D. @ 20' below grade 0940 overdrilled pilot hole with plugged (Enviroplug) 11" O.D. Auger to 20.0 ft. for 4" SS Mon. well install. Bent./Cement Grout 5'-1ft grade Bent. Seal 8'-5' Sugar Sand (20-40) 9'-8' Primary filterpack (10-30) 20'-9' 4" SS #10 slot screen 20'-10' T.D. - 20.0 below grade

PROJECT | HOLE NO.

000179

Hole No. SOWW02(S)

027703

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LHAAP - Karnack, TX	SHEET 1 OF 1 SHEETS
1. PROJECT: LHAAP Group II Phase III		10. SIZE AND TYPE OF BIT: Auger bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
DRILLING AGENCY: GPI Inc - Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 5' CME Cont sampler / 3½" I.D. HSA & 11" O.D. HSA	
4. HOLE NO. (As shown on drawing title and file number): SOWW02		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED	UNDISTURBED
5. NAME OF DRILLER: José Lonteros		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE: STARTED 7-25-98	COMPLETED 7-26-98
7. THICKNESS OF OVERBURDEN: Penetrated 19 ft.		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK: N/A		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
9. TOTAL DEPTH OF HOLE: 19.0' ft. below grade		19. SIGNATURE OF INSPECTOR: CMG	

ELEVATION (a)	DEPTH (ft.) (b)	USC 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	Fill	Fill - Dark brown and Reddish brown silty clay, silty sand and sandy silt with abundant fine to coarse gravel, trace Asphalt Frag. - Dry	2.5'	SS #1 0.0' to 4.0'	Commenced HSA 7" O.D pilot hole @ 1330
	3	CL	- Silty clay - Dark brown and reddish-brown some orange-brown silt laminations - Dry to Damp (Stiff)			HNu Reading @ sample = 0 ppm
	4					HNu Reading @ Auger = 0 ppm
	5		- Clayey silt - Lt. to med. gray with some orange brown and reddish-brown mottling, streaking and staining, abundant V. thin fissures & seams and fine sandy silt inclusion layers. sl. plastic - Dry to Damp (med. stiff) (inc. silt + sand content with Depth)	4.0'	SS #2 4.0' to 9.0'	HNu Reading @ sample = 0 ppm
	8					(clay "mows" easily in hand [moisture] below 8 ft.)
	9					
	10		- Clay silt / silty clay - Lt. greenish-gray, tan and gray with some reddish brown streaking and staining, trace to some fine sand throughout, plastic - Damp to Moist (stiff)	No Rec. (logged cuttings)	SS #3 9.0' to 14.0'	HNu Reading @ sample = NA
	12					HNu Reading @ auger = 0 ppm
	13					
	14		- Silty clay - Lt. gray and Cl. greenish-gray with some to abundant reddish and orange-brown streaking, staining and mottling, some fine sand throughout with occ in V. thin layers, trace roots - Damp to Moist - Lt. wet along fine sands (stiff)	5.0'	SS #4 14.0' to 19.0'	HNu Reading @ Sample = 0 ppm
	17					
	18					
	19		T.D. @ 19.0' below grade in silty clay @ 1430			Water @ base of hole (rpm) after 15 min.
	20					

PROJECT | HOLE NO.

000180

027704

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. SDWW02

PROJECT LHAAP Group I Phase III | INSTALLATION LHAAP - Karnack, TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
						Over-drilled pilot hole with 11" O.D. plugged HSA - Installed 4" SS mon. well Grout - 4.5' to surface Bent. Seal 2.5'-4.5' Sugar Sand (30-70) 8.5-7.5' Primary Sand (16-30) 11-8.5' 4" SS #10 slot screen 19'-9' T.D. hole 19' backfilled

ENG FORM [illegible] PROJECT LHAAP Group II HOLE NO. [illegible]

000181

Hole No. 50WW03(S) 027705

DRILLING LOG	DIVISION: USACE - Tulsa	INSTALLATION: LHAAP - Karnack, TX	SHEET 1 OF 2 SHEETS
1. PROJECT: LHAAP Group II Site 50		10. SIZE AND TYPE OF BIT: Auger Bits	
2. LOCATION (Coordinates or Station): LHAAP Group II Phase III Site 50		11. DATUM FOR ELEVATION SHOWN (TBM or MSL):	
3. DRILLING AGENCY: GPI, Inc. Austin, TX		12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75 / 5 cmt cont. Sampler / 3¼" I.D. 7" O.D. HSA	11"OD HSAs
4. HOLE NO. (As shown on drawing title and file number): 50WW03		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5	UNDISTURBED —
5. NAME OF DRILLER: Jose Lunderos		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: —	
		16. DATE HOLE: STARTED 7-26-98	COMPLETED 7-26-98
7. THICKNESS OF OVERBURDEN: Penetrated 20.0 ft.		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK: N/A		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
9. TOTAL DEPTH OF HOLE: 20.0 below grade		19. SIGNATURE OF INSPECTOR: [signature] CPG	

ELEVATION (a)	DEPTH (Ft) (b)	USC 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)
	0–1	SM	- Sandy silt - Lt. gray, lt. brown, and tan, fine grained sand, poorly graded, trace roots - Dry to Damp (med. stiff to soft)	4.0'	SS #1 0.0' to 4.0'	Commenced HSA @ 3¼" I.D. HSAs @ HNu Reading @ Sampler = (10.2 eV PID) 0 ppm HNu Reading @ Augers = ppm
	3	CL	- Silty clay - Lt. tomed. gray, abundant reddish-brown and yellow-brown mottling and staining, some fine sand, trace roots - Some Dry to Generally Moist plastic (stiff)			
	5–6		- Silty clay - Lt. to med. gray-blown, tan, orange-brown and yellow-brown mottled streaked and stained, Tr. fine sand and roots - Damp	4.5'	SS #2 4.0' to 9.0'	HNu Reading @ Sampler = 0 ppm
	7					HNu Reading @ augers 0 ppm
	8	SC	Sandy clay - Lt. gray tan and orange-brown (mottled), fine grained sand, Sl. plastic - Moist			
	9	CL				
	10		- Silty clay - Lt. gray and greenish gray with abundant yellowish orange and reddish-brown staining some black colored root-like structures, some fine sand - Damp to Prev. Moist (V. stiff)	5.0'	SS #3 9.0' to 14.0'	HNu Reading @ Sampler = 0 ppm
	12					HNu Reading @ Augers = 0 ppm
	13		*(Some vis H2O along some horizontal breaks and in thin silt and Sandy)			
	14		- Silty clay - Lt. gray and greenish-gray with abundant yellowish-orange mottling and staining, some black root-like structures though out sample, trace to some fine sand - Moist to wet along w/thin silt/sand breaks (stiff	5.0'	SS #4 14.0' to 19.0'	(* Trace "solvent like odor from Sample #4)
	16					HNu Reading @ Sample = 0 ppm
	17					HNu Reading @ Augers = 20+ ppm
	18		- Silty clay - Lt. gray and greenish gray with yellowish-orange staining (5to 15%) black root-like structures - Moist			
	19		(Vis. H2O in sampler along hori. mode breaks @ 19.0' of sample #4)	1.0'	SS #5 19.0' to 20.0'	HNu Reading @ Sampler = 0 ppm
	20		@ 20.0' @ CMP T.D. in Silty clay as above)			HNu Reading on Augers = 104 ppm

000185

FIG FORM [illegible] PROJECT [illegible] HOLE NO.

027706

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. SDWW03

PROJECT: Group J Phase II Site 58 | INSTALLATION: CHAAP - Kurnell TX | SHEET 2 OF 2 SHEETS

ELEVATION 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
						- pulled Augers up 10ft and waiting on water in open hole @ 0950
						- 1010 WL @ 19.2' in open hole
						• Overdrilled 7" pilot hole with plugged 11" O.D HSA to 20' For 4" SS Well Installation
						- Bentonite Grout 5' to grade
						- Bent. seal 8' - 5'
						- Sand pack (30-70) 9' - 5'
						- Primary Sand (16-30) 20' - 9'
						- 4" SS #10 slot screen 20' - 10'
						- T.D. - 20.0' below grade with 11" O.D. Augers

000183

ENG FORM [illegible] (ER 1110-1-1801) | PROJECT | HOLE NO.

Hole No. SOWW04 027707

DRILLING LOG	DIVISION Gulf - Texas	INSTALLATION LHAAP - Karnack, TX	SHEET 1 OF 7 SHEETS
1. PROJECT CHAAP Group IV Phase III		10. SIZE AND TYPE OF BIT Tricone Bits	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY GPI - Austin TX		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75 / 3¼ I.D. HSA / 2" O.D. Split Spoon / 11" OD HSA	
4. HOLE NO. (As shown on drawing title and file number) SOWW04		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5	UNDISTURBED —
5. NAME OF DRILLER José Londeios		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN Penetrated 20 ft.		16. DATE HOLE STARTED 7-26-98 COMPLETED 7-27-98	
8. DEPTH DRILLED INTO ROCK N/A		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 20.0 ft. Below Grade		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR Cindy Sue	

ELEVATION a	DEPTH (Ft) b	USC 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
	0–4	SM	- Sandy silt - Lt. gray, Lt. brown, mottled, Fine grained sand, poorly sorted, trace to some roots - Dry (stiff)	4.0'	SS #1 0.0' to 4.0'	Commenced T.O.D. HSA @ 1415
			(clay content inc.)			HNu Reading in sampler = 0ppm
	4–9	CL	- Silty clay - Med Reddish brown with Lt. to med. gray mottling, some small black specks throughout, trace to some fine sand, trace roots; plastic - Moist (stiff)	5.0'	SS #2 4.0' to 9.0'	HNu Reading @ Auger is 0ppm
						HNu Reading in sampler = 0ppm
	9–11	SC	- Sandy clay - Lt. gray to med. gray, tan, orange-brown, and yellowish-orange (mottled) fine grained sand, sl plastic throughout in non clayey zones - Moist to sl. wet (soft-loose)	5.0'	SS #3 9.0' to 14.0'	HNu Reading @ Auger is 0ppm
						HNu Reading in sampler = 0ppm
	11–14	CL	- Silty clay - Lt. gray, greenish-gray, tan and Dark gray mottled, streaked & layered (v. thin), some v. thin sl. wet sandy silt lenses (horiz.), some fine sand throughout - Moist to sl. wet			HNu Reading @ Auger is 0ppm
	14–17		- Clayey silt - Lt. to med. gray and greenish-gray, tan and yellowish-orange, some to abundant fine sand throughout sample, sl. plastic - Moist to sl. wet (soft to stiff)	5.0'	SS #4 14.0' to 17.0'	HNu Reading in Sampler = 0ppm
						HNu Reading @ Auger is 0ppm
	19–20		T.D. @ 20.0' Below Grade in gray clay @ 1500	1.0'	SS #5 19 to 20.0	HNu Reading @ Auger is 0ppm

000184

PROJECT HOLE NO.

027708

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. SOWW04

PROJECT | INSTALLATION | SHEET 1 OF 2 SHEETS

ELEVATION 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
						-1' of water @ base of borehole upon completion (T.D. @ 20.0')
						-Pilot hole was overdrilled with plugged 11" HSA to 20.0' below grade, for 4" SS mon. well install
						Bent/cement Grout 5'-grade
						Bent. seal 8'-5'
						Sugar Sand (30-70) 9'-8'
						Primary Filterpack (16-30) 20-9'
						4" SS #10 slot screen 20'-10'
						T.D. @ 20.0' below grade

ENG FORM 1836-A (ER 1110-1-1801) GPO 1980 OF-620-603 | PROJECT | HOLE NO. SOWW04

000185

027709

Appendix B

Analytical Tables Pre-Phase I

Table and Lists of Laboratory Analyses Performed
EPS 1982: *Longhorn Army Ammunition Plant Contamination Survey*

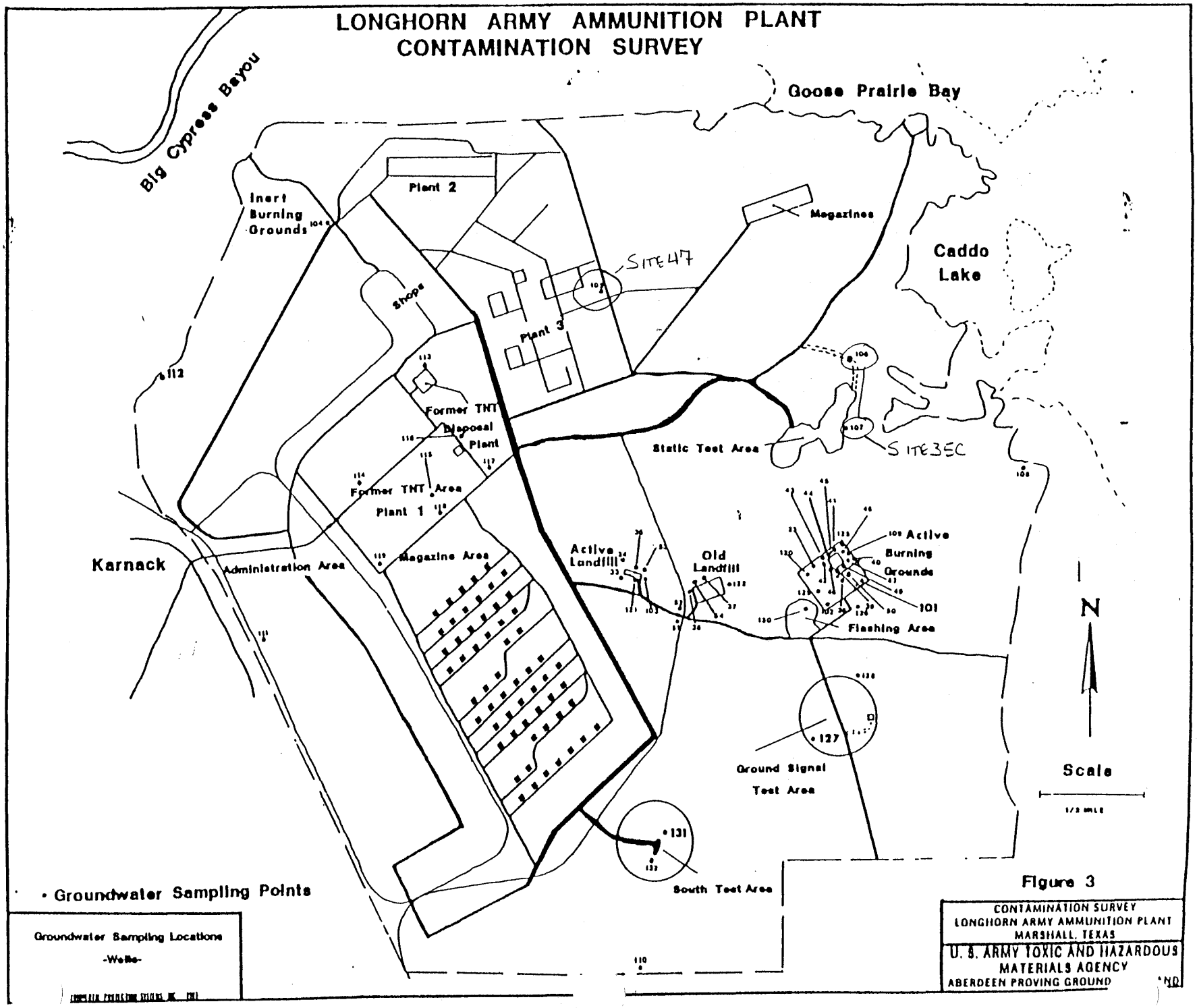
Table 4

Analytes Determined for the Longhorn
Army Ammunition Plant Contamination Survey

Analytical Category	Analyte	Matrix
1	1,3 Dinitrobenzene (1,3-DNB)	All
	2,4,6-Trinitrotoluene (2,4,6-TNT)	All
	1,3,5-Trinitrobenzene (1,3,5,-TNB)	All
	2,4-Dinitrotoluene (2,4-DNT)	All
	2,6-Dinitrotoluene (2,6-DNT)	All
	Nitrobenzene (NB)	All
2	Nitrates	All
	Nitrites	All
	Phosphates	All
	Sulfates	All
	Chloride*	All
	Fluoride*	All
	Chromate*	All
	Cyanide*	All
3	Aluminum	All
	Antimony	All
	Barium	All
	Cadmium	All
	Chromium	All
	Lead	All
	Manganese	All
	Strontium	All
	Mercury*	All
	Copper*	All
	Zinc*	All
	Arsenic*	All
	Beryllium*	All
	Silver*	All
	Thallium*	All
4	GC/MS (Volatiles)	W
	GC/MS (Acid fraction)	All
	GC/MS (Base/neutral fraction)	All
5	HPLC (Screen of general organic compounds)	All
6	GC/EC (Screen for pesticides, organochlorines, PCB's, and related compounds)	All

* Semi-quantitative determination
W=Surface water and groundwater
All=Surface water, Groundwater, soil and sediment

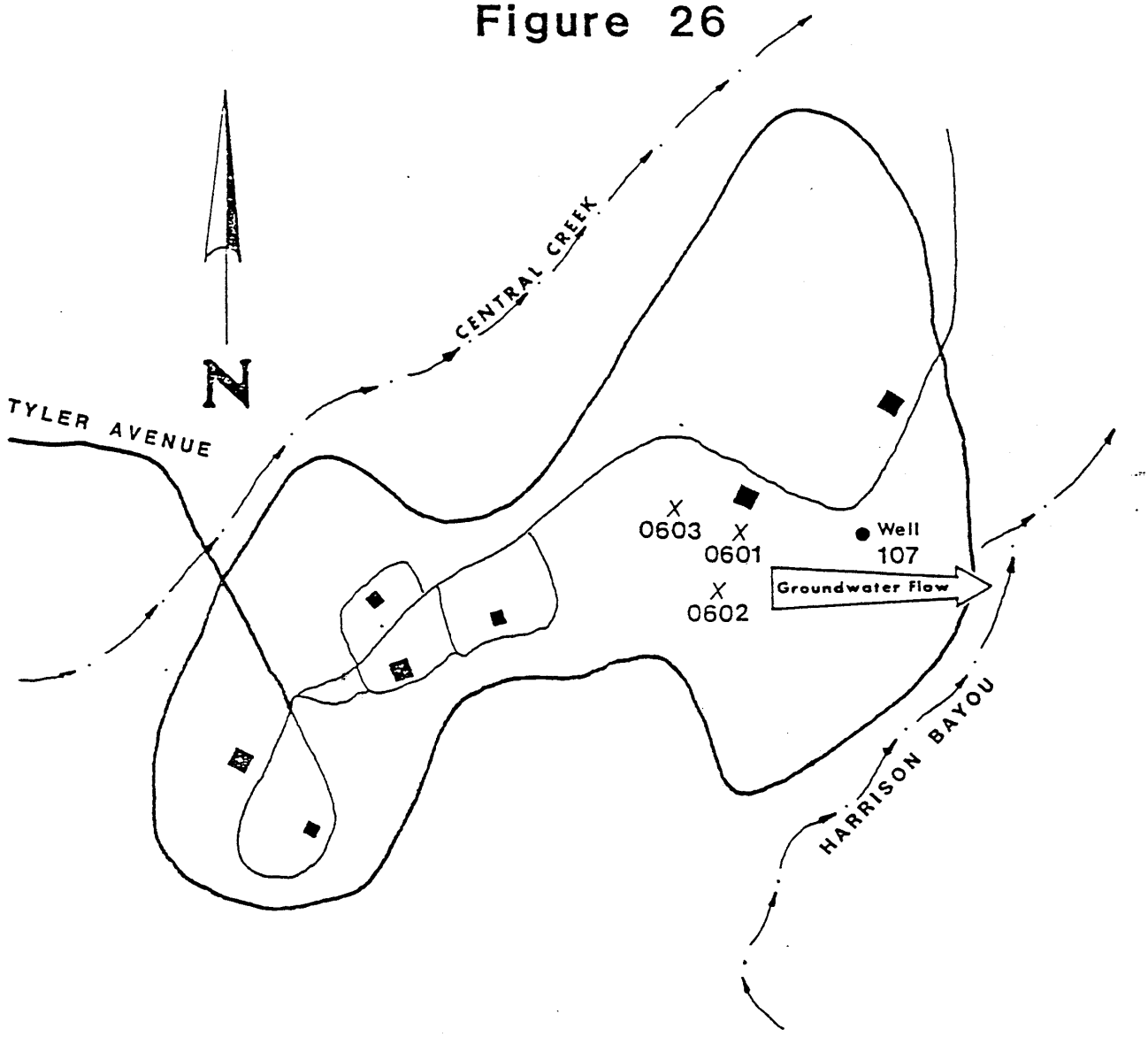
000062



9

027714

Figure 26



▲ Surface Water/Sediment Sampling Site
X Soil Sampling Site
● Well Installed During Project
▲ Existing AEHA Well (*AEHA No.)
▲ Proposed Surface Water/Sediment Sampling Site
● Proposed Well Location
X Proposed Soil Sampling Location

APPROX SCALE 1:4180

Static Test Area

SOURCE: ENVIRONMENTAL PROTECTION SYSTEMS, INC. - 1983

CONTAMINATION SURVEY
LONGHORN ARMY AMMUNITION PLANT
MARSHALL, TEXAS

U. S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
ABERDEEN PROVING GROUND, MARYLAND

0000004

Table A-2

Longhorn Army Ammunition Plant Contamination Survey
Summary of Analytical Data for Groundwater Samples

SITE 35C

Analyte	Inert Burning Ground	Former TNT Incinerator	South Test Area		Static Test Area	
	Well 104	Well 113	Well 131	Well 132	Well 106	Well 107
ANIONS						
Nitrate	3500.		<	<	<	<
Nitrite	<		<	<	<	<
Phosphates	<		<	<	<	<
Sulfate	5710.		216600.	337000.	73300.	54650.
Chloride	8000.		27850000.	10330000.	137000.	145000.
Fluoride	<		1000.	1000.	<	<
Chromate	<		<	<	<	<
Thiocyanate	<		<	<	<	<
Cyanide	<		<	<	<	<
METALS						
Aluminum	372.00		222.00	232.00	249.00	154.00
Antimony	<		<	<	<	<
Barium	67.00		47.80	53.40	13.30	<
Cadmium	0.97		0.93	9.24	3.92	4.68
Chromium	45.70		<	14.50	8.50	10.30
Lead	34.30		<	16.30	15.10	10.00
Manganese	85.00*		<	1448.00*	652.00*	187.00*
Strontium	96.00		1340.00	2640.00	272.00	260.00
Mercury	<		<	<	<	<
Copper	<		<	<	<	<
Zinc	<		<	<	<	<
Arsenic	21.		<	<	<	<
Beryllium	<		<	<	<	<
Nickel	57.+		53.+	102.+	41.+	<
Selenium	<		<	<	<	<
[illegible]ver	<		<	<	<	<
[illegible]lium	<		90.+	100.+	<	<

0227713

Table A-2
(Continued)

Analyte	Inert Burning Ground	Former TNT Incinerator	South Test Area		Static Test Area	
	Well 104	Well 113	Well 131	Well 132	Well 106	Well 107
EXPLOSIVES						
1,3-DNB	<	<	<	<	<	<
2,4,6-TNT	<	<	<	<	<	<
1,3,5-TNB	9.74	<	<	<	4.38	<
2,4-DNT	<	<	<	<	<	<
2,6-DNT	<	<	<	<	<	<
Nitrobenzene	1.82	<	<	<	<	<
ORGANICS (GC/MS)						
Benzene	<	NA	<	NA	NA	<
Chloroform	<	NA	<	NA	NA	<
Trichlorethylene	<	NA	<	NA	NA	<
Pentachlorophenol	<	NA	<	NA	NA	<
o-chlorophenol	<	NA	<	NA	NA	<
2,4-dichlorophenol	<	NA	<	NA	NA	<
Dibutylphthalate	<	NA	<	NA	NA	<
Diethylphthalate	<	NA	52.	NA	NA	<
Nitrobenzene	<	NA	<	NA	NA	ND
Dichloromethane	<	NA	ND	NA	NA	<
1,1'-bicyclohexyl	ND	NA	<	NA	NA	ND
2-(1,1-dimethyl-ethoxy)-ethanol	ND	NA	24.	NA	NA	ND
Pentane	ND	NA	ND	NA	NA	<
Trichloroethane	ND	NA	ND	NA	NA	<
Trichloromethane	ND	NA	ND	NA	NA	<
Trichloroethene	ND	NA	ND	NA	NA	<

000005

027714

000006

Table A-2
(Continued)

Analyte	Inert Burning Ground	Former TNT Incinerator	South Test Area		Static Test Area	
	Well 104	Well 113	Well 131	Well 132	Well 106	Well 107
Glycine,N-acetyl-N-(trifluoroacetyl)-methylester	ND	NA	ND	NA	NA	<
1-bromo-2-methoxy-cyclopentane	ND	NA	ND	NA	NA	<
Di-N-butylphthalate	ND	NA	ND	NA	NA	<
ORGANICS (GC/EC)						
p,p'-DDT	<	NA	ND	NA	<	NA
Dieldrin	<	NA	ND	NA	<	NA
Alpha-BHC	<	NA	ND	NA	<	NA
Heptachlor	<	NA	ND	NA	<	NA
Lindane	<	NA	ND	NA	<	NA
Toxaphene	<	NA	ND	NA	<	NA
Aroclor 1016	<	NA	ND	NA	<	NA
Aroclor 1260	<	NA	ND	NA	<	NA

All results are expressed in ug/l
< Less than established detection limit (Table 5) or, for semiquantitative organics <10 ug/l
* Exceeds limit designated by Texas Department of Health Drinking Water Standards (Table 6)
+ Exceeds limit of Aquatic Life Criteria or Human Health Criteria designated by U.S. Environmental Protection Agency (Table 7)
# Exceeds limit recommended by U.S. Army Medical Bioengineering Research and Development Laboratory (Table 8)
NA Not analyzed
ND Not detected

027715

Table C-6

Longhorn Army Ammunition Plant Contamination Survey
Summary of Analytical Data for Soil Samples from
Static Test Area

Analyte	Soil 601	Soil 602	Soil 603
ANIONS			
Nitrate	<	14.94	12.23
Nitrite	<	<	<
Phosphates			
Sulfate	70.00	411.05	148.72
Chloride	21.	1224.	89.
Fluoride	11.	<	9.
Chromate	<	<	<
Thiocyanate	<	<	<
Cyanide	<	<	<
METALS			
Aluminum	3.7	1276.7	1185.6
Antimony	<	<	<
Barium	126.2	83.8	106.1
Cadmium	<	<	<
Chromium	9.8	6.0	8.8
Lead	27.0	27.3	27.4
Manganese	141.6	61.2	162.2
Strontium	14.5	6.6	10.8
Mercury	<	<	<
Copper	23.8	4.2	9.4
Zinc	26.9	52.9	49.9
Arsenic	<	<	<
Beryllium	<	<	<
Nickel	8.	3.	7.
Selenium	<	<	<
Silver	<	<	<
Thallium	<	<	<

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027716

000088

Table C-6
(Continued)

Analyte	Soil 601	Soil 602	Soil 603
EXPLOSIVES			
1,3-DNB	<	<	<
2,4,6-TNT	<	<	<
1,3,5-TNB	<	<	<
2,4-DNT	<	<	<
2,6-DNT	<	<	<
Nitrobenzene	<	<	<
ORGANICS (GC/MS)			
Benzene	NA	NA	NA
Chloroform	NA	NA	NA
Trichlorethylene	NA	NA	NA
Pentachlorophenol	NA	NA	NA
o-chlorophenol	NA	NA	NA
2,4-dichlorophenol	NA	NA	NA
Dibutylphthalate	NA	NA	NA
Diethylphthalate	NA	NA	NA
Nitrobenzene	NA	NA	NA

All results for soil samples are reported in ug/g
< Less than established detection limit (Table 5) or, for semiquantitative organics <10 ug/g
NA Not analyzed

027717

Table A-6

Longhorn Army Ammunition Plant Contamination Survey
Summary of Analytical Data for Groundwater Samples

Analyte	Flashing Area Well 130 (Site 17)	Ground Signal Test Area Well 127	Ground Signal Test Area Well 128	Site 47 Rocket Motor Plant Well 105
ANIONS				
Nitrate	<	<	<	24000.*
Nitrite	<	<	<	<
Phosphates	<	<	<	<
Sulfate	152200.	1622000.*	559000.*	1846690.*
Chloride	2348000.*	832000.*	1000000.*	820000.*
Fluoride	1000.	1000.	<	<
Chromate	<	<	<	<
Thiocyanate	<	<	<	<
Cyanide	<	<	<	<
METALS				
Aluminum	125.00	36.90	353.00	377.00
Antimony	<	<	<	<
Barium	105.00	46.00	51.50	32.50
Cadmium	2.22	9.99	4.69	9.72
Chromium	<	11.60	<	11.90
Lead	<	<	<	<
Manganese	<	1860.00*	1088.00*	3340.00*
Strontium	1160.00	3360.00	4120.00	6920.00
Mercury	<	<	<	<
Copper	<	<	<	<
Zinc	<	<	<	<
Arsenic	<	<	<	<
Beryllium	<	<	<	<
Nickel	81.+	157.+	82.+	137.+
Selenium	<	<	<	<
Silver	<	<	<	<
Thallium	100.+	140.+	110.+	60.+

000089

027718

000010

Table A-6
(Continued)

Analyte	Flashing Area Well 130	Ground Signal Test Area Well 127	Ground Signal Test Area Well 128	Rocket Motor Plant Well 105
EXPLOSIVES				
1,3-DNB	<	<	<	<
2,4,6-TNT	<	<	<	<
1,3,5-TNB	<	<	<	<
2,4-DNT	<	<	<	<
2,6-DNT	<	<	<	<
Nitrobenzene	<	<	<	<
ORGANICS (GC/MS)				
Benzene	<	NA	<	NA
Chloroform	<	NA	<	NA
Trichlorethylene	<	NA	<	NA
Pentachlorophenol	<	NA	<	NA
o-chlorophenol	<	NA	<	NA
2,4-dichlorophenol	<	NA	<	NA
Dibutylphthalate	<	NA	<	NA
Diethylphthalate	<	NA	<	NA
Nitrobenzene	<	NA	<	NA
Dichloromethane	153.	NA	ND	NA
Tetrahydrofuran	46.	NA	ND	NA
Trichloroethene	< 9	NA	ND	NA
2-(1,1-dimethyl-ethoxy)-ethanol	<	NA	ND	NA

All results are expressed in ug/l;
< Less than established detection limit (Table 5) or, for semiquantitative organics <10 ug/l
* Exceeds limit designated by Texas Department of Health Drinking Water Standards (Table 6)
+ Exceeds limit of Aquatic Life Criteria or Human Health Criteria designated by U.S. Environmental Protection Agency (Table 7)
# Exceeds limit recommended by U.S. Army Medical Bioengineering Research and Development Laboratory (Table 8)
NA analyzed
ND detected

027719

Appendix C

Remedial Investigation Results for Detected Compounds

VOCs and SVOCs in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	LH-S114-01	LH-S114-01	LH-S114-01	LH-S114-02	LH-S114-02	LH-S114-02	LH-S115-01
Sample Number:	LH-S114-01_1	LH-S114-01_2	LH-S114-01_3	LH-S114-02_1	LH-S114-02_2	LH-S114-02_3	LH-S115-01_1
Date Sampled:	07/13/1993	07/13/1993	07/13/1993	07/13/1993	07/13/1993	07/13/1993	08/04/1993
Depth (ft.):	0.50	3.00	11.50	0.50	3.40	12.00	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ACETONE	ND [100] U	11/5/00	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	396

0000001

027721

VOCs and SVOCs in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	LH-S115-01	LH-S115-01	LH-S115-02	LH-S115-02	LH-S115-02	LH-S116-01	LH-S116-01
Sample Number:	LH-S115-01_2	LH-S115-01_3	LH-S115-02_1	LH-S115-02_2	LH-S115-02_3	LH-S116-01_1	LH-S116-01_2
Date Sampled:	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	07/07/1993	07/07/1993
Depth (ft.):	7.00	8.50	0.60	7.00	15.00	0.00	4.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
bis(2-ETHYLHEXYL) PHTHALATE	775	1100	1340	427	829	ND [330] U	ND [330] U

000002

027722

VOCs and SVOCs in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	LH-S116-02	LH-S116-02	LH-S118-01	LH-S118-01	LH-S118-02	LH-S118-02
Sample Number:	LH-S116-02_1	LH-S116-02_2	LH-S118-01_1	LH-S118-01_2	LH-S118-02_1	LH-S118-02_2
Date Sampled:	07/07/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993
Depth (ft.):	0.00	4.00	0.00	2.00	0.00	2.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

000003

027723

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	LH-S114-01	LH-S114-01	LH-S114-01	LH-S114-02	LH-S114-02	LH-S114-02	LH-S116-01	LH-S116-01
Sample Number:	LH-S114-01_1	LH-S114-01_2	LH-S114-01_3	LH-S114-02_1	LH-S114-02_2	LH-S114-02_3	LH-S116-01_1	LH-S116-01_2
Date Sampled:	07/13/1993	07/13/1993	07/13/1993	07/13/1993	07/13/1993	07/13/1993	07/07/1993	07/07/1993
Depth (ft.):	0.50	3.00	11.50	0.50	3.40	12.00	0.00	4.00
PESTICIDES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS								

0000074

027724

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	LH-S116-02	LH-S116-02	LH-S118-01	LH-S118-01	LH-S118-02	LH-S118-02	SUMP114	SUMP114
Sample Number:	LH-S116-02_1	LH-S116-02_2	LH-S118-01_1	LH-S118-01_2	LH-S118-02_1	LH-S118-02_2	SUMP114(0-0.5)	SUMP114(3-5)
Date Sampled:	07/07/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	08/07/1998	08/07/1998
Depth (ft.):	0.00	4.00	0.00	2.00	0.00	2.00	0.00	3.00
PESTICIDES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA		
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	66 J	ND [38] U
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	173.964	18.928
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	17.462	ND [1.008] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	19.12	ND [1.711] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	ND [1.794] U	ND [1.014] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	8.275	ND [1.141] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	27.066	ND [1.237] U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	ND [2.011] U	ND [1.804] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	ND [3.126] U	ND [1.845] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	615.415	43.031
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	17.462	ND [1.008] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	50.13	ND [1.014] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	30.678	ND [1.141] U
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	5883.823	3187.375
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	30.376	ND [2.095] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	111.827	ND [1.292] U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	ND [2.011] U	ND [1.804] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	ND [3.126] U	ND [1.845] U
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS							NA	NA

0000005

027725

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	SUMP118	SUMP118	SUMP118
Sample Number:	SUMP118(0-0.5)	SUMP118(0-0.5)FD	SUMP118(3-5)
Date Sampled:	08/12/1998	08/12/1998	08/12/1998
Depth (ft.):	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG			
NO DETECTED COMPOUNDS		NA	
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG			
PCB-1254 (AROCHLOR 1254)	ND [36] U	NA	ND [43] U
DIOXINS AND FURANS - UNITS: NG/KG			
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	75.982	NA	ND [2.336] U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	11.272	NA	ND [0.833] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	2.528	NA	ND [0.67] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.287	NA	ND [0.705] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.375] U	NA	ND [0.447] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.482] U	NA	ND [0.373] U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	2.027	NA	ND [0.91] U
2,3,7,8-TETRACHLORODIBENZOFURAN	3.71	3.194	ND [0.979] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	159.034	NA	ND [2.336] U
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	11.272	NA	ND [0.833] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	15.886	NA	ND [0.705] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	14.277	NA	ND [0.447] U
OCTACHLORODIBENZO-p-DIOXIN	1130.927	NA	45.909
OCTACHLORODIBENZOFURAN	32.701	NA	ND [1.472] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	3.148	NA	ND [0.389] U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	2.027	NA	ND [0.91] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.453] U	NA	0.979
EXPLOSIVES - UNITS: UG/KG			
NO DETECTED COMPOUNDS	NA	NA	NA

000006

027726

Metals in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	LH-S114-01	LH-S114-01	LH-S114-01	LH-S114-02	LH-S114-02	LH-S114-02	LH-S115-01	LH-S115-01	LH-S115-01
Sample Number:	LH-S114-01_1	LH-S114-01_2	LH-S114-01_3	LH-S114-02_1	LH-S114-02_2	LH-S114-02_3	LH-S115-01_1	LH-S115-01_2	LH-S115-01_3
Date Sampled:	07/13/1993	07/13/1993	07/13/1993	07/13/1993	07/13/1993	07/13/1993	08/04/1993	08/04/1993	08/04/1993
Depth (ft.):	0.50	3.00	11.50	0.50	3.40	12.00	0.50	7.00	8.50
METALS - UNITS: UG/KG									
ALUMINUM	9150000	11700000	4260000	11100000	23500000	12500000	4950000	7960000	5970000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2700	2000	1300	2600	ND [1000] U	4900	1800	2500	2100
BARIUM	75000	71400	79500	60500	79800	166000	70000	14000	27000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	283000	815000	384000	999000	879000	1780000	535000	560000	445000
CHROMIUM, TOTAL	15300	12800	5700	13900	20400	16100	7000	10000	9000
COBALT	3800	2800	5300	5100	4200	10100	ND [1000] U	ND [1000] U	ND [1000] U
COPPER	2900	6100	3600	5900	6700	8600	3000	2000	4000
IRON	16500000	19200000	10600000	17400000	15900000	26100000	8190000	10800000	11000000
LEAD	12400	9800	4700	11300	7200	6800	1600	1700	6500
MAGNESIUM	1360000	1130000	1270000	786000	1710000	2600000	311000	341000	574000
MANGANESE	160000	32200	53300	183000	36500	198000	28000	14000	24000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	444000	670000	354000	669000	1260000	994000	313000	380000	398000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	4900	13300	7500	13400	21200	36600	15000	8000	17000
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	15100	29000	24100	45600	42400	55500	8000	7000	10000

0027727

0027727

Metals in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	LH-S115-02	LH-S115-02	LH-S115-02	LH-S116-01	LH-S116-01	LH-S116-02	LH-S116-02	LH-S118-01	LH-S118-01
Sample Number:	LH-S115-02_1	LH-S115-02_2	LH-S115-02_3	LH-S116-01_1	LH-S116-01_2	LH-S116-02_1	LH-S116-02_2	LH-S118-01_1	LH-S118-01_2
Date Sampled:	08/04/1993	08/04/1993	08/04/1993	07/07/1993	07/07/1993	07/07/1993	07/08/1993	07/08/1993	07/08/1993
Depth (ft.):	0.60	7.00	15.00	0.00	4.00	0.00	4.00	0.00	2.00
METALS - UNITS: UG/KG									
ALUMINUM	9470000	6560000	12300000	10300000	8170000	2100000	9780000	9560000	19500000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	4200.00	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2100	1900	1400	1300	1100	ND [1000] U	1300	2400	3200
BARIUM	29000	18000	86000	221000	36300	38400	651000	109000	85200
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1070000	262000	389000	1690000	11300000	691000	878000	1810000	397000
CHROMIUM, TOTAL	12000	15000	11000	23700	14200	27900	7200	10300	16400
COBALT	1000	ND [1000] U	4000	4100	3000	2900	4400	4200	7700
COPPER	3000	ND [3000] U	3000	25300	10100	8000	5400	8100	8000
IRON	14000000	11800000	10200000	14800000	14400000	8290000	13400000	17300000	17600000
LEAD	5200	4700	6400	9700.00	84300	4200	5700	11700	14000
MAGNESIUM	391000	247000	768000	802000	739000	238000	834000	883000	883000
MANGANESE	35000	14000	117000	187000	33300	147000	188000	358000	135000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	540000	344000	849000	936000	273000	260000	492000	393000	627000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	17000	9000	11000	34400	17800	11600	13300	18300	11600
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	10000	7000	18000	69200	37200	26700	22600	21900	24200

0000008

027728

Metals in Soil Samples at the Independent Sumps
Longhorn Army Ammunition Plant, Texas

Location:	LH-S118-02	LH-S118-02	SUMP114	SUMP114	SUMP116	SUMP116	SUMP118	SUMP118
Sample Number:	LH-S118-02_1	LH-S118-02_2	SUMP114(0-0.5)	SUMP114(3-5)	SUMP116(0-0.5)	SUMP116(6-6.5)	SUMP118(0-0.5)	SUMP118(3-5)
Date Sampled:	07/08/1993	07/08/1993	08/07/1998	08/07/1998	09/28/1998	09/28/1998	08/12/1998	08/12/1998
Depth (ft.):	0.00	2.00	0.00	3.00	0.00	6.00	0.00	3.00
METALS - UNITS: UG/KG								
ALUMINUM	6570000	21700000	NA	NA	NA	NA	NA	NA
ANTIMONY	4300	ND [3000] U	NA	NA	NA	NA	NA	NA
ARSENIC	3400	1400	NA	NA	NA	NA	NA	NA
BARIUM	70700	106000	NA	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	832	833	ND [649] UJ	ND [584] UJ	608	782
CADMIUM	ND [1000] U	ND [1000] U	NA	NA	NA	NA	NA	NA
CALCIUM	896000	763000	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	9100	21000	NA	NA	NA	NA	NA	NA
COBALT	3800	3200	NA	NA	NA	NA	NA	NA
COPPER	4700	8400	NA	NA	NA	NA	NA	NA
IRON	10100000	20600000	NA	NA	NA	NA	NA	NA
LEAD	10300	14900	NA	NA	NA	NA	NA	NA
MAGNESIUM	402000	1200000	NA	NA	NA	NA	NA	NA
MANGANESE	336000	29400	NA	NA	NA	NA	NA	NA
MERCURY	ND [100] U	ND [100] U	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	15000	16000	ND [5200] UJ	ND [4700] UJ	7900	11000
POTASSIUM	237000	669000	NA	NA	NA	NA	NA	NA
SELENIUM	ND [1000] U	ND [1000] U	NA	NA	NA	NA	NA	NA
SILVER	ND [1000] U	ND [1000] U	NA	NA	NA	NA	NA	NA
STRONTIUM	10600	17000	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	39000 J	38000 J	11000 J	8700 J	50000	31000
ZINC	11800	25500	NA	NA	NA	NA	NA	NA

000069

027729

VOCs, SVOCs, and PAHs in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASB03	35ASB03	35ASB03	35ASB05	35ASB05	35ASB05
Sample Number:	35ASB03(0-0.5)	35ASB03(1-3)	35ASB03(3-5)	35ASB05(0-0.5)	35ASB05(0-0.5)RFD	35ASB05(1-3)
Date Sampled:	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998
Depth (ft.):	0.00	1.00	3.00	0.00	0.00	1.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
CARBON DISULFIDE	ND [5.6] U	ND [5.7] U	ND [6] U	ND [5.4] U	NA	ND [5.7] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [22] U	ND [23] U	ND [24] U	ND [22] U	NA	ND [23] U
TOLUENE	ND [5.6] U	ND [5.7] U	ND [6] U	4.3	NA	ND [5.7] U
TRICHLOROETHYLENE (TCE)	ND [11] U	ND [11] U	ND [12] U	ND [11] U	NA	ND [11] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
ANTHRACENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
BENZO(a)ANTHRACENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
BENZO(a)PYRENE	ND [930] U	ND [200] U	ND [200] U	ND [900] U	NA	ND [190] U
BENZO(b)FLUORANTHENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
BENZO(g,h,i)PERYLENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
BENZO(k)FLUORANTHENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
CHRYSENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
DI-n-BUTYL PHTHALATE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
DIBENZ(a,h)ANTHRACENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
DIETHYL PHTHALATE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
FLUORANTHENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
INDENO(1,2,3-c,d)PYRENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
PHENANTHRENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
PYRENE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [1900] U	ND [390] U	ND [400] U	ND [1800] U	NA	ND [380] U
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG						
ACENAPHTHENE	ND [37] U	NA	NA	ND [36] UJ	ND [180] UJ	NA
ANTHRACENE	ND [37] U	NA	NA	ND [36] UJ	ND [180] UJ	NA
BENZO(a)ANTHRACENE	ND [37] U	NA	NA	ND [36] UJ	ND [180] UJ	NA
BENZO(a)PYRENE	ND [37] U	NA	NA	ND [36] UJ	ND [180] UJ	NA
CHRYSENE	ND [37] U	NA	NA	ND [36] UJ	ND [180] UJ	NA
FLUORANTHENE	ND [37] U	NA	NA	ND [36] UJ	ND [180] UJ	NA
NAPHTHALENE	ND [37] U	NA	NA	ND [36] UJ	ND [180] UJ	NA
PHENANTHRENE	ND [37] U	NA	NA	ND [36] UJ	ND [180] UJ	NA

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VOCs, SVOCs, and PAHs in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASB05	35ASS01	35ASS02	35ASS02	35ASS04	35ASS06
Sample Number:	35ASB05(3-5)	35ASS01(0-0.5)	35ASS02(0-0.5)	35ASS02(0-0.5)DFD	35ASS04(0-0.5)	35ASS06(0-0.5)
Date Sampled:	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998
Depth (ft.):	3.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
CARBON DISULFIDE	ND [5.8] U	NA	NA	NA	NA	NA
METHYL ETHYL KETONE (2-BUTANONE)	ND [23] U	NA	NA	NA	NA	NA
TOLUENE	ND [5.8] U	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [12] U	NA	NA	NA	NA	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
ANTHRACENE	ND [390] U	NA	NA	NA	NA	NA
BENZO(a)ANTHRACENE	ND [390] U	NA	NA	NA	NA	NA
BENZO(a)PYRENE	ND [190] U	NA	NA	NA	NA	NA
BENZO(b)FLUORANTHENE	ND [390] U	NA	NA	NA	NA	NA
BENZO(g,h,i)PERYLENE	ND [390] U	NA	NA	NA	NA	NA
BENZO(k)FLUORANTHENE	ND [390] U	NA	NA	NA	NA	NA
CHRYSENE	ND [390] U	NA	NA	NA	NA	NA
DI-n-BUTYL PHTHALATE	ND [390] U	NA	NA	NA	NA	NA
DIBENZ(a,h)ANTHRACENE	ND [390] U	NA	NA	NA	NA	NA
DIETHYL PHTHALATE	ND [390] U	NA	NA	NA	NA	NA
FLUORANTHENE	ND [390] U	NA	NA	NA	NA	NA
INDENO(1,2,3-c,d)PYRENE	ND [390] U	NA	NA	NA	NA	NA
PHENANTHRENE	ND [390] U	NA	NA	NA	NA	NA
PYRENE	ND [390] U	NA	NA	NA	NA	NA
bis(2-ETHYLHEXYL) PHTHALATE	ND [390] U	NA	NA	NA	NA	NA
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG						
ACENAPHTHENE	NA	1200	ND [38] U	ND [190] U	ND [34] U	ND [39] U
ANTHRACENE	NA	ND [38] U	86	ND [190] U	ND [34] U	ND [39] U
BENZO(a)ANTHRACENE	NA	83	ND [38] U	ND [190] U	ND [34] U	27
BENZO(a)PYRENE	NA	75	ND [38] U	ND [190] U	ND [34] U	ND [39] U
CHRYSENE	NA	83	ND [38] U	ND [190] U	ND [34] U	27
FLUORANTHENE	NA	ND [38] U	ND [38] U	ND [190] U	ND [34] U	120
NAPHTHALENE	NA	ND [38] U	ND [38] U	ND [190] U	ND [34] U	350
PHENANTHRENE	NA	46	ND [38] U	ND [190] U	ND [34] U	ND [39] U

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VOCs, SVOCs, and PAHs in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL723-01	LH-S111-01	LH-S111-01	LH-S112-01	LH-S112-01	LH-S113-01	LH-S113-01
Sample Number:	LH-DL723-01	LH-S111-01_1	LH-S111-01_2	LH-S112-01_1	LH-S112-01_2	LH-S113-01_1	LH-S113-01_2
Date Sampled:	06/26/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	08/04/1993	08/04/1993
Depth (ft.):	1.00	0.00	2.00	0.00	3.00	0.50	4.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
CARBON DISULFIDE	33	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	64	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
TOLUENE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	2	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ANTHRACENE	ND [649] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(a)ANTHRACENE	ND [390] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(a)PYRENE	ND [649] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(b)FLUORANTHENE	ND [1299] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(g,h,i)PERYLENE	ND [2597] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(k)FLUORANTHENE	ND [1299] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
CHRYSENE	ND [6494] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [4987] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIBENZ(a,h)ANTHRACENE	ND [2597] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	494	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [649] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
INDENO(1,2,3-c,d)PYRENE	ND [1299] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [649] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PYRENE	ND [649] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [234] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG							
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(a)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(a)PYRENE	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA

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VOCs, SVOCs, and PAHs in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S117-01	LH-S117-01	LH-S119-01	LH-S119-01	LH-S119-02	LH-S119-02	LH-S120-01
Sample Number:	LH-S117-01_1	LH-S117-01_2	LH-S119-01_1	LH-S119-01_2	LH-S119-02_1	LH-S119-02_2	LH-S120-01_1
Date Sampled:	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993
Depth (ft.):	0.50	5.00	0.50	5.00	0.50	5.00	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
CARBON DISULFIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(a)ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(a)PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(g,h,i)PERYLENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(k)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
CHRYSENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIBENZ(a,h)ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
INDENO(1,2,3-c,d)PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG							
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(a)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(a)PYRENE	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA

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VOCs, SVOCs, and PAHs in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S120-01	LH-S120-02	LH-S120-02	LH-S723-01	LH-S723-01	LH-S723-02	LH-S723-02
Sample Number:	LH-S120-01_2	LH-S120-02 _1	LH-S120-02_2	LH-S723-01_1	LH-S723-01_2	LH-S723-02_1	LH-S723-02_2
Date Sampled:	08/04/1993	08/04/1993	08/04/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	4.00	0.50	4.00	0.50	4.00	0.50	4.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
CARBON DISULFIDE	ND [5] U	ND [5] U	ND [5] U	ND [14] U	ND [6] U	ND [6] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [135] U	ND [65] U	ND [62] U	ND [63] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [14] U	ND [6] U	ND [6] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [5] U	ND [5] U	ND [5] U	ND [14] U	ND [6] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [1351] U	ND [649] U	ND [617] U	ND [633] U
BENZO(a)ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [811] U	ND [390] U	ND [370] U	ND [380] U
BENZO(a)PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [1351] U	ND [649] U	ND [617] U	ND [633] U
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [2703] U	ND [1299] U	ND [1235] U	ND [1266] U
BENZO(g,h,i)PERYLENE	ND [330] U	ND [330] U	ND [330] U	ND [5405] U	ND [2597] U	ND [2469] U	ND [2532] U
BENZO(k)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [2703] U	ND [1299] U	ND [1235] U	ND [1266] U
CHRYSENE	ND [330] U	ND [330] U	ND [330] U	ND [13514] U	ND [6494] U	ND [6173] U	ND [6329] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [6730] U	ND [6701] U	ND [4321] U	ND [1481] U
DIBENZ(a,h)ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [5405] U	ND [2597] U	ND [2469] U	ND [2532] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	541 J	ND [649] U	123 J	ND [633] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [1351] U	ND [649] U	ND [617] U	ND [633] U
INDENO(1,2,3-c,d)PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [2703] U	ND [1299] U	ND [1235] U	ND [1266] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [1351] U	ND [649] U	ND [617] U	ND [633] U
PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [1351] U	ND [649] U	ND [617] U	ND [633] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	380	373	ND [405] U	ND [130] U	ND [1012] U	ND [633] U
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG							
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(a)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(a)PYRENE	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA

0027734
0027734

VOCs, SVOCs, and PAHs in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-1	LHS-MW-2	LHS-MW-3	LHS-MW-4	LHS-MW-5	LHS-MW-6	LHS-MW-7	LHS-SH-01	LHS-SH-02
Sample Number:	LHS-MW1	LHS-MW2	LHS-MW3	LHS-MW4	LHS-MW5	LHS-MW6	LHS-MW7	LHS-SH-01	LHS-SH-02
Date Sampled:	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	01/11/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
CARBON DISULFIDE	ND [8] U	ND [5] U	ND [5] U	ND [7] U	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [15] U	ND [11] U	ND [10] U	ND [15] U	ND [12] U	ND [11] U	ND [11] U	ND [12] U	ND [12] U
TOLUENE	ND [8] U	ND [5] U	ND [5] U	ND [7] U	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [8] U	ND [5] U	ND [5] U	ND [7] U	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
ANTHRACENE	ND [500] U	ND [360] U	ND [350] U	ND [490] U	ND [380] U	ND [350] U	ND [370] U	ND [410] U	ND [400] U
BENZO(a)ANTHRACENE	ND [500] U	51 J	ND [350] U	ND [490] U	ND [380] U	110 J	150 J	ND [410] U	ND [400] U
BENZO(a)PYRENE	ND [500] U	ND [360] U	ND [350] U	ND [490] U	ND [380] U	150 J	150 J	ND [410] U	ND [400] U
BENZO(b)FLUORANTHENE	ND [500] U	88 J	ND [350] U	ND [490] U	ND [380] U	230 J	180 J	ND [410] U	ND [400] U
BENZO(g,h,i)PERYLENE	ND [500] U	ND [360] U	ND [350] U	ND [490] U	ND [380] U	120 J	150 J	ND [410] U	ND [400] U
BENZO(k)FLUORANTHENE	ND [500] U	ND [360] U	ND [350] U	ND [490] U	ND [380] U	110 J	120 J	ND [410] U	ND [400] U
CHRYSENE	ND [500] U	84 J	ND [350] U	ND [490] U	ND [380] U	160 J	160 J	ND [410] U	ND [400] U
DI-n-BUTYL PHTHALATE	ND [500] U	ND [360] U	ND [350] U	110 J	ND [380] U	92 J	120 J	ND [410] U	ND [400] U
DIBENZ(a,h)ANTHRACENE	ND [500] U	ND [360] U	ND [350] U	ND [490] U	ND [380] U	ND [350] U	37 J	ND [410] U	ND [400] U
DIETHYL PHTHALATE	ND [500] U	ND [360] U	ND [350] U	ND [490] U	ND [380] U	ND [350] U	ND [370] U	ND [410] U	ND [400] U
FLUORANTHENE	ND [500] U	77 J	ND [350] U	ND [490] U	ND [380] U	170 J	190 J	ND [410] U	ND [400] U
INDENO(1,2,3-c,d)PYRENE	ND [500] U	ND [360] U	ND [350] U	ND [490] U	ND [380] U	120 J	ND [370] U	ND [410] U	ND [400] U
PHENANTHRENE	ND [500] U	ND [360] U	ND [350] U	ND [490] U	ND [380] U	ND [350] U	ND [370] U	ND [410] U	ND [400] U
PYRENE	ND [500] U	84 J	ND [350] U	ND [490] U	ND [380] U	160 J	56 J	ND [410] U	ND [400] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [500] U	91 J	ND [350] U	130 J	160 J	150 J	70 J	ND [410] U	ND [400] U
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG									
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(a)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(a)PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA

0027735
0027735

VOCs, SVOCs, and PAHs in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHS-SH-03	LHS-SH-04	LHS-SH-05
Sample Number:	LHS-SH-03	LHS-SH-04	LHS-SH-05
Date Sampled:	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG			
CARBON DISULFIDE	ND [8] U	ND [8] U	ND [7] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [16] U	ND [16] U	ND [15] U
TOLUENE	ND [8] U	ND [8] U	ND [7] U
TRICHLOROETHYLENE (TCE)	ND [8] U	ND [8] U	ND [7] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG			
ANTHRACENE	ND [530] U	270 J	ND [500] U
BENZO(a)ANTHRACENE	ND [530] U	1600	ND [500] U
BENZO(a)PYRENE	ND [530] U	1900	ND [500] U
BENZO(b)FLUORANTHENE	ND [530] U	3100	150 J
BENZO(g,h,i)PERYLENE	ND [530] U	1500	ND [500] U
BENZO(k)FLUORANTHENE	ND [530] U	1300	66 J
CHRYSENE	ND [530] U	3600	ND [500] U
DI-n-BUTYL PHTHALATE	ND [530] U	ND [540] U	ND [500] U
DIBENZ(a,h)ANTHRACENE	ND [530] U	300 J	ND [500] U
DIETHYL PHTHALATE	ND [530] U	ND [540] U	ND [500] U
FLUORANTHENE	ND [530] U	3700	85 J
INDENO(1,2,3-c,d)PYRENE	ND [530] U	1500	ND [500] U
PHENANTHRENE	ND [530] U	1200	ND [500] U
PYRENE	ND [530] U	5200 J	140 J
bis(2-ETHYLHEXYL) PHTHALATE	ND [530] U	ND [540] U	200000
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG			
ACENAPHTHENE	NA	NA	NA
ANTHRACENE	NA	NA	NA
BENZO(a)ANTHRACENE	NA	NA	NA
BENZO(a)PYRENE	NA	NA	NA
CHRYSENE	NA	NA	NA
FLUORANTHENE	NA	NA	NA
NAPHTHALENE	NA	NA	NA
PHENANTHRENE	NA	NA	NA

027736
027736

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASB03	35ASB03	35ASB03	35ASB03	35ASB03	35ASB03	35ASB05
Sample Number:	35ASB03(0-0.5)	35ASB03(0-0.5)DFD	35ASB03(0-0.5)FD	35ASB03(1-3)	35ASB03(3-5)	35ASB03(3-5)FD	35ASB05(0-0.5)
Date Sampled:	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998
Depth (ft.):	0.00	0.00	0.00	1.00	3.00	3.00	0.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [3.7] U	NA	NA	ND [3.9] U	ND [4] U	NA	ND [3.6] UJ
p,p'-DDD	ND [3.7] U	NA	NA	ND [3.9] U	ND [4] U	NA	ND [3.6] UJ
p,p'-DDE	ND [3.7] U	NA	NA	ND [3.9] U	ND [4] U	NA	ND [3.6] UJ
p,p'-DDT	ND [3.7] U	NA	NA	ND [3.9] U	ND [4] U	NA	ND [3.6] UJ
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	1300	1300	NA	ND [39] U	ND [40] U	NA	1200
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	84.534	NA	NA	11.232	4.204	NA	16.637 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	14.457	NA	NA	1.384	0.421	NA	7.394 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	17.853	NA	NA	5.364	1.903	NA	39.075 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [1.744] U	NA	NA	ND [0.243] U	ND [0.122] U	NA	ND [0.662] UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [2.365] U	NA	NA	ND [0.387] U	0.248	NA	1.743 J
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [2.008] U	NA	NA	ND [0.233] U	ND [0.117] U	NA	ND [0.633] UJ
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	ND [4.079] U	NA	NA	ND [0.486] U	ND [0.086] U	NA	ND [0.486] UJ
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [10.44] U	NA	NA	ND [0.393] U	ND [0.118] U	NA	ND [2.981] UJ
1,2,3,7,8-PENTACHLORODIBENZOFURAN	50.4	NA	NA	2.383	0.407	NA	12.057 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [3.202] U	NA	NA	1.011	0.476	NA	2.671 J
2,3,4,7,8-PENTACHLORODIBENZOFURAN	5.168	NA	NA	ND [0.325] U	ND [0.096] U	NA	0.742 J
2,3,7,8-TETRACHLORODIBENZOFURAN	113.417	NA	ND [0.431] UJ	ND [0.151] U	0.684	ND [0.214] U	ND [1.323] UJ
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	80.782	NA	NA	23.642	12.255	NA	36.011
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	14.457	NA	NA	1.384	0.568	NA	7.394
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [1.744] UJ	NA	NA	ND [0.243] U	ND [0.122] U	NA	ND [0.662] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	16	NA	NA	15.463	6.434	NA	19.687
OCTACHLORODIBENZO-p-DIOXIN	1548.242	NA	NA	538.154	260.566	NA	491.878 J
OCTACHLORODIBENZOFURAN	31.462	NA	NA	2.127	0.65	NA	11.984 J
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [10.44] U	NA	NA	ND [0.393] U	ND [0.118] U	NA	ND [2.981] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	177.377 J	NA	NA	36.741	13.782	NA	65.608
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [1.515] U	NA	NA	ND [0.167] U	ND [0.096] U	NA	ND [0.664] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	166.452	NA	NA	5.404	2.107	NA	31.975

000004

027737

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASB03	35ASB03	35ASB03	35ASB03	35ASB03	35ASB03	35ASB05
Sample Number:	35ASB03(0-0.5)	35ASB03(0-0.5)DFD	35ASB03(0-0.5)FD	35ASB03(1-3)	35ASB03(3-5)	35ASB03(3-5)FD	35ASB05(0-0.5)
Date Sampled:	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998
Depth (ft.):	0.00	0.00	0.00	1.00	3.00	3.00	0.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS		NA	NA			NA	

000918

027738

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASB05	35ASB05	35ASB05	35ASB05	35ASB05	LH-DL723-01	LH-S111-01
Sample Number:	35ASB05(0-0.5)DFD	35ASB05(1-3)	35ASB05(1-3)FD	35ASB05(3-5)	35ASB05(3-5)FD	LH-DL723-01	LH-S111-01_1
Date Sampled:	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	06/26/1993	07/08/1993
Depth (ft.):	0.00	1.00	1.00	3.00	3.00	1.00	0.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	NA	ND [3.8] U	NA	ND [3.8] U	NA	NA	NA
p,p'-DDD	NA	ND [3.8] U	NA	ND [3.8] U	NA	NA	NA
p,p'-DDE	NA	ND [3.8] U	NA	ND [3.8] U	NA	NA	NA
p,p'-DDT	NA	ND [3.8] U	NA	ND [3.8] U	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	1300	43	NA	ND [39] U	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	11.666	NA	15.671	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	0.296	NA	1.013	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	0.431	NA	1.178	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.078] U	NA	ND [0.102] U	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.06] U	NA	ND [0.062] U	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	0.175	NA	ND [0.098] U	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	ND [0.075] U	NA	ND [0.077] U	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.153] U	NA	ND [0.319] U	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	0.45	NA	0.876	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.067] U	NA	ND [0.069] U	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.12] U	NA	ND [0.151] U	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	0.505	ND [0.165] U	0.946	0.299	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	77.687	NA	102.628	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.062] U	NA	2.126	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	191.875	NA	242.258	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.307	NA	1.428	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	714.106	NA	1144.824	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	0.553	NA	1.539	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	17.222	NA	21.02	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.45	NA	1.758	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	1.801	NA	15.609	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	2.511	NA	6.651	NA	NA	NA

0277739

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASB05	35ASB05	35ASB05	35ASB05	35ASB05	LH-DL723-01	LH-S111-01
Sample Number:	35ASB05(0-0.5)DFD	35ASB05(1-3)	35ASB05(1-3)FD	35ASB05(3-5)	35ASB05(3-5)FD	LH-DL723-01	LH-S111-01_1
Date Sampled:	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	06/26/1993	07/08/1993
Depth (ft.):	0.00	1.00	1.00	3.00	3.00	1.00	0.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA		NA		NA	NA	NA

027740

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S111-01	LH-S112-01	LH-S112-01	LH-S113-01	LH-S113-01	LH-S117-01	LH-S117-01	LH-S723-01
Sample Number:	LH-S111-01_2	LH-S112-01_1	LH-S112-01_2	LH-S113-01_1	LH-S113-01_2	LH-S117-01_1	LH-S117-01_2	LH-S723-01_1
Date Sampled:	07/08/1993	07/08/1993	07/08/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	06/26/1993
Depth (ft.):	2.00	0.00	3.00	0.50	4.00	0.50	5.00	0.50
PESTICIDES - UNITS: UG/KG								
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA

027741

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S111-01	LH-S112-01	LH-S112-01	LH-S113-01	LH-S113-01	LH-S117-01	LH-S117-01	LH-S723-01
Sample Number:	LH-S111-01_2	LH-S112-01_1	LH-S112-01_2	LH-S113-01_1	LH-S113-01_2	LH-S117-01_1	LH-S117-01_2	LH-S723-01_1
Date Sampled:	07/08/1993	07/08/1993	07/08/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	06/26/1993
Depth (ft.):	2.00	0.00	3.00	0.50	4.00	0.50	5.00	0.50
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA

0006322

027742

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S723-01	LH-S723-02	LH-S723-02	LHS-MW-1	LHS-MW-2	LHS-MW-3	LHS-MW-4	LHS-MW-5	LHS-MW-6
Sample Number:	LH-S723-01_2	LH-S723-02_1	LH-S723-02_2	LHS-MW1	LHS-MW2	LHS-MW3	LHS-MW4	LHS-MW5	LHS-MW6
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994
Depth (ft.):	4.00	0.50	4.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA

0277743

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S723-01	LH-S723-02	LH-S723-02	LHS-MW-1	LHS-MW-2	LHS-MW-3	LHS-MW-4	LHS-MW-5	LHS-MW-6
Sample Number:	LH-S723-01_2	LH-S723-02_1	LH-S723-02_2	LHS-MW1	LHS-MW2	LHS-MW3	LHS-MW4	LHS-MW5	LHS-MW6
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994
Depth (ft.):	4.00	0.50	4.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS	NA	NA	NA						

0027744

0027744

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-7	SUMP112	SUMP112	SUMP112	SUMP113	SUMP113	SUMP113
Sample Number:	LHS-MW7	SUMP112(0-0.5)	SUMP112(0-0.5)FD	SUMP112(3-5)	SUMP113(0-0.5)	SUMP113(0-0.5)FD	SUMP113(3-5)
Date Sampled:	09/30/1994	08/12/1998	08/12/1998	08/12/1998	08/12/1998	08/12/1998	08/12/1998
Depth (ft.):	0.00	0.00	0.00	3.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	NA	8.6 J	NA	ND [4] U	ND [3.7] U	ND [18] U	ND [3.7] U
p,p'-DDD	NA	ND [3.6] U	NA	ND [4] U	ND [3.7] U	ND [18] U	ND [3.7] U
p,p'-DDE	NA	11 J	NA	ND [4] U	49	50	ND [3.7] U
p,p'-DDT	NA	ND [3.6] U	NA	ND [4] U	45	37	ND [3.7] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	NA	99	NA	ND [40] U	ND [37] U	NA	ND [37] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	59.425	NA	ND [0.979] U	119.852	75.416 J	13.374
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	9.734	NA	ND [0.422] U	33.067	23.525	1.473
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.841] U	NA	ND [0.602] U	115.517	73.985 J	4.73
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	2.374	NA	ND [0.698] U	4.657	ND [1.013] UJ	ND [0.796] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.561] U	NA	ND [0.401] U	6.359	4.86 J	ND [0.424] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.862] U	NA	ND [0.829] U	ND [1.329] U	ND [1.203] UJ	ND [0.945] U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	ND [0.915] U	NA	ND [0.655] U	ND [3.877] U	5.544 J	ND [0.692] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.953] U	NA	ND [0.644] U	ND [1.812] U	ND [1.346] UJ	ND [0.497] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.576] U	NA	ND [0.511] U	5.149 J	ND [1.6] UJ	ND [0.396] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.821] U	NA	ND [0.588] U	21.897	ND [4.976] UJ	ND [0.621] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.602] U	NA	ND [0.534] U	ND [1.291] UJ	ND [1.671] UJ	ND [0.414] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	4.302	3.504	ND [1.098] U	ND [2.673] UJ	4.914 J	ND [0.661] UJ
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	115.04	NA	ND [0.979] U	249.284	147.486	36.281
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	9.734	NA	ND [0.422] U	33.067	23.525	4.422
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	2.374	NA	ND [0.698] U	4.657	10.814	ND [0.796] UJ
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	12.767	NA	ND [0.401] U	210.8	259.328	5.817
OCTACHLORODIBENZO-p-DIOXIN	NA	515.972	NA	46.46	1898.443 J	1234.673 J	1335.668
OCTACHLORODIBENZOFURAN	NA	17.762	NA	ND [0.808] U	58.629	39.264	3.081
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.953] U	NA	ND [0.644] U	1.564	ND [1.346] U	ND [0.497] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.602] U	NA	ND [0.534] U	143.774	277.643	3.321 J
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.639] U	NA	ND [0.75] U	ND [1.458] U	ND [0.932] U	ND [0.639] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	10.41	NA	ND [1.098] U	38.784	42.022	2.131

027745
000032

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-7	SUMP112	SUMP112	SUMP112	SUMP113	SUMP113	SUMP113
Sample Number:	LHS-MW7	SUMP112(0-0.5)	SUMP112(0-0.5)FD	SUMP112(3-5)	SUMP113(0-0.5)	SUMP113(0-0.5)FD	SUMP113(3-5)
Date Sampled:	09/30/1994	08/12/1998	08/12/1998	08/12/1998	08/12/1998	08/12/1998	08/12/1998
Depth (ft.):	0.00	0.00	0.00	3.00	0.00	0.00	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA

000026

027746

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	SUMP117	SUMP117	SUMP117	SUMP117	SUMP120	SUMP120
Sample Number:	SUMP117(0-0.5)	SUMP117(0-0.5)FD	SUMP117(3-5)	SUMP117(3-5)FD	SUMP120(0-0.5)	SUMP120(3-5)
Date Sampled:	08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/12/1998	08/12/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	3.00
PESTICIDES - UNITS: UG/KG						
DIELDRIN	ND [4.2] U	ND [22] U	ND [3.8] U	ND [38] U	ND [4.2] U	ND [3.8] U
p,p'-DDD	67 J	78	200 J	160	ND [4.2] U	ND [3.8] U
p,p'-DDE	22 J	13	25	20	ND [4.2] U	ND [3.8] U
p,p'-DDT	ND [4.2] U	ND [22] U	ND [3.8] U	ND [38] U	ND [4.2] U	ND [3.8] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	ND [42] U	NA	ND [38] U	NA	ND [42] U	ND [38] U
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	25.159	NA	8.085 J	NA	14.003	2.391
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	3.84	NA	2.307 J	NA	0.405	ND [0.273] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	3.409	NA	0.965	NA	2.188	ND [0.251] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.636] U	NA	0.993	NA	ND [0.183] U	ND [0.273] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	1.185	NA	0.783	NA	ND [0.123] U	ND [0.167] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.756] U	NA	ND [0.132] U	NA	ND [0.218] U	ND [0.325] U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	ND [0.509] U	NA	ND [0.089] U	NA	ND [0.2] U	ND [0.273] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.502] U	NA	0.363	NA	ND [0.206] U	ND [0.203] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.258] U	NA	0.451	NA	ND [0.154] U	ND [0.195] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.567] U	NA	ND [0.08] U	NA	ND [0.18] U	ND [0.245] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.269] U	NA	ND [0.081] U	NA	ND [0.161] U	ND [0.203] U
2,3,7,8-TETRACHLORODIBENZOFURAN	2.093	NA	0.408	NA	ND [0.409] U	ND [0.41] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	44.736	NA	14.984	NA	30.259	4.754
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	3.84	NA	6.621	NA	0.772	ND [0.273] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	1.969	NA	0.993	NA	1.038	ND [0.273] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	5.832	NA	1.714	NA	2.406	ND [0.167] U
OCTACHLORODIBENZO-p-DIOXIN	397.594	NA	143.68 J	NA	4130.899	603.28
OCTACHLORODIBENZOFURAN	12.968	NA	6.04 J	NA	0.972	ND [0.208] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.502] U	NA	0.363	NA	ND [0.206] U	ND [0.203] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	1.107	NA	0.262	NA	0.691	ND [0.203] U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.382] U	NA	ND [0.158] U	NA	ND [0.327] U	ND [0.305] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	2.093	NA	0.974	NA	ND [0.409] U	ND [0.41] U

0277471

Pesticides, PCBs, Dioxins/Furans and Explosives in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	SUMP117	SUMP117	SUMP117	SUMP117	SUMP120	SUMP120
Sample Number:	SUMP117(0-0.5)	SUMP117(0-0.5)FD	SUMP117(3-5)	SUMP117(3-5)FD	SUMP120(0-0.5)	SUMP120(3-5)
Date Sampled:	08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/12/1998	08/12/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	3.00
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

0027748

Metals in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASB03	35ASB03	35ASB03	35ASB05	35ASB05	35ASB05	LH-DL723-01	LH-S111-01	LH-S111-01
Sample Number:	35ASB03(0-0.5)	35ASB03(1-3)	35ASB03(3-5)	35ASB05(0-0.5)	35ASB05(1-3)	35ASB05(3-5)	LH-DL723-01	LH-S111-01_1	LH-S111-01_2
Date Sampled:	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998	06/26/1993	07/08/1993	07/08/1993
Depth (ft.):	0.00	1.00	3.00	0.00	1.00	3.00	1.00	0.00	2.00
METALS - UNITS: UG/KG									
ALUMINUM	4500000	7500000	8800000	5600000	8100000	13000000	5430000	3430000	18100000
ANTIMONY	ND [6710] UJ	ND [7070] UJ	ND [7260] UJ	ND [6450] UJ	ND [6880] UJ	ND [6940] UJ	ND [6400] U	3400	4100
ARSENIC	9050	2660	3390	6800	2390	3650	704	2300	2000
BARIUM	42000	90000	77000	53000	50000	49000	81300	106000	52400
BERYLLIUM	ND [559] U	ND [589] U	ND [605] U	682	ND [573] U	ND [578] U	NA	NA	NA
CADMIUM	ND [559] U	ND [589] U	ND [605] U	ND [538] U	ND [573] U	ND [578] U	2460	ND [1000] U	ND [1000] U
CALCIUM	15000000 J	2100000	1000000	18000000	740000	820000	1240000	651000	360000
CHROMIUM, TOTAL	20000	11000	12000	26000 J	10000	15000	171000	6000	12800
COBALT	ND [5600] U	ND [5900] U	ND [6000] U	ND [5400] U	ND [5700] U	ND [5800] U	1730	4200	3900
COPPER	6220	4060	4250	9000 J	4220	6780	25000	4900	8400
IRON	27000000	9900000	11000000	43000000	8300000	15000000	4380000	9720000	27700000
LEAD	30200	10700	10300	82200	9460	11900	44500	7700	14500
MAGNESIUM	ND [560000] U	ND [590000] U	650000	640000	640000	1100000	524000	252000	918000
MANGANESE	113000	179000	131000	269000	159000	67800	86400	157000	9400
MERCURY	ND [110] U	ND [120] U	ND [120] U	ND [110] U	ND [110] U	ND [120] U	1100	ND [100] U	ND [100] U
NICKEL	6200	5500	7900	6100	5200	7600	NA	NA	NA
POTASSIUM	610000	1000000	1400000	ND [540000] U	1200000	1300000	370000	255000	526000
SELENIUM	2410	ND [1180] U	1410	4270	ND [1150] U	2630	ND [640] U	ND [1000] U	ND [1000] U
SILVER	1300	1300	ND [1200] U	ND [1100] U	1100	1200	109000	ND [1000] U	ND [1000] U
SODIUM	ND [560000] U	ND [590000] U	ND [600000] U	ND [540000] U	ND [570000] U	ND [580000] U	NA	NA	NA
STRONTIUM	20000 J	6400 J	6200 J	37000	8600	17000	NA	9700	15000
THALLIUM	ND [559] U	ND [589] U	ND [605] U	ND [538] U	ND [573] U	ND [578] U	NA	NA	NA
VANADIUM	36000	21000	22000	66000 J	22000	33000	NA	NA	NA
ZINC	34000	13000	18000	55000	12000	17000	72200	10500	19500

0027749
0027749

Metals in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S112-01	LH-S112-01	LH-S113-01	LH-S113-01	LH-S117-01	LH-S117-01	LH-S119-01	LH-S119-01	LH-S119-02
Sample Number:	LH-S112-01_1	LH-S112-01_2	LH-S113-01_1	LH-S113-01_2	LH-S117-01_1	LH-S117-01_2	LH-S119-01_1	LH-S119-01_2	LH-S119-02_1
Date Sampled:	07/08/1993	07/08/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993
Depth (ft.):	0.00	3.00	0.50	4.00	0.50	5.00	0.50	5.00	0.50
METALS - UNITS: UG/KG									
ALUMINUM	4850000	6040000	14800000	18900000	15600000	14300000	9030000	14400000	7210000
ANTIMONY	8500	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	1800	2200	2000	1800	3100	2300	2000	4400	1600
BARIUM	55900	105000	69400	73200	255000	124000	96000	128000	67000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	608000	1050000	2100000	1240000	2660000	1370000	2520000	2070000	1910000
CHROMIUM, TOTAL	17700	7200	14800	16700	28700	17300	15000	21000	11000
COBALT	4400	4900	2900	3300	8300	8300	8000	19000	5000
COPPER	3800	4100	3800	4200	829000	9700	3000	3000	3000
IRON	42900000	12300000	13900000	17600000	16200000	18700000	13800000	19100000	8220000
LEAD	23800	8000	11400	9700	112800	12700	6800	21300	5900
MAGNESIUM	129000	286000	767000	1190000	2090000	1250000	1080000	1050000	1040000
MANGANESE	157000	629000	160000	126000	542000	316000	529000	593000	229000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	140000	235000	592000	631000	758000	567000	582000	758000	511000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	17700	11400	16800	31000	26000	28400	8000	11000	6000
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	41000	17900	19900	22300	576000	28000	14000	30000	17000

0606620

027750

Metals in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S119-02	LH-S120-01	LH-S120-01	LH-S120-02	LH-S120-02	LH-S723-01	LH-S723-01	LH-S723-02	LH-S723-02	LHS-MW-1
Sample Number:	LH-S119-02_2	LH-S120-01_1	LH-S120-01_2	LH-S120-02 _1	LH-S120-02_2	LH-S723-01_1	LH-S723-01_2	LH-S723-02_1	LH-S723-02_2	LHS-MW1
Date Sampled:	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	09/30/1994
Depth (ft.):	5.00	0.50	4.00	0.50	4.00	0.50	4.00	0.50	4.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	13000000	6870000	12400000	6720000	22200000	16300000	8510000	14400000	13100000	8070000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [18500] U	ND [5960] U	ND [9480] U	ND [7240] U	ND [9500] U
ARSENIC	2100	2200	4600	2700	5200	17800	2860	1750	941	3600
BARIUM	79000	39000	71000	148000	69000	171000	72700	87300	126000	62600
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	18500	4380	4740	3510	ND [950] U
CALCIUM	886000	2400000	909000	805000	1190000	3360000	1020000	2210000	1940000	1580000
CHROMIUM, TOTAL	25000	9000	15000	10000	23000	28300	16700	15000	11400	13100
COBALT	11000	3000	19000	9000	4000	12900	4350	4080	3550	3700
COPPER	3000	3000	3000	2960	4000	152000	5780	8860	7460	5600
IRON	13500000	7810000	15300000	9330000	19700000	72800000	15700000	14400000	11900000	12200000
LEAD	4100	7100	10300	8600	8100	123000	19400	26900	24900	18100
MAGNESIUM	491000	3330000	528000	334000	978000	742000	431000	590000	898000	563000
MANGANESE	759000	194000	582000	1030000	94000	856000	311000	247000	75500	223000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [90] U	ND [42] U	88	ND [54] U	ND [110] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	673000	930000	478000	331000	875000	701000	413000	580000	395000	394000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1850] U	ND [596] U	ND [948] U	724	330
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	766	39	ND [47] U	36	ND [950] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	9000	6000	11000	8000	15000	NA	NA	NA	NA	14200
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND [47400] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	26000	16000	17000	12000	23000	141000	21100	28400	20900	29300

0277751
0277751

Metals in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-2	LHS-MW-3	LHS-MW-4	LHS-MW-5	LHS-MW-6	LHS-MW-7	LHS-SH-01	LHS-SH-02	LHS-SH-03	LHS-SH-04
Sample Number:	LHS-MW2	LHS-MW3	LHS-MW4	LHS-MW5	LHS-MW6	LHS-MW7	LHS-SH-01	LHS-SH-02	LHS-SH-03	LHS-SH-04
Date Sampled:	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	01/11/1995	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	9020000	3880000	5600000	4260000	8480000	8750000	6680000	4500000	7140000	2740000
ANTIMONY	ND [6800] U	ND [6300] U	ND [9600] U	ND [6600] U	ND [6900] U	ND [7300] U	ND [11100] UJ	ND [10000] UJ	ND [13000] UJ	ND [11100] UJ
ARSENIC	4100	1400	3900	3400	11500	7800	2000 J	1800 J	1400 J	5100 J
BARIUM	117000	80900	79700	91800	58600	95600	65000	53400	82100	39400
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [680] U	ND [630] U	ND [960] U	ND [660] U	ND [690] U	1100	ND [1100] U	ND [1000] U	ND [1300] U	ND [1100] U
CALCIUM	1190000	537000	663000	676000	1010000	7590000	510000	422000	387000	5770000
CHROMIUM, TOTAL	20700	9000	14100	16400	24700	26500	20300	7300	14000	11500
COBALT	7700	5700	4400	6700	5300	5900	4100	6100	2900	ND [2200] U
COPPER	105000	2700	4700	4800	4700	13700	7200	4100	4800	15500
IRON	19400000	5300000	8050000	5090000	39900000	27200000	13800000	4680000	6720000	12800000
LEAD	26800	15600	16300	259000	22400	162000	14200	7200	23600	44500
MAGNESIUM	953000	209000	328000	310000	513000	552000	387000	221000	407000	241000
MANGANESE	582000	611000	566000	803000	131000	341000	148000	662000	501000	321000
MERCURY	ND [100] U	ND [100] U	ND [130] U	ND [120] U	ND [100] U	190	ND [91] U	ND [89] U	ND [120] U	ND [140] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	413000	321000	284000	173000	351000	489000	254000	264000	295000	ND [222000] U
SELENIUM	330	160	380	260	430	320	310	340	460	510
SILVER	ND [680] U	ND [630] U	ND [960] U	ND [660] U	ND [690] U	ND [730] U	ND [1100] U	ND [1000] U	ND [1300] U	ND [1100] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	19700	ND [6300] U	ND [9600] U	7800	11100	20100	ND [11100] U	ND [10000] U	ND [13000] U	13100
THALLIUM	ND [34000] U	ND [31400] U	ND [48100] U	ND [33000] U	ND [34700] U	ND [36300] U	ND [55600] U	ND [49800] U	ND [65200] U	ND [55600] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	2580000	10600	15800	214000	44500	64600	20100	12400	21900	114000

0277752
0277752

Metals in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHS-SH-05	SUMP111	SUMP111	SUMP112	SUMP112	SUMP113	SUMP113	SUMP117	SUMP117
Sample Number:	LHS-SH-05	SUMP111(0-0.5)	SUMP111(5.5-6)	SUMP112(0-0.5)	SUMP112(3-5)	SUMP113(0-0.5)	SUMP113(3-5)	SUMP117(0-0.5)	SUMP117(3-5)
Date Sampled:	01/12/1995	09/25/1998	09/25/1998	08/12/1998	08/12/1998	08/12/1998	08/12/1998	08/05/1998	08/05/1998
Depth (ft.):	0.00	0.00	5.50	0.00	3.00	0.00	3.00	0.00	3.00
METALS - UNITS: UG/KG									
ALUMINUM	7110000	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	ND [13100] UJ	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	4800 J	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	155000	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	NA	ND [605] UJ	755 J	ND [535] U	ND [602] U	ND [553] U	ND [561] U	ND [635] U	626
CADMIUM	3300	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	6050000	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	47600	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	6000	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	135000	NA	NA	NA	NA	NA	NA	NA	NA
IRON	35700000	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	141000	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	934000	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	359000	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	43700	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	ND [4800] UJ	11000 J	10000	6400	5700	7800	14000	18000
POTASSIUM	276000	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	640	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	ND [1300] U	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	32900	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	ND [65400] U	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	27000 J	42000 J	37000	30000	18000	20000	21000	32000
ZINC	310000	NA	NA	NA	NA	NA	NA	NA	NA

550000

027753

Metals in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	SUMP119	SUMP119	SUMP120	SUMP120	WRSUMP744A	WRSUMP744A
Sample Number:	SUMP119(0-0.5)	SUMP119(6-6.5)	SUMP120(0-0.5)	SUMP120(3-5)	WRSP744A(0-0.5)	WRSP744A(3-3.5)
Date Sampled:	09/25/1998	09/25/1998	08/12/1998	08/12/1998	09/28/1998	09/28/1998
Depth (ft.):	0.00	6.00	0.00	3.00	0.00	3.00
METALS - UNITS: UG/KG						
ALUMINUM	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [530] UJ	ND [575] UJ	ND [628] U	ND [569] U	ND [556] U	ND [599] U
CADMIUM	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA
NICKEL	ND [4200] UJ	ND [4600] UJ	7500	8100	8400	9700
POTASSIUM	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA
VANADIUM	7800 J	25000 J	38000	21000	19000	14000
ZINC	NA	NA	NA	NA	NA	NA

0027754
0027754

Petroleum Hydrocarbons in Soil Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LH-S113-01	LH-S113-01	LH-S117-01	LH-S117-01	LHS-MW-7
Sample Number:	LH-S113-01_1	LH-S113-01_2	LH-S117-01_1	LH-S117-01_2	LHS-MW7
Date Sampled:	08/04/1993	08/04/1993	08/04/1993	08/04/1993	09/30/1994
Depth (ft.):	0.50	4.00	0.50	5.00	0.00
PETROLEUM HYDROCARBONS - UNITS: MG/KG					
NO DETECTED COMPOUNDS					

000035

027755

VOCs and SVOCs in Sediment Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASD01	35ASD02
Sample Number:	35ASD01	35ASD02
Date Sampled:	11/09/1998	11/09/1998
Depth (ft.):	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
NO DETECTED COMPOUNDS		
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
NO DETECTED COMPOUNDS		

0277756

Pesticides, PCBs, Dioxins/Furans, and Explosives in Sediment Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASD01	35ASD01	35ASD02	35ASD02	LHS-SH-01	LHS-SH-02	LHS-SH-03	LHS-SH-04	LHS-SH-05
Sample Number:	35ASD01	35ASD01	35ASD02	35ASD02	LHS-SH-01	LHS-SH-02	LHS-SH-03	LHS-SH-04	LHS-SH-05
Date Sampled:	11/09/1998	12/03/1998	11/09/1998	12/03/1998	01/11/1995	01/12/1995	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
NO DETECTED COMPOUNDS			NA		NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	95	ND [44] U	NA	ND [42] U	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	39.176	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	2.922	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	3.631	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.007	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.001	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	80.063	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	2.922	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	2.008	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	5.979	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	4444.364	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	8.289	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	5.613	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	0.762	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS		NA		NA					

0227757

0227757

Metals in Sediment Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASD01	35ASD02
Sample Number:	35ASD01	35ASD02
Date Sampled:	11/09/1998	11/09/1998
Depth (ft.):	0.00	0.00
METALS - UNITS: UG/KG		
ALUMINUM	12000000	1800000
ANTIMONY	ND [9950] UJ	ND [8020] UJ
ARSENIC	7620	ND [1340] U
BARIUM	100000	ND [27000] U
BERYLLIUM	ND [829] U	ND [668] U
CADMIUM	ND [829] U	ND [668] U
CALCIUM	1000000	ND [670000] U
CHROMIUM, TOTAL	18000	4300
COBALT	ND [8300] U	ND [6700] U
COPPER	10600	ND [3340] U
IRON	20000000	3500000
LEAD	18700	2160
MAGNESIUM	1000000	ND [670000] U
MANGANESE	180000 J	17000 J
MERCURY	ND [170] U	ND [130] U
NICKEL	ND [6600] U	ND [5300] U
POTASSIUM	1500000 J	ND [670000] UJ
SELENIUM	3370	ND [1340] U
SILVER	ND [1600] U	ND [1300] U
SODIUM	ND [830000] U	ND [670000] U
STRONTIUM	ND [8300] U	ND [6700] U
THALLIUM	ND [829] U	ND [668] U
VANADIUM	36000	7000
ZINC	46000	6600

660000

027758

Anions and Physical Properties of Sediment Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASD01	35ASD02
Sample Number:	35ASD01	35ASD02
Date Sampled:	11/09/1998	11/09/1998
Depth (ft.):	0.00	0.00
ANIONS - UNITS: UG/KG		
CYANIDE	ND [847.1] UJ	ND [668.3] UJ
PHYSICAL PROPERTIES - UNITS: MG/KG		
TOTAL ORGANIC CARBON	107000	495000

0027759
0027759

VOCs and SVOCs in Surface Water Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASW01	35ASW02
Sample Number:	35ASW01	35ASW02
Date Sampled:	11/09/1998	11/09/1998
Depth (ft.):	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L		
NO DETECTED COMPOUNDS		
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L		
NO DETECTED COMPOUNDS		

027760

027760

Pesticides, PCBs, and Explosives in Surface Water Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASW01	35ASW01	35ASW02	35ASW02
Sample Number:	35ASW01	35ASW01	35ASW02	35ASW02
Date Sampled:	11/09/1998	12/03/1998	11/09/1998	12/03/1998
Depth (ft.):	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L				
NO DETECTED COMPOUNDS			NA	
POLYCHLORINATED BIPHENYLS - UNITS: UG/L				
NO DETECTED COMPOUNDS			NA	
EXPLOSIVES - UNITS: UG/L				
NO DETECTED COMPOUNDS		NA		NA

000042

027761

Metals in Surface Water Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASW01	35ASW02
Sample Number:	35ASW01	35ASW02
Date Sampled:	11/09/1998	11/09/1998
Depth (ft.):	0.00	0.00
METALS - UNITS: UG/L		
ALUMINUM	4600	810
ANTIMONY	ND [5] U	ND [5] U
ARSENIC	ND [10] U	ND [10] U
BARIUM	ND [200] U	ND [200] U
BERYLLIUM	ND [0.5] U	ND [0.5] U
CADMIUM	ND [0.8] U	ND [0.8] U
CALCIUM	ND [5000] U	ND [5000] U
CHROMIUM, TOTAL	ND [10] UJ	ND [10] UJ
COBALT	ND [50] U	ND [50] U
COPPER	ND [25] U	ND [25] U
IRON	8400 J	3200 J
LEAD	4	ND [3] U
MAGNESIUM	ND [5000] U	ND [5000] U
MANGANESE	252	84
MERCURY	ND [0.2] U	ND [0.2] U
NICKEL	ND [40] U	ND [40] U
POTASSIUM	ND [5000] U	ND [5000] U
SELENIUM	ND [5] U	ND [5] U
SILVER	ND [10] U	ND [10] U
SODIUM	5200	ND [5000] U
STRONTIUM	ND [50] U	ND [50] U
THALLIUM	1.2 J	1.3 J
TIN	110	ND [100] U
VANADIUM	ND [50] U	ND [50] U
ZINC	40	20

27C0072

027762

Anions and Physical Properties in Surface Water Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35ASW01	35ASW02
Sample Number:	35ASW01	35ASW02
Date Sampled:	11/09/1998	11/09/1998
Depth (ft.):	0.00	0.00
ANIONS - UNITS: UG/L		
CYANIDE	ND [10] UJ	ND [10] UJ
PHYSICAL PROPERTIES - UNITS: MG/L		
HARDNESS (AS CaCO3)	32	32

027769

VOCs and SVOCs in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35AWW01	35AWW02	35AWW03	35AWW04	35AWW04	LHSMW01	LHSMW01	LHSMW01	LHSMW01
Sample Number:	35AWW01	35AWW02	35AWW03	35AWW04	35AWW04	MW-1	LHS-MW-01	LHS-MW-1	LHS-MW-01
Date Sampled:	11/08/1998	11/08/1998	11/08/1998	09/30/1998	11/08/1998	01/31/1996	05/13/1998	08/12/1996	11/29/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,2-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U
1,1-DICHLOROETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.32] U	NA
1,2-DICHLOROETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U
ACETONE	ND [5] U	5.3	ND [5] U	ND [5] U	ND [5] U	NA	ND [5] U	NA	ND [10] U
BENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
CARBON DISULFIDE	ND [1] U	ND [1] U	0.54	ND [1] U	ND [1] U	NA	ND [1] U	NA	ND [5] U
CHLOROFORM	0.8	32	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
METHYLENE CHLORIDE	ND [1] U	0.97	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [1] U	ND [1] U	3.6	ND [1] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U
VINYL CHLORIDE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.24] U	NA
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.29] U	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
DIETHYL PHTHALATE	ND [10] U	ND [10] UJ	ND [10] U	ND [10] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U
PHENOL	ND [10] U	6.8 J	ND [10] U	ND [10] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	12 J	ND [10] U	ND [10] U	ND [10] U	ND [0.92] U	ND [10] U	ND [0.92] U	ND [10] U

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VOCs and SVOCs in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW02	LHSMW02	LHSMW02	LHSMW03	LHSMW03	LHSMW03	LHSMW04	LHSMW04	LHSMW04
Sample Number:	LHS-MW-02	LHS-MW-2	LHS-MW-02	LHS-MW-03	LHS-MW-3	LHS-MW-03	LHS-MW-04	LHS-MW-4	LHS-MW-04
Date Sampled:	05/13/1998	08/12/1996	11/29/1994	05/13/1998	08/13/1996	11/29/1994	05/13/1998	08/12/1996	12/01/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,2-TRICHLOROETHANE	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [0.65] U	ND [5] U
1,1-DICHLOROETHANE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U
1,1-DICHLOROETHENE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [0.32] U	NA
1,2-DICHLOROETHANE	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [0.31] U	ND [5] U
ACETONE	ND [5] U	NA	ND [10] U	ND [5] U	NA	ND [10] U	ND [5] U	NA	ND [10] U
BENZENE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U
CARBON DISULFIDE	ND [1] U	NA	ND [5] U	ND [1] U	NA	ND [5] U	ND [1] U	NA	ND [5] U
CHLOROFORM	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U
METHYLENE CHLORIDE	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [0.22] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [0.25] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	ND [5] U	NA	NA	ND [5] U	NA	NA	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [0.25] U	ND [5] U
VINYL CHLORIDE	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [0.24] U	NA
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA
trans-1,2-DICHLOROETHENE	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [0.29] U	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
DIETHYL PHTHALATE	ND [10] U	ND [1] U	2 J	ND [10] U	ND [1] U	ND [10] U	ND [10] U	ND [1] U	ND [10] U
PHENOL	ND [10] U	ND [0.89] U	ND [10] U	ND [10] U	ND [0.89] U	ND [10] U	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [0.92] U	ND [10] U	ND [10] U	ND [0.92] U	88	ND [10] U	ND [0.92] U	ND [10] U

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VOCs and SVOCs in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW05	LHSMW05	LHSMW05	LHSMW05	LHSMW05	LHSMW05	LHSMW06	LHSMW06
Sample Number:	MW-5	LHS-MW-05	LHS-MW-05DLFD	LHS-MW-5	LHS-MW-05	LHS-MW-05FD	LHS-MW-06	LHS-MW-6
Date Sampled:	01/31/1996	05/13/1998	05/13/1998	08/12/1996	12/01/1994	12/01/1994	05/13/1998	08/13/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,2-TRICHLOROETHANE	ND [1] U	ND [40] U	ND [80] U	ND [0.65] U	ND [5] U	NA	ND [1] U	ND [0.65] U
1,1-DICHLOROETHANE	ND [1] U	ND [40] U	ND [80] U	0.27	ND [5] U	NA	3.6	4.2
1,1-DICHLOROETHENE	ND [1] U	ND [40] U	ND [80] U	ND [0.2] U	ND [5] U	NA	1.3	2
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [40] U	ND [80] U	0.73	NA	NA	ND [1] U	ND [0.32] U
1,2-DICHLOROETHANE	ND [1] U	ND [40] U	ND [80] U	ND [0.31] U	ND [5] U	NA	ND [1] U	ND [0.31] U
ACETONE	ND [1] U	ND [200] U	ND [400] U	NA	ND [10] U	NA	ND [5] U	NA
BENZENE	ND [1] U	ND [40] U	ND [80] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [0.2] U
CARBON DISULFIDE	ND [1] U	ND [40] U	ND [80] U	NA	ND [5] U	NA	ND [1] U	NA
CHLOROFORM	ND [1] U	ND [40] U	ND [80] U	0.38	ND [5] U	NA	ND [1] U	ND [0.2] U
METHYLENE CHLORIDE	ND [1] U	ND [40] U	ND [80] U	ND [0.22] U	ND [5] U	NA	ND [1] U	ND [0.22] U
TETRACHLOROETHYLENE(PCE)	4884	5400	49010	2700	870	280	0.69	0.27
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	ND [5] U	NA	NA	NA
TRICHLOROETHYLENE (TCE)	99	160	160.00	39.7	49	NA	0.53	0.43
VINYL CHLORIDE	ND [1] U	ND [40] U	ND [80] U	ND [0.24] U	NA	NA	ND [1] U	0.62
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [40] U	ND [80] U	0.21	NA	NA	1.4	0.98
trans-1,2-DICHLOROETHENE	ND [1] U	ND [40] U	ND [80] U	ND [0.29] U	NA	NA	ND [1] U	ND [0.29] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
DIETHYL PHTHALATE	ND [1] U	ND [10] U	NA	ND [1] U	ND [10] U	NA	ND [10] U	ND [1] U
PHENOL	ND [0.89] U	ND [10] U	NA	ND [0.89] U	ND [10] U	NA	ND [10] U	ND [0.89] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	NA	ND [0.92] U	ND [10] U	NA	ND [10] U	ND [0.92] U

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VOCs and SVOCs in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW06	LHSMW07	LHSMW07	LHSMW07	LHSMW07	LHSMW07
Sample Number:	LHS-MW-06	LHS-MW-07	LHS-MW-07DLFD	LHS-MW-7	LHS-MW-07	LHS-MW-07FD
Date Sampled:	12/01/1994	05/13/1998	05/13/1998	08/12/1996	12/01/1994	12/01/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L						
1,1,2-TRICHLOROETHANE	ND [5] U	7.1	ND [20] U	1.6	4 J	NA
1,1-DICHLOROETHANE	3 J	87	110	23.9	65	NA
1,1-DICHLOROETHENE	ND [5] U	1200.00	950	311	750	430
1,2,4-TRICHLOROBENZENE	NA	ND [1] U	ND [20] U	ND [0.32] U	NA	NA
1,2-DICHLOROETHANE	ND [5] U	2	ND [20] U	0.51	ND [5] U	NA
ACETONE	ND [10] U	ND [5] U	ND [100] U	NA	ND [10] U	NA
BENZENE	ND [5] U	0.8	ND [20] U	0.22	ND [5] U	NA
CARBON DISULFIDE	ND [5] U	ND [1] U	ND [20] U	NA	ND [5] U	NA
CHLOROFORM	ND [5] U	ND [1] U	ND [20] U	ND [0.2] U	ND [5] U	NA
METHYLENE CHLORIDE	ND [5] U	ND [1] U	ND [20] U	ND [0.22] U	ND [5] U	NA
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [1] U	ND [20] U	2.7	ND [5] U	NA
TOTAL 1,2-DICHLOROETHENE	ND [5] U	NA	NA	NA	10	NA
TRICHLOROETHYLENE (TCE)	ND [5] U	25	31	5.9	16	NA
VINYL CHLORIDE	NA	7.2	ND [20] U	1.1	NA	NA
cis-1,2-DICHLOROETHYLENE	NA	11	13	2.5	NA	NA
trans-1,2-DICHLOROETHENE	NA	0.73	ND [20] U	ND [0.29] U	NA	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L						
DIETHYL PHTHALATE	ND [10] U	ND [10] U	NA	ND [1] U	ND [10] U	NA
PHENOL	ND [10] U	ND [10] U	NA	ND [0.89] U	ND [10] U	NA
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	NA	2.3	ND [10] U	NA

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35AWW01	35AWW02	35AWW03	35AWW04	35AWW04	LHSMW01	LHSMW01	LHSMW01	LHSMW01
Sample Number:	35AWW01	35AWW02	35AWW03	35AWW04	35AWW04	MW-1	LHS-MW-01	LHS-MW-1	LHS-MW-01
Date Sampled:	11/08/1998	11/08/1998	11/08/1998	09/30/1998	11/08/1998	01/31/1996	05/13/1998	08/12/1996	11/29/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
3-NITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U
TETRYL	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW02	LHSMW02	LHSMW02	LHSMW03	LHSMW03	LHSMW03	LHSMW03	LHSMW04
Sample Number:	LHS-MW-02	LHS-MW-2	LHS-MW-02	LHS-MW-03	LHS-MW-03REFD	LHS-MW-3	LHS-MW-03	LHS-MW-04
Date Sampled:	05/13/1998	08/12/1996	11/29/1994	05/13/1998	05/13/1998	08/13/1996	11/29/1994	05/13/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L								
3-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [2.6] UJ	ND [2.6] UJ	ND [0.26] U	ND [0.5] U	ND [2.6] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [1.3] U	1.9	ND [0.54] U	ND [1.3] UJ	ND [1.3] UJ	88.3	ND [0.54] U	ND [1.3] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [1.3] UJ	ND [1.3] UJ	5.6	ND [1.1] U	ND [1.3] U
TETRYL	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [2.6] UJ	ND [2.6] UJ	4.8	ND [0.37] U	ND [2.6] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW04	LHSMW04	LHSMW05	LHSMW05	LHSMW05	LHSMW05	LHSMW05	LHSMW06	LHSMW06
Sample Number:	LHS-MW-4	LHS-MW-04	MW-5	LHS-MW-05	LHS-MW-5	LHS-MW-05	LHS-MW-05	LHS-MW-06	LHS-MW-6
Date Sampled:	08/12/1996	12/01/1994	01/31/1996	05/13/1998	08/12/1996	08/26/1998	12/01/1994	05/13/1998	08/13/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA		NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA		NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
3-NITROTOLUENE	0.68	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	NA	ND [0.5] U	ND [2.6] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	1.8	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	NA	ND [0.54] U	ND [1.3] U	0.26
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	NA	ND [1.1] U	ND [1.3] U	ND [0.26] U
TETRYL	0.19	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.37] U	ND [2.6] U	ND [0.13] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW06	LHSMW07	LHSMW07	LHSMW07	LHSMW07
Sample Number:	LHS-MW-06	LHS-MW-07	LHS-MW-7	LHS-MW-07	LHS-MW-07
Date Sampled:	12/01/1994	05/13/1998	08/12/1996	08/26/1998	12/01/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L					
NO DETECTED COMPOUNDS	NA	NA	NA		NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L					
NO DETECTED COMPOUNDS	NA	NA	NA		NA
HERBICIDES - UNITS: UG/L					
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L					
NO DETECTED COMPOUNDS	NA	NA	NA		NA
EXPLOSIVES - UNITS: UG/L					
3-NITROTOLUENE	ND [0.5] U	ND [2.6] U	ND [0.26] U	NA	ND [0.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.54] U	ND [1.3] U	ND [0.26] U	NA	ND [0.54] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.1] U	ND [1.3] U	ND [0.26] U	NA	ND [1.1] U
TETRYL	ND [0.37] U	ND [2.6] U	ND [0.13] U	NA	ND [0.37] U

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Metals in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	35AWW01	35AWW02	35AWW02	35AWW03	35AWW04	35AWW04	LHSMW01	LHSMW01	LHSMW01	LHSMW01	LHSMW02
Sample Number:	35AWW01	35AWW02	35AWW02AFD	35AWW03	35AWW04	35AWW04	MW-1	LHS-MW-01	LHS-MW-1	LHS-MW-01	LHS-MW-2
Date Sampled:	11/08/1998	11/08/1998	11/08/1998	11/08/1998	09/30/1998	11/08/1998	01/31/1996	05/13/1998	08/12/1996	11/29/1994	01/31/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	ND [200] U	740	2600	4800	5300 J	1,200.00	400	ND [200] U	256	23300	2010 J
ANTIMONY	ND [5] U	ND [5] U	462	13	10	ND [5] U	ND [25] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U
ARSENIC	ND [10] U	ND [10] U	1940	ND [10] U	ND [10] U	ND [10] U	ND [2] U	ND [10] U	ND [2] U	8	ND [2] U
BARIUM	ND [200] U	ND [200] U	2200	210	ND [200] U	ND [200] U	18	ND [200] U	19	280	33
BERYLLIUM	ND [0.5] U	ND [0.5] U	49.5	0.7	0.6	ND [0.5] U	0.56	1.1	ND [10] U	NA	ND [5] U
CADMIUM	ND [0.8] U	ND [0.8] U	49.7	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.2] U	ND [0.8] U	ND [10] U	ND [10] U	ND [50] U
CALCIUM	48000	6300	6200	28000	230000	240000	345000	350000	397000	329000	285000
CHROMIUM, TOTAL	140 J	600 J	780 J	30 J	70	20 J	16	120	55	1300	33
COBALT	ND [50] U	ND [50] U	510	ND [50] U	ND [50] U	ND [50] U	3.1	ND [50] U	ND [20] U	26	ND [10] U
COPPER	ND [25] U	41	296	ND [25] U	ND [25] U	ND [25] U	5.9	ND [25] U	ND [10] U	49	ND [10] U
IRON	1200 J	3400 J	4400 J	8500 J	9700	2800 J	240	1300	537	28100	2860 J
LEAD	ND [3] U	ND [3] U	497.00	ND [3] U	7	ND [3] U	ND [1] U	ND [3] U	ND [90] U	15	ND [150] U
MAGNESIUM	27000	ND [5000] U	ND [5000] U	19000	190000	180000	187000	210000	208000	175000	122000 J
MANGANESE	20	85	613	255	218	114	1500	1990	1450 J	1100	158
MERCURY	ND [0.2] U	ND [0.2] U	NA	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U
NICKEL	70	340	810	50	230	80	120	120	87	NA	15
POTASSIUM	ND [5000] U	6700	6200	ND [5000] U	ND [5000] U	ND [5000] U	1400	ND [5000] U	3930 J	4100	1780 J
SELENIUM	ND [5] U	ND [5] U	1870	ND [5] U	ND [5] U	ND [5] U	ND [2] U	ND [5] U	5	ND [4] U	10.1
SILVER	ND [10] U	ND [10] U	60	ND [10] U	ND [10] U	ND [10] U	ND [0.4] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	57000	93000	92000	120000	640000	610000	NA	1100000	NA	NA	NA
STRONTIUM	1600	330	330	640	8000	9600	7500	10000	357	7200	4840 J
THALLIUM	ND [1] UJ	1.8 J	50 J	1.6 J	ND [1] U	1.1 J	ND [1.7] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U
TIN	ND [100] U	ND [100] U	750	530	ND [100] U	ND [100] U	NA	ND [100] U	NA	NA	NA
VANADIUM	ND [50] U	ND [50] U	490	ND [50] U	ND [50] U	ND [50] U	ND [1.7] U	ND [50] U	ND [20] U	NA	ND [10] U
ZINC	30	40	570	50	40	30	ND [1.9] U	60	ND [20] U	NA	34

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Metals in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW02	LHSMW02	LHSMW02	LHSMW03	LHSMW03	LHSMW03	LHSMW03	LHSMW04	LHSMW04	LHSMW04	LHSMW04	LHSMW05
Sample Number:	LHS-MW-02	LHS-MW-2	LHS-MW-02	LHS-MW-3	LHS-MW-03	LHS-MW-3	LHS-MW-03	LHS-MW-4	LHS-MW-04	LHS-MW-4	LHS-MW-04	MW-5
Date Sampled:	05/13/1998	08/12/1996	11/29/1994	01/31/1996	05/13/1998	08/13/1996	11/29/1994	01/31/1996	05/13/1998	08/12/1996	12/01/1994	01/31/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L												
ALUMINUM	950	851	9600	24000 J	17000	18300 J	98200	12500 J	740	1310 J	8200	1900
ANTIMONY	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [25] U
ARSENIC	ND [10] U	ND [2] U	4	ND [2] U	11	ND [2] U	ND [2] U	ND [2] U	ND [10] U	ND [2] U	5.3	ND [2] U
BARIUM	ND [200] U	22	84	375	400	436	1600	244	ND [200] U	273	220	69
BERYLLIUM	ND [0.5] U	ND [10] U	NA	ND [5] U	1.5	ND [10] U	NA	ND [5] U	ND [0.5] U	ND [10] U	NA	1.9
CADMIUM	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	0.9	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	2
CALCIUM	78000	283000	151000	8010 J	6200	7200 J	16800	24800 J	23000	33400 J	28900	283000
CHROMIUM, TOTAL	10	16	ND [20] U	63	80	111	170	348	230	65	58	40
COBALT	ND [50] U	ND [20] U	ND [20] U	13	ND [50] U	ND [20] U	72	14	ND [50] U	ND [20] U	22	230
COPPER	ND [25] U	ND [10] U	ND [20] U	25	69	36	130	27	ND [25] U	ND [10] U	ND [20] U	15
IRON	1100	1220 J	10600	29800	24000	37800 J	167000	20800 J	1900	2900 J	19900	3,300.00
LEAD	ND [3] U	ND [90] U	9.2	ND [30] U	19	ND [90] U	90	ND [30] U	ND [3] U	ND [90] U	13	ND [1] U
MAGNESIUM	40000	125000	83200	7210 J	6200	7050 J	23200	14800 J	11000	16500 J	16600	182000
MANGANESE	49	63	130	208	276	323	1400	330	165	160.00	460	4600
MERCURY	ND [0.2] U	0.116	0.31	ND [0.2] U	ND [0.2] U	ND [0.1] U	0.39	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U
NICKEL	ND [40] U	ND [20] U	NA	47	60	97	NA	74.8	150	73	NA	340
POTASSIUM	ND [5000] U	1510 J	2300	3200 J	7300	2830 J	8200	2640 J	ND [5000] U	1410 J	2100	1200
SELENIUM	ND [5] U	9	ND [2] U	2.8	8	2	ND [10] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	0.7
SODIUM	250000	NA	NA	NA	23000	NA	NA	NA	110000	NA	NA	NA
STRONTIUM	2000	5760 J	3900	188	150	185	490	729	750	1080 J	790	5400
THALLIUM	ND [1] U	ND [90] U	ND [500] U	ND [90] U	1.8	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [1.7] U
TIN	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA
VANADIUM	ND [50] U	ND [20] U	NA	56	ND [50] U	55	NA	30	ND [50] U	ND [20] U	NA	ND [1.7] U
ZINC	20	24	NA	119	90	136	NA	NA	20	27	NA	45

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Metals in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW05	LHSMW05	LHSMW05	LHSMW06	LHSMW06	LHSMW06	LHSMW06	LHSMW07	LHSMW07	LHSMW07	LHSMW07
Sample Number:	LHS-MW-05	LHS-MW-5	LHS-MW-05	LHS-MW-6	LHS-MW-06	LHS-MW-6	LHS-MW-06	LHS-MW-7	LHS-MW-07	LHS-MW-7	LHS-MW-07
Date Sampled:	05/13/1998	08/12/1996	12/01/1994	02/01/1996	05/13/1998	08/13/1996	12/01/1994	01/31/1996	05/13/1998	08/12/1996	12/01/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	2400	4930 J	35400	NA	1800	3950 J	17300	1720 J	ND [200] U	NA	23600
ANTIMONY	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U
ARSENIC	ND [10] U	3.5	7.3	ND [2] U	ND [10] U	3.3	4.2	ND [2] U	ND [10] U	ND [2] U	10
BARIUM	ND [200] U	74	400	49	ND [200] U	84	340	30	ND [200] U	20	140
BERYLLIUM	3.7	ND [10] U	NA	ND [5] U	0.5	ND [10] U	NA	ND [5] U	0.7	ND [10] U	NA
CADMIUM	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [100] U	ND [10] U
CALCIUM	220000	247000	310000	134000 J	130000	137000 J	192000	714000	710000	733000	799000
CHROMIUM, TOTAL	160	1180 J	2800	16	260	55	120	39	20	ND [100] U	83
COBALT	250	230	240	ND [10] U	ND [50] U	ND [20] U	ND [20] U	ND [10] U	ND [50] U	ND [200] U	ND [20] U
COPPER	29	21	59	ND [10] U	ND [25] U	ND [10] U	25	ND [10] U	ND [25] U	ND [10] U	61
IRON	3300	11100 J	62700	2240 J	330	7570 J	39300	1590 J	1400	1670 J	35600
LEAD	ND [3] U	ND [90] U	29.00	ND [30] U	ND [3] U	ND [90] U	16	ND [30] U	ND [3] U	ND [90] U	21
MAGNESIUM	150000	132000	200000	70600 J	67000	69500 J	98400	124000	480000	453000	537000
MANGANESE	4070	3190 J	5800	1040 J	751	1110 J	1600	134	92	ND [100] U	560
MERCURY	0.9	0.222	0.36	ND [0.2] U	ND [0.2] U	ND [0.1] U	0.22	ND [0.2] U	ND [0.2] U	0.384	ND [0.2] U
NICKEL	240	1100 J	NA	51	130	106	NA	50	ND [40] U	ND [200] U	NA
POTASSIUM	ND [5000] U	1410 J	3300	1160 J	ND [5000] U	1490 J	2600	7500 J	ND [5000] U	4930 J	7700
SELENIUM	ND [5] U	6	ND [10] U	8.4	ND [5] U	5	ND [2] U	65.8	ND [5] U	56	ND [10] U
SILVER	ND [10] U	10	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	670000	NA	NA	NA	380000	NA	NA	NA	1200000	NA	NA
STRONTIUM	4900	4060 J	6200	2790 J	3200	3120 J	4400	19200	23000	17500 J	22400
THALLIUM	3.2	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U	3.6	ND [900] U	ND [500] U
TIN	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA
ZINC	40	63	NA	39	20	54	NA	42	ND [20] U	70	NA

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Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW01	LHSMW01	LHSMW01	LHSMW01	LHSMW02	LHSMW03	LHSMW03	LHSMW04	LHSMW04	LHSMW05
Sample Number:	MW-1	LHSMW01	LHSMW01	LHS-MW-1	LHS-MW-2	MW-3	LHS-MW-3	MW-4	LHS-MW-4	MW-5
Date Sampled:	01/31/1996	02/08/2001	05/24/2000	08/12/1996	08/12/1996	01/31/1996	08/13/1996	01/31/1996	08/12/1996	01/31/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	2020000	NA	NA	1460000 J	300000	4800	3600	280000	275000	1390000
CYANIDE	ND [10] U	NA	NA	NA	NA	NA	NA	NA	NA	ND [10] U
NITROGEN, NITRATE (AS N)	ND [500] U	NA	NA	ND [500] U	ND [500] U	ND [500] U	500	ND [500] U	ND [500] U	ND [500] U
NITROGEN, NITRITE	ND [500] U	NA	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	NA	81	36.9	NA	NA	NA	NA	NA	NA	NA
SULFATE (AS SO4)	454000:	NA	NA	1580000 J:	159000	10000	10000	31000	34000	1422000:
PETROLEUM HYDROCARBONS - UNITS: MG/L										
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA	NA	NA	

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Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 35A
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW05	LHSMW06	LHSMW06	LHSMW07	LHSMW07	LHSMW07
Sample Number:	LHS-MW-5	MW-6	LHS-MW-6	MW-7	LHS-MW-7	LHS-MW-07
Date Sampled:	08/12/1996	02/01/1996	08/13/1996	01/31/1996	08/12/1996	12/01/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L						
CHLORIDE (AS CL)	165000	635000	584000	2605000	196000	NA
CYANIDE	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	2000	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA
NITROGEN, NITRITE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA
PERCHLORATE	NA	NA	NA	NA	NA	NA
SULFATE (AS SO4)	485000:	473000:	462000:	2550000:	301000	NA
PETROLEUM HYDROCARBONS - UNITS: MG/L						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

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VOCs and SVOCs in Soil Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	35BSB01	35BSB01	35BSB01	LH-WRS14-01	LH-WRS14-01	LHS-3-30	LHS-MW-58
Sample Number:	35BSB01(0-0.5)	35BSB01(1-3)	35BSB01(3-5)	LH-WRS14-01_1	LH-WRS14-01_2	LHS-3-30	LHS-MW58
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	06/26/1993	06/26/1993	01/11/1995	10/05/1994
Depth (ft.):	0.00	1.00	3.00	0.50	3.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
CARBON DISULFIDE	ND [5.6] U	ND [5.6] U	ND [5.6] U	324	66	ND [6] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [11] U	ND [11] U	ND [11] U	ND [6] U	6	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(a)ANTHRACENE	420	ND [370] U	ND [370] U	ND [353] U	ND [357] U	ND [4000] U	ND [420] U
BENZO(a)PYRENE	390	ND [180] U	ND [180] U	ND [588] U	ND [595] U	ND [4000] U	ND [420] U
BENZO(b)FLUORANTHENE	530	ND [370] U	ND [370] U	ND [1176] U	ND [1190] U	ND [4000] U	ND [420] U
BENZO(g,h,i)PERYLENE	250	ND [370] U	ND [370] U	ND [2353] U	ND [2381] U	ND [4000] U	ND [420] U
CHRYSENE	450	ND [370] U	ND [370] U	ND [5882] U	ND [5952] U	ND [4000] U	ND [420] U
FLUORANTHENE	760	ND [370] U	ND [370] U	ND [588] U	ND [595] U	ND [4000] U	ND [420] U
INDENO(1,2,3-c,d)PYRENE	350	ND [370] U	ND [370] U	ND [1176] U	ND [1190] U	ND [4000] U	ND [420] U
PHENANTHRENE	370	ND [370] U	ND [370] U	ND [588] U	ND [595] U	ND [4000] U	ND [420] U
PYRENE	560	ND [370] U	ND [370] U	ND [588] U	ND [595] U	ND [4000] U	ND [420] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [370] U	ND [370] U	ND [370] U	ND [212] U	ND [167] U	560 J	160 J

250000

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VOCs and SVOCs in Soil Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-59
Sample Number:	LHS-MW59
Date Sampled:	10/05/1994
Depth (ft.):	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG	
CARBON DISULFIDE	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG	
BENZO(a)ANTHRACENE	ND [380] U
BENZO(a)PYRENE	ND [380] U
BENZO(b)FLUORANTHENE	ND [380] U
BENZO(g,h,i)PERYLENE	ND [380] U
CHRYSENE	ND [380] U
FLUORANTHENE	ND [380] U
INDENO(1,2,3-c,d)PYRENE	ND [380] U
PHENANTHRENE	ND [380] U
PYRENE	ND [380] U
bis(2-ETHYLHEXYL) PHTHALATE	49 J

850090

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	35BSB01	35BSB01	35BSB01	35BSB01	35BSB01	35BSB01	LH-WRS14-01
Sample Number:	35BSB01(0-0.5)	35BSB01(0-0.5)DFD	35BSB01(1-3)	35BSB01(1-3)FD	35BSB01(3-5)	35BSB01(3-5)FD	LH-WRS14-01_1
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	06/26/1993
Depth (ft.):	0.00	0.00	1.00	1.00	3.00	3.00	0.50
PESTICIDES - UNITS: UG/KG							
ALDRIN	170	ND [9.3] U	ND [1.8] U	NA	ND [1.8] U	NA	NA
p,p'-DDE	130 J	130 J	16	NA	11	NA	NA
p,p'-DDT	24 J	37 J	ND [3.7] U	NA	6.1 J	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
NO DETECTED COMPOUNDS		NA		NA		NA	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	33.263	NA	4.192	NA	2.063	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	5.765	NA	0.525	NA	0.236	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [3.241] U	NA	0.373	NA	0.219	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	2.008	NA	0.259	NA	ND [0.072] U	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [1.392] U	NA	0.506	0.273	0.455	ND [0.256] U	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	69.33	NA	8.984	NA	4.485	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	5.765	NA	0.584	NA	0.602	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	11.141	NA	1.343	NA	0.574	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	5.299	NA	1.066	NA	0.234	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	669.292	NA	133.977	NA	241.082	NA	NA
OCTACHLORODIBENZOFURAN	15.485	NA	1.57	NA	0.626	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	6.501	NA	1.017	NA	ND [0.073] U	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	2.56 J	NA	0.506	NA	0.959	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS		NA		NA		NA	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS14-01	LHS-3-30	LHS-MW-58	LHS-MW-59	WRSUMP014	WRSUMP014	WRSUMP014
Sample Number:	LH-WRS14-01_2	LHS-3-30	LHS-MW58	LHS-MW59	WRSUMP014(0-.5)	WRSUMP14(0-0.5)	WRSUMP014(3-5)
Date Sampled:	06/26/1993	01/11/1995	10/05/1994	10/05/1994	08/07/1998	08/07/1998	08/07/1998
Depth (ft.):	3.00	0.00	0.00	0.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
ALDRIN	NA	NA	NA	NA	NA	ND [1.9] U	ND [1.9] U
p,p'-DDE	NA	NA	NA	NA	NA	ND [3.9] U	ND [3.9] U
p,p'-DDT	NA	NA	NA	NA	NA	ND [3.9] U	ND [3.9] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	18.068	NA	3.553
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	0.938	NA	0.248
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.2] U	NA	ND [0.215] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.171] U	NA	ND [0.195] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.296] U	NA	ND [0.196] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	37.365	NA	3.553
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	1.348	NA	ND [0.14] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	ND [0.186] U	NA	ND [0.219] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	0.865	NA	ND [0.143] U
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	2104.093 J	NA	237.982 J
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	1.721	NA	ND [0.259] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	ND [0.179] U	NA	ND [0.204] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	ND [0.296] U	NA	ND [0.196] U
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA				NA	NA	NA

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Metals in Soil Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	35BSB01	35BSB01	35BSB01	LH-WRS14-01	LH-WRS14-01	LHS-3-30	LHS-MW-58	LHS-MW-59	WRSUMP014
Sample Number:	35BSB01(0-0.5)	35BSB01(1-3)	35BSB01(3-5)	LH-WRS14-01_1	LH-WRS14-01_2	LHS-3-30	LHS-MW58	LHS-MW59	WRSUMP14(0-0.5)
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	06/26/1993	06/26/1993	01/11/1995	10/05/1994	10/05/1994	08/07/1998
Depth (ft.):	0.00	1.00	3.00	0.50	3.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG									
ALUMINUM	5900000 J	8100000 J	13000000 J	18600000	9810000	5110000	3300000	4190000	NA
ANTIMONY	ND [6740] R	ND [6650] R	ND [6640] R	ND [11300] U	ND [13600] U	ND [10100] UJ	ND [8500] UJ	ND [6200] UJ	NA
ARSENIC	6570	3630	4470	3150	3270	7500 J	1600 J	2000 J	NA
BARIUM	55000 J	77000 J	78000 J	44600	38900	177000	80700	190000	NA
BERYLLIUM	630 J	603 J	593 J	NA	NA	NA	NA	NA	ND [581] U
CADMIUM	ND [562] U	ND [554] U	ND [553] U	4560	3610	7500	ND [850] U	ND [620] U	NA
CALCIUM	3500000 J	2200000 J	1700000 J	1370000	660000	2130000	872000	598000	NA
CHROMIUM, TOTAL	35000 J	22000 J	15000 J	15000	11700	42900 J	9100	16700	NA
COBALT	ND [5600] U	6200 J	5800 J	2980	2460	7000	5500	24100	NA
COPPER	ND [2810] U	3570 J	5150 J	7990	6750	10800	3600	3300	NA
IRON	39000000 J	15000000 J	19000000 J	17500000	10300000	47000000	6200000	12800000	NA
LEAD	31100	8030	8260	29400	ND [20500] U	40300	9500	13600	NA
MAGNESIUM	ND [560000] U	630000 J	1100000 J	704000	542000	311000	274000	175000	NA
MANGANESE	303000 J	228000 J	64000 J	21500	7770	266000	462000	1860000	NA
MERCURY	ND [110] U	ND [110] U	ND [110] U	ND [27] U	ND [27] U	600	110	ND [82] U	NA
NICKEL	6900 J	9300 J	11000 J	NA	NA	NA	NA	NA	13000
POTASSIUM	ND [560000] U	810000	800000	637000	587000	241000	269000	199000	NA
SELENIUM	4120	1300	1550	ND [1130] U	ND [1360] U	510 J	210	220	NA
SILVER	ND [1100] U	ND [1100] U	ND [1100] U	90	ND [68] U	ND [1000] U	ND [850] U	ND [620] U	NA
SODIUM	ND [560000] U	ND [550000] U	ND [550000] U	NA	NA	NA	NA	NA	NA
STRONTIUM	6300	10000	18000	11300	9620	31900	9000	ND [6200] U	NA
THALLIUM	ND [562] U	ND [554] U	ND [553] U	NA	NA	ND [50400] U	ND [42300] U	ND [30900] U	NA
VANADIUM	48000 J	25000 J	31000 J	NA	NA	NA	NA	NA	37000 J
ZINC	58000 J	19000 J	20000 J	28500	19600	1100000	21000	11800	NA

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Metals in Soil Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP014
Sample Number:	WRSUMP014(3-5)
Date Sampled:	08/07/1998
Depth (ft.):	3.00
METALS - UNITS: UG/KG	
ALUMINUM	NA
ANTIMONY	NA
ARSENIC	NA
BARIUM	NA
BERYLLIUM	ND [588] U
CADMIUM	NA
CALCIUM	NA
CHROMIUM, TOTAL	NA
COBALT	NA
COPPER	NA
IRON	NA
LEAD	NA
MAGNESIUM	NA
MANGANESE	NA
MERCURY	NA
NICKEL	11000
POTASSIUM	NA
SELENIUM	NA
SILVER	NA
SODIUM	NA
STRONTIUM	NA
THALLIUM	NA
VANADIUM	33000 J
ZINC	NA

027782

VOCs and SVOCs in Groundwater Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	35BWW01	35BWW02	LHSMW58	LHSMW58	LHSMW58	LHSMW58	LHSMW59	LHSMW59	LHSMW59
Sample Number:	35BWW01	35BWW02	MW-58	LHS-MW-58	LHS-MW-58	LHS-MW-58	MW-59	LHS-MW-59	LHS-MW-59DLFD
Date Sampled:	11/08/1998	11/08/1998	02/10/1996	05/20/1998	08/21/1996	12/11/1994	02/10/1996	05/20/1998	05/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [1] U	ND [1] U	12	0.96	26.5	37	ND [1] U	ND [1] U	ND [4] U
1,1-DICHLOROETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	2.1	ND [5] U	ND [1] U	ND [1] U	ND [4] U
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	18	4.2	25.4	58	ND [1] U	ND [1] U	ND [4] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [4] U
ACETONE	ND [5] U	2.4	NA	ND [5] U	NA	ND [10] U	ND [1] U	ND [5] U	ND [20] U
BENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	3 J	ND [1] U	ND [1] U	ND [4] U
CHLOROBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	2.6	2 J	ND [1] U	ND [1] U	ND [4] U
CHLOROFORM	ND [1] U	ND [1] U	ND [1] U	ND [1] U	0.38	ND [5] U	ND [1] U	ND [1] U	ND [4] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	8	9.5	7.9	21	16	7	6
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	7	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [1] U	9	9.4	11.5	NA	249	300	330
TRICHLOROFLUOROMETHANE	ND [2] U	ND [2] U	ND [1] U	ND [2] U	2.3	NA	ND [1] U	ND [2] U	ND [8] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	1.8	0.53	2.1	NA	ND [1] U	ND [1] U	ND [4] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
DI-n-OCTYLPHTHALATE	ND [10] U	ND [10] U	1.6	ND [10] U	3.6	ND [10] U	3.4	ND [10] U	NA
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	1	ND [10] U	ND [0.92] U	ND [10] U	1.4	ND [10] U	NA

027783

VOCs and SVOCs in Groundwater Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW59	LHSMW59
Sample Number:	LHS-MW-59	LHS-MW-59
Date Sampled:	08/21/1996	12/11/1994
Depth (ft.):	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L		
1,1,1-TRICHLOROETHANE	9.7	ND [5] U
1,1-DICHLOROETHANE	ND [0.2] U	ND [5] U
1,1-DICHLOROETHENE	2.2	ND [5] U
1,2,4-TRICHLOROBENZENE	1.5	NA
ACETONE	NA	ND [10] U
BENZENE	ND [0.2] U	ND [5] U
CHLOROBENZENE	ND [0.5] U	ND [5] U
CHLOROFORM	ND [0.2] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	16.9	11
TOTAL 1,2-DICHLOROETHENE	NA	ND [5] U
TRICHLOROETHYLENE (TCE)	327	NA
TRICHLOROFLUOROMETHANE	2.7	NA
cis-1,2-DICHLOROETHYLENE	ND [0.2] U	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L		
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	1 J

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	35BWW01	35BWW01	35BWW02	LHSMW58	LHSMW58	LHSMW58	LHSMW58	LHSMW59	LHSMW59
Sample Number:	35BWW01	35BWW01REFD	35BWW02	MW-58	LHS-MW-58	LHS-MW-58	LHS-MW-58	MW-59	LHS-MW-59
Date Sampled:	11/08/1998	11/08/1998	11/08/1998	02/10/1996	05/20/1998	08/21/1996	12/11/1994	02/10/1996	05/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA		NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA		NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA		NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3-DINITROBENZENE	ND [0.13] UJ	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	0.1 J	ND [1.3] U
TETRYL	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	0.41	ND [2.6] U	ND [0.13] U	ND [0.37] U	0.072 J	ND [2.6] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW59	LHSMW59	LHSMW59
Sample Number:	LHS-MW-59	LHS-MW-59	LHS-MW-59
Date Sampled:	08/21/1996	08/26/1998	12/11/1994
Depth (ft.):	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L			
NO DETECTED COMPOUNDS	NA		NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L			
NO DETECTED COMPOUNDS	NA		NA
HERBICIDES - UNITS: UG/L			
NO DETECTED COMPOUNDS	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L			
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	5.157 U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	5.225 J	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	10.051	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	20.87 U	NA
EXPLOSIVES - UNITS: UG/L			
1,3-DINITROBENZENE	ND [0.13] U	NA	ND [0.12] U
TETRYL	ND [0.13] U	NA	ND [0.37] U

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Metals in Groundwater Samples at Site 35B
Longhorn Army Ammunition Plant, Texas

Location:	35BWW01	35BWW02	LHSMW58	LHSMW58	LHSMW58	LHSMW58	LHSMW59	LHSMW59	LHSMW59	LHSMW59
Sample Number:	35BWW01	35BWW02	MW-58	LHS-MW-58	LHS-MW-58	LHS-MW-58	LHS-MW-59	LHS-MW-59	LHS-MW-59	LHS-MW-59
Date Sampled:	11/08/1998	11/05/1998	02/10/1996	05/20/1998	08/21/1996	12/11/1994	02/10/1996	05/20/1998	08/21/1996	12/11/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L										
ALUMINUM	2300	2600	490	ND [200] U	219 J	3900	NA	ND [200] U	106 J	4700
ANTIMONY	ND [5] U	ND [5] U	ND [25] U	ND [5] R	80 J	ND [100] U	ND [60] U	ND [5] R	55 J	ND [100] U
ARSENIC	ND [10] U	ND [10] U	ND [2] U	ND [10] U	ND [1] U	ND [2] U	ND [2] U	ND [10] U	ND [1] U	ND [2] U
BARIUM	ND [200] U	ND [200] U	83	ND [200] U	70 J	110	299	ND [200] U	207	130
BERYLLIUM	ND [0.5] U	ND [0.5] U	ND [0.2] U	ND [0.5] U	ND [6] U	NA	ND [5] U	ND [0.5] U	ND [6] U	NA
CADMIUM	ND [0.8] U	ND [0.8] U	0.3	ND [0.8] U	ND [6] U	ND [10] U	ND [10] U	ND [0.8] U	ND [6] U	ND [10] U
CALCIUM	ND [5000] U	ND [5000] U	3300	7300	4360 J	9700	40700 J	41000	43100 J	35500
CHROMIUM, TOTAL	10 J	10 J	4.3	ND [10] U	ND [10] U	25	ND [10] U	ND [10] U	ND [10] U	21
COBALT	ND [50] U	ND [50] U	ND [2.5] U	ND [50] U	ND [20] U	ND [20] U	ND [10] U	ND [50] U	ND [20] U	ND [20] U
COPPER	ND [25] U	ND [25] U	3.3	ND [25] U	19 J	ND [20] U	23	ND [25] U	8 J	ND [20] U
IRON	2600 J	2600 J	1200	150	139 J	7300	343	280	45 J	7000
LEAD	ND [3] U	ND [3] U	ND [1] U	ND [3] U	ND [90] U	3.7	ND [30] U	ND [3] U	ND [90] U	3.9
MAGNESIUM	ND [5000] U	ND [5000] U	1400	ND [5000] U	1870 J	4600	17700 J	19000	16800 J	18800
MANGANESE	72	52	67	16	55 J	180	201	237	158	380
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.04 J	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.02] U	ND [0.2] U
NICKEL	ND [40] U	ND [40] U	ND [7.6] U	ND [40] U	23 J	NA	68	ND [40] U	25 J	NA
POTASSIUM	ND [5000] U	ND [5000] U	670	ND [5000] U	736 J	ND [2000] U	1850 J	ND [5000] U	1650 J	2500
SELENIUM	ND [5] U	ND [5] U	ND [2] U	ND [5] U	ND [1] U	ND [2] U	2.4	ND [5] U	ND [1] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [0.4] U	ND [10] U	ND [6] U	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U
SODIUM	7900	ND [5000] U	NA	35000	NA	NA	NA	92000	NA	NA
STRONTIUM	ND [50] U	ND [50] U	96	230	116 J	280	1570 J	1900	1450 J	1300
THALLIUM	1.8 J	ND [1] UJ	ND [1.7] U	ND [1] R	98 J	ND [500] U	ND [90] U	ND [1] R	ND [90] U	ND [500] U
TIN	ND [100] U	ND [100] U	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	ND [50] U	ND [50] U	3.2	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA
ZINC	30	30	35	ND [20] U	34 J	40	21	ND [20] U	ND [20] U	37

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VOCs and SVOCs in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	35CSB01	35CSB01	35CSB01	LH-DL102-01	LH-DL103-01	LH-DL104-01	LH-DL105-01
Sample Number:	35CSB01(0-0.5)	35CSB01(1-3)	35CSB01(3-5)	LH-DL102-01	LH-DL103-01	LH-DL104-01	LH-DL105-01
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	08/03/1993	07/25/1993	08/04/1993	08/03/1993
Depth (ft.):	0.00	1.00	3.00	2.00	2.00	2.00	2.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ACETONE	ND [22] U	ND [22] U	ND [22] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(a)ANTHRACENE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(a)PYRENE	ND [180] U	ND [180] U	ND [190] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(b)FLUORANTHENE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(k)FLUORANTHENE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
CHRYSENE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PYRENE	ND [360] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [360] U	ND [360] U	ND [370] U	580	ND [330] U	ND [330] U	ND [330] U

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VOCs and SVOCs in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LH-S102-01	LH-S102-01	LH-S102-02	LH-S102-02	LH-S103-01	LH-S103-01	LH-S103-01
Sample Number:	LH-S102-01_1	LH-S102-01_2	LH-S102-02_1	LH-S102-02_2	LH-S103-01_1	LH-S103-01_2	LH-S103-01_3
Date Sampled:	08/03/1993	08/03/1993	08/03/1993	08/03/1993	07/24/1993	07/24/1993	07/24/1993
Depth (ft.):	0.50	4.00	0.50	4.00	0.50	4.00	9.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(a)ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(a)PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(k)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
CHRYSENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

0027789

VOCs and SVOCs in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LH-S103-02	LH-S103-02	LH-S103-02	LH-S104-01	LH-S104-01	LH-S104-02	LH-S104-02
Sample Number:	LH-S103-02_1	LH-S103-02_2	LH-S103-02_3	LH-S104-01_1	LH-S104-01_2	LH-S104-02_1	LH-S104-02_2
Date Sampled:	07/25/1993	07/25/1993	07/25/1993	08/03/1993	08/03/1993	08/03/1993	08/03/1993
Depth (ft.):	0.50	4.00	9.00	1.50	9.00	0.50	7.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(a)ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(a)PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZO(k)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
CHRYSENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

027790

VOCs and SVOCs in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LH-S105-01	LH-S105-01	LH-S105-02	LH-S105-02	LHS-MW-67	LHS-MW-68	LHS-MW-69	LHS-MW-70
Sample Number:	LH-S105-01_1	LH-S105-01_2	LH-S105-02_1	LH-S105-02_2	LHS-MW67	LHS-MW68	LHS-MW69	LHS-MW70
Date Sampled:	08/03/1993	08/03/1993	08/03/1993	08/03/1993	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.50	4.00	0.50	4.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [11] U	ND [10] U	ND [10] U	5 J
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(a)ANTHRACENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [370] U	ND [350] U	ND [350] U	ND [360] U
BENZO(a)PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [370] U	ND [350] U	ND [350] U	ND [360] U
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [370] U	ND [350] U	ND [350] U	ND [360] U
BENZO(k)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [370] U	ND [350] U	ND [350] U	ND [360] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [370] U	ND [350] U	ND [350] U	ND [360] U
CHRYSENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [370] U	ND [350] U	ND [350] U	ND [360] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	66 J	68 J	66 J	81 J
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	74 J	54 J	ND [350] U	39 J
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	49 J	41 J	ND [350] U	ND [360] U
PYRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [370] U	ND [350] U	ND [350] U	ND [360] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	80 J	62 J	36 J	82 J

0277791
0277791

VOCs and SVOCs in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-71	LHS-T-01	LHS-T-02
Sample Number:	LHS-MW71	LHS-T-01	LHS-T-02
Date Sampled:	10/05/1994	01/11/1995	01/11/1995
Depth (ft.):	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG			
ACETONE	ND [10] U	ND [15] U	ND [16] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG			
BENZO(a)ANTHRACENE	ND [340] U	140 J	ND [520] U
BENZO(a)PYRENE	ND [340] U	110 J	ND [520] U
BENZO(b)FLUORANTHENE	ND [340] U	280 J	ND [520] U
BENZO(k)FLUORANTHENE	ND [340] U	110 J	ND [520] U
BENZYL BUTYL PHTHALATE	ND [340] U	220 J	ND [520] U
CHRYSENE	ND [340] U	290 J	ND [520] U
DI-n-BUTYL PHTHALATE	66 J	ND [500] U	ND [520] U
FLUORANTHENE	ND [340] U	420 J	ND [520] U
PHENANTHRENE	ND [340] U	ND [500] U	ND [520] U
PYRENE	ND [340] U	320 J	ND [520] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [340] U	81 J	ND [520] U

027792

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	35CSB01	35CSB01	35CSB01	LH-DL103-01	LHS-MW-67	LHS-MW-68	LHS-MW-69	LHS-MW-70
Sample Number:	35CSB01(0-0.5)	35CSB01(1-3)	35CSB01(3-5)	LH-DL103-01	LHS-MW67	LHS-MW68	LHS-MW69	LHS-MW70
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/25/1993	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	1.00	3.00	2.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG								
p,p'-DDE	3	ND [3.6] U	ND [3.7] U	NA	NA	NA	NA	NA
p,p'-DDT	6.8 J	ND [3.6] U	ND [3.7] U	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
NO DETECTED COMPOUNDS				NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	20.704 J	1453.11	68.28	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	3.203 J	218.228	9.51	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.178 J	11.969	0.518	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.065] UJ	10.646	0.348	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.482 J	19.746	0.856	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.772 J	52.792	2.119	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.06] UJ	4.069	0.203	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.203 J	21.791	0.952	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.103] UJ	1.267	ND [0.075] U	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.067] UJ	5.037	0.311	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.084] UJ	0.139	ND [0.041] U	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	0.464	0.476	0.394	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	31.614 J	2217.853	100.475	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	3.381 J	230.197	10.029	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	2.773 J	186.674	7.699	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	4.215 J	256.552	12.16	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	141.093 J	7068.108	450.139	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	11.88 J	904.49	51.12	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.103] UJ	1.15	ND [0.075] U	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.084] UJ	19.912	0.472	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.112] UJ	0.78	0.394	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS				NA				

240809

027793

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-71	SUMP105	SUMP105
Sample Number:	LHS-MW71	SUMP105(0-0.5)	SUMP105(3-5)
Date Sampled:	10/05/1994	08/11/1998	08/11/1998
Depth (ft.):	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG			
p,p'-DDE	NA	ND [3.8] U	ND [3.9] U
p,p'-DDT	NA	ND [3.8] U	ND [3.9] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG			
NO DETECTED COMPOUNDS	NA		
DIOXINS AND FURANS - UNITS: NG/KG			
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	60.154	3.147
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	2.182	ND [0.21] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.194] U	ND [0.28] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.34] U	ND [0.569] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	0.469	ND [0.26] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	0.654	ND [0.318] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.109] U	ND [0.173] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	1.273	ND [0.377] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.186] U	ND [0.234] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.159] U	ND [0.254] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.102] U	ND [0.209] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	ND [0.229] U	ND [0.346] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	130.144	8.236
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	2.182	ND [0.21] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	14.956	ND [0.318] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	3.195	ND [0.173] U
OCTACHLORODIBENZO-p-DIOXIN	NA	17491.922	340.795 J
OCTACHLORODIBENZOFURAN	NA	7.395	ND [0.2] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.186] U	ND [0.234] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.102] U	ND [0.209] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.229] U	ND [0.346] U
EXPLOSIVES - UNITS: UG/KG			
NO DETECTED COMPOUNDS		NA	NA

027794

Metals in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	35CSB01	35CSB01	35CSB01	LH-DL102-01	LH-DL103-01	LH-DL104-01	LH-DL105-01	LH-S102-01	LH-S102-01
Sample Number:	35CSB01(0-0.5)	35CSB01(1-3)	35CSB01(3-5)	LH-DL102-01	LH-DL103-01	LH-DL104-01	LH-DL105-01	LH-S102-01_1	LH-S102-01_2
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	08/03/1993	07/25/1993	08/04/1993	08/03/1993	08/03/1993	08/03/1993
Depth (ft.):	0.00	1.00	3.00	2.00	2.00	2.00	2.00	0.50	4.00
METALS - UNITS: UG/KG									
ALUMINUM	4600000 J	9700000 J	6000000 J	15000000	ND [12700000] U	15700000	23200000	22300000	20100000
ANTIMONY	ND [6510] R	ND [6540] R	ND [6750] R	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	3730	4180	3550	3000	3900	3100	5700	2000	3300
BARIUM	43000 J	150000 J	59000 J	135000	92500	111000	124000	101000	122000
BERYLLIUM	624 J	1020 J	732 J	NA	NA	NA	NA	NA	NA
CADMIUM	ND [542] U	ND [545] U	ND [562] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	ND [540000] U	820000 J	ND [560000] U	799000	1610000	971000	2100000	2460000	1260000
CHROMIUM, TOTAL	9600 J	14000 J	15000 J	20200	21500	18000	22700	25700	23800
COBALT	5900 J	11000 J	16000 J	11100	23800	10000	6600	6900	7000
COPPER	8810 J	8400 J	2820 J	7600	6700	7000	7100	7200	6900
IRON	8200000 J	14000000 J	12000000 J	18000000	ND [19700000] U	19200000	21100000	20900000	17800000
LEAD	6910	9230	9380	9100	13600	3800	9600	21200	7000
MAGNESIUM	890000 J	2000000 J	580000 J	2370000	1300000	2210000	2380000	2170000	1660000
MANGANESE	61700 J	50200 J	315000 J	49200	513000	45000	58900	61500	109000
MERCURY	ND [110] U	ND [110] U	ND [110] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	8800 J	17000 J	8900 J	NA	NA	NA	NA	NA	NA
POTASSIUM	890000	1700000	1100000	1200000	1350000	934000	1390000	1710000	1590000
SELENIUM	ND [1080] U	2150	ND [1120] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1100] U	ND [1100] U	ND [1100] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	ND [540000] U	ND [540000] U	ND [560000] U	NA	NA	NA	NA	NA	NA
STRONTIUM	6000	16000	ND [5600] U	22200	17900	25000	49500	24000	16800
THALLIUM	ND [542] U	ND [545] U	ND [562] U	NA	NA	NA	NA	NA	NA
VANADIUM	14000 J	23000 J	22000 J	NA	NA	NA	NA	NA	NA
ZINC	28000 J	57000 J	22000 J	67200	45500	60000	56900	59900	45400

027795

Metals in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LH-S102-02	LH-S102-02	LH-S103-01	LH-S103-01	LH-S103-01	LH-S103-02	LH-S103-02	LH-S103-02	LH-S104-01
Sample Number:	LH-S102-02_1	LH-S102-02_2	LH-S103-01_1	LH-S103-01_2	LH-S103-01_3	LH-S103-02_1	LH-S103-02_2	LH-S103-02_3	LH-S104-01_1
Date Sampled:	08/03/1993	08/03/1993	07/24/1993	07/24/1993	07/24/1993	07/25/1993	07/25/1993	07/25/1993	08/03/1993
Depth (ft.):	0.50	4.00	0.50	4.00	9.00	0.50	4.00	9.00	1.50
METALS - UNITS: UG/KG									
ALUMINUM	15300000	23800000	ND [7990000] U	ND [15500000] U	ND [7760000] U	ND [11600000] U	ND [18000000] U	ND [5240000] U	15400000
ANTIMONY	ND [3000] U	ND [3300] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	3400	3400	3400	3700	1600	2400	4100	1400	3800
BARIUM	107000	103000	87800	90600	45800	88000	88800	57600	83000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1800000	1220000	2290000	1520000	328000	2500000	1360000	257000	648000
CHROMIUM, TOTAL	21800	27500	12600	20600	10300	17200	21600	7300	18000
COBALT	9300	5300	7400	12300	5300	8000	29800	3800	10000
COPPER	6900	6800	6500	7300	3900	6800	7900	3800	7000
IRON	21000000	22500000	ND [15300000] U	ND [19900000] U	ND [10100000] U	ND [22300000] U	ND [20500000] U	ND [7620000] U	20700000
LEAD	10000	7200	11400	13700	5500	7100	16900	5000	3900
MAGNESIUM	1740000	1770000	969000	1320000	1270000	1540000	1720000	874000	1990000
MANGANESE	64400	191000	93300	183000	69700	70300	354000	46700	79000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	1130000	1600000	673000	1430000	674000	890000	1860000	422000	921000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	19600	16200	14600	16500	9300	19500	18000	7000	20000
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	59000	44000	54500	56800	25900	56100	53600	22700	61000

027796

Metals in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LH-S104-01	LH-S104-02	LH-S104-02	LH-S105-01	LH-S105-01	LH-S105-02	LH-S105-02	LHS-MW-67	LHS-MW-68	LHS-MW-69
Sample Number:	LH-S104-01_2	LH-S104-02_1	LH-S104-02_2	LH-S105-01_1	LH-S105-01_2	LH-S105-02_1	LH-S105-02_2	LHS-MW67	LHS-MW68	LHS-MW69
Date Sampled:	08/03/1993	08/03/1993	08/03/1993	08/03/1993	08/03/1993	08/03/1993	08/03/1993	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	9.00	0.50	7.00	0.50	4.00	0.50	4.00	0.00	0.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	16700000	9420000	7980000	16100000	13700000	23300000	17200000	16500000	7440000	9450000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [7200] U	ND [6200] U	ND [6600] U
ARSENIC	2200	6000	2300	6300	3500	5600	5100	2900	1800	12100
BARIUM	45000	71500	79300	85000	124000	103000	75700	52900	66900	39700
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [720] U	ND [620] U	ND [660] U
CALCIUM	779000	2170000	1040000	2290000	1960000	3350000	1140000	728000	616000	1640000
CHROMIUM, TOTAL	18000	20700	49700	23500	17400	23600	18700	20700	10200	49800
COBALT	6000	8600	1600	14100	12400	8900	11200	5600	6900	2000
COPPER	5000	4100	3000	8400	5800	7900	6700	7000	8300	6800
IRON	14000000	18100000	12700000	27800000	12200000	22600000	19000000	21500000	10400000	50700000
LEAD	3100	9500	6700	13500	7100	18500	10700	13300	8200	9900
MAGNESIUM	1640000	773000	472000	1930000	1420000	1750000	1860000	1560000	1140000	357000
MANGANESE	69000	316000	46300	244000	58100	163000	166000	72800	143000	63700
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	240	ND [91] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	904000	662000	781000	1420000	935000	1470000	1160000	1030000	641000	381000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	420	160	660
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	810	ND [620] U	1800
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	13000	12100	8900	21100	22300	23600	21000	15800	12600	9700
THALLIUM	NA	NA	NA	NA	NA	NA	NA	ND [35800] U	ND [31200] U	ND [32900] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	55000	36800	29700	55900	58600	55500	47400	44700	33000	20400

027797

Metals in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-70	LHS-MW-71	LHS-T-01	LHS-T-02	SUMP102	SUMP102	SUMP103	SUMP103	SUMP104
Sample Number:	LHS-MW70	LHS-MW71	LHS-T-01	LHS-T-02	SUMP102(0-0.5)	SUMP102(9.5-10)	SUMP103(0-0.5)	SUMP103(8-8.5)	SUMP104(0-0.5)
Date Sampled:	10/05/1994	10/05/1994	01/11/1995	01/11/1995	09/25/1998	09/25/1998	09/25/1998	09/25/1998	09/25/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	9.50	0.00	8.00	0.00
METALS - UNITS: UG/KG									
ALUMINUM	10300000	5550000	5890000	4950000	NA	NA	NA	NA	NA
ANTIMONY	ND [6200] U	ND [6100] U	ND [11800] UJ	ND [12100] UJ	NA	NA	NA	NA	NA
ARSENIC	2000	16200	10100	2400	NA	NA	NA	NA	NA
BARIUM	70700	38600	66300	48800	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	ND [623] U	ND [616] U	710	ND [566] U	ND [613] U
CADMIUM	ND [620] U	ND [610] U	ND [1200] U	1600	NA	NA	NA	NA	NA
CALCIUM	809000	356000	1070000	53200000	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	17900	28000	20600	10100	NA	NA	NA	NA	NA
COBALT	6100	2900	6500	3800	NA	NA	NA	NA	NA
COPPER	7600	3800	9600	13500	NA	NA	NA	NA	NA
IRON	24000000	34100000	17200000	7410000	NA	NA	NA	NA	NA
LEAD	10500	10900	28500	29000	NA	NA	NA	NA	NA
MAGNESIUM	908000	299000	441000	617000	NA	NA	NA	NA	NA
MANGANESE	86300	101000	170000	175000	NA	NA	NA	NA	NA
MERCURY	ND [98] U	ND [90] U	ND [120] U	ND [140] U	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	ND [5000] U	6900	9700	ND [4600] U	ND [4900] U
POTASSIUM	569000	289000	363000	400000	NA	NA	NA	NA	NA
SELENIUM	390	800	430 J	400 J	NA	NA	NA	NA	NA
SILVER	1000	1500	ND [1200] U	3900	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	13200	ND [6100] U	ND [11800] U	82500	NA	NA	NA	NA	NA
THALLIUM	ND [31200] U	ND [30700] U	ND [59000] U	ND [60300] U	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	44000	11000	16000	7800	33000
ZINC	39100	22400	50200 J	201000 J	NA	NA	NA	NA	NA

0277798

Metals in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	SUMP104	SUMP105	SUMP105	SUMP105
Sample Number:	SUMP104(5.5-6)	SUMP105(0-0.5)	SUMP105(3-5)	SUMP105(3-5)LFD
Date Sampled:	09/25/1998	08/11/1998	08/11/1998	08/11/1998
Depth (ft.):	5.50	0.00	3.00	3.00
METALS - UNITS: UG/KG				
ALUMINUM	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA
BERYLLIUM	ND [613] U	ND [576] U	718	ND [2900] U
CADMIUM	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA
COBALT	NA	NA	NA	NA
COPPER	NA	NA	NA	NA
IRON	NA	NA	NA	NA
LEAD	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA
NICKEL	ND [4900] U	ND [4600] U	8600	ND [23000] U
POTASSIUM	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA
SILVER	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA
VANADIUM	9100	51000	28000	32000
ZINC	NA	NA	NA	NA

0027799
0027799

Anions in Soil Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	35CSB02	35CSB02	35CSB03	35CSB03
Sample Number:	35CSB02(0-0.5)	35CSB02(1-2)	35CSB03(0-0.5)	35CSB03(1-2)
Date Sampled:	06/01/2000	06/01/2000	06/01/2000	06/01/2000
Depth (ft.):	0.00	1.00	0.00	1.00
ANIONS - UNITS: UG/KG				
PERCHLORATE	ND [5.96] U	ND [6.84] U	60.9	ND [6.11] U

027800

VOCs and SVOCs in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	106	106	106	107	107	107	LHSMW67	LHSMW67	LHSMW67
Sample Number:	MW-106	106	LHS-MW-106	MW-107	107	LHS-MW-107	MW-67	LHS-MW-67	LHS-MW-67
Date Sampled:	02/13/1996	05/28/1998	08/15/1996	02/13/1996	05/28/1998	08/15/1996	02/09/1996	05/27/1998	08/14/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,2-DICHLOROETHANE	ND [1] U	ND [1] U	ND [0.31] U	ND [1] U	ND [1] U	ND [0.31] U	ND [1] U	ND [1] U	ND [0.31] U
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [1] U	ND [0.25] U	ND [1] U	ND [1] U	ND [0.25] U	7.0	ND [1] U	ND [0.25] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND	ND	ND	ND	ND	8.0	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	ND [1.2] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [1.2] U	ND [10] U	ND [1.2] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	ND [1] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U	ND [10] U	ND [1] U
PHENOL	ND [0.89] U	ND [10] U	ND [0.89] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [0.89] U	ND [10] U	ND [0.89] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	7.6	ND [0.92] U	ND [0.92] U	ND [10] U	ND [0.92] U	ND [0.92] U	8.7	ND [0.92] U

0027801

VOCs and SVOCs in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW67	LHSMW68	LHSMW68	LHSMW68	LHSMW68	LHSMW69	LHSMW69	LHSMW69	LHSMW69
Sample Number:	LHS-MW-67	MW-68	LHS-MW-68	LHS-MW-68	LHS-MW-68	MW-69	LHS-MW-69	LHS-MW-69	LHS-MW-69
Date Sampled:	12/10/1994	02/09/1996	05/27/1998	08/15/1996	12/10/1994	02/09/1996	05/27/1998	08/15/1996	12/10/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,2-DICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	0.53	3 J
TRICHLOROETHYLENE (TCE)	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	2.0	0.85	ND [0.25] U	NA
cis-1,2-DICHLOROETHYLENE	ND	ND [1] U	ND	ND	ND	ND [1] U	ND	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
DI-n-OCTYLPHTHALATE	ND [10] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	0.6 J	ND [10] U	2.7	ND [10] U
DIETHYL PHTHALATE	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U	0.57 J	ND [10] U	ND [1] U	ND [10] U
PHENOL	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	3.9	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [0.92] U	ND [10] U	ND [0.92] U	21	ND [0.92] U	ND [10] U	ND [0.92] U	ND [10] U

2000000

027802

VOCs and SVOCs in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW70	LHSMW70	LHSMW70	LHSMW70	LHSMW71	LHSMW71	LHSMW71	LHSMW71
Sample Number:	**MW-70**	**LHS-MW-70**	**LHS-MW-70**	**LHS-MW-70**	**MW-71**	**LHS-MW-71**	**LHS-MW-71**	**LHS-MW-71**
Date Sampled:	**02/09/1996**	**05/28/1998**	**08/14/1996**	**12/12/1994**	**02/10/1996**	**05/28/1998**	**08/14/1996**	**12/12/1994**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,2-DICHLOROETHANE	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U	ND [0.25] U	NA
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND	ND	ND	ND [1] U	ND	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U
PHENOL	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	ND [0.92] U	2 J	0.62 J	ND [10] U	ND [0.92] U	1 J

0027803

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	106	106	106	107	107	107	LHSMW67	LHSMW67	LHSMW67
Sample Number:	MW-106	106	LHS-MW-106	MW-107	107	LHS-MW-107	MW-67	LHS-MW-67	LHS-MW-67
Date Sampled:	02/13/1996	05/28/1998	08/15/1996	02/13/1996	05/28/1998	08/15/1996	02/09/1996	05/27/1998	08/14/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	0.14 J	ND [2.6] U	ND [0.26] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.26] U	ND [1.3] U	ND [0.26] U

000033

027804

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW67	LHSMW67	LHSMW67	LHSMW68	LHSMW68	LHSMW68	LHSMW68	LHSMW69	LHSMW69
Sample Number:	LHS-MW-67	LHS-MW-67FD	LHS-MW-67	MW-68	LHS-MW-68	LHS-MW-68	LHS-MW-68	MW-69	LHS-MW-69
Date Sampled:	08/25/1998	08/25/1998	12/10/1994	02/09/1996	05/27/1998	08/15/1996	12/10/1994	02/09/1996	05/27/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA		NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA		NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA		NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	17.367	ND [32.775] R	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	4.007	ND [48.377] R	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	7.304	ND [98.75] U	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	17.367	ND [32.775] U	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	97.192	ND [77.748] R	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,6-DINITROTOLUENE	NA	NA	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U
2-NITROTOLUENE	NA	NA	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.28	ND [2.6] U
3-NITROTOLUENE	NA	NA	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NA	NA	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U

0027805
0027805

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW69	LHSMW69	LHSMW70	LHSMW70	LHSMW70	LHSMW70	LHSMW71	LHSMW71	LHSMW71
Sample Number:	LHS-MW-69	LHS-MW-69	MW-70	LHS-MW-70	LHS-MW-70	LHS-MW-70	MW-71	LHS-MW-71	LHS-MW-71
Date Sampled:	08/15/1996	12/10/1994	02/09/1996	05/28/1998	08/14/1996	12/12/1994	02/10/1996	05/28/1998	08/14/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	0.62	ND [2.6] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	0.95	ND [2.6] U	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.26 J	ND [2.6] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	0.49	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U

027806

027806

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW71
Sample Number:	LHS-MW-71
Date Sampled:	12/12/1994
Depth (ft.):	0.00
PESTICIDES - UNITS: UG/L	
NO DETECTED COMPOUNDS	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L	
NO DETECTED COMPOUNDS	NA
HERBICIDES - UNITS: UG/L	
NO DETECTED COMPOUNDS	NA
DIOXINS AND FURANS - UNITS: PG/L	
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA
OCTACHLORODIBENZO-p-DIOXIN	NA
EXPLOSIVES - UNITS: UG/L	
2,6-DINITROTOLUENE	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	NA
2-NITROTOLUENE	ND [0.5] U
3-NITROTOLUENE	ND [0.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.54] U

0027801

Metals in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	106	106	106	107	107	107	LHSMW67	LHSMW67	LHSMW67	LHSMW67	LHSMW68
Sample Number:	LHS-MW-106	106	LHS-MW-106	LHS-MW-107	107	LHS-MW-107	LHS-MW-67	LHS-MW-67	LHS-MW-67	LHS-MW-67	LHS-MW-68
Date Sampled:	02/13/1996	05/28/1998	08/15/1996	02/13/1996	05/28/1998	08/15/1996	02/09/1996	05/27/1998	08/14/1996	12/10/1994	02/09/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	5270 J	1000	3350 J	915	320	1140 J	19000 J	27000	16100 J	55400	2500 J
ANTIMONY	ND [60] U	ND [5] U	ND [60] U	ND [60] U	ND [5] U	ND [60] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U
ARSENIC	ND [2] U	ND [10] U	ND [2] U	ND [2] U	ND [10] U	ND [2] U	5	ND [10] U	3	7.8	ND [2] U
BARIUM	44	ND [200] U	41	104	ND [200] U	117	126	200	139	480	41
BERYLLIUM	ND [5] U	1.6	ND [10] U	ND [5] U	0.7	ND [10] U	ND [5] U	1.2	ND [10] U	NA	ND [5] U
CADMIUM	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U
CALCIUM	2920 J	ND [5000] U	1590 J	11100 J	12000	19000 J	6510 J	5100	5410 J	18100	1060 J
CHROMIUM, TOTAL	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [100] U	549	780	1340 J	98	33
COBALT	ND [10] U	ND [50] U	ND [20] U	15	ND [50] U	ND [20] U	21	ND [50] U	26	41	ND [10] U
COPPER	18	ND [25] U	ND [10] U	22	ND [25] U	ND [10] U	29	ND [25] U	17	45	ND [10] U
IRON	3480 J	1200	3110 J	2230 J	3500	3270 J	20200 J	33000	21900 J	78100	2930 J
LEAD	ND [30] U	ND [3] U	ND [90] U	ND [30] U	ND [3] U	ND [90] U	49	4	ND [90] U	40	150
MAGNESIUM	2980 J	ND [5000] U	2220 J	8110 J	9300	14000 J	39900 J	5400	3450 J	10400	1240 J
MANGANESE	52	85	42	267	327	322	286	545	488	740	21
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.1] U	0.2	ND [0.2] U	ND [0.1] U	0.3	0.3	ND [0.1] U	ND [0.2] U	ND [0.2] U
NICKEL	ND [15] U	ND [40] U	ND [20] U	ND [15] U	ND [40] U	ND [20] U	248	400	576	NA	19
POTASSIUM	923	ND [5000] U	602	1810 J	ND [5000] U	2010 J	1520 J	ND [5000] U	1440 J	3600	880
SELENIUM	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [10] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	10	ND [10] U	ND [10] U	ND [10] U
SODIUM	NA	56000	NA	NA	100000	NA	NA	110000	NA	NA	NA
STRONTIUM	62	60	41	197	250	293	121	90	60	190	16
THALLIUM	ND [90] U	ND [1] UJ	ND [90] U	ND [90] U	ND [1] UJ	ND [90] U	ND [90] U	ND [1] UJ	ND [90] U	ND [500] U	ND [90] U
TIN	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	NA
VANADIUM	ND [10] U	ND [50] U	ND [20] U	ND [10] U	ND [50] U	ND [20] U	ND [10] U	ND [50] U	27	NA	ND [10] U
ZINC	51	30	80	34	30	43	65	100	78	210	30

027808

027808

Metals in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW68	LHSMW68	LHSMW68	LHSMW69	LHSMW69	LHSMW69	LHSMW69	LHSMW70	LHSMW70	LHSMW70	LHSMW70
Sample Number:	LHS-MW-68	LHS-MW-68	LHS-MW-68	MW-69	LHS-MW-69	LHS-MW-69	LHS-MW-69	LHS-MW-70	LHS-MW-70	LHS-MW-70	LHS-MW-70
Date Sampled:	05/27/1998	08/15/1996	12/10/1994	02/09/1996	05/27/1998	08/15/1996	12/10/1994	02/09/1996	05/28/1998	08/14/1996	12/12/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	790	2640 J	47100	390	200	ND [200] U	9400	970	710	322	36600
ANTIMONY	ND [5] U	ND [60] U	ND [100] U	ND [25] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] UJ	ND [60] U	ND [100] U
ARSENIC	ND [10] U	ND [2] U	3.6	3.5	16	8.1	7	ND [2] U	ND [10] U	ND [2] U	8.2
BARIUM	ND [200] U	60	610	66	ND [200] U	50	180	36	ND [200] U	30	200
BERYLLIUM	ND [0.5] U	ND [10] U	NA	ND [0.2] U	ND [0.5] U	ND [10] U	NA	ND [5] U	1.2	ND [10] U	NA
CADMIUM	ND [0.8] U	ND [10] U	ND [10] U	ND [0.2] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U
CALCIUM	ND [5000] U	906	6500	9200	11000	4530 J	17500	1420 J	ND [5000] U	542	5800
CHROMIUM, TOTAL	370	258	260	5.5	10	ND [10] U	56	101	50	16	83
COBALT	ND [50] U	ND [20] U	62	4.1	ND [50] U	ND [20] U	ND [20] U	38	ND [50] U	35	45
COPPER	ND [25] U	ND [10] U	56	5.5	ND [25] U	ND [10] U	ND [20] U	80	ND [25] U	16	26
IRON	3900	6470 J	93600	7000	19000	8190 J	44400	2270 J	3900	1120 J	29800
LEAD	ND [3] U	ND [90] U	45	1.8	ND [3] U	298	16	56	ND [3] U	ND [90] U	13
MAGNESIUM	ND [5000] U	1890 J	12600	4300	6100	1850 J	7400	674	ND [5000] U	489	4700
MANGANESE	34	46	860	550	552	270	960	563	659	567	920
MERCURY	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U
NICKEL	ND [40] U	25	NA	ND [7.6] U	ND [40] U	ND [20] U	NA	38	ND [40] U	ND [20] U	NA
POTASSIUM	ND [5000] U	1070 J	5400	990	ND [5000] U	683	2500	479	ND [5000] U	691	3200
SELENIUM	ND [5] U	ND [2] U	ND [10] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	0.8	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	14000	NA	NA	NA	100000	NA	NA	NA	24000	NA	NA
STRONTIUM	ND [50] U	23	140	120	260	53	240	15	ND [50] U	12	ND [100] U
THALLIUM	ND [1] UJ	ND [90] U	ND [500] U	ND [1.7] U	ND [1] UJ	ND [90] U	ND [500] U	ND [90] U	ND [1] UJ	ND [90] U	ND [500] U
TIN	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	ND [50] U	ND [20] U	NA	2.3	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA
ZINC	ND [20] U	38	270	54	50	66	170	44	20	33	150

027809

Metals in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW71	LHSMW71	LHSMW71	LHSMW71
Sample Number:	LHS-MW-71	LHS-MW-71	LHS-MW-71	LHS-MW-71
Date Sampled:	02/10/1996	05/28/1998	08/14/1996	12/12/1994
Depth (ft.):	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L				
ALUMINUM	2600 J	8300	5630 J	108000
ANTIMONY	ND [60] U	ND [5] U	ND [60] U	ND [100] U
ARSENIC	ND [2] U	ND [10] U	ND [2] U	6.9
BARIUM	143	200	143	470
BERYLLIUM	ND [5] U	ND [0.5] U	ND [10] U	NA
CADMIUM	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U
CALCIUM	23400 J	8700	35300 J	37400
CHROMIUM, TOTAL	3630 J	43000	7550 J	560
COBALT	52	ND [50] U	78	150
COPPER	58	244	41	140
IRON	16000 J	170000	29700 J	115000
LEAD	69	ND [3] U	ND [90] U	65
MAGNESIUM	20100 J	9100	27500 J	33200
MANGANESE	546	390	718	1400
MERCURY	ND [0.2] U	0.6	ND [0.1] U	ND [0.2] U
NICKEL	1150 J	2500	1010 J	NA
POTASSIUM	1830 J	ND [5000] U	2370 J	7800
SELENIUM	ND [2] U	5	ND [2] U	7.6
SILVER	ND [10] U	1200	ND [10] U	ND [10] U
SODIUM	NA	220000	NA	NA
STRONTIUM	429	180	642	630
THALLIUM	ND [90] U	ND [1] UJ	134	ND [500] U
TIN	NA	ND [100] U	NA	NA
VANADIUM	ND [10] U	ND [50] U	ND [20] U	NA
ZINC	67	ND [20] U	107	560

027810

Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	106	106	107	107	LHSMW67	LHSMW67	LHSMW67	LHSMW67	LHSMW68
Sample Number:	LHS-MW-106	LHS-MW-106	LHS-MW-107	LHS-MW-107	LHS-MW-67	LHSMW67	LHSMW67	LHS-MW-67	LHS-MW-68
Date Sampled:	02/13/1996	08/15/1996	02/13/1996	08/15/1996	02/09/1996	02/09/2001	05/18/2000	08/14/1996	02/09/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L									
CHLORIDE (AS CL)	22000	ND [2000] U	198000	215000	62000	NA	NA	ND [2000] U	7000
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA	NA	ND [500] U	ND [500] U
NITROGEN, NITRITE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA	NA	ND [500] U	ND [500] U
PERCHLORATE	NA	NA	NA	NA	NA	ND [0.71] U	2.8	NA	NA
SULFATE (AS SO4)	94000	ND [2000] U	23000	23000	37000	NA	NA	40000	9600
PETROLEUM HYDROCARBONS - UNITS: MG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA

027811

Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 35C
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW68	LHSMW68	LHSMW69	LHSMW69	LHSMW69	LHSMW70	LHSMW70	LHSMW71	LHSMW71
Sample Number:	**LHSMW68**	**LHS-MW-68**	**LHS-MW-69**	**MW-69**	**LHS-MW-69**	**LHS-MW-70**	**LHS-MW-70**	**LHS-MW-71**	**LHS-MW-71**
Date Sampled:	**05/18/2000**	**08/15/1996**	**02/09/1996**	**02/09/1996**	**08/15/1996**	**02/09/1996**	**08/14/1996**	**02/10/1996**	**08/14/1996**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ANIONS - UNITS: UG/L									
CHLORIDE (AS CL)	NA	15800	79000	NA	40100	36000	33000	752000	971000
CYANIDE	NA	NA	NA	ND [10] U	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	NA	ND [500] U	ND [500] U	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
NITROGEN, NITRITE	NA	ND [500] U	ND [500] U	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	ND [1] U	NA	NA	NA	NA	NA	NA	NA	NA
SULFATE (AS SO4)	NA	7880	81000	NA	48500	23000	18000	163000	173000
PETROLEUM HYDROCARBONS - UNITS: MG/L									
NO DETECTED COMPOUNDS	NA	NA	NA		NA	NA	NA	NA	NA

027812

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL27-01	LH-DL29-01	LH-S01-01	LH-S01-01	LH-S01-01	LH-S01-02	LH-S01-02	LH-S01-02
Sample Number:	LH-DL27-01	LH-DL29-01	LH-S01-01_1	LH-S01-01_2	LH-S01-01_3	LH-S01-02_1	LH-S01-02_2	LH-S01-02_3
Date Sampled:	06/24/1993	06/25/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	1.50	2.00	0.50	5.70	7.90	0.50	5.00	14.40
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	525	ND [330] U	393	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

000093

027813

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S017-01	LH-S017-01	LH-S017-02	LH-S017-02	LH-S018-01	LH-S018-01	LH-S018-01
Sample Number:	LH-S017-01_1	LH-S017-01_2	LH-S017-02_1	LH-S017-02_2	LH-S018-01_1	LH-S018-01_2	LH-S018-01_3
Date Sampled:	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993
Depth (ft.):	0.50	2.50	0.50	2.50	0.50	1.10	5.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	382	ND [330] U	ND [330] U

000094

027814

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S02-01	LH-S02-01	LH-S02-02	LH-S02-02	LH-S021-01	LH-S021-01	LH-S021-02	LH-S021-02
Sample Number:	LH-S02-01_1	LH-S02-01_2	LH-S02-02_1	LH-S02-02_2	LH-S021-01_1	LH-S021-01_2	LH-S021-02_1	LH-S021-02_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993
Depth (ft.):	0.50	4.00	0.50	4.00	1.00	3.50	0.50	2.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	414	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

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027815

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S021-02	LH-S025-01	LH-S025-01	LH-S025-02	LH-S025-02	LH-S025-02	LH-S026-01
Sample Number:	LH-S021-02_3	LH-S025-01_1	LH-S025-01_2	LH-S025-02_1	LH-S025-02_2	LH-S025-02_3	LH-S026-01_1
Date Sampled:	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/08/1993
Depth (ft.):	3.40	0.50	5.00	0.50	1.50	3.50	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [500] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [250] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [250] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	376	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	465	356	490	356	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

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027816

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S026-01	LH-S026-02	LH-S026-02	LH-S026-02	LH-S03-01	LH-S03-01	LH-S03-02	LH-S03-02
Sample Number:	LH-S026-01_2	LH-S026-02_1	LH-S026-02_2	LH-S026-02_3	LH-S03-01_1	LH-S03-01_2	LH-S03-02_1	LH-S03-02_2
Date Sampled:	08/08/1993	08/08/1993	08/08/1993	08/08/1993	07/10/1993	07/10/1993	07/10/1993	07/10/1993
Depth (ft.):	3.50	0.50	1.00	3.50	0.00	4.00	0.00	4.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	338	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

0000097

027817

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S04-01	LH-S04-01	LH-S04-02	LH-S04-02	LH-S05-01	LH-S05-01	LH-S05-02	LH-S05-02
Sample Number:	LH-S04-01_1	LH-S04-01_2	LH-S04-02_1	LH-S04-02_2	LH-S05-01_1	LH-S05-01_2	LH-S05-02_1	LH-S05-02_2
Date Sampled:	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993
Depth (ft.):	0.00	4.00	0.00	4.00	0.00	3.00	0.00	3.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

660059

027818

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S06-01	LH-S06-01	LH-S06-01	LH-S06-02	LH-S06-02	LH-S06-02	LH-S07-01	LH-S07-01
Sample Number:	LH-S06-01_1	LH-S06-01_2	LH-S06-01_3	LH-S06-02_1	LH-S06-02_2	LH-S06-02_3	LH-S07-01_1	LH-S07-01_2
Date Sampled:	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	06/25/1993	06/25/1993
Depth (ft.):	0.00	4.00	10.00	0.00	3.00	10.00	0.50	2.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

0027819
0027819

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S07-01	LH-S07-02	LH-S07-02	LH-S07-02	LH-S08-01	LH-S08-01	LH-S08-02	LH-S08-02
Sample Number:	LH-S07-01_3	LH-S07-02_1	LH-S07-02_2	LH-S07-02_3	LH-S08-01_1	LH-S08-01_2	LH-S08-02_1	LH-S08-02_2
Date Sampled:	06/25/1993	06/25/1993	06/25/1993	07/09/1993	07/12/1993	07/12/1993	07/12/1993	07/12/1993
Depth (ft.):	9.00	0.00	2.00	9.00	0.00	4.00	0.00	4.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

027820
027820

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S09-01	LH-S09-01	LH-S09-01	LH-S09-02	LH-S09-02	LH-S09-02	LH-S10-01	LH-S10-01
Sample Number:	LH-S09-01_1	LH-S09-01_2	LH-S09-01_3	LH-S09-02_1	LH-S09-02_2	LH-S09-02_3	LH-S10-01_1	LH-S10-01_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	5.00	6.50	0.50	5.00	7.00	0.50	8.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U
ACETONE	ND [110] U	ND [120] U	ND [120] U	ND [120] U	ND [130] U	ND [120] U	ND [100] U	ND [100] U
BENZENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U
CHLOROFORM	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [110] U	ND [120] U	ND [120] U	ND [120] U	ND [130] U	ND [120] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [55] U	ND [62] U	ND [59] U	ND [58] U	ND [64] U	ND [58] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U
TOLUENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [1176] U	ND [1266] U	ND [1176] U	ND [1149] U	ND [1351] U	ND [1163] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [588] U	ND [633] U	ND [588] U	ND [575] U	ND [676] U	ND [581] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	6788	5684	5894	3287	4351	4628	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [588] U	ND [633] U	ND [588] U	ND [575] U	ND [676] U	ND [581] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [588] U	190	212	ND [575] U	ND [676] U	ND [581] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [588] U	ND [633] U	ND [588] U	ND [575] U	ND [676] U	ND [581] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [1176] U	ND [1266] U	ND [1176] U	ND [1149] U	ND [1351] U	ND [1163] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [588] U	ND [633] U	ND [588] U	ND [575] U	ND [676] U	ND [581] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [588] U	ND [633] U	ND [588] U	ND [575] U	ND [676] U	ND [581] U	ND [330] U	ND [330] U

027821

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S10-02	LH-S10-02	LH-S107-01	LH-S107-01	LH-S107-01	LH-S108-01	LH-S108-01
Sample Number:	LH-S10-02_2	LH-S10-02_1	LH-S107-01_1	LH-S107-01_2	LH-S107-01_3	LH-S108-01_1	LH-S108-01_2
Date Sampled:	06/26/1993	07/11/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	9.00	0.00	0.50	1.00	2.00	0.50	2.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
1,1,1-TRICHLOROETHANE	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
ACETONE	ND [120] U	ND [100] U	ND [120] U	ND [120] U	ND [120] U	ND [110] U	ND [32] U
BENZENE	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
CHLOROBENZENE	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
CHLOROFORM	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [120] U	ND [50] U	ND [120] U	ND [120] U	ND [120] U	ND [110] U	ND [63] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [60] U	ND [50] U	ND [61] U	ND [61] U	ND [62] U	ND [56] U	ND [63] U
METHYLENE CHLORIDE	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
TOLUENE	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
XYLENES, TOTAL	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(b)FLUORANTHENE	ND [1220] U	ND [330] U	NA	ND [1266] U	ND [1149] U	ND [1099] U	ND [1149] U
BENZYL BUTYL PHTHALATE	ND [610] U	ND [330] U	NA	ND [633] U	ND [575] U	ND [549] U	ND [575] U
DI-n-BUTYL PHTHALATE	6939	ND [330] U	NA	3785	5586	7462	5402
DI-n-OCTYLPHTHALATE	ND [610] U	ND [330] U	NA	ND [633] U	ND [575] U	ND [549] U	ND [575] U
DIETHYL PHTHALATE	ND [610] U	ND [330] U	NA	ND [633] U	ND [575] U	ND [549] U	ND [575] U
FLUORANTHENE	ND [610] U	ND [330] U	NA	ND [633] U	ND [575] U	ND [549] U	ND [575] U
HEXACHLOROBENZENE	ND [1220] U	ND [330] U	NA	ND [1266] U	ND [1149] U	ND [1099] U	ND [1149] U
PHENANTHRENE	ND [610] U	ND [330] U	NA	ND [633] U	ND [575] U	ND [549] U	ND [575] U
bis(2-ETHYLHEXYL) PHTHALATE	183	ND [330] U	NA	127 J	ND [575] U	176 J	126 J

000102

027822

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S108-01	LH-S109-01	LH-S109-01	LH-S11-01	LH-S11-01	LH-S11-02	LH-S11-02	LH-S110-01
Sample Number:	LH-S108-01_3	LH-S109-01_1	LH-S109-01_2	LH-S11-01_1	LH-S11-01_2	LH-S11-02_1	LH-S11-02_2	LH-S110-01_1
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/25/1993	06/25/1993	06/26/1993	07/10/1993	08/04/1993
Depth (ft.):	4.00	0.50	2.00	0.00	10.00	0.50	10.00	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [120] U	ND [120] U	ND [120] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [120] U	ND [120] U	ND [120] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [58] U	ND [62] U	ND [62] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [1205] U	ND [1250] U	ND [1235] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [602] U	ND [625] U	ND [617] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	2735	4775	2420	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [602] U	ND [625] U	ND [617] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [602] U	13 J	ND [617] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [602] U	ND [625] U	ND [617] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [1205] U	ND [1250] U	ND [1235] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [602] U	ND [625] U	ND [617] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	2349	150 J	185	ND [330] U	ND [330] U	ND [330] U	ND [330] U	519

000403

027823

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S110-01	LH-S12-01	LH-S12-01	LH-S12-02	LH-S12-02	LH-S13-01	LH-S13-01	LH-S13-02
Sample Number:	LH-S110-01_2	LH-S12-01_1	LH-S12-01_2	LH-S12-02_1	LH-S12-02_2	LH-S13-01_1	LH-S13-01_2	LH-S13-02_1
Date Sampled:	08/04/1993	07/11/1993	07/11/1993	07/11/1993	07/11/1993	07/10/1993	07/10/1993	07/10/1993
Depth (ft.):	3.00	0.00	9.00	0.00	9.00	0.00	8.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

0001034

027824

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S13-02	LH-S14-01	LH-S14-01	LH-S14-02	LH-S14-02	LH-S15-01	LH-S15-01	LH-S15-02
Sample Number:	LH-S13-02_2	LH-S14-01_1	LH-S14-01_2	LH-S14-02_1	LH-S14-02_2	LH-S15-01_1	LH-S15-01_2	LH-S15-02_1
Date Sampled:	07/10/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993
Depth (ft.):	8.00	0.50	3.20	0.50	3.50	0.50	5.20	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	66.6	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [350] U

000195

027825

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S15-02	LH-S16-01	LH-S16-01	LH-S16-01	LH-S19-01	LH-S19-01	LH-S19-01	LH-S19-02
Sample Number:	**LH-S15-02_2**	**LH-S16-01_1**	**LH-S16-01_2**	**LH-S16-01_3**	**LH-S19-01**	**LH-S19-01_1**	**LH-S19-01_2**	**LH-S19-02_1**
Date Sampled:	**07/08/1993**	**07/08/1993**	**07/08/1993**	**07/08/1993**	**08/06/1993**	**08/06/1993**	**08/06/1993**	**08/06/1993**
Depth (ft.):	**5.00**	**0.50**	**4.20**	**8.00**	**1.00**	**1.50**	**5.00**	**1.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [500] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	58.8	ND [5] U	42.2	26.4	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [250] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [250] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	22.4	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	99.7	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [3300] U	ND [330] U	ND [330] U	ND [330] U

000106

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VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S19-02	LH-S20-01	LH-S20-01	LH-S20-02	LH-S20-02	LH-S22-01	LH-S22-01	LH-S22-02
Sample Number:	LH-S19-02_2	LH-S20-01_1	LH-S20-01_2	LH-S20-02_1	LH-S20-02_2	LH-S22-01_1	LH-S22-01_2	LH-S22-02_1
Date Sampled:	08/06/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993
Depth (ft.):	5.00	0.50	2.00	0.50	5.00	0.50	5.00	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [10] U	ND [10] U	16	13	ND [10] U	12	26
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	19
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	6
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYLENE CHLORIDE	ND [5] U	27:*	ND [10] U	11:*	ND [10] U	ND [10] U	ND [10] U	15:*
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	5	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	157	ND [150] U	ND [150] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [150] U	ND [150] U	ND [150] U	298	ND [150] U	ND [150] U	190
DIETHYL PHTHALATE	ND [330] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U
FLUORANTHENE	ND [330] U	ND [150] U	ND [150] U	168	ND [150] U	ND [150] U	ND [150] U	ND [150] U
HEXACHLOROBENZENE	ND [330] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	244	ND [150] U	ND [150] U
PHENANTHRENE	ND [330] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [150] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U

027827
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VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S22-02	LH-S23-01	LH-S23-01	LH-S23-02	LH-S23-02	LH-S24-01	LH-S24-01	LH-S27-01
Sample Number:	LH-S22-02_2	LH-S23-01_1	LH-S23-01_2	LH-S23-02_1	LH-S23-02_2	LH-S24-01_1	LH-S24-01_2	LH-S27-01_1
Date Sampled:	06/25/1993	07/25/1993	07/25/1993	07/25/1993	07/25/1993	06/25/1993	06/25/1993	06/24/1993
Depth (ft.):	5.00	0.50	3.00	1.00	3.50	0.50	2.00	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [10] U	ND [100] U	ND [100] U	ND [100] U	217	ND [10] U	ND [10] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	13	ND [5] U	ND [5] U
CHLOROBENZENE	5	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	110	6	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [5] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [5] U	ND [5] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [5] U	ND [50] U	ND [50] U	ND [50] U	126	ND [5] U	ND [5] U	ND [50] U
METHYLENE CHLORIDE	ND [10] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [10] U	ND [10] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [150] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [150] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [150] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [150] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [330] U
DIETHYL PHTHALATE	ND [150] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [330] U
FLUORANTHENE	ND [150] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [330] U
HEXACHLOROBENZENE	ND [150] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [330] U
PHENANTHRENE	ND [150] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [1000] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [1000] U	ND [1000] U	ND [330] U

027828

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VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S27-01	LH-S27-02	LH-S27-02	LH-S28-01	LH-S28-01	LH-S29-01	LH-S29-01	LH-S29-02
Sample Number:	LH-S27-01_2	LH-S27-02 _1	LH-S27-02_2	LH-S28-01_1	LH-S28-01_2	LH-S29-01_1	LH-S29-01_2	LH-S29-02_1
Date Sampled:	06/24/1993	06/24/1993	06/24/1993	07/22/1993	07/22/1993	06/25/1993	06/25/1993	06/25/1993
Depth (ft.):	2.00	0.50	2.00	0.50	3.00	0.50	2.50	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	10	19	ND [10] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	167	6
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [5] U	ND [5] U	ND [5] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [5] U	ND [5] U	ND [5] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [10] U	ND [10] U	ND [10] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [150] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [150] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	289	191
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [150] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [150] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [150] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [150] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U	ND [150] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	422	ND [330] U	ND [330] U	ND [330] U	ND [1000] U	ND [1000] U	ND [1000] U

000109

027829

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S29-02	LH-S29-02	LH-S30-01	LH-S30-01	LH-S31-01	LH-S31-01	LH-S32-01	LH-S32-01
Sample Number:	LH-S29-02_2	LH-S29-02_3	LH-S30-01_1	LH-S30-01_2	LH-S31-01_1	LH-S31-01_2	LH-S32-01_1	LH-S32-01_2
Date Sampled:	06/25/1993	06/25/1993	06/25/1993	06/25/1993	07/21/1993	07/21/1993	06/25/1993	06/25/1993
Depth (ft.):	2.00	10.00	0.50	2.50	0.50	3.00	0.50	3.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	32	15	ND [10] U	10	ND [100] U	ND [100] U	13	22
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U	ND [50] U	ND [5] U	ND [5] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U	ND [50] U	ND [5] U	ND [5] U
METHYLENE CHLORIDE	23:*	ND [10] U	ND [10] U	ND [10] U	ND [5] U	ND [5] U	ND [10] U	ND [10] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U
BENZYL BUTYL PHTHALATE	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U
DI-n-BUTYL PHTHALATE	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U
DI-n-OCTYLPHTHALATE	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U
DIETHYL PHTHALATE	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U
FLUORANTHENE	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U
HEXACHLOROBENZENE	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U
PHENANTHRENE	ND [150] U	ND [150] U	ND [150] U	ND [150] U	ND [330] U	ND [330] U	ND [150] U	ND [150] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [330] U	ND [330] U	ND [1000] U	ND [1000] U

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027830

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S33-01	LH-S33-01	LH-S34-01	LH-S34-01	LH-S35-01	LH-S35-01	LH-S37-01	LH-S37-01
Sample Number:	LH-S33-01_1	LH-S33-01_2	LH-S34-01_1	LH-S34-01_2	LH-S35-01_1	LH-S35-01_2	LH-S37-01_1	LH-S37-01_2
Date Sampled:	07/21/1993	07/21/1993	06/25/1993	07/10/1993	06/25/1993	06/25/1993	07/25/1993	07/25/1993
Depth (ft.):	0.50	3.00	3.50	0.50	0.50	3.50	0.50	3.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	702	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	1550	ND [330] U	ND [330] U

000111

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VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S38-01	LH-S38-01	LH-S39-01	LH-S39-01	LH-S40-01	LH-S40-01	LH-S41-01	LH-S41-01
Sample Number:	LH-S38-01_1	LH-S38-01_2	LH-S39-01_1	LH-S39-01_2	LH-S40-01_1	LH-S40-01_2	LH-S41-01_1	LH-S41-01_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/25/1993	06/25/1993
Depth (ft.):	0.50	3.20	0.50	3.00	0.50	3.30	0.50	3.20
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U	ND [120] U	ND [120] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [120] U	ND [120] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [60] U	ND [59] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [1220] U	ND [1205] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [610] U	ND [602] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	2510	ND [330] U	1939	4422	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [610] U	ND [602] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [610] U	ND [602] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [610] U	ND [602] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [1220] U	ND [1205] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [610] U	ND [602] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [610] U	145 J	ND [330] U	ND [330] U	ND [330] U	ND [330] U

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VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S42-01	LH-S42-01	LH-S43-01	LH-S43-01	LH-WRS-5	LH-WRS-5	LH-WRS-6	LH-WRS-6
Sample Number:	LH-S42-01_1	LH-S42-01_2	LH-S43-01_1	LH-S43-01_2	LH-WRS-5_1	LH-WRS-5_2	LH-WRS-6_1	LH-WRS-6_2
Date Sampled:	06/25/1993	06/25/1993	06/26/1993	06/26/1993	07/12/1993	07/12/1993	07/10/1993	07/10/1993
Depth (ft.):	0.50	2.50	0.50	1.50	0.00	3.00	0.00	2.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	14.2	11.7
ACETONE	ND [100] U	ND [100] U	ND [110] U	ND [120] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [110] U	ND [120] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [55] U	ND [58] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [1099] U	ND [1149] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [549] U	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	5066	6885	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [549] U	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [549] U	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [549] U	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [1099] U	ND [1149] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [549] U	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [549] U	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

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VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS-6	LH-WRS07-01	LH-WRS07-01	LH-WRS07-01	LH-WRS10-01	LH-WRS10-01	LH-WRS11-01
Sample Number:	LH-WRS-6_3	LH-WRS07-01_1	LH-WRS07-01_2	LH-WRS07-01_3	LH-WRS10-01_1	LH-WRS10-01_2	LH-WRS11-01_1
Date Sampled:	07/24/1993	07/22/1993	07/22/1993	07/22/1993	08/08/1993	08/08/1993	08/08/1993
Depth (ft.):	18.00	0.50	3.50	6.10	0.50	3.50	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [1000] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [500] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [500] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U	30.7:*	27.2:*	54:*
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [50] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(b)FLUORANTHENE	ND [1] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	1210

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027834

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS11-01	LH-WRS11-01	LH-WRS12-01	LH-WRS12-01	LH-WRS12-01	LH-WRS13-01
Sample Number:	LH-WRS11-01_2	LH-WRS11-01_3	LH-WRS12-01_1	LH-WRS12-01_2	LH-WRS12-01_3	LH-WRS13-01_1
Date Sampled:	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	06/26/1993
Depth (ft.):	1.20	3.50	0.50	3.00	3.50	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U
ACETONE	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [28] U
BENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U
CHLOROBENZENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U
CHLOROFORM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [57] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [57] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	42.1:*	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U
TOLUENE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U
XYLENES, TOTAL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [1136] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [568] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [1409] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [568] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [568] U
FLUORANTHENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [568] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [1136] U
PHENANTHRENE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [568] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [568] U

027835
027835

VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS13-01	LH-WRS15-01	LH-WRS15-01	LH-WRS16-01	LH-WRS16-01	LH-WRS19-01
Sample Number:	LH-WRS13-01_2	LH-WRS15-01_1	LH-WRS15-01_2	LH-WRS16-01_1	LH-WRS16-01_2	LH-WRS19-01_1
Date Sampled:	06/26/1993	08/03/1993	08/03/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	3.00	0.50	4.00	0.50	3.50	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
1,1,1-TRICHLOROETHANE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U
ACETONE	ND [30] U	ND [100] U	ND [100] U	ND [110] U	ND [130] U	ND [110] U
BENZENE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U
CHLOROBENZENE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U
CHLOROFORM	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [61] U	ND [50] U	ND [50] U	ND [110] U	ND [130] U	ND [110] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [61] U	ND [50] U	ND [50] U	ND [53] U	ND [63] U	ND [56] U
METHYLENE CHLORIDE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U
TOLUENE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U
XYLENES, TOTAL	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
BENZO(b)FLUORANTHENE	ND [1221] U	ND [330] U	ND [330] U	ND [1064] U	ND [1282] U	ND [1136] U
BENZYL BUTYL PHTHALATE	ND [610.1] U	ND [330] U	ND [330] U	117 J	ND [641] U	ND [568] U
DI-n-BUTYL PHTHALATE	ND [4395.6] U	ND [330] U	ND [330] U	2362	7423	2148
DI-n-OCTYLPHTHALATE	ND [610.1] U	ND [330] U	ND [330] U	ND [532] U	ND [641] U	ND [568] U
DIETHYL PHTHALATE	ND [610.1] U	ND [330] U	ND [330] U	ND [532] U	ND [641] U	ND [568] U
FLUORANTHENE	ND [610.1] U	ND [330] U	ND [330] U	ND [532] U	ND [641] U	ND [568] U
HEXACHLOROBENZENE	ND [1221] U	ND [330] U	ND [330] U	ND [1064] U	ND [1282] U	ND [1136] U
PHENANTHRENE	ND [610.1] U	ND [330] U	ND [330] U	ND [532] U	ND [641] U	ND [568] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [232] U	572	ND [330] U	809 J	179	125 J

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VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS19-01	LH-WRS21-01	LH-WRS21-01	LH-WRS4-01	LH-WRS4-01	LH-WRS8-01	LH-WRS8-01
Sample Number:	LH-WRS19-01_2	LH-WRS21-01_1	LH-WRS21-01_2	LH-WRS4-01_1	LH-WRS4-01_2	LH-WRS8-01_1	LH-WRS8-01_2
Date Sampled:	06/26/1993	08/08/1993	08/08/1993	07/10/1993	07/10/1993	08/06/1993	08/06/1993
Depth (ft.):	3.00	0.50	3.50	0.50	3.50	0.50	3.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
1,1,1-TRICHLOROETHANE	ND [6] U	ND [5] U	ND [5] U	14.4	12.7	ND [5] U	ND [5] U
ACETONE	21	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
BENZENE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROBENZENE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CHLOROFORM	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [57] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [57] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
METHYLENE CHLORIDE	5	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOLUENE	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZO(b)FLUORANTHENE	ND [1149] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	5782	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
FLUORANTHENE	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [1149] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
PHENANTHRENE	ND [575] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	126 J	1120	ND [330] U	ND [330] U	ND [330] U	ND [330] U	ND [330] U

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VOCs and SVOCs in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS9-01	LH-WRS9-01
Sample Number:	LH-WRS9-01_1	LH-WRS9-01_2
Date Sampled:	08/06/1993	08/06/1993
Depth (ft.):	0.50	3.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
1,1,1-TRICHLOROETHANE	ND [5] U	ND [5] U
ACETONE	ND [100] U	ND [100] U
BENZENE	ND [5] U	ND [5] U
CHLOROBENZENE	ND [5] U	ND [5] U
CHLOROFORM	ND [5] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [50] U	ND [50] U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ND [50] U	ND [50] U
METHYLENE CHLORIDE	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [5] U
TOLUENE	ND [5] U	ND [5] U
XYLENES, TOTAL	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
BENZO(b)FLUORANTHENE	ND [330] U	ND [330] U
BENZYL BUTYL PHTHALATE	ND [330] U	ND [330] U
DI-n-BUTYL PHTHALATE	ND [330] U	ND [330] U
DI-n-OCTYLPHTHALATE	ND [330] U	ND [330] U
DIETHYL PHTHALATE	ND [330] U	ND [330] U
FLUORANTHENE	ND [330] U	ND [330] U
HEXACHLOROBENZENE	ND [330] U	ND [330] U
PHENANTHRENE	ND [330] U	ND [330] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [330] U	ND [330] U

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VOCs, SVOCs, and PAHs in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	400ASS05	400ASS06	400ASS06	46SB01	46SB01	46SB01
Sample Number:	400ASS05(0-0.5)	400ASS06(0-0.5)	400ASS06(0-0.5)FD	46SB01(0-0.5)	46SB01(1-3)	46SB01(3-5)
Date Sampled:	07/26/1998	07/26/1998	12/04/1998	07/27/1998	07/27/1998	07/27/1998
Depth (ft.):	0.00	0.00	0.00	0.00	1.00	3.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
ACETONE	NA	NA	NA	10	6.1	7.9
DICHLORODIFLUOROMETHANE	NA	NA	NA	ND [17] U	ND [17] U	ND [19] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
2-METHYLPHENOL (o-CRESOL)	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
4-METHYLPHENOL (p-CRESOL)	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
ACENAPHTHYLENE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
ANTHRACENE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
BENZO(a)ANTHRACENE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
BENZO(a)PYRENE	NA	NA	NA	190	ND [180] U	ND [210] U
BENZO(b)FLUORANTHENE	NA	NA	NA	410	ND [370] U	ND [420] U
BENZO(g,h,i)PERYLENE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
BENZO(k)FLUORANTHENE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
BENZOIC ACID	NA	NA	NA	ND [920] U	ND [920] U	ND [1000] U
BENZYL BUTYL PHTHALATE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
CHRYSENE	NA	NA	NA	300	ND [370] U	ND [420] U
DI-n-BUTYL PHTHALATE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
DIBENZ(a,h)ANTHRACENE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
FLUORANTHENE	NA	NA	NA	290	ND [370] U	ND [420] U
INDENO(1,2,3-c,d)PYRENE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
PHENANTHRENE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
PYRENE	NA	NA	NA	300	ND [370] U	ND [420] U
bis(2-ETHYLHEXYL) PHTHALATE	NA	NA	NA	ND [370] U	ND [370] U	ND [420] U
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG						
ACENAPHTHENE	ND [38] U	ND [38] UJ	ND [40] U	NA	NA	NA
ANTHRACENE	ND [38] U	ND [38] UJ	ND [40] U	NA	NA	NA
BENZO(g,h,i)PERYLENE	ND [38] U	ND [38] UJ	ND [40] U	NA	NA	NA
NAPHTHALENE	ND [38] U	ND [38] UJ	ND [40] U	NA	NA	NA
PHENANTHRENE	ND [38] U	ND [38] UJ	ND [40] U	NA	NA	NA

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VOCs, SVOCs, and PAHs in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SB02	46SB02	46SB02	46SB02	46SB03	46SB03	46SB03
Sample Number:	46SB02(0-0.5)	46SB02(0-0.5)RAFD	46SB02(1-3)	46SB02(3-5)	46SB03(0-0.5)	46SB03(0-0.5)FD	46SB03(1-3)
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998
Depth (ft.):	0.00	0.00	1.00	3.00	0.00	0.00	1.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ACETONE	ND [21] UJ	ND [21] U	ND [22] U	ND [22] U	ND [23] UJ	ND [23] U	ND [23] U
DICHLORODIFLUOROMETHANE	ND [16] UJ	ND [16] U	ND [17] U	ND [17] U	100 J	ND [17] U	ND [17] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
2-METHYLPHENOL (o-CRESOL)	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
4-METHYLPHENOL (p-CRESOL)	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
ACENAPHTHYLENE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
ANTHRACENE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
BENZO(a)ANTHRACENE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
BENZO(a)PYRENE	ND [170] U	NA	ND [190] U	ND [190] U	ND [940] U	NA	ND [190] U
BENZO(b)FLUORANTHENE	430	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
BENZO(g,h,i)PERYLENE	190	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
BENZO(k)FLUORANTHENE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
BENZOIC ACID	ND [870] U	NA	ND [930] U	ND [930] U	ND [4700] U	NA	ND [950] U
BENZYL BUTYL PHTHALATE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
CHRYSENE	280	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
DI-n-BUTYL PHTHALATE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
DIBENZ(a,h)ANTHRACENE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
FLUORANTHENE	240	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
INDENO(1,2,3-c,d)PYRENE	290	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
PHENANTHRENE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
PYRENE	220	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [350] U	NA	ND [370] U	ND [370] U	ND [1900] U	NA	ND [380] U
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG							
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA

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VOCs, SVOCs, and PAHs in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SB03	LHS-2-01	LHS-2-02	LHS-2-03	LHS-2-04	LHS-2-05	LHS-2-06	LHS-2-07	LHS-2-08
Sample Number:	46SB03(3-5)	LHS-2-01	LHS-2-02	LHS-2-03	LHS-2-04	LHS-2-05	LHS-2-06	LHS-2-07	LHS-2-08
Date Sampled:	07/27/1998	01/09/1995	01/09/1995	01/09/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995
Depth (ft.):	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
ACETONE	ND [25] U	ND [17] U	ND [15] U	ND [14] U	ND [14] U	ND [130] U	ND [300] U	ND [20] U	ND [14] U
DICHLORODIFLUOROMETHANE	ND [19] U	ND [34] U	ND [30] U	ND [28] U	ND [27] U	ND [27] U	ND [60] U	ND [40] U	ND [27] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLPHENOL (o-CRESOL)	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	170 J	ND [450] U
4-METHYLPHENOL (p-CRESOL)	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	180 J	ND [450] U
ACENAPHTHYLENE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
ANTHRACENE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
BENZO(a)ANTHRACENE	ND [410] U	ND [560] U	ND [490] U	150 J	72 J	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
BENZO(a)PYRENE	ND [210] U	77 J	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
BENZO(b)FLUORANTHENE	ND [410] U	130 J	ND [490] U	ND [470] U	240 J	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
BENZO(g,h,i)PERYLENE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
BENZO(k)FLUORANTHENE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	65 J	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
BENZOIC ACID	ND [1000] U	ND [2800] U	ND [2400] U	ND [2400] U	ND [2200] U	ND [2200] U	ND [5000] U	ND [3300] U	ND [2200] U
BENZYL BUTYL PHTHALATE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
CHRYSENE	ND [410] U	ND [560] U	ND [490] U	240 J	190 J	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
DI-n-BUTYL PHTHALATE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
DIBENZ(a,h)ANTHRACENE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
FLUORANTHENE	ND [410] U	ND [560] U	ND [490] U	170 J	120 J	ND [440] U	ND [1000] U	240 J	ND [450] U
INDENO(1,2,3-c,d)PYRENE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
PHENANTHRENE	ND [410] U	ND [560] U	ND [490] U	ND [470] U	ND [440] U	ND [440] U	ND [1000] U	ND [660] U	ND [450] U
PYRENE	ND [410] U	ND [560] U	ND [490] U	220 J	120 J	ND [440] U	ND [1000] U	150 J	ND [450] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [410] U	110 J	ND [490] U	ND [470] U	ND [440] U	ND [440] U	110 J	270 J	ND [450] U
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG									
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA

027841

VOCs, SVOCs, and PAHs in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-2-09	LHS-2-10	LHS-2-11	LHS-2-12	LHS-2-13	LHS-2-14	LHS-2-15	LHS-2-16	LHS-2-17
Sample Number:	LHS-2-09	LHS-2-10	LHS-2-11	LHS-2-12	LHS-2-13	LHS-2-14	LHS-2-15	LHS-2-16	LHS-2-17
Date Sampled:	01/10/1995	01/10/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
ACETONE	ND [380] U	ND [140] U	ND [16] U	ND [16] U	ND [21] U	ND [13] U	ND [14] U	ND [27] U	ND [21] U
DICHLORODIFLUOROMETHANE	ND [38] U	ND [29] U	ND [32] U	ND [31] U	ND [42] U	ND [26] U	ND [29] U	ND [54] U	ND [42] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLPHENOL (o-CRESOL)	ND [620] U	ND [470] U	ND [540] U	ND [510] U	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
4-METHYLPHENOL (p-CRESOL)	ND [620] U	ND [470] U	110 J	ND [510] U	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
ACENAPHTHYLENE	ND [620] U	ND [470] U	ND [540] U	190 J	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
ANTHRACENE	ND [620] U	ND [470] U	ND [540] U	140 J	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
BENZO(a)ANTHRACENE	ND [620] U	ND [470] U	ND [540] U	310 J	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
BENZO(a)PYRENE	ND [620] U	97 J	200 J	490 J	280 J	200 J	ND [470] U	ND [890] U	ND [690] U
BENZO(b)FLUORANTHENE	ND [620] U	190 J	430 J	1700	140 J	ND [430] U	ND [470] U	ND [890] U	ND [690] U
BENZO(g,h,i)PERYLENE	ND [620] U	ND [470] U	ND [540] U	300 J	270 J	ND [430] U	ND [470] U	ND [890] U	ND [690] U
BENZO(k)FLUORANTHENE	ND [620] U	ND [470] U	140 J	630	83 J	ND [430] U	ND [470] U	ND [890] U	ND [690] U
BENZOIC ACID	ND [3100] U	ND [2400] U	290 J	ND [2500] U	ND [3500] U	ND [2100] U	ND [2400] U	ND [4400] U	ND [3400] U
BENZYL BUTYL PHTHALATE	ND [620] U	ND [470] U	ND [540] U	ND [510] U	ND [700] U	ND [430] U	490	ND [890] U	ND [690] U
CHRYSENE	ND [620] U	150 J	330 J	1500	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
DI-n-BUTYL PHTHALATE	ND [620] U	ND [470] U	ND [540] U	ND [510] U	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
DIBENZ(a,h)ANTHRACENE	ND [620] U	ND [470] U	ND [540] U	110 J	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
FLUORANTHENE	ND [620] U	290 J	550	2300	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
INDENO(1,2,3-c,d)PYRENE	ND [620] U	ND [470] U	ND [540] U	320 J	ND [700] U	300 J	ND [470] U	ND [890] U	ND [690] U
PHENANTHRENE	ND [620] U	ND [470] U	130 J	490 J	ND [700] U	ND [430] U	ND [470] U	ND [890] U	ND [690] U
PYRENE	ND [620] U	240 J	370 J	1600	ND [700] U	ND [430] U	ND [470] U	ND [890] U	190 J
bis(2-ETHYLHEXYL) PHTHALATE	ND [620] U	ND [470] U	ND [540] U	ND [510] U	ND [700] U	ND [430] U	60 J	490 J	92 J
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG									
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	NA

027842

VOCs, SVOCs, and PAHs in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-2-18	LHS-2-19	LHS-MW-10	LHS-MW-11	LHS-MW-12	LHS-MW-13	LHS-MW-14	LHS-MW-15
Sample Number:	**LHS-2-18**	**LHS-2-19**	**LHS-MW10**	**LHS-MW11**	**LHS-MW12**	**LHS-MW13**	**LHS-MW14**	**LHS-MW15**
Date Sampled:	**01/11/1995**	**01/11/1995**	**09/30/1994**	**09/30/1994**	**09/30/1994**	**09/30/1994**	**09/30/1994**	**09/30/1994**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
ACETONE	ND [16] U	ND [18] U	11	ND [10] U	ND [11] U	ND [10] U	ND [11] U	ND [11] U
DICHLORODIFLUOROMETHANE	ND [32] U	ND [36] U	ND [23] U	ND [21] U	ND [22] U	ND [21] U	ND [22] U	ND [23] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLPHENOL (o-CRESOL)	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
4-METHYLPHENOL (p-CRESOL)	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
ACENAPHTHYLENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
ANTHRACENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
BENZO(a)ANTHRACENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
BENZO(a)PYRENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
BENZO(b)FLUORANTHENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
BENZO(g,h,i)PERYLENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
BENZO(k)FLUORANTHENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
BENZOIC ACID	ND [2600] U	ND [3000] U	ND [1900] U	ND [1700] U	ND [1900] U	ND [1700] U	ND [1800] U	ND [1900] U
BENZYL BUTYL PHTHALATE	760	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
CHRYSENE	110 J	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
DI-n-BUTYL PHTHALATE	ND [530] U	ND [600] U	110 J	73 J	130 J	110 J	180 J	190 J
DIBENZ(a,h)ANTHRACENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
FLUORANTHENE	110 J	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
INDENO(1,2,3-c,d)PYRENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
PHENANTHRENE	ND [530] U	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
PYRENE	140 J	ND [600] U	ND [370] U	ND [350] U	ND [370] U	ND [340] U	ND [360] U	ND [380] U
bis(2-ETHYLHEXYL) PHTHALATE	120 J	250 J	64 J	59 J	60 J	100 J	90 J	83 J
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG								
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA

027843
027843

VOCs, SVOCs, and PAHs in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-16	LHS-MW-17	LHS-MW-18	LHS-MW-19	LHS-MW-20	LHS-MW-21	LHS-MW-22	LHS-MW-23
Sample Number:	**LHS-MW16**	**LHS-MW17**	**LHS-MW18**	**LHS-MW19**	**LHS-MW20**	**LHS-MW21**	**LHS-MW22**	**LHS-MW23**
Date Sampled:	**09/30/1994**	**09/30/1994**	**09/30/1994**	**09/30/1994**	**10/03/1994**	**10/03/1994**	**10/03/1994**	**10/03/1994**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
ACETONE	ND [10] U	ND [11] U	ND [11] U	ND [10] U	ND [11] U	ND [10] U	ND [11] U	ND [10] U
DICHLORODIFLUOROMETHANE	ND [21] U	ND [22] U	ND [22] U	ND [21] U	ND [22] U	ND [21] U	ND [21] U	ND [21] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLPHENOL (o-CRESOL)	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	ND [340] U	ND [350] U	ND [340] U
4-METHYLPHENOL (p-CRESOL)	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	ND [340] U	ND [350] U	ND [340] U
ACENAPHTHYLENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	500	ND [350] U	ND [340] U
ANTHRACENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	430	ND [350] U	ND [340] U
BENZO(a)ANTHRACENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	2300	ND [350] U	110 J
BENZO(a)PYRENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	2100	ND [350] U	82 J
BENZO(b)FLUORANTHENE	ND [340] U	75 J	ND [360] U	ND [350] U	ND [370] U	4500	ND [350] U	140 J
BENZO(g,h,i)PERYLENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	1300	ND [350] U	ND [340] U
BENZO(k)FLUORANTHENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	1200	ND [350] U	71 J
BENZOIC ACID	ND [1700] U	ND [1800] U	ND [1800] U	ND [1800] U	ND [1800] U	ND [1700] U	ND [1800] U	ND [1700] U
BENZYL BUTYL PHTHALATE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	ND [340] U	ND [350] U	ND [340] U
CHRYSENE	ND [340] U	75 J	ND [360] U	ND [350] U	ND [370] U	2600	ND [350] U	130 J
DI-n-BUTYL PHTHALATE	230 J	390	ND [360] U	230 J	ND [370] U	ND [340] U	ND [350] U	ND [340] U
DIBENZ(a,h)ANTHRACENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	380	ND [350] U	ND [340] U
FLUORANTHENE	ND [340] U	180 J	ND [360] U	ND [350] U	ND [370] U	2700	ND [350] U	200 J
INDENO(1,2,3-c,d)PYRENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	1600	ND [350] U	ND [340] U
PHENANTHRENE	ND [340] U	ND [360] U	ND [360] U	ND [350] U	ND [370] U	180 J	ND [350] U	ND [340] U
PYRENE	ND [340] U	97 J	ND [360] U	ND [350] U	ND [370] U	2800	ND [350] U	150 J
bis(2-ETHYLHEXYL) PHTHALATE	93 J	43 J	ND [360] U	35 J	88 J	58 J	ND [350] U	41 J
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG								
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA

0027844

VOCs, SVOCs, and PAHs in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-24	LHS-MW-25	LHS-MW-26	LHS-MW-27	LHS-MW-8	LHS-MW-9	MW21SS01
Sample Number:	LHS-MW24	LHS-MW25	LHS-MW26	LHS-MW27	LHS-MW8	LHS-MW9	MW21SS01(0-0.5)
Date Sampled:	10/03/1994	10/03/1994	10/03/1994	10/03/1994	09/30/1994	09/30/1994	07/26/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
ACETONE	ND [12] U	ND [11] U	ND [11] U	ND [10] U	ND [10] U	23	NA
DICHLORODIFLUOROMETHANE	ND [23] U	ND [21] U	ND [21] U	ND [21] U	ND [21] U	ND [22] U	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
2-METHYLPHENOL (o-CRESOL)	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
4-METHYLPHENOL (p-CRESOL)	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
ACENAPHTHYLENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
ANTHRACENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
BENZO(a)ANTHRACENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
BENZO(a)PYRENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
BENZO(b)FLUORANTHENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
BENZO(g,h,i)PERYLENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
BENZO(k)FLUORANTHENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
BENZOIC ACID	ND [1900] U	ND [1800] U	ND [1800] U	ND [1800] U	ND [1700] U	ND [1800] U	NA
BENZYL BUTYL PHTHALATE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
CHRYSENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
DI-n-BUTYL PHTHALATE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	75 J	94 J	NA
DIBENZ(a,h)ANTHRACENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
FLUORANTHENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
INDENO(1,2,3-c,d)PYRENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
PHENANTHRENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
PYRENE	ND [380] U	ND [350] U	ND [350] U	ND [350] U	ND [340] U	ND [360] U	NA
bis(2-ETHYLHEXYL) PHTHALATE	690	46 J	ND [350] U	ND [350] U	75 J	73 J	NA
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG							
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	ND [36] U
ANTHRACENE	NA	NA	NA	NA	NA	NA	ND [36] U
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	NA	NA	ND [36] U
NAPHTHALENE	NA	NA	NA	NA	NA	NA	ND [36] U
PHENANTHRENE	NA	NA	NA	NA	NA	NA	ND [36] U

0027845
0027845

VOCs, SVOCs, and PAHs in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	MW21SS02	MW21SS03	MW21SS04	MW21SS05	MW21SS06
Sample Number:	MW21SS02(0-0.5)	MW21SS03(0-0.5)	MW21SS04(0-0.5)	MW21SS05(0-0.5)	MW21SS06(0-0.5)
Date Sampled:	07/26/1998	07/26/1998	07/26/1998	07/26/1998	07/26/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG					
ACETONE	NA	NA	NA	NA	NA
DICHLORODIFLUOROMETHANE	NA	NA	NA	NA	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG					
2-METHYLPHENOL (o-CRESOL)	NA	NA	NA	NA	NA
4-METHYLPHENOL (p-CRESOL)	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA
BENZO(a)ANTHRACENE	NA	NA	NA	NA	NA
BENZO(a)PYRENE	NA	NA	NA	NA	NA
BENZO(b)FLUORANTHENE	NA	NA	NA	NA	NA
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA	NA
BENZO(k)FLUORANTHENE	NA	NA	NA	NA	NA
BENZOIC ACID	NA	NA	NA	NA	NA
BENZYL BUTYL PHTHALATE	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA
DI-n-BUTYL PHTHALATE	NA	NA	NA	NA	NA
DIBENZ(a,h)ANTHRACENE	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA
INDENO(1,2,3-c,d)PYRENE	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA
bis(2-ETHYLHEXYL) PHTHALATE	NA	NA	NA	NA	NA
POLYNUCLEAR AROMATIC HYDROCARBONS - UNITS: UG/KG					
ACENAPHTHENE	ND [41] U	ND [42] U	170	ND [36] U	ND [37] U
ANTHRACENE	ND [41] U	ND [42] U	ND [42] U	390	ND [37] U
BENZO(g,h,i)PERYLENE	ND [41] U	ND [42] U	ND [42] U	ND [36] U	180
NAPHTHALENE	ND [41] U	ND [42] U	180	ND [36] U	270
PHENANTHRENE	120	ND [42] U	ND [42] U	ND [36] U	860

000136

027846

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL27-01	LH-DL29-01	LH-S017-01	LH-S017-01	LH-S017-02	LH-S017-02	LH-S018-01	LH-S018-01	LH-S018-01
Sample Number:	LH-DL27-01	LH-DL29-01	LH-S017-01_1	LH-S017-01_2	LH-S017-02_1	LH-S017-02_2	LH-S018-01_1	LH-S018-01_2	LH-S018-01_3
Date Sampled:	06/24/1993	06/25/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993
Depth (ft.):	1.50	2.00	0.50	2.50	0.50	2.50	0.50	1.10	5.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

027847

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S021-01	LH-S021-01	LH-S021-02	LH-S021-02	LH-S021-02	LH-S025-01	LH-S025-01	LH-S025-02	LH-S025-02
Sample Number:	LH-S021-01_1	LH-S021-01_2	LH-S021-02_1	LH-S021-02_2	LH-S021-02_3	LH-S025-01_1	LH-S025-01_2	LH-S025-02_1	LH-S025-02_2
Date Sampled:	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993
Depth (ft.):	1.00	3.50	0.50	2.00	3.40	0.50	5.00	0.50	1.50
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

000176

027848

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S025-02	LH-S026-01	LH-S026-01	LH-S026-02	LH-S026-02	LH-S026-02	LH-S03-01	LH-S03-01	LH-S03-02
Sample Number:	LH-S025-02_3	LH-S026-01_1	LH-S026-01_2	LH-S026-02_1	LH-S026-02_2	LH-S026-02_3	LH-S03-01_1	LH-S03-01_2	LH-S03-02_1
Date Sampled:	08/06/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	07/10/1993	07/10/1993	07/10/1993
Depth (ft.):	3.50	0.50	3.50	0.50	1.00	3.50	0.00	4.00	0.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

000129

027849

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S03-02	LH-S04-01	LH-S04-01	LH-S04-02	LH-S04-02	LH-S05-01	LH-S05-01	LH-S05-02	LH-S05-02	LH-S06-01
Sample Number:	LH-S03-02_2	LH-S04-01_1	LH-S04-01_2	LH-S04-02_1	LH-S04-02_2	LH-S05-01_1	LH-S05-01_2	LH-S05-02_1	LH-S05-02_2	LH-S06-01_1
Date Sampled:	07/10/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993
Depth (ft.):	4.00	0.00	4.00	0.00	4.00	0.00	3.00	0.00	3.00	0.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

027850

027850

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S06-01	LH-S06-01	LH-S06-02	LH-S06-02	LH-S06-02	LH-S07-01	LH-S07-01	LH-S07-01	LH-S07-02	LH-S07-02
Sample Number:	LH-S06-01_2	LH-S06-01_3	LH-S06-02_1	LH-S06-02_2	LH-S06-02_3	LH-S07-01_1	LH-S07-01_2	LH-S07-01_3	LH-S07-02_1	LH-S07-02_2
Date Sampled:	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993
Depth (ft.):	4.00	10.00	0.00	3.00	10.00	0.50	2.50	9.00	0.00	2.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

0027851

0027851

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S07-02	LH-S08-01	LH-S08-01	LH-S08-02	LH-S08-02	LH-S09-01	LH-S09-01	LH-S09-01	LH-S09-02	LH-S09-02
Sample Number:	LH-S07-02_3	LH-S08-01_1	LH-S08-01_2	LH-S08-02_1	LH-S08-02_2	LH-S09-01_1	LH-S09-01_2	LH-S09-01_3	LH-S09-02_1	LH-S09-02_2
Date Sampled:	07/09/1993	07/12/1993	07/12/1993	07/12/1993	07/12/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	9.00	0.00	4.00	0.00	4.00	0.50	5.00	6.50	0.50	5.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

0027852
0027852

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S09-02	LH-S10-02	LH-S10-02	LH-S107-01	LH-S107-01	LH-S108-01	LH-S108-01	LH-S108-01	LH-S109-01
Sample Number:	LH-S09-02_3	LH-S10-02_2	LH-S10-02_1	LH-S107-01_2	LH-S107-01_3	LH-S108-01_1	LH-S108-01_2	LH-S108-01_3	LH-S109-01_1
Date Sampled:	06/26/1993	06/26/1993	07/11/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	7.00	9.00	0.00	1.00	2.00	0.50	2.00	4.00	0.50
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

0027853

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S109-01	LH-S11-01	LH-S11-01	LH-S11-02	LH-S12-01	LH-S12-01	LH-S12-02	LH-S12-02	LH-S13-01	LH-S13-01
Sample Number:	LH-S109-01_2	LH-S11-01_1	LH-S11-01_2	LH-S11-02_2	LH-S12-01_1	LH-S12-01_2	LH-S12-02_1	LH-S12-02_2	LH-S13-01_1	LH-S13-01_2
Date Sampled:	06/26/1993	06/25/1993	06/25/1993	07/10/1993	07/11/1993	07/11/1993	07/11/1993	07/11/1993	07/10/1993	07/10/1993
Depth (ft.):	2.00	0.00	10.00	10.00	0.00	9.00	0.00	9.00	0.00	8.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

0027854

0027854

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S13-02	LH-S13-02	LH-S14-01	LH-S14-01	LH-S14-02	LH-S14-02	LH-S15-01	LH-S15-01	LH-S15-02	LH-S15-02
Sample Number:	LH-S13-02_1	LH-S13-02_2	LH-S14-01_1	LH-S14-01_2	LH-S14-02_1	LH-S14-02_2	LH-S15-01_1	LH-S15-01_2	LH-S15-02_1	LH-S15-02_2
Date Sampled:	07/10/1993	07/10/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993
Depth (ft.):	0.00	8.00	0.50	3.20	0.50	3.50	0.50	5.20	0.50	5.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

027855

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S16-01	LH-S16-01	LH-S16-01	LH-S19-01	LH-S19-01	LH-S19-01	LH-S19-02	LH-S19-02	LH-S20-01	LH-S20-01
Sample Number:	LH-S16-01_1	LH-S16-01_2	LH-S16-01_3	LH-S19-01	LH-S19-01_1	LH-S19-01_2	LH-S19-02_1	LH-S19-02_2	LH-S20-01_1	LH-S20-01_2
Date Sampled:	07/08/1993	07/08/1993	07/08/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	06/25/1993	06/25/1993
Depth (ft.):	0.50	4.20	8.00	1.00	1.50	5.00	1.00	5.00	0.50	2.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

0027856

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S20-02	LH-S20-02	LH-S22-01	LH-S22-01	LH-S22-02	LH-S22-02	LH-S23-01	LH-S23-01	LH-S23-02	LH-S24-01
Sample Number:	LH-S20-02_1	LH-S20-02_2	LH-S22-01_1	LH-S22-01_2	LH-S22-02_1	LH-S22-02_2	LH-S23-01_1	LH-S23-01_2	LH-S23-02_2	LH-S24-01_1
Date Sampled:	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	07/25/1993	07/25/1993	07/25/1993	06/25/1993
Depth (ft.):	0.50	5.00	0.50	5.00	0.50	5.00	0.50	3.00	3.50	0.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

000437

027857

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S24-01	LH-S27-01	LH-S27-01	LH-S27-02	LH-S27-02	LH-S28-01	LH-S28-01	LH-S29-01	LH-S29-01	LH-S29-02
Sample Number:	LH-S24-01_2	LH-S27-01_1	LH-S27-01_2	LH-S27-02 _1	LH-S27-02_2	LH-S28-01_1	LH-S28-01_2	LH-S29-01_1	LH-S29-01_2	LH-S29-02_1
Date Sampled:	06/25/1993	06/24/1993	06/24/1993	06/24/1993	06/24/1993	07/22/1993	07/22/1993	06/25/1993	06/25/1993	06/25/1993
Depth (ft.):	2.00	0.50	2.00	0.50	2.00	0.50	3.00	0.50	2.50	0.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

000128

027858

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S29-02	LH-S29-02	LH-S30-01	LH-S30-01	LH-S31-01	LH-S31-01	LH-S32-01	LH-S32-01	LH-S33-01	LH-S33-01
Sample Number:	LH-S29-02_2	LH-S29-02_3	LH-S30-01_1	LH-S30-01_2	LH-S31-01_1	LH-S31-01_2	LH-S32-01_1	LH-S32-01_2	LH-S33-01_1	LH-S33-01_2
Date Sampled:	06/25/1993	06/25/1993	06/25/1993	06/25/1993	07/21/1993	07/21/1993	06/25/1993	06/25/1993	07/21/1993	07/21/1993
Depth (ft.):	2.00	10.00	0.50	2.50	0.50	3.00	0.50	3.00	0.50	3.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

000139

027859

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S34-01	LH-S34-01	LH-S35-01	LH-S35-01	LH-S37-01	LH-S37-01	LH-S39-01	LH-S39-01	LH-S41-01	LH-S41-01
Sample Number:	LH-S34-01_1	LH-S34-01_2	LH-S35-01_1	LH-S35-01_2	LH-S37-01_1	LH-S37-01_2	LH-S39-01_1	LH-S39-01_2	LH-S41-01_1	LH-S41-01_2
Date Sampled:	06/25/1993	07/10/1993	06/25/1993	06/25/1993	07/25/1993	07/25/1993	06/26/1993	06/26/1993	06/25/1993	06/25/1993
Depth (ft.):	3.50	0.50	0.50	3.50	0.50	3.00	0.50	3.00	0.50	3.20
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

027860
027860

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-S42-01	LH-S42-01	LH-S43-01	LH-S43-01	LH-WRS-5	LH-WRS-5	LH-WRS-6	LH-WRS-6	LH-WRS07-01	LH-WRS07-01
Sample Number:	LH-S42-01_1	LH-S42-01_2	LH-S43-01_1	LH-S43-01_2	LH-WRS-5_1	LH-WRS-5_2	LH-WRS-6_1	LH-WRS-6_2	LH-WRS07-01_1	LH-WRS07-01_2
Date Sampled:	06/25/1993	06/25/1993	06/26/1993	06/26/1993	07/12/1993	07/12/1993	07/10/1993	07/10/1993	07/22/1993	07/22/1993
Depth (ft.):	0.50	2.50	0.50	1.50	0.00	3.00	0.00	2.50	0.50	3.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

027861
027861

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS07-01	LH-WRS10-01	LH-WRS10-01	LH-WRS11-01	LH-WRS11-01	LH-WRS11-01	LH-WRS12-01	LH-WRS12-01
Sample Number:	LH-WRS07-01_3	LH-WRS10-01_1	LH-WRS10-01_2	LH-WRS11-01_1	LH-WRS11-01_2	LH-WRS11-01_3	LH-WRS12-01_1	LH-WRS12-01_2
Date Sampled:	07/22/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993
Depth (ft.):	6.10	0.50	3.50	0.50	1.20	3.50	0.50	3.00
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS								

000182

027862

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS12-01	LH-WRS13-01	LH-WRS13-01	LH-WRS16-01	LH-WRS16-01	LH-WRS19-01	LH-WRS19-01	LH-WRS21-01
Sample Number:	LH-WRS12-01_3	LH-WRS13-01_1	LH-WRS13-01_2	LH-WRS16-01_1	LH-WRS16-01_2	LH-WRS19-01_1	LH-WRS19-01_2	LH-WRS21-01_1
Date Sampled:	08/08/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	08/08/1993
Depth (ft.):	3.50	0.50	3.00	0.50	3.50	0.50	3.00	0.50
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS								

027863
027863

Explosives in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS21-01	LH-WRS4-01	LH-WRS4-01	LH-WRS8-01	LH-WRS8-01	LH-WRS9-01	LH-WRS9-01
Sample Number:	LH-WRS21-01_2	LH-WRS4-01_1	LH-WRS4-01_2	LH-WRS8-01_1	LH-WRS8-01_2	LH-WRS9-01_1	LH-WRS9-01_2
Date Sampled:	08/08/1993	07/10/1993	07/10/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993
Depth (ft.):	3.50	0.50	3.50	0.50	3.50	0.50	3.50
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS							

027864
027864

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SB01	46SB01	46SB01	46SB02	46SB02	46SB02	46SB03	46SB03
Sample Number:	46SB01(0-0.5)	46SB01(1-3)	46SB01(3-5)	46SB02(0-0.5)	46SB02(1-3)	46SB02(3-5)	46SB03(0-0.5)	46SB03(0-0.5)FD
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998
Depth (ft.):	0.00	1.00	3.00	0.00	1.00	3.00	0.00	0.00
PESTICIDES - UNITS: UG/KG								
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [1.8] UJ	ND [1.8] U	ND [2.1] U	10	ND [1.9] U	ND [1.9] U	ND [1.9] UJ	NA
GAMMA BHC (LINDANE)	ND [1.8] UJ	ND [1.8] U	ND [2.1] U	8 J:*	ND [1.9] U	ND [1.9] U	ND [1.9] UJ	NA
HEPTACHLOR	ND [1.8] UJ	ND [1.8] U	ND [2.1] U	ND [1.7] U	ND [1.9] U	ND [1.9] U	ND [1.9] UJ	NA
HEPTACHLOR EPOXIDE	ND [1.8] UJ	ND [1.8] U	ND [2.1] U	ND [1.7] U	ND [1.9] U	ND [1.9] U	ND [1.9] UJ	NA
p,p'-DDD	ND [3.7] UJ	ND [3.7] U	ND [4.1] U	ND [3.5] U	ND [3.7] U	ND [3.7] U	ND [3.8] UJ	NA
p,p'-DDE	ND [3.7] UJ	ND [3.7] U	ND [4.1] U	ND [3.5] U	ND [3.7] U	ND [3.7] U	ND [3.8] UJ	NA
p,p'-DDT	ND [3.7] UJ	ND [3.7] U	ND [4.1] U	ND [3.5] U	ND [3.7] U	ND [3.7] U	ND [3.8] UJ	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	ND [37] U	ND [37] U	ND [42] U	ND [35] U	ND [37] U	ND [37] U	ND [38] U	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	62.575	15.552	2.407	18.771	1.8	11.721	43.267 J	84.84 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	3.476	0.683	ND [0.181] U	2.665	ND [0.172] U	0.434	4.395	10.775 J
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.709] U	ND [0.537] U	ND [0.213] U	ND [0.42] U	ND [0.202] U	ND [0.259] U	ND [0.968] U	ND [2.106] UJ
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.512] U	ND [0.545] U	ND [0.378] U	ND [0.343] U	ND [0.268] U	ND [0.319] U	ND [0.432] U	ND [0.982] UJ
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	2.694	ND [0.541] U	ND [0.305] U	7.748	ND [0.197] U	0.66	1.843	2.832 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	2.052	ND [0.317] U	ND [0.284] U	ND [0.257] U	ND [0.201] U	ND [0.239] U	ND [0.4] UJ	ND [0.736] UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.154] U	ND [0.367] U	ND [0.264] U	ND [0.339] U	ND [0.17] U	ND [0.247] U	ND [0.457] U	ND [0.608] UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	2.312	ND [0.365] U	ND [0.298] U	0.615	ND [0.211] U	ND [0.251] U	ND [0.383] UJ	ND [0.773] UJ
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.302] U	ND [0.292] U	ND [0.281] U	ND [0.352] U	ND [0.338] U	ND [0.412] U	ND [0.397] U	ND [0.561] UJ
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.182] U	ND [0.228] U	ND [0.204] U	ND [0.304] U	ND [0.183] U	ND [0.257] U	1.761 J	ND [0.655] UJ
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.195] U	ND [0.497] U	ND [0.335] U	2.987	ND [0.216] U	ND [0.313] U	ND [0.514] U	ND [0.772] UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.181] U	2.022	ND [0.277] U	ND [0.443] U	ND [0.189] U	ND [0.63] U	2.469 J	ND [0.839] UJ
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	115.884	33.922	5.369	51.005	4.109	23.067	92.015	179.385
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.603] U	0.683	ND [0.181] U	ND [0.357] U	ND [0.172] U	ND [0.221] U	ND [0.773] UJ	10.775
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	16.667	2.654	ND [0.284] U	6.293	ND [0.201] U	3.522	6.566	21.537
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	5.465	ND [0.367] U	ND [0.264] U	34.927	ND [0.17] U	1.118	2 J	15.018
OCTACHLORODIBENZO-p-DIOXIN	1089.275	1068.453	306.555	611.392	189.168	198.582	901.997 J	2409.478 J
OCTACHLORODIBENZOFURAN	13.768	2.041	ND [0.307] U	5.968	ND [0.22] U	ND [0.238] U	8.298	26.587 J
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.302] U	ND [0.292] U	ND [0.281] U	ND [0.352] U	ND [0.338] U	ND [0.412] U	ND [0.397] U	ND [0.561] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	1.709	ND [0.227] U	ND [0.198] U	36.565	ND [0.177] U	1.595	1.761	4.871

027865

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SB01	46SB01	46SB01	46SB02	46SB02	46SB02	46SB03	46SB03
Sample Number:	46SB01(0-0.5)	46SB01(1-3)	46SB01(3-5)	46SB02(0-0.5)	46SB02(1-3)	46SB02(3-5)	46SB03(0-0.5)	46SB03(0-0.5)FD
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998
Depth (ft.):	0.00	1.00	3.00	0.00	1.00	3.00	0.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.181] U	3.834	ND [0.277] U	1.317	ND [0.189] U	ND [0.63] U	2.469 J	ND [0.839] U
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS								NA

027866

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SB03	46SB03	LHS-MW-10	LHS-MW-11	LHS-MW-12	LHS-MW-13	LHS-MW-14	LHS-MW-15	LHS-MW-16
Sample Number:	46SB03(1-3)	46SB03(3-5)	LHS-MW10	LHS-MW11	LHS-MW12	LHS-MW13	LHS-MW14	LHS-MW15	LHS-MW16
Date Sampled:	07/27/1998	07/27/1998	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994
Depth (ft.):	1.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [1.9] U	ND [2.1] U	NA	NA	NA	NA	NA	NA	NA
GAMMA BHC (LINDANE)	ND [1.9] U	ND [2.1] U	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	ND [1.9] U	ND [2.1] U	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	ND [1.9] U	ND [2.1] U	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	3.9	ND [4.1] U	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	3.3	ND [4.1] U	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	2 J	ND [4.1] U	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	ND [38] U	ND [41] U	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	15.582	2.587	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.762	ND [0.21] U	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.232] U	ND [0.247] U	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.078] U	ND [0.314] U	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	5.421	ND [0.229] U	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.646	ND [0.235] U	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.099] U	ND [0.197] U	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.069] U	ND [0.247] U	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.118] U	ND [0.421] U	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.997	ND [0.301] U	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.111] U	ND [0.251] U	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.093] U	ND [0.474] U	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	25.419	5.48	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.185] U	ND [0.21] U	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	3.648	ND [0.235] U	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	2.756	ND [0.197] U	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	258.749	174.84	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	10.365	ND [0.466] U	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.118] U	ND [0.421] U	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	4.883	ND [0.291] U	NA	NA	NA	NA	NA	NA	NA

027867

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SB03	46SB03	LHS-MW-10	LHS-MW-11	LHS-MW-12	LHS-MW-13	LHS-MW-14	LHS-MW-15	LHS-MW-16
Sample Number:	46SB03(1-3)	46SB03(3-5)	LHS-MW10	LHS-MW11	LHS-MW12	LHS-MW13	LHS-MW14	LHS-MW15	LHS-MW16
Date Sampled:	07/27/1998	07/27/1998	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994
Depth (ft.):	1.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	3.528	ND [0.474] U	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

0027868

0027868

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-17	LHS-MW-18	LHS-MW-19	LHS-MW-20	LHS-MW-21	LHS-MW-22	LHS-MW-23	LHS-MW-24	LHS-MW-25
Sample Number:	LHS-MW17	LHS-MW18	LHS-MW19	LHS-MW20	LHS-MW21	LHS-MW22	LHS-MW23	LHS-MW24	LHS-MW25
Date Sampled:	09/30/1994	09/30/1994	09/30/1994	10/03/1994	10/03/1994	10/03/1994	10/03/1994	10/03/1994	10/03/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA

027869

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-17	LHS-MW-18	LHS-MW-19	LHS-MW-20	LHS-MW-21	LHS-MW-22	LHS-MW-23	LHS-MW-24	LHS-MW-25
Sample Number:	LHS-MW17	LHS-MW18	LHS-MW19	LHS-MW20	LHS-MW21	LHS-MW22	LHS-MW23	LHS-MW24	LHS-MW25
Date Sampled:	09/30/1994	09/30/1994	09/30/1994	10/03/1994	10/03/1994	10/03/1994	10/03/1994	10/03/1994	10/03/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

0027870

0027870

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-26	LHS-MW-27	LHS-MW-8	LHS-MW-9	SUMP001	SUMP001	SUMP001	SUMP001
Sample Number:	LHS-MW26	LHS-MW27	LHS-MW8	LHS-MW9	SUMP001(0-0.5)	SUMP001(0-0.5)FD	SUMP001(3-5)	SUMP001(3-5)FD
Date Sampled:	10/03/1994	10/03/1994	09/30/1994	09/30/1994	07/29/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00
PESTICIDES - UNITS: UG/KG								
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	NA	NA	NA	NA	ND [1.8] U	NA	ND [1.9] U	NA
GAMMA BHC (LINDANE)	NA	NA	NA	NA	ND [1.8] U	NA	ND [1.9] U	NA
HEPTACHLOR	NA	NA	NA	NA	ND [1.8] U	NA	ND [1.9] U	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	ND [1.8] U	NA	ND [1.9] U	NA
p,p'-DDD	NA	NA	NA	NA	ND [3.6] U	NA	ND [3.8] U	NA
p,p'-DDE	NA	NA	NA	NA	ND [3.6] U	NA	ND [3.8] U	NA
p,p'-DDT	NA	NA	NA	NA	ND [3.6] U	NA	ND [3.8] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	ND [36] U	NA	ND [38] U	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	28.201	NA	1.586	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	3.249	NA	ND [0.191] U	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.526] U	NA	ND [0.224] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	ND [0.588] U	NA	ND [0.474] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	2.136	NA	ND [0.275] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	ND [0.441] U	NA	ND [0.356] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.411] U	NA	ND [0.238] U	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	ND [0.463] U	NA	ND [0.373] U	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	ND [0.487] U	NA	ND [0.411] U	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.431] U	NA	ND [0.257] U	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.522] U	NA	ND [0.302] U	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	2.431	1.31	2.094	1.674
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	53.32	NA	2.978	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	3.249	NA	ND [0.191] U	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	8.208	NA	ND [0.356] U	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	3.419	NA	ND [0.238] U	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	317.956	NA	18.37	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	6.956	NA	ND [0.253] U	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	ND [0.487] U	NA	ND [0.411] U	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	ND [0.417] U	NA	ND [0.249] U	NA

027871
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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-26	LHS-MW-27	LHS-MW-8	LHS-MW-9	SUMP001	SUMP001	SUMP001	SUMP001
Sample Number:	LHS-MW26	LHS-MW27	LHS-MW8	LHS-MW9	SUMP001(0-0.5)	SUMP001(0-0.5)FD	SUMP001(3-5)	SUMP001(3-5)FD
Date Sampled:	10/03/1994	10/03/1994	09/30/1994	09/30/1994	07/29/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	2.431	NA	2.094	NA
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS					NA	NA	NA	NA

000152

027872

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP004	SUMP004	SUMP004	SUMP004	SUMP006	SUMP006	SUMP006
Sample Number:	SUMP004(0-0.5)	SUMP004(0-0.5)FD	SUMP004(3-5)	SUMP004(3-5)FD	SUMP006(0-0.5)	SUMP006(0-0.5)FD	SUMP006(3-5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [1.8] U	NA	ND [1.9] U	NA	ND [2] U	NA	ND [2] U
GAMMA BHC (LINDANE)	ND [1.8] U	NA	ND [1.9] U	NA	ND [2] U	NA	ND [2] U
HEPTACHLOR	ND [1.8] U	NA	ND [1.9] U	NA	ND [2] U	NA	ND [2] U
HEPTACHLOR EPOXIDE	ND [1.8] U	NA	ND [1.9] U	NA	ND [2] U	NA	ND [2] U
p,p'-DDD	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.9] U	NA	ND [4] U
p,p'-DDE	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.9] U	NA	ND [4] U
p,p'-DDT	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.9] U	NA	ND [4] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [37] U	NA	ND [39] U	NA	ND [39] U	NA	ND [40] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	32.268 J	40.674 J	2.827	NA	ND [0.515] U	NA	ND [0.451] U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	3.564 J	6.426 J	ND [0.259] U	NA	ND [0.268] U	NA	ND [0.216] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [2.609] UJ	ND [3.525] UJ	ND [0.305] U	NA	ND [0.315] U	NA	ND [0.254] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [2.581] UJ	ND [2.849] UJ	ND [0.45] U	NA	ND [0.587] U	NA	ND [0.418] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [3.227] UJ	ND [2.624] UJ	ND [0.254] U	NA	ND [0.412] U	NA	ND [0.305] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [1.442] UJ	ND [2.137] UJ	ND [0.337] U	NA	ND [0.44] U	NA	ND [0.314] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [2.151] UJ	ND [2.267] UJ	ND [0.219] U	NA	ND [0.356] U	NA	ND [0.263] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [1.712] UJ	ND [2.242] UJ	ND [0.354] U	NA	ND [0.462] U	NA	ND [0.329] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [1.817] UJ	ND [2.747] UJ	ND [0.495] U	NA	ND [0.562] U	NA	ND [0.602] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [1.477] UJ	ND [3.167] UJ	ND [0.327] U	NA	ND [0.407] U	NA	ND [0.356] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [3.15] UJ	ND [2.877] UJ	ND [0.278] U	NA	ND [0.451] U	NA	ND [0.334] U
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [7.199] UJ	ND [21.037] UJ	2.568	2.075	2.83	2.184 J	3.439
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	32.268	89.892	7.97	NA	ND [0.515] U	NA	ND [0.451] U
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [1.954] U	ND [2.998] U	ND [0.259] U	NA	ND [0.268] U	NA	ND [0.216] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [1.442] U	ND [2.137] U	1.052	NA	ND [0.44] U	NA	ND [0.314] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	ND [2.151] U	ND [2.267] U	ND [0.219] U	NA	ND [0.356] U	NA	ND [0.263] U
OCTACHLORODIBENZO-p-DIOXIN	1006.217 J	1071.522 J	73.545	NA	21.974	NA	14.658
OCTACHLORODIBENZOFURAN	10.052 J	13.128 J	ND [0.476] U	NA	ND [0.363] U	NA	ND [0.791] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [1.817] U	ND [2.747] U	ND [0.495] U	NA	ND [0.562] U	NA	ND [0.602] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [1.542] U	ND [3.063] U	ND [0.316] U	NA	ND [0.393] U	NA	ND [0.344] U

027873

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP004	SUMP004	SUMP004	SUMP004	SUMP006	SUMP006	SUMP006
Sample Number:	SUMP004(0-0.5)	SUMP004(0-0.5)FD	SUMP004(3-5)	SUMP004(3-5)FD	SUMP006(0-0.5)	SUMP006(0-0.5)FD	SUMP006(3-5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	0.00	3.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [7.199] U	ND [21.037] U	4.63	NA	5.762	NA	6.075
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0027874
0027874

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP006	SUMP010	SUMP010	SUMP010	SUMP010	SUMP016
Sample Number:	SUMP006(3-5)FD	SUMP010(0-0.5)	SUMP010(0-0.5)FD	SUMP010(3-5)	SUMP010(3-5)FD	SUMP016(0-0.5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/06/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00
PESTICIDES - UNITS: UG/KG						
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	NA	ND [1.8] U	NA	ND [1.9] U	NA	ND [2] UJ
GAMMA BHC (LINDANE)	NA	ND [1.8] U	NA	ND [1.9] U	NA	ND [2] UJ
HEPTACHLOR	NA	2.2	NA	ND [1.9] U	NA	ND [2] UJ
HEPTACHLOR EPOXIDE	NA	16	NA	ND [1.9] U	NA	ND [2] UJ
p,p'-DDD	NA	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.9] UJ
p,p'-DDE	NA	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.9] UJ
p,p'-DDT	NA	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.9] UJ
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	NA	ND [37] U	NA	ND [39] U	NA	540
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	16.604	NA	ND [0.208] U	NA	107.648 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	1.298	NA	ND [0.148] U	NA	8.762 J
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.323] U	NA	ND [0.173] U	NA	ND [4.646] R
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.629] U	NA	ND [0.289] U	NA	ND [5.172] R
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.47] U	NA	ND [0.173] U	NA	6.553 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.472] U	NA	ND [0.217] U	NA	ND [2.889] R
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.406] U	NA	ND [0.15] U	NA	ND [2.413] R
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.495] U	NA	ND [0.227] U	NA	ND [3.431] R
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.378] U	NA	ND [0.351] U	NA	ND [3.255] R
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.363] U	NA	ND [0.273] U	NA	ND [2.117] R
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.515] U	NA	ND [0.19] U	NA	ND [3.535] R
2,3,7,8-TETRACHLORODIBENZOFURAN	2.605	1.883	1.664	2.119	1.773	ND [2.36] R
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	35.146	NA	0.885	NA	227.391
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	3.832	NA	ND [0.148] U	NA	8.762
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.472] U	NA	ND [0.217] U	NA	19.949
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.406] U	NA	ND [0.15] U	NA	30.49
OCTACHLORODIBENZO-p-DIOXIN	NA	436.623	NA	12.129	NA	5078.55 J
OCTACHLORODIBENZOFURAN	NA	4.554	NA	ND [0.278] U	NA	20.32 J
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.378] U	NA	ND [0.351] U	NA	ND [3.255] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.351] U	NA	ND [0.264] U	NA	32.705

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP006	SUMP010	SUMP010	SUMP010	SUMP010	SUMP016
Sample Number:	SUMP006(3-5)FD	SUMP010(0-0.5)	SUMP010(0-0.5)FD	SUMP010(3-5)	SUMP010(3-5)FD	SUMP016(0-0.5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/06/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	2.188	NA	3.706	NA	ND [2.36] U
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

0027876
0027876

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP016	SUMP016	SUMP018	SUMP018	SUMP019	SUMP019	SUMP019
Sample Number:	SUMP016(0-0.5)DFD	SUMP016(3-5)	SUMP018(0-0.5)	SUMP018(3-5)	SUMP019(0-0.5)	SUMP019(0-0.5)FD	SUMP019(3-5)
Date Sampled:	08/06/1998	08/06/1998	08/11/1998	08/11/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	NA	ND [1.9] U	NA	NA	ND [1.8] U	NA	ND [1.9] U
GAMMA BHC (LINDANE)	NA	ND [1.9] U	NA	NA	ND [1.8] U	NA	ND [1.9] U
HEPTACHLOR	NA	ND [1.9] U	NA	NA	ND [1.8] U	NA	ND [1.9] U
HEPTACHLOR EPOXIDE	NA	ND [1.9] U	NA	NA	ND [1.8] U	NA	ND [1.9] U
p,p'-DDD	NA	ND [3.7] U	NA	NA	ND [3.6] U	NA	ND [3.9] U
p,p'-DDE	NA	ND [3.7] U	NA	NA	ND [3.6] U	NA	ND [3.9] U
p,p'-DDT	NA	ND [3.7] U	NA	NA	ND [3.6] U	NA	ND [3.9] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	380	ND [38] U	NA	NA	ND [37] U	NA	ND [39] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	ND [0.527] U	100.006	1.333	8.959	NA	ND [0.367] U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	ND [0.113] U	9.632	ND [0.35] U	0.94	NA	ND [0.28] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.161] U	ND [0.458] U	ND [0.467] U	ND [0.294] U	NA	ND [0.329] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.465] U	2.376	ND [0.991] U	ND [0.479] U	NA	ND [0.316] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.348] U	2.615 J	ND [0.351] U	1.258	NA	ND [0.269] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.271] U	3.17 J	ND [0.553] U	ND [0.359] U	NA	ND [0.237] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.236] U	ND [0.459] U	ND [0.234] U	ND [0.396] U	NA	ND [0.232] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.312] U	7.006	ND [0.657] U	ND [0.377] U	NA	ND [0.249] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.214] U	ND [1.03] U	ND [0.609] U	ND [0.244] U	NA	ND [0.492] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.147] U	ND [0.551] U	ND [0.393] U	ND [0.237] U	NA	ND [0.389] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.32] U	ND [0.672] U	ND [0.342] U	ND [0.502] U	NA	ND [0.295] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	ND [0.236] U	ND [0.587] U	ND [0.614] U	2.172	1.895	2.232
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.527] U	216.449	3.372	23.652	NA	1.964
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.113] U	9.632	ND [0.35] U	0.94	NA	ND [0.28] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.271] U	39.638	ND [0.553] U	ND [0.359] U	NA	ND [0.237] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.236] U	8.501	ND [0.234] U	2.903	NA	ND [0.232] U
OCTACHLORODIBENZO-p-DIOXIN	NA	25.157	1320.083	125.545	362.029	NA	21.904
OCTACHLORODIBENZOFURAN	NA	ND [0.538] U	10.875	ND [0.558] U	2.66	NA	ND [0.395] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.214] U	ND [1.03] U	ND [0.609] U	ND [0.244] U	NA	ND [0.492] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.147] U	2.356 J	ND [0.411] U	4.439	NA	ND [0.376] U

027871

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP016	SUMP016	SUMP018	SUMP018	SUMP019	SUMP019	SUMP019
Sample Number:	SUMP016(0-0.5)DFD	SUMP016(3-5)	SUMP018(0-0.5)	SUMP018(3-5)	SUMP019(0-0.5)	SUMP019(0-0.5)FD	SUMP019(3-5)
Date Sampled:	08/06/1998	08/06/1998	08/11/1998	08/11/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	0.00	3.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.236] U	3.869 J	ND [0.614] U	2.172	NA	4.226
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0274878

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP019	SUMP020	SUMP020	SUMP020	SUMP020	SUMP023	SUMP023
Sample Number:	SUMP019(3-5)FD	SUMP020(0-0.5)	SUMP020(0-0.5)FD	SUMP020(3-5)	SUMP020(3-5)FD	SUMP023(0-0.5)	SUMP023(3-5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/06/1998	08/06/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	NA	ND [1.8] U	NA	ND [1.9] U	NA	ND [1.8] U	ND [1.8] U
GAMMA BHC (LINDANE)	NA	ND [1.8] U	NA	ND [1.9] U	NA	ND [1.8] U	ND [1.8] U
HEPTACHLOR	NA	ND [1.8] U	NA	ND [1.9] U	NA	ND [1.8] U	ND [1.8] U
HEPTACHLOR EPOXIDE	NA	ND [1.8] U	NA	ND [1.9] U	NA	ND [1.8] U	ND [1.8] U
p,p'-DDD	NA	ND [3.6] U	NA	ND [3.8] U	NA	ND [3.6] U	ND [3.6] U
p,p'-DDE	NA	3.4	NA	ND [3.8] U	NA	ND [3.6] U	ND [3.6] U
p,p'-DDT	NA	ND [3.6] U	NA	ND [3.8] U	NA	ND [3.6] U	ND [3.6] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	NA	ND [36] U	NA	ND [39] U	NA	ND [36] U	ND [37] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	896.546	NA	4.186	NA	28.677	0.676 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	108.085	NA	4.426	NA	3.58	ND [0.179] UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [9.935] U	NA	ND [0.485] U	NA	ND [0.455] U	ND [0.257] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	16.351	NA	ND [0.447] U	NA	0.844	ND [0.368] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	32.225	NA	ND [0.355] U	NA	1.343	ND [0.214] UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	31.132	NA	ND [0.335] U	NA	1.236	ND [0.214] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	7.807	NA	ND [0.306] U	NA	ND [0.169] U	ND [0.145] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	45.823	NA	ND [0.352] U	NA	1.105	ND [0.247] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	6.038	NA	ND [0.294] U	NA	ND [0.246] U	ND [0.216] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.91] U	NA	ND [0.269] U	NA	ND [0.226] U	ND [0.198] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	13.543	NA	ND [0.389] U	NA	ND [0.229] U	ND [0.196] U
2,3,7,8-TETRACHLORODIBENZOFURAN	1.827	ND [1.249] U	3.16	3.259	2.485	ND [0.68] U	ND [0.339] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	1757.964	NA	4.186	NA	26.767	ND [0.27] U
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	108.085	NA	ND [0.413] U	NA	3.58	ND [0.179] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	345.749	NA	0.647	NA	10.36	ND [0.214] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	203.75	NA	ND [0.306] U	NA	4.045	ND [0.145] U
OCTACHLORODIBENZO-p-DIOXIN	NA	7307.296	NA	420.731	NA	702.311	10.182 J
OCTACHLORODIBENZOFURAN	NA	97.552	NA	ND [0.401] U	NA	4.662	ND [0.283] UJ
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	11.516	NA	ND [0.294] U	NA	ND [0.246] U	ND [0.216] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	75.474	NA	ND [0.26] U	NA	1.393	ND [0.198] U

027879

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP019	SUMP020	SUMP020	SUMP020	SUMP020	SUMP023	SUMP023
Sample Number:	SUMP019(3-5)FD	SUMP020(0-0.5)	SUMP020(0-0.5)FD	SUMP020(3-5)	SUMP020(3-5)FD	SUMP023(0-0.5)	SUMP023(3-5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/06/1998	08/06/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00	3.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	5.97	NA	5.93	NA	ND [0.68] U	ND [0.339] U
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0001150

0027880

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP024	SUMP024	SUMP026	SUMP026	SUMP027	SUMP027	SUMP027
Sample Number:	SUMP024(0-0.5)	SUMP024(3-5)	SUMP026(0-0.5)	SUMP026(3-5)	SUMP027(0-0.5)	SUMP027(3-5)	SUMP027(3-5)FD
Date Sampled:	08/08/1998	08/08/1998	08/08/1998	08/08/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	3.00	3.00
PESTICIDES - UNITS: UG/KG							
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [1.8] U	ND [1.8] U	ND [1.9] U	ND [2.1] U	ND [1.8] U	ND [2] U	NA
GAMMA BHC (LINDANE)	ND [1.8] U	ND [1.8] U	ND [1.9] U	ND [2.1] U	ND [1.8] U	ND [2] U	NA
HEPTACHLOR	ND [1.8] U	ND [1.8] U	ND [1.9] U	ND [2.1] U	ND [1.8] U	ND [2] U	NA
HEPTACHLOR EPOXIDE	ND [1.8] U	ND [1.8] U	ND [1.9] U	ND [2.1] U	ND [1.8] U	ND [2] U	NA
p,p'-DDD	ND [3.7] U	ND [3.6] U	ND [3.9] U	ND [4.2] U	ND [3.6] U	4.5	NA
p,p'-DDE	ND [3.7] U	ND [3.6] U	ND [3.9] U	ND [4.2] U	ND [3.6] U	ND [3.9] U	NA
p,p'-DDT	ND [3.7] U	ND [3.6] U	ND [3.9] U	ND [4.2] U	ND [3.6] U	ND [3.9] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [37] U	ND [36] U	ND [38] U	ND [42] U	ND [36] U	ND [40] U	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	137.863	4.584	10.985	8.515	4.785	2.493	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	6.835	ND [0.3] U	0.733	0.598	ND [0.231] U	ND [0.272] U	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [2.672] U	ND [0.401] U	ND [0.257] U	ND [0.165] U	ND [0.271] U	ND [0.32] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.83] U	ND [0.752] U	ND [0.33] U	ND [0.254] U	ND [0.429] U	ND [0.66] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	2.833	ND [0.437] U	ND [0.202] U	ND [0.127] U	ND [0.432] U	ND [0.432] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	3.24	ND [0.42] U	ND [0.306] U	ND [0.235] U	ND [0.322] U	ND [0.495] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.994] U	ND [0.291] U	ND [0.195] U	ND [0.122] U	ND [0.373] U	ND [0.373] U	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	5.542	ND [0.499] U	ND [0.293] U	ND [0.225] U	ND [0.337] U	ND [0.519] U	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.522] U	ND [0.52] U	ND [0.237] U	ND [0.174] U	ND [0.564] U	ND [0.645] U	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.43] U	ND [0.339] U	ND [0.194] UJ	ND [0.11] U	ND [0.388] U	ND [0.379] U	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [1.455] U	ND [0.426] U	ND [0.22] U	ND [0.138] U	ND [0.474] U	ND [0.473] U	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.402] U	ND [0.493] U	1.276 J	1.482	ND [0.424] U	ND [0.403] U	ND [0.231] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	259.4	9.75	25.575	26.676	10.24	2.493	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	6.835	ND [0.3] U	ND [0.205] U	1.008	ND [0.231] U	0.543	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	28.976	ND [0.42] U	ND [0.306] U	7.447	ND [0.322] U	ND [0.495] U	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	4.898	ND [0.291] U	0.519	0.348	0.694	0.466	NA
OCTACHLORODIBENZO-p-DIOXIN	2602.523 J	134.13 J	826.283	599.128	388.85	45.279	NA
OCTACHLORODIBENZOFURAN	19.551	ND [0.528] U	ND [0.715] U	1.455	ND [0.417] U	ND [0.56] U	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.522] U	ND [0.52] U	ND [0.237] U	ND [0.174] U	ND [0.564] U	ND [0.645] U	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	5.682	ND [0.354] U	ND [0.197] U	ND [0.112] U	0.988	ND [0.366] U	NA

0027881

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP024	SUMP024	SUMP026	SUMP026	SUMP027	SUMP027	SUMP027
Sample Number:	SUMP024(0-0.5)	SUMP024(3-5)	SUMP026(0-0.5)	SUMP026(3-5)	SUMP027(0-0.5)	SUMP027(3-5)	SUMP027(3-5)FD
Date Sampled:	08/08/1998	08/08/1998	08/08/1998	08/08/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	3.00	3.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	5.509	ND [0.493] U	2.368	2.775	0.404	ND [0.403] U	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0001C3

027882

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP029	SUMP029	SUMP029	SUMP030	SUMP030	SUMP034	SUMP034
Sample Number:	SUMP029(0-0.5)	SUMP029(3-5)	SUMP029(3-5)FD	SUMP030(0-0.5)	SUMP030(3-5)	SUMP034(0-0.5)	SUMP034(0-0.5)FD
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	08/08/1998	08/08/1998	08/07/1998	08/07/1998
Depth (ft.):	0.00	3.00	3.00	0.00	3.00	0.00	0.00
PESTICIDES - UNITS: UG/KG							
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [1.7] U	ND [1.9] U	NA	ND [1.8] U	ND [1.9] U	ND [1.9] U	NA
GAMMA BHC (LINDANE)	ND [1.7] U	ND [1.9] U	NA	ND [1.8] U	ND [1.9] U	ND [1.9] U	NA
HEPTACHLOR	ND [1.7] U	ND [1.9] U	NA	ND [1.8] U	ND [1.9] U	ND [1.9] U	NA
HEPTACHLOR EPOXIDE	ND [1.7] U	ND [1.9] U	NA	ND [1.8] U	ND [1.9] U	ND [1.9] U	NA
p,p'-DDD	ND [3.6] U	ND [3.8] U	NA	ND [3.7] U	ND [3.8] U	ND [3.8] U	NA
p,p'-DDE	ND [3.6] U	ND [3.8] U	NA	ND [3.7] U	ND [3.8] U	ND [3.8] U	NA
p,p'-DDT	ND [3.6] U	ND [3.8] U	NA	ND [3.7] U	ND [3.8] U	ND [3.8] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [35] U	ND [38] U	NA	ND [37] U	ND [39] U	ND [38] U	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	69.926	1.213	NA	9.449	0.896	5.288	7.301 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	5.527	ND [0.259] U	NA	1.486 U	ND [0.201] U	ND [0.407] U	ND [0.862] UJ
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.884] U	ND [0.304] U	NA	ND [0.171] U	ND [0.269] U	ND [0.544] U	ND [1.15] UJ
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.36] U	ND [0.295] U	NA	ND [0.277] U	ND [0.474] U	ND [0.755] U	ND [1.075] UJ
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	3.108	ND [0.271] U	NA	2.564	ND [0.251] U	ND [0.467] U	ND [0.87] UJ
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.27] U	ND [0.221] U	NA	0.395	ND [0.265] U	ND [0.422] U	ND [0.6] UJ
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.356] U	ND [0.234] U	NA	ND [0.135] U	ND [0.167] U	ND [0.311] U	ND [0.58] UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.283] U	ND [0.232] U	NA	ND [0.184] U	ND [0.314] U	ND [0.501] U	ND [0.713] UJ
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.413] U	ND [0.319] U	NA	ND [0.227] U	ND [0.384] U	ND [0.663] U	ND [0.836] UJ
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.331] U	ND [0.239] U	NA	ND [0.151] U	ND [0.229] U	ND [0.392] UJ	ND [0.729] UJ
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.452] U	ND [0.297] U	NA	ND [0.198] U	ND [0.245] U	ND [0.456] U	ND [0.849] UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.369] U	ND [0.19] U	ND [0.16] U	2.017	2.612	2.636	ND [1.097] UJ
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	104.335	1.213	NA	21.142	3.018	11.47	17.167
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	34.612	ND [0.259] U	NA	ND [0.128] U	ND [0.201] U	ND [0.407] U	ND [0.862] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	1.081	ND [0.221] U	NA	1.636	ND [0.265] U	ND [0.422] U	ND [0.6] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	55.007	ND [0.234] U	NA	5.654	ND [0.167] U	ND [0.311] U	0.898
OCTACHLORODIBENZO-p-DIOXIN	2308.821	127.916	NA	692.874	46.57	982.034	1412.052 J
OCTACHLORODIBENZOFURAN	42.806	ND [0.33] U	NA	3.036	ND [0.354] U	ND [0.586] U	ND [1.071] UJ
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.413] U	ND [0.319] U	NA	ND [0.227] U	ND [0.384] U	ND [0.663] U	ND [0.836] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	12.598	ND [0.231] U	NA	3.85	ND [0.239] U	ND [0.409] U	ND [0.761] U

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP029	SUMP029	SUMP029	SUMP030	SUMP030	SUMP034	SUMP034
Sample Number:	SUMP029(0-0.5)	SUMP029(3-5)	SUMP029(3-5)FD	SUMP030(0-0.5)	SUMP030(3-5)	SUMP034(0-0.5)	SUMP034(0-0.5)FD
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	08/08/1998	08/08/1998	08/07/1998	08/07/1998
Depth (ft.):	0.00	3.00	3.00	0.00	3.00	0.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	1.905	0.672	NA	2.017	ND [0.311] U	5.068	ND [1.097] U
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP034	SUMP036	SUMP036	SUMP037	SUMP037	SUMP040	SUMP040
Sample Number:	SUMP034(3-5)	SUMP036(0-0.5)	SUMP036(3-5)	SUMP037(0-0.5)	SUMP037(3-5)	SUMP040(0-0.5)	SUMP040(3-5)
Date Sampled:	08/07/1998	07/30/1998	07/30/1998	08/08/1998	08/08/1998	08/08/1998	08/08/1998
Depth (ft.):	3.00	0.00	3.00	0.00	3.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [2] U	ND [1.8] U	ND [1.9] U	ND [1.9] U	ND [2] U	ND [1.8] U	ND [1.9] U
GAMMA BHC (LINDANE)	ND [2] U	ND [1.8] U	ND [1.9] U	ND [1.9] U	ND [2] U	ND [1.8] U	ND [1.9] U
HEPTACHLOR	ND [2] U	ND [1.8] U	ND [1.9] U	ND [1.9] U	ND [2] U	ND [1.8] U	ND [1.9] U
HEPTACHLOR EPOXIDE	ND [2] U	19	ND [1.9] U	ND [1.9] U	ND [2] U	ND [1.8] U	ND [1.9] U
p,p'-DDD	ND [4] U	ND [3.6] U	ND [3.8] U	ND [3.8] U	ND [4] U	ND [3.7] U	ND [3.8] U
p,p'-DDE	ND [4] U	ND [3.6] U	ND [3.8] U	ND [3.8] U	ND [4] U	ND [3.7] U	ND [3.8] U
p,p'-DDT	ND [4] U	ND [3.6] U	ND [3.8] U	ND [3.8] U	ND [4] U	ND [3.7] U	ND [3.8] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [40] U	ND [35] U	ND [38] U	ND [38] U	ND [40] U	ND [37] U	ND [38] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	2.733	18.312	2.565	28.195	1.248	1.715	8.448
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ND [0.152] U	2.428	ND [0.336] U	2.623	ND [0.157] U	0.869 U	ND [1.817] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.203] U	ND [0.451] U	ND [0.396] U	ND [1.002] U	ND [0.21] U	ND [0.298] U	ND [2.426] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.485] U	ND [0.381] U	ND [0.323] U	ND [0.487] U	ND [0.352] U	ND [0.582] U	ND [5.142] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [0.316] U	1.077	ND [0.257] U	0.488	ND [0.328] U	0.624	ND [2.565] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.271] U	ND [0.285] U	ND [0.242] U	0.593	ND [0.197] U	ND [0.325] U	ND [2.872] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.211] U	ND [0.41] U	ND [0.222] U	ND [0.201] U	ND [0.219] U	ND [0.216] U	ND [1.71] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.321] U	ND [0.299] U	ND [0.254] U	ND [0.323] U	ND [0.234] U	ND [0.386] U	ND [3.411] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.386] U	ND [0.301] U	ND [0.372] U	ND [0.467] U	ND [0.372] U	ND [0.32] U	ND [2.773] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.209] U	ND [0.37] U	ND [0.19] U	0.737	ND [0.266] U	ND [0.284] U	ND [1.961] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.309] U	ND [0.52] U	ND [0.282] U	ND [0.294] U	ND [0.32] U	ND [0.316] U	ND [2.504] U
2,3,7,8-TETRACHLORODIBENZOFURAN	2.418	ND [1.68] U	ND [0.215] U	1.82	ND [0.288] U	1.953	ND [3.243] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	9.667	32.716	6.065	71.198	2.801	2.377	20.445
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.152] U	7.942	ND [0.336] U	2.623	ND [0.157] U	ND [0.224] U	ND [1.817] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	3.1	2.925	ND [0.242] U	6.586	ND [0.197] U	ND [0.325] U	ND [2.872] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.211] U	14.622	0.951	3.595	ND [0.219] U	1.274	ND [1.71] U
OCTACHLORODIBENZO-p-DIOXIN	328.81	411.682	162.28	1553.544	95.612	25.335	338.995
OCTACHLORODIBENZOFURAN	ND [0.446] U	6.947	ND [0.273] U	7.702	ND [0.418] U	0.649	ND [3.852] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.386] U	ND [0.301] U	ND [0.372] U	ND [0.467] U	ND [0.372] U	ND [0.32] U	ND [2.773] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.218] U	5.477	ND [0.183] U	ND [0.355] U	ND [0.278] U	ND [0.297] U	ND [2.048] U

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP034	SUMP036	SUMP036	SUMP037	SUMP037	SUMP040	SUMP040
Sample Number:	SUMP034(3-5)	SUMP036(0-0.5)	SUMP036(3-5)	SUMP037(0-0.5)	SUMP037(3-5)	SUMP040(0-0.5)	SUMP040(3-5)
Date Sampled:	08/07/1998	07/30/1998	07/30/1998	08/08/1998	08/08/1998	08/08/1998	08/08/1998
Depth (ft.):	3.00	0.00	3.00	0.00	3.00	0.00	3.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	4.391	ND [1.68] U	ND [0.215] U	1.82	ND [0.288] U	1.621	ND [3.243] U
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP043	SUMP043	SUMP108	SUMP108	SUMP110	SUMP110	WRSUMP007
Sample Number:	SUMP043(0-0.5)	SUMP043(3-5)	SUMP108(0-0.5)	SUMP108(3-5)	SUMP110(0-0.5)	SUMP110(3-5)	WRSUMP007(0-.5)
Date Sampled:	08/08/1998	08/08/1998	08/11/1998	08/11/1998	08/12/1998	08/12/1998	07/29/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	3.00	0.00
PESTICIDES - UNITS: UG/KG							
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [1.9] U	ND [1.8] U	ND [1.8] U	ND [1.9] U	ND [1.8] U	ND [1.9] U	NA
GAMMA BHC (LINDANE)	ND [1.9] U	ND [1.8] U	ND [1.8] U	ND [1.9] U	ND [1.8] U	ND [1.9] U	NA
HEPTACHLOR	ND [1.9] U	ND [1.8] U	ND [1.8] U	ND [1.9] U	ND [1.8] U	ND [1.9] U	NA
HEPTACHLOR EPOXIDE	ND [1.9] U	ND [1.8] U	ND [1.8] U	ND [1.9] U	ND [1.8] U	ND [1.9] U	NA
p,p'-DDD	ND [3.8] U	ND [3.7] U	ND [3.6] U	ND [3.7] U	ND [3.6] U	ND [3.8] U	NA
p,p'-DDE	ND [3.8] U	ND [3.7] U	ND [3.6] U	ND [3.7] U	7.7	ND [3.8] U	NA
p,p'-DDT	ND [3.8] U	ND [3.7] U	3.4	ND [3.7] U	6.4	ND [3.8] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [38] U	ND [37] U	ND [36] U	ND [37] U	ND [36] U	ND [38] U	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	1158.49	41.681	NA	NA	66.693	2.976	8.51
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	142.996	ND [2.613] U	NA	NA	12.576	ND [0.614] U	0.55
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [42.49] U	ND [3.488] U	NA	NA	ND [1.185] U	ND [0.819] U	ND [0.189] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [5.094] U	ND [3.233] U	NA	NA	ND [1.016] U	ND [1.177] U	ND [0.5] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	58.745	ND [2.577] U	NA	NA	ND [0.837] U	ND [0.613] U	ND [0.317] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	30.644	ND [1.805] U	NA	NA	ND [0.567] U	ND [0.657] U	ND [0.375] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [8.044] U	ND [1.718] U	NA	NA	ND [0.558] U	ND [0.408] U	ND [0.274] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [3.379] U	ND [2.144] U	NA	NA	ND [0.674] U	ND [0.78] U	ND [0.393] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [8.018] U	ND [3.084] U	NA	NA	ND [0.738] U	ND [0.663] U	ND [0.467] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [4.391] U	ND [1.656] U	NA	NA	ND [0.472] U	ND [0.447] U	ND [0.321] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [11.782] U	ND [2.516] U	NA	NA	ND [0.818] U	ND [0.598] U	ND [0.347] U
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [4.673] U	ND [1.988] U	NA	NA	ND [0.806] U	ND [0.694] U	1.514
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	1956.481	48.852	NA	NA	107.386	ND [0.894] U	19.59
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	142.996	ND [2.613] U	NA	NA	12.576	ND [0.614] U	0.55
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	164.387	ND [1.805] U	NA	NA	ND [0.567] U	ND [0.657] U	ND [0.375] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	231.335	ND [1.718] U	NA	NA	17.989	ND [0.408] U	ND [0.274] U
OCTACHLORODIBENZO-p-DIOXIN	13978.165	1914.172	NA	NA	1319.488	474.427	506.466
OCTACHLORODIBENZOFURAN	637.759	20.51	NA	NA	43.736	ND [0.649] U	1.446
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [8.018] U	ND [3.084] U	NA	NA	ND [0.738] U	ND [0.663] U	ND [0.467] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	66.414	ND [1.729] U	NA	NA	ND [0.493] U	ND [0.467] U	ND [0.31] U

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP043	SUMP043	SUMP108	SUMP108	SUMP110	SUMP110	WRSUMP007
Sample Number:	SUMP043(0-0.5)	SUMP043(3-5)	SUMP108(0-0.5)	SUMP108(3-5)	SUMP110(0-0.5)	SUMP110(3-5)	WRSUMP007(0-.5)
Date Sampled:	08/08/1998	08/08/1998	08/11/1998	08/11/1998	08/12/1998	08/12/1998	07/29/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	3.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	33.304	ND [1.988] U	NA	NA	ND [0.806] U	ND [0.694] U	1.449
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP007	WRSUMP007	WRSUMP007	WRSUMP007	WRSUMP008	WRSUMP008
Sample Number:	WRSUMP007(0-.5)FD	WRSUMP007(3-5)	WRSUMP007(3-5)FD	WRSUMP07(0-0.5)	WRSUMP008(0-.5)	WRSUMP008(0-.5)FD
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	3.00	3.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG						
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	NA	ND [2] U	NA	ND [1.7] U	NA	NA
GAMMA BHC (LINDANE)	NA	ND [2] U	NA	ND [1.7] U	NA	NA
HEPTACHLOR	NA	ND [2] U	NA	ND [1.7] U	NA	NA
HEPTACHLOR EPOXIDE	NA	ND [2] U	NA	ND [1.7] U	NA	NA
p,p'-DDD	NA	ND [3.9] U	NA	ND [3.4] U	NA	NA
p,p'-DDE	NA	ND [3.9] U	NA	ND [3.4] U	NA	NA
p,p'-DDT	NA	ND [3.9] U	NA	ND [3.4] U	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	NA	ND [39] U	NA	ND [34] U	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	1.822	NA	NA	167.14 J	202.962 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	ND [0.258] U	NA	NA	26.1	35.878 J
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.303] U	NA	NA	ND [5.603] U	1.25 J
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.541] U	NA	NA	ND [0.272] U	3.365 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.407] U	NA	NA	4.187 J	6.951 J
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.406] U	NA	NA	5.676	9.714 J
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.352] U	NA	NA	ND [1.522] UJ	ND [0.576] UJ
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.426] U	NA	NA	6.272	8.418 J
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.633] U	NA	NA	ND [0.636] U	1.209 J
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.389] U	NA	NA	ND [0.88] UJ	7.399 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.446] U	NA	NA	ND [2.229] UJ	ND [0.648] UJ
2,3,7,8-TETRACHLORODIBENZOFURAN	1.451	2.022	2	NA	1.826 J	9.609 J
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.524] U	NA	NA	329.774	402.708
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.258] U	NA	NA	26.1	37.128
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.406] U	NA	NA	56.181	88.883
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.352] U	NA	NA	41.606	53.744
OCTACHLORODIBENZO-p-DIOXIN	NA	248.542	NA	NA	1654.719 J	2134.677 J
OCTACHLORODIBENZOFURAN	NA	ND [0.748] U	NA	NA	51.863	73.164 J
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.633] U	NA	NA	ND [0.636] U	ND [0.422] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.376] U	NA	NA	ND [0.919] U	34.321

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP007	WRSUMP007	WRSUMP007	WRSUMP007	WRSUMP008	WRSUMP008
Sample Number:	WRSUMP007(0-.5)FD	WRSUMP007(3-5)	WRSUMP007(3-5)FD	WRSUMP07(0-0.5)	WRSUMP008(0-.5)	WRSUMP008(0-.5)FD
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	3.00	3.00	0.00	0.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	2.03	NA	NA	1.826	28.474
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP008	WRSUMP008	WRSUMP008	WRSUMP010	WRSUMP010	WRSUMP010
Sample Number:	WRSUMP08(0-0.5)	WRSUMP008(3-5)	WRSUMP008(3-5)FD	WRSUMP010(0-.5)	WRSUMP10(0-0.5)	WRSUMP010(3-5)
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	08/05/1998	08/05/1998	08/05/1998
Depth (ft.):	0.00	3.00	3.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG						
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [1.8] U	ND [2.1] U	NA	NA	ND [1.8] U	ND [2.1] U
GAMMA BHC (LINDANE)	ND [1.8] U	ND [2.1] U	NA	NA	ND [1.8] U	ND [2.1] U
HEPTACHLOR	ND [1.8] U	ND [2.1] U	NA	NA	ND [1.8] U	ND [2.1] U
HEPTACHLOR EPOXIDE	ND [1.8] U	ND [2.1] U	NA	NA	ND [1.8] U	ND [2.1] U
p,p'-DDD	ND [3.6] U	28	NA	NA	ND [3.6] U	ND [4.1] U
p,p'-DDE	ND [3.6] U	4.7	NA	NA	ND [3.6] U	ND [4.1] U
p,p'-DDT	ND [3.6] U	ND [4.2] U	NA	NA	ND [3.6] U	ND [4.1] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	ND [37] U	ND [42] U	NA	NA	ND [36] U	ND [41] U
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	5.98	NA	45.383 J	NA	3.489
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	1.292	NA	4.596	NA	ND [0.169] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.112] U	NA	ND [1.303] U	NA	ND [0.242] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.147] U	NA	ND [0.423] U	NA	ND [0.521] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	0.372	NA	ND [0.377] U	NA	ND [0.306] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.137] U	NA	1.766	NA	ND [0.303] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.105] U	NA	6.676	NA	ND [0.208] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.131] U	NA	ND [0.283] U	NA	ND [0.349] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.178] U	NA	ND [0.34] U	NA	ND [0.375] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.121] U	NA	15.63	NA	ND [0.276] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.118] U	NA	ND [0.346] U	NA	ND [0.281] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	0.379	0.285	5.073	NA	2.331
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	12.649	NA	114.417	NA	3.489
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	1.292	NA	4.596	NA	0.642
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	1.704	NA	17.318	NA	ND [0.303] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	1.67	NA	18.653	NA	ND [0.208] U
OCTACHLORODIBENZO-p-DIOXIN	NA	142.733	NA	1360.688 J	NA	258.771
OCTACHLORODIBENZOFURAN	NA	3.42	NA	6.91	NA	0.973 J
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.178] U	NA	ND [0.34] U	NA	ND [0.375] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.691	NA	93.038	NA	ND [0.275] U

0027891

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP008	WRSUMP008	WRSUMP008	WRSUMP010	WRSUMP010	WRSUMP010
Sample Number:	WRSUMP08(0-0.5)	WRSUMP008(3-5)	WRSUMP008(3-5)FD	WRSUMP010(0-.5)	WRSUMP10(0-0.5)	WRSUMP010(3-5)
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	08/05/1998	08/05/1998	08/05/1998
Depth (ft.):	0.00	3.00	3.00	0.00	0.00	3.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.904	NA	16.629	NA	2.331
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

000172

027892

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP015	WRSUMP015	WRSUMP015	WRSUMP015	WRSUMP016	WRSUMP016
Sample Number:	WRSUMP015(0-.5)	WRSUMP15(0-0.5)	WRSUMP015(3-5)	WRSUMP015(3-5)FD	WRSUMP016(0-.5)	WRSUMP016(0-.5)FD
Date Sampled:	08/11/1998	08/11/1998	08/11/1998	08/11/1998	08/11/1998	08/11/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	0.00
PESTICIDES - UNITS: UG/KG						
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	NA	ND [1.9] U	ND [1.9] U	NA	NA	NA
GAMMA BHC (LINDANE)	NA	ND [1.9] U	ND [1.9] U	NA	NA	NA
HEPTACHLOR	NA	ND [1.9] U	ND [1.9] U	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	ND [1.9] U	ND [1.9] U	NA	NA	NA
p,p'-DDD	NA	ND [3.9] U	ND [3.9] U	NA	NA	NA
p,p'-DDE	NA	ND [3.9] U	ND [3.9] U	NA	NA	NA
p,p'-DDT	NA	ND [3.9] U	ND [3.9] U	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	NA	ND [39] U	ND [39] U	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	50.774	NA	4.87	114.306	68.119	63.287
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	3.529	NA	ND [0.249] U	3.488	6.913	8.315
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.44] U	NA	ND [0.333] U	ND [0.407] U	ND [0.978] U	ND [0.571] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.546] U	NA	ND [0.469] U	ND [0.574] U	ND [0.424] U	ND [0.502] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.892	NA	ND [0.496] U	ND [0.313] U	1.291	1.661
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.086	NA	ND [0.262] U	ND [0.321] U	2.888	2.323
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.347] U	NA	ND [0.33] U	ND [0.209] U	ND [0.318] U	ND [0.182] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.983	NA	ND [0.311] U	2.345	3.13	4.556
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.366] U	NA	ND [0.306] U	ND [0.506] U	ND [0.297] U	1.041
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.266] U	NA	ND [0.21] U	ND [0.27] U	ND [0.392] U	ND [0.283] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.509] U	NA	ND [0.484] U	ND [0.306] U	ND [0.466] U	ND [0.266] U
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.314] U	NA	ND [0.358] U	ND [1.023] U	ND [0.669] U	ND [0.426] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	93.777	NA	9.552	214.064	128.774	121.556
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	3.529	NA	ND [0.249] U	3.488	6.913	8.315
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	4.624	NA	ND [0.262] U	6.119	26.181	28.949
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	2.965	NA	ND [0.33] U	1.317	7.66	5.064
OCTACHLORODIBENZO-p-DIOXIN	2365.526	NA	224.073	3804.85	1138.3	1072.068
OCTACHLORODIBENZOFURAN	8.123	NA	ND [0.776] U	20.511	15.102	15.886
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.366] U	NA	ND [0.306] U	ND [0.506] U	ND [0.297] U	1.041
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	0.442	NA	ND [0.22] U	0.952	ND [0.409] U	2.552

027893

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP015	WRSUMP015	WRSUMP015	WRSUMP015	WRSUMP016	WRSUMP016
Sample Number:	WRSUMP015(0-.5)	WRSUMP15(0-0.5)	WRSUMP015(3-5)	WRSUMP015(3-5)FD	WRSUMP016(0-.5)	WRSUMP016(0-.5)FD
Date Sampled:	08/11/1998	08/11/1998	08/11/1998	08/11/1998	08/11/1998	08/11/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.314] U	NA	ND [0.358] U	ND [1.023] U	ND [0.669] U	ND [0.426] U
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

0027894
0027894

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP016	WRSUMP016	WRSUMP019	WRSUMP019	WRSUMP019	WRSUMP019
Sample Number:	WRSUMP16(0-0.5)	WRSUMP016(3-5)	WRSUMP019(0-.5)	WRSUMP019(3-5)	WRSUMP019(3-5)	WRSUMP19(0-0.5)
Date Sampled:	08/11/1998	08/11/1998	08/12/1998	08/12/1998	08/13/1998	08/13/1998
Depth (ft.):	0.00	3.00	0.00	3.00	3.00	0.00
PESTICIDES - UNITS: UG/KG						
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	ND [1.8] UJ	ND [2] U	NA	NA	ND [1.9] U	ND [1.9] U
GAMMA BHC (LINDANE)	ND [1.8] UJ	ND [2] U	NA	NA	ND [1.9] U	ND [1.9] U
HEPTACHLOR	ND [1.8] UJ	ND [2] U	NA	NA	ND [1.9] U	ND [1.9] U
HEPTACHLOR EPOXIDE	ND [1.8] UJ	ND [2] U	NA	NA	ND [1.9] U	ND [1.9] U
p,p'-DDD	ND [3.6] UJ	ND [4] U	NA	NA	ND [3.8] U	ND [3.7] U
p,p'-DDE	ND [3.6] UJ	ND [4] U	NA	NA	ND [3.8] U	30
p,p'-DDT	ND [3.6] UJ	ND [4] U	NA	NA	ND [3.8] U	12
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	ND [36] U	ND [40] U	NA	NA	ND [38] U	ND [38] U
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	3.92	23.021	0.945	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	0.328	4.267	ND [0.111] U	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.216] U	ND [0.218] U	ND [0.148] U	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.425] U	ND [0.346] U	ND [0.365] U	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.359] U	0.897	ND [0.202] U	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.237] U	0.785	ND [0.204] U	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.239] U	ND [0.179] U	ND [0.135] U	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.282] U	0.754	ND [0.242] U	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.316] U	ND [0.251] U	ND [0.22] U	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.176] U	ND [0.205] U	ND [0.136] U	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.35] U	ND [0.263] U	ND [0.198] U	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	ND [0.293] UJ	ND [0.216] U	ND [0.32] U	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	7.917	41.298	2.478	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.638	4.267	ND [0.111] U	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.237] U	1.539	ND [0.204] U	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.239] U	4.396	ND [0.135] U	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	333.89	357.467	63.714	NA	NA
OCTACHLORODIBENZOFURAN	NA	1.098	17.475	ND [0.169] U	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.316] U	ND [0.251] U	ND [0.22] U	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.183] U	2.667	ND [0.142] U	NA	NA

027895

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP016	WRSUMP016	WRSUMP019	WRSUMP019	WRSUMP019	WRSUMP019
Sample Number:	WRSUMP16(0-0.5)	WRSUMP016(3-5)	WRSUMP019(0-.5)	WRSUMP019(3-5)	WRSUMP019(3-5)	WRSUMP19(0-0.5)
Date Sampled:	08/11/1998	08/11/1998	08/12/1998	08/12/1998	08/13/1998	08/13/1998
Depth (ft.):	0.00	3.00	0.00	3.00	3.00	0.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.293] U	ND [0.216] U	ND [0.32] U	NA	NA
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

027896

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP021	WRSUMP021	WRSUMP021	WRSUMP021	WRSUMP021
Sample Number:	WRSUMP021(0-.5)	WRSUMP021(0-.5)FD	WRSUMP21(0-0.5)	WRSUMP021(3-5)	WRSUMP021(3-5)FD
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	0.00	0.00	3.00	3.00
PESTICIDES - UNITS: UG/KG					
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	NA	NA	ND [1.8] U	ND [1.9] U	NA
GAMMA BHC (LINDANE)	NA	NA	ND [1.8] U	ND [1.9] U	NA
HEPTACHLOR	NA	NA	ND [1.8] U	ND [1.9] U	NA
HEPTACHLOR EPOXIDE	NA	NA	ND [1.8] U	ND [1.9] U	NA
p,p'-DDD	NA	NA	ND [3.7] U	ND [3.7] U	NA
p,p'-DDE	NA	NA	ND [3.7] U	ND [3.7] U	NA
p,p'-DDT	NA	NA	ND [3.7] U	ND [3.7] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG					
PCB-1254 (AROCHLOR 1254)	NA	NA	ND [37] U	ND [38] U	NA
DIOXINS AND FURANS - UNITS: NG/KG					
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	11.688	NA	NA	9.634	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	2.999	NA	NA	1.024	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.16] U	NA	NA	ND [0.231] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.214] U	NA	NA	ND [0.158] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.351	NA	NA	0.303	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.488	NA	NA	0.419	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.187] U	NA	NA	ND [0.113] U	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.19] U	NA	NA	0.661	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.224] U	NA	NA	ND [0.195] U	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.147] U	NA	NA	ND [0.086] U	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.21] U	NA	NA	ND [0.127] U	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.153] U	0.481	NA	0.388	0.395
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	22.591	NA	NA	26.156	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	2.999	NA	NA	2.524	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	2.294	NA	NA	6.028	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	4.417	NA	NA	0.93	NA
OCTACHLORODIBENZO-p-DIOXIN	181.597	NA	NA	365.205	NA
OCTACHLORODIBENZOFURAN	5.112	NA	NA	1.471	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.224] U	NA	NA	ND [0.195] U	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	0.961	NA	NA	ND [0.088] U	NA

027897

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP021	WRSUMP021	WRSUMP021	WRSUMP021	WRSUMP021
Sample Number:	WRSUMP021(0-.5)	WRSUMP021(0-.5)FD	WRSUMP21(0-0.5)	WRSUMP021(3-5)	WRSUMP021(3-5)FD
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	0.00	0.00	3.00	3.00
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	0.279	NA	NA	ND [0.134] U	NA
EXPLOSIVES - UNITS: UG/KG					
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA

027898

027898

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-DL27-01	LH-DL29-01	LH-S01-01	LH-S01-01	LH-S01-01	LH-S01-02	LH-S01-02	LH-S01-02	LH-S017-01	LH-S017-01
Sample Number	LH-DL27-01	LH-DL29-01	LH-S01-01_1	LH-S01-01_2	LH-S01-01_3	LH-S01-02_1	LH-S01-02_2	LH-S01-02_3	LH-S017-01_1	LH-S017-01_2
Date Sampled	06/24/1993	06/25/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	08/08/1993	08/08/1993
Depth (ft.)	1.50	2.00	0.50	5.70	7.90	0.50	5.00	14.40	0.50	2.50
METALS - UNITS										
ALUMINUM	15300000	30700000	17200000	8970000	10000000	31400000	6210000	12100000	1240000	1060000
ANTIMONY	ND [3000] U	ND [3000] U	5600	3000	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [5000] U	ND [5000] U
ARSENIC	ND [1000] U	4600	3000	2800	1100	2400	1500	3200	500	600
BARIUM	1330000	58000	63600	92800	123000	106000	69900	55300	29900	38500
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	3/3/1900 8	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1230000	853000	1890000	857000	2110000	836000	810000	895000	115000	292000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	13200	23500	14400	27300	15800	24500	7300	20700	ND [1000] U	ND [1000] U
COBALT	12500	3990	5100	14200	12000	7100	6700	7000	ND [2000] U	ND [2000] U
COPPER	4440	4040	5700	9300	11500	8000	6200	7400	ND [1000] U	1300
IRON	12600000	29300000	21700000	27500000	10500000	18000000	10700000	17800000	16500000	2150000
LEAD	6900	6700	9900	8000	13300	13600	5800	10500	1700	1900
MAGNESIUM	1510000	1410000	1080000	1380000	3010000	2140000	1200000	4870000	48700	88400
MANGANESE	111000	29900	37200	89900	242000	53000	57500	234000	87400	25000
MERCURY	170	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	898000	1780000	649000	692000	913000	1480000	497000	1430000	127000	ND [100000] U
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [500] U	ND [500] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	48100	12500	21000	23600	55300	25400	20100	54600	3500	2900
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	42700	31500	44200	44500	57700	38200	29600	89100	ND [3000] U	8100

0027899

0027899

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S017-02	LH-S017-02	LH-S018-01	LH-S018-01	LH-S018-01	LH-S02-01	LH-S02-01	LH-S02-02	LH-S02-02	LH-S021-01
Sample Number	LH-S017-02_1	LH-S017-02_2	LH-S018-01_1	LH-S018-01_2	LH-S018-01_3	LH-S02-01_1	LH-S02-01_2	LH-S02-02_1	LH-S02-02_2	LH-S021-01_1
Date Sampled	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	08/06/1993
Depth (ft.)	0.50	2.50	0.50	1.10	5.00	0.50	4.00	0.50	4.00	1.00
METALS - UNITS										
ALUMINUM	1710000	1740000	7220000	10100000	7950000	9450000	36100	54600	13700000	1190000
ANTIMONY	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	5100	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	1000	1140	3310	2800	2900	5300	1900	1700	4700	ND [1000] U
BARIUM	68400	64000	55300	45800	24200	1960000	1400000	1750000	1580000	61800
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	252000	177000	589000	893000	507000	895000	1050000	1020000	787000	181000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	7000	ND [1000] U	18900	14300	7000	22100	10700	11400	14300	2100
COBALT	ND [2000] U	ND [2000] U	ND [2000] U	ND [2000] U	ND [2000] U	7000	6400	6300	5700	1000
COPPER	1500	1900	3000	3400	2600	7400	4700	4000	5600	1900
IRON	3060000	3120000	17800000	18900000	12000000	47200000	13500000	12100000	40800000	1310000
LEAD	2300	1500	8000	2300	6400	20100	7100	7100	7300	1800
MAGNESIUM	90500	71500	598000	674000	570000	558000	717000	452000	676000	96500
MANGANESE	97400	102000	152000	65400	15100	242000	79100	141000	106000	13800
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	113000	110000	221000	288000	147000	522000	555000	453000	615000	98000
SELENIUM	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	3700	3400	9200	12700	11600	84200	8360000	7130000	30900	9000
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	14300	44800	15600	22300	16100	101000	21100	15800	23600	3800

0027900

0027900

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S021-01	LH-S021-02	LH-S021-02	LH-S021-02	LH-S025-01	LH-S025-01	LH-S025-02	LH-S025-02	LH-S025-02
Sample Number	LH-S021-01_2	LH-S021-02_1	LH-S021-02_2	LH-S021-02_3	LH-S025-01_1	LH-S025-01_2	LH-S025-02_1	LH-S025-02_2	LH-S025-02_3
Date Sampled	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993
Depth (ft.)	3.50	0.50	2.00	3.40	0.50	5.00	0.50	1.50	3.50
METALS - UNITS									
ALUMINUM	1510000	2070000	1950000	1700000	3460000	12700000	19400000	20900000	18700000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	4500	3400	1600	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	4900	2700	9300	7200	4100
BARIUM	61500	79000	69800	48400	182000	228000	159000	134000	66900
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	203000	218000	242000	170000	472000	1840000	2070000	1390000	1140000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	3900	33500	11300	4800	108000	14100	30100	35200	17700
COBALT	1000	ND [1000] U	ND [1000] U	ND [1000] U	1400	7100	7200	6600	4800
COPPER	2500	6700	7300	6500	6700	3800	8400	8300	5300
IRON	1900000	1540000	2030000	1380000	10400000	13200000	32400000	120000000	17200000
LEAD	1900	17700	9900	3000	210000	10600	13200	13700	9300
MAGNESIUM	113000	94400	129000	116000	175000	1400000	1770000	1430000	1490000
MANGANESE	10900	8600	13900	11300	199000	145000	195000	272000	136000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	119000	58200	126000	127000	171000	621000	1540000	1650000	867000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	16700	5500	7300	5200	3600	33800	46600	38100	26700
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	5000	46200	36700	24300	88600	22000	130000	1770000	29700

0027901

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S026-01	LH-S026-01	LH-S026-02	LH-S026-02	LH-S026-02	LH-S03-01	LH-S03-01	LH-S03-02	LH-S03-02	LH-S04-01
Sample Number	LH-S026-01_1	LH-S026-01_2	LH-S026-02_1	LH-S026-02_2	LH-S026-02_3	LH-S03-01_1	LH-S03-01_2	LH-S03-02_1	LH-S03-02_2	LH-S04-01_1
Date Sampled	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	07/10/1993	07/10/1993	07/10/1993	07/10/1993	07/09/1993
Depth (ft.)	0.50	3.50	0.50	1.00	3.50	0.00	4.00	0.00	4.00	0.00
METALS - UNITS										
ALUMINUM	8410000	8500000	2300000	2360000	2390000	9930000	9130000	5030000	14100000	4240000
ANTIMONY	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	3100	2300	4800	3500	3100	1800	1600	1900	1600	ND [2200] U
BARIUM	230000	26900	62600	37900	51800	774000	165000	1620000	304000	ND [46500] U
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1400] U
CALCIUM	1350000	530000	1660000	1730000	908000	2060000	1580000	558000	483000	622000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	123000	7600	80000	ND [1000] U	18800	18200	15400	28500	14700	ND [12500] U
COBALT	5000	ND [2000] U	ND [2000] U	ND [2000] U	ND [2000] U	9300	8300	3300	4500	4100
COPPER	14800	3000	4700	1600	2200	3700	2800	1800	3400	2400
IRON	10900000	10300000	4730000	3070000	3920000	25300000	20900000	24100000	17800000	11400000
LEAD	61000	370000	380000	950000	27000	13000	10700	6800	6500	8600
MAGNESIUM	235000	638000	298000	293000	303000	1220000	1200000	265000	955000	140000
MANGANESE	185000	15200	246000	62500	55700	226000	120000	54900	28900	206000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	ND [100000] U	269000	ND [100000] U	ND [100000] U	ND [100000] U	598000	467000	247000	557000	187000
SELENIUM	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	9000	12900	8300	ND [10000] U	10500	98400	32400	50700	17300	ND [1000] U
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	98600	18800	29300	12200	10300	48600	34000	35000	22700	11900

027902

027902

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S04-01	LH-S04-02	LH-S04-02	LH-S05-01	LH-S05-01	LH-S05-02	LH-S05-02	LH-S06-01	LH-S06-01	LH-S06-01
Sample Number	LH-S04-01_2	LH-S04-02_1	LH-S04-02_2	LH-S05-01_1	LH-S05-01_2	LH-S05-02_1	LH-S05-02_2	LH-S06-01_1	LH-S06-01_2	LH-S06-01_3
Date Sampled	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993
Depth (ft.)	4.00	0.00	4.00	0.00	3.00	0.00	3.00	0.00	4.00	10.00
METALS - UNITS										
ALUMINUM	3160000	7060000	6770000	5060000	19300000	10100000	4600000	10500000	14400000	9840000
ANTIMONY	ND [3000] U	3200	ND [3000] U	4200	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	ND [1200] U	ND [2500] U	ND [1800] U	ND [1900] U	ND [1200] U	ND [1600] U	ND [1000] U	ND [4700] U	ND [1500] U	ND [1000] U
BARIUM	ND [57600] U	ND [71200] U	ND [76300] U	ND [75900] U	ND [78300] U	ND [176000] U	ND [43700] U	ND [51000] U	ND [126000] U	ND [175000] U
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	449000	1590000	1270000	462000	997000	1390000	410000	944000	1130000	1750000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	ND [9700] U	ND [13400] U	ND [13600] U	ND [9400] U	ND [19000] U	ND [13300] U	ND [6800] U	ND [20800] U	ND [13200] U	ND [12900] U
COBALT	1900	3200	2600	5000	5000	5700	1400	5100	9400	15700
COPPER	1700	2800	4000	3300	5100	4600	2000	4400	5100	6700
IRON	5890000	14200000	16400000	104000000	20200000	18100000	6990000	40700000	14900000	8670000
LEAD	7200	32900	14200	11900	8100	21300	7800	10200	1/4/1901 8	8900
MAGNESIUM	141000	355000	334000	139000	909000	753000	224000	429000	897000	2080000
MANGANESE	89600	121000	77700	89100	167000	133000	57200	209000	262000	1560000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	183000	292000	322000	213000	1140000	583000	284000	350000	612000	762000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [1000] U	11800	4900	ND [1000] U	4400	6600	ND [1000] U	ND [1000] U	3400	27800
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	11400	15500	17300	24500	25700	51500	11600	33000	22400	30600

0027903

0027903

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S06-02	LH-S06-02	LH-S06-02	LH-S07-01	LH-S07-01	LH-S07-01	LH-S07-02	LH-S07-02	LH-S07-02	LH-S08-01
Sample Number	LH-S06-02_1	LH-S06-02_2	LH-S06-02_3	LH-S07-01_1	LH-S07-01_2	LH-S07-01_3	LH-S07-02_1	LH-S07-02_2	LH-S07-02_3	LH-S08-01_1
Date Sampled	07/09/1993	07/09/1993	07/09/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	07/09/1993	07/12/1993
Depth (ft.)	0.00	3.00	10.00	0.50	2.50	9.00	0.00	2.00	9.00	0.00
METALS - UNITS										
ALUMINUM	13400000	9660000	11400000	13500000	27900000	24500000	8190000	8240000	9420000	6100000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	5040	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	ND [1900] U	ND [1400] U	ND [1000] U	5400	3200	3100	14700	5100	ND [1000] U	2000
BARIUM	ND [81300] U	ND [101000] U	ND [190000] U	61700	242000	114000	34200	30400	ND [290000] U	66300
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	2340	ND [1000] U	3/5/1900 10	4/24/1900 10	2/28/1900 2	ND [1000] U	ND [1000] U
CALCIUM	2030000	812000	1920000	1970000	940000	1260000	657000	435000	1570000	1510000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	ND [19800] U	ND [12400] U	ND [15200] U	16200	22000	18800	22000	24500	ND [10500] U	9700
COBALT	8000	9000	71300	3690	8610	12600	2260	1740	38400	5000
COPPER	3800	3700	8100	7450	9310	6750	6540	5660	4900	2400
IRON	20600000	11600000	11900000	34400000	23200000	20600000	41200000	27300000	8980000	11700000
LEAD	5200	9600	9800	5000	4200	6900	6000	5000	10900	7500
MAGNESIUM	958000	714000	2910000	688000	1670000	1470000	247000	261000	1960000	404000
MANGANESE	202000	312000	1470000	206000	486000	434000	81000	43400	1310000	189000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	564000	382000	1100000	672000	1310000	1330000	302000	315000	658000	253000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	1030	ND [1000] U	ND [1000] U	1100	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	14000	9900	39900	18900	20800	17100	7610	5710	31100	10300
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	23900	15400	45300	24900	35700	31700	19800	10700	21500	16100

0027904

027904

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S08-01	LH-S08-02	LH-S08-02	LH-S09-01	LH-S09-01	LH-S09-01	LH-S09-02	LH-S09-02	LH-S09-02	LH-S10-01
Sample Number	LH-S08-01_2	LH-S08-02_1	LH-S08-02_2	LH-S09-01_1	LH-S09-01_2	LH-S09-01_3	LH-S09-02_1	LH-S09-02_2	LH-S09-02_3	LH-S10-01_1
Date Sampled	07/12/1993	07/12/1993	07/12/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.)	4.00	0.00	4.00	0.50	5.00	6.50	0.50	5.00	7.00	0.50
METALS - UNITS										
ALUMINUM	11800000	5310000	9500000	6920000	9860000	8050000	10400000	19800000	6320000	7990000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [5200] U	ND [5740] U	ND [6120] U	ND [9220] U	ND [6340] U	ND [5000] U	3400
ARSENIC	1700	9200	2400	3740	3240	2570	697	2190	ND [500] U	2900
BARIUM	77500	53400	57900	ND [100000] U	ND [27800] U	ND [272000] U	ND [68200] U	ND [104000] U	ND [45800] U	109000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	4160	4590	4500	2490	6020	ND [1250] U	ND [1000] U
CALCIUM	2130000	745000	918000	1370000	1490000	1320000	1380000	3170000	1050000	1050000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	15000	18800	14800	12200	10100	10800	10800	16300	7300	12900
COBALT	9500	4100	8800	3090	8150	8140	4560	8080	9180	7900
COPPER	5500	2300	3900	ND [4890] U	ND [8290] U	ND [9730] U	ND [7840] U	ND [8940] U	ND [4380] U	5600
IRON	18200000	22500000	21200000	18200000	19000000	17300000	9220000	22200000	4280000	16500000
LEAD	11500	8000	11400	14000	19500	18600	19500	27900	10600	7600
MAGNESIUM	1010000	264000	858000	753000	1530000	943000	491000	1510000	1100000	1020000
MANGANESE	71100	196000	107000	130000	91400	66200	67300	138000	12600	157000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [53] U	ND [56] U	ND [53] U	ND [52] U	ND [57] U	ND [50] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	505000	216000	363000	332000	334000	390000	618000	1370000	287000	643000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [520] U	ND [574] U	ND [612] U	ND [922] U	ND [634] U	ND [500] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [26] U	ND [29] U	ND [31] U	ND [46] U	ND [32] U	ND [25] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	20400	5600	14400	ND [8870] U	ND [22500] U	ND [57100] U	ND [10900] U	ND [42500] U	ND [20900] U	16200
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	25700	22300	21900	32100	49600	21700	20900	39800	16800	24900

0001795

027905

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S10-01	LH-S10-02	LH-S10-02	LH-S107-01	LH-S107-01	LH-S107-01	LH-S108-01	LH-S108-01	LH-S108-01	LH-S109-01
Sample Number	LH-S10-01_2	LH-S10-02_2	LH-S10-02_1	LH-S107-01_1	LH-S107-01_2	LH-S107-01_3	LH-S108-01_1	LH-S108-01_2	LH-S108-01_3	LH-S109-01_1
Date Sampled	06/26/1993	06/26/1993	07/11/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.)	8.50	9.00	0.00	0.50	1.00	2.00	0.50	2.00	4.00	0.50
METALS - UNITS										
ALUMINUM	8010000	6970000	10200000	15000000	11100000	4700000	4030000	5540000	16800000	7180000
ANTIMONY	5800	ND [4580] U	3400	ND [3200] U	ND [5560] U	ND [3620] U	ND [5260] U	ND [3800] U	ND [4560] U	ND [4640] U
ARSENIC	1100	ND [458] U	3400	1300	2420	1430	2450	1750	4260	719
BARIUM	86800	ND [43200] U	79400	ND [91600] U	ND [62500] U	ND [34200] U	ND [29700] U	ND [28900] U	ND [52200] U	ND [105000] U
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [2200] U	ND [1000] U	ND [5060] U	ND [4840] U	ND [2640] U	ND [3730] U	ND [2700] U	ND [6220] U	ND [2900] U
CALCIUM	915000	1170000	1370000	2250000	1690000	650000	478000	522000	678000	2010000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	11000	10900	27900	17500	16700	10800	11600	13800	15200	9740
COBALT	15500	3920	9300	3820	3610	1540	1870	1900	4400	3180
COPPER	6500	ND [6320] U	87400	ND [4750] U	ND [3530] U	ND [3260] U	ND [3920] U	ND [2170] U	ND [3350] U	ND [2390] U
IRON	12900000	8820000	39100000	17000000	17200000	7670000	11000000	8780000	22000000	9110000
LEAD	4800	8700	8800	25600	21400	11600	10200	11500	26400	18500
MAGNESIUM	1310000	1210000	594000	1200000	611000	287000	340000	343000	863000	1750000
MANGANESE	301000	66200	222000	40000	77300	27700	32900	16900	13000	14000
MERCURY	ND [100] U	ND [55] U	ND [100] U	ND [54] U	ND [59] U	ND [49] U	ND [49] U	ND [47] U	ND [54] U	ND [58] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	510000	343000	519000	318000	326000	224000	251000	276000	515000	189000
SELENIUM	ND [1000] U	ND [458] U	ND [1000] U	ND [320] U	ND [556] U	724	ND [526] U	ND [380] U	ND [456] U	ND [464] U
SILVER	ND [1000] U	ND [23] U	ND [1000] U	ND [21] U	ND [28] U	ND [20] U	ND [26] U	ND [27] U	ND [23] U	ND [23] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	18600	ND [19100] U	9500	ND [17800] U	ND [10600] U	ND [4830] U	ND [5730] U	ND [7330] U	ND [13700] U	ND [44300] U
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	28500	24900	18700	21900	17300	23400	13300	10000	21000	22700

000196

027906

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S109-01	LH-S11-01	LH-S11-01	LH-S11-02	LH-S11-02	LH-S110-01	LH-S110-01	LH-S12-01	LH-S12-01	LH-S12-02
Sample Number	LH-S109-01_2	LH-S11-01_1	LH-S11-01_2	LH-S11-02_1	LH-S11-02_2	LH-S110-01_1	LH-S110-01_2	LH-S12-01_1	LH-S12-01_2	LH-S12-02_1
Date Sampled	06/26/1993	06/25/1993	06/25/1993	06/26/1993	07/10/1993	08/04/1993	08/04/1993	07/11/1993	07/11/1993	07/11/1993
Depth (ft.)	2.00	0.00	10.00	0.50	10.00	0.50	3.00	0.00	9.00	0.00
METALS - UNITS										
ALUMINUM	6380000	34900000	12300000	8760000	7880000	11200000	9060000	8080000	19000000	20800000
ANTIMONY	ND [3260] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	1580	4500	1400	2100	1400	3700	2900	1400	1000	4800
BARIUM	ND [92500] U	128000	69200	55600	129000	44000	29000	173000	236000	124000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [3290] U	2200	1160	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1510000	4170000	989000	5450000	1030000	484000	667000	490000	1660000	1810000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	14300	28200	12000	11800	11600	16000	10000	8300	25500	34000
COBALT	3810	7460	6190	5600	7700	2000	ND [1000] U	3400	7900	9600
COPPER	ND [815] U	9240	6160	4900	6100	2000	3000	2100	7800	2600
IRON	12300000	27900000	11300000	12900000	16600000	13500000	9200000	8260000	31800000	39800000
LEAD	16900	7800	3900	5100	7800	3100	49900	5400	7200	11900
MAGNESIUM	1500000	2890000	1220000	577000	1480000	435000	304000	435000	2800000	1260000
MANGANESE	21500	190000	47500	92600	245000	27000	15000	64100	145000	255000
MERCURY	ND [58] U	200	170	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	181000	2490000	836000	623000	558000	483000	456000	538000	1050000	988000
SELENIUM	ND [326] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [16] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [36500] U	37500	20300	13600	20900	8000	10000	159000	39300	24000
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	24300	51000	29500	17800	33700	13000	9000	13100	58100	31600

027907

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S12-02	LH-S13-01	LH-S13-01	LH-S13-02	LH-S13-02	LH-S14-01	LH-S14-01	LH-S14-02	LH-S14-02	LH-S15-01
Sample Number	**LH-S12-02_2**	**LH-S13-01_1**	**LH-S13-01_2**	**LH-S13-02_1**	**LH-S13-02_2**	**LH-S14-01_1**	**LH-S14-01_2**	**LH-S14-02_1**	**LH-S14-02_2**	**LH-S15-01_1**
Date Sampled	**07/11/1993**	**07/10/1993**	**07/10/1993**	**07/10/1993**	**07/10/1993**	**07/08/1993**	**07/08/1993**	**07/08/1993**	**07/08/1993**	**07/08/1993**
Depth (ft.)	**9.00**	**0.00**	**8.00**	**0.00**	**8.00**	**0.50**	**3.20**	**0.50**	**3.50**	**0.50**
METALS - UNITS										
ALUMINUM	9800000	8010000	9560000	8260000	10600000	1080000	15100000	3730000	8400000	3890000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	6300	6100	5900
ARSENIC	1700	3700	1600	1900	1300	ND [1000] U	2000	5400	2400	3700
BARIUM	47400	68600	171000	90400	99400	15000	106000	19600	82300	454000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1520000	982000	1760000	1250000	1030000	158000	1670000	508000	1740000	389000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	14700	17400	12500	12000	12300	1600	13700	84500	8700	18800
COBALT	37900	6600	27900	10800	9900	ND [1000] U	7400	1100	3700	ND [1000] U
COPPER	7000	2700	9400	2600	3600	1400	8700	6700	6000	5400
IRON	24000000	20700000	18000000	13500000	13200000	1870000	22400000	47000000	13000000	19500000
LEAD	10700	16000	12100	13700	8100	1500	7700	7700	11500	11200
MAGNESIUM	1990000	451000	1920000	505000	1080000	60900	1610000	58000	654000	585000
MANGANESE	228000	191000	299000	431000	76700	94900	63800	18900	41700	8600
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	550000	354000	654000	413000	479000	83400	989000	105000	412000	150000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	29600	8600	32300	10000	16700	1400	29400	4500	19500	5200
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	49300	33500	50900	18200	28100	46600	41900	8800	20900	16500

000135

027908

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S15-01	LH-S15-02	LH-S15-02	LH-S16-01	LH-S16-01	LH-S16-01	LH-S19-01	LH-S19-01	LH-S19-01	LH-S19-02
Sample Number	LH-S15-01_2	LH-S15-02_1	LH-S15-02_2	LH-S16-01_1	LH-S16-01_2	LH-S16-01_3	LH-S19-01	LH-S19-01_1	LH-S19-01_2	LH-S19-02_1
Date Sampled	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	07/08/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993
Depth (ft.)	5.20	0.50	5.00	0.50	4.20	8.00	1.00	1.50	5.00	1.00
METALS - UNITS										
ALUMINUM	9270000	3990000	15400000	7010000	8190000	12300000	970000	1540000	17000000	1590000
ANTIMONY	ND [3000] U	3100	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	1900	2400	ND [1000] U	ND [2700] U	ND [2300] U	ND [1000] U	ND [1000] U	ND [1000] U	3400	ND [1000] U
BARIUM	492000	366000	594000	ND [67000] U	ND [935000] U	ND [105000] U	63600	130000	1110000	196000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	938000	434000	1790000	555000	1890000	3630000	176000	918000	1710000	1190000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	7800	20400	15900	ND [12600] U	ND [9200] U	ND [22900] U	2300	21500	19200	4300
COBALT	5100	1300	7200	1200	7300	16900	1000	1100	10800	1000
COPPER	5700	4200	4100	4600	4000	20700	2100	3200	7100	3100
IRON	18000000	21300000	16000000	12200000	12800000	23800000	844000	3630000	20800000	1930000
LEAD	10700	7000	8000	4500	5000	7500	1700	3000	9400	1900
MAGNESIUM	982000	274000	1700000	304000	1450000	5080000	53900	92600	2100000	123000
MANGANESE	53500	12500	37200	20800	75000	574000	8300	26400	149000	20000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	350000	151000	848000	386000	429000	885000	76100	110000	753000	132000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	27200	5200	29700	6100	29500	51700	2000	4900	32800	4800
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	25800	12000	34800	16000	23100	119000	2800	9000	35700	24100

000159

027909

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S19-02	LH-S20-01	LH-S20-01	LH-S20-02	LH-S20-02	LH-S22-01	LH-S22-01	LH-S22-02	LH-S22-02	LH-S23-01
Sample Number	LH-S19-02_2	LH-S20-01_1	LH-S20-01_2	LH-S20-02_1	LH-S20-02_2	LH-S22-01_1	LH-S22-01_2	LH-S22-02_1	LH-S22-02_2	LH-S23-01_1
Date Sampled	08/06/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993	07/25/1993
Depth (ft.)	5.00	0.50	2.00	0.50	5.00	0.50	5.00	0.50	5.00	0.50
METALS - UNITS										
ALUMINUM	1530000	1930000	2500000	7990000	24900000	8130000	20800000	39200000	12000000	ND [1040000] U
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	2000	5500	1200	ND [3000] U	ND [3000] U
ARSENIC	4200	ND [1000] U	ND [1000] U	ND [1500] U	3400	3500	2400	2700	1600	ND [1000] U
BARIUM	393000	25600	148000	115000	86500	146000	75100	117000	45800	100000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [10000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1720000	253000	550000	493000	972000	16400000	722000	6770000	873000	97100
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	17000	1800	1300	5700	19300	19100	17300	29300	11400	3400
COBALT	7400	ND [1000] U	ND [1000] U	2400	3900	1700	4500	5500	5600	ND [1000] U
COPPER	6000	ND [1000] U	2000	2000	4700	8600	5900	8400	7600	1100
IRON	19200000	ND [4420000] U	3440000	8910000	26600000	14100000	23100000	27500000	17000000	ND [1430000] U
LEAD	10000	1900	10900	1300	11400	63000	8300	7000	6000	4700
MAGNESIUM	1580000	226000	588000	568000	1890000	1260000	1150000	1490000	1330000	87900
MANGANESE	153000	22700	25400	90300	45300	76600	59400	43400	33100	9400
MERCURY	ND [100] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	657000	128000	715000	551000	1460000	416000	880000	2590000	928000	58400
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [10000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	29600	38100	52200	23900	16300	86700	16300	37300	14100	15200
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	28500	5200	33800	19400	33600	68000	39600	40000	36500	14500

000150

027910

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S23-01	LH-S23-02	LH-S23-02	LH-S24-01	LH-S24-01	LH-S27-01	LH-S27-01	LH-S27-02	LH-S27-02	LH-S28-01
Sample Number	LH-S23-01_2	LH-S23-02_1	LH-S23-02_2	LH-S24-01_1	LH-S24-01_2	LH-S27-01_1	LH-S27-01_2	LH-S27-02 _1	LH-S27-02_2	LH-S28-01_1
Date Sampled	07/25/1993	07/25/1993	07/25/1993	06/25/1993	06/25/1993	06/24/1993	06/24/1993	06/24/1993	06/24/1993	07/22/1993
Depth (ft.)	3.00	1.00	3.50	0.50	2.00	0.50	2.00	0.50	2.00	0.50
METALS - UNITS										
ALUMINUM	ND [11500000] U	ND [807000] U	ND [1000000] U	18200000	22300000	3170000	4010000	8570000	2330000	13100000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	ND [1000] U	ND [1000] U	ND [1000] U	2900	2500	1300	1000	1700	ND [1000] U	2300
BARIUM	66500	164000	67700	214000	719000	29800	129000	44800	19800	51700
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	37500	ND [1000] U	ND [1000] U	1580	2310	ND [1000] U	ND [1000] U
CALCIUM	476000	140000	112000	2480000	2340000	1230000	459000	1070000	183000	255000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	14000	2500	2400	49500	23300	4080	5050	14300	5240	16100
COBALT	4100	ND [1000] U	ND [1000] U	5500	11900	ND [1000] U	6850	ND [1000] U	ND [1000] U	4500
COPPER	3200	ND [1000] U	1900	5800	6300	2740	2960	4680	1490	3600
IRON	ND [12200000] U	ND [1410000] U	ND [1460000] U	17300000	19700000	4180000	5150000	10200000	2030000	13000000
LEAD	5400	1000	ND [1000] U	8900	11800	2000	2300	3540	2260	7700
MAGNESIUM	801000	245000	142000	1340000	3340000	150000	418000	247000	122000	557000
MANGANESE	68200	19600	14400	77500	147000	23100	62100	21000	32200	74800
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	398000	73200	88700	1030000	1250000	229000	268000	487000	154000	455000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	14000	13000	11400	23000	47800	3930	9080	20700	3360	5300
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	15100	12000	5500	63800	42500	9710	12800	44500	14400	16900

0601121

027911

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S28-01	LH-S29-01	LH-S29-01	LH-S29-02	LH-S29-02	LH-S29-02	LH-S30-01	LH-S30-01	LH-S31-01	LH-S31-01
Sample Number	**LH-S28-01_2**	**LH-S29-01_1**	**LH-S29-01_2**	**LH-S29-02_1**	**LH-S29-02_2**	**LH-S29-02_3**	**LH-S30-01_1**	**LH-S30-01_2**	**LH-S31-01_1**	**LH-S31-01_2**
Date Sampled	**07/22/1993**	**06/25/1993**	**06/25/1993**	**06/25/1993**	**06/25/1993**	**06/25/1993**	**06/25/1993**	**06/25/1993**	**07/21/1993**	**07/21/1993**
Depth (ft.)	**3.00**	**0.50**	**2.50**	**0.00**	**2.00**	**10.00**	**0.50**	**2.50**	**0.50**	**3.00**
METALS - UNITS										
ALUMINUM	17900000	20600000	25900000	10400000	16400000	16000000	9890000	31600000	6620000	17300000
ANTIMONY	ND [3000] U	16200	ND [3000] U	6800	ND [3000] U	3200	15700	13200	7000	ND [3000] U
ARSENIC	3100	3400	3500	2600	2800	2700	2000	3600	3800	1700
BARIUM	50000	84800	81900	67300	68300	69100	70500	111000	ND [82700] U	ND [72000] U
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	1200	1800	ND [1000] U	1100	1100	ND [1000] U	1900	ND [1000] U	ND [1000] U
CALCIUM	180000	1750000	1960000	860000	683000	765000	1440000	410000	545000	274000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	18100	18900	23900	13600	16100	16200	12800	25700	ND [11300] U	ND [12300] U
COBALT	5200	4100	4500	3600	3500	4900	4200	3400	4900	3400
COPPER	5200	6600	8800	2700	5300	7100	3900	8200	4000	5000
IRON	19700000	21400000	24100000	12000000	18100000	19400000	8640000	27600000	16500000	14800000
LEAD	12100	8600	8200	6100	8800	9400	6700	10400	12800	6600
MAGNESIUM	952000	1950000	1860000	821000	1100000	1090000	1290000	1730000	402000	968000
MANGANESE	26300	98800	73600	316000	159000	122000	287000	40200	275000	21800
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	733000	1940000	1700000	1010000	966000	1030000	1830000	1670000	385000	697000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	8500	12900	19700	8900	10000	8600	3500	10100	7100	10800
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	24300	28500	34900	16000	27000	25900	11700	35000	14000	21900

0027912

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S32-01	LH-S32-01	LH-S33-01	LH-S33-01	LH-S34-01	LH-S34-01	LH-S35-01	LH-S35-01	LH-S37-01	LH-S37-01
Sample Number	LH-S32-01_1	LH-S32-01_2	LH-S33-01_1	LH-S33-01_2	LH-S34-01_1	LH-S34-01_2	LH-S35-01_1	LH-S35-01_2	LH-S37-01_1	LH-S37-01_2
Date Sampled	06/25/1993	06/25/1993	07/21/1993	07/21/1993	06/25/1993	07/10/1993	06/25/1993	06/25/1993	07/25/1993	07/25/1993
Depth (ft.)	0.50	3.00	0.50	3.00	3.50	0.50	0.50	3.50	0.50	3.00
METALS - UNITS										
ALUMINUM	11200000	16100000	12600000	11300000	19900000	9620000	7190000	10600000	ND [8430000] U	ND [22000000] U
ANTIMONY	8800	5100	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	3800	1700	4400	2600	3700	2900	3200	2000	5100	4300
BARIUM	74900	83500	ND [71200] U	ND [65100] U	95600	778000	51200	48900	67800	74000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	1900	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	647000	650000	1690000	1900000	669000	1620000	411000	340000	1290000	1190000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	19100	17700	ND [16500] U	ND [15900] U	18400	13800	11600	11200	19700	22600
COBALT	2800	3500	3600	4200	3290	4300	4830	5640	3300	3900
COPPER	4900	4600	8700	8000	5460	4700	5300	3380	6800	4300
IRON	18900000	12500000	23700000	22300000	20300000	21000000	9700000	9080000	ND [22900000] U	ND [21000000] U
LEAD	6400	6600	12300	8300	9360	26000	14320	7580	1500	6100
MAGNESIUM	706000	850000	898000	704000	1020000	1300000	732000	698000	538000	1190000
MANGANESE	293000	275000	142000	189000	37300	203000	254000	142000	154000	127000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	762000	1030000	722000	618000	764000	438000	330000	522000	335000	1070000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	3800	5600	12300	14800	8500	10300	3530	4690	12800	16200
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	19300	19400	42500	28900	22500	52900	19500	15800	18000	26900

0001393

027913

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S38-01	LH-S38-01	LH-S39-01	LH-S39-01	LH-S40-01	LH-S40-01	LH-S41-01	LH-S41-01	LH-S42-01	LH-S42-01
Sample Number	LH-S38-01_1	LH-S38-01_2	LH-S39-01_1	LH-S39-01_2	LH-S40-01_1	LH-S40-01_2	LH-S41-01_1	LH-S41-01_2	LH-S42-01_1	LH-S42-01_2
Date Sampled	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/25/1993	06/25/1993	06/25/1993	06/25/1993
Depth (ft.)	0.50	3.20	0.50	3.00	0.50	3.30	0.50	3.20	0.50	2.50
METALS - UNITS										
ALUMINUM	9520000	11600000	15500000	9070000	13300000	11900000	8020000	16800000	6460000	12000000
ANTIMONY	4400	ND [3000] U	ND [4000] U	ND [3260] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2700	4300	2520	4890	2100	3200	1900	4500	2700	2600
BARIUM	62300	117000	ND [104000] U	ND [31500] U	121000	119000	105000	100000	67000	117000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [3460] U	ND [4420] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	5600	2000000	1470000	264000	1530000	1920000	363000	632000	788000	836000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	13200	29000	23100	19800	35100	31300	17900	32400	10800	21100
COBALT	4800	5500	2980	2850	4400	5100	5900	3210	4290	1760
COPPER	3900	6000	ND [10500] U	ND [4270] U	5100	6200	2960	5360	8130	3560
IRON	19600000	17400000	13000000	18900000	14300000	15100000	7190000	19500000	10300000	10300000
LEAD	5600	5900	20500	18500	10000	8400	6460	6840	7770	ND [0] U
MAGNESIUM	496000	619000	529000	316000	757000	713000	538000	714000	404000	501000
MANGANESE	214000	116000	22600	21600	103000	95700	350000	81400	174000	61800
MERCURY	ND [100] U	ND [100] U	ND [55] U	ND [49] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	478000	535000	644000	316000	674000	601000	424000	1090000	394000	611000
SELENIUM	ND [1000] U	ND [1000] U	ND [400] U	ND [326] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [28] U	ND [18] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	7400	13300	ND [10900] U	ND [4340] U	14800	13800	4310	7760	4900	7530
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	15400	30000	126000	14000	30000	25600	83400	20900	27200	15300

0027914
0027914

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-S43-01	LH-S43-01	LH-WRS-5	LH-WRS-5	LH-WRS-6	LH-WRS-6	LH-WRS-6	LH-WRS07-01	LH-WRS07-01
Sample Number	**LH-S43-01_1**	**LH-S43-01_2**	**LH-WRS-5_1**	**LH-WRS-5_2**	**LH-WRS-6_1**	**LH-WRS-6_2**	**LH-WRS-6_3**	**LH-WRS07-01_1**	**LH-WRS07-01_2**
Date Sampled	**06/26/1993**	**06/26/1993**	**07/12/1993**	**07/12/1993**	**07/10/1993**	**07/10/1993**	**07/24/1993**	**07/22/1993**	**07/22/1993**
Depth (ft.)	**0.50**	**1.50**	**0.00**	**3.00**	**0.00**	**2.50**	**18.00**	**0.50**	**3.50**
METALS - UNITS									
ALUMINUM	3170000	3530000	10800000	4270000	7050000	7840000	ND [6880000] U	1390000	10500000
ANTIMONY	ND [4040] U	ND [3840] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	970	1340	4500	2200	8900	2700	2900	ND [1000] U	1600
BARIUM	ND [50300] U	ND [75600] U	117000	43600	81200	56700	53700	6300	60800
BERYLLIUM	NA	NA	ND [0] U	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1190] U	ND [1840] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	660000	769000	2100000	1120000	1100000	562000	1650000	222000	476000
CHROMIUM, HEXAVALENT	NA	NA	ND [0] U	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	7070	10100	20300	8300	19700	17200	13800	4000	9100
COBALT	4000	6340	9200	3800	9100	3800	6600	ND [1000] U	4000
COPPER	ND [3330] U	ND [4450] U	3600	2100	2500	2500	9300	ND [1000] U	3700
IRON	4850000	8410000	25100000	11200000	25300000	16400000	ND [18200000] U	5340000	12200000
LEAD	6180	ND [5760] U	9200	6100	14300	6700	9100	1900	9900
MAGNESIUM	178000	157000	694000	334000	329000	380000	2230000	71700	767000
MANGANESE	244000	545000	676000	106000	382000	93600	95200	4900	9200
MERCURY	ND [48] U	ND [51] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	ND [0] U	NA	NA	NA	NA	NA	NA
POTASSIUM	161000	200000	459000	250000	249000	262000	613000	76700	291000
SELENIUM	ND [404] U	ND [384] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [20] U	ND [40] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	ND [0] U	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [5980] U	ND [7370] U	17400	9200	8300	5100	29000	1900	13900
THALLIUM	NA	NA	ND [0] U	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	ND [0] U	NA	NA	NA	NA	NA	NA
ZINC	6280	11300	26100	13300	21300	12200	42000	3800	12800

0001595

027915

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-WRS07-01	LH-WRS10-01	LH-WRS10-01	LH-WRS11-01	LH-WRS11-01	LH-WRS11-01	LH-WRS12-01	LH-WRS12-01
Sample Number	LH-WRS07-01_3	LH-WRS10-01_1	LH-WRS10-01_2	LH-WRS11-01_1	LH-WRS11-01_2	LH-WRS11-01_3	LH-WRS12-01_1	LH-WRS12-01_2
Date Sampled	07/22/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993	08/08/1993
Depth (ft.)	6.10	0.50	3.50	0.50	1.20	3.50	0.50	3.00
METALS - UNITS								
ALUMINUM	7680000	5500000	6320000	3030000	1560000	6340000	5550000	2010000
ANTIMONY	ND [3000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U
ARSENIC	1100	3250	2000	3400	600	1100	2100	500
BARIUM	132000	88300	70100	20300	4700	19300	95800	7000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	667000	1210000	1490000	169000	127000	111000	547000	270000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	9900	7900	7300	ND [1000] U	ND [1000] U	ND [1000] U	11800	ND [1000] U
COBALT	7400	ND [2000] U	ND [2000] U	ND [2000] U	ND [2000] U	ND [2000] U	14300	ND [2000] U
COPPER	3600	3600	3100	1700	ND [1000] U	1900	2100	ND [1000] U
IRON	7360000	8410000	12700000	3440000	3830000	7570000	10200000	5600000
LEAD	5900	8100	6400	4300	1700	3800	6800	2000
MAGNESIUM	1060000	431000	364000	181000	49200	250000	288000	49000
MANGANESE	15800	58000	58600	9600	4700	10300	532000	50800
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	474000	209000	182000	143000	ND [100000] U	344000	266000	164000
SELENIUM	ND [1000] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	19000	10100	12400	3100	2400	3700	7400	5000
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	25400	22100	17800	6700	ND [3000] U	12300	12400	ND [3000] U

027916
027916

Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-WRS12-01	LH-WRS13-01	LH-WRS13-01	LH-WRS15-01	LH-WRS15-01	LH-WRS16-01	LH-WRS16-01	LH-WRS19-01
Sample Number	LH-WRS12-01_3	LH-WRS13-01_1	LH-WRS13-01_2	LH-WRS15-01_1	LH-WRS15-01_2	LH-WRS16-01_1	LH-WRS16-01_2	LH-WRS19-01_1
Date Sampled	08/08/1993	06/26/1993	06/26/1993	08/03/1993	08/03/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.)	3.50	0.50	3.00	0.50	4.00	0.50	3.50	0.50
METALS - UNITS								
ALUMINUM	1710000	6860000	13000000	14300000	2900000	2200000	1830000	9340000
ANTIMONY	ND [5000] U	ND [9100] U	ND [7900] U	ND [3000] U	ND [3000] U	ND [4740] U	ND [5560] U	ND [5260] U
ARSENIC	1400	2090	4820	7400	1200	901	778	4290
BARIUM	4400	80100	48800	62300	9800	ND [6610] U	ND [8650] U	ND [82700] U
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1000] U	ND [2870] U	6950	ND [1000] U	ND [1000] U	ND [2110] U	ND [2280] U	ND [4580] U
CALCIUM	196000	1100000	1460000	2030000	345000	483000	396000	1020000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	ND [1000] U	8960	15400	24500	6100	5780	5030	25500
COBALT	ND [2000] U	4820	3200	5200	ND [1000] U	356	361	5710
COPPER	ND [1000] U	4410	9360	2900	ND [1000] U	ND [3200] U	ND [2750] U	ND [6470] U
IRON	3410000	8500000	26200000	26000000	7830000	6400000	6010000	14600000
LEAD	1800	ND [13600] U	25000	11700	2600	ND [7110] U	ND [8340] U	62400
MAGNESIUM	50400	301000	598000	813000	140000	134000	123000	574000
MANGANESE	20000	346000	13600	135000	7200	5970	4140	122000
MERCURY	ND [100] U	44	ND [28] U	ND [100] U	ND [100] U	ND [45] U	ND [61] U	ND [48] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	ND [100000] U	335000	498000	728000	188000	138000	128000	514000
SELENIUM	ND [500] U	ND [910] U	ND [790] U	ND [1000] U	ND [1000] U	ND [474] U	ND [556] U	ND [526] U
SILVER	ND [1000] U	ND [46] U	ND [40] U	ND [1000] U	ND [1000] U	ND [24] U	ND [28] U	ND [26] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	3800	8280	24000	9700	3300	ND [3600] U	ND [2770] U	ND [12200] U
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	ND [3000] U	31200	12700	32500	3500	7870	9840	65700

0027914
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Metals in Phase I Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location	LH-WRS19-01	LH-WRS21-01	LH-WRS21-01	LH-WRS4-01	LH-WRS4-01	LH-WRS8-01	LH-WRS8-01	LH-WRS9-01	LH-WRS9-01
Sample Number	LH-WRS19-01_2	LH-WRS21-01_1	LH-WRS21-01_2	LH-WRS4-01_1	LH-WRS4-01_2	LH-WRS8-01_1	LH-WRS8-01_2	LH-WRS9-01_1	LH-WRS9-01_2
Date Sampled	06/26/1993	08/08/1993	08/08/1993	07/10/1993	07/10/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993
Depth (ft.)	3.00	0.50	3.50	0.50	3.50	0.50	3.50	0.50	3.50
METALS - UNITS									
ALUMINUM	2250000	7300000	8730000	11200000	8060000	8640000	20500000	15900000	12500000
ANTIMONY	ND [5860] U	ND [5000] U	ND [5000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	1050	3000	2220	2500	3200	2300	2800	4500	2800
BARIUM	ND [6360] U	35900	27400	114000	368000	75800	442000	180000	149000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1900] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	444000	534000	471000	894000	1160000	940000	955000	3370000	818000
CHROMIUM, HEXAVALENT	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	3750	11600	8000	11600	10000	13400	19900	18200	13800
COBALT	ND [352] U	ND [2000] U	ND [2000] U	6100	13300	4800	11200	6900	8300
COPPER	ND [2840] U	2200	3400	3800	4000	4300	6100	5800	6100
IRON	4550000	16000000	11000000	14900000	14700000	10700000	17200000	18800000	13200000
LEAD	ND [8790] U	4800	5200	9200	13400	21500	10800	16800	21400
MAGNESIUM	113000	271000	437000	973000	1640000	528000	1870000	1130000	1420000
MANGANESE	2340	52900	19000	26100	118000	387000	38700	129000	120000
MERCURY	ND [50] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	123000	340000	390000	392000	449000	418000	728000	561000	608000
SELENIUM	ND [586] U	ND [500] U	ND [500] U	ND [1000] U	ND [1000] U	ND [1000] U	1000	ND [1000] U	ND [1000] U
SILVER	ND [29] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [3750] U	21500	10500	20300	35700	8200	29600	23600	23000
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	7000	14900	9500	20500	33800	37900	33600	37000	45600

027918
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Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SB01	46SB01	46SB01	46SB02	46SB02	46SB02	46SB03	46SB03	46SB03	LHS-2-01
Sample Number:	46SB01(0-0.5)	46SB01(1-3)	46SB01(3-5)	46SB02(0-0.5)	46SB02(1-3)	46SB02(3-5)	46SB03(0-0.5)	46SB03(1-3)	46SB03(3-5)	LHS-2-01
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	01/09/1995
Depth (ft.):	0.00	1.00	3.00	0.00	1.00	3.00	0.00	1.00	3.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	7800000	12000000	16000000	2700000 J	5300000 J	5000000 J	9400000	12000000	27000000	12700000
ANTIMONY	ND [6630] UJ	ND [6620] UJ	ND [7480] UJ	ND [6260] R	ND [6710] R	ND [6730] R	ND [6780] UJ	ND [6800] UJ	ND [7420] UJ	ND [13700] UJ
ARSENIC	3750	4240	5520	2820	2880	3190	9220	5220	3840	8100 J
BARIUM	57000	62000	45000	39000 J	28000 J	45000 J	66000	82000	150000	1270000
BERYLLIUM	ND [552] U	ND [552] U	686	ND [522] U	ND [559] U	ND [561] U	608	ND [567] U	910	NA
CADMIUM	ND [552] U	ND [552] U	ND [623] U	ND [522] U	ND [559] U	ND [561] U	ND [565] U	ND [567] U	ND [618] U	ND [1400] U
CALCIUM	840000	ND [550000] U	ND [620000] U	530000 J	ND [560000] U	ND [560000] U	26000000	2600000	750000	1650000
CHROMIUM, TOTAL	12000	13000	22000	5600 J	19000 J	8200 J	27000	20000	23000	37800 J
COBALT	ND [5600] U	ND [5600] U	ND [6200] U	ND [5200] U	ND [5600] U	ND [5600] U	ND [5600] U	ND [5700] U	ND [6200] U	9800
COPPER	3880	5000	4540	3770 J	4040 J	3330 J	14600	4970	7560	15300
IRON	9000000	13000000	20000000	5900000 J	11000000 J	8200000 J	36000000	25000000	20000000	35000000
LEAD	9200	9610	9320	8030	5170	6260	18100	10600	13000	24400
MAGNESIUM	640000	790000	1000000	ND [520000] U	ND [560000] U	ND [560000] U	1000000	980000	1900000	818000
MANGANESE	108000	94500	31600	48700 J	23400 J	51900 J	172000	132000	40500	350000 J
MERCURY	ND [110] U	ND [110] U	ND [120] U	ND [100] U	ND [110] U	ND [110] U	ND [110] U	ND [110] U	ND [120] U	180
NICKEL	6300	8200	11000	ND [4200] U	ND [4500] U	ND [4500] U	7500	8600	15000	NA
POTASSIUM	970000	1100000	1200000	ND [520000] U	ND [560000] U	ND [560000] U	610000	960000	1400000	619000
SELENIUM	ND [1100] U	1660	1410	1270	1400	ND [1120] U	2750	1960	1890	580 J
SILVER	ND [1100] U	1600	ND [1200] U	1200 J	ND [1100] U	ND [1100] U	ND [1100] U	ND [1100] U	ND [1200] U	ND [1400] U
SODIUM	ND [550000] U	ND [550000] U	ND [620000] U	ND [520000] U	ND [560000] U	ND [560000] U	ND [560000] U	ND [570000] U	ND [620000] U	NA
STRONTIUM	ND [5600] U	ND [5600] U	ND [6200] U	ND [5200] U	ND [5600] U	ND [5600] U	33000	7200	11000	320000
THALLIUM	ND [552] U	ND [552] U	ND [623] U	ND [522] U	ND [559] U	ND [561] U	ND [565] U	ND [567] U	ND [618] U	ND [68400] U
VANADIUM	18000	27000	45000	11000 J	19000 J	18000 J	49000	41000	41000	NA
ZINC	19000	17000	20000	12000 J	9600 J	12000 J	59000	20000	42000	222000

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Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-2-02	LHS-2-03	LHS-2-04	LHS-2-05	LHS-2-06	LHS-2-07	LHS-2-08	LHS-2-09	LHS-2-10	LHS-2-11
Sample Number:	LHS-2-02	LHS-2-03	LHS-2-04	LHS-2-05	LHS-2-06	LHS-2-07	LHS-2-08	LHS-2-09	LHS-2-10	LHS-2-11
Date Sampled:	01/09/1995	01/09/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/11/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	8530000	8880000	8970000	5140000	32800000	9660000	7480000	8430000	7240000	4300000
ANTIMONY	ND [12100] UJ	ND [11700] UJ	ND [10700] UJ	ND [10200] UJ	ND [25000] UJ	ND [18700] UJ	ND [9200] UJ	ND [17800] UJ	ND [9900] UJ	ND [14700] UJ
ARSENIC	2800 J	2200 J	8000 J	5700 J	8700 J	12600 J	16800 J	2600 J	3500 J	5500 J
BARIUM	57300	73700	46900	60000	266000	290000	1470000	183000	40200	668000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1200] U	ND [1200] U	ND [1100] U	ND [1000] U	ND [2500] U	ND [1900] U	ND [920] U	ND [1800] U	ND [990] U	ND [1500] U
CALCIUM	730000	859000	1040000	578000	1410000	2560000	1610000	1200000	804000	827000
CHROMIUM, TOTAL	11300 J	12900 J	11300 J	14900	60900	131000	13800	27500	12100	8800
COBALT	10100	7200	2900	3100	9400	5800	4100	ND [3600] U	2600	3600
COPPER	5600	4700	4200	5500	274000	20100	11200	10100	7000	5800
IRON	9780000	11100000	11200000	17100000	18200000	15100000	13200000	10300000	11100000	11900000
LEAD	12600	12800	14800	18300	104000	179000	14800	46200	8200	18700
MAGNESIUM	525000	543000	431000	224000	673000	602000	452000	491000	347000	300000
MANGANESE	263000 J	308000 J	153000 J	89400	134000	411000	227000	77400	66300	319000
MERCURY	260	210	ND [110] U	ND [100] U	ND [260] U	ND [140] U	ND [100] U	ND [130] U	ND [96] U	ND [120] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	415000	427000	403000	ND [203000] U	607000	563000	297000	ND [356000] U	318000	ND [295000] U
SELENIUM	320 J	370 J	510 J	430	ND [500] U	800	ND [1100] U	400	360	530
SILVER	ND [1200] U	ND [1200] U	ND [1100] U	ND [1000] U	ND [2500] U	ND [1900] U	ND [920] U	ND [1800] U	ND [990] U	ND [1500] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [12100] U	ND [11700] U	ND [10700] U	ND [10200] U	ND [25000] U	20700	11400	ND [17800] U	ND [9900] U	34600
THALLIUM	ND [60700] U	ND [58300] U	ND [53400] U	ND [50800] U	ND [125000] U	ND [93400] U	ND [46200] U	ND [89000] U	ND [49400] U	ND [73600] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	43700	39200	24900	21600	4120000	118000	35200	209000	14800	36800

027920

027920

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-2-12	LHS-2-13	LHS-2-14	LHS-2-15	LHS-2-16	LHS-2-17	LHS-2-18	LHS-2-19	LHS-MW-10	LHS-MW-11
Sample Number:	LHS-2-12	LHS-2-13	LHS-2-14	LHS-2-15	LHS-2-16	LHS-2-17	LHS-2-18	LHS-2-19	LHS-MW10	LHS-MW11
Date Sampled:	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	09/30/1994	09/30/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	11400000	4890000	3620000	4790000	22600000	15100000	4740000	7160000	6800000	7190000
ANTIMONY	ND [12800] UJ	ND [15000] UJ	ND [12600] UJ	ND [8100] UJ	ND [22500] UJ	ND [16500] UJ	ND [10600] UJ	ND [14600] UJ	ND [7300] U	ND [7000] U
ARSENIC	3000 J	2800 J	2500 J	1800	8100	6000	7900	7000	2800	2300
BARIUM	2060000	73500	37300	43800	101000	332000	36700	159000	80200	53000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1300] U	ND [1500] U	ND [1300] U	ND [810] U	ND [2200] U	ND [1600] U	ND [1100] U	ND [1500] U	ND [730] U	ND [700] U
CALCIUM	1050000	2550000	445000	339000	1390000	1230000	1260000	3570000	756000	1430000
CHROMIUM, TOTAL	25200	13600	8000	11200	17400	22400	12000	23900	10400	16900
COBALT	3700	3600	ND [2500] U	ND [1600] U	10600	ND [3300] U	ND [2100] U	7800	3000	4100
COPPER	8900	15900	3000	3200	18400	119000	10500	27800	3500	3600
IRON	11700000	10900000	9610000	5870000	19500000	10800000	12100000	28300000	7580000	16100000
LEAD	15200	21600	8900	10500	38100	38800	34500	62700	11100	12800
MAGNESIUM	571000	584000	449000	206000	691000	992000	260000	519000	376000	352000
MANGANESE	63000	107000	60600	23400	467000	50600	50000	175000	325000	214000
MERCURY	ND [120] U	ND [180] U	ND [86] U	160	560	190	ND [110] U	ND [120] U	ND [110] U	ND [95] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	648000	ND [301000] U	ND [252000] U	207000	561000	690000	ND [213000] U	314000	359000	282000
SELENIUM	430	620	560	250 J	1600 J	460 J	430 J	480 J	250	180
SILVER	ND [1300] U	ND [1500] U	ND [1300] U	ND [810] U	ND [2200] U	ND [1600] U	ND [1100] U	ND [1500] U	ND [730] U	ND [700] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	119000	21800	ND [12600] U	ND [8100] U	ND [22500] U	23300	ND [10600] U	19200	9400	7100
THALLIUM	ND [64000] U	ND [75200] U	ND [63000] U	ND [40400] U	ND [112000] U	ND [82400] U	ND [53200] U	ND [73000] U	ND [36600] U	ND [34800] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	47700	130000	11600	59000 J	986000 J	131000 J	120000 J	182000 J	12200	15100

0602021

027921

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-12	LHS-MW-13	LHS-MW-14	LHS-MW-15	LHS-MW-16	LHS-MW-17	LHS-MW-18	LHS-MW-19	LHS-MW-20	LHS-MW-21	LHS-MW-22
Sample Number:	LHS-MW12	LHS-MW13	LHS-MW14	LHS-MW15	LHS-MW16	LHS-MW17	LHS-MW18	LHS-MW19	LHS-MW20	LHS-MW21	LHS-MW22
Date Sampled:	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	09/30/1994	10/03/1994	10/03/1994	10/03/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG											
ALUMINUM	5690000	6720000	5970000	6410000	4860000	6020000	7960000	5640000	5690000	4210000	4990000
ANTIMONY	ND [6300] U	ND [6400] U	ND [6700] U	ND [7500] U	ND [6700] U	ND [6300] U	ND [6600] U	ND [6500] U	ND [9400] UJ	ND [8600] UJ	ND [9000] UJ
ARSENIC	11900	1800	8500	7500	2800	2300	6900	13100	2000 J	2400 J	3300 J
BARIUM	59500	67400	64600	37900	156000	56300	55700	30800	80300	66600	72200
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [630] U	ND [640] U	ND [670] U	ND [750] U	ND [670] U	ND [630] U	ND [660] U	ND [650] U	ND [940] U	ND [860] U	ND [900] U
CALCIUM	2110000	542000	1170000	1030000	211000	625000	888000	450000	1950000	718000	986000
CHROMIUM, TOTAL	22000	13800	25600	29800	19000	12600	31100	26500	10100	11200	14000
COBALT	3200	4900	3400	1800	5100	2900	4000	3300	4600	4700	3100
COPPER	3000	2800	2300	2900	2200	3800	4300	4400	4300	2400	4400
IRON	19300000	10500000	37900000	29700000	20800000	13300000	37600000	37500000	9780000	7350000	13900000
LEAD	14100	10400	17600	9700	9300	12400	14200	20000	20100	14600	11600
MAGNESIUM	266000	413000	403000	266000	921000	365000	606000	212000	283000	237000	348000
MANGANESE	126000	300000	215000	70800	448000	191000	183000	101000	344000	207000	269000
MERCURY	ND [97] U	ND [80] U	ND [110] U	ND [110] U	ND [91] U	ND [100] U	ND [94] U	ND [96] U	ND [110] U	ND [79] U	ND [100] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	207000	223000	223000	186000	158000	308000	488000	200000	262000	178000	217000
SELENIUM	320	300	460	520	420	290	690	400	290 J	250 J	350 J
SILVER	ND [630] U	ND [640] U	ND [670] U	ND [750] U	ND [670] U	ND [630] U	ND [660] U	ND [650] U	ND [940] U	ND [860] U	ND [900] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	6900	8200	10400	ND [7500] U	ND [6700] U	6700	11100	ND [6500] U	10100	8800	ND [9000] U
THALLIUM	ND [31400] U	ND [32200] U	ND [33600] U	ND [37400] U	ND [33400] U	ND [31400] U	ND [32800] U	ND [32400] U	ND [46900] U	ND [42800] U	ND [44800] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	15400	8500	15300	14500	10700	17500	23600	32000	22500	7500	22900

2960909

027922

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-23	LHS-MW-24	LHS-MW-25	LHS-MW-26	LHS-MW-27	LHS-MW-8	LHS-MW-9	SUMP001	SUMP001	SUMP002
Sample Number:	LHS-MW23	LHS-MW24	LHS-MW25	LHS-MW26	LHS-MW27	LHS-MW8	LHS-MW9	SUMP001(0-0.5)	SUMP001(3-5)	SUMP002(0-0.5)
Date Sampled:	10/03/1994	10/03/1994	10/03/1994	10/03/1994	10/03/1994	09/30/1994	09/30/1994	07/29/1998	07/29/1998	09/22/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	6410000	8070000	8520000	8720000	13500000	4010000	5280000	NA	NA	NA
ANTIMONY	ND [8700] UJ	ND [9800] UJ	ND [8800] UJ	ND [9100] UJ	ND [8900] UJ	ND [6400] U	ND [7300] U	NA	NA	NA
ARSENIC	10100 J	3100 J	3500 J	9800 J	2100 J	2900	3600	NA	NA	NA
BARIUM	218000	116000	460000	57200	76900	60500	53000	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	612	ND [569] U	ND [571] U
CADMIUM	ND [870] U	ND [980] U	ND [880] U	ND [910] U	ND [890] U	ND [640] U	ND [730] U	NA	NA	NA
CALCIUM	1890000	364000	378000	1580000	524000	312000	2480000	NA	NA	NA
CHROMIUM, TOTAL	33900	23200	23400	41900	18900	9600	12200	NA	NA	NA
COBALT	5600	7800	30600	3800	9900	3800	3000	NA	NA	NA
COPPER	5600	4700	5300	5200	4900	ND [1300] U	4800	NA	NA	NA
IRON	38600000	19600000	22700000	51200000	13900000	5470000	14100000	NA	NA	NA
LEAD	17700	14700	17700	18900	10900	7900	25100	NA	NA	NA
MAGNESIUM	259000	405000	442000	544000	756000	210000	338000	NA	NA	NA
MANGANESE	1130000	595000	3740000	192000	217000	281000	272000	NA	NA	NA
MERCURY	ND [86] U	ND [97] U	ND [82] U	ND [110] U	ND [110] U	ND [100] U	ND [84] U	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	9800	9600	7900
POTASSIUM	291000	287000	363000	293000	635000	153000	341000	NA	NA	NA
SELENIUM	470 J	450 J	460 J	420 J	340 J	230	310	NA	NA	NA
SILVER	ND [870] U	ND [980] U	ND [880] U	ND [910] U	ND [890] U	ND [640] U	ND [730] U	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [8700] U	ND [9800] U	ND [8800] U	ND [9100] U	9800	ND [6400] U	12900	NA	NA	NA
THALLIUM	ND [43600] U	ND [49000] U	ND [43800] U	ND [45400] U	ND [44700] U	ND [32200] U	ND [36300] U	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	77000	14000	21000
ZINC	28500	13400	17200	25900	17800	6500	26700	NA	NA	NA

027923

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP002	SUMP003	SUMP003	SUMP004	SUMP004	SUMP004	SUMP005	SUMP005
Sample Number:	SUMP002(9.5-10)	SUMP003(0-0.5)	SUMP003(9.5-10)	SUMP004(0-0.5)	SUMP004(0-0.5)LFD	SUMP004(3-5)	SUMP005(0-0.5)	SUMP005(9.5-10)
Date Sampled:	09/22/1998	09/22/1998	09/22/1998	07/29/1998	07/29/1998	07/29/1998	09/22/1998	09/22/1998
Depth (ft.):	9.50	0.00	9.50	0.00	0.00	3.00	0.00	9.50
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	1510	ND [593] U	1050	ND [556] U	ND [2780] U	ND [579] U	ND [595] U	1940
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	28000	7600	22000	6900	ND [22000] U	7500	11000	44000
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	13000	20000	27000	23000	ND [28000] U	29000	36000	21000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0027924

0027924

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP006	SUMP006	SUMP007	SUMP007	SUMP007	SUMP008	SUMP008	SUMP009
Sample Number:	SUMP006(0-0.5)	SUMP006(3-5)	SUMP007(0-0.5)	SUMP007(0-0.5)LFD	SUMP007(6.5-7)	SUMP008(0-0.5)	SUMP008(9.5-10)	SUMP009(0-0.5)
Date Sampled:	07/29/1998	07/29/1998	09/23/1998	09/23/1998	09/23/1998	09/23/1998	09/23/1998	09/23/1998
Depth (ft.):	0.00	3.00	0.00	0.00	6.50	0.00	9.50	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	691	921	ND [577] U	ND [2890] U	ND [583] U	ND [617] U	ND [569] U	ND [643] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	11000	13000	7300	ND [23000] U	6900	6800	5100	8600
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	44000	58000	13000	ND [29000] U	16000	28000	10000	46000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

027925

027925

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP009	SUMP010	SUMP010	SUMP011	SUMP011	SUMP012	SUMP012	SUMP013
Sample Number:	SUMP09(1.8-2.3)	SUMP010(0-0.5)	SUMP010(3-5)	SUMP011(0-0.5)	SUMP011(6-6.5)	SUMP012(0-0.5)	SUMP012(9.5-10)	SUMP013(0-0.5)
Date Sampled:	09/23/1998	07/29/1998	07/29/1998	09/23/1998	09/23/1998	09/24/1998	09/24/1998	09/23/1998
Depth (ft.):	1.75	0.00	3.00	0.00	6.00	0.00	9.50	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [542] U	562	ND [587] U	657	ND [595] U	687	ND [597] U	710
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	5400	5000	ND [4700] U	7900	6800	8200	12000	11000
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	34000	24000	21000	20000	15000	18000	13000	44000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0027926

0027926

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP013	SUMP014	SUMP014	SUMP015	SUMP015	SUMP016	SUMP016	SUMP017
Sample Number:	SUMP013(9.5-10)	SUMP014(0-0.5)	SUMP014(9.5-10)	SUMP015(0-0.5)	SUMP015(9.5-10)	SUMP016(0-0.5)	SUMP016(3-5)	SUMP017(0-0.5)
Date Sampled:	09/23/1998	09/22/1998	09/22/1998	09/22/1998	09/22/1998	08/06/1998	08/06/1998	09/22/1998
Depth (ft.):	9.50	0.00	9.50	0.00	9.50	0.00	3.00	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	694	ND [571] U	1550	ND [568] U	1780	ND [578] U	826	ND [593] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	10000	ND [4600] U	42000	ND [4600] U	47000	6400	21000	ND [4700] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	12000	13000	27000	16000	20000	25000	25000	16000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

027927
027927

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP017	SUMP018	SUMP018	SUMP018	SUMP019	SUMP019	SUMP020	SUMP020
Sample Number:	SUMP017(9.5-10)	SUMP018(0-0.5)	SUMP018(0-0.5)LFD	SUMP018(9.5-10)	SUMP019(0-0.5)	SUMP019(3-5)	SUMP020(0-0.5)	SUMP020(3-5)
Date Sampled:	09/22/1998	09/23/1998	09/23/1998	09/23/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	9.50	0.00	0.00	9.50	0.00	3.00	0.00	3.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	1560	ND [615] U	ND [3080] U	1350	ND [548] U	838	ND [541] U	ND [578] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	39000	8600	ND [25000] U	34000	ND [4400] U	4700	ND [4300] U	ND [4600] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	17000	34000	43000	15000	30000	35000	25000	43000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

027928
027928

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP021	SUMP021	SUMP022	SUMP022	SUMP023	SUMP023	SUMP024	SUMP024
Sample Number:	SUMP021(0-0.5)	SUMP021(9.5-10)	SUMP022(0-0.5)	SUMP022(6.5-7)	SUMP023(0-0.5)	SUMP023(3-5)	SUMP024(0-0.5)	SUMP024(3-5)
Date Sampled:	09/23/1998	09/23/1998	09/23/1998	09/23/1998	08/06/1998	08/06/1998	08/08/1998	08/08/1998
Depth (ft.):	0.00	9.50	0.00	6.50	0.00	3.00	0.00	3.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [571] U	ND [595] U	ND [583] U	ND [625] U	ND [539] U	722	ND [554] U	697
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	8200	8800	5600	6200	7900	17000	7900	11000
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	34000	13000	16000	10000	24000	31000	37000	13000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0009699

0279029

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP025	SUMP025	SUMP026	SUMP026	SUMP026	SUMP027	SUMP027	SUMP028
Sample Number:	**SUMP025(0-0.5)**	**SUMP25(5.8-6.3)**	**SUMP026(0-0.5)**	**SUMP026(0-0.5)LFD**	**SUMP026(3-5)**	**SUMP027(0-0.5)**	**SUMP027(3-5)**	**SUMP028(0-0.5)**
Date Sampled:	**09/23/1998**	**09/23/1998**	**08/08/1998**	**08/08/1998**	**08/08/1998**	**07/30/1998**	**07/30/1998**	**09/23/1998**
Depth (ft.):	**0.00**	**5.75**	**0.00**	**0.00**	**3.00**	**0.00**	**3.00**	**0.00**
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [628] U	985	825	ND [2910] U	846	ND [534] U	745	ND [588] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	7500	7100	14000	ND [23000] U	14000	ND [4300] U	7600	7800
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	38000	31000	60000 J	63000 J	37000	27000	19000	23000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0279307

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP028	SUMP029	SUMP029	SUMP030	SUMP030	SUMP031	SUMP031	SUMP032
Sample Number:	SUMP028(9.5-10)	SUMP029(0-0.5)	SUMP029(3-5)	SUMP030(0-0.5)	SUMP030(3-5)	SUMP031(0-0.5)	SUMP031(9.5-10)	SUMP032(0-0.5)
Date Sampled:	09/23/1998	07/30/1998	07/30/1998	08/08/1998	08/08/1998	09/24/1998	09/24/1998	09/24/1998
Depth (ft.):	9.50	0.00	3.00	0.00	3.00	0.00	9.50	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [579] U	ND [526] U	ND [566] U	ND [551] U	593	ND [549] U	ND [592] U	ND [558] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	5200	ND [4200] U	ND [4600] U	9800	9600	ND [4400] U	ND [4700] U	4800
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	ND [5800] U	24000	21000	27000 J	30000 J	12000	ND [5900] U	11000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

000841

027931

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP032	SUMP033	SUMP033	SUMP034	SUMP034	SUMP035	SUMP035	SUMP036
Sample Number:	SUMP032(9.5-10)	SUMP033(0-0.5)	SUMP033(5.5-6)	SUMP034(0-0.5)	SUMP034(3-5)	SUMP035(0-0.5)	SUMP035(5.5-6)	SUMP036(0-0.5)
Date Sampled:	09/24/1998	09/24/1998	09/24/1998	08/07/1998	08/07/1998	09/24/1998	09/24/1998	07/30/1998
Depth (ft.):	9.50	0.00	5.50	0.00	3.00	0.00	5.50	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	995	ND [634] U	ND [609] U	650	ND [600] U	ND [572] U	ND [607] U	ND [529] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	20000	11000	9400	16000	13000	5000	6900	ND [4200] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	12000	35000	19000	41000 J	38000 J	12000	16000	19000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0027932

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP036	SUMP037	SUMP037	SUMP038	SUMP038	SUMP039	SUMP039	SUMP040	SUMP040
Sample Number:	SUMP036(3-5)	SUMP037(0-0.5)	SUMP037(3-5)	SUMP038(0-0.5)	SUMP038(7-7.5)	SUMP039(0-0.5)	SUMP039(3-3.5)	SUMP040(0-0.5)	SUMP040(3-5)
Date Sampled:	07/30/1998	08/08/1998	08/08/1998	09/28/1998	09/28/1998	09/28/1998	09/28/1998	08/08/1998	08/08/1998
Depth (ft.):	3.00	0.00	3.00	0.00	7.00	0.00	3.00	0.00	3.00
METALS - UNITS: UG/KG									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	631	ND [570] U	ND [598] U	913	ND [557] U	ND [595] U	ND [602] U	ND [552] U	625
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	8200	9000	9700	11000	5200	ND [4800] U	ND [4800] U	6600	14000
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	29000	28000 J	39000 J	30000	9600	8600	12000	22000 J	28000 J
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP041	SUMP041	SUMP042	SUMP042	SUMP043	SUMP043	SUMP107	SUMP107
Sample Number:	SUMP041(0-0.5)	SUMP041(5.5-6)	SUMP042(0-0.5)	SUMP042(3.5-4)	SUMP043(0-0.5)	SUMP043(3-5)	SUMP107(0-0.5)	SUMP107(3-3.5)
Date Sampled:	09/24/1998	09/24/1998	09/24/1998	09/24/1998	08/08/1998	08/08/1998	09/28/1998	09/28/1998
Depth (ft.):	0.00	5.50	0.00	3.50	0.00	3.00	0.00	3.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [572] U	ND [592] U	ND [573] U	ND [592] U	ND [565] U	ND [551] U	ND [597] U	ND [597] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	6000	ND [4700] U	ND [4600] U	5800	10000	6800	ND [4800] U	ND [4800] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	10000	6200	8400	15000	29000 J	33000	38000	28000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0027934

0027934

Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	SUMP108	SUMP108	SUMP108	SUMP109	SUMP109	SUMP110	SUMP110	WRSUMP004
Sample Number:	SUMP108(0-0.5)	SUMP108(3-5)	SUMP108(3-5)LFD	SMP109(7.8-8.3)	SUMP109(0-0.5)	SUMP110(0-0.5)	SUMP110(3-5)	WRSUMP04(0-0.5)
Date Sampled:	08/11/1998	08/11/1998	08/11/1998	09/25/1998	09/25/1998	08/12/1998	08/12/1998	09/27/1998
Depth (ft.):	0.00	3.00	3.00	7.75	0.00	0.00	3.00	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [544] U	604	ND [2800] U	ND [659] UJ	ND [591] U	ND [536] U	ND [568] U	ND [760] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4300] U	9700	ND [22000] U	8500 J	5000	5400	9700	8400
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	26000	25000	ND [28000] U	28000 J	13000	25000	40000	21000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

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Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP004	WRSUMP005	WRSUMP005	WRSUMP006	WRSUMP006	WRSUMP007	WRSUMP007
Sample Number:	WRSUMP04(4-4.5)	WRSUMP05(0-0.5)	WRSUMP05(7-7.5)	WRSUMP06(0-0.5)	WRSUMP06(7-7.5)	WRSUMP007(3-5)	WRSUMP07(0-0.5)
Date Sampled:	09/27/1998	09/27/1998	09/27/1998	09/24/1998	09/24/1998	07/29/1998	07/29/1998
Depth (ft.):	4.00	0.00	7.00	0.00	7.00	3.00	0.00
METALS - UNITS: UG/KG							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [566] U	ND [586] U	626	ND [573] U	ND [606] U	ND [588] U	ND [515] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA
NICKEL	8100	5900	10000	5600	9400	ND [4700] U	ND [4100] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	11000	17000	11000	15000	10000	28000	37000
ZINC	NA	NA	NA	NA	NA	NA	NA

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Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP008	WRSUMP008	WRSUMP009	WRSUMP009	WRSUMP010	WRSUMP010	WRSUMP010
Sample Number:	WRSUMP08(0-0.5)	WRSUMP008(3-5)	WRSMP9(7.8-8.3)	WRSUMP09(0-0.5)	WRSUMP10(0-0.5)	WRSUMP10(0-0.5)FD	WRSUMP010(3-5)
Date Sampled:	07/30/1998	07/30/1998	09/24/1998	09/24/1998	08/05/1998	08/05/1998	08/05/1998
Depth (ft.):	0.00	3.00	7.75	0.00	0.00	0.00	3.00
METALS - UNITS: UG/KG							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [549] U	ND [627] U	ND [607] U	ND [597] U	252.5	ND [269.7] U	518.1
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4400] U	9900	7000	5700	ND [4300] U	ND [22000] U	ND [5000] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	16000	24000	ND [6100] U	16000	11000	ND [27000] U	30000
ZINC	NA	NA	NA	NA	NA	NA	NA

0027937

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Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP011	WRSUMP011	WRSUMP012	WRSUMP012	WRSUMP013	WRSUMP013	WRSUMP015
Sample Number:	WRSUMP11(0-0.5)	WRSUMP11(4.5-5)	WRSMP12(9.5-10)	WRSUMP12(0-0.5)	WRSUMP13(0-0.5)	WRSUMP13(5-5.5)	WRSUMP15(0-0.5)
Date Sampled:	09/24/1998	09/24/1998	09/27/1998	09/27/1998	09/27/1998	09/27/1998	08/11/1998
Depth (ft.):	0.00	4.50	9.50	0.00	0.00	5.00	0.00
METALS - UNITS: UG/KG							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [580] U	ND [598] U	ND [566] U	ND [523] U	ND [566] U	ND [597] U	ND [583] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA
NICKEL	5600	7300	9300	5900	7100	5200	ND [4700] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	15000	11000	14000	18000	19000	12000	38000
ZINC	NA	NA	NA	NA	NA	NA	NA

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Metals in Phase II and Phase III Soil Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP015	WRSUMP016	WRSUMP016	WRSUMP019	WRSUMP019	WRSUMP021	WRSUMP021
Sample Number:	WRSUMP015(3-5)	WRSUMP16(0-0.5)	WRSUMP016(3-5)	WRSUMP019(3-5)	WRSUMP19(0-0.5)	WRSUMP21(0-0.5)	WRSUMP021(3-5)
Date Sampled:	08/11/1998	08/11/1998	08/11/1998	08/13/1998	08/13/1998	07/30/1998	07/30/1998
Depth (ft.):	3.00	0.00	3.00	3.00	0.00	0.00	3.00
METALS - UNITS: UG/KG							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [585] U	ND [545] U	ND [596] U	ND [573] U	ND [564] U	ND [549] U	ND [563] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4700] U	ND [4300] U	ND [4800] U	10000	12000	ND [4400] U	ND [4600] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	21000	33000	9600	22000	23000	28000	20000
ZINC	NA	NA	NA	NA	NA	NA	NA

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VOCs and SVOCs in Sediment Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SD01	46SD02	46SD03	46SD04	46SD04	46SD05	46SD06	46SD06	46SD07
Sample Number:	46SD01	46SD02	46SD03	46SD04	46SD04RAFD	46SD05	46SD06	46SD06RAFD	46SD07
Date Sampled:	11/09/1998	11/09/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
METHYLENE CHLORIDE	ND [7.1] U	ND [12] U	8	1.7	1.6	1.6	1.6	2.1	ND [6.6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
NO DETECTED COMPOUNDS					NA			NA	

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VOCs and SVOCs in Sediment Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SD08	46SD08
Sample Number:	46SD08	46SD08RAFD
Date Sampled:	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
METHYLENE CHLORIDE	1.5	ND [8.5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
NO DETECTED COMPOUNDS		NA

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Pesticides, PCBs, Explosive Compounds, and Dioxins/Furans in Sediment Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SD01	46SD01	46SD02	46SD02	46SD03	46SD03	46SD04	46SD04	46SD05
Sample Number:	46SD01	46SD01	46SD02	46SD02FD	46SD03	46SD03	46SD04	46SD04	46SD05
Date Sampled:	11/09/1998	12/03/1998	11/09/1998	11/09/1998	11/10/1998	12/03/1998	11/10/1998	12/07/1998	11/10/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
NO DETECTED COMPOUNDS	NA			NA	NA		NA		
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	NA	ND [58] U	690 J	NA	NA	280	NA	24	ND [47] U
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	49.095	NA	NA	NA	NA	NA	7.174
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	5.397	NA	NA	NA	NA	NA	0.795
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	2.806	NA	NA	NA	NA	NA	0.494
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	1.986	NA	NA	NA	NA	NA	ND [0.198] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	1.712	NA	NA	NA	NA	NA	ND [0.189] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	1.058	0.921	NA	NA	NA	NA	ND [0.114] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	105.51	NA	NA	NA	NA	NA	15.867
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	ND [0.461] U	NA	NA	NA	NA	NA	1.624
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	1.986	NA	NA	NA	NA	NA	2.67
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	8.713	NA	NA	NA	NA	NA	1.145
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	777.512	NA	NA	NA	NA	NA	137.519
OCTACHLORODIBENZOFURAN	NA	NA	16.593	NA	NA	NA	NA	NA	1.509
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	2.105	NA	NA	NA	NA	NA	ND [0.111] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	4.329	NA	NA	NA	NA	NA	ND [0.114] U
EXPLOSIVES - UNITS: UG/KG									
NITROBENZENE	ND [100] U	NA	1100:*	NA	ND [100] U	NA	ND [100] U	NA	ND [100] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [100] U	NA	ND [100] U	NA	ND [100] U	NA	ND [100] U	NA	ND [100] U

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Pesticides, PCBs, Explosive Compounds, and Dioxins/Furans in Sediment Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SD06	46SD06	46SD07	46SD07	46SD08	46SD08	LHS-2-01	LHS-2-02	LHS-2-03
Sample Number:	46SD06	46SD06	46SD07	46SD07	46SD08	46SD08	LHS-2-01	LHS-2-02	LHS-2-03
Date Sampled:	11/10/1998	12/03/1998	11/10/1998	12/03/1998	11/10/1998	12/03/1998	01/09/1995	01/09/1995	01/09/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
NO DETECTED COMPOUNDS			NA		NA		NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	ND [74] U	ND [35] U	NA	ND [35] U	NA	ND [54] U	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG									
NITROBENZENE	ND [100] U	NA	ND [100] U	NA	ND [100] U	NA	ND [230] U	ND [240] U	ND [240] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [100] U	NA	ND [100] U	NA	ND [100] U	NA	ND [2000] U	ND [2100] U	ND [2000] U

0027943

Pesticides, PCBs, Explosive Compounds, and Dioxins/Furans in Sediment Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-2-04	LHS-2-05	LHS-2-06	LHS-2-07	LHS-2-08	LHS-2-09	LHS-2-10	LHS-2-11	LHS-2-12
Sample Number:	LHS-2-04	LHS-2-05	LHS-2-06	LHS-2-07	LHS-2-08	LHS-2-09	LHS-2-10	LHS-2-11	LHS-2-12
Date Sampled:	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/11/1995	01/11/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG									
NITROBENZENE	ND [250] U	ND [250] U	ND [250] U	ND [250] U	ND [240] U	ND [240] U	ND [230] U	ND [230] U	ND [240] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [2100] U	ND [2100] U	ND [2100] U	ND [2100] U	ND [2100] U	ND [2000] U	ND [1900] U	ND [2000] U	ND [2000] U

027944

Pesticides, PCBs, Explosive Compounds, and Dioxins/Furans in Sediment Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHS-2-13	LHS-2-14	LHS-2-15	LHS-2-16	LHS-2-17	LHS-2-18	LHS-2-19
Sample Number:	LHS-2-13	LHS-2-14	LHS-2-15	LHS-2-16	LHS-2-17	LHS-2-18	LHS-2-19
Date Sampled:	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NITROBENZENE	ND [260] U	ND [250] U	ND [260] U	ND [260] U	ND [250] U	ND [240] U	ND [230] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [2200] U	3000	ND [2200] U	ND [2200] U	ND [2100] U	ND [2000] U	ND [2000] U

0027945

0027945

Metals in Sediment Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SD01	46SD02	46SD02	46SD03	46SD04	46SD05	46SD06	46SD07	46SD08
Sample Number:	46SD01	46SD02	46SD02LFD	46SD03	46SD04	46SD05	46SD06	46SD07	46SD08
Date Sampled:	11/09/1998	11/09/1998	11/09/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG									
ALUMINUM	8400000	16000000	16000000	12000000	9300000	5300000	11000000	10000000	6900000
ANTIMONY	ND [8510] UJ	ND [14100] UJ	ND [70400] UJ	ND [14800] UJ	ND [10900] UJ	ND [8400] UJ	ND [13300] UJ	ND [7860] UJ	ND [10200] UJ
ARSENIC	10600	11000	12500	10600	2890	9320	17600	4570	5010
BARIUM	260000	91000	ND [230000] U	71000	140000	110000	290000	75000	45000
BERYLLIUM	853	ND [1170] U	ND [5870] U	ND [1240] U	ND [907] U	836	ND [1110] U	ND [655] U	ND [847] U
CADMIUM	ND [709] U	ND [1170] U	ND [5870] U	ND [1240] U	ND [907] U	ND [700] U	ND [1110] U	ND [655] U	ND [847] U
CALCIUM	750000	3200000	ND [5900000] U	ND [1200000] U	2100000	850000	1200000	1500000	ND [850000] U
CHROMIUM, TOTAL	22000	21000	21000	20000	29000	25000	19000	15000	13000
COBALT	13000	ND [12000] U	ND [59000] U	ND [12000] U	ND [9100] U	ND [7000] U	ND [11000] U	7200	ND [8500] U
COPPER	4260	14000	ND [29300] U	8470	16100	10300	51800	5900	9330
IRON	29000000	21000000	21000000	14000000	8400000	24000000	20000000	15000000	11000000
LEAD	33400	37300	49700	15400	18100	9480	25800	7510	9840
MAGNESIUM	ND [710000] U	ND [1200000] U	ND [5900000] U	ND [1200000] U	ND [910000] U	ND [700000] U	ND [1100000] U	1100000	ND [850000] U
MANGANESE	649000 J	235000 J	238000 J	38800 J	160000 J	90800 J	68000 J	196000 J	80900 J
MERCURY	ND [140] U	ND [230] U	NA	ND [250] U	ND [180] U	ND [140] U	ND [220] U	ND [130] U	ND [170] U
NICKEL	ND [5700] U	ND [9400] U	ND [47000] U	ND [9900] U	ND [7200] U	ND [5600] U	ND [8800] U	ND [5200] U	ND [6800] U
POTASSIUM	840000 J	ND [1200000] UJ	ND [5900000] UJ	ND [1200000] UJ	1100000 J	720000 J	1500000 J	1100000 J	ND [850000] UJ
SELENIUM	5690	ND [2350] U	ND [11700] U	ND [2480] U	ND [1810] U	4750	3490	2940	ND [1690] U
SILVER	ND [1400] U	ND [2300] U	ND [12000] U	ND [2500] U	ND [1800] U	ND [1400] U	ND [2200] U	ND [1300] U	ND [1700] U
SODIUM	ND [710000] U	2100000	ND [5900000] U	ND [1200000] U	1400000	ND [700000] U	1700000	ND [660000] U	ND [850000] U
STRONTIUM	ND [7100] U	ND [12000] U	ND [59000] U	ND [12000] U	ND [9100] U	ND [7000] U	ND [11000] U	7000	ND [8500] U
THALLIUM	ND [709] U	ND [1170] U	ND [5870] U	ND [1240] U	ND [907] U	ND [700] U	ND [1110] U	ND [655] U	ND [847] U
VANADIUM	48000	35000	ND [59000] U	31000	19000	53000	27000	29000	21000
ZINC	87000	760000	770000	170000	480000	120000	550000	78000	220000

000256

027946

Anions and Physical Properties of Sediment Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SD01	46SD02	46SD03	46SD04	46SD05	46SD06	46SD07	46SD08
Sample Number:	46SD01	46SD02	46SD03	46SD04	46SD05	46SD06	46SD07	46SD08
Date Sampled:	11/09/1998	11/09/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/KG								
CYANIDE	ND [709.4] UJ	ND [1175] UJ	ND [1192] UJ	ND [908.1] UJ	ND [700.2] UJ	ND [1106] UJ	ND [655] UJ	ND [848] UJ
PHYSICAL PROPERTIES - UNITS: MG/KG								
TOTAL ORGANIC CARBON	28400	58500	383000	254000	528000 J	497000	420000	441000

027947

VOCs and SVOCs in Surface Water Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SW01	46SW02	46SW03	46SW04	46SW05	46SW06	46SW07	46SW08
Sample Number:	46SW01	46SW02	46SW03	46SW04	46SW05	46SW06	46SW07	46SW08
Date Sampled:	11/09/1998	11/09/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
NO DETECTED COMPOUNDS								
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
NO DETECTED COMPOUNDS								

0027948
0027948

Pesticides, PCBs, Dioxins/Furans, and Explosives in Surface Water Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SW01	46SW01	46SW02	46SW02	46SW03	46SW03	46SW04	46SW04	46SW05	46SW05
Sample Number:	46SW01	46SW01	46SW02	46SW02FD	46SW03	46SW03	46SW04	46SW04	46SW05	46SW05FD
Date Sampled:	11/09/1998	12/03/1998	11/09/1998	11/09/1998	11/10/1998	12/03/1998	11/10/1998	12/07/1998	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L										
NO DETECTED COMPOUNDS	NA			NA	NA		NA			NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L										
NO DETECTED COMPOUNDS	NA			NA	NA		NA			NA
DIOXINS AND FURANS - UNITS: PG/L										
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	ND [1.665] U	ND [0.923] U	NA	NA	NA	NA	6.258 J	4.717 J
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	ND [1.665] U	ND [0.923] U	NA	NA	NA	NA	13.618	4.717
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	41.673 J	49.511	NA	NA	NA	NA	185.432 J	86.445
EXPLOSIVES - UNITS: UG/L										
3-NITROTOLUENE	3.6	NA	ND [0.26] U	NA	ND [0.26] U	NA	ND [0.26] U	NA	ND [0.26] U	NA

000329

027949

Pesticides, PCBs, Dioxins/Furans, and Explosives in Surface Water Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SW06	46SW06	46SW07	46SW07	46SW08	46SW08
Sample Number:	46SW06	46SW06	46SW07	46SW07	46SW08	46SW08
Date Sampled:	11/10/1998	12/03/1998	11/10/1998	12/03/1998	11/10/1998	12/03/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L						
NO DETECTED COMPOUNDS	NA		NA		NA	
POLYCHLORINATED BIPHENYLS - UNITS: UG/L						
NO DETECTED COMPOUNDS	NA		NA		NA	
DIOXINS AND FURANS - UNITS: PG/L						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L						
3-NITROTOLUENE	ND [0.26] U	NA	ND [0.26] U	NA	ND [0.26] U	NA

000230

027950

Metals in Surface Water Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SW01	46SW02	46SW02	46SW03	46SW04	46SW05	46SW06	46SW07	46SW08
Sample Number:	46SW01	46SW02	46SW02AFD	46SW03	46SW04	46SW05	46SW06	46SW07	46SW08
Date Sampled:	11/09/1998	11/09/1998	11/09/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L									
ALUMINUM	210000	480	2200	ND [200] U	2000	4200	3100	670	270
ANTIMONY	ND [5] U	ND [5] U	454	7	ND [5] U	37	5	8	ND [5] U
ARSENIC	66	ND [10] U	1880	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
BARIUM	3300	ND [200] U	2300	ND [200] U	ND [200] U	ND [200] U	200	ND [200] U	ND [200] U
BERYLLIUM	11.9	ND [0.5] U	51.3	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U
CADMIUM	6.7	ND [0.8] U	50	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U
CALCIUM	58000	18000	18000	13000	8700	7700	6900	9000	11000
CHROMIUM, TOTAL	230 J	ND [10] UJ	200 J	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
COBALT	120	ND [50] U	530	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
COPPER	106	ND [25] U	241	ND [25] U	ND [25] U	52	ND [25] U	ND [25] U	ND [25] U
IRON	220000 J	830 J	1900 J	390	2200	4400	2800	900	500
LEAD	292	ND [3] U	511	ND [3] U	8	ND [3] U	3	5	4
MAGNESIUM	13000	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U
MANGANESE	11800	90	631	137	99	38	47	44	143
MERCURY	ND [0.2] U	ND [0.2] U	NA	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	110	ND [40] U	510	ND [40] U	ND [40] U	ND [40] U	ND [40] U	ND [40] U	ND [40] U
POTASSIUM	17000	ND [5000] U	ND [5000] U	ND [5000] UJ	ND [5000] UJ	ND [5000] UJ	ND [5000] UJ	ND [5000] UJ	ND [5000] UJ
SELENIUM	ND [5] U	ND [5] U	1960	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SILVER	ND [10] U	ND [10] U	50	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	9600	5800	6800	8500	ND [5000] U	ND [5000] U	ND [5000] U	5300	7100
STRONTIUM	290	70	70	50	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
THALLIUM	2.4 J	1.9 J	44.3	1.4	ND [1] U	1.1	1.1	1.3	ND [1] U
TIN	ND [100] U	ND [100] U	590	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
VANADIUM	480	ND [50] U	490	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
ZINC	3300	40	560	270	290	140	430	240	400

027951

027951

Anions and Physical Properties of Surface Water Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46SW01	46SW02	46SW03	46SW04	46SW05	46SW06	46SW07	46SW08
Sample Number:	46SW01	46SW02	46SW03	46SW04	46SW05	46SW06	46SW07	46SW08
Date Sampled:	11/09/1998	11/09/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L								
CYANIDE	ND [10] UJ	ND [10] UJ	ND [10] UJ	ND [10] UJ	ND [10] UJ	ND [10] UJ	ND [10] UJ	ND [10] UJ
PHYSICAL PROPERTIES - UNITS: MG/L								
HARDNESS (AS CaCO3)	68	72	60	36	38	60	42	54

027952

VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46WW01	46WW01	46WW02	46WW03	46WW04	LHSMW08	LHSMW08	LHSMW08	LHSMW09
Sample Number:	46WW01	46WW01	46WW02	46WW03	46WW04	LHS-MW-08	LHS-MW-8	LHS-MW-08	LHS-MW-09
Date Sampled:	10/01/1998	11/07/1998	11/06/1998	11/06/1998	11/07/1998	05/13/1998	08/13/1996	12/03/1994	05/14/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	0.63	ND [1] U	ND [1] U	ND [1] U	0.58	ND [5] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
ACETONE	ND [5] U	ND [5] U	ND [5] U	6.5 U	ND [5] U	ND [5] U	NA	ND [10] U	ND [5] U
CARBON DISULFIDE	0.78	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	ND [5] U	ND [1] U
CHLOROFORM	ND [1] U	ND [1] U	0.54	69	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	5.4
ISOPROPYLBENZENE (CUMENE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	12 U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	NA	ND [10] U	ND [5] U
METHYLENE CHLORIDE	ND [1] U	ND [1] U	0.88	1.4	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U
SEC-BUTYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	ND [5] U	NA
TRICHLOROETHYLENE (TCE)	6.6	ND [1] U	24	ND [1] U	0.71	ND [1] U	ND [0.25] U	NA	ND [1] U
TRICHLOROFLUOROMETHANE	ND [2] U	ND [2] U	ND [2] U	ND [2] U	ND [2] U	ND [2] U	ND [1] U	NA	ND [2] U
VINYL CHLORIDE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U
cis-1,2-DICHLOROETHYLENE	1.2	ND [1] U	1	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
n-BUTYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
n-PROPYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
t-BUTYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	NA	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [0.84] U	ND [10] U	ND [10] U
DI-n-BUTYL PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [0.63] U	ND [10] U	ND [10] U
PHENOL	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [0.89] U	ND [10] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	27	25	ND [10] U	ND [10] U	ND [0.92] U	2 J	ND [10] U

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW09	LHSMW09	LHSMW10	LHSMW10	LHSMW10	LHSMW10	LHSMW11	LHSMW11	LHSMW11
Sample Number:	LHS-MW-9	LHS-MW-09	MW-10	LHS-MW-10	LHS-MW-10	LHS-MW-10	LHS-MW-11	LHS-MW-11	LHS-MW-11
Date Sampled:	08/15/1996	12/03/1994	02/09/1996	05/14/1998	08/13/1996	12/03/1994	05/14/1998	08/13/1996	12/02/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U
1,2,4-TRICHLOROBENZENE	0.61	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [0.32] U	NA
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA
ACETONE	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	ND [5] U	NA	ND [10] U
CARBON DISULFIDE	NA	7	NA	ND [1] U	NA	ND [5] U	ND [1] U	NA	ND [5] U
CHLOROFORM	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [0.2] U	ND [5] U
DICHLORODIFLUOROMETHANE	3.2	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [0.36] U	ND [20] U
ISOPROPYLBENZENE (CUMENE)	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA
METHYL ETHYL KETONE (2-BUTANONE)	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	ND [5] U	NA	ND [10] U
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [0.22] U	ND [5] U
NAPHTHALENE	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1.3] U	NA
SEC-BUTYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA
TETRACHLOROETHYLENE(PCE)	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [0.25] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	NA	ND [5] U	NA	NA	NA	ND [5] U	NA	NA	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [0.25] U	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [0.25] U	NA
TRICHLOROFLUOROMETHANE	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [2] U	ND [1] U	NA
VINYL CHLORIDE	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [0.24] U	NA
cis-1,2-DICHLOROETHYLENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA
n-BUTYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA
n-PROPYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA
t-BUTYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [0.2] U	NA
trans-1,2-DICHLOROETHENE	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [0.29] U	NA
1,1-DICHLOROETHANE	ND	NA	ND [1] U	ND	ND	NA	ND	ND	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [10] U	ND [0.84] U	ND [10] U
DI-n-BUTYL PHTHALATE	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [10] U	ND [0.63] U	ND [10] U
PHENOL	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	0.62 J	ND [10] U	ND [0.92] U	2 J	13 U	ND [0.92] U	21

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW12	LHSMW12	LHSMW12	LHSMW13	LHSMW13	LHSMW13	LHSMW13	LHSMW14	LHSMW14
Sample Number:	LHS-MW-12	LHS-MW-12	LHS-MW-12	MW-13	LHS-MW-13	LHS-MW-13	LHS-MW-13	MW-14	LHS-MW-14
Date Sampled:	05/14/1998	08/13/1996	12/02/1994	02/06/1996	05/14/1998	08/15/1996	12/02/1994	02/06/1996	05/14/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
ACETONE	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U
CARBON DISULFIDE	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U
CHLOROFORM	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U
ISOPROPYLBENZENE (CUMENE)	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U
METHYLENE CHLORIDE	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U
SEC-BUTYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	ND [5] U	NA	NA	NA	ND [5] U	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U
TRICHLOROFLUOROMETHANE	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U
VINYL CHLORIDE	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
n-BUTYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
n-PROPYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
t-BUTYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	ND	ND	NA	ND [1] U	ND	ND	NA	ND [1] U	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U
DI-n-BUTYL PHTHALATE	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U
PHENOL	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	9.4 U	ND [0.92] U	1 J	ND [0.92] U	10 U:	ND [0.92] U	ND [10] U	2.1	11 U

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW14	LHSMW14	LHSMW15	LHSMW15	LHSMW15	LHSMW15	LHSMW16	LHSMW16	LHSMW16
Sample Number:	LHS-MW-14	LHS-MW-14	MW-15	LHS-MW-15	LHS-MW-15	LHS-MW-15	MW-16	LHS-MW-16	LHS-MW-16
Date Sampled:	08/14/1996	11/29/1994	02/06/1996	05/14/1998	08/15/1996	12/03/1994	02/06/1996	05/14/1998	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
1,2,4-TRICHLOROBENZENE	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
ACETONE	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA
CARBON DISULFIDE	NA	ND [5] U	NA	ND [1] U	NA	1 J	NA	ND [1] U	NA
CHLOROFORM	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
DICHLORODIFLUOROMETHANE	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U
ISOPROPYLBENZENE (CUMENE)	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
METHYL ETHYL KETONE (2-BUTANONE)	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U
NAPHTHALENE	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U
SEC-BUTYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
TETRACHLOROETHYLENE(PCE)	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U
TOTAL 1,2-DICHLOROETHENE	NA	ND [5] U	NA	NA	NA	ND [5] U	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U	ND [0.25] U
TRICHLOROFLUOROMETHANE	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U
VINYL CHLORIDE	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U
cis-1,2-DICHLOROETHYLENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
n-BUTYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
n-PROPYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
t-BUTYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
trans-1,2-DICHLOROETHENE	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U
1,1-DICHLOROETHANE	ND	NA	ND [1] U	ND	ND	NA	ND [1] U	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U
DI-n-BUTYL PHTHALATE	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	1 J	ND [0.63] U	ND [10] U	ND [0.63] U
PHENOL	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	ND [0.92] U	6.3 U	ND [0.92] U	ND [10] U	ND [0.92] U	16 U	ND [0.92] U

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW16	LHSMW17	LHSMW17	LHSMW17	LHSMW17	LHSMW17	LHSMW17	LHSMW18	LHSMW18
Sample Number:	LHS-MW-16	MW-17	LHS-MW-17	LHSMW17D	LHSMW17	LHS-MW-17	LHS-MW-17	MW-18	LHS-MW-18
Date Sampled:	11/29/1994	02/12/1996	05/14/1998	05/24/2000	05/24/2000	08/15/1996	12/02/1994	02/12/1996	05/14/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [5] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	3.8
1,2,4-TRICHLOROBENZENE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
ACETONE	ND [10] U	NA	ND [5] U	ND [5] U	ND [5] U	NA	ND [10] U	NA	ND [5] U
CARBON DISULFIDE	ND [5] U	NA	ND [1] U	NA	NA	NA	ND [5] U	NA	ND [1] U
CHLOROFORM	ND [5] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [20] U	ND [1] U	ND [1] U	ND [2] U	ND [2] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U
ISOPROPYLBENZENE (CUMENE)	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [10] U	NA	ND [5] U	ND [5] U	ND [5] U	NA	ND [10] U	NA	ND [5] U
METHYLENE CHLORIDE	ND [5] U	ND [1] U	ND [1] U	ND [2] U	ND [2] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U
NAPHTHALENE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U
SEC-BUTYLBENZENE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	1.1
TOTAL 1,2-DICHLOROETHENE	ND [5] U	NA	NA	NA	NA	NA	ND [5] U	NA	NA
TRICHLOROETHYLENE (TCE)	ND [5] U	ND [1] U	ND [1] U	1	ND [1] U	ND [0.25] U	NA	21	38
TRICHLOROFLUOROMETHANE	NA	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	NA	ND [1] U	ND [2] U
VINYL CHLORIDE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	0.71
cis-1,2-DICHLOROETHYLENE	NA	ND [1] U	ND [1] U	12 J	ND [1] U	ND [0.2] U	NA	4.5	9.8
n-BUTYLBENZENE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
n-PROPYLBENZENE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
t-BUTYLBENZENE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.29] U	NA	6.5	12
1,1-DICHLOROETHANE	NA	ND [1] U	ND	ND	ND	ND	NA	1.7	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	1 J	ND [0.84] U	ND [10] U	NA	NA	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U
DI-n-BUTYL PHTHALATE	ND [10] U	ND [0.63] U	ND [10] U	NA	NA	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U
PHENOL	ND [10] U	ND [0.89] U	ND [10] U	NA	NA	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	2 J	0.47 J	11 U	NA	NA	ND [0.92] U	1 J	ND [0.92] U	9.6 U

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW18	LHSMW18	LHSMW19	LHSMW19	LHSMW19	LHSMW19	LHSMW20	LHSMW20	LHSMW20
Sample Number:	LHS-MW-18	LHS-MW-18	MW-19	LHS-MW-19	LHS-MW-19	LHS-MW-19	MW-20	LHS-MW-20	LHS-MW-20
Date Sampled:	08/15/1996	12/02/1994	02/06/1996	05/15/1998	08/15/1996	12/02/1994	02/07-08/1996	05/15/1998	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	3.2	2 J	ND [3] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
1,2,4-TRICHLOROBENZENE	ND [0.32] U	NA	ND [3] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	ND [3] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	0.31
ACETONE	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA
CARBON DISULFIDE	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA
CHLOROFORM	ND [0.2] U	ND [5] U	ND [3] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
DICHLORODIFLUOROMETHANE	ND [0.36] U	ND [20] U	ND [3] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U
ISOPROPYLBENZENE (CUMENE)	ND [0.2] U	NA	ND [3] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
METHYL ETHYL KETONE (2-BUTANONE)	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	ND [3] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U
NAPHTHALENE	ND [1.3] U	NA	ND [3] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U
SEC-BUTYLBENZENE	ND [0.2] U	NA	ND [3] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
TETRACHLOROETHYLENE(PCE)	1.3	ND [5] U	ND [3] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U
TOTAL 1,2-DICHLOROETHENE	NA	4 J	NA	NA	NA	ND [5] U	NA	NA	NA
TRICHLOROETHYLENE (TCE)	27.5	NA	77	70	47.1	NA	ND [1] U	ND [1] U	ND [0.25] U
TRICHLOROFLUOROMETHANE	ND [1] U	NA	ND [3] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U
VINYL CHLORIDE	0.68	NA	ND [3] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U
cis-1,2-DICHLOROETHYLENE	6.1	NA	ND [3] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
n-BUTYLBENZENE	ND [0.2] U	NA	ND [3] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
n-PROPYLBENZENE	ND [0.2] U	NA	ND [3] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
t-BUTYLBENZENE	ND [0.2] U	NA	ND [3] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
trans-1,2-DICHLOROETHENE	9.4	NA	ND [3] U	0.58	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U
1,1-DICHLOROETHANE	ND	NA	ND [3] U	ND	ND	NA	ND [1] U	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U
DI-n-BUTYL PHTHALATE	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U
PHENOL	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	3.5	ND [10] U	ND [0.92] U	3 J	2.3	ND [10] U	ND [0.92] U

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW20	LHSMW21	LHSMW21	LHSMW21	LHSMW21	LHSMW22	LHSMW22	LHSMW22	LHSMW22
Sample Number:	LHS-MW-20	MW-21	LHS-MW-21	LHS-MW-21	LHS-MW-21	MW-22	LHS-MW-22	LHS-MW-22	LHS-MW-22
Date Sampled:	12/04/1994	02/07/1996	05/15/1998	08/15/1996	12/04/1994	02/07/1996	05/15/1998	08/15/1996	12/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	1.2	0.78	ND [5] U
1,2,4-TRICHLOROBENZENE	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U	NA
1,2,4-TRIMETHYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
ACETONE	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U
CARBON DISULFIDE	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U
CHLOROFORM	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
DICHLORODIFLUOROMETHANE	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U
ISOPROPYLBENZENE (CUMENE)	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
METHYL ETHYL KETONE (2-BUTANONE)	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U
METHYLENE CHLORIDE	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U
NAPHTHALENE	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA
SEC-BUTYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	1.0	2.4	1.9	ND [5] U
TOTAL 1,2-DICHLOROETHENE	ND [5] U	NA	NA	NA	ND [5] U	NA	NA	NA	ND [5] U
TRICHLOROETHYLENE (TCE)	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U	3.1	1.7	NA
TRICHLOROFLUOROMETHANE	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U	NA
VINYL CHLORIDE	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA
cis-1,2-DICHLOROETHYLENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	1.1	0.54	NA
n-BUTYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
n-PROPYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
t-BUTYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
trans-1,2-DICHLOROETHENE	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	1.0	3.5	1.9	NA
1,1-DICHLOROETHANE	NA	ND [1] U	ND	ND	NA	4.0	ND	ND	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	1 J
DI-n-BUTYL PHTHALATE	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U
PHENOL	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	2.7	ND [10] U	ND [0.92] U	4 J	2.4	ND [10] U	ND [0.92] U	4 J

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW23	LHSMW23	LHSMW23	LHSMW23	LHSMW24	LHSMW24	LHSMW24	LHSMW24	LHSMW25
Sample Number:	MW-23	LHS-MW-23	LHS-MW-23	LHS-MW-23	MW-24	LHS-MW-24	LHS-MW-24	LHS-MW-24	MW-25
Date Sampled:	02/06/1996	05/15/1998	08/15/1996	12/04/1994	02/07/1996	05/15/1998	08/20/1996	12/04/1994	02/07/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	0.23 J	NA	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
ACETONE	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA
CARBON DISULFIDE	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA
CHLOROFORM	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U
ISOPROPYLBENZENE (CUMENE)	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA
METHYLENE CHLORIDE	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U
SEC-BUTYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	ND [5] U	NA	NA	NA	ND [5] U	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	1.3	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U
TRICHLOROFLUOROMETHANE	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U
VINYL CHLORIDE	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
n-BUTYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
n-PROPYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
t-BUTYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U
1,1-DICHLOROETHANE	ND [1] U	ND	ND	NA	ND [1] U	ND	ND	NA	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U
DI-n-BUTYL PHTHALATE	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U
PHENOL	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U
bis(2-ETHYLHEXYL) PHTHALATE	2.8	ND [10] U	ND [0.92] U	ND [10] U	3	ND [10] U	ND [0.92] U	3 J	2.3

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW25	LHSMW25	LHSMW25	LHSMW26	LHSMW26	LHSMW26	LHSMW26	LHSMW27	LHSMW27
Sample Number:	LHS-MW-25	LHS-MW-25	LHS-MW-25	MW-26	LHS-MW-26	LHS-MW-26	LHS-MW-26	MW-27	LHS-MW-27
Date Sampled:	05/15/1998	08/20/1996	12/04/1994	02/12/1996	05/15/1998	08/20/1996	12/04/1994	02/08/1996	05/15/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
ACETONE	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U
CARBON DISULFIDE	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U
CHLOROFORM	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U
ISOPROPYLBENZENE (CUMENE)	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	3.3	NA	ND [1] U	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U
METHYLENE CHLORIDE	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	1.1 J	NA	ND [1] U	ND [1] U
SEC-BUTYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	1.9	NA	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	ND [5] U	NA	NA	NA	ND [5] U	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U
TRICHLOROFLUOROMETHANE	ND [2] U	2.1	NA	ND [1] U	ND [2] U	2.1	NA	ND [1] U	ND [2] U
VINYL CHLORIDE	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
n-BUTYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	1	NA	ND [1] U	ND [1] U
n-PROPYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	4.4	NA	ND [1] U	ND [1] U
t-BUTYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	0.29	NA	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	ND	ND	NA	ND [1] U	ND	ND	NA	ND [1] U	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U	ND [0.84] U	ND [10] U
DI-n-BUTYL PHTHALATE	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U	ND [0.63] U	ND [10] U
PHENOL	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U	ND [0.89] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [0.92] U	2 J	ND [0.92] U	ND [10] U	ND [0.92] U	ND [10] U	ND [0.92] U	ND [10] U

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW27	LHSMW27	MW-14	MW-14	MW-14	MW-14	MW-18	MW-18	MW-18
Sample Number:	LHS-MW-27	LHS-MW-27	MW-14	MW-14	MW-14FD	MW-14REFD	MW-18D	MW-18DRA1FD	MW-18
Date Sampled:	08/20/1996	12/03/1994	03/13/1999	07/23/1998	07/23/1998	07/23/1998	05/23/2000	05/23/2000	05/23/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1-DICHLOROETHENE	ND [0.2] U	ND [5] U	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [0.32] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
ACETONE	NA	ND [10] U	ND [100] U	NA	ND [1000] U	NA	ND [5] UJ	ND [500] U	ND [5] U
CARBON DISULFIDE	NA	ND [5] U	ND [20] U	NA	ND [200] U	NA	NA	NA	NA
CHLOROFORM	ND [0.2] U	ND [5] U	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [0.36] U	ND [20] U	ND [20] U	NA	ND [200] U	NA	ND [2] UJ	ND [200] U	ND [2] U
ISOPROPYLBENZENE (CUMENE)	ND [0.2] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	NA	ND [10] U	ND [100] U	NA	ND [1000] U	NA	ND [5] UJ	ND [500] U	ND [5] U
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	ND [20] U	NA	13000	NA	ND [2] UJ	ND [200] U	ND [2] U
NAPHTHALENE	ND [1.3] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
SEC-BUTYLBENZENE	ND [0.2] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [0.25] U	ND [5] U	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	ND [5] U	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [0.25] U	NA	770	NA	1400	NA	ND [1] UJ	ND [100] U	ND [1] U
TRICHLOROFLUOROMETHANE	2.1	NA	ND [40] U	NA	ND [400] U	NA	ND [1] UJ	ND [100] U	ND [1] U
VINYL CHLORIDE	ND [0.24] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [0.2] U	NA	250	NA	320	NA	3.4 J	ND [100] U	ND [1] U
n-BUTYLBENZENE	ND [0.2] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
n-PROPYLBENZENE	ND [0.2] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
t-BUTYLBENZENE	ND [0.2] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [0.29] U	NA	ND [20] U	NA	ND [200] U	NA	ND [1] UJ	ND [100] U	ND [1] U
1,1-DICHLOROETHANE	ND	NA	ND	NA	ND	NA	ND	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
BENZO(g,h,i)PERYLENE	ND [0.84] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	NA	NA
DI-n-BUTYL PHTHALATE	ND [0.63] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	NA	NA
PHENOL	ND [0.89] U	ND [10] U	NA	12	NA	10	NA	NA	NA
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	NA	ND [10] U	NA	9.2	NA	NA	NA

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VOCs and SVOCs in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	MW-18	MW-19	MW-19	MW-19
Sample Number:	MW-18	MW-19D	MW-19	MW-19
Date Sampled:	07/21/1998	05/23/2000	05/23/2000	07/23/1998
Depth (ft.):	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L				
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
ACETONE	ND [5] U	ND [5] U	ND [5] U	ND [5] U
CARBON DISULFIDE	ND [1] U	NA	NA	ND [1] U
CHLOROFORM	ND [1] U	ND [1] U	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [2] U	ND [2] U	ND [1] U
ISOPROPYLBENZENE (CUMENE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [5] U	ND [5] U	ND [5] U	ND [5] U
METHYLENE CHLORIDE	ND [1] U	ND [2] U	ND [2] U	2.9
NAPHTHALENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
SEC-BUTYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	6.7	9.8	3.9
TRICHLOROFLUOROMETHANE	ND [2] U	ND [1] U	ND [1] U	ND [2] U
VINYL CHLORIDE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	ND [1] UJ	ND [1] U
n-BUTYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
n-PROPYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
t-BUTYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	ND	ND	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L				
BENZO(g,h,i)PERYLENE	NA	NA	NA	NA
DI-n-BUTYL PHTHALATE	NA	NA	NA	NA
PHENOL	NA	NA	NA	NA
bis(2-ETHYLHEXYL) PHTHALATE	NA	NA	NA	NA

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46WW01	46WW01	46WW01	46WW01	46WW02	46WW03	46WW04	LHSMW08	LHSMW08
Sample Number:	46WW01	46WW01REFD	46WW01	46WW01REFD	46WW02	46WW03	46WW04	LHS-MW-08	LHS-MW-8
Date Sampled:	10/01/1998	10/01/1998	11/07/1998	11/07/1998	11/06/1998	11/06/1998	11/07/1998	05/13/1998	08/13/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA		NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA		NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	ND [2.73] U	NA	6.54	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ND [2.475] U	NA	ND [0.834] U	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [3.026] U	NA	ND [1.008] U	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	8.154	NA	15.32	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [2.475] U	NA	ND [0.834] U	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	ND [2.017] U	NA	ND [0.973] U	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	224.423	NA	188.293	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	ND [4.295] U	NA	ND [5.108] U	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [1.3] U	ND [0.13] U
2,4-DINITROTOLUENE	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [1.3] U	ND [0.13] U
2-NITROTOLUENE	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
4-NITROTOLUENE	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
NITROBENZENE	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [1.3] U	ND [0.13] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW08	LHSMW09	LHSMW09	LHSMW09	LHSMW10	LHSMW10	LHSMW10	LHSMW10	LHSMW11
Sample Number:	LHS-MW-08	LHS-MW-09	LHS-MW-9	LHS-MW-09	MW-10	LHS-MW-10	LHS-MW-10	LHS-MW-10	LHS-MW-11
Date Sampled:	12/03/1994	05/14/1998	08/15/1996	12/03/1994	02/09/1996	05/14/1998	08/13/1996	12/03/1994	05/14/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [0.12] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [1.3] U
2,4-DINITROTOLUENE	ND [0.12] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [1.3] U
2-NITROTOLUENE	ND [0.5] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.17 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [2.6] U
3-NITROTOLUENE	ND [0.5] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [2.6] U
4-NITROTOLUENE	ND [1.5] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [2.6] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.54] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [1.3] U
NITROBENZENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [1.3] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW11	LHSMW11	LHSMW12	LHSMW12	LHSMW12	LHSMW13	LHSMW13	LHSMW13	LHSMW13
Sample Number:	LHS-MW-11	LHS-MW-11	LHS-MW-12	LHS-MW-12	LHS-MW-12	MW-13	LHS-MW-13	LHS-MW-13	LHS-MW-13
Date Sampled:	08/13/1996	12/02/1994	05/14/1998	08/13/1996	12/02/1994	02/06/1996	05/14/1998	08/15/1996	12/02/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
3-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-NITROTOLUENE	ND [0.26] U	ND [1.5] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [0.54] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
NITROBENZENE	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW14	LHSMW14	LHSMW14	LHSMW14	LHSMW15	LHSMW15	LHSMW15	LHSMW15	LHSMW16
Sample Number:	MW-14	LHS-MW-14	LHS-MW-14	LHS-MW-14	MW-15	LHS-MW-15	LHS-MW-15	LHS-MW-15	MW-16
Date Sampled:	02/06/1996	05/14/1998	08/14/1996	11/29/1994	02/06/1996	05/14/1998	08/15/1996	12/03/1994	02/06/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U
2,4-DINITROTOLUENE	0.067 J	ND [1.3] U	ND [0.13] U	ND [0.12] U	0.073 J	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U
3-NITROTOLUENE	0.13 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.15 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U
4-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	0.32	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW16	LHSMW16	LHSMW16	LHSMW17	LHSMW17	LHSMW17	LHSMW17	LHSMW18	LHSMW18
Sample Number:	LHS-MW-16	LHS-MW-16	LHS-MW-16	MW-17	LHS-MW-17	LHS-MW-17	LHS-MW-17	MW-18	LHS-MW-18
Date Sampled:	05/14/1998	08/15/1996	11/29/1994	02/12/1996	05/14/1998	08/15/1996	12/02/1994	02/12/1996	05/14/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U
2,4-DINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U
2-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U
3-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U
4-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [1.3] U	ND [0.26] U	ND [0.54] U	0.19 J	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U
NITROBENZENE	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW18	LHSMW18	LHSMW19	LHSMW19	LHSMW19	LHSMW19	LHSMW19	LHSMW20	LHSMW20
Sample Number:	LHS-MW-18	LHS-MW-18	MW-19	LHS-MW-19	LHS-MW-19	LHS-MW-19	LHS-MW-19	MW-20	LHS-MW-20
Date Sampled:	08/15/1996	12/02/1994	02/06/1996	05/15/1998	08/15/1996	08/26/1998	12/02/1994	02/07/1996	05/15/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA		NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA		NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	ND [5.47] U	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	ND [2.596] U	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	ND [2.247] U	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	ND [5.47] U	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	ND [2.596] U	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	ND [1.498] U	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	39.002	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	ND [5.054] U	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	NA	ND [0.12] U	ND [0.13] U	ND [1.3] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	NA	ND [0.12] U	ND [0.13] U	ND [1.3] U
2-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	NA	ND [0.5] U	ND [0.26] U	ND [2.6] U
3-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	NA	ND [0.5] U	ND [0.26] U	ND [2.6] U
4-NITROTOLUENE	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	NA	ND [1.5] U	ND [0.26] U	ND [2.6] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	NA	ND [0.54] U	ND [0.26] U	ND [1.3] U
NITROBENZENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	NA	ND [0.13] U	ND [0.13] U	ND [1.3] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW20	LHSMW20	LHSMW21	LHSMW21	LHSMW21	LHSMW21	LHSMW22	LHSMW22	LHSMW22
Sample Number:	LHS-MW-20	LHS-MW-20	MW-21	LHS-MW-21	LHS-MW-21	LHS-MW-21	MW-22	LHS-MW-22	LHS-MW-22
Date Sampled:	08/15/1996	12/04/1994	02/07/1996	05/15/1998	08/15/1996	12/04/1994	02/07/1996	05/15/1998	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	0.35	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
4-NITROTOLUENE	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW22	LHSMW23	LHSMW23	LHSMW23	LHSMW23	LHSMW24	LHSMW24	LHSMW24	LHSMW24
Sample Number:	LHS-MW-22	MW-23	LHS-MW-23	LHS-MW-23	LHS-MW-23	MW-24	LHS-MW-24	LHS-MW-24	LHS-MW-24
Date Sampled:	12/04/1994	02/06/1996	05/15/1998	08/15/1996	12/04/1994	02/07/1996	05/15/1998	08/20/1996	12/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,4-DINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2-NITROTOLUENE	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
3-NITROTOLUENE	ND [0.5] U	0.15 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-NITROTOLUENE	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
NITROBENZENE	ND [0.13] U	0.21	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW25	LHSMW25	LHSMW25	LHSMW25	LHSMW25	LHSMW26	LHSMW26	LHSMW26	LHSMW26
Sample Number:	MW-25	LHS-MW-25	LHS-MW-25REFD	LHS-MW-25	LHS-MW-25	MW-26	LHS-MW-26	LHS-MW-26	LHS-MW-26
Date Sampled:	02/07/1996	05/15/1998	05/15/1998	08/20/1996	12/04/1994	02/12/1996	05/15/1998	08/20/1996	12/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [1.3] UJ	ND [1.3] UJ	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [1.3] UJ	ND [1.3] UJ	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2-NITROTOLUENE	ND [0.26] U	ND [2.6] UJ	ND [2.6] UJ	ND [0.26] U	ND [0.5] U	0.19 J	ND [2.6] U	ND [0.26] U	ND [0.5] U
3-NITROTOLUENE	ND [0.26] U	ND [2.6] UJ	ND [2.6] UJ	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-NITROTOLUENE	ND [0.26] U	ND [2.6] UJ	ND [2.6] UJ	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [1.3] UJ	ND [1.3] UJ	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
NITROBENZENE	ND [0.13] U	ND [1.3] UJ	ND [1.3] UJ	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW27	LHSMW27	LHSMW27	LHSMW27	MW-14	MW-18	MW-19
Sample Number:	MW-27	LHS-MW-27	LHS-MW-27	LHS-MW-27	MW-14	MW-18	MW-19
Date Sampled:	02/08/1996	05/15/1998	08/20/1996	12/03/1994	07/23/1998	07/21/1998	07/23/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L							
NO DETECTED COMPOUNDS	NA	NA	NA	NA		NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L							
NO DETECTED COMPOUNDS	NA	NA	NA	NA		NA	NA
HERBICIDES - UNITS: UG/L							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	ND [0.472] U	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	4.287	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	2.431	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	4.428	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	0.872	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	2.419	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	13.963 U	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	5.247	NA	NA
EXPLOSIVES - UNITS: UG/L							
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
2-NITROTOLUENE	0.13 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
3-NITROTOLUENE	0.15 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
4-NITROTOLUENE	0.14 J	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.26] U	ND [0.26] U	ND [0.26] U

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Metals in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46WW01	46WW01	46WW02	46WW03	46WW04	LHSMW08	LHSMW08	LHSMW08	LHSMW08	LHSMW09	LHSMW09	LHSMW09
Sample Number:	46WW01	46WW01	46WW02	46WW03	46WW04	LHS-MW-8	LHS-MW-08	LHS-MW-8	LHS-MW-08	LHS-MW-9	LHS-MW-09	LHS-MW-9
Date Sampled:	10/01/1998	11/07/1998	11/06/1998	11/06/1998	11/07/1998	02/01/1996	05/13/1998	08/13/1996	12/03/1994	02/01/1996	05/14/1998	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L												
ALUMINUM	8400 J	7500	220	340	1600	1080 J	400	636	5400	2570 J	1600	786
ANTIMONY	ND [5] U	8	ND [5] U	ND [5] U	ND [5] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U
ARSENIC	ND [10] U	ND [10] U	11	10	ND [10] U	ND [2] U	ND [10] U	2.2	ND [2] U	ND [2] U	ND [10] U	ND [2] U
BARIUM	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	42	ND [200] U	40	52	90	ND [200] U	70
BERYLLIUM	1	0.7	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [5] U	ND [0.5] U	ND [10] U	NA	ND [5] U	0.5	ND [10] U
CADMIUM	ND [0.8] U	0.9	2.5	1.5	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U
CALCIUM	ND [5000] U	ND [5000] U	23000	40000	92000	30000 J	15000	25600 J	76000	3440 J	ND [5000] U	2610 J
CHROMIUM, TOTAL	110	50 J	20	20	520	ND [10] U	ND [10] U	ND [10] U	ND [20] U	ND [10] U	ND [10] U	13
COBALT	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [10] U	ND [50] U	ND [20] U	ND [20] U	12	ND [50] U	ND [20] U
COPPER	ND [25] U	33	ND [25] U	ND [25] U	53	ND [10] U	ND [25] U	ND [10] U	ND [20] U	13	ND [25] U	ND [10] U
IRON	20000	22000	1300	1100	3600	1430	590	1000	7800	3990	2400	2530
LEAD	10	3	ND [3] U	4	ND [3] U	60	ND [3] U	ND [90] U	4.9	ND [30] U	ND [3] U	ND [90] U
MAGNESIUM	ND [5000] U	ND [5000] U	20000	24000	47000	21200 J	12000	18900 J	57500	2030 J	ND [5000] U	1670 J
MANGANESE	304	171	196	128	177	259	217	244	680	129	132	91
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U
NICKEL	130	60	90	ND [40] U	200	ND [15] U	ND [40] U	ND [20] U	NA	18	ND [40] U	ND [20] U
POTASSIUM	ND [5000] U	ND [5000] U	10000	7000	ND [5000] U	896	ND [5000] U	887	ND [2000] U	787	ND [5000] U	542
SELENIUM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	5	ND [5] U	ND [2] U	ND [2] U	2.1	ND [5] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] R	ND [10] R	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	23000	14000	43000	110000	210000	NA	120000	NA	NA	NA	12000	NA
STRONTIUM	60	ND [50] U	220	550	1500	617	290	538	1500	56	90	54
THALLIUM	ND [1] U	1.3 J	1.2	ND [1] U	1.1 J	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U
TIN	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	NA	ND [100] U	NA	NA	NA	ND [100] U	NA
VANADIUM	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [10] U	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U
ZINC	60	70	110	ND [20] U	40	29	ND [20] U	47	NA	48	ND [20] U	25

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Metals in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW09	LHSMW10	LHSMW10	LHSMW10	LHSMW10	LHSMW11	LHSMW11	LHSMW11	LHSMW11	LHSMW12	LHSMW12
Sample Number:	LHS-MW-09	LHS-MW-10	LHS-MW-10	LHS-MW-10	LHS-MW-10	LHS-MW-11	LHS-MW-11	LHS-MW-11	LHS-MW-11	LHS-MW-12	LHS-MW-12
Date Sampled:	12/03/1994	02/09/1996	05/14/1998	08/13/1996	12/03/1994	02/01/1996	05/14/1998	08/13/1996	12/02/1994	02/01/1996	05/14/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	3300	536	ND [200] U	1550 J	11500	573	760	280	3700	6970	49000
ANTIMONY	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U
ARSENIC	ND [2] U	ND [2] U	ND [10] U	6.7	ND [2] U	ND [2] U	ND [10] U	2.9	ND [2] U	ND [2] U	15
BARIUM	140	3690	2900	3730	3700	51	ND [200] U	98	58	110	750
BERYLLIUM	NA	ND [5] U	1.4	ND [10] U	NA	ND [5] U	0.6	ND [10] U	NA	ND [5] U	6.5
CADMIUM	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U
CALCIUM	3800	76100 J	62000	74500 J	73000	165000 J	220000	219000	174000	11000 J	20000
CHROMIUM, TOTAL	ND [20] U	271	1500	1730	230	36	240	79	ND [20] U	44	1100
COBALT	ND [20] U	130	70	104	91	117	130	134	130	11	100
COPPER	ND [20] U	31	ND [25] U	27	21	18	ND [25] U	ND [10] U	ND [20] U	14	137
IRON	5800	1660	8500	11500	17600	670	2600	1200	3800	14600	97000
LEAD	3.4	99	ND [3] U	ND [90] U	9.5	43	ND [3] U	ND [90] U	2.1	ND [30] U	22
MAGNESIUM	2600	53400 J	44000	53200 J	52900	83600 J	110000	98600 J	88700	7620 J	21000
MANGANESE	240	2870	1870	2660	2300	1180	1560	1380	1200	322	3410
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	NA	1090 J	1100	1190 J	NA	64	260	152	NA	78	530
POTASSIUM	ND [2000] U	2590 J	ND [5000] U	2650 J	3400	1780 J	ND [5000] U	1870 J	2100	1020 J	6200
SELENIUM	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [10] U	12.2	ND [5] U	3	ND [2] U	4.1	6
SILVER	ND [10] U	ND [10] U	40	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	30
SODIUM	NA	NA	610000	NA	NA	NA	630000	NA	NA	NA	100000
STRONTIUM	ND [100] U	1470 J	1300	1600 J	1500	2670 J	3600	3530 J	2400	161	300
THALLIUM	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U	1.2	ND [90] U	ND [500] U	ND [90] U	2.1
TIN	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U
VANADIUM	NA	ND [10] U	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA	13	100
ZINC	NA	40	ND [20] U	45	NA	23	ND [20] U	26	NA	56	240

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Metals in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW12	LHSMW12	LHSMW13	LHSMW13	LHSMW13	LHSMW13	LHSMW14	LHSMW14	LHSMW14	LHSMW14	LHSMW15
Sample Number:	LHS-MW-12	LHS-MW-12	MW-13	LHS-MW-13	LHS-MW-13	LHS-MW-13	MW-14	LHS-MW-14	LHS-MW-14	LHS-MW-14	MW-15
Date Sampled:	08/13/1996	12/02/1994	02/06/1996	05/14/1998	08/15/1996	12/02/1994	02/06/1996	05/14/1998	08/14/1996	11/29/1994	02/06/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	13900	59400	3640	5700	2000	23300	3060	8100	5450	30400	1650
ANTIMONY	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [300] U
ARSENIC	ND [2] U	ND [2] U	6.3	ND [10] U	ND [2] U	5.7	ND [2] U	ND [10] U	ND [2] U	3.6	9
BARIUM	230	620	26	ND [200] U	37	160	52	ND [200] U	88	320	30
BERYLLIUM	ND [10] U	NA	ND [5] U	1.2	ND [10] U	NA	ND [5] U	0.7	ND [10] U	NA	ND [25] U
CADMIUM	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [50] U
CALCIUM	14400 J	20200	9640 J	ND [5000] U	2900 J	10200	2830 J	ND [5000] U	3550 J	7000	309
CHROMIUM, TOTAL	116	130	ND [10] U	80	26	48	19	640	30	82	ND [50] U
COBALT	25	66	14	ND [50] U	ND [20] U	23	ND [10] U	ND [50] U	ND [20] U	23	ND [50] U
COPPER	24	72	ND [10] U	ND [25] U	ND [10] U	35	10	ND [25] U	ND [10] U	ND [20] U	ND [50] U
IRON	31500	126000	4930	7600	3430	31900	3990	15000	8320	54100	1800
LEAD	ND [90] U	26	ND [30] U	ND [3] U	ND [90] U	9.7	ND [30] U	6	ND [90] U	14	ND [150] U
MAGNESIUM	10900 J	21100	7480 J	ND [5000] U	2010 J	8900	1610 J	ND [5000] U	2430 J	6500	135000
MANGANESE	702	2200	376	89	95	430	56	75	79	270	1760
MERCURY	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U
NICKEL	115	NA	ND [15] U	80	ND [20] U	NA	20	90	27	NA	125
POTASSIUM	1690 J	4400	621	ND [5000] U	509	ND [2000] U	724	ND [5000] U	1140 J	2700	1730
SELENIUM	ND [2] U	ND [10] U	3	ND [5] U	ND [2] U	ND [10] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	20	ND [10] U	ND [10] U	ND [50] U
SODIUM	NA	NA	NA	52000	NA	NA	NA	9600	NA	NA	NA
STRONTIUM	227	350	160	60	46	190	53	ND [50] U	67	160	4170 J
THALLIUM	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [450] U
TIN	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA
VANADIUM	31	NA	ND [10] U	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA	ND [50] U
ZINC	98	NA	36	70	31	NA	24	30	37	NA	ND [75] U

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Metals in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW15	LHSMW15	LHSMW15	LHSMW16	LHSMW16	LHSMW16	LHSMW16	LHSMW17	LHSMW17	LHSMW17	LHSMW17
Sample Number:	LHS-MW-15	LHS-MW-15	LHS-MW-15	MW-16	LHS-MW-16	LHS-MW-16	LHS-MW-16	LHS-MW-17	LHS-MW-17	LHS-MW-17	LHS-MW-17
Date Sampled:	05/14/1998	08/15/1996	12/03/1994	02/06/1996	05/14/1998	08/15/1996	11/29/1994	02/12/1996	05/14/1998	08/15/1996	12/02/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	7000	660	5300	450	ND [200] U	871	80000	5210	50000	NA	59200
ANTIMONY	ND [5] U	ND [60] U	ND [100] U	ND [25] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U
ARSENIC	ND [10] U	ND [2] U	2.1	ND [2] U	ND [10] U	ND [2] U	11	ND [2] U	20	ND [2] U	5.8
BARIUM	ND [200] U	20	75	190	230	209	1400	91	460	41	610
BERYLLIUM	0.8	ND [10] U	NA	ND [0.2] U	0.9	ND [10] U	NA	ND [5] U	5.4	ND [10] U	NA
CADMIUM	ND [0.8] U	ND [10] U	ND [10] U	ND [0.2] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U
CALCIUM	250000	224000	287000	82400	67000	72300 J	91000	14300 J	14000	4930 J	26500
CHROMIUM, TOTAL	4700	15	ND [20] U	4.4	ND [10] U	16	190	10	230	ND [10] U	120
COBALT	ND [50] U	ND [20] U	ND [20] U	ND [2.5] U	ND [50] U	ND [20] U	63	ND [10] U	ND [50] U	ND [20] U	57
COPPER	125	ND [10] U	ND [20] U	8.1	ND [25] U	ND [10] U	160	42	170	25	120
IRON	26000	2090	10500	610	380	386	129000	7050	320000	4420	107000
LEAD	ND [3] U	370	5.3	ND [1] U	ND [3] U	210	100	ND [30] U	14	ND [90] U	36
MAGNESIUM	120000	105000	134000	72100	71000	69200 J	90500	11300 J	19000	3960 J	32200
MANGANESE	1810	1420	2400	72	49	55	1800	202	468	83	1000
MERCURY	0.5	0.556	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	0.41	0.2	1.4	0.565	0.28
NICKEL	410	44	NA	46	ND [40] U	ND [20] U	NA	17	90	ND [20] U	NA
POTASSIUM	ND [5000] U	1070 J	ND [2000] U	390	ND [5000] U	531	5700	1610 J	ND [5000] U	604	7400
SELENIUM	ND [5] U	ND [2] U	ND [2] U	6.5	ND [5] U	ND [2] U	ND [10] U	ND [2] U	33	ND [2] U	ND [10] U
SILVER	120	ND [10] U	ND [10] U	1.9	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	680000	NA	NA	NA	130000	NA	NA	NA	44000	NA	NA
STRONTIUM	3900	3030 J	4200	1500	1300	1320 J	1700	221	340	81	490
THALLIUM	ND [1] U	ND [90] U	ND [500] U	ND [1.7] U	2	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U
TIN	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	ND [50] U	ND [20] U	NA	2.8	ND [50] U	ND [20] U	NA	ND [10] U	140	ND [20] U	NA
ZINC	20	ND [20] U	NA	6.5	ND [20] U	ND [20] U	NA	40	200	22	NA

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Metals in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW18	LHSMW18	LHSMW18	LHSMW18	LHSMW19	LHSMW19	LHSMW19	LHSMW19	LHSMW20	LHSMW20	LHSMW20
Sample Number:	LHS-MW-18	LHS-MW-18	LHS-MW-18	LHS-MW-18	MW-19	LHS-MW-19	LHS-MW-19	LHS-MW-19	LHS-MW-20	LHS-MW-20	LHS-MW-20
Date Sampled:	02/12/1996	05/14/1998	08/15/1996	12/02/1994	02/06/1996	05/15/1998	08/15/1996	12/02/1994	05/15/1998	08/15/1996	12/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	1480	540	498	33200	310	ND [200] U	334	6400	ND [200] U	254	9000
ANTIMONY	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [25] U	ND [5] U	ND [60] U	ND [100] U	ND [5] U	ND [60] U	ND [100] U
ARSENIC	ND [2] U	ND [10] U	ND [2] U	7.5	ND [2] U	ND [10] U	ND [2] U	3.1	ND [10] U	ND [2] U	15
BARIUM	35	ND [200] U	28	370	160	ND [200] U	175	130	ND [200] U	41	160
BERYLLIUM	ND [5] U	0.9	ND [10] U	NA	ND [0.2] U	ND [0.5] U	ND [10] U	NA	ND [0.5] U	ND [10] U	NA
CADMIUM	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	0.3	ND [0.8] U	ND [10] U	ND [10] U	0.9	ND [10] U	ND [10] U
CALCIUM	140000 J	150000	151000 J	167000	84000	95000	105000 J	50400	110000	98600 J	213000
CHROMIUM, TOTAL	16	40	26	65	5.3	40	ND [10] U	42	10	27	29
COBALT	18	ND [50] U	20	58	ND [2.5] U	ND [50] U	ND [20] U	ND [20] U	ND [50] U	ND [20] U	21
COPPER	39	ND [25] U	20	41	3.6	ND [25] U	ND [10] U	ND [20] U	ND [25] U	87	28
IRON	3400	1700	1690	58700	360	210	199	1000	510	1350	14800
LEAD	ND [30] U	ND [3] U	338	24	1.5	ND [3] U	151	7.1	ND [3] U	197	11
MAGNESIUM	108000 J	120000	113000	125000	23800	17000	39700 J	31700	93000	73200 J	209000
MANGANESE	2490	2290	2540	6500	76	ND [15] U	86	700	1430	1850	4300
MERCURY	0.2	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	1.6	ND [0.2] U
NICKEL	165	120	152	NA	19	ND [40] U	ND [20] U	NA	90	105	NA
POTASSIUM	1720 J	ND [5000] U	1530 J	4800	6200	ND [5000] U	4940 J	12900	ND [5000] U	1380 J	5400
SELENIUM	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [0.4] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	NA	400000	NA	NA	NA	110000	NA	NA	450000	NA	NA
STRONTIUM	1990 J	2400	2030 J	2300	3300	3400	3270 J	1600	3100	1440 J	3300
THALLIUM	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [1.7] U	ND [1] U	ND [90] U	ND [500] U	ND [1] U	ND [90] U	ND [500] U
TIN	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	ND [100] U	NA	NA
VANADIUM	ND [10] U	ND [50] U	ND [20] U	NA	ND [1.7] U	ND [50] U	ND [20] U	NA	ND [50] U	ND [20] U	NA
ZINC	48	30	31	NA	14	ND [20] U	ND [20] U	NA	40	44	NA

0027978

0027978

Metals in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW21	LHSMW21	LHSMW21	LHSMW21	LHSMW22	LHSMW22	LHSMW22	LHSMW22	LHSMW23	LHSMW23	LHSMW23
Sample Number:	MW-21	LHS-MW-21	LHS-MW-21	LHS-MW-21	MW-22	LHS-MW-22	LHS-MW-22	LHS-MW-22	MW-23	LHS-MW-23	LHS-MW-23
Date Sampled:	02/07/1996	05/15/1998	08/15/1996	12/04/1994	02/07/1996	05/15/1998	08/15/1996	12/04/1994	02/06/1996	05/15/1998	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	1020	ND [200] U	414	31100	3000	ND [200] U	347	60800	1200	ND [200] U	356
ANTIMONY	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U
ARSENIC	9.4	ND [10] U	ND [2] U	7.9	11.1	ND [10] U	ND [2] U	13	12.6	ND [10] U	ND [2] U
BARIUM	36	ND [200] U	39	390	56	ND [200] U	41	470	34	ND [200] U	28
BERYLLIUM	ND [5] U	0.6	ND [10] U	NA	ND [5] U	ND [0.5] U	ND [10] U	NA	ND [5] U	ND [0.5] U	ND [10] U
CADMIUM	ND [10] U	1.3	ND [10] U	ND [10] U	ND [10] U	1.2	ND [10] U	ND [10] U	ND [10] U	1.5	ND [10] U
CALCIUM	337000	320000	354000	292000	332000	190000	327000	383000	313000	230000	429000 J
CHROMIUM, TOTAL	ND [10] U	20	25	94	74	110	135	280	21	210	140
COBALT	ND [10] U	ND [50] U	ND [20] U	25	36	ND [50] U	37	91	14	ND [50] U	ND [20] U
COPPER	ND [10] U	ND [25] U	30	47	20	ND [25] U	14	110	21	ND [25] U	25
IRON	1740	1500	1210	79200	6340	1700	1750	81200	2400	3800	1620
LEAD	ND [30] U	ND [3] U	559	30	ND [30] U	ND [3] U	667	81	ND [30] U	ND [3] U	673
MAGNESIUM	196000 J	230000	216000	197000	269000	170000	264000	352000	227000	170000	305000 J
MANGANESE	625	417	602	3700	4870	4590	5470	5700	1020	1210	1000
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	0.42	ND [0.2] U	ND [0.2] U	ND [0.1] U
NICKEL	43	50	44	NA	317	380	265	NA	75	770	100
POTASSIUM	3730 J	ND [5000] U	4400 J	6600	3750 J	ND [5000] U	1660 J	8600	3110 J	ND [5000] U	3380 J
SELENIUM	2	ND [5] U	3.66	2.5	ND [2] U	ND [5] U	3.28	ND [2] U	ND [2] U	ND [5] U	3.9
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	NA	590000	NA	NA	NA	700000	NA	NA	NA	720000	NA
STRONTIUM	4170 J	10000	4670 J	3800	5180 J	5600	4860 J	6200	4480 J	6700	6170 J
THALLIUM	ND [90] U	1.5	166	ND [500] U	ND [90] U	1.6	ND [90] U	ND [500] U	ND [90] U	1.6	ND [90] U
TIN	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA
VANADIUM	ND [10] U	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA	10	ND [50] U	20
ZINC	26	20	39	NA	97	50	55	NA	60	50	36

0027979

Metals in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW23	LHSMW24	LHSMW24	LHSMW24	LHSMW24	LHSMW25	LHSMW25	LHSMW25	LHSMW25	LHSMW26	LHSMW26
Sample Number:	LHS-MW-23	MW-24	LHS-MW-24	LHS-MW-24	LHS-MW-24	MW-25	LHS-MW-25	LHS-MW-25	LHS-MW-25	LHS-MW-26	LHS-MW-26
Date Sampled:	12/04/1994	02/07/1996	05/15/1998	08/20/1996	12/04/1994	02/07/1996	05/15/1998	08/20/1996	12/04/1994	02/12/1996	05/15/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	19000	1310	ND [200] U	633	47700	570	ND [200] U	259	14200	NA	1300
ANTIMONY	ND [100] U	ND [60] U	ND [5] U	ND [40] U	ND [100] U	40	ND [5] U	ND [40] U	ND [100] U	ND [60] U	ND [5] U
ARSENIC	3.4	14.7	ND [10] U	3.3 J	6.9	ND [2] U	ND [10] U	1.8 J	3.2	ND [2] U	ND [10] U
BARIUM	100	63	ND [200] U	63 J	470	170	ND [200] U	147	290	68	ND [200] U
BERYLLIUM	NA	ND [5] U	ND [0.5] U	ND [6] U	NA	ND [0.2] U	0.5	ND [6] U	NA	ND [5] U	0.7
CADMIUM	ND [10] U	ND [10] U	2	ND [6] U	ND [10] U	0.8	2.2	ND [6] U	ND [10] U	ND [10] U	1.2
CALCIUM	434000	402000	270000	348000	469000	243000	300000	288000	187000	70300 J	57000
CHROMIUM, TOTAL	60	105	130	74 J	160	72	10	23 J	60	92	60
COBALT	21	10	ND [50] U	ND [20] U	42	ND [2.5] U	ND [50] U	ND [20] U	ND [20] U	ND [10] U	ND [50] U
COPPER	40	83	45	128	73	6.6	ND [25] U	ND [7] U	38	28	ND [25] U
IRON	40400	2170	1300	1920	72600	2000	510	819	29900	10100	3910
LEAD	28	ND [30] U	ND [3] U	514	10	ND [1] U	ND [3] U	453	12	ND [30] U	ND [3] U
MAGNESIUM	304000	243000	210000	242000	340000	185000	250000	213000	142000	48300 J	44000
MANGANESE	1200	2930	3080	3240	2600	170	107	175	750	188	156
MERCURY	ND [0.2] U	ND [0.2] U	0.6	0.041 J	0.31	ND [0.2] U	ND [0.2] U	0.064 J	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	NA	200	140	166	NA	61	ND [40] U	26 J	NA	37	ND [40] U
POTASSIUM	5000	2680 J	ND [5000] U	1950 J	10700	4200	ND [5000] U	4640 J	6300	2850 J	ND [5000] U
SELENIUM	ND [4] U	ND [2] U	ND [5] U	7.7	ND [10] U	ND [2] U	ND [5] U	8.1	ND [10] U	ND [2] U	ND [5] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U	3	ND [10] U	ND [6] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	NA	NA	960000	NA	NA	NA	500000	NA	NA	NA	230000
STRONTIUM	6300	5650 J	8600	5300 J	7300	5200	12000	5410 J	3700	1280 J	2600
THALLIUM	ND [500] U	105	4.5	ND [90] U	ND [500] U	ND [1.7] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U	ND [1] U
TIN	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U
VANADIUM	NA	ND [10] U	ND [50] U	ND [20] U	NA	ND [1.7] U	ND [50] U	ND [20] U	NA	18	ND [50] U
ZINC	NA	61	30	34 J	NA	10	ND [20] U	36 J	NA	44	ND [20] U

027980

Metals in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW26	LHSMW26	LHSMW27	LHSMW27	LHSMW27	LHSMW27	MW-14	MW-18	MW-19
Sample Number:	LHS-MW-26	LHS-MW-26	MW-27	LHS-MW-27	LHS-MW-27	LHS-MW-27	MW-14	MW-18	MW-19
Date Sampled:	08/20/1996	12/04/1994	02/08/1996	05/15/1998	08/20/1996	12/03/1994	07/23/1998	07/21/1998	07/23/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L									
ALUMINUM	3180	17800	10700	6000	12300	15700	ND [200] U	ND [200] U	ND [200] U
ANTIMONY	ND [40] U	ND [100] U	ND [60] U	ND [5] U	63	ND [100] U	19	ND [5] U	15
ARSENIC	1.1 J	4.6	3.1	ND [10] U	ND [1] U	3.9	ND [10] U	ND [10] U	ND [10] U
BARIUM	63 J	210	103	ND [200] U	212	200	720	270	ND [200] U
BERYLLIUM	ND [6] U	NA	ND [5] U	0.9	76 *	NA	ND [0.5] U	ND [0.5] U	ND [0.5] U
CADMIUM	ND [6] U	ND [10] U	ND [10] U	0.8	20 *	ND [10] U	ND [0.8] U	ND [0.8] U	ND [0.8] U
CALCIUM	88000 J	83000	3730 J	ND [5000] U	5460 J	5700	54000	8100	160000
CHROMIUM, TOTAL	127	62	ND [10] U	10	100	42	670	ND [10] U	ND [10] U
COBALT	ND [20] U	23	11	ND [50] U	83 J	ND [20] U	ND [50] U	ND [50] U	ND [50] U
COPPER	10 J	52	17	ND [25] U	48 J	ND [20] U	ND [25] U	ND [25] U	ND [25] U
IRON	8840	38800	14200	9700	24900	30600	19000	25000	140000
LEAD	88	32	82	ND [3] U	96	12	ND [3] U	ND [3] U	ND [3] U
MAGNESIUM	59000 J	53500	3030 J	ND [5000] U	5070 J	4300	22000	ND [5000] U	95000
MANGANESE	286	630	11	160	233	350	1770	530	2810
MERCURY	0.075 J	ND [0.2] U	0.62	0.2	0.429	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	29	NA	28	ND [40] U	92 J	NA	1600	ND [40] U	ND [40] U
POTASSIUM	2520 J	4800	1330 J	ND [5000] U	2380 J	ND [2000] U	14000	ND [5000] UJ	ND [5000] U
SELENIUM	3.3 J	2.3	ND [2] U	ND [5] U	1.1 J	ND [10] U	ND [5] U	ND [5] U	10
SILVER	ND [6] U	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U	30	ND [10] U	10
SODIUM	NA	NA	NA	65000	NA	NA	150000	47000	1400000
STRONTIUM	1470 J	1600	58	80	161 J	ND [100] U	4400	120	3700
THALLIUM	ND [90] U	ND [500] U	93	ND [1] U	ND [90] U	ND [500] U	1.7 J	2 J	3.7
TIN	NA	NA	NA	ND [100] U	NA	NA	NA	NA	NA
VANADIUM	ND [20] U	NA	21	ND [50] U	107 J	NA	ND [50] U	ND [50] U	ND [50] U
ZINC	31 J	NA	46	40	94 J	NA	30	ND [20] U	20

0027981

Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	46WW01	46WW04	LHSMW08	LHSMW08	LHSMW09	LHSMW09	LHSMW10	LHSMW10	LHSMW11	LHSMW11
Sample Number:	46WW01	46WW04	MW-8	LHS-MW-8	MW-9	LHS-MW-9	LHS-MW-10	LHS-MW-10	MW-11	LHS-MW-11
Date Sampled:	05/19/2000	02/12/2001	02/01/1996	08/13/1996	02/01/1996	08/15/1996	02/09/1996	08/13/1996	02/01/1996	08/13/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	NA	NA	112000	100000	19000	17000	1456000	1750000 J	1537000	1870000 J
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	NA	NA	1400	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
NITROGEN, NITRATE-NITRITE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRITE	NA	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	ND [1] U	30	NA	NA	NA	NA	NA	NA	NA	NA
SULFATE (AS SO4)	NA	NA	127000	127000	22000	19000	3000	ND [20000] U	115000	329000
PETROLEUM HYDROCARBONS - UNITS: MG/L										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

027982

Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW12	LHSMW12	LHSMW13	LHSMW13	LHSMW14	LHSMW14	LHSMW15	LHSMW15	LHSMW16	LHSMW16
Sample Number:	MW-12	LHS-MW-12	MW-13	LHS-MW-13	MW-14	LHS-MW-14	MW-15	LHS-MW-15	MW-16	LHS-MW-16
Date Sampled:	02/01/1996	08/13/1996	02/06/1996	08/15/1996	02/06/1996	08/14/1996	02/06/1996	08/15/1996	02/06/1996	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	47000	50000	14000	11000	3600	7000	835000	668000	152000	61000
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	ND [10] U	NA
NITROGEN, NITRATE (AS N)	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
NITROGEN, NITRATE-NITRITE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRITE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SULFATE (AS SO4)	111000	124000	72000	75000	ND [2000] U	2000	1664000	1386000	96000	45000
PETROLEUM HYDROCARBONS - UNITS: MG/L										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA		NA

027983

Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW17	LHSMW17	LHSMW17	LHSMW17	LHSMW18	LHSMW18	LHSMW18	LHSMW18	LHSMW19	LHSMW19
Sample Number:	LHS-MW-17	LHSMW17D	LHSMW17	LHS-MW-17	LHS-MW-18	LHSMW18	LHSMW18	LHS-MW-18	MW-19	LHS-MW-19
Date Sampled:	02/12/1996	05/24/2000	05/24/2000	08/15/1996	02/12/1996	02/12/2001	05/19/2000	08/15/1996	02/06/1996	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	7000	NA	NA	4800	394000	NA	NA	415000	173000	196000
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	ND [10] U	NA
NITROGEN, NITRATE (AS N)	ND [500] U	NA	NA	ND [500] U	ND [500] U	NA	NA	ND [500] U	ND [500] U	ND [500] U
NITROGEN, NITRATE-NITRITE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRITE	ND [500] U	NA	NA	ND [500] U	ND [500] U	NA	NA	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	NA	4.44 J	ND [1] U	NA	NA	ND [0.71] U	ND [1] U	NA	NA	NA
SULFATE (AS SO4)	179000	NA	NA	118000	1044000	NA	NA	1171000	221000	231000
PETROLEUM HYDROCARBONS - UNITS: MG/L										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA		NA

0027984

Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW20	LHSMW20	LHSMW21	LHSMW21	LHSMW22	LHSMW22	LHSMW22	LHSMW23	LHSMW24	LHSMW24
Sample Number:	MW-20	LHS-MW-20	MW-21	LHS-MW-21	MW-22	LHSMW22	LHS-MW-22	LHS-MW-23	MW-24	LHS-MW-24
Date Sampled:	02/07/1996	08/15/1996	02/07/1996	08/15/1996	02/07/1996	05/19/2000	08/15/1996	08/15/1996	02/07/1996	08/20/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	281000	113000	507000	634000	1023000	NA	992000	1404000 J	1861000	1370000 J
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA	500	ND [500] U	ND [500] U	4900
NITROGEN, NITRATE-NITRITE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRITE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	NA	NA	NA	NA	NA	ND [1] U	NA	NA	NA	NA
SULFATE (AS SO4)	1830000	1106000	1236000	20000	1929000	NA	1873000 J	1766000 J	1084000	1220000 J
PETROLEUM HYDROCARBONS - UNITS: MG/L										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

027985

Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW25	LHSMW25	LHSMW26	LHSMW26	LHSMW27	LHSMW27	MW-14	MW-17	MW-17	MW-18
Sample Number:	MW-25	LHS-MW-25	LHS-MW-26	LHS-MW-26	LHS-MW-27	LHS-MW-27	MW-14	MW-17	MW-17	MW-18
Date Sampled:	02/07/1996	08/20/1996	02/12/1996	08/20/1996	02/08/1996	08/20/1996	07/23/1998	02/01/2001	05/25/2000	02/03/2001
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	791000	836000	226000	246000	17000	16000	481000	NA	NA	NA
CYANIDE	ND [10] U	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA	NA	NA	NA
NITROGEN, NITRATE-NITRITE	NA	NA	NA	NA	NA	NA	311	NA	NA	NA
NITROGEN, NITRITE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA	NA	NA	NA
PERCHLORATE	NA	NA	NA	NA	NA	NA	NA	550	113 J	ND [0.85] U
SULFATE (AS SO4)	384000	570000	335000	338000	52000	53000	19000	NA	NA	NA
PETROLEUM HYDROCARBONS - UNITS: MG/L										
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA	NA	NA	NA

0027986

0027986

Anions and Petroleum Hydrocarbons in Groundwater Samples at Site 46
Longhorn Army Ammunition Plant, Texas

Location:	MW-18	MW-18	MW-18	MW-19	MW-19	MW-19	MW-19	MW-20	MW-20
Sample Number:	MW-18D	MW-18	MW-18	MW-19	MW-19D	MW-19	MW-19	MW-20	MW-20
Date Sampled:	05/23/2000	05/23/2000	07/21/1998	01/31/2001	05/23/2000	05/23/2000	07/23/1998	02/03/2001	05/23/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L									
CHLORIDE (AS CL)	NA	NA	151000	NA	NA	NA	2990000	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE-NITRITE	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
NITROGEN, NITRITE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	24.6	12.7 J	NA	45	27.1	117	NA	ND [0.85] U	20.7
SULFATE (AS SO4)	NA	NA	ND [2000] U	NA	NA	NA	430000	NA	NA
PETROLEUM HYDROCARBONS - UNITS: MG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA

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VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB01	47SB01	47SB01	47SB02	47SB02	47SB02	47SB03	47SB03
Sample Number:	47SB01(0-0.5)	47SB01(1-3)	47SB01(3-5)	47SB02(0-0.5)	47SB02(1-3)	47SB02(3-5)	47SB03(0-0.5)	47SB03(1-3)
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998
Depth (ft.):	0.00	1.00	3.00	0.00	1.00	3.00	0.00	1.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5.6] U	ND [5.4] U	ND [5.6] U	ND [5.5] U	ND [5.4] U	ND [5.8] U	ND [6.1] U	ND [5.8] U
ACETONE	10	4.9	8	ND [22] U	ND [22] U	ND [23] U	ND [24] U	ND [23] U
BENZENE	ND [5.6] U	ND [5.4] U	ND [5.6] U	ND [5.5] U	ND [5.4] U	ND [5.8] U	ND [6.1] U	ND [5.8] U
TETRACHLOROETHYLENE(PCE)	ND [5.6] U	ND [5.4] U	ND [5.6] U	ND [5.5] U	ND [5.4] U	ND [5.8] U	ND [6.1] U	ND [5.8] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [11] U	ND [11] U	ND [11] U	ND [11] U	ND [11] U	ND [12] U	ND [12] U	ND [12] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
ACENAPHTHENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
ANTHRACENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
BENZO(a)ANTHRACENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
BENZO(a)PYRENE	ND [180] U	ND [180] U	ND [190] U	ND [180] U	ND [180] U	ND [190] U	ND [200] U	ND [190] U
BENZO(b)FLUORANTHENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
BENZO(k)FLUORANTHENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
BENZYL BUTYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
CHRYSENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
DI-n-BUTYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
DIBENZOFURAN	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
DIETHYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
DIMETHYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
FLUORANTHENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
FLUORENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
NAPHTHALENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
PHENANTHRENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
PHENOL	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
PYRENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	430	ND [380] U

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VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB03	LHS-3-01	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05	LHS-3-06	LHS-3-07	LHS-3-08
Sample Number:	47SB03(3-5)	LHS-3-01	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05	LHS-3-06	LHS-3-07	LHS-3-08
Date Sampled:	07/27/1998	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/10/1995	01/10/1995
Depth (ft.):	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1,1-TRICHLOROETHANE	ND [5.9] U	ND [19] U	ND [10] U	ND [9] U	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
ACETONE	ND [24] U	ND [38] U	ND [21] U	ND [19] U	ND [19] U	ND [16] U	ND [19] U	ND [13] U	ND [16] U
BENZENE	ND [5.9] U	ND [19] U	ND [10] U	ND [9] U	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
TETRACHLOROETHYLENE(PCE)	ND [5.9] U	ND [19] U	ND [10] U	ND [9] U	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
TOTAL 1,2-DICHLOROETHENE	NA	ND [19] U	ND [10] U	63	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
TRICHLOROETHYLENE (TCE)	ND [12] U	ND [19] U	ND [10] U	75	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
ACENAPHTHENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
ANTHRACENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
BENZO(a)ANTHRACENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	210 J	ND [620] U	ND [430] U	210 J
BENZO(a)PYRENE	ND [200] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	200 J	ND [620] U	ND [430] U	260 J
BENZO(b)FLUORANTHENE	ND [390] U	ND [1200] U	110 J	ND [610] U	ND [640] U	480 J	140 J	ND [430] U	1100
BENZO(k)FLUORANTHENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	170 J	ND [620] U	ND [430] U	390 J
BENZYL BUTYL PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
CHRYSENE	ND [390] U	ND [1200] U	110 J	ND [610] U	ND [640] U	330 J	130 J	ND [430] U	1300
DI-n-BUTYL PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	190 J
DIBENZOFURAN	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
DIETHYL PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
DIMETHYL PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	280 J	ND [530] U	ND [620] U	ND [430] U	ND [530] U
FLUORANTHENE	ND [390] U	ND [1200] U	180 J	ND [610] U	78 J	520 J	320 J	ND [430] U	1400
FLUORENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
NAPHTHALENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
PHENANTHRENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	340 J	110 J	ND [430] U	540
PHENOL	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
PYRENE	ND [390] U	ND [1200] U	160 J	ND [610] U	87 J	1200	210 J	ND [430] U	2200
bis(2-ETHYLHEXYL) PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	64 J	150 J	ND [530] U	ND [620] U	ND [430] U	ND [530] U

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VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-09	LHS-3-10	LHS-3-11	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15	LHS-3-16	LHS-3-17
Sample Number:	LHS-3-09	LHS-3-10	LHS-3-11	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15	LHS-3-16	LHS-3-17
Date Sampled:	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1,1-TRICHLOROETHANE	ND [6] U	12	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
ACETONE	ND [12] U	ND [13] U	ND [12] U	ND [12] U	ND [24] U	ND [15] U	ND [14] U	ND [14] U	ND [15] U
BENZENE	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
ACENAPHTHENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	380 J	ND [470] U	ND [500] U
ANTHRACENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	850	ND [470] U	ND [500] U
BENZO(a)ANTHRACENE	140 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	150 J	2300	ND [470] U	ND [500] U
BENZO(a)PYRENE	370 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	150 J	2100	ND [470] U	ND [500] U
BENZO(b)FLUORANTHENE	670	ND [440] U	ND [380] U	ND [410] U	ND [790] U	300 J	2900	ND [470] U	ND [500] U
BENZO(k)FLUORANTHENE	330 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	110 J	1400	ND [470] U	ND [500] U
BENZYL BUTYL PHTHALATE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
CHRYSENE	270 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	210 J	2700	ND [470] U	ND [500] U
DI-n-BUTYL PHTHALATE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
DIBENZOFURAN	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	180 J	ND [470] U	ND [500] U
DIETHYL PHTHALATE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
DIMETHYL PHTHALATE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
FLUORANTHENE	410	ND [440] U	ND [380] U	ND [410] U	ND [790] U	470 J	4900	ND [470] U	ND [500] U
FLUORENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	400 J	ND [470] U	ND [500] U
NAPHTHALENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
PHENANTHRENE	150 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	240 J	3400	ND [470] U	ND [500] U
PHENOL	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
PYRENE	460	ND [440] U	ND [380] U	ND [410] U	ND [790] U	630	6800	ND [470] U	ND [500] U
bis(2-ETHYLHEXYL) PHTHALATE	66 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U

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VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-18	LHS-3-19	LHS-3-20	LHS-3-21	LHS-3-22	LHS-3-23	LHS-3-24	LHS-3-25	LHS-3-26
Sample Number:	**LHS-3-18**	**LHS-3-19**	**LHS-3-20**	**LHS-3-21**	**LHS-3-22**	**LHS-3-23**	**LHS-3-24**	**LHS-3-25**	**LHS-3-26**
Date Sampled:	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/11/1995**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1,1-TRICHLOROETHANE	ND [7] U	ND [6] U	ND [7] U	ND [9] U	ND [11] U	ND [8] U	ND [8] U	ND [9] U	ND [7] U
ACETONE	ND [14] U	ND [12] U	ND [14] U	ND [19] U	ND [22] U	ND [17] U	ND [15] U	ND [18] U	ND [14] U
BENZENE	ND [7] U	ND [6] U	ND [7] U	ND [9] U	ND [11] U	ND [8] U	ND [8] U	8 J	ND [7] U
TETRACHLOROETHYLENE(PCE)	ND [7] U	ND [6] U	ND [7] U	ND [9] U	ND [11] U	ND [8] U	ND [8] U	ND [9] U	ND [7] U
TOTAL 1,2-DICHLOROETHENE	ND [7] U	ND [6] U	ND [7] U	100	ND [11] U	ND [8] U	ND [8] U	ND [9] U	ND [7] U
TRICHLOROETHYLENE (TCE)	ND [7] U	ND [6] U	ND [7] U	8 J	ND [11] U	ND [8] U	ND [8] U	ND [9] U	ND [7] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
ACENAPHTHENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
ANTHRACENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
BENZO(a)ANTHRACENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
BENZO(a)PYRENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
BENZO(b)FLUORANTHENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	170 J	130 J	180 J	ND [600] U	ND [470] U
BENZO(k)FLUORANTHENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	76 J	ND [560] U	82 J	ND [600] U	ND [470] U
BENZYL BUTYL PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
CHRYSENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
DI-n-BUTYL PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
DIBENZOFURAN	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
DIETHYL PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
DIMETHYL PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	130 J	ND [600] U	ND [470] U
FLUORANTHENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	65 J	ND [600] U	ND [470] U
FLUORENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
NAPHTHALENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
PHENANTHRENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
PHENOL	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
PYRENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	80 J	ND [600] U	ND [470] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	170 J	78 J	220 J	320 J	ND [470] U

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VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW-28	LHS-MW-29	LHS-MW-30	LHS-MW-31	LHS-MW-32	LHS-MW-33
Sample Number:	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW28	LHS-MW29	LHS-MW30	LHS-MW31	LHS-MW32	LHS-MW33
Date Sampled:	01/11/1995	01/11/1995	01/11/1995	10/03/1994	10/03/1994	10/03/1994	10/04/1994	10/04/1994	10/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1,1-TRICHLOROETHANE	ND [8] U	ND [7] U	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
ACETONE	ND [16] U	ND [13] U	ND [15] U	ND [10] U	ND [11] U	ND [11] U	ND [11] U	ND [11] U	ND [11] U
BENZENE	ND [8] U	11	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [8] U	ND [7] U	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	ND [8] U	ND [7] U	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [8] U	ND [7] U	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
ACENAPHTHENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
ANTHRACENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
BENZO(a)ANTHRACENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
BENZO(a)PYRENE	ND [540] U	57 J	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
BENZO(b)FLUORANTHENE	140 J	260 J	240 J	72 J	ND [360] U	ND [360] U	47 J	ND [360] U	ND [360] U
BENZO(k)FLUORANTHENE	ND [540] U	69 J	140 J	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
BENZYL BUTYL PHTHALATE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
CHRYSENE	ND [540] U	ND [430] U	ND [510] U	160 J	ND [360] U	ND [360] U	ND [360] U	49 J	ND [360] U
DI-n-BUTYL PHTHALATE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
DIBENZOFURAN	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
DIETHYL PHTHALATE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
DIMETHYL PHTHALATE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
FLUORANTHENE	170 J	ND [430] U	87 J	230 J	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
FLUORENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
NAPHTHALENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
PHENANTHRENE	140 J	ND [430] U	ND [510] U	79 J	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
PHENOL	ND [540] U	ND [430] U	ND [510] U	ND [340] U	120 J	ND [360] U	ND [360] U	ND [360] U	ND [360] U
PYRENE	160 J	ND [430] U	120 J	170 J	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [540] U	ND [430] U	ND [510] U	58 J	69 J	ND [360] U	85 J	220 J	90 J

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VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-34	LHS-MW-35	LHS-MW-36	LHS-MW-37	LHS-MW-38	LHS-MW-39	LHS-MW-40	LHS-MW-41
Sample Number:	LHS-MW34	LHS-MW35	LHS-MW36	LHS-MW37	LHS-MW38	LHS-MW39	LHS-MW40	LHS-MW41
Date Sampled:	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [11] U	ND [13] U	ND [11] U	ND [10] U	ND [11] U	ND [11] U	ND [11] U	ND [11] U
BENZENE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
ACENAPHTHENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
ANTHRACENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZO(a)ANTHRACENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZO(a)PYRENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZO(b)FLUORANTHENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZO(k)FLUORANTHENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZYL BUTYL PHTHALATE	380	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
CHRYSENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
DI-n-BUTYL PHTHALATE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
DIBENZOFURAN	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
DIETHYL PHTHALATE	90 J	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
DIMETHYL PHTHALATE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
FLUORANTHENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
FLUORENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
NAPHTHALENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
PHENANTHRENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
PHENOL	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
PYRENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [370] U	160 J	ND [380] U	110 J	110 J	ND [350] U	ND [360] U	110 J

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VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-42	LHS-MW-43	LHS-MW-44	LHS-MW-45	LHS-MW-46	LHS-MW-47	LHS-MW-48	LHS-MW-49
Sample Number:	LHS-MW42	LHS-MW43	LHS-MW44	LHS-MW45	LHS-MW46	LHS-MW47	LHS-MW48	LHS-MW49
Date Sampled:	10/04/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
ACETONE	ND [11] U	ND [11] U	ND [11] U	ND [11] U	280	340	460	ND [11] U
BENZENE	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
ACENAPHTHENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
ANTHRACENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZO(a)ANTHRACENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZO(a)PYRENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZO(b)FLUORANTHENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZO(k)FLUORANTHENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZYL BUTYL PHTHALATE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
CHRYSENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
DI-n-BUTYL PHTHALATE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
DIBENZOFURAN	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
DIETHYL PHTHALATE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
DIMETHYL PHTHALATE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
FLUORANTHENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
FLUORENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
NAPHTHALENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
PHENANTHRENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
PHENOL	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
PYRENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
bis(2-ETHYLHEXYL) PHTHALATE	49 J	ND [360] U	52 J	47 J	ND [380] U	ND [360] U	ND [350] U	40 J

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VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-50	LHS-MW-51	LHS-MW-52	LHS-MW-53	LHS-MW-54	LHS-MW-55	LHS-MW-56	LHS-MW-57
Sample Number:	LHS-MW50	LHS-MW51	LHS-MW52	LHS-MW53	LHS-MW54	LHS-MW55	LHS-MW56	LHS-MW57
Date Sampled:	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U
ACETONE	ND [11] U	ND [11] U	ND [11] U	13	ND [12] U	ND [11] U	ND [11] U	ND [11] U
BENZENE	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	ND [5] U	3 J	ND [6] U	ND [5] U	ND [5] U	ND [6] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [370] U	ND [380] U	230 J	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
ACENAPHTHENE	ND [370] U	ND [380] U	360 J	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
ANTHRACENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZO(a)ANTHRACENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZO(a)PYRENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZO(b)FLUORANTHENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZO(k)FLUORANTHENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZYL BUTYL PHTHALATE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
CHRYSENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
DI-n-BUTYL PHTHALATE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
DIBENZOFURAN	ND [370] U	ND [380] U	590	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
DIETHYL PHTHALATE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
DIMETHYL PHTHALATE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
FLUORANTHENE	86 J	ND [380] U	3100	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
FLUORENE	ND [370] U	ND [380] U	130 J	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
NAPHTHALENE	ND [370] U	ND [380] U	470	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
PHENANTHRENE	ND [370] U	ND [380] U	4600	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
PHENOL	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
PYRENE	ND [370] U	ND [380] U	1600	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
bis(2-ETHYLHEXYL) PHTHALATE	270 J	120 J	ND [360] U	ND [350] U	320 J	54 J	36 J	ND [370] U

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027995

VOCs and SVOCs in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-60	LHS-MW-61
Sample Number:	LHS-MW60	LHS-MW61
Date Sampled:	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
1,1,1-TRICHLOROETHANE	ND [6] U	ND [5] U
ACETONE	ND [11] U	ND [11] U
BENZENE	ND [6] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
2-METHYLNAPHTHALENE	ND [380] U	ND [350] U
ACENAPHTHENE	ND [380] U	ND [350] U
ANTHRACENE	ND [380] U	ND [350] U
BENZO(a)ANTHRACENE	ND [380] U	ND [350] U
BENZO(a)PYRENE	ND [380] U	ND [350] U
BENZO(b)FLUORANTHENE	ND [380] U	71 J
BENZO(k)FLUORANTHENE	ND [380] U	ND [350] U
BENZYL BUTYL PHTHALATE	ND [380] U	ND [350] U
CHRYSENE	ND [380] U	ND [350] U
DI-n-BUTYL PHTHALATE	ND [380] U	ND [350] U
DIBENZOFURAN	ND [380] U	ND [350] U
DIETHYL PHTHALATE	ND [380] U	ND [350] U
DIMETHYL PHTHALATE	ND [380] U	ND [350] U
FLUORANTHENE	ND [380] U	ND [350] U
FLUORENE	ND [380] U	ND [350] U
NAPHTHALENE	ND [380] U	ND [350] U
PHENANTHRENE	ND [380] U	ND [350] U
PHENOL	ND [380] U	ND [350] U
PYRENE	ND [380] U	ND [350] U
bis(2-ETHYLHEXYL) PHTHALATE	890 J	42 J

027996

VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB01	47SB01	47SB01	47SB02	47SB02	47SB02	47SB03	47SB03
Sample Number:	47SB01(0-0.5)	47SB01(1-3)	47SB01(3-5)	47SB02(0-0.5)	47SB02(1-3)	47SB02(3-5)	47SB03(0-0.5)	47SB03(1-3)
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998
Depth (ft.):	0.00	1.00	3.00	0.00	1.00	3.00	0.00	1.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [5.6] U	ND [5.4] U	ND [5.6] U	ND [5.5] U	ND [5.4] U	ND [5.8] U	ND [6.1] U	ND [5.8] U
ACETONE	10	4.9	8	ND [22] U	ND [22] U	ND [23] U	ND [24] U	ND [23] U
BENZENE	ND [5.6] U	ND [5.4] U	ND [5.6] U	ND [5.5] U	ND [5.4] U	ND [5.8] U	ND [6.1] U	ND [5.8] U
TETRACHLOROETHYLENE(PCE)	ND [5.6] U	ND [5.4] U	ND [5.6] U	ND [5.5] U	ND [5.4] U	ND [5.8] U	ND [6.1] U	ND [5.8] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [11] U	ND [11] U	ND [11] U	ND [11] U	ND [11] U	ND [12] U	ND [12] U	ND [12] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
ACENAPHTHENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
ANTHRACENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
BENZO(a)ANTHRACENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
BENZO(a)PYRENE	ND [180] U	ND [180] U	ND [190] U	ND [180] U	ND [180] U	ND [190] U	ND [200] U	ND [190] U
BENZO(b)FLUORANTHENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
BENZO(k)FLUORANTHENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
BENZYL BUTYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
CHRYSENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
DI-n-BUTYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
DIBENZOFURAN	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
DIETHYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
DIMETHYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
FLUORANTHENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
FLUORENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
NAPHTHALENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
PHENANTHRENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
PHENOL	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
PYRENE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	ND [400] U	ND [380] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [370] U	ND [360] U	ND [380] U	430	ND [380] U

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VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB03	LHS-3-01	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05	LHS-3-06	LHS-3-07	LHS-3-08
Sample Number:	47SB03(3-5)	LHS-3-01	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05	LHS-3-06	LHS-3-07	LHS-3-08
Date Sampled:	07/27/1998	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/10/1995	01/10/1995
Depth (ft.):	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1,1-TRICHLOROETHANE	ND [5.9] U	ND [19] U	ND [10] U	ND [9] U	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
ACETONE	ND [24] U	ND [38] U	ND [21] U	ND [19] U	ND [19] U	ND [16] U	ND [19] U	ND [13] U	ND [16] U
BENZENE	ND [5.9] U	ND [19] U	ND [10] U	ND [9] U	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
TETRACHLOROETHYLENE(PCE)	ND [5.9] U	ND [19] U	ND [10] U	ND [9] U	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
TOTAL 1,2-DICHLOROETHENE	NA	ND [19] U	ND [10] U	63	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
TRICHLOROETHYLENE (TCE)	ND [12] U	ND [19] U	ND [10] U	75	ND [10] U	ND [8] U	ND [9] U	ND [6] U	ND [8] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
ACENAPHTHENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
ANTHRACENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
BENZO(a)ANTHRACENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	210 J	ND [620] U	ND [430] U	210 J
BENZO(a)PYRENE	ND [200] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	200 J	ND [620] U	ND [430] U	260 J
BENZO(b)FLUORANTHENE	ND [390] U	ND [1200] U	110 J	ND [610] U	ND [640] U	480 J	140 J	ND [430] U	1100
BENZO(k)FLUORANTHENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	170 J	ND [620] U	ND [430] U	390 J
BENZYL BUTYL PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
CHRYSENE	ND [390] U	ND [1200] U	110 J	ND [610] U	ND [640] U	330 J	130 J	ND [430] U	1300
DI-n-BUTYL PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	190 J
DIBENZOFURAN	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
DIETHYL PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
DIMETHYL PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	280 J	ND [530] U	ND [620] U	ND [430] U	ND [530] U
FLUORANTHENE	ND [390] U	ND [1200] U	180 J	ND [610] U	78 J	520 J	320 J	ND [430] U	1400
FLUORENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
NAPHTHALENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
PHENANTHRENE	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	340 J	110 J	ND [430] U	540
PHENOL	ND [390] U	ND [1200] U	ND [680] U	ND [610] U	ND [640] U	ND [530] U	ND [620] U	ND [430] U	ND [530] U
PYRENE	ND [390] U	ND [1200] U	160 J	ND [610] U	87 J	1200	210 J	ND [430] U	2200
bis(2-ETHYLHEXYL) PHTHALATE	ND [390] U	ND [1200] U	ND [680] U	64 J	150 J	ND [530] U	ND [620] U	ND [430] U	ND [530] U

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VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-09	LHS-3-10	LHS-3-11	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15	LHS-3-16	LHS-3-17
Sample Number:	LHS-3-09	LHS-3-10	LHS-3-11	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15	LHS-3-16	LHS-3-17
Date Sampled:	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1,1-TRICHLOROETHANE	ND [6] U	12	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
ACETONE	ND [12] U	ND [13] U	ND [12] U	ND [12] U	ND [24] U	ND [15] U	ND [14] U	ND [14] U	ND [15] U
BENZENE	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [12] U	ND [8] U	ND [7] U	ND [7] U	ND [8] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
ACENAPHTHENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	380 J	ND [470] U	ND [500] U
ANTHRACENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	850	ND [470] U	ND [500] U
BENZO(a)ANTHRACENE	140 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	150 J	2300	ND [470] U	ND [500] U
BENZO(a)PYRENE	370 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	150 J	2100	ND [470] U	ND [500] U
BENZO(b)FLUORANTHENE	670	ND [440] U	ND [380] U	ND [410] U	ND [790] U	300 J	2900	ND [470] U	ND [500] U
BENZO(k)FLUORANTHENE	330 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	110 J	1400	ND [470] U	ND [500] U
BENZYL BUTYL PHTHALATE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
CHRYSENE	270 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	210 J	2700	ND [470] U	ND [500] U
DI-n-BUTYL PHTHALATE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
DIBENZOFURAN	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	180 J	ND [470] U	ND [500] U
DIETHYL PHTHALATE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
DIMETHYL PHTHALATE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
FLUORANTHENE	410	ND [440] U	ND [380] U	ND [410] U	ND [790] U	470 J	4900	ND [470] U	ND [500] U
FLUORENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	400 J	ND [470] U	ND [500] U
NAPHTHALENE	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
PHENANTHRENE	150 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	240 J	3400	ND [470] U	ND [500] U
PHENOL	ND [390] U	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U
PYRENE	460	ND [440] U	ND [380] U	ND [410] U	ND [790] U	630	6800	ND [470] U	ND [500] U
bis(2-ETHYLHEXYL) PHTHALATE	66 J	ND [440] U	ND [380] U	ND [410] U	ND [790] U	ND [510] U	ND [450] U	ND [470] U	ND [500] U

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VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-18	LHS-3-19	LHS-3-20	LHS-3-21	LHS-3-22	LHS-3-23	LHS-3-24	LHS-3-25	LHS-3-26
Sample Number:	LHS-3-18	LHS-3-19	LHS-3-20	LHS-3-21	LHS-3-22	LHS-3-23	LHS-3-24	LHS-3-25	LHS-3-26
Date Sampled:	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/11/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1,1-TRICHLOROETHANE	ND [7] U	ND [6] U	ND [7] U	ND [9] U	ND [11] U	ND [8] U	ND [8] U	ND [9] U	ND [7] U
ACETONE	ND [14] U	ND [12] U	ND [14] U	ND [19] U	ND [22] U	ND [17] U	ND [15] U	ND [18] U	ND [14] U
BENZENE	ND [7] U	ND [6] U	ND [7] U	ND [9] U	ND [11] U	ND [8] U	ND [8] U	8 J	ND [7] U
TETRACHLOROETHYLENE(PCE)	ND [7] U	ND [6] U	ND [7] U	ND [9] U	ND [11] U	ND [8] U	ND [8] U	ND [9] U	ND [7] U
TOTAL 1,2-DICHLOROETHENE	ND [7] U	ND [6] U	ND [7] U	100	ND [11] U	ND [8] U	ND [8] U	ND [9] U	ND [7] U
TRICHLOROETHYLENE (TCE)	ND [7] U	ND [6] U	ND [7] U	8 J	ND [11] U	ND [8] U	ND [8] U	ND [9] U	ND [7] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
ACENAPHTHENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
ANTHRACENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
BENZO(a)ANTHRACENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
BENZO(a)PYRENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
BENZO(b)FLUORANTHENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	170 J	130 J	180 J	ND [600] U	ND [470] U
BENZO(k)FLUORANTHENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	76 J	ND [560] U	82 J	ND [600] U	ND [470] U
BENZYL BUTYL PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
CHRYSENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
DI-n-BUTYL PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
DIBENZOFURAN	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
DIETHYL PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
DIMETHYL PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	130 J	ND [600] U	ND [470] U
FLUORANTHENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	65 J	ND [600] U	ND [470] U
FLUORENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
NAPHTHALENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
PHENANTHRENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
PHENOL	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	ND [510] U	ND [600] U	ND [470] U
PYRENE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	ND [740] U	ND [560] U	80 J	ND [600] U	ND [470] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [460] U	ND [390] U	ND [450] U	ND [620] U	170 J	78 J	220 J	320 J	ND [470] U

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VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW-28	LHS-MW-29	LHS-MW-30	LHS-MW-31	LHS-MW-32	LHS-MW-33
Sample Number:	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW28	LHS-MW29	LHS-MW30	LHS-MW31	LHS-MW32	LHS-MW33
Date Sampled:	01/11/1995	01/11/1995	01/11/1995	10/03/1994	10/03/1994	10/03/1994	10/04/1994	10/04/1994	10/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1,1-TRICHLOROETHANE	ND [8] U	ND [7] U	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
ACETONE	ND [16] U	ND [13] U	ND [15] U	ND [10] U	ND [11] U	ND [11] U	ND [11] U	ND [11] U	ND [11] U
BENZENE	ND [8] U	11	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [8] U	ND [7] U	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	ND [8] U	ND [7] U	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [8] U	ND [7] U	ND [8] U	ND [5] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
ACENAPHTHENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
ANTHRACENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
BENZO(a)ANTHRACENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
BENZO(a)PYRENE	ND [540] U	57 J	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
BENZO(b)FLUORANTHENE	140 J	260 J	240 J	72 J	ND [360] U	ND [360] U	47 J	ND [360] U	ND [360] U
BENZO(k)FLUORANTHENE	ND [540] U	69 J	140 J	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
BENZYL BUTYL PHTHALATE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
CHRYSENE	ND [540] U	ND [430] U	ND [510] U	160 J	ND [360] U	ND [360] U	ND [360] U	49 J	ND [360] U
DI-n-BUTYL PHTHALATE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
DIBENZOFURAN	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
DIETHYL PHTHALATE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
DIMETHYL PHTHALATE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
FLUORANTHENE	170 J	ND [430] U	87 J	230 J	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
FLUORENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
NAPHTHALENE	ND [540] U	ND [430] U	ND [510] U	ND [340] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
PHENANTHRENE	140 J	ND [430] U	ND [510] U	79 J	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
PHENOL	ND [540] U	ND [430] U	ND [510] U	ND [340] U	120 J	ND [360] U	ND [360] U	ND [360] U	ND [360] U
PYRENE	160 J	ND [430] U	120 J	170 J	ND [360] U	ND [360] U	ND [360] U	ND [360] U	ND [360] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [540] U	ND [430] U	ND [510] U	58 J	69 J	ND [360] U	85 J	220 J	90 J

T82 3001

028001

VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-34	LHS-MW-35	LHS-MW-36	LHS-MW-37	LHS-MW-38	LHS-MW-39	LHS-MW-40	LHS-MW-41
Sample Number:	**LHS-MW34**	**LHS-MW35**	**LHS-MW36**	**LHS-MW37**	**LHS-MW38**	**LHS-MW39**	**LHS-MW40**	**LHS-MW41**
Date Sampled:	**10/04/1994**	**10/04/1994**	**10/04/1994**	**10/04/1994**	**10/04/1994**	**10/04/1994**	**10/04/1994**	**10/04/1994**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ACETONE	ND [11] U	ND [13] U	ND [11] U	ND [10] U	ND [11] U	ND [11] U	ND [11] U	ND [11] U
BENZENE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
ACENAPHTHENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
ANTHRACENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZO(a)ANTHRACENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZO(a)PYRENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZO(b)FLUORANTHENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZO(k)FLUORANTHENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
BENZYL BUTYL PHTHALATE	380	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
CHRYSENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
DI-n-BUTYL PHTHALATE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
DIBENZOFURAN	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
DIETHYL PHTHALATE	90 J	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
DIMETHYL PHTHALATE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
FLUORANTHENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
FLUORENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
NAPHTHALENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
PHENANTHRENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
PHENOL	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
PYRENE	ND [370] U	ND [420] U	ND [380] U	ND [340] U	ND [350] U	ND [350] U	ND [360] U	ND [360] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [370] U	160 J	ND [380] U	110 J	110 J	ND [350] U	ND [360] U	110 J

282000
028002

VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-42	LHS-MW-43	LHS-MW-44	LHS-MW-45	LHS-MW-46	LHS-MW-47	LHS-MW-48	LHS-MW-49
Sample Number:	LHS-MW42	LHS-MW43	LHS-MW44	LHS-MW45	LHS-MW46	LHS-MW47	LHS-MW48	LHS-MW49
Date Sampled:	10/04/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
ACETONE	ND [11] U	ND [11] U	ND [11] U	ND [11] U	280	340	460	ND [11] U
BENZENE	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
ACENAPHTHENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
ANTHRACENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZO(a)ANTHRACENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZO(a)PYRENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZO(b)FLUORANTHENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZO(k)FLUORANTHENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
BENZYL BUTYL PHTHALATE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
CHRYSENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
DI-n-BUTYL PHTHALATE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
DIBENZOFURAN	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
DIETHYL PHTHALATE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
DIMETHYL PHTHALATE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
FLUORANTHENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
FLUORENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
NAPHTHALENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
PHENANTHRENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
PHENOL	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
PYRENE	ND [360] U	ND [360] U	ND [350] U	ND [360] U	ND [380] U	ND [360] U	ND [350] U	ND [360] U
bis(2-ETHYLHEXYL) PHTHALATE	49 J	ND [360] U	52 J	47 J	ND [380] U	ND [360] U	ND [350] U	40 J

000283

028003

VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-50	LHS-MW-51	LHS-MW-52	LHS-MW-53	LHS-MW-54	LHS-MW-55	LHS-MW-56	LHS-MW-57
Sample Number:	LHS-MW50	LHS-MW51	LHS-MW52	LHS-MW53	LHS-MW54	LHS-MW55	LHS-MW56	LHS-MW57
Date Sampled:	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1,1-TRICHLOROETHANE	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U
ACETONE	ND [11] U	ND [11] U	ND [11] U	13	ND [12] U	ND [11] U	ND [11] U	ND [11] U
BENZENE	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	ND [5] U	3 J	ND [6] U	ND [5] U	ND [5] U	ND [6] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [370] U	ND [380] U	230 J	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
ACENAPHTHENE	ND [370] U	ND [380] U	360 J	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
ANTHRACENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZO(a)ANTHRACENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZO(a)PYRENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZO(b)FLUORANTHENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZO(k)FLUORANTHENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
BENZYL BUTYL PHTHALATE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
CHRYSENE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
DI-n-BUTYL PHTHALATE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
DIBENZOFURAN	ND [370] U	ND [380] U	590	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
DIETHYL PHTHALATE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
DIMETHYL PHTHALATE	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
FLUORANTHENE	86 J	ND [380] U	3100	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
FLUORENE	ND [370] U	ND [380] U	130 J	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
NAPHTHALENE	ND [370] U	ND [380] U	470	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
PHENANTHRENE	ND [370] U	ND [380] U	4600	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
PHENOL	ND [370] U	ND [380] U	ND [360] U	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
PYRENE	ND [370] U	ND [380] U	1600	ND [350] U	ND [400] U	ND [360] U	ND [360] U	ND [370] U
bis(2-ETHYLHEXYL) PHTHALATE	270 J	120 J	ND [360] U	ND [350] U	320 J	54 J	36 J	ND [370] U

000284

028004

VOCs and SVOCs in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-60	LHS-MW-61
Sample Number:	LHS-MW60	LHS-MW61
Date Sampled:	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
1,1,1-TRICHLOROETHANE	ND [6] U	ND [5] U
ACETONE	ND [11] U	ND [11] U
BENZENE	ND [6] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	ND [6] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
2-METHYLNAPHTHALENE	ND [380] U	ND [350] U
ACENAPHTHENE	ND [380] U	ND [350] U
ANTHRACENE	ND [380] U	ND [350] U
BENZO(a)ANTHRACENE	ND [380] U	ND [350] U
BENZO(a)PYRENE	ND [380] U	ND [350] U
BENZO(b)FLUORANTHENE	ND [380] U	71 J
BENZO(k)FLUORANTHENE	ND [380] U	ND [350] U
BENZYL BUTYL PHTHALATE	ND [380] U	ND [350] U
CHRYSENE	ND [380] U	ND [350] U
DI-n-BUTYL PHTHALATE	ND [380] U	ND [350] U
DIBENZOFURAN	ND [380] U	ND [350] U
DIETHYL PHTHALATE	ND [380] U	ND [350] U
DIMETHYL PHTHALATE	ND [380] U	ND [350] U
FLUORANTHENE	ND [380] U	ND [350] U
FLUORENE	ND [380] U	ND [350] U
NAPHTHALENE	ND [380] U	ND [350] U
PHENANTHRENE	ND [380] U	ND [350] U
PHENOL	ND [380] U	ND [350] U
PYRENE	ND [380] U	ND [350] U
bis(2-ETHYLHEXYL) PHTHALATE	890 J	42 J

028005

028285

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL063-01	LH-DL063-01	LH-DL064-01	LH-DL065-01	LH-DL44-01	LH-DL45-01	LH-DL47-01	LH-DL47-02	LH-DL48-01	LH-DL50-01
Sample Number:	LH-DL063-01	LH-DL063-01FD	LH-DL064-01	LH-DL065-01	LH-DL44-01	LH-DL45-01	LH-DL47-01	LH-DL47-02	LH-DL48-01	LH-DL50-01
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	07/10/1993	07/10/1993	07/09/1993	07/09/1993	07/11/1993	07/11/1993
Depth (ft.):	1.00	1.00	2.00	1.50	2.10	2.30	0.50	2.70	2.70	2.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS		NA			NA	NA	NA	NA	NA	NA

028006

028006

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL53-01	LH-DL54-01	LH-DL55-01	LH-DL55-02	LH-DL58-01	LH-DL61-01	LH-DL69-01	LH-DL71-01	LH-DL73-01	LH-DL74-01	LH-DL75-01
Sample Number:	LH-DL53-01	LH-DL54-01	LH-DL55-01	LH-DL55-02	LH-DL58-01	LH-DL61-01	LH-DL69-01	LH-DL71-01	LH-DL73-01	LH-DL74-01	LH-DL75-01
Date Sampled:	07/13/1993	07/12/1993	07/12/1993	07/12/1993	06/26/1993	08/06/1993	06/26/1993	07/24/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.00	2.50	2.50	2.50	2.10	2.00	2.50	2.00	2.00	2.00	2.00
EXPLOSIVES - UNITS: UG/KG											
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

282000

028007

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL76-01	LH-DL77-01	LH-DL81-01	LH-DL82-01	LH-DL83-01	LH-DL84-01	LH-DL85-01	LH-DL88-01	LH-DL89-01	LH-DL90-01	LH-DL90-02
Sample Number:	LH-DL76-01	LH-DL77-01	LH-DL81-01	LH-DL82-01	LH-DL83-01	LH-DL84-01	LH-DL85-01	LH-DL88-01	LH-DL89-01	LH-DL90-01	LH-DL90-02
Date Sampled:	06/26/1993	06/26/1993	07/23/1993	07/23/1993	07/23/1993	07/21/1993	06/26/1993	07/22/1993	07/21/1993	07/21/1993	07/21/1993
Depth (ft.):	2.00	2.00	2.00	2.00	2.00	2.00	2.50	2.00	2.00	2.00	2.00
EXPLOSIVES - UNITS: UG/KG											
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000288

028008

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL91	LH-DL92-01	LH-DL93-01	LH-S062-01	LH-S062-01	LH-S062-01	LH-S062-01	LH-S062-02	LH-S062-02	LH-S063-01
Sample Number:	LH-DL91	LH-DL92-01	LH-DL93-01	LH-S062-01_1	LH-S062-01_1FD	LH-S062-01_2	LH-S062-01_3	LH-S062-02_1	LH-S062-02_2	LH-S063-01_1
Date Sampled:	07/23/1993	07/23/1993	07/27/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993
Depth (ft.):	2.50	2.50	2.50	0.50	0.50	2.50	3.50	0.50	2.50	1.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA		NA					

000289

028009

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S063-01	LH-S063-01	LH-S064-01	LH-S064-01	LH-S064-01	LH-S064-02	LH-S064-02	LH-S064-02	LH-S065-01
Sample Number:	LH-S063-01_2	LH-S063-01_3	LH-S064-01_1	LH-S064-01_2	LH-S064-01_3	LH-S064-02_1	LH-S064-02_2	LH-S064-02_3	LH-S065-01_1
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993
Depth (ft.):	2.00	2.50	1.50	4.00	0.50	1.00	2.50	4.00	0.50
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

0028010
0028010

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S065-01	LH-S065-01	LH-S065-02	LH-S065-02	LH-S065-02	LH-S121-01	LH-S121-01	LH-S121-02	LH-S121-02
Sample Number:	LH-S065-01_2	LH-S065-01_3	LH-S065-02_1	LH-S065-02_2	LH-S065-02_3	LH-S121-01_1	LH-S121-01_2	LH-S121-02_1	LH-S121-02_2
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993
Depth (ft.):	2.00	4.00	0.50	3.00	4.00	0.50	5.00	0.50	5.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS						NA	NA	NA	NA

000291

028011

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S44-01	LH-S44-01	LH-S44-01	LH-S44-02	LH-S44-02	LH-S44-02	LH-S45-01	LH-S45-01	LH-S45-01	LH-S45-02
Sample Number:	LH-S44-01_1	LH-S44-01_2	LH-S44-01_3	LH-S44-02_1	LH-S44-02_2	LH-S44-02_3	LH-S45-01_1	LH-S45-01_2	LH-S45-01_3	LH-S45-02_1
Date Sampled:	07/10/1993	07/10/1993	07/10/1993	07/11/1993	07/11/1993	07/11/1993	07/10/1993	07/10/1993	07/10/1993	07/10/1993
Depth (ft.):	0.50	4.00	7.90	0.50	4.00	7.70	0.50	6.70	8.40	0.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

262000

028012

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S45-02	LH-S47-01	LH-S47-01	LH-S47-02	LH-S47-02	LH-S48-01	LH-S48-01	LH-S48-01	LH-S48-02	LH-S49-01
Sample Number:	LH-S45-02_2	LH-S47-01_1	LH-S47-01_2	LH-S47-02_1	LH-S47-02_2	LH-S48-01_1	LH-S48-01_2	LH-S48-01_3	LH-S48-02	LH-S49-01_1
Date Sampled:	07/10/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/27/1993	07/27/1993	07/27/1993	07/27/1993	07/09/1993
Depth (ft.):	7.00	0.50	2.20	0.50	2.50	0.50	5.00	6.50	0.50	0.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000293

028013

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S49-01	LH-S50-01	LH-S50-01	LH-S50-01	LH-S51-01	LH-S51-01	LH-S51-01	LH-S53-01	LH-S53-01	LH-S53-02
Sample Number:	LH-S49-01_2	LH-S50-01_2	LH-S50-01_3	LH-S50-01_1	LH-S51-01_1	LH-S51-01_2	LH-S51-01_3	LH-S53-01_1	LH-S53-01_2	LH-S53-02_1
Date Sampled:	07/09/1993	07/27/1993	07/27/1993	07/28/1993	07/11/1993	07/11/1993	07/11/1993	07/13/1993	07/13/1993	07/13/1993
Depth (ft.):	4.00	0.50	4.00	0.50	0.50	6.00	15.70	0.50	7.00	0.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000294

028014

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S53-02	LH-S54-01	LH-S54-01	LH-S55-01	LH-S55-01	LH-S56-01	LH-S56-01	LH-S57-01	LH-S57-01	LH-S57-01
Sample Number:	LH-S53-02_2	LH-S54-01_1	LH-S54-01_2	LH-S55-01_1	LH-S55-01_2	LH-S56-01_1	LH-S56-01_2	LH-S57-01_1	LH-S57-01_2	LH-S57-01_3
Date Sampled:	07/13/1993	07/12/1993	07/12/1993	07/12/1993	07/12/1993	08/05/1993	08/09/1993	07/22/1993	07/22/1993	07/22/1993
Depth (ft.):	7.00	0.00	4.00	0.00	3.50	0.50	3.50	0.50	2.00	8.40
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000295

028015

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S57-02	LH-S57-02	LH-S57-02	LH-S58-01	LH-S58-01	LH-S59-01	LH-S59-01	LH-S59-01	LH-S59-02	LH-S59-02
Sample Number:	LH-S57-02_1	LH-S57-02_2	LH-S57-02_3	LH-S58-01_1	LH-S58-01_2	LH-S59-01_1	LH-S59-01_2	LH-S59-01_3	LH-S59-02_1	LH-S59-02_2
Date Sampled:	07/22/1993	07/22/1993	07/22/1993	06/26/1993	06/26/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993
Depth (ft.):	0.50	2.00	8.40	0.50	3.00	0.50	4.00	6.50	0.50	4.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000596

028016

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S59-02	LH-S60-01	LH-S60-01	LH-S60-02	LH-S60-02	LH-S60-02	LH-S61-01	LH-S61-01	LH-S61-02	LH-S61-02
Sample Number:	LH-S59-02_3	LH-S60-01_1	LH-S60-01_2	LH-S60-02_1	LH-S60-02_2	LH-S60-02_3	LH-S61-01_1	LH-S61-01_2	LH-S61-02_1	LH-S61-02_2
Date Sampled:	07/21/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993
Depth (ft.):	9.90	0.50	3.00	5.00	0.50	2.50	0.50	8.00	1.00	8.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

028017
028017

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S66-01	LH-S66-01	LH-S66-01	LH-S66-01	LH-S66-02	LH-S66-02	LH-S66-02	LH-S66-02	LH-S67-01
Sample Number:	LH-S66-01_1	LH-S66-01_1FD	LH-S66-01_2	LH-S66-01_2FD	LH-S66-02_1	LH-S66-02_1FD	LH-S66-02_2	LH-S66-02_2FD	LH-S67-01_1
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/06/1993
Depth (ft.):	0.50	0.50	4.00	4.00	0.50	0.50	4.00	4.00	0.50
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS		NA		NA		NA		NA	

0028018
0028018

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S67-01	LH-S67-01	LH-S67-01	LH-S68-01	LH-S68-01	LH-S68-02	LH-S69-01	LH-S69-01	LH-S69-01	LH-S69-02
Sample Number:	LH-S67-01_1FD	LH-S67-01_2	LH-S67-01_2FD	LH-S68-01_1	LH-S68-01_2	LH-S68-02	LH-S69-01_1	LH-S69-01_2	LH-S69-01_3	LH-S69-02_1
Date Sampled:	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	3.00	3.00	0.50	5.00	0.50	0.50	4.00	5.50	0.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA		NA	NA	NA	NA	NA	NA	NA	NA

692000

028019

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S69-02	LH-S70-01	LH-S70-01	LH-S70-02	LH-S70-02	LH-S71-01	LH-S71-01	LH-S71-01	LH-S71-02	LH-S71-02
Sample Number:	LH-S69-02_2	LH-S70-01_1	LH-S70-01_2	LH-S70-02_1	LH-S70-02_2	LH-S71-01_1	LH-S71-01_2	LH-S71-01_3	LH-S71-02_1	LH-S71-02_2
Date Sampled:	06/26/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993
Depth (ft.):	4.50	0.50	7.00	0.50	7.00	1.00	3.00	4.50	1.00	3.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000300

028020

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S71-02	LH-S73-01	LH-S73-01	LH-S74-01	LH-S75-01	LH-S75-01	LH-S75-02	LH-S75-02	LH-S76-01	LH-S76-01
Sample Number:	LH-S71-02_3	LH-S73-01_1	LH-S73-01_2	LH-S74-01	LH-S75-01_1	LH-S75-01_2	LH-S75-02_1	LH-S75-02_2	LH-S76-01_1	LH-S76-01_2
Date Sampled:	07/24/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	5.00	0.50	2.50	2.50	0.50	3.50	0.50	3.50	0.50	2.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000304

028021

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S76-01	LH-S76-02	LH-S76-02	LH-S76-02	LH-S77-01	LH-S77-01	LH-S77-01	LH-S77-02	LH-S77-02	LH-S77-02
Sample Number:	LH-S76-01_3	LH-S76-02_1	LH-S76-02_2	LH-S76-02_3	LH-S77-01_1	LH-S77-01_2	LH-S77-01_3	LH-S77-02_1	LH-S77-02_2	LH-S77-02_3
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	5.50	0.50	5.50	7.00	0.50	1.50	5.50	0.50	2.50	5.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

208050

028022

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S78-01	LH-S78-01	LH-S78-01	LH-S79-01	LH-S79-01	LH-S80-01	LH-S80-01	LH-S81-01	LH-S81-01	LH-S81-01
Sample Number:	LH-S78-01_1	LH-S78-01_2	LH-S78-01_3	LH-S79-01_1	LH-S79-01_2	LH-S80-01_1	LH-S80-01_2	LH-S81-01_1	LH-S81-01_2	LH-S81-01_3
Date Sampled:	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/23/1993	07/23/1993	07/23/1993
Depth (ft.):	0.50	3.00	15.00	0.50	3.00	0.50	8.00	0.50	5.00	9.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000303

028023

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S81-02	LH-S81-02	LH-S81-02	LH-S82-01	LH-S82-01	LH-S82-01	LH-S82-02	LH-S82-02	LH-S83-01	LH-S83-01
Sample Number:	LH-S81-02_1	LH-S81-02_2	LH-S81-02_3	LH-S82-01_1	LH-S82-01_2	LH-S82-01_3	LH-S82-02_1	LH-S82-02_2	LH-S83-01_1	LH-S83-01_2
Date Sampled:	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993
Depth (ft.):	0.50	5.00	9.00	0.50	6.00	14.00	2.50	6.00	0.50	8.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000304

028024

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S83-02	LH-S83-02	LH-S84-01	LH-S84-01	LH-S85-01	LH-S85-02	LH-S86-01	LH-S86-01	LH-S86-02	LH-S86-02
Sample Number:	LH-S83-02_1	LH-S83-02_2	LH-S84-01_1	LH-S84-01_2	LH-S85-01_1	LH-S85-02_1	LH-S86-01_1	LH-S86-01_2	LH-S86-02_2	LH-S86-02_3
Date Sampled:	07/23/1993	07/23/1993	07/21/1993	07/21/1993	06/26/1993	06/26/1993	07/27/1993	07/27/1993	07/27/1993	07/27/1993
Depth (ft.):	0.50	8.00	0.50	3.00	3.50	3.50	0.50	7.00	4.00	7.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000305

028025

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S87-01	LH-S87-01	LH-S88-01	LH-S88-01	LH-S88-01	LH-S88-02	LH-S88-02	LH-S88-02	LH-S89-01	LH-S89-01
Sample Number:	LH-S87-01_2	LH-S87-01_1	LH-S88-01_1	LH-S88-01_2	LH-S88-01_3	LH-S88-02_1	LH-S88-02_2	LH-S88-02_3	LH-S89-01_1	LH-S89-01_2
Date Sampled:	06/26/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	07/21/1993	07/21/1993
Depth (ft.):	2.50	0.50	0.50	4.00	6.00	0.50	4.00	6.00	0.50	6.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000306

028026

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S89-02	LH-S89-02	LH-S90-01	LH-S90-01	LH-S90-02	LH-S90-02	LH-S91-01	LH-S91-01	LH-S91-01	LH-S91-02
Sample Number:	LH-S89-02_1	LH-S89-02_2	LH-S90-01_1	LH-S90-01_2	LH-S90-02_1	LH-S90-02_2	LH-S91-01_1	LH-S91-01_2	LH-S91-01_3	LH-S91-02_1
Date Sampled:	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/23/1993	07/23/1993	07/23/1993	07/24/1993
Depth (ft.):	0.50	6.00	0.50	8.00	0.50	8.00	0.50	5.00	10.40	0.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

208006

028027

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S91-02	LH-S91-02	LH-S92-01	LH-S92-01	LH-S92-01	LH-S92-02	LH-S92-02	LH-S92-02	LH-S93-01	LH-S93-01
Sample Number:	LH-S91-02_2	LH-S91-02_3	LH-S92-01_1	LH-S92-01_2	LH-S92-01_3	LH-S92-02_1	LH-S92-02_2	LH-S92-02_3	LH-S93-01_1	LH-S93-01_2
Date Sampled:	07/24/1993	07/24/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/24/1993	07/24/1993
Depth (ft.):	5.50	10.00	0.50	6.50	10.50	0.50	6.50	10.50	0.50	4.50
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

805000

028028

Explosives in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S93-01	LH-S93-02	LH-S93-02	LH-WRS17-01	LH-WRS17-01	LH-WRS18-01	LH-WRS18-01
Sample Number:	LH-S93-01_3	LH-S93-02 _1	LH-S93-02_2	LH-WRS17-01_1	LH-WRS17-01_2	LH-WRS18-01_1	LH-WRS18-01_2
Date Sampled:	07/24/1993	07/24/1993	07/24/1993	07/22/1993	07/22/1993	06/26/1993	06/26/1993
Depth (ft.):	12.50	0.50	3.00	0.50	4.00	0.50	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

005000

028029

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB01	47SB01	47SB01	47SB01	47SB02	47SB02	47SB02	47SB02
Sample Number:	47SB01(0-0.5)	47SB01(1-3)	47SB01(3-5)	47SB01(0-0.5)	47SB02(0-0.5)	47SB02(1-3)	47SB02(3-5)	47SB02(0-0.5)
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	12/01/1998	07/27/1998	07/27/1998	07/27/1998	12/01/1998
Depth (ft.):	0.00	1.00	3.00	0.00	0.00	1.00	3.00	0.00
PESTICIDES - UNITS: UG/KG								
DIELDRIN	ND [3.7] U	ND [3.6] U	ND [3.7] U	NA	ND [3.6] U	ND [3.6] U	ND [3.8] U	NA
HEPTACHLOR	ND [1.8] U	ND [1.8] U	ND [1.8] U	NA	ND [1.8] U	ND [1.8] U	ND [1.9] U	NA
p,p'-DDD	ND [3.7] U	ND [3.6] U	ND [3.7] U	NA	ND [3.6] U	ND [3.6] U	ND [3.8] U	NA
p,p'-DDE	ND [3.7] U	ND [3.6] U	ND [3.7] U	NA	ND [3.6] U	ND [3.6] U	ND [3.8] U	NA
p,p'-DDT	ND [3.7] U	ND [3.6] U	ND [3.7] U	NA	ND [3.6] U	ND [3.6] U	ND [3.8] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	ND [37] U	ND [36] U	ND [37] U	NA	ND [37] U	ND [36] U	ND [38] U	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	3.772	31.31	11.782	NA	28.282	2.905	30.909
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	0.664	6.127	2.48	NA	0.986	ND [0.104] U	1.086
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.322] U	ND [0.234] U	ND [1.074] U	NA	ND [0.188] U	ND [0.122] U	ND [0.685] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.258] U	ND [0.521] U	ND [1.019] U	NA	ND [0.254] U	ND [0.164] U	ND [0.721] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.181] U	1.304	ND [1.618] U	NA	1.38	ND [0.157] U	ND [0.58] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.194] U	0.388	ND [0.569] U	NA	ND [0.191] U	ND [0.123] U	ND [0.402] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.156] U	ND [0.212] U	ND [1.079] U	NA	ND [0.203] U	ND [0.135] U	ND [0.387] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.203] U	0.528	ND [0.676] U	NA	ND [0.2] U	ND [0.129] U	ND [0.478] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.149] U	ND [0.291] U	ND [0.417] U	NA	ND [0.21] U	ND [0.132] U	ND [0.498] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.144] U	ND [0.281] U	ND [0.436] U	NA	ND [0.203] U	ND [0.128] U	ND [0.52] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	ND [0.218] U	ND [0.524] U	ND [1.212] U	NA	ND [0.219] U	ND [0.171] U	ND [0.424] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	4.553	62.181	13.097	NA	62.511	5.624	71.806
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.965	6.127	4.032	NA	ND [0.16] U	ND [0.104] U	ND [0.513] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	0.776	3.503	3.445	NA	4.16	ND [0.123] U	ND [0.402] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.156] U	3.844	1.764	NA	0.61	ND [0.135] U	ND [0.387] U
OCTACHLORODIBENZO-p-DIOXIN	NA	135.471	978.518	299.008	NA	2406.362	294.586	1034.011
OCTACHLORODIBENZOFURAN	NA	1.422	11.963	4.157	NA	2.822	ND [0.151] U	4.419
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.273] U	ND [0.25] U	ND [0.41] U	NA	ND [0.255] U	ND [0.165] U	ND [0.621] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.144] U	ND [0.281] U	ND [0.436] U	NA	ND [0.203] U	ND [0.128] U	ND [0.52] U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.281] U	ND [0.267] U	ND [1.063] U	NA	ND [0.262] U	ND [0.17] U	ND [0.581] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.218] U	ND [0.524] U	ND [1.212] U	NA	ND [0.219] U	ND [0.171] U	ND [0.424] U

000310

028030

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB01	47SB01	47SB01	47SB01	47SB02	47SB02	47SB02	47SB02
Sample Number:	47SB01(0-0.5)	47SB01(1-3)	47SB01(3-5)	47SB01(0-0.5)	47SB02(0-0.5)	47SB02(1-3)	47SB02(3-5)	47SB02(0-0.5)
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	12/01/1998	07/27/1998	07/27/1998	07/27/1998	12/01/1998
Depth (ft.):	0.00	1.00	3.00	0.00	0.00	1.00	3.00	0.00
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS				NA				NA

0280031
0280031

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB03	47SB03	47SB03	47SB03	LHS-3-01	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05
Sample Number:	47SB03(0-0.5)	47SB03(1-3)	47SB03(3-5)	47SB03(0-0.5)	LHS-3-01	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	12/01/1998	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/09/1995
Depth (ft.):	0.00	1.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
DIELDRIN	ND [4] U	ND [3.8] U	ND [3.9] U	NA	NA	NA	NA	NA	NA
HEPTACHLOR	ND [2] U	ND [1.9] U	ND [2] U	NA	NA	NA	NA	NA	NA
p,p'-DDD	ND [4] U	ND [3.8] U	ND [3.9] U	NA	NA	NA	NA	NA	NA
p,p'-DDE	19	ND [3.8] U	ND [3.9] U	NA	NA	NA	NA	NA	NA
p,p'-DDT	11	ND [3.8] U	ND [3.9] U	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	ND [40] U	ND [38] U	ND [39] U	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	9.413 J	2.591	1.651	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	1.397 J	0.42	0.195	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.169] U	ND [0.166] U	ND [0.077] U	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.304] U	ND [0.216] U	ND [0.117] U	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.237] U	ND [0.166] U	ND [0.109] U	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.228] U	ND [0.162] U	ND [0.108] U	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.205] U	ND [0.143] U	ND [0.105] U	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.239] U	ND [0.17] U	ND [0.103] U	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.237] U	ND [0.15] U	ND [0.075] U	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.229] U	ND [0.146] U	ND [0.077] U	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	ND [0.26] U	ND [0.197] U	0.284	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	26.532	7.467	4.322	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.143] U	0.674	0.399	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	4.502 J	ND [0.162] U	ND [0.108] U	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.849	ND [0.143] U	ND [0.105] U	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	265.21 J	48.815 J	72.205	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	3.907 J	0.89	0.518	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.266] U	ND [0.192] U	ND [0.122] U	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.241	ND [0.146] U	ND [0.077] U	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.241] U	ND [0.215] U	ND [0.106] U	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.26] U	ND [0.197] U	0.284	NA	NA	NA	NA	NA

000342

028032

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB03	47SB03	47SB03	47SB03	LHS-3-01	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05
Sample Number:	47SB03(0-0.5)	47SB03(1-3)	47SB03(3-5)	47SB03(0-0.5)	LHS-3-01	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	12/01/1998	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/09/1995
Depth (ft.):	0.00	1.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS				NA					

000343

028033

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-06	LHS-3-07	LHS-3-08	LHS-3-09	LHS-3-10	LHS-3-11	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15
Sample Number:	LHS-3-06	LHS-3-07	LHS-3-08	LHS-3-09	LHS-3-10	LHS-3-11	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15
Date Sampled:	01/09/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG										
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG										
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG										
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

000344

028034

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-06	LHS-3-07	LHS-3-08	LHS-3-09	LHS-3-10	LHS-3-11	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15
Sample Number:	LHS-3-06	LHS-3-07	LHS-3-08	LHS-3-09	LHS-3-10	LHS-3-11	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15
Date Sampled:	01/09/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

028035

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-16	LHS-3-17	LHS-3-18	LHS-3-19	LHS-3-20	LHS-3-21	LHS-3-22	LHS-3-23	LHS-3-24	LHS-3-25
Sample Number:	LHS-3-16	LHS-3-17	LHS-3-18	LHS-3-19	LHS-3-20	LHS-3-21	LHS-3-22	LHS-3-23	LHS-3-24	LHS-3-25
Date Sampled:	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG										
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG										
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG										
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

0028036
0028036

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-16	LHS-3-17	LHS-3-18	LHS-3-19	LHS-3-20	LHS-3-21	LHS-3-22	LHS-3-23	LHS-3-24	LHS-3-25
Sample Number:	LHS-3-16	LHS-3-17	LHS-3-18	LHS-3-19	LHS-3-20	LHS-3-21	LHS-3-22	LHS-3-23	LHS-3-24	LHS-3-25
Date Sampled:	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS										

2220000

028037

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-26	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW-28	LHS-MW-29	LHS-MW-30	LHS-MW-31	LHS-MW-32
Sample Number:	LHS-3-26	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW28	LHS-MW29	LHS-MW30	LHS-MW31	LHS-MW32
Date Sampled:	01/11/1995	01/11/1995	01/11/1995	01/11/1995	10/03/1994	10/03/1994	10/03/1994	10/04/1994	10/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA

028038
028038

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-26	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW-28	LHS-MW-29	LHS-MW-30	LHS-MW-31	LHS-MW-32
Sample Number:	LHS-3-26	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW28	LHS-MW29	LHS-MW30	LHS-MW31	LHS-MW32
Date Sampled:	01/11/1995	01/11/1995	01/11/1995	01/11/1995	10/03/1994	10/03/1994	10/03/1994	10/04/1994	10/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

000242

028039

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-33	LHS-MW-34	LHS-MW-35	LHS-MW-36	LHS-MW-37	LHS-MW-38	LHS-MW-39	LHS-MW-40	LHS-MW-41
Sample Number:	LHS-MW33	LHS-MW34	LHS-MW35	LHS-MW36	LHS-MW37	LHS-MW38	LHS-MW39	LHS-MW40	LHS-MW41
Date Sampled:	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA

028040
028040

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-33	LHS-MW-34	LHS-MW-35	LHS-MW-36	LHS-MW-37	LHS-MW-38	LHS-MW-39	LHS-MW-40	LHS-MW-41
Sample Number:	LHS-MW33	LHS-MW34	LHS-MW35	LHS-MW36	LHS-MW37	LHS-MW38	LHS-MW39	LHS-MW40	LHS-MW41
Date Sampled:	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

0280041

0009321

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-42	LHS-MW-43	LHS-MW-44	LHS-MW-45	LHS-MW-46	LHS-MW-47	LHS-MW-48	LHS-MW-49	LHS-MW-50
Sample Number:	LHS-MW42	LHS-MW43	LHS-MW44	LHS-MW45	LHS-MW46	LHS-MW47	LHS-MW48	LHS-MW49	LHS-MW50
Date Sampled:	10/04/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA

0028042
0028042

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-42	LHS-MW-43	LHS-MW-44	LHS-MW-45	LHS-MW-46	LHS-MW-47	LHS-MW-48	LHS-MW-49	LHS-MW-50
Sample Number:	LHS-MW42	LHS-MW43	LHS-MW44	LHS-MW45	LHS-MW46	LHS-MW47	LHS-MW48	LHS-MW49	LHS-MW50
Date Sampled:	10/04/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

0280043

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-51	LHS-MW-52	LHS-MW-53	LHS-MW-54	LHS-MW-55	LHS-MW-56	LHS-MW-57	LHS-MW-60	LHS-MW-61
Sample Number:	LHS-MW51	LHS-MW52	LHS-MW53	LHS-MW54	LHS-MW55	LHS-MW56	LHS-MW57	LHS-MW60	LHS-MW61
Date Sampled:	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA

0003334

028044

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-51	LHS-MW-52	LHS-MW-53	LHS-MW-54	LHS-MW-55	LHS-MW-56	LHS-MW-57	LHS-MW-60	LHS-MW-61
Sample Number:	LHS-MW51	LHS-MW52	LHS-MW53	LHS-MW54	LHS-MW55	LHS-MW56	LHS-MW57	LHS-MW60	LHS-MW61
Date Sampled:	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

000325

028045

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP045	SUMP045	SUMP045	SUMP045	SUMP047	SUMP047	SUMP049
Sample Number:	SUMP045(0-0.5)	SUMP045(0-0.5)FD	SUMP045(3-5)	SUMP045(3-5)FD	SUMP047(0-0.5)	SUMP047(3-5)	SUMP049(3-5)
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	07/30/1998	08/09/1998	08/09/1998	08/09/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	3.00	3.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [3.6] U	NA	ND [3.6] U	NA	ND [3.9] U	ND [3.4] U	ND [3.7] U
HEPTACHLOR	ND [1.8] U	NA	ND [1.8] U	NA	ND [1.9] U	ND [1.7] U	ND [1.8] U
p,p'-DDD	ND [3.6] U	NA	ND [3.6] U	NA	ND [3.9] U	ND [3.4] U	ND [3.7] U
p,p'-DDE	ND [3.6] U	NA	ND [3.6] U	NA	ND [3.9] U	ND [3.4] U	ND [3.7] U
p,p'-DDT	ND [3.6] U	NA	ND [3.6] U	NA	ND [3.9] U	ND [3.4] U	ND [3.7] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [36] U	NA	ND [36] U	NA	ND [38] U	ND [37] U	ND [37] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	17.045	NA	6.947	NA	13.101	ND [0.682] U	ND [0.826] U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.721	NA	0.245	NA	0.999	ND [0.237] U	ND [0.261] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.311] U	NA	ND [0.106] U	NA	ND [0.51] U	ND [0.317] U	ND [0.349] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.318] U	NA	ND [0.103] U	NA	ND [0.608] U	ND [0.682] U	ND [0.754] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.792	NA	ND [0.113] U	NA	0.885	ND [0.44] U	ND [0.506] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.238] U	NA	ND [0.096] U	NA	ND [0.339] U	ND [0.381] U	ND [0.421] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.134] U	NA	ND [0.109] U	NA	ND [0.245] U	ND [0.293] U	ND [0.337] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.25] U	NA	ND [0.092] U	NA	ND [0.403] U	ND [0.452] U	ND [0.5] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.161] U	NA	ND [0.094] U	NA	ND [0.285] U	ND [0.323] U	ND [0.325] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.156] U	NA	ND [0.095] U	NA	ND [0.298] U	ND [0.338] U	ND [0.34] U
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.21] U	0.309	0.492	0.468	ND [0.26] U	ND [0.333] U	ND [0.456] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	94.512	NA	19.605	NA	74.664	1.877	ND [0.826] U
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	5.623	NA	0.401	NA	0.999	ND [0.237] U	ND [0.261] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	3.63	NA	0.496	NA	2.755	ND [0.381] U	ND [0.421] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	6.545	NA	ND [0.109] U	NA	ND [0.245] U	ND [0.293] U	ND [0.337] U
OCTACHLORODIBENZO-p-DIOXIN	745.583	NA	1079.656	NA	422.737 J	95.248 J	156.395 J
OCTACHLORODIBENZOFURAN	3.707	NA	0.634	NA	3.828	ND [0.443] U	ND [0.788] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.202] U	NA	ND [0.127] U	NA	ND [0.427] U	ND [0.502] U	ND [0.515] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	4.366	NA	ND [0.095] U	NA	ND [0.298] U	ND [0.338] U	ND [0.34] U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.243] U	NA	ND [0.147] U	NA	ND [0.417] U	ND [0.473] U	ND [0.442] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	2.419	NA	0.492	NA	ND [0.26] U	ND [0.333] U	ND [0.456] U

000326

028046

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP045	SUMP045	SUMP045	SUMP045	SUMP047	SUMP047	SUMP049
Sample Number:	SUMP045(0-0.5)	SUMP045(0-0.5)FD	SUMP045(3-5)	SUMP045(3-5)FD	SUMP047(0-0.5)	SUMP047(3-5)	SUMP049(3-5)
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	07/30/1998	08/09/1998	08/09/1998	08/09/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	3.00	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0280047

0003207

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP049	SUMP049	SUMP052	SUMP052	SUMP053	SUMP053	SUMP053
Sample Number:	SUMP049(0-0.5)	SUMP049(0-0.5)	SUMP052(0-0.5)	SUMP052(3-5)	SUMP053(0-0.5)	SUMP053(3-5)	SUMP053(3-5)FD
Date Sampled:	08/09/1998	12/01/1998	08/09/1998	08/09/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	0.00	0.00	3.00	0.00	3.00	3.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [3.8] U	NA	ND [3.8] U	ND [3.9] U	ND [3.6] U	ND [3.7] U	NA
HEPTACHLOR	ND [1.9] U	NA	ND [1.9] U	ND [1.9] U	ND [1.7] U	ND [1.9] U	NA
p,p'-DDD	ND [3.8] U	NA	ND [3.8] U	ND [3.9] U	ND [3.6] U	ND [3.7] U	NA
p,p'-DDE	10	NA	7.6	ND [3.9] U	ND [3.6] U	ND [3.7] U	NA
p,p'-DDT	9.8	NA	ND [3.8] U	ND [3.9] U	ND [3.6] U	ND [3.7] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	130	NA	ND [39] U	ND [39] U	ND [35] U	ND [37] U	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	19.962	6.161	ND [0.393] U	113.007	40.904	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	2.558	1.209	ND [0.162] U	13.034	4.15	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [1.135] U	ND [0.245] U	ND [0.216] U	ND [0.996] U	0.391	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.609] U	ND [0.778] U	ND [0.415] U	0.522	ND [0.224] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [1.051] U	1.802	ND [0.272] U	4.201	1.717	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.34] U	ND [0.434] U	ND [0.232] U	2.37	1.582	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.7] U	0.776	ND [0.182] U	ND [0.264] U	ND [0.163] U	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.404] U	ND [0.516] U	ND [0.276] U	1.619	0.577	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	1.006	0.692	ND [0.194] U	1.612	ND [0.124] U	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.523] U	ND [0.396] U	ND [0.203] U	ND [0.174] U	ND [0.126] U	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	ND [0.528] U	ND [0.361] U	ND [0.246] U	ND [0.225] U	0.499	0.355
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	48.951	14.144	ND [0.393] U	306.217	67.241	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	2.558	1.209	ND [0.162] U	13.034	ND [0.168] U	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.34] U	ND [0.434] U	ND [0.232] U	15.789	5.375	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.7] U	0.776	ND [0.182] U	17.848	4.65	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	807.439	364.619 J	51.349 J	1774.962	297.528	NA
OCTACHLORODIBENZOFURAN	NA	5.825	2.321	ND [0.424] U	33.571	20.253	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.671] U	ND [0.465] U	ND [0.333] U	ND [0.292] U	ND [0.231] U	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	1.678	1.295	ND [0.203] U	11.201	ND [0.126] U	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.534] U	ND [0.436] U	ND [0.327] U	ND [0.181] U	ND [0.19] U	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	5.486	0.967	ND [0.246] U	1.312	0.499	NA

0028048
0003288

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP049	SUMP049	SUMP052	SUMP052	SUMP053	SUMP053	SUMP053
Sample Number:	SUMP049(0-0.5)	SUMP049(0-0.5)	SUMP052(0-0.5)	SUMP052(3-5)	SUMP053(0-0.5)	SUMP053(3-5)	SUMP053(3-5)FD
Date Sampled:	08/09/1998	12/01/1998	08/09/1998	08/09/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	0.00	0.00	3.00	0.00	3.00	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

632000

028049

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP055	SUMP055	SUMP056	SUMP056	SUMP056	SUMP057	SUMP057
Sample Number:	SUMP055(0-0.5)	SUMP055(3-5)	SUMP056(0-0.5)	SUMP056(0-0.5)FD	SUMP056(3-5)	SUMP057(0-0.5)	SUMP057(0-0.5)FD
Date Sampled:	08/09/1998	08/09/1998	08/10/1998	08/10/1998	08/10/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	3.00	0.00	0.00	3.00	0.00	0.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [4.1] U	ND [3.9] U	ND [3.9] U	ND [200] U	ND [3.9] U	ND [3.6] U	NA
HEPTACHLOR	ND [2] U	ND [2] U	24	ND [98] U	ND [1.9] U	ND [1.8] U	NA
p,p'-DDD	ND [4.1] U	ND [3.9] U	ND [3.9] U	ND [200] U	ND [3.9] U	ND [3.6] U	NA
p,p'-DDE	ND [4.1] U	ND [3.9] U	490 J	350	ND [3.9] U	ND [3.6] U	NA
p,p'-DDT	ND [4.1] U	ND [3.9] U	950 J	760	ND [3.9] U	ND [3.6] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [41] U	ND [39] U	ND [39] U	NA	ND [39] U	ND [36] U	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	2.429	3.499	61.332	NA	5.514	37.855	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.761	ND [0.283] U	12.84	NA	0.4	8.765	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.378] U	ND [0.378] U	ND [0.287] U	NA	ND [0.337] U	ND [0.861] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.475] U	ND [0.695] U	ND [0.617] U	NA	ND [0.443] U	ND [0.331] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [0.294] U	ND [0.421] U	4.485	NA	ND [0.291] U	1.128	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.265] U	ND [0.388] U	3.402	NA	ND [0.247] U	1.656	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.196] U	ND [0.281] U	3.044	NA	ND [0.194] U	ND [0.374] U	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.315] U	ND [0.461] U	ND [0.41] U	NA	ND [0.294] U	ND [0.261] U	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.325] U	ND [0.235] U	5.244	NA	ND [0.21] U	0.718	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.34] U	ND [0.245] U	ND [0.58] U	NA	ND [0.219] U	ND [0.288] U	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.322] U	ND [0.416] U	ND [1.377] U	NA	ND [0.384] U	2.192	1.603
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	9.413	7.67	120.25	NA	ND [0.943] U	78.067	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	2.264	ND [0.283] U	12.84	NA	0.4	8.765	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.265] U	ND [0.388] U	11.543	NA	1.357	11.499	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.196] U	ND [0.281] U	17.831	NA	ND [0.194] U	5.807	NA
OCTACHLORODIBENZO-p-DIOXIN	158.452 J	594.635	1503.153	NA	297.491 J	706.968	NA
OCTACHLORODIBENZOFURAN	ND [0.566] U	ND [0.313] U	26.491	NA	ND [0.237] U	22.163	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.497] U	ND [0.477] U	ND [0.534] U	NA	ND [0.31] U	ND [0.35] U	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.34] U	ND [0.245] U	14.803	NA	ND [0.219] U	1.116	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.467] U	ND [0.443] U	ND [0.518] U	NA	ND [0.345] U	ND [0.424] U	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.322] U	ND [0.416] U	18.869	NA	ND [0.384] U	6.798	NA

028050
028050

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP055	SUMP055	SUMP056	SUMP056	SUMP056	SUMP057	SUMP057
Sample Number:	SUMP055(0-0.5)	SUMP055(3-5)	SUMP056(0-0.5)	SUMP056(0-0.5)FD	SUMP056(3-5)	SUMP057(0-0.5)	SUMP057(0-0.5)FD
Date Sampled:	08/09/1998	08/09/1998	08/10/1998	08/10/1998	08/10/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	3.00	0.00	0.00	3.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0003334

028051

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP057	SUMP057	SUMP058	SUMP058	SUMP058	SUMP058	SUMP059
Sample Number:	SUMP057(3-5)	SUMP057(3-5)FD	SUMP058(0-0.5)	SUMP058(0-0.5)FD	SUMP058(3-5)	SUMP058(3-5)FD	SUMP059(0-0.5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/10/1998
Depth (ft.):	3.00	3.00	0.00	0.00	3.00	3.00	0.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [3.7] U	NA	ND [3.7] U	NA	ND [3.7] U	NA	ND [3.6] U
HEPTACHLOR	ND [1.9] U	NA	ND [1.8] U	NA	ND [1.8] U	NA	ND [1.8] U
p,p'-DDD	ND [3.7] U	NA	ND [3.7] U	NA	ND [3.7] U	NA	ND [3.6] U
p,p'-DDE	ND [3.7] U	NA	ND [3.7] U	NA	ND [3.7] U	NA	2.4
p,p'-DDT	ND [3.7] U	NA	ND [3.7] U	NA	ND [3.7] U	NA	2.8
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [37] U	NA	ND [37] U	NA	ND [37] U	NA	ND [36] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	9.928	NA	1.548	NA	1.885	NA	226.336
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.668	NA	0.289	NA	ND [0.228] U	NA	45.289
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.148] U	NA	ND [0.231] U	NA	ND [0.304] U	NA	ND [12.772] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.419] U	NA	ND [0.31] U	NA	ND [0.585] U	NA	ND [0.558] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [0.317] U	NA	ND [0.422] U	NA	ND [0.253] U	NA	19.279
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.314] U	NA	ND [0.233] U	NA	ND [0.327] U	NA	6.7
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.274] U	NA	ND [0.365] U	NA	ND [0.168] U	NA	ND [0.897] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.329] U	NA	ND [0.244] U	NA	ND [0.388] U	NA	ND [0.37] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.322] U	NA	ND [0.239] U	NA	ND [0.198] U	NA	ND [0.261] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.311] U	NA	ND [0.231] U	NA	ND [0.207] U	NA	ND [0.272] U
2,3,7,8-TETRACHLORODIBENZOFURAN	1.489	1.702	1.716	1.435	ND [0.284] U	2.277 J	ND [0.252] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	17.97	NA	3.26	NA	4.375	NA	516.218
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	0.947	NA	ND [0.197] U	NA	ND [0.228] U	NA	45.289
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	0.791	NA	ND [0.233] U	NA	ND [0.327] U	NA	19.198
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	0.36	NA	ND [0.365] U	NA	ND [0.168] U	NA	40.149
OCTACHLORODIBENZO-p-DIOXIN	201.866	NA	76.577	NA	305.887	NA	3044.795 J
OCTACHLORODIBENZOFURAN	ND [0.472] U	NA	0.308	NA	ND [0.469] U	NA	381.018
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.506] U	NA	ND [0.441] U	NA	ND [0.389] U	NA	ND [0.228] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.311] U	NA	0.208	NA	ND [0.207] U	NA	1.419 J
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.532] U	NA	ND [0.368] U	NA	ND [0.365] U	NA	ND [0.359] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	1.393	NA	3.005	NA	ND [0.284] U	NA	0.211

225000

0280052

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP057	SUMP057	SUMP058	SUMP058	SUMP058	SUMP058	SUMP059
Sample Number:	SUMP057(3-5)	SUMP057(3-5)FD	SUMP058(0-0.5)	SUMP058(0-0.5)FD	SUMP058(3-5)	SUMP058(3-5)FD	SUMP059(0-0.5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/10/1998
Depth (ft.):	3.00	3.00	0.00	0.00	3.00	3.00	0.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0028053
0028053

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP059	SUMP061	SUMP061	SUMP061	SUMP061	SUMP065	SUMP065
Sample Number:	SUMP059(3-5)	SUMP061(0-0.5)	SUMP061(0-0.5)FD	SUMP061(3-5)	SUMP061(3-5)FD	SUMP065(0-0.5)	SUMP065(3-5)
Date Sampled:	08/10/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/10/1998	08/10/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [3.8] UJ	ND [4] U	NA	ND [4.2] U	NA	ND [3.9] U	18
HEPTACHLOR	ND [1.9] UJ	ND [2] U	NA	ND [2.1] U	NA	ND [1.9] U	ND [2] U
p,p'-DDD	ND [3.8] UJ	ND [4] U	NA	ND [4.2] U	NA	ND [3.9] U	ND [4.1] U
p,p'-DDE	ND [3.8] UJ	ND [4] U	NA	ND [4.2] U	NA	ND [3.9] U	9.1
p,p'-DDT	ND [3.8] UJ	ND [4] U	NA	ND [4.2] U	NA	ND [3.9] U	29
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [38] UJ	72	NA	ND [42] U	NA	ND [39] U	150 J
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	7.32	0.508	NA	0.551	NA	3.844	ND [0.38] U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.213	ND [0.064] U	NA	ND [0.062] U	NA	ND [0.177] U	ND [0.176] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.656] U	ND [0.081] U	NA	ND [0.077] U	NA	ND [0.236] U	ND [0.235] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.497] U	ND [0.083] U	NA	ND [0.102] U	NA	ND [0.351] U	ND [0.493] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.585	ND [0.062] U	NA	ND [0.068] U	NA	ND [0.329] U	ND [0.231] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.278] U	ND [0.077] U	NA	ND [0.094] U	NA	ND [0.196] U	ND [0.275] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.129] U	ND [0.059] U	NA	ND [0.065] U	NA	ND [0.219] U	ND [0.154] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.33] U	ND [0.073] U	NA	ND [0.09] U	NA	ND [0.233] U	ND [0.327] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.191] U	ND [0.09] U	NA	ND [0.097] U	NA	ND [0.215] U	0.599
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.2] U	ND [0.091] U	NA	ND [0.099] U	NA	ND [0.225] U	ND [0.234] U
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.314] U	0.48	0.335	0.308	ND [0.171] U	ND [0.225] U	ND [0.382] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	16.78	0.508	NA	1.131	NA	19.024	5.394
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.491] U	ND [0.064] U	NA	ND [0.062] U	NA	ND [0.177] U	0.6
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.278] U	ND [0.077] U	NA	ND [0.094] U	NA	ND [0.196] U	ND [0.275] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	1.385	ND [0.059] U	NA	ND [0.065] U	NA	0.435	ND [0.154] U
OCTACHLORODIBENZO-p-DIOXIN	511.203 J	25.095	NA	98.235	NA	204.212 J	92.937 J
OCTACHLORODIBENZOFURAN	8.621	ND [0.123] U	NA	ND [0.139] U	NA	ND [0.464] U	ND [0.302] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.295] U	ND [0.122] U	NA	ND [0.1] U	NA	ND [0.296] U	ND [0.293] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.2] U	ND [0.091] U	NA	ND [0.099] U	NA	ND [0.225] U	1.855
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.307] U	ND [0.087] U	NA	ND [0.087] U	NA	ND [0.314] U	ND [0.298] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.314] U	0.358	NA	0.528	NA	ND [0.225] U	2.067

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP059	SUMP061	SUMP061	SUMP061	SUMP061	SUMP065	SUMP065
Sample Number:	SUMP059(3-5)	SUMP061(0-0.5)	SUMP061(0-0.5)FD	SUMP061(3-5)	SUMP061(3-5)FD	SUMP065(0-0.5)	SUMP065(3-5)
Date Sampled:	08/10/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/10/1998	08/10/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

523500 000335

028055

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP067	SUMP067	SUMP067	SUMP067	SUMP068	SUMP068	SUMP068
Sample Number:	SUMP067(0-0.5)	SUMP067(0-0.5)FD	SUMP067(3-5)	SUMP067(3-5)FD	SUMP068(0-0.5)	SUMP068(0-0.5)FD	SUMP068(3-5)
Date Sampled:	08/11/1998	08/11/1998	08/11/1998	08/11/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.8] U	NA	ND [3.9] U
HEPTACHLOR	ND [1.8] U	NA	ND [1.9] U	NA	ND [1.9] U	NA	ND [2] U
p,p'-DDD	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.8] U	NA	ND [3.9] U
p,p'-DDE	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.8] U	NA	ND [3.9] U
p,p'-DDT	ND [3.7] U	NA	ND [3.9] U	NA	ND [3.8] U	NA	ND [3.9] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	530	NA	ND [39] U	NA	ND [39] U	NA	ND [39] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	218.074	NA	4.654	NA	10.592	NA	0.918
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	7.074	NA	ND [0.415] U	NA	0.255	NA	ND [0.092] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [1.796] U	NA	ND [0.554] U	NA	ND [0.066] U	NA	ND [0.115] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.885] U	NA	ND [0.852] U	NA	ND [0.125] U	NA	ND [0.149] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	2.845	NA	ND [0.447] U	NA	ND [0.057] U	NA	ND [0.102] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	2.168	NA	ND [0.476] U	NA	ND [0.115] U	NA	ND [0.138] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.833] U	NA	ND [0.298] U	NA	ND [0.055] U	NA	ND [0.099] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.304	NA	ND [0.565] U	NA	ND [0.11] U	NA	ND [0.132] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	8.979	NA	ND [0.357] U	NA	ND [0.069] U	NA	ND [0.104] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [1.11] U	NA	ND [0.373] U	NA	ND [0.07] U	NA	ND [0.106] U
2,3,7,8-TETRACHLORODIBENZOFURAN	12.47	ND [0.201] U	3.445	2.836	0.409	0.377	0.433
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	477.498	NA	9.394	NA	19.519	NA	0.918
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	7.074	NA	ND [0.415] U	NA	0.874	NA	ND [0.092] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	19.836	NA	ND [0.476] U	NA	0.382	NA	ND [0.138] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	3.273	NA	ND [0.298] U	NA	ND [0.055] U	NA	ND [0.099] U
OCTACHLORODIBENZO-p-DIOXIN	5586.265	NA	712.17	NA	1294.211	NA	135.913
OCTACHLORODIBENZOFURAN	27.479	NA	ND [0.372] U	NA	1.315	NA	ND [0.204] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [1.429] U	NA	ND [0.643] U	NA	ND [0.125] U	NA	ND [0.174] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	94.949	NA	ND [0.373] U	NA	ND [0.07] U	NA	ND [0.106] U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.558] U	NA	ND [0.394] U	NA	ND [0.086] U	NA	ND [0.132] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	92.976	NA	3.822	NA	0.736	NA	0.433

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP067	SUMP067	SUMP067	SUMP067	SUMP068	SUMP068	SUMP068
Sample Number:	SUMP067(0-0.5)	SUMP067(0-0.5)FD	SUMP067(3-5)	SUMP067(3-5)FD	SUMP068(0-0.5)	SUMP068(0-0.5)FD	SUMP068(3-5)
Date Sampled:	08/11/1998	08/11/1998	08/11/1998	08/11/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	0.00	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

U280577

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP068	SUMP069	SUMP069	SUMP069	SUMP069	SUMP070
Sample Number:	SUMP068(3-5)FD	SUMP069(0-0.5)	SUMP069(0-0.5)FD	SUMP069(3-5)	SUMP069(3-5)FD	SUMP070(0-0.5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00
PESTICIDES - UNITS: UG/KG						
DIELDRIN	NA	ND [4] U	NA	ND [4] U	NA	ND [3.7] U
HEPTACHLOR	NA	ND [2] U	NA	ND [2] U	NA	ND [1.9] U
p,p'-DDD	NA	ND [4] U	NA	ND [4] U	NA	ND [3.7] U
p,p'-DDE	NA	6.7	NA	ND [4] U	NA	ND [3.7] U
p,p'-DDT	NA	11	NA	ND [4] U	NA	ND [3.7] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	NA	ND [40] U	NA	ND [40] U	NA	ND [37] U
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	7.258	NA	2.704	NA	18.163
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	0.603	NA	0.361	NA	0.903
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.103] U	NA	ND [0.041] U	NA	ND [0.097] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.128] U	NA	ND [0.07] U	NA	ND [0.113] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	0.239	NA	0.152	NA	0.969
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	0.291	NA	ND [0.065] U	NA	0.288
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.061] U	NA	ND [0.05] U	NA	ND [0.073] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.114] U	NA	ND [0.062] U	NA	ND [0.1] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.07] U	NA	ND [0.068] U	NA	ND [0.055] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.071] U	NA	ND [0.069] U	NA	ND [0.056] U
2,3,7,8-TETRACHLORODIBENZOFURAN	0.393	0.443	ND [0.158] U	0.438	ND [0.129] U	0.455
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	15.017	NA	6.053	NA	106.585
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.082] U	NA	0.282	NA	ND [0.078] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	1.352	NA	0.95	NA	8.046
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.497	NA	ND [0.05] U	NA	0.522
OCTACHLORODIBENZO-p-DIOXIN	NA	1516.194	NA	270.078	NA	479.931
OCTACHLORODIBENZOFURAN	NA	3.75	NA	0.634	NA	3.409
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.107] U	NA	ND [0.088] U	NA	ND [0.166] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.071] U	NA	ND [0.069] U	NA	0.218
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.104] U	NA	ND [0.08] U	NA	ND [0.072] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.682	NA	0.741	NA	1.339

000328

028058

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP068	SUMP069	SUMP069	SUMP069	SUMP069	SUMP070
Sample Number:	SUMP068(3-5)FD	SUMP069(0-0.5)	SUMP069(0-0.5)FD	SUMP069(3-5)	SUMP069(3-5)FD	SUMP070(0-0.5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

0033339

0280059

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP070	SUMP070	SUMP070	SUMP071	SUMP071	SUMP071	SUMP071
Sample Number:	SUMP070(0-0.5)FD	SUMP070(3-5)	SUMP070(3-5)FD	SUMP071(0-0.5)	SUMP071(0-0.5)FD	SUMP071(3-5)	SUMP071(3-5)FD
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	3.00	3.00	0.00	0.00	3.00	3.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	NA	ND [4] U	NA	ND [3.6] U	NA	ND [4] U	NA
HEPTACHLOR	NA	ND [2] U	NA	ND [1.8] U	NA	ND [2] U	NA
p,p'-DDD	NA	ND [4] U	NA	ND [3.6] U	NA	ND [4] U	NA
p,p'-DDE	NA	ND [4] U	NA	28	NA	ND [4] U	NA
p,p'-DDT	NA	ND [4] U	NA	12	NA	ND [4] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	NA	110	NA	ND [37] U	NA	ND [40] U	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	1.237	NA	26.681	NA	2.065	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	0.292	NA	2.741	NA	0.229	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.219] U	NA	ND [0.196] U	NA	ND [0.109] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.238] U	NA	ND [0.253] U	NA	ND [0.15] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.179] U	NA	1.258	NA	ND [0.115] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.221] U	NA	0.738	NA	ND [0.139] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.173] U	NA	ND [0.378] U	NA	ND [0.111] U	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.211] U	NA	0.707	NA	ND [0.133] U	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.135] U	NA	0.832	NA	ND [0.097] U	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.137] U	NA	ND [0.146] U	NA	ND [0.098] U	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.219] U	ND [0.14] U	ND [0.164] U	0.491	0.342	0.394	0.308
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	3.624	NA	53.835	NA	3.803	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.175] U	NA	2.741	NA	ND [0.087] U	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.221] U	NA	3.196	NA	ND [0.139] U	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.173] U	NA	2.032	NA	0.255	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	27.006	NA	3126.033	NA	226.574	NA
OCTACHLORODIBENZOFURAN	NA	0.83	NA	9.164	NA	0.658	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.26] U	NA	ND [0.245] U	NA	ND [0.144] U	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.137] U	NA	0.902	NA	ND [0.098] U	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.248] U	NA	ND [0.203] U	NA	ND [0.118] U	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.14] U	NA	ND [0.184] U	NA	0.394	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP070	SUMP070	SUMP070	SUMP071	SUMP071	SUMP071	SUMP071
Sample Number:	SUMP070(0-0.5)FD	SUMP070(3-5)	SUMP070(3-5)FD	SUMP071(0-0.5)	SUMP071(0-0.5)FD	SUMP071(3-5)	SUMP071(3-5)FD
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	0.00	3.00	3.00	0.00	0.00	3.00	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0028061

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP072	SUMP072	SUMP072	SUMP072	SUMP075	SUMP075	SUMP075
Sample Number:	SUMP072(0-0.5)	SUMP072(0-0.5)FD	SUMP072(3-5)	SUMP072(3-5)FD	SUMP075(0-0.5)	SUMP075(0-0.5)FD	SUMP075(3-5)
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	07/30/1998	08/11/1998	08/11/1998	08/11/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [3.7] U	NA	ND [4] U	NA	ND [3.6] U	ND [36] U	ND [4] U
HEPTACHLOR	ND [1.8] U	NA	ND [2] U	NA	ND [1.8] U	ND [18] U	ND [2] U
p,p'-DDD	ND [3.7] U	NA	ND [4] U	NA	24	17	ND [4] U
p,p'-DDE	ND [3.7] U	NA	ND [4] U	NA	140	180	ND [4] U
p,p'-DDT	ND [3.7] U	NA	ND [4] U	NA	140	150	ND [4] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [37] U	NA	ND [40] U	NA	ND [36] U	NA	ND [40] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	10.583	NA	2.751	NA	31.626	NA	7.498
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.729	NA	0.255	NA	3.55	NA	ND [0.227] U
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.107] U	NA	ND [0.181] U	NA	ND [0.467] U	NA	ND [0.304] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.135] U	NA	ND [0.274] U	NA	ND [0.855] U	NA	ND [0.778] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.426	NA	ND [0.232] U	NA	1.063	NA	ND [0.429] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.201	NA	ND [0.254] U	NA	ND [0.478] U	NA	ND [0.435] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.075] U	NA	ND [0.224] U	NA	ND [0.315] U	NA	ND [0.286] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.12] U	NA	ND [0.243] U	NA	ND [0.567] U	NA	ND [0.516] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.578	NA	ND [0.17] U	NA	ND [0.469] U	NA	ND [0.421] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.07] U	NA	ND [0.172] U	NA	ND [0.489] U	NA	ND [0.44] U
2,3,7,8-TETRACHLORODIBENZOFURAN	0.533	0.348	ND [0.162] U	0.422	4.905	4.073	3.157
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	29.453	NA	6.584	NA	106.762	NA	17.822
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.086] U	NA	0.638	NA	3.55	NA	ND [0.227] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	0.953	NA	ND [0.254] U	NA	10.626	NA	ND [0.435] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	0.479	NA	ND [0.224] U	NA	5.006	NA	ND [0.286] U
OCTACHLORODIBENZO-p-DIOXIN	802.591	NA	160.386	NA	566.898	NA	889.632
OCTACHLORODIBENZOFURAN	2.376	NA	0.89	NA	10.424	NA	ND [0.413] U
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.153] U	NA	ND [0.305] U	NA	ND [0.646] U	NA	ND [0.418] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	1.089	NA	ND [0.172] U	NA	1.964	NA	ND [0.44] U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.109] U	NA	ND [0.246] U	NA	ND [0.415] U	NA	ND [0.408] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	0.997	NA	ND [0.162] U	NA	4.905	NA	5.309

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP072	SUMP072	SUMP072	SUMP072	SUMP075	SUMP075	SUMP075
Sample Number:	SUMP072(0-0.5)	SUMP072(0-0.5)FD	SUMP072(3-5)	SUMP072(3-5)FD	SUMP075(0-0.5)	SUMP075(0-0.5)FD	SUMP075(3-5)
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	07/30/1998	08/11/1998	08/11/1998	08/11/1998
Depth (ft.):	0.00	0.00	3.00	3.00	0.00	0.00	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP075	SUMP076	SUMP076	SUMP076	SUMP076	SUMP077
Sample Number:	SUMP075(3-5)FD	SUMP076(0-0.5)	SUMP076(0-0.5)FD	SUMP076(3-5)	SUMP076(3-5)FD	SUMP077(0-0.5)
Date Sampled:	08/11/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00
PESTICIDES - UNITS: UG/KG						
DIELDRIN	NA	ND [3.6] U	NA	ND [4] U	NA	ND [3.6] U
HEPTACHLOR	NA	ND [1.8] U	NA	ND [2] U	NA	ND [1.8] U
p,p'-DDD	NA	ND [3.6] U	NA	ND [4] U	NA	ND [3.6] U
p,p'-DDE	NA	ND [3.6] U	NA	ND [4] U	NA	47
p,p'-DDT	NA	11	NA	ND [4] U	NA	14
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	NA	ND [36] U	NA	ND [40] U	NA	ND [35] U
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	130.956 J	122.785 J	26.117	NA	29.678
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	3.864	4.477	ND [0.191] U	NA	5.174
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.828] U	ND [0.311] U	ND [0.255] U	NA	ND [0.274] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.471] U	ND [0.324] U	ND [0.374] U	NA	ND [0.163] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	1.262	1.613	ND [0.25] U	NA	1.633
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.263] U	1.321	ND [0.209] U	NA	1.208
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.309] U	ND [0.197] U	ND [0.167] U	NA	ND [0.111] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.312] U	1.483	ND [0.248] U	NA	0.664
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.27] UJ	ND [0.182] UJ	ND [0.145] U	NA	0.461
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.282] UJ	ND [0.185] UJ	ND [0.152] U	NA	ND [0.127] U
2,3,7,8-TETRACHLORODIBENZOFURAN	2.479	2.644 J	ND [0.337] UJ	1.982	0.499	1.984
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	856.545	854.937	167.129	NA	61.462
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	3.864	4.477	ND [0.191] U	NA	5.174
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	50.585	65.872	159.96	NA	2.718
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	1.534	3.351	ND [0.167] U	NA	4.554
OCTACHLORODIBENZO-p-DIOXIN	NA	3166.458 J	1743.823 J	5574.201	NA	489.689
OCTACHLORODIBENZOFURAN	NA	26.37	30.725	ND [0.211] U	NA	12.52
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.51] U	ND [0.229] U	6.381	NA	ND [0.149] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.282] U	ND [0.185] U	ND [0.152] U	NA	15.29
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.529] U	ND [0.181] U	ND [0.284] U	NA	ND [0.143] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	2.781	0.637	3.394	NA	26.376

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP075	SUMP076	SUMP076	SUMP076	SUMP076	SUMP077
Sample Number:	SUMP075(3-5)FD	SUMP076(0-0.5)	SUMP076(0-0.5)FD	SUMP076(3-5)	SUMP076(3-5)FD	SUMP077(0-0.5)
Date Sampled:	08/11/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	3.00	0.00	0.00	3.00	3.00	0.00
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP077	SUMP077	SUMP077	SUMP078	SUMP078	SUMP078	SUMP078
Sample Number:	SUMP077(0-0.5)FD	SUMP077(3-5)	SUMP077(3-5)FD	SUMP078(0-0.5)	SUMP078(0-0.5)FD	SUMP078(3-5)	SUMP078(3-5)FD
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	08/11/1998	08/11/1998	08/11/1998	08/11/1998
Depth (ft.):	0.00	3.00	3.00	0.00	0.00	3.00	3.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [18] U	ND [3.8] U	NA	ND [3.7] U	ND [19] U	ND [3.8] U	NA
HEPTACHLOR	ND [8.8] U	ND [1.9] U	NA	ND [1.8] U	ND [9.3] U	ND [1.9] U	NA
p,p'-DDD	ND [18] U	ND [3.8] U	NA	ND [3.7] U	ND [19] U	ND [3.8] U	NA
p,p'-DDE	70	ND [3.8] U	NA	61	69	ND [3.8] U	NA
p,p'-DDT	16	ND [3.8] U	NA	26	32	ND [3.8] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	NA	ND [38] U	NA	ND [37] U	NA	ND [38] U	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	8.618	NA	73.886	NA	44.303	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	ND [0.063] U	NA	12.179	NA	11.533	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [0.078] U	NA	ND [1.551] U	NA	ND [1.145] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [0.117] U	NA	ND [1.325] U	NA	ND [2.593] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.051] U	NA	ND [1.389] U	NA	ND [1.461] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.108] U	NA	ND [0.74] U	NA	ND [1.448] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [0.05] U	NA	ND [0.926] U	NA	ND [0.974] U	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.104] U	NA	ND [0.879] U	NA	ND [1.72] U	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.055] U	NA	ND [1.202] U	NA	ND [0.462] U	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.056] U	NA	ND [1.256] U	NA	ND [0.482] U	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	2.43	1.611	4.596	4.171	3.712	3.657
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	19.292	NA	135.223	NA	69.375	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	0.504	NA	12.179	NA	11.533	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	1.46	NA	12.584	NA	5.993	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.05] U	NA	ND [0.926] U	NA	13.131	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	811	NA	1149.451	NA	804.663	NA
OCTACHLORODIBENZOFURAN	NA	0.95	NA	26.05	NA	30.615	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.052] U	NA	ND [1.341] U	NA	ND [1.033] U	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	ND [0.056] U	NA	ND [1.256] U	NA	2.587	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.073] U	NA	ND [0.856] U	NA	ND [0.854] U	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	4.533	NA	19.773	NA	3.712	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP077	SUMP077	SUMP077	SUMP078	SUMP078	SUMP078	SUMP078
Sample Number:	SUMP077(0-0.5)FD	SUMP077(3-5)	SUMP077(3-5)FD	SUMP078(0-0.5)	SUMP078(0-0.5)FD	SUMP078(3-5)	SUMP078(3-5)FD
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	08/11/1998	08/11/1998	08/11/1998	08/11/1998
Depth (ft.):	0.00	3.00	3.00	0.00	0.00	3.00	3.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP082	SUMP082	SUMP088	SUMP088	SUMP090	SUMP090	SUMP092
Sample Number:	SUMP082(0-0.5)	SUMP082(3-5)	SUMP088(0-0.5)	SUMP088(3-5)	SUMP090(0-0.5)	SUMP090(3-5)	SUMP092(0-0.5)
Date Sampled:	08/04/1998	08/04/1998	08/04/1998	08/04/1998	08/04/1998	08/04/1998	08/04/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	3.00	0.00
PESTICIDES - UNITS: UG/KG							
DIELDRIN	ND [3.4] U	ND [3.9] U	ND [4.6] U	ND [4] U	ND [3.5] U	ND [3.9] U	ND [3.6] U
HEPTACHLOR	ND [1.7] U	ND [1.9] U	ND [2.3] U	ND [2] U	ND [1.7] U	ND [1.9] U	ND [1.8] U
p,p'-DDD	ND [3.4] U	ND [3.9] U	ND [4.6] U	ND [4] U	ND [3.5] U	ND [3.9] U	ND [3.6] U
p,p'-DDE	ND [3.4] U	ND [3.9] U	ND [4.6] U	ND [4] U	ND [3.5] U	ND [3.9] U	ND [3.6] U
p,p'-DDT	ND [3.4] U	ND [3.9] U	ND [4.6] U	ND [4] U	ND [3.5] U	ND [3.9] U	ND [3.6] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	ND [34] U	ND [39] U	ND [46] U	ND [40] U	ND [35] U	ND [39] U	ND [36] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	44.665	0.393	6.43	ND [0.277] U	21.695	ND [0.272] U	9.887
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	3.47	ND [0.21] U	0.747	ND [0.11] U	3.164	ND [0.187] U	1.275
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.221] U	ND [0.3] U	ND [0.245] U	ND [0.137] U	ND [0.251] U	ND [0.234] U	ND [0.119] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	0.59	ND [0.26] U	ND [0.361] U	ND [0.209] U	ND [0.721] U	ND [0.238] U	ND [0.19] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.689	ND [0.185] U	ND [0.226] U	ND [0.146] U	6.337	ND [0.122] U	0.3
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	1.598	ND [0.151] U	ND [0.21] U	ND [0.194] U	ND [0.403] U	ND [0.22] U	ND [0.176] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.182] U	ND [0.125] U	ND [0.153] U	ND [0.141] U	ND [0.983] U	ND [0.118] U	ND [0.048] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.361	ND [0.174] U	ND [0.242] U	ND [0.185] U	ND [0.478] U	ND [0.211] U	ND [0.168] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.155] U	ND [0.157] U	ND [0.188] U	ND [0.163] U	1.458	ND [0.151] U	ND [0.153] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.155] U	ND [0.156] U	ND [0.187] U	ND [0.166] U	1.339	ND [0.153] U	ND [0.156] U
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.249] U	ND [0.227] U	ND [0.213] U	ND [0.248] U	ND [2.153] U	ND [0.231] U	ND [0.241] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	54.627	ND [0.232] U	ND [0.315] U	ND [0.277] U	46.996	ND [0.272] U	21.567
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	3.47	ND [0.21] U	ND [0.171] U	ND [0.11] U	ND [0.188] U	ND [0.187] U	ND [0.095] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	12.917	ND [0.151] U	2.074	ND [0.194] U	ND [0.403] U	ND [0.22] U	4.353
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	2.372	ND [0.125] U	0.427	ND [0.141] U	ND [0.983] U	ND [0.118] U	0.694
OCTACHLORODIBENZO-p-DIOXIN	2576.892	9.809	140.307	48.371	1346.179	11.247	248.294
OCTACHLORODIBENZOFURAN	6.36	ND [0.16] U	1.675	ND [0.28] U	9.7	ND [0.371] U	2.799
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.184] U	ND [0.522] U	ND [0.23] U	ND [0.185] U	ND [0.884] U	ND [0.237] U	ND [0.137] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.155] U	ND [0.156] U	ND [0.187] U	ND [0.166] U	13.765	ND [0.153] U	ND [0.156] U
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.361] U	ND [0.446] U	ND [0.337] U	ND [0.152] U	ND [0.344] U	0.777	ND [0.119] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	0.492	ND [0.227] U	ND [0.213] U	1.415	25.099	ND [0.231] U	ND [0.241] U

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Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP082	SUMP082	SUMP088	SUMP088	SUMP090	SUMP090	SUMP092
Sample Number:	SUMP082(0-0.5)	SUMP082(3-5)	SUMP088(0-0.5)	SUMP088(3-5)	SUMP090(0-0.5)	SUMP090(3-5)	SUMP092(0-0.5)
Date Sampled:	08/04/1998	08/04/1998	08/04/1998	08/04/1998	08/04/1998	08/04/1998	08/04/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	3.00	0.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

000249

028069

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP092	WRSUMP017	WRSUMP017	WRSUMP017
Sample Number:	SUMP092(3-5)	WRSUMP017(0-.5)	WRSUMP17(0-0.5)	WRSUMP017(3-5)
Date Sampled:	08/04/1998	08/04/1998	08/04/1998	08/04/1998
Depth (ft.):	3.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG				
DIELDRIN	ND [3.9] U	NA	ND [4.5] U	ND [3.8] U
HEPTACHLOR	ND [1.9] U	NA	ND [2.2] U	ND [1.9] U
p,p'-DDD	ND [3.9] U	NA	ND [4.5] U	ND [3.8] U
p,p'-DDE	ND [3.9] U	NA	ND [4.5] U	ND [3.8] U
p,p'-DDT	ND [3.9] U	NA	ND [4.5] U	ND [3.8] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG				
PCB-1254 (AROCHLOR 1254)	ND [39] U	NA	ND [45] U	ND [38] U
DIOXINS AND FURANS - UNITS: NG/KG				
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	ND [0.447] U	2.145	NA	169.409
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ND [0.193] U	ND [0.225] U	NA	18.994
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.257] U	ND [0.322] U	NA	ND [3.437] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.642] U	ND [0.282] U	NA	2.709
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [0.404] U	ND [0.204] U	NA	3.096
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.358] U	ND [0.164] U	NA	6.594
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.269] U	ND [0.139] U	NA	1.284
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.426] U	ND [0.189] U	NA	5.25
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.25] U	ND [0.24] U	NA	2.494
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.261] U	ND [0.24] U	NA	ND [0.975] U
2,3,7,8-TETRACHLORODIBENZOFURAN	1.422 J	2.339	NA	4.418
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.447] U	2.405	NA	288.721
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.193] U	ND [0.225] U	NA	18.994
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.358] U	ND [0.164] U	NA	45.998
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.269] U	ND [0.139] U	NA	26.616
OCTACHLORODIBENZO-p-DIOXIN	80.946 J	288.295	NA	1905.984
OCTACHLORODIBENZOFURAN	ND [0.583] U	0.345	NA	32.93
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.392] U	0.483	NA	ND [0.279] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.261] U	ND [0.24] U	NA	9.954
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.295] U	1.514	NA	ND [0.418] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	1.244	4.017	NA	4.418

0028070
0028070

Pesticides, PCBs, Dioxins/Furans, and Explosives in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP092	WRSUMP017	WRSUMP017	WRSUMP017
Sample Number:	SUMP092(3-5)	WRSUMP017(0-.5)	WRSUMP17(0-0.5)	WRSUMP017(3-5)
Date Sampled:	08/04/1998	08/04/1998	08/04/1998	08/04/1998
Depth (ft.):	3.00	0.00	0.00	3.00
EXPLOSIVES - UNITS: UG/KG				
NO DETECTED COMPOUNDS	NA	NA	NA	NA

255000

028071

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL063-01	LH-DL064-01	LH-DL065-01	LH-DL072-01	LH-DL44-01	LH-DL45-01	LH-DL47-01	LH-DL47-02	LH-DL48-01	LH-DL50-01
Sample Number:	LH-DL063-01	LH-DL064-01	LH-DL065-01	LH-DL072-01	LH-DL44-01	LH-DL45-01	LH-DL47-01	LH-DL47-02	LH-DL48-01	LH-DL50-01
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/04/1993	07/10/1993	07/10/1993	07/09/1993	07/09/1993	07/11/1993	07/11/1993
Depth (ft.):	1.00	2.00	1.50	2.00	2.10	2.30	0.50	2.70	2.70	2.00
METALS - UNITS: UG/KG										
ALUMINUM	6330000	10100000	7670000	6760000	9300000	10600000	13900000	6750000	4820000	10400000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2800	3200	4200	2700	ND [1000] U	ND [1000] U	ND [1600] U	ND [1300] U	2300	3600
BARIUM	142000	60400	90000	47000	35500	53900	ND [131000] U	ND [104000] U	48100	32500
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	895000	925000	1500000	656000	1160000	941000	1650000	810000	887000	356000
CHROMIUM, TOTAL	11000	11300	15000	12000	10500	14500	ND [15500] U	ND [10200] U	11800	14500
COBALT	10000	3400	7000	6000	4500	4400	9100	9700	3400	3800
COPPER	3000	1600	3000	3000	4800	3100	4300	2400	4000	4000
IRON	7820000	12800000	15200000	7360000	14100000	11800000	16400000	9740000	10100000	17400000
LEAD	8100	4200	12300	3800	7300	7000	6600	6100	7500	9700
MAGNESIUM	313000	595000	466000	294000	685000	449000	1180000	321000	199000	422000
MANGANESE	990000	61900	326000	175000	43600	117000	235000	490000	150000	23500
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	274000	385000	335000	302000	418000	496000	690000	376000	223000	440000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	8000	ND [10000] U	10000	7000	14300	8300	18000	7400	4200	4400
ZINC	9000	12000	11000	24000	30300	15200	24100	9400	13500	15500

025000

028072

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL52-01	LH-DL53-01	LH-DL54-01	LH-DL55-01	LH-DL55-02	LH-DL58-01	LH-DL61-01	LH-DL69-01	LH-DL71-01	LH-DL73-01	LH-DL74-01
Sample Number:	LH-DL52-01	LH-DL53-01	LH-DL54-01	LH-DL55-01	LH-DL55-02	LH-DL58-01	LH-DL61-01	LH-DL69-01	LH-DL71-01	LH-DL73-01	LH-DL74-01
Date Sampled:	08/03/1993	07/13/1993	07/12/1993	07/12/1993	07/12/1993	06/26/1993	08/06/1993	06/26/1993	07/24/1993	06/26/1993	06/26/1993
Depth (ft.):	1.30	0.00	2.50	2.50	2.50	2.10	2.00	2.50	2.00	2.00	2.00
METALS - UNITS: UG/KG											
ALUMINUM	9950000	16900000	6040000	4660000	13400000	12000000	22100000	6830000	ND [17500000] U	4920000	5830000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [9180] U	ND [3000] U	ND [2980] U	ND [3000] U	ND [11400] U	ND [6260] U
ARSENIC	2000	2100	1900	1900	1700	1700	5800	1070	2700	2560	1820
BARIUM	63100	60800	54600	65700	67900	78800	94000	ND [77900] U	81800	38600	59400
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	3210:00:00	ND [1000] U	ND [1940] U	ND [1000] U	3180	3780
CALCIUM	934000	296000	750000	2180000	935000	1680000	1090000	1050000	1500000	1670000	1950000
CHROMIUM, TOTAL	15500	12100	12900	21100	18500	8540	28300	10700	21800	6700	8890
COBALT	3900	3400	3300	7500	7100	2980	5900	2820	7000	5110	ND [532] U
COPPER	5900	1800	1900	3400	3900	8170	6600	ND [4720] U	3700	9660	8890
IRON	14100000	9940000	9940000	7580000	12700000	9990000	27600000	8660000	ND [15100000] U	11800000	13300000
LEAD	6000	6600	6300	9400	7100	18600	11300	13600	7000	ND [17000] U	13800
MAGNESIUM	1180000	707000	313000	195000	732000	427000	1150000	402000	982000	694000	840000
MANGANESE	49300	40100	91000	445000	140000	44800	178000	111000	153000	47800	176000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [41] U	ND [100] U	ND [54] U	ND [100] U	ND [27] U	ND [26] U
POTASSIUM	744000	706000	360000	300000	923000	535000	859000	381000	959000	397000	353000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [918] U	ND [1000] U	ND [298] U	ND [1000] U	ND [1140] U	ND [626] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [46] U	ND [1000] U	ND [21] U	ND [1000] U	ND [57] U	ND [31] U
STRONTIUM	13200	8600	9600	14400	9100	NA	13100	ND [20900] U	15300	24100	23900
ZINC	32100	16200	8600	183000	20400	35000	33100	13800	25400	40100	27800

0028073
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Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL75-01	LH-DL76-01	LH-DL77-01	LH-DL81-01	LH-DL82-01	LH-DL83-01	LH-DL84-01	LH-DL85-01	LH-DL88-01	LH-DL89-01	LH-DL90-01
Sample Number:	LH-DL75-01	LH-DL76-01	LH-DL77-01	LH-DL81-01	LH-DL82-01	LH-DL83-01	LH-DL84-01	LH-DL85-01	LH-DL88-01	LH-DL89-01	LH-DL90-01
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	07/23/1993	07/23/1993	07/23/1993	07/21/1993	06/26/1993	07/22/1993	07/21/1993	07/21/1993
Depth (ft.):	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.50	2.00	2.00	2.00
METALS - UNITS: UG/KG											
ALUMINUM	6280000	7610000	7540000	10400000	14000000	5110000	14600000	18200000	7820000	8880000	8640000
ANTIMONY	ND [4900] U	ND [4060] U	ND [4660] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [5120] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	1640	812	1960	ND [1000] U	ND [1000] U	ND [1000] U	5700	2590	1000	2300	2500
BARIUM	ND [69200] U	ND [63400] U	ND [75800] U	114000	158000	148000	ND [63700] U	ND [96500] U	106000	ND [146000] U	ND [93100] U
CADMIUM	3820	1540	2490	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [5450] U	ND [1000] U	ND [1000] U	1700:00:00
CALCIUM	1960000	1080000	1380000	1630000	2870000	677000	1750000	701000	875000	993000	1110000
CHROMIUM, TOTAL	12800	9890	7970	16600	17400	15700	ND [17700] U	19300	13800	ND [14800] U	ND [13300] U
COBALT	6710	3920	5940	9300	10300	11200	3500	5710	8500	8100	6800
COPPER	ND [8670] U	ND [6230] U	ND [4540] U	5400	7500	2200	10400	ND [8060] U	2700	3800	4700
IRON	14400000	6940000	8140000	13800000	17800000	9420000	25600000	19600000	8570000	9560000	10800000
LEAD	12700	15700	15100	3400	3100	4100	7400	25300	7600	6400	12500
MAGNESIUM	707000	360000	414000	1170000	1360000	252000	823000	787000	376000	504000	572000
MANGANESE	204000	261000	619000	469000	421000	1110000	52800	318000	294000	801000	162000
MERCURY	ND [53] U	ND [55] U	ND [58] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [52] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	350000	337000	361000	675000	902000	256000	667000	758000	461000	511000	522000
SELENIUM	ND [490] U	ND [406] U	ND [466] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [512] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [24] U	57	35	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [28] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	ND [20800] U	ND [14300] U	ND [19500] U	24900	32500	7400	16500	ND [10100] U	12700	13000	10600
ZINC	33100	14600	17000	42400	38500	9100	43200	30900	13800	17500	50200

0028074

0028074

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL90-02	LH-DL91	LH-DL92-01	LH-DL93-01	LH-S062-01	LH-S062-01	LH-S062-02	LH-S062-02	LH-S063-01	LH-S063-01
Sample Number:	LH-DL90-02	LH-DL91	LH-DL92-01	LH-DL93-01	LH-S062-01_1	LH-S062-01_2	LH-S062-02_1	LH-S062-02_2	LH-S063-01_1	LH-S063-01_2
Date Sampled:	07/21/1993	07/23/1993	07/23/1993	07/27/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993
Depth (ft.):	2.00	2.50	2.50	2.50	0.50	2.50	0.50	2.50	1.00	2.00
METALS - UNITS: UG/KG										
ALUMINUM	8300000	6890000	9850000	7090000	12300000	9390000	8440000	19400000	17700000	15500000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2500	ND [1000] U	ND [1000] U	2500	3900	2900	4300	4000	3200	7100
BARIUM	ND [78800] U	113000	76800	51100	98000	102000	70000	140000	157000	87000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	983000	710000	475000	1830000	1500000	325000	911000	973000	2560000	520000
CHROMIUM, TOTAL	ND [14100] U	19500	14800	12700	16000	12000	14000	22600	17000	23000
COBALT	3600	11600	7700	4200	9000	8000	7000	6300	15000	7000
COPPER	4000	2600	3100	6400	3000	3000	3000	5800	4000	2000
IRON	9820000	12600000	8920000	15800000	12600000	8430000	9560000	17200000	16900000	23900000
LEAD	8400	6700	7600	4700	7900	10000	10200	8000	8000	9900
MAGNESIUM	570000	386000	455000	945000	724000	418000	428000	843000	1630000	910000
MANGANESE	301000	577000	256000	66700	583000	520000	288000	462000	495000	213000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	432000	439000	489000	583000	558000	498000	333000	992000	797000	548000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	8000	11800	7800	19900	12000	5000	8000	11000	24000	11000
ZINC	16300	27600	16500	26500	19000	12000	11000	23000	37000	22000

0009355

028075

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S063-01	LH-S064-01	LH-S064-01	LH-S064-01	LH-S064-02	LH-S064-02	LH-S064-02	LH-S065-01	LH-S065-01
Sample Number:	LH-S063-01_3	LH-S064-01_1	LH-S064-01_2	LH-S064-01_3	LH-S064-02_1	LH-S064-02_2	LH-S064-02_3	LH-S065-01_1	LH-S065-01_2
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993
Depth (ft.):	2.50	1.50	4.00	0.50	1.00	2.50	4.00	0.50	2.00
METALS - UNITS: UG/KG									
ALUMINUM	40400000	11600000	14500000	7950000	14000000	12000000	17900000	16300000	16700000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	3800	2100	2800	5300	3900	2500	1900	3000	4100
BARIUM	175000	172000	734000	104000	535000:	124000	472000:	131000	850000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	526000	1830000	1510000	4150000	3130000	958000	1500000	2550000	2570000
CHROMIUM, TOTAL	27000	13800	11800	14000	19300	12600	13300	15200	17600
COBALT	10000	9900	25300	10000	15900	5400	13600	11100	25000
COPPER	6000	2800	3700	2000	2900	3200	3800	3600	5200
IRON	22200000	8770000	12800000	14000000	20600000	11300000	13400000	14400000	18800000
LEAD	12400	6800	9300	11500	7100	6100	5300	5700	10400
MAGNESIUM	2150000	754000	1590000	526000	1290000	908000	1610000	1100000	1950000
MANGANESE	138000	317000	516000	777000	638000	358000	385000	228000	368000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	1500000	492000	508000	346000	653000	408000	644000	690000	830000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	19000	14700	37000	13000	42000	18700	36100	26200	32800
ZINC	47000	18800	27000	14000	28000	17000	25000	23000	31000

000355

028076

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S065-01	LH-S065-02	LH-S065-02	LH-S065-02	LH-S072-01	LH-S072-01	LH-S072-01	LH-S072-02	LH-S072-02
Sample Number:	LH-S065-01_3	LH-S065-02_1	LH-S065-02_2	LH-S065-02_3	LH-S072-01_1	LH-S072-01_2	LH-S072-01_3	LH-S072-02_1	LH-S072-02_2
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993	08/04/1993
Depth (ft.):	4.00	0.50	3.00	4.00	0.50	3.00	6.00	0.50	3.50
METALS - UNITS: UG/KG									
ALUMINUM	11000000	7010000	9830000	6590000	9600000	14600000	27400000	12800000	9230000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	4100	4700	3600	3900	2700	2800	5100	3200	2500
BARIUM	378000	73000	110000	134000	78000	44000	87000	79000	74000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	974000	1660000	4180000	1460000	706000	998000	1020000	1470000	1220000
CHROMIUM, TOTAL	10000	19000	13000	11000	16000	15000	24000	16000	13000
COBALT	12000	5000	13000	8000	6000	3000	10000	7000	6000
COPPER	4000	2000	3000	2000	4000	3000	7000	5000	3000
IRON	12800000	21500000	11700000	10100000	10400000	9650000	22800000	12300000	8970000
LEAD	10000	8700	5700	5900	6300	3700	6600	5800	4300
MAGNESIUM	1120000	330000	874000	521000	531000	564000	1450000	641000	406000
MANGANESE	205000	145000	780000	581000	80000	157000	45000	290000	195000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	366000	276000	463000	234000	355000	619000	1320000	596000	407000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	21000	7000	18000	11000	7000	9000	22000	12000	11000
ZINC	16000	18000	18000	10000	55000	21000	40000	22000	16000

020077

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S121-01	LH-S121-01	LH-S121-02	LH-S121-02	LH-S44-01	LH-S44-01	LH-S44-01	LH-S44-02	LH-S44-02	LH-S44-02
Sample Number:	LH-S121-01_1	LH-S121-01_2	LH-S121-02_1	LH-S121-02_2	LH-S44-01_1	LH-S44-01_2	LH-S44-01_3	LH-S44-02_1	LH-S44-02_2	LH-S44-02_3
Date Sampled:	08/04/1993	08/04/1993	08/04/1993	08/04/1993	07/10/1993	07/10/1993	07/10/1993	07/11/1993	07/11/1993	07/11/1993
Depth (ft.):	0.50	5.00	0.50	5.00	0.50	4.00	7.90	0.50	4.00	7.70
METALS - UNITS: UG/KG										
ALUMINUM	12200000	16200000	8470000	24000000	6520000	8810000	1960000	8510000	13000000	4620000
ANTIMONY	4300	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2700	4500	2000	3800	1600	2500	ND [1000] U	ND [1000] U	1400	ND [1000] U
BARIUM	103000	161000	115000	129000	72900	44600	13600	63500	72500	23500
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	635000	431000	569000	771000	1890000	439000	163000	841000	568000	178000
CHROMIUM, TOTAL	17400	24000	16600	22500	7600	12800	2400	9200	12700	4600
COBALT	7200	26700	13200	9500	7900	4000	ND [1000] U	4300	6100	1000
COPPER	4200	5200	3400	6500	3800	3000	ND [1000] U	4000	4700	1000
IRON	18500000	27600000	9830000	22400000	11500000	17500000	3490000	9120000	15900000	3860000
LEAD	9300	13800	10500	11000	8000	8500	3900	ND [1000] U	8200	3800
MAGNESIUM	739000	879000	467000	1760000	573000	421000	127000	711000	992000	281000
MANGANESE	351000	582000	157000	472000	79800	159000	14100	33000	159000	25500
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	541000	707000	426000	1000000	359000	373000	90700	432000	430000	217000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	11800	11600	7900	22400	17600	6300	1900	11800	12000	2900
ZINC	21700	30200	19300	47600	23700	21900	6700	22900	26400	7100

S5S3000

028078

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S45-01	LH-S45-01	LH-S45-01	LH-S45-02	LH-S45-02	LH-S47-01	LH-S47-01	LH-S47-02	LH-S47-02	LH-S48-01
Sample Number:	LH-S45-01_1	LH-S45-01_2	LH-S45-01_3	LH-S45-02_1	LH-S45-02_2	LH-S47-01_1	LH-S47-01_2	LH-S47-02_1	LH-S47-02_2	LH-S48-01_1
Date Sampled:	07/10/1993	07/10/1993	07/10/1993	07/10/1993	07/10/1993	07/09/1993	07/09/1993	07/09/1993	07/09/1993	07/27/1993
Depth (ft.):	0.50	6.70	8.40	0.50	7.00	0.50	2.20	0.50	2.50	0.50
METALS - UNITS: UG/KG										
ALUMINUM	8280000	10200000	3600000	7610000	7920000	16700000	12700000	10500000	9210000	7470000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	3400	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	1600	3000	ND [1000] U	1900	2700	ND [1800] U	ND [1300] U	ND [1700] U	ND [1800] U	2300
BARIUM	32500	50700	33700	27900	91400	ND [99800] U	ND [74600] U	ND [158000] U	ND [31600] U	48400
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1750000	357000	307000	786000	546000	1400000	1030000	713000	160000	609000
CHROMIUM, TOTAL	11300	12100	7500	9700	12100	ND [18900] U	ND [13700] U	ND [13200] U	ND [10100] U	12500
COBALT	3900	5000	2600	2900	6000	5700	3300	5700	2600	1900
COPPER	5300	3500	1800	2800	3800	5800	4300	3600	2900	3500
IRON	12800000	18900000	6930000	11300000	15300000	17800000	10800000	14500000	10700000	9960000
LEAD	7200	8300	8600	6400	8600	7000	4600	4800	5600	8100
MAGNESIUM	547000	670000	247000	427000	643000	1270000	672000	675000	608000	456000
MANGANESE	52000	108000	125000	31600	224000	94800	101000	110000	53500	35400
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	449000	450000	179000	354000	329000	828000	683000	475000	608000	370000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	1200	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	10700	7400	2900	7800	9600	17700	13000	10700	13500	5200
ZINC	31200	19500	15900	23400	17400	28900	15800	19000	14000	11300

000359

0208079

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S48-01	LH-S48-01	LH-S48-02	LH-S49-01	LH-S50-01	LH-S50-01	LH-S50-01	LH-S51-01	LH-S51-01	LH-S51-01
Sample Number:	LH-S48-01_2	LH-S48-01_3	LH-S48-02	LH-S49-01_1	LH-S50-01_2	LH-S50-01_3	LH-S50-01_1	LH-S51-01_1	LH-S51-01_2	LH-S51-01_3
Date Sampled:	07/27/1993	07/27/1993	07/27/1993	07/09/1993	07/27/1993	07/27/1993	07/28/1993	07/11/1993	07/11/1993	07/11/1993
Depth (ft.):	5.00	6.50	0.50	0.50	0.50	4.00	0.50	0.50	6.00	15.70
METALS - UNITS: UG/KG										
ALUMINUM	10000000	23200000	5820000	7980000	14300000	12000000	13700000	5140000	6680000	8240000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2300	2100	3300	ND [1500] U	4600	3400	3800	1900	1000	1600
BARIUM	129000	79300	39900	ND [48400] U	98000	62800	65700	65200	39200	250000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	656000	985000	1230000	1010000	2760000	1720000	2090000	1250000	399000	2140000
CHROMIUM, TOTAL	13200	22500	45900	ND [9700] U	28500	16300	24300	13100	7800	14600
COBALT	5400	8300	2800	2700	6900	6100	6500	3900	4100	21500
COPPER	3400	6200	8400	2000	6500	7100	3000	2900	2900	17300
IRON	10800000	21700000	28200000	8850000	49400000	19500000	43100000	12700000	8950000	17600000
LEAD	7900	13400	15500	4300	20200	11400	16400	13500	13700	11400
MAGNESIUM	575000	1850000	268000	348000	1280000	1370000	1280000	213000	574000	3570000
MANGANESE	145000	32900	68100	54300	162000	26100	204000	331000	95900	285000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	618000	1100000	258000	313000	623000	737000	535000	205000	269000	842000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	6600	18300	7700	3900	21200	22200	18300	5300	9500	47600
ZINC	16000	38800	32200	10400	43000	30100	38600	17000	12500	91600

0280080
0280080

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S52-01	LH-S52-01	LH-S53-01	LH-S53-01	LH-S53-02	LH-S53-02	LH-S54-01	LH-S54-01	LH-S55-01	LH-S55-01
Sample Number:	**LH-S52-01_1**	**LH-S52-01_2**	**LH-S53-01_1**	**LH-S53-01_2**	**LH-S53-02_1**	**LH-S53-02_2**	**LH-S54-01_1**	**LH-S54-01_2**	**LH-S55-01_1**	**LH-S55-01_2**
Date Sampled:	**08/03/1993**	**08/03/1993**	**07/13/1993**	**07/13/1993**	**07/13/1993**	**07/13/1993**	**07/12/1993**	**07/12/1993**	**07/12/1993**	**07/12/1993**
Depth (ft.):	**0.50**	**1.50**	**0.50**	**7.00**	**0.50**	**7.00**	**0.00**	**4.00**	**0.00**	**3.50**
METALS - UNITS: UG/KG										
ALUMINUM	21600000	9590000	7680000	5470000	13900000	3980000	3960000	5480000	5010000	4710000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	3000:00:00	ND [3000] U
ARSENIC	3300	2300	1800	2300	2100	1000	23100	1600	2600	2100
BARIUM	99500	96000	54700	89800	60000	49400	30400	28000	52200	31800
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	2830000	574000	622000	661000	883000	460000	1540000	825000	1410000	898000
CHROMIUM, TOTAL	31100	14700	23600	8800	15700	8600	15700	6800	15300	11600
COBALT	7800	4900	6100	21400	5100	7000	2200	4400	5900	5400
COPPER	7400	3000	2400	3300	4900	3200	2200	2000	7200	2500
IRON	25800000	8890000	12300000	11000000	16700000	6490000	20000000	9410000	11300000	11200000
LEAD	8900	6700	6400	5400	10400	3300	ND [1000] U	7600	14500	5700
MAGNESIUM	2180000	546000	272000	721000	632000	626000	175000	317000	654000	300000
MANGANESE	111000	185000	177000	192000	41800	63800	73600	36600	212000	105000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	1740000	681000	367000	329000	671000	293000	197000	299000	312000	268000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	26700	7600	5700	15800	9000	12700	6700	8100	6700	11400
ZINC	52300	15100	11000	23000	90600	14900	55500	12400	144000	8100

000361

0280081

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S56-01	LH-S56-01	LH-S57-01	LH-S57-01	LH-S57-01	LH-S57-02	LH-S57-02	LH-S57-02	LH-S58-01	LH-S58-01
Sample Number:	LH-S56-01_1	LH-S56-01_2	LH-S57-01_1	LH-S57-01_2	LH-S57-01_3	LH-S57-02_1	LH-S57-02_2	LH-S57-02_3	LH-S58-01_1	LH-S58-01_2
Date Sampled:	08/05/1993	08/09/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	3.50	0.50	2.00	8.40	0.50	2.00	8.40	0.50	3.00
METALS - UNITS: UG/KG										
ALUMINUM	7090000	14500000	29900000	22000000	8170000	38900000	18800000	7450000	13500000	11000000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [9560] U	ND [5960] U
ARSENIC	2100	2000	ND [1000] U	2400	1700	1300	1500	2400	7120	2980
BARIUM	71600	72200	162000	348000:	208000	159000	104000	155000	53900	69500
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	6840:00:00	3610:00:00
CALCIUM	338000	503000	2040000	826000	613000	1090000	1010000	580000	668000	915000
CHROMIUM, TOTAL	11900	23000	26800	19800	14100	28700	18500	15300	27100	16800
COBALT	7800	7300	5500	6300	11200	6300	8900	11900	4730	6140
COPPER	ND [1000] U	6700	6400	6100	4100	7200	5200	6500	7700	6110
IRON	7920000	26900000	18000000	16700000	12500000	20200000	18100000	13100000	24500000	12200000
LEAD	5400	6200	12500	11100	6200	13900	8000	5900	29100	20000
MAGNESIUM	333000	788000	1490000	1420000	1420000	1780000	1690000	1320000	429000	457000
MANGANESE	127000	144000	65700	78200	135000	77500	105000	141000	93600	94900
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	70	ND [27] U
POTASSIUM	378000	714000	979000	769000	509000	1380000	772000	495000	592000	557000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [956] U	ND [596] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	48	45
STRONTIUM	5700	10300	21600	22700	20100	19300	30000	18200	5980	8640
ZINC	11100	24300	42200	39300	53000	53800	40800	63400	26800	22400

000362

028082

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S59-01	LH-S59-01	LH-S59-01	LH-S59-02	LH-S59-02	LH-S59-02	LH-S60-01	LH-S60-01	LH-S60-02	LH-S60-02
Sample Number:	LH-S59-01_1	LH-S59-01_2	LH-S59-01_3	LH-S59-02_1	LH-S59-02_2	LH-S59-02_3	LH-S60-01_1	LH-S60-01_2	LH-S60-02_1	LH-S60-02_2
Date Sampled:	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/22/1993	07/22/1993	07/22/1993	07/22/1993
Depth (ft.):	0.50	4.00	6.50	0.50	4.00	9.90	0.50	3.00	5.00	0.50
METALS - UNITS: UG/KG										
ALUMINUM	8800000	10300000	19800000	16100000	15200000	5800000	14200000	16800000	17500000	16000000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	9600	4300	3000	4300	2700	1900	2000	ND [1000] U	1100	1600
BARIUM	ND [63000] U	ND [106000] U	ND [1490000] U	ND [92200] U	ND [138000] U	ND [78500] U	106000	86500	307000	393000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1800000	1820000	1380000	1360000	1050000	843000	1580000	2670000	1060000	2150000
CHROMIUM, TOTAL	ND [26400] U	ND [12400] U	ND [18500] U	ND [17700] U	ND [17000] U	ND [6500] U	24300	14900	12700	15400
COBALT	5200	6000	12200	8500	6100	7000	10400	4900	6800	9600
COPPER	8300	8400	8600	7500	6200	6500	5400	4700	5000	4100
IRON	89100000	21900000	18500000	18700000	14900000	10300000	15400000	11200000	11600000	13500000
LEAD	15100	10300	12000	8900	7200	4100	12300	13100	11100	15600
MAGNESIUM	648000	1060000	2580000	1280000	956000	1010000	1230000	955000	1220000	1360000
MANGANESE	197000	115000	64900	281000	242000	126000	343000	94200	42600	367000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	407000	626000	1560000	1060000	944000	462000	659000	635000	567000	703000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	13100	21400	40900	20200	21400	17700	14600	29100	30600	28900
ZINC	42100	28100	48500	32900	26500	46100	36500	21200	23000	24600

000363

028083

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S60-02	LH-S61-01	LH-S61-01	LH-S61-02	LH-S61-02	LH-S66-01	LH-S66-01	LH-S66-02	LH-S66-02	LH-S67-01
Sample Number:	LH-S60-02_3	LH-S61-01_1	LH-S61-01_2	LH-S61-02_1	LH-S61-02_2	LH-S66-01_1	LH-S66-01_2	LH-S66-02_1	LH-S66-02_2	LH-S67-01_1
Date Sampled:	07/22/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/06/1993
Depth (ft.):	2.50	0.50	8.00	1.00	8.00	0.50	4.00	0.50	4.00	0.50
METALS - UNITS: UG/KG										
ALUMINUM	22300000	16000000	18900000	10400000	16300000	14600000	20900000	15000000	15700000	11400000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	7500:00:00	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	4200
ARSENIC	2400	3900	8600	16600:	3900	4600	2800	2300	2500	10700
BARIUM	123000	194000	253000	55600	236000	74200	77200	66200	61600	70900
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	2900:00:00	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1700000	3040000	2720000	30500000	1920000	1390000	1620000	1750000	1210000	1860000
CHROMIUM, TOTAL	26200	25500	27800	56200	22900	15100	18200	15100	16800	42300
COBALT	7100	21800	54400	5500	51000	9100	5500	6900	5700	6100
COPPER	4300	9100	13500	ND [1000] U	9500	3700	4500	4700	3900	5900
IRON	24400000	30100000	38100000	29600000	21200000	13400000	15900000	15300000	20700000	29700000
LEAD	12200	24400	10900	18900	9500	6400	3700	12700	9300	60000
MAGNESIUM	1290000	1990000	2920000	1970000	3080000	756000	955000	865000	883000	713000
MANGANESE	152000	260000	481000	202000	397000	257000	99800	84800	84600	296000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	980000	895000	1240000	277000	1210000	665000	1240000	860000	894000	440000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	29000	41000	48500	81900	43500	8900	10500	10200	10400	10100
ZINC	30900	82700	151000	54900	100000	18400	26000	25200	25700	83000

000354

028084

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S67-01	LH-S68-01	LH-S68-01	LH-S68-02	LH-S69-01	LH-S69-01	LH-S69-01	LH-S69-02	LH-S69-02	LH-S70-01
Sample Number:	LH-S67-01_2	LH-S68-01_1	LH-S68-01_2	LH-S68-02	LH-S69-01_1	LH-S69-01_2	LH-S69-01_3	LH-S69-02_1	LH-S69-02_2	LH-S70-01_1
Date Sampled:	08/06/1993	08/06/1993	08/06/1993	08/06/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	07/24/1993
Depth (ft.):	3.00	0.50	5.00	0.50	0.50	4.00	5.50	0.50	4.50	0.50
METALS - UNITS: UG/KG										
ALUMINUM	20000000	4150000	2920000	4560000	6860000	8220000	6790000	10700000	9950000	ND [17000000] U
ANTIMONY	4900	ND [3000] U	ND [3000] U	ND [3000] U	ND [3440] U	ND [4640] U	ND [5380] U	ND [4800] U	ND [3500] U	ND [3000] U
ARSENIC	3500	1300	ND [1000] U	2800	2440	1350	672	1100	1580	3100
BARIUM	81500	28400	22200	40700	ND [56400] U	ND [62600] U	ND [58700] U	ND [74200] U	ND [74300] U	102000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [3160] U	ND [2920] U	ND [1780] U	ND [3500] U	ND [4040] U	ND [1000] U
CALCIUM	1530000	655000	359000	888000	1090000	1000000	1190000	1890000	1480000	1820000
CHROMIUM, TOTAL	24000	10400	6200	14700	12700	19000	14200	11300	11700	19100
COBALT	6500	ND [1000] U	ND [1000] U	ND [1000] U	5090	5850	4840	3770	7520	7500
COPPER	6300	4300	3700	3000	ND [3660] U	ND [4990] U	ND [5950] U	ND [9410] U	ND [6370] U	6100
IRON	17400000	7970000	3560000	12900000	13200000	11900000	7010000	11000000	15200000	ND [15700000] U
LEAD	6400	3300	2500	3900	15800	15300	31800	20100	20800	9100
MAGNESIUM	1040000	203000	149000	192000	404000	475000	387000	498000	697000	1120000
MANGANESE	205000	71800	31000	104000	209000	160000	106000	82300	156000	175000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [47] U	ND [52] U	ND [53] U	ND [48] U	ND [60] U	ND [100] U
POTASSIUM	1070000	239000	180000	264000	292000	443000	363000	484000	480000	1010000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [344] U	ND [464] U	ND [538] U	ND [480] U	ND [350] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [17] U	ND [23] U	ND [27] U	ND [24] U	ND [19] U	ND [1000] U
STRONTIUM	10900	7600	7300	6600	ND [10200] U	ND [14000] U	ND [10200] U	ND [15100] U	ND [16100] U	20400
ZINC	28300	13800	8400	12200	21300	16100	16100	19200	22100	31600

000365

028085

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S70-01	LH-S70-02	LH-S70-02	LH-S71-01	LH-S71-01	LH-S71-01	LH-S71-02	LH-S71-02
Sample Number:	LH-S70-01_2	LH-S70-02_1	LH-S70-02_2	LH-S71-01_1	LH-S71-01_2	LH-S71-01_3	LH-S71-02_1	LH-S71-02_2
Date Sampled:	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993
Depth (ft.):	7.00	0.50	7.00	1.00	3.00	4.50	1.00	3.00
METALS - UNITS: UG/KG								
ALUMINUM	ND [11900000] U	ND [7150000] U	ND [8330000] U	ND [13400000] U	ND [17000000] U	ND [27900000] U	ND [19300000] U	ND [20900000] U
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	1400	1600	2000	2100	1600	ND [1000] U	ND [1000] U	3000
BARIUM	77500	49600	173000	65400	178000	364000	131000	85800
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1100000	1020000	1210000	2550000	4440000	1520000	2260000	1470000
CHROMIUM, TOTAL	17000	9600	13200	17300	21400	27200	20600	25600
COBALT	12800	4000	11900	6400	12200	14200	9300	8900
COPPER	4000	2900	3500	6200	17100	7800	5500	4400
IRON	ND [11800000] U	ND [7240000] U	ND [10800000] U	ND [14900000] U	ND [20600000] U	ND [22400000] U	ND [17400000] U	ND [26500000] U
LEAD	2700	3800	4400	12100	12300	11500	7600	5400
MAGNESIUM	1670000	352000	972000	927000	905000	2100000	1090000	1070000
MANGANESE	261000	96100	147000	99800	791000	240000	317000	166000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	776000	370000	486000	783000	797000	1440000	814000	910000
SELENIUM	ND [1000] U	ND [1000] U	ND [100] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [100] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	32500	8500	23100	17000	21500	38300	22700	18100
ZINC	49100	11800	25700	30900	31400	56200	31000	26900

000366

028086

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S71-02	LH-S73-01	LH-S73-01	LH-S74-01	LH-S75-01	LH-S75-01	LH-S75-02	LH-S75-02	LH-S76-01	LH-S76-01
Sample Number:	**LH-S71-02_3**	**LH-S73-01_1**	**LH-S73-01_2**	**LH-S74-01**	**LH-S75-01_1**	**LH-S75-01_2**	**LH-S75-02_1**	**LH-S75-02_2**	**LH-S76-01_1**	**LH-S76-01_2**
Date Sampled:	**07/24/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**
Depth (ft.):	**5.00**	**0.50**	**2.50**	**2.50**	**0.50**	**3.50**	**0.50**	**3.50**	**0.50**	**2.00**
METALS - UNITS: UG/KG										
ALUMINUM	ND [16400000] U	5520000	8260000	4940000	5130000	6400000	6970000	5290000	7770000	11800000
ANTIMONY	ND [3000] U	ND [5980] U	ND [5260] U	ND [7960] U	ND [5400] U	ND [5340] U	ND [5840] U	ND [4540] U	ND [5700] U	ND [7880] U
ARSENIC	ND [1000] U	2510	2390	2510	1810	1230	8440	658	3110	3590
BARIUM	253000	ND [45100] U	ND [51400] U	53300	ND [95300] U	ND [116000] U	ND [180000] U	ND [90200] U	ND [278000] U	ND [190000] U
CADMIUM	ND [1000] U	3500	3340	3540	3430	3200	4880	3040	5870	5870
CALCIUM	952000	2850000	1240000	1950000	60000000	981000	693000	1730000	2580000	1860000
CHROMIUM, TOTAL	18100	8820	16100	6930	7830	9290	13000	7170	9920	15400
COBALT	16800	3740	4790	6450	3160	6700	6480	4450	6330	2880
COPPER	6000	ND [7590] U	ND [3730] U	21700	ND [5240] U	ND [5950] U	ND [9900] U	ND [7450] U	ND [8580] U	ND [9810] U
IRON	ND [16700000] U	11900000	12700000	11500000	9770000	10200000	16900000	9150000	21800000	19500000
LEAD	6500	13700	15800	18300	21400	32800	18800	11200	15500	19600
MAGNESIUM	1640000	454000	418000	482000	545000	348000	2230000	786000	731000	725000
MANGANESE	104000	73600	46100	294000	639000	417000	92400	59600	117000	122000
MERCURY	ND [100] U	5780	ND [48] U	ND [27] U	ND [51] U	ND [58] U	ND [56] U	ND [55] U	ND [50] U	ND [53] U
POTASSIUM	761000	299000	371000	287000	241000	304000	547000	355000	304000	437000
SELENIUM	ND [1000] U	ND [598] U	ND [526] U	ND [796] U	ND [540] U	ND [534] U	ND [584] U	ND [454] U	ND [570] U	ND [788] U
SILVER	ND [1000] U	1280	58	ND [40] U	ND [27] U	93	ND [29] U	73	ND [28] U	ND [39] U
STRONTIUM	38100	ND [16400] U	ND [15800] U	17200	ND [112000] U	ND [13900] U	ND [32100] U	ND [75400] U	ND [236000] U	ND [257000] U
ZINC	41900	34600	15400	39300	27400	16700	48700	23500	27200	27300

000357

0280087

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S76-01	LH-S76-02	LH-S76-02	LH-S76-02	LH-S77-01	LH-S77-01	LH-S77-01	LH-S77-02	LH-S77-02	LH-S77-02
Sample Number:	LH-S76-01_3	LH-S76-02_1	LH-S76-02_2	LH-S76-02_3	LH-S77-01_1	LH-S77-01_2	LH-S77-01_3	LH-S77-02_1	LH-S77-02_2	LH-S77-02_3
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	5.50	0.50	5.50	7.00	0.50	1.50	5.50	0.50	2.50	5.50
METALS - UNITS: UG/KG										
ALUMINUM	12700000	13700000	12700000	11100000	11400000	6620000	18000000	8950000	8630000	13800000
ANTIMONY	ND [6020] U	ND [6980] U	ND [5500] U	ND [6500] U	ND [6100] U	ND [3800] U	ND [6040] U	ND [5040] U	ND [5180] U	ND [6540] U
ARSENIC	1440	5550	1160	1760	9120	2580	1030	3280	1550	3110
BARIUM	ND [64400] U	ND [1430000] U	ND [102000] U	ND [79800] U	ND [73800] U	ND [136000] U	ND [144000] U	ND [62900] U	ND [88300] U	ND [89000] U
CADMIUM	3970	5200	3240	4060	8880	3650	4080	5270	2870	5360
CALCIUM	9900000	1530000	860000	1030000	1690000	701000	677000	2200000	1680000	1810000
CHROMIUM, TOTAL	9870	14700	11000	10400	22500	18600	12100	13500	9950	15700
COBALT	6380	3800	6440	6990	5950	2700	6340	3180	1840	7160
COPPER	ND [9390] U	ND [8200] U	ND [10000] U	ND [7150] U	ND [5250] U	ND [5850] U	ND [11300] U	ND [5070] U	ND [5590] U	ND [10900] U
IRON	12300000	17800000	9520000	12600000	33300000	9890000	12300000	18500000	9110000	17300000
LEAD	22500	23200	19100	17900	26800	17400	25600	17900	15700	18400
MAGNESIUM	911000	825000	967000	1100000	545000	424000	1090000	423000	521000	795000
MANGANESE	18200	70700	23800	33800	162000	98600	38900	138000	157000	135000
MERCURY	72	ND [53] U	ND [57] U	107	69	ND [54] U	ND [59] U	ND [46] U	ND [56] U	ND [55] U
POTASSIUM	304000	485000	349000	364000	355000	268000	522000	417000	450000	598000
SELENIUM	602	ND [698] U	ND [550] U	ND [650] U	ND [610] U	ND [380] U	ND [604] U	ND [504] U	ND [518] U	ND [654] U
SILVER	1770	45	30	ND [32] U	ND [30] U	21	51	ND [25] U	ND [26] U	ND [33] U
STRONTIUM	ND [23500] U	ND [890000] U	ND [23200] U	ND [30900] U	ND [46400] U	ND [64000] U	ND [18500] U	ND [22600] U	ND [57200] U	ND [28000] U
ZINC	25900	32400	29200	28100	35200	18700	35400	32500	23800	32200

000356

028088

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S78-01	LH-S78-01	LH-S78-01	LH-S79-01	LH-S79-01	LH-S80-01	LH-S80-01	LH-S81-01	LH-S81-01
Sample Number:	LH-S78-01_1	LH-S78-01_2	LH-S78-01_3	LH-S79-01_1	LH-S79-01_2	LH-S80-01_1	LH-S80-01_2	LH-S81-01_1	LH-S81-01_2
Date Sampled:	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/23/1993	07/23/1993
Depth (ft.):	0.50	3.00	15.00	0.50	3.00	0.50	8.00	0.50	5.00
METALS - UNITS: UG/KG									
ALUMINUM	ND [22200000] U	ND [4780000] U	ND [4360000] U	ND [12300000] U	ND [11500000] U	ND [12300000] U	ND [9250000] U	6860000	26500000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	3000	2500	2000	3300	3500	3500	1200	2300	1700
BARIUM	86100	10100	37300	174000	117000	97300	136000	66700	129000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	2030000	241000	668000	1350000	716000	1030000	1080000	783000	1660000
CHROMIUM, TOTAL	35400	12400	7500	58900	38300	18100	14900	12200	31600
COBALT	4000	ND [1000] U	6900	5200	7200	9400	12300	7700	9900
COPPER	16500	2800	2900	194000	65000	3700	10300	2600	6700
IRON	ND [35000000] U	ND [12100000] U	ND [13900000] U	ND [23900000] U	ND [20300000] U	ND [13400000] U	ND [18200000] U	15100000	26300000
LEAD	8100	2400	3000	40600	6400	4900	2100	7100	10000
MAGNESIUM	1540000	166000	711000	563000	611000	566000	1610000	409000	1900000
MANGANESE	103000	18100	223000	211000	356000	802000	363000	337000	179000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	970000	782000	271000	827000	1390000	633000	695000	359000	1270000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	9600	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	17800	3600	15200	13900	10800	10500	28200	8900	30300
ZINC	50900	5900	27200	206000	150000	22900	47500	19500	44900

0028089

000363

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S81-01	LH-S81-02	LH-S81-02	LH-S81-02	LH-S82-01	LH-S82-01	LH-S82-01	LH-S82-02	LH-S82-02
Sample Number:	**LH-S81-01_3**	**LH-S81-02_1**	**LH-S81-02_2**	**LH-S81-02_3**	**LH-S82-01_1**	**LH-S82-01_2**	**LH-S82-01_3**	**LH-S82-02_1**	**LH-S82-02_2**
Date Sampled:	**07/23/1993**	**07/23/1993**	**07/23/1993**	**07/23/1993**	**07/23/1993**	**07/23/1993**	**07/23/1993**	**07/23/1993**	**07/23/1993**
Depth (ft.):	**9.00**	**0.50**	**5.00**	**9.00**	**0.50**	**6.00**	**14.00**	**2.50**	**6.00**
METALS - UNITS: UG/KG									
ALUMINUM	ND [13000000] U	ND [5460000] U	ND [12300000] U	ND [8490000] U	8830000	21300000	6640000	9720000	16200000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2800	2000	2700	1800	2800	2200	2200	2400	1000
BARIUM	453000	69500	256000	66000	154000	781000	184000	67300	300000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	1620000	956000	2250000	1100000	2490000	2780000	927000	1860000	2180000
CHROMIUM, TOTAL	19000	10200	18100	11300	19300	22800	11400	15300	17500
COBALT	12400	6600	11300	13900	13200	18000	36200	6600	9200
COPPER	5500	3200	6000	4100	7000	7500	4800	5700	5500
IRON	ND [16200000] U	ND [10100000] U	ND [16900000] U	ND [11100000] U	18600000	24300000	13400000	15800000	14900000
LEAD	10200	7900	9200	7000	9300	11100	12700	8600	14300
MAGNESIUM	1390000	391000	1320000	1230000	919000	2410000	908000	962000	1390000
MANGANESE	285000	274000	313000	119000	210000	127000	1070000	161000	196000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	795000	317000	768000	734000	526000	1250000	450000	571000	690000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	27700	8100	23800	19300	23800	61800	21600	28600	42000
ZINC	36800	13900	42900	39100	43900	55500	41100	29400	30800

000370

028090

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S82-02	LH-S83-01	LH-S83-01	LH-S83-02	LH-S83-02	LH-S84-01	LH-S84-01	LH-S85-01	LH-S85-02	LH-S86-01
Sample Number:	LH-S82-02_3	LH-S83-01_1	LH-S83-01_2	LH-S83-02_1	LH-S83-02_2	LH-S84-01_1	LH-S84-01_2	LH-S85-01_1	LH-S85-02_1	LH-S86-01_1
Date Sampled:	07/24/1993	07/23/1993	07/23/1993	07/23/1993	07/23/1993	07/21/1993	07/21/1993	06/26/1993	06/26/1993	07/27/1993
Depth (ft.):	0.00	0.50	8.00	0.50	8.00	0.50	3.00	3.50	3.50	0.50
METALS - UNITS: UG/KG										
ALUMINUM	ND [142000] U	16700000	5200000	12600000	5880000	6040000	16300000	6790000	16200000	6490000
ANTIMONY	ND [60000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [4180] U	ND [4020] U	ND [3000] U
ARSENIC	ND [2000] U	3000	1100	3700	2200	2500	3400	2340	1150	4000
BARIUM	ND [5000] U	133000	54700	26900	46100	ND [92300] U	ND [75500] U	ND [63800] U	ND [117000] U	109000
CADMIUM	ND [10000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [4680] U	ND [4640] U	ND [1000] U
CALCIUM	ND [200000] U	1480000	456000	800000	694000	880000	2370000	816000	1230000	1420000
CHROMIUM, TOTAL	ND [10000] U	21900	9400	31500	9500	ND [12400] U	ND [17300] U	10700	14600	19500
COBALT	ND [10000] U	6300	4700	1200	6200	12400	10500	8790	6330	ND [1000] U
COPPER	ND [10000] U	4200	3000	2300	5600	4300	6300	ND [5330] U	ND [8740] U	4300
IRON	ND [399000] U	19300000	7740000	22800000	11800000	10000000	19900000	17100000	16700000	21000000
LEAD	ND [5000] U	6300	3300	6400	3700	11700	11300	13600	26800	27000
MAGNESIUM	ND [200000] U	907000	647000	468000	704000	340000	918000	433000	1170000	373000
MANGANESE	ND [10000] U	456000	36300	27700	44700	881000	93100	206000	67400	17500
MERCURY	ND [200] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [4700] U	ND [100] U	ND [60] U	ND [57] U	ND [100] U
POTASSIUM	ND [200000] U	738000	355000	574000	411000	339000	1030000	300000	652000	390000
SELENIUM	ND [2000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [418] U	ND [402] U	ND [1000] U
SILVER	ND [10000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [44] U	ND [24] U	ND [1000] U
STRONTIUM	ND [10000] U	18700	13900	12800	17000	8000	15600	ND [8670] U	ND [24500] U	182000
ZINC	ND [10000] U	25300	23300	12800	26000	13200	28500	15700	29900	9500

000371

028091

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S86-01	LH-S86-02	LH-S86-02	LH-S86-02	LH-S87-01	LH-S87-01	LH-S88-01	LH-S88-01	LH-S88-01	LH-S88-02
Sample Number:	**LH-S86-01_2**	**LH-S86-02_1**	**LH-S86-02_2**	**LH-S86-02_3**	**LH-S87-01_2**	**LH-S87-01_1**	**LH-S88-01_1**	**LH-S88-01_2**	**LH-S88-01_3**	**LH-S88-02_1**
Date Sampled:	**07/27/1993**	**07/27/1993**	**07/27/1993**	**07/27/1993**	**06/26/1993**	**07/22/1993**	**07/22/1993**	**07/22/1993**	**07/22/1993**	**07/22/1993**
Depth (ft.):	**7.00**	**0.50**	**4.00**	**7.00**	**2.50**	**0.50**	**0.50**	**4.00**	**6.00**	**0.50**
METALS - UNITS: UG/KG										
ALUMINUM	5150000	6420000	10800000	5650000	8160000	14200000	13500000	21200000	18500000	12800000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [4320] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2300	4000	3100	2900	2180	1400	1200	2000	1900	1700
BARIUM	117000	117000	481000	89500	ND [84300] U	80700	394000	91800	128000	104000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [2700] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	758000	1600000	2040000	947000	1810000	1480000	2430000	1020000	892000	1550000
CHROMIUM, TOTAL	8900	27500	14500	8700	11900	20800	14100	31500	18100	18300
COBALT	14600	7600	31700	9300	8190	8100	11700	10600	23600	11200
COPPER	4400	3900	7400	3400	ND [7820] U	5600	9100	4900	9500	5100
IRON	11400000	21300000	18000000	12300000	9730000	15400000	17900000	25400000	22000000	17700000
LEAD	4300	17000	13800	6000	18600	21000	10100	9700	19200	5000
MAGNESIUM	421000	283000	626000	440000	380000	613000	1050000	887000	2170000	666000
MANGANESE	83600	597000	225000	102000	374000	306000	129000	150000	133000	361000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [51] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	437000	295000	662000	457000	473000	632000	754000	931000	1120000	622000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [432] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [22] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	18500	12600	45100	20500	ND [10000] U	11600	26400	14000	31500	14800
ZINC	43300	18100	38400	43600	23000	29600	45000	33400	72900	58900

000374

028092

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S88-02	LH-S88-02	LH-S89-01	LH-S89-01	LH-S89-02	LH-S89-02	LH-S90-01	LH-S90-01	LH-S90-02	LH-S90-02
Sample Number:	LH-S88-02_2	LH-S88-02_3	LH-S89-01_1	LH-S89-01_2	LH-S89-02_1	LH-S89-02_2	LH-S90-01_1	LH-S90-01_2	LH-S90-02_1	LH-S90-02_2
Date Sampled:	07/22/1993	07/22/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993	07/21/1993
Depth (ft.):	4.00	6.00	0.50	6.00	0.50	6.00	0.50	8.00	0.50	8.00
METALS - UNITS: UG/KG										
ALUMINUM	40800000	23600000	12800000	19000000	8950000	18500000	8010000	6650000	9370000	5370000
ANTIMONY	ND [3000] U	3600:00:00	ND [5200] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	ND [1000] U	1300	23100	3200	2700	3400	2400	1900	2600	1700
BARIUM	202000	348000:	ND [111000] U	ND [130000] U	ND [108000] U	ND [121000] U	ND [141000] U	ND [109000] U	ND [141000] U	ND [78300] U
CADMIUM	ND [1000] U	ND [1000] U	1500:00:00	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	3060000	2760000	1590000	401000	1490000	1810000	1960000	984000	1760000	864000
CHROMIUM, TOTAL	28600	20800	ND [15400] U	ND [17400] U	ND [12700] U	ND [16100] U	ND [12800] U	ND [11000] U	ND [11900] U	ND [7900] U
COBALT	10400	18300	11600	11400	8700	10200	11000	9100	9900	5300
COPPER	7600	7300	7400	6900	5400	9700	6000	7700	5100	7400
IRON	22400000	20900000	14400000	16900000	12300000	20500000	11400000	9470000	12500000	7500000
LEAD	6800	13600	25900	10000	6900	8100	7900	5000	7000	4200
MAGNESIUM	2400000	2410000	816000	2090000	838000	2560000	732000	1450000	634000	1170000
MANGANESE	43700	69500	544000	91000	393000	62000	619000	119000	775000	71600
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	1870000	1340000	900000	1440000	623000	1350000	548000	627000	523000	543000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	47900	51100	12800	22400	19700	39300	17500	25400	15000	23000
ZINC	55600	62300	51600	55400	23500	52600	27100	40900	18900	39800

000373

028093

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S91-01	LH-S91-01	LH-S91-01	LH-S91-02	LH-S91-02	LH-S91-02	LH-S92-01	LH-S92-01	LH-S92-01	LH-S92-02
Sample Number:	**LH-S91-01_1**	**LH-S91-01_2**	**LH-S91-01_3**	**LH-S91-02_1**	**LH-S91-02_2**	**LH-S91-02_3**	**LH-S92-01_1**	**LH-S92-01_2**	**LH-S92-01_3**	**LH-S92-02_1**
Date Sampled:	**07/23/1993**	**07/23/1993**	**07/23/1993**	**07/24/1993**	**07/24/1993**	**07/24/1993**	**07/23/1993**	**07/23/1993**	**07/23/1993**	**07/23/1993**
Depth (ft.):	**0.50**	**5.00**	**10.40**	**0.50**	**5.50**	**10.00**	**0.50**	**6.50**	**10.50**	**0.50**
METALS - UNITS: UG/KG										
ALUMINUM	14400000	21100000	4660000	ND [8210000] U	ND [13300000] U	ND [4700000] U	10600000	10700000	6380000	15000000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U
ARSENIC	2000	ND [1000] U	ND [1000] U	2500	2500	2300	2600	1200	2300	2500
BARIUM	83600	83700	64200	76400	85600	45000	59200	170000	99200	96200
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	2300000	944000	481000	2330000	1020000	456000	2120000	626000	673000	5130000
CHROMIUM, TOTAL	16600	18200	10000	13900	18800	9100	15100	13100	11400	18900
COBALT	7500	7100	8600	6500	9700	7800	6600	8200	8100	6900
COPPER	7400	5700	2500	6300	8900	4000	5200	4900	7500	6000
IRON	16600000	15400000	3650000	ND [15300000] U	ND [17400000] U	ND [9000000] U	13400000	11700000	13000000	16200000
LEAD	6600	3900	2800	8800	8700	9600	7400	5300	5900	8900
MAGNESIUM	1350000	1450000	700000	947000	1550000	743000	922000	1420000	1170000	923000
MANGANESE	135000	82700	12400	113000	26800	20300	117000	33700	52000	223000
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	902000	859000	306000	570000	700000	398000	546000	556000	472000	719000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	25200	24400	15800	19400	21800	12200	20300	23700	21800	19900
ZINC	40100	30800	25900	26600	40000	20300	33400	36900	34800	38300

0003754

028094

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S92-02	LH-S92-02	LH-S93-01	LH-S93-01	LH-S93-01	LH-S93-02	LH-S93-02	LH-WRS17-01	LH-WRS17-01
Sample Number:	LH-S92-02_2	LH-S92-02_3	LH-S93-01_1	LH-S93-01_2	LH-S93-01_3	LH-S93-02_1	LH-S93-02_2	LH-WRS17-01_1	LH-WRS17-01_2
Date Sampled:	07/23/1993	07/23/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/24/1993	07/22/1993	07/22/1993
Depth (ft.):	6.50	10.50	0.50	4.50	12.50	0.50	3.00	0.50	4.00
METALS - UNITS: UG/KG									
ALUMINUM	14400000	4500000	ND [9630000] U	ND [9300000] U	ND [942000] U	ND [7900000] U	ND [10900000] U	10400000	36200000
ANTIMONY	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	ND [3000] U	6300	ND [3000] U
ARSENIC	2000	ND [1000] U	2700	2300	ND [1000] U	3200	2000	26400	2800
BARIUM	102000	82400	89800	90000	6700	78900	45800	42600	171000
CADMIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
CALCIUM	609000	233000	1240000	1250000	155000	2380000	896000	785000	419000
CHROMIUM, TOTAL	14300	16500	15800	17500	2800	12400	15100	41500	30100
COBALT	9300	6000	10800	15700	2400	11600	5500	4500	11400
COPPER	5700	7100	4500	3400	1100	4600	3800	ND [1000] U	7600
IRON	11900000	15500000	ND [14300000] U	ND [13200000] U	ND [1670000] U	ND [13800000] U	ND [10300000] U	32400000	30500000
LEAD	10300	3000	9100	8700	1800	12100	6700	128100	13700
MAGNESIUM	1610000	504000	679000	534000	159000	603000	621000	288000	2690000
MANGANESE	58300	51900	360000	528000	8700	348000	136000	234000	68600
MERCURY	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U
POTASSIUM	791000	282000	633000	594000	108000	481000	876000	208000	1680000
SELENIUM	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
SILVER	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U
STRONTIUM	25100	9100	11700	9300	2700	12200	7300	7900	29300
ZINC	38100	27700	20200	20000	5400	22000	20900	52100	51400

000325

028095

Metals in Phase I Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS18-01	LH-WRS18-01
Sample Number:	LH-WRS18-01_1	LH-WRS18-01_2
Date Sampled:	06/26/1993	06/26/1993
Depth (ft.):	0.50	3.00
METALS - UNITS: UG/KG		
ALUMINUM	7580000	12500000
ANTIMONY	ND [4940] U	ND [4500] U
ARSENIC	5530	2520
BARIUM	ND [76700] U	ND [70300] U
CADMIUM	6740	3820
CALCIUM	1550000	756000
CHROMIUM, TOTAL	18400	16900
COBALT	18500	13000
COPPER	ND [4960] U	ND [7200] U
IRON	24100000	16800000
LEAD	20100	22300
MAGNESIUM	640000	671000
MANGANESE	493000	261000
MERCURY	ND [51] U	ND [55] U
POTASSIUM	279000	432000
SELENIUM	ND [494] U	ND [450] U
SILVER	3880	25
STRONTIUM	ND [16000] U	ND [12400] U
ZINC	28300	21400

000376

028096

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB01	47SB01	47SB01	47SB02	47SB02	47SB02	47SB03	47SB03	47SB03	LHS-3-01
Sample Number:	47SB01(0-0.5)	47SB01(1-3)	47SB01(3-5)	47SB02(0-0.5)	47SB02(1-3)	47SB02(3-5)	47SB03(0-0.5)	47SB03(1-3)	47SB03(3-5)	LHS-3-01
Date Sampled:	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	07/27/1998	01/09/1995
Depth (ft.):	0.00	1.00	3.00	0.00	1.00	3.00	0.00	1.00	3.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	9300000 J	8100000 J	4000000 J	5400000 J	5500000 J	13000000	5900000	12000000	10000000	7840000
ANTIMONY	ND [6650] R	ND [6440] R	ND [6670] R	ND [6590] R	ND [6510] R	ND [6930] R	7590 J	ND [6910] R	ND [7110] R	ND [30700] UJ
ARSENIC	4520	4230	2640	3260	3340	4310	1950	4480	5700	11600 J
BARIUM	85000 J	97000 J	83000 J	63000 J	110000 J	77000	80000	110000	350000	70500
BERYLLIUM	686 J	618 J	ND [556] U	ND [549] U	769 J	700	ND [607] U	803	1150	NA
CADMIUM	ND [554] U	ND [536] U	ND [556] U	ND [549] U	ND [542] U	ND [577] U	ND [607] U	ND [576] U	ND [592] U	ND [3100] U
CALCIUM	1100000 J	1600000 J	13000000 J	1500000 J	1100000 J	1100000	740000	1600000	1400000	4050000
CHROMIUM, TOTAL	15000 J	16000 J	21000 J	11000 J	13000 J	13000	57000	18000	14000	14700 J
COBALT	6900 J	7200 J	ND [5600] U	8600 J	18000 J	6900	ND [6100] U	11000	18000	ND [6100] U
COPPER	5990 J	8280 J	4450 J	3880 J	3710 J	4810	6460	8330	10100	28200
IRON	18000000 J	21000000 J	6000000 J	11000000 J	10000000 J	13000000	7400000	16000000	20000000	14500000
LEAD	18300	17200	15400	15100	12300	8230	182000	11900	40800	36000
MAGNESIUM	710000 J	630000 J	ND [560000] U	ND [550000] U	ND [540000] U	940000	ND [610000] U	2200000	2300000	521000
MANGANESE	201000 J	385000 J	108000 J	263000 J	637000 J	106000	130000	146000	1170000	311000 J
MERCURY	ND [110] U	ND [110] U	ND [110] U	ND [110] U	ND [110] U	ND [120] U	ND [120] U	ND [120] U	ND [120] U	ND [290] U
NICKEL	8300 J	7100 J	5400 J	6600 J	7600 J	9900	8100	20000	25000	NA
POTASSIUM	1000000	750000	ND [560000] U	670000	1000000	1100000	750000	2000000	2500000	ND [613000] U
SELENIUM	2130	2100	ND [1110] U	1490	1720	1540	ND [1210] U	1650	2080	610 J
SILVER	ND [1100] U	ND [1100] U	ND [1100] U	ND [1100] U	ND [1100] U	ND [1100] U	1300	ND [1100] U	ND [1200] U	ND [3100] U
SODIUM	ND [550000] U	ND [540000] U	ND [560000] U	ND [550000] U	ND [540000] U	ND [580000] U	ND [610000] U	ND [580000] U	ND [590000] U	NA
STRONTIUM	9800	12000	20000	ND [5500] U	6700	8300	ND [6100] U	28000	30000	ND [30700] U
THALLIUM	ND [554] U	ND [536] U	ND [556] U	ND [549] U	ND [542] U	ND [577] U	ND [607] U	ND [576] U	ND [592] U	ND [153000] U
VANADIUM	28000 J	29000 J	15000 J	20000 J	21000 J	28000	19000	24000	28000	NA
ZINC	38000 J	29000 J	27000 J	17000 J	13000 J	18000	55000	50000	90000	120000

0028097

0028097

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05	LHS-3-06	LHS-3-07	LHS-3-08	LHS-3-09	LHS-3-10	LHS-3-11
Sample Number:	LHS-3-02	LHS-3-03	LHS-3-04	LHS-3-05	LHS-3-06	LHS-3-07	LHS-3-08	LHS-3-09	LHS-3-10	LHS-3-11
Date Sampled:	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/09/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995	01/10/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	14100000	8470000	7890000	8390000	10400000	2790000	9190000	6060000	10100000	6930000
ANTIMONY	ND [17200] UJ	ND [15600] UJ	ND [15600] UJ	ND [13400] UJ	ND [10300] UJ	ND [11800] UJ	ND [15300] UJ	ND [11300] UJ	ND [6700] UJ	ND [9200] UJ
ARSENIC	4400 J	4500 J	4200 J	25700 J	4200 J	2100 J	1600 J	5000 J	3500 J	2700 J
BARIUM	117000	232000	181000	38200	89200	23500	55300	49500	61800	36400
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1700] U	ND [1600] U	ND [1600] U	ND [1300] U	ND [1000] U	ND [1200] U	ND [1500] U	ND [1100] U	ND [670] U	ND [920] U
CALCIUM	1460000	1800000	1600000	968000	618000	205000	1160000	687000	986000	496000
CHROMIUM, TOTAL	14600 J	12700 J	14700 J	37900 J	22800 J	8300 J	57200 J	10700 J	22400 J	10500 J
COBALT	6000	4800	4300	ND [2700] U	ND [2100] U	2500	3300	ND [2300] U	5700	15000
COPPER	9500	25400	44100	46200	64100	ND [2400] U	90800	4700	46200	9300
IRON	10000000	8090000	9660000	47600000	7040000	6660000	7270000	6960000	13400000	7960000
LEAD	36400	39000	81100	24500	162000	14300	108000	14600	11400	10200
MAGNESIUM	790000	488000	499000	275000	255000	132000	580000	341000	552000	472000
MANGANESE	273000 J	105000 J	198000 J	124000 J	63400 J	75200 J	41600 J	52100 J	109000 J	603000 J
MERCURY	ND [210] U	360	ND [180] U	ND [120] U	ND [170] U	ND [85] U	240	170	ND [110] U	ND [86] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	686000	350000	459000	ND [268000] U	211000	ND [237000] U	376000	340000	481000	383000
SELENIUM	460 J	470 J	530 J	1000 J	340 J	230 J	480 J	320 J	190 J	290 J
SILVER	26900	ND [1600] U	ND [1600] U	1500	ND [1000] U	ND [1200] U	ND [1500] U	ND [1100] U	ND [670] U	ND [920] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [17200] U	28400	34300	ND [13400] U	ND [10300] U	ND [11800] U	ND [15300] U	ND [11300] U	8200	ND [9200] U
THALLIUM	ND [85900] U	ND [78000] U	ND [77800] U	ND [67000] U	ND [51400] U	ND [59200] U	ND [76700] U	ND [56300] U	ND [33300] U	ND [45900] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	59000	145000	128000	161000	2330000	107000	402000	56300	37400	20200

000378

028098

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-12	LHS-3-13	LHS-3-14	LHS-3-15	LHS-3-16	LHS-3-17	LHS-3-18	LHS-3-19	LHS-3-20	LHS-3-21
Sample Number:	**LHS-3-12**	**LHS-3-13**	**LHS-3-14**	**LHS-3-15**	**LHS-3-16**	**LHS-3-17**	**LHS-3-18**	**LHS-3-19**	**LHS-3-20**	**LHS-3-21**
Date Sampled:	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
METALS - UNITS: UG/KG										
ALUMINUM	2140000	7860000	14500000	6150000	11200000	14800000	18700000	8140000	5010000	13100000
ANTIMONY	ND [12200] UJ	ND [20000] UJ	ND [11600] UJ	ND [9200] UJ	ND [7900] UJ	ND [9900] UJ	ND [13000] UJ	ND [15300] UJ	ND [9500] UJ	ND [18000] UJ
ARSENIC	3100 J	5200 J	3900 J	1600 J	6300 J	31800 J	9600 J	9600 J	1900 J	5900 J
BARIUM	9600	48200	66800	50100	78200	112000	110000	81100	61600	126000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1200] U	ND [2000] U	ND [1200] U	ND [920] U	ND [790] U	ND [990] U	ND [1300] U	ND [860] U	ND [950] U	ND [1800] U
CALCIUM	335000	1150000	1530000	675000	1160000	3830000	956000	211000	1730000	5140000
CHROMIUM, TOTAL	10800 J	37500 J	17900 J	8800 J	15800 J	19300 J	57700 J	80400 J	8600 J	20500 J
COBALT	ND [2400] U	ND [4000] U	4200	3100	6300	5400	4700	8400	6200	6500
COPPER	8500	77100	13100	4200	4900	20900	67500	4000	76500	17000
IRON	7140000	12100000	12800000	6550000	14600000	15700000	64800000	69300000	5830000	16700000
LEAD	22000	94100	13900	24000	11400	41400	31600	10200	47700	40000
MAGNESIUM	132000	494000	954000	394000	649000	867000	1160000	214000	459000	962000
MANGANESE	25200 J	60800 J	70800 J	191000 J	366000 J	197000 J	267000 J	236000	247000	173000
MERCURY	340	ND [210] U	ND [130] U	220	ND [140] U	140	ND [110] U	ND [100] U	ND [130] U	ND [170] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	ND [244000] U	541000	727000	363000	531000	625000	838000	ND [172000] U	307000	533000
SELENIUM	ND [140] UJ	490 J	250 J	200 J	290 J	620 J	560 J	520 J	360 J	690 J
SILVER	ND [1200] U	ND [2000] U	ND [1200] U	ND [920] U	ND [790] U	ND [990] U	2200	ND [1500] U	ND [950] U	ND [1800] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [12200] U	ND [20000] U	16600	ND [9200] U	13800	21100	16200	ND [8600] U	ND [9500] U	25300
THALLIUM	ND [61000] U	ND [100000] U	ND [58100] U	ND [45800] U	ND [39300] U	ND [49400] U	ND [64900] U	ND [42900] U	ND [47300] U	ND [90200] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	68000	326000	41100	27300	24800	109000	104000	15700	173000	208000

000379

028099

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-3-22	LHS-3-23	LHS-3-24	LHS-3-25	LHS-3-26	LHS-3-27	LHS-3-28	LHS-3-29	LHS-MW-28	LHS-MW-29
Sample Number:	**LHS-3-22**	**LHS-3-23**	**LHS-3-24**	**LHS-3-25**	**LHS-3-26**	**LHS-3-27**	**LHS-3-28**	**LHS-3-29**	**LHS-MW28**	**LHS-MW29**
Date Sampled:	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/10/1995**	**01/11/1995**	**01/11/1995**	**01/11/1995**	**01/11/1995**	**10/03/1994**	**10/03/1994**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
METALS - UNITS: UG/KG										
ALUMINUM	9810000	9210000	7530000	10600000	19100000	11200000	3830000	5740000	5430000	9120000
ANTIMONY	ND [15900] UJ	ND [11200] UJ	ND [10700] UJ	ND [16000] UJ	ND [11600] UJ	ND [13700] UJ	ND [9200] UJ	ND [14000] UJ	ND [8600] UJ	ND [9100] UJ
ARSENIC	4900 J	3300 J	970 J	7000 J	4000 J	4300 J	1800 J	7200 J	9600 J	4500 J
BARIUM	63300	56800	4170000	79700	90000	64300	72200	67000	55300	69900
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [1600] U	ND [1100] U	ND [1100] U	ND [1600] U	ND [1200] U	ND [1400] U	ND [920] U	ND [1400] U	ND [860] U	ND [910] U
CALCIUM	1230000	878000	2760000	3400000	1800000	837000	491000	1380000	1660000	314000
CHROMIUM, TOTAL	25100 J	16200 J	144000 J	53300 J	20700 J	16300 J	6700 J	16900 J	24500	14200
COBALT	4700	5700	4700	6100	11900	5800	5200	5800	4200	7600
COPPER	168000	18500	22700	13900	9600	59300	6800	14900	9700	5700
IRON	19100000	11300000	12500000	15600000	21600000	11300000	3560000	17400000	30800000	10400000
LEAD	79500	29800	60900	113000	12800	12600	9800	17400	20800	12300
MAGNESIUM	464000	472000	1660000	681000	1120000	505000	247000	522000	286000	502000
MANGANESE	72900	87200	211000	239000	329000	106000	455000	309000	260000	439000
MERCURY	ND [170] U	130	790	ND [150] U	ND [120] U	ND [120] U	ND [91] U	ND [110] U	ND [98] U	ND [77] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	447000	462000	495000	621000	857000	450000	246000	318000	243000	403000
SELENIUM	930 J	680 J	360 J	700 J	510 J	470 J	290 J	360 J	400 J	560 J
SILVER	ND [1600] U	ND [1100] U	ND [1100] U	ND [1600] U	ND [1200] U	ND [1400] U	ND [920] U	ND [1400] U	ND [860] U	ND [910] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [15900] U	ND [11200] U	889000	23600	17700	ND [13700] U	ND [9200] U	ND [14000] U	ND [8600] U	ND [9100] U
THALLIUM	ND [79600] U	ND [56100] U	ND [53600] U	ND [80200] U	ND [58000] U	ND [68400] U	ND [46200] U	ND [70000] U	ND [43000] U	ND [45500] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	207000	97900	106000	140000	56900	47900	21000	265000	31000	15500

000380

028100

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-30	LHS-MW-31	LHS-MW-32	LHS-MW-33	LHS-MW-34	LHS-MW-35	LHS-MW-36	LHS-MW-37	LHS-MW-38	LHS-MW-39	LHS-MW-40
Sample Number:	LHS-MW30	LHS-MW31	LHS-MW32	LHS-MW33	LHS-MW34	LHS-MW35	LHS-MW36	LHS-MW37	LHS-MW38	LHS-MW39	LHS-MW40
Date Sampled:	10/03/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994	10/04/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG											
ALUMINUM	7250000	9330000	5240000	8610000	5450000	8680000	4910000	6470000	10900000	7630000	9400000
ANTIMONY	ND [8900] UJ	ND [9200] UJ	ND [8800] UJ	ND [9100] UJ	ND [9400] UJ	ND [10400] UJ	ND [7900] UJ	ND [7900] UJ	ND [7900] UJ	ND [7700] UJ	ND [7700] UJ
ARSENIC	3500 J	6000 J	1700 J	2400 J	1600 J	4800 J	2600 J	2300 J	8600 J	2300 J	5500 J
BARIUM	165000	300000	109000	56300	79200	111000	646000	43100	63900	55600	64600
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [890] U	ND [920] U	ND [880] U	ND [910] U	ND [940] U	ND [1000] U	ND [790] U	ND [790] U	ND [790] U	ND [770] U	ND [770] U
CALCIUM	603000	608000	804000	751000	513000	2880000	3500000	1130000	662000	315000	794000
CHROMIUM, TOTAL	14900	16400	8700	11500	10100	14800	8900	18500	22200	10400	10700
COBALT	16600	21000	6500	7200	7700	6100	7700	3100	14700	2600	3500
COPPER	2800	4200	3100	12600	2300	4600	3000	3300	4000	2600	3900
IRON	14100000	15200000	6850000	10600000	6200000	16500000	5170000	18700000	17300000	7890000	9530000
LEAD	18900	19600	15500	12300	10200	16400	16700	9300	13000	13100	11100
MAGNESIUM	442000	548000	342000	777000	322000	388000	426000	276000	643000	393000	554000
MANGANESE	1740000	2620000	721000	287000	628000	508000	1340000	195000	376000	268000	273000
MERCURY	ND [82] U	ND [100] U	ND [99] U	ND [87] U	ND [100] U	ND [94] U	ND [91] U	ND [95] U	420	ND [100] U	ND [79] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	324000	423000	265000	576000	286000	406000	277000	339000	671000	388000	362000
SELENIUM	370 J	420 J	230 J	180 J	230 J	300 J	220 J	320 J	710 J	390 J	550 J
SILVER	ND [890] U	ND [920] U	ND [880] U	ND [910] U	ND [940] U	ND [1000] U	ND [790] U	ND [790] U	ND [790] U	ND [770] U	ND [770] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	12500	10100	9800	12000	ND [9400] U	21300	52500	ND [7900] U	9500	ND [7700] U	9000
THALLIUM	ND [44600] U	ND [46200] U	ND [43800] U	ND [45400] U	ND [47000] U	ND [51900] U	ND [39600] U	ND [39600] U	ND [39700] U	ND [38400] U	ND [38300] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	14300	19600	19200	26300	18700	35600	37700	26400	20100	12700	15800

000381

0281101

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-41	LHS-MW-42	LHS-MW-43	LHS-MW-44	LHS-MW-45	LHS-MW-46	LHS-MW-47	LHS-MW-48	LHS-MW-49	LHS-MW-50	LHS-MW-51
Sample Number:	LHS-MW41	LHS-MW42	LHS-MW43	LHS-MW44	LHS-MW45	LHS-MW46	LHS-MW47	LHS-MW48	LHS-MW49	LHS-MW50	LHS-MW51
Date Sampled:	10/04/1994	10/04/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG											
ALUMINUM	13000000	6800000	5520000	5180000	11800000	3830000	5860000	4710000	7530000	8400000	5520000
ANTIMONY	ND [8200] UJ	ND [8300] UJ	ND [7000] UJ	ND [6800] UJ	ND [7400] UJ	ND [7300] UJ	ND [7300] UJ	ND [7000] UJ	ND [6700] UJ	ND [7600] UJ	ND [7400] UJ
ARSENIC	3700 J	1100 J	1400 J	1700 J	4100 J	2000 J	4400 J	2500 J	2600 J	5800	2300 J
BARIUM	90100	107000	96000	68000	68200	91300	175000	89600	162000	92900	97100
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [820] U	ND [830] U	ND [700] U	ND [680] U	ND [740] U	ND [730] U	ND [730] U	ND [700] U	ND [670] U	ND [760] U	ND [740] U
CALCIUM	633000	501000	629000	723000	100000	710000	1440000	354000	2640000	651000	1050000
CHROMIUM, TOTAL	13100	8000	11300	10700	23900	8900	12500	15200	12100	17400	9200
COBALT	7600	3300	5600	5600	4300	11500	6000	7300	6700	5300	7100
COPPER	6200	2600	4000	3000	5800	2400	3400	3200	6500	4500	4500
IRON	13000000	5840000	8210000	8510000	24700000	5730000	13600000	8040000	9930000	16100000	9000000
LEAD	10800	13600	12400	11900	13200	8900	14100	8800	18200	13400	11400
MAGNESIUM	981000	396000	458000	327000	551000	181000	362000	212000	662000	492000	314000
MANGANESE	151000	1120000	356000	510000	153000	610000	348000	775000	304000	487000	868000
MERCURY	ND [95] U	ND [96] U	ND [90] U	ND [85] U	ND [100] U	ND [100] U	ND [79] U	ND [89] U	ND [88] U	ND [110] U	ND [91] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	655000	296000	324000	313000	429000	183000	249000	291000	319000	342000	196000
SELENIUM	500 J	210 J	270	480	510	350	330	210	270	390	230
SILVER	ND [820] U	ND [830] U	2800	ND [680] U	970	ND [730] U	ND [730] U	ND [700] U	ND [670] U	ND [760] U	ND [740] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	22300	8300	10100	8600	10700	ND [7300] U	10900	ND [7000] U	21500	10700	10700
THALLIUM	ND [40800] U	ND [41400] U	ND [34800] U	ND [34100] U	ND [37200] U	ND [36600] U	ND [36500] U	ND [35000] U	ND [33600] U	ND [37800] U	ND [37200] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	34700	14900	23100	12500	19100	8200	20600	9900	33600	20800	23100

000382

028102

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-52	LHS-MW-53	LHS-MW-54	LHS-MW-55	LHS-MW-56	LHS-MW-57	LHS-MW-60	LHS-MW-61	SUMP044	SUMP044
Sample Number:	LHS-MW52	LHS-MW53	LHS-MW54	LHS-MW55	LHS-MW56	LHS-MW57	LHS-MW60	LHS-MW61	SUMP044(0-0.5)	SUMP044(5-5.5)
Date Sampled:	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	10/05/1994	09/27/1998	09/27/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
METALS - UNITS: UG/KG										
ALUMINUM	6140000	5230000	6990000	5810000	5630000	6230000	3550000	6840000	NA	NA
ANTIMONY	ND [5900] UJ	ND [6900] UJ	ND [7500] UJ	ND [7200] UJ	ND [6600] UJ	ND [7500] UJ	7400	ND [6600] U	NA	NA
ARSENIC	8100 J	1300 J	2200 J	5500 J	7500 J	5200 J	1400	1600	NA	NA
BARIUM	40800	58700	73400	69000	54100	39100	59100	71800	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	ND [608] U	ND [605] U
CADMIUM	ND [590] U	ND [690] U	ND [750] U	ND [720] U	ND [660] U	ND [750] U	ND [740] U	ND [660] U	NA	NA
CALCIUM	57800000	739000	532000	697000	1370000	953000	650000	449000	NA	NA
CHROMIUM, TOTAL	26600	10400	13500	36400	25900	58000	8400	23000	NA	NA
COBALT	2600	4200	8600	4300	3600	2700	3900	7200	NA	NA
COPPER	4700	2600	4400	3600	4700	4000	3200	2800	NA	NA
IRON	33700000	6470000	12600000	40500000	29500000	75200000	7490000	11300000	NA	NA
LEAD	18600	11400	11900	20100	26500	27700	9800	11900	NA	NA
MAGNESIUM	3240000	311000	535000	238000	385000	195000	199000	366000	NA	NA
MANGANESE	179000	315000	579000	330000	157000	189000	354000	322000	NA	NA
MERCURY	ND [83] U	140	ND [120] U	ND [91] U	ND [74] U	ND [78] U	130	ND [79] U	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	8000	7900
POTASSIUM	246000	237000	307000	231000	263000	164000	164000	535000	NA	NA
SELENIUM	340	290	170	200	230	ND [140] U	170	190	NA	NA
SILVER	ND [590] U	ND [690] U	ND [750] U	1300	940	2000	ND [740] U	ND [660] U	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	71800	ND [6900] U	8400	ND [7200] U	7600	ND [7500] U	ND [7400] U	7200	NA	NA
THALLIUM	ND [29600] U	ND [34400] U	ND [37400] U	ND [35800] U	ND [32900] U	ND [37400] U	ND [37000] U	ND [33000] U	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	18000	18000
ZINC	36800	10800	19700	21400	23200	23200	13900	12100	NA	NA

000383

0281103

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP045	SUMP045	SUMP045	SUMP047	SUMP047	SUMP048	SUMP048	SUMP049
Sample Number:	SUMP045(0-0.5)	SUMP045(0-0.5)LFD	SUMP045(3-5)	SUMP047(0-0.5)	SUMP047(3-5)	SUMP048(0-0.5)	SUMP048(8.5-9)	SUMP049(3-5)
Date Sampled:	07/30/1998	07/30/1998	07/30/1998	08/09/1998	08/09/1998	09/27/1998	09/27/1998	08/09/1998
Depth (ft.):	0.00	0.00	3.00	0.00	3.00	0.00	8.50	3.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	712	ND [2700] U	ND [539] U	1050	ND [505] U	ND [536] U	ND [564] U	571
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	4400	ND [22000] U	5600	7800	5700	6600	4700	8300
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	27000	29000	21000	28000	15000	23000	6700	14000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

000384

028104

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP049	SUMP050	SUMP050	SUMP051	SUMP051	SUMP052	SUMP052	SUMP053
Sample Number:	SUMP049(0-0.5)	SUMP050(0-0.5)	SUMP050(8-8.5)	SUMP051(0-0.5)	SUMP051(6-6.5)	SUMP052(0-0.5)	SUMP052(3-5)	SUMP053(0-0.5)
Date Sampled:	08/09/1998	09/27/1998	09/27/1998	09/27/1998	09/27/1998	08/09/1998	08/09/1998	07/30/1998
Depth (ft.):	0.00	0.00	8.00	0.00	6.00	0.00	3.00	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [566] U	ND [616] U	ND [585] U	ND [635] U	ND [588] U	ND [578] U	ND [586] U	ND [525] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	7800	11000	5600	9600	4700	15000	10000	ND [4200] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	22000	42000	ND [5800] U	16000	19000	25000	38000	44000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0028105

0028105

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP053	SUMP054	SUMP054	SUMP055	SUMP055	SUMP055	SUMP056	SUMP056
Sample Number:	SUMP053(3-5)	SUMP054(0-0.5)	SUMP054(6.5-7)	SUMP055(0-0.5)	SUMP055(3-5)	SUMP055(3-5)LFD	SUMP056(0-0.5)	SUMP056(3-5)
Date Sampled:	07/30/1998	09/27/1998	09/27/1998	08/09/1998	08/09/1998	08/09/1998	08/10/1998	08/10/1998
Depth (ft.):	3.00	0.00	6.50	0.00	3.00	3.00	0.00	3.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [558] U	ND [639] U	ND [595] U	893	ND [591] U	ND [2960] U	ND [585] U	717
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4500] U	11000	5400	13000	9000	ND [24000] U	18000	14000
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	22000	51000	11000	40000	15000	ND [30000] U	28000	39000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

000386

028106

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP057	SUMP057	SUMP058	SUMP058	SUMP059	SUMP059	SUMP060	SUMP060	SUMP061
Sample Number:	SUMP057(0-0.5)	SUMP057(3-5)	SUMP058(0-0.5)	SUMP058(3-5)	SUMP059(0-0.5)	SUMP059(3-5)	SUMP060(0-0.5)	SUMP060(5-5.5)	SUMP061(0-0.5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	08/10/1998	08/10/1998	09/27/1998	09/27/1998	07/29/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	3.00	0.00	5.00	0.00
METALS - UNITS: UG/KG									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	543	652	ND [550] U	ND [555] U	837	720	ND [676] U	ND [623] U	ND [601] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4300] U	5300	ND [4400] U	ND [4400] U	13000	12000	8600	5500	5000
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	27000	22000	31000	20000	39000	27000	25000	17000	26000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA

0028107
0028107

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP061	SUMP062	SUMP062	SUMP062	SUMP063	SUMP063	SUMP064	SUMP064
Sample Number:	SUMP061(3-5)	SUMP062(0-0.5)	SUMP062(0-0.5)LFD	SUMP062(8.5-9)	SUMP063(0-0.5)	SUMP063(5.5-6)	SUMP064(0-0.5)	SUMP064(9.5-10)
Date Sampled:	07/29/1998	09/27/1998	09/27/1998	09/27/1998	09/27/1998	09/27/1998	09/27/1998	09/27/1998
Depth (ft.):	3.00	0.00	0.00	8.50	0.00	5.50	0.00	9.50
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	1050	ND [575] U	ND [2870] U	ND [574] U	ND [622] U	ND [600] U	ND [644] U	ND [602] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [5000] U	5900	ND [23000] U	5000	9400	8000	11000	8000
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	40000	12000	ND [29000] U	11000	31000	25000	51000	ND [6000] U
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0028108
0028108

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP064	SUMP065	SUMP065	SUMP066	SUMP066	SUMP067	SUMP067	SUMP068
Sample Number:	SUMP064(9.5-10)FD	SUMP065(0-0.5)	SUMP065(3-5)	SUMP066(0-0.5)	SUMP066(6-6.5)	SUMP067(0-0.5)	SUMP067(3-5)	SUMP068(0-0.5)
Date Sampled:	09/27/1998	08/10/1998	08/10/1998	09/27/1998	09/27/1998	08/11/1998	08/11/1998	07/29/1998
Depth (ft.):	9.50	0.00	3.00	0.00	6.00	0.00	3.00	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [3010] U	711	923	ND [580] U	ND [597] U	597	607	632
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [24000] U	11000	17000	8000	7800	11000	10000	ND [4600] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	ND [30000] U	26000	23000	16000	18000	23000	25000	120000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0003899

028109

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP068	SUMP069	SUMP069	SUMP070	SUMP070	SUMP071	SUMP071	SUMP072	SUMP072
Sample Number:	SUMP068(3-5)	SUMP069(0-0.5)	SUMP069(3-5)	SUMP070(0-0.5)	SUMP070(3-5)	SUMP071(0-0.5)	SUMP071(3-5)	SUMP072(0-0.5)	SUMP072(3-5)
Date Sampled:	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/29/1998	07/30/1998	07/30/1998	07/30/1998	07/30/1998
Depth (ft.):	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00
METALS - UNITS: UG/KG									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [591] U	ND [597] U	699	738	ND [609] U	ND [549] U	686	605	ND [602] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4700] U	6100	17000	9600	7800	ND [4400] U	ND [4800] U	ND [4400] U	ND [4800] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	29000	49000	29000	29000	17000	38000	24000	23000	18000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA

000390

028110

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP072	SUMP072	SUMP073	SUMP073	SUMP073	SUMP074	SUMP074	SUMP075
Sample Number:	SUMP072(0-0.5)	SUMP072(6-6.5)	SUMP073(0-0.5)	SUMP073(6-6.5)	SUMP073(6-6.5)FD	SUMP074(0-0.5)	SUMP074(9.5-10)	SUMP075(0-0.5)
Date Sampled:	09/26/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998	08/11/1998
Depth (ft.):	0.00	6.00	0.00	6.00	6.00	0.00	9.50	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [568] U	ND [633] U	683	810	ND [3280] U	ND [604] U	1060	702
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	7000	7200	10000	13000	ND [26000] U	12000	19000	8200
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	13000	18000	19000	23000	ND [33000] U	40000	10000	20000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

000391

028111

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP075	SUMP076	SUMP076	SUMP076	SUMP076	SUMP077	SUMP077	SUMP078	SUMP078
Sample Number:	SUMP075(3-5)	SUMP076(0-0.5)	SUMP076(3-5)	SUMP076(0-0.5)	SUMP076(9.5-10)	SUMP077(0-0.5)	SUMP077(3-5)	SUMP078(0-0.5)	SUMP078(3-5)
Date Sampled:	08/11/1998	07/30/1998	07/30/1998	09/26/1998	09/26/1998	07/30/1998	07/30/1998	08/11/1998	08/11/1998
Depth (ft.):	3.00	0.00	3.00	0.00	9.50	0.00	3.00	0.00	3.00
METALS - UNITS: UG/KG									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [596] U	579	ND [600] U	626	1090	ND [529] U	577	696	ND [576] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4800] U	4800	ND [4800] U	9700	16000	6600	9000	ND [4400] U	ND [4600] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	17000	21000	28000	21000	12000	15000	24000	55000	36000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA

0003392

0281112

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP079	SUMP079	SUMP080	SUMP080	SUMP081	SUMP081	SUMP082	SUMP082
Sample Number:	SUMP079(0-0.5)	SUMP079(8.5-9)	SUMP080(0-0.5)	SUMP080(7.5-8)	SUMP081(0-0.5)	SUMP081(9.5-10)	SUMP082(0-0.5)	SUMP082(0-0.5)LFD
Date Sampled:	09/26/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998	08/04/1998	08/04/1998
Depth (ft.):	0.00	8.50	0.00	7.50	0.00	9.50	0.00	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [600] U	ND [617] U	ND [613] U	743	ND [625] U	1170	551	ND [2570] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	10000	8600	12000	9000	7100	20000	8900	ND [21000] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	31000	12000	38000	8900	39000	19000	23000	ND [26000] U
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

000393

0281113

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP082	SUMP083	SUMP083	SUMP084	SUMP084	SUMP085	SUMP085	SUMP086
Sample Number:	SUMP082(3-5)	SUMP083(0-0.5)	SUMP083(9.5-10)	SUMP084(0-0.5)	SUMP084(6.5-7)	SUMP085(0-0.5)	SUMP085(7-7.5)	SUMP086(0-0.5)
Date Sampled:	08/04/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998	09/26/1998
Depth (ft.):	3.00	0.00	9.50	0.00	6.50	0.00	7.00	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	701.3	ND [639] U	ND [640] U	ND [630] U	ND [618] U	ND [635] U	711	ND [625] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4700] U	7300	5700	7400	6000	5600	6800	6900
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	18000	34000	ND [6400] U	41000	14000	41000	26000	32000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0003694

0281114

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP086	SUMP087	SUMP087	SUMP088	SUMP088	SUMP089	SUMP089	SUMP090
Sample Number:	SUMP086(9.5-10)	SUMP087(0-0.5)	SUMP87(5.8-6.3)	SUMP088(0-0.5)	SUMP088(3-5)	SUMP089(0-0.5)	SUMP89(5.8-6.3)	SUMP090(0-0.5)
Date Sampled:	09/26/1998	09/26/1998	09/26/1998	08/04/1998	08/04/1998	09/26/1998	09/26/1998	08/04/1998
Depth (ft.):	9.50	0.00	5.75	0.00	3.00	0.00	5.75	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	607	ND [579] U	ND [600] U	471.2	497.7	ND [561] U	881	512.7
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	7600	ND [4600] U	ND [4800] U	ND [5500] U	ND [4800] U	4900	7900	ND [4200] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	7800	44000	17000	25000	21000	18000	30000	14000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0028115

000395

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP090	SUMP091	SUMP091	SUMP092	SUMP092	SUMP093	SUMP093	SUMP121
Sample Number:	SUMP090(3-5)	SUMP091(0-0.5)	SUMP091(5.5-6)	SUMP092(0-0.5)	SUMP092(3-5)	SUMP093(0-0.5)	SUMP093(6-6.5)	SUMP121(0-0.5)
Date Sampled:	08/04/1998	09/26/1998	09/26/1998	08/04/1998	08/04/1998	09/26/1998	09/26/1998	09/27/1998
Depth (ft.):	3.00	0.00	5.50	0.00	3.00	0.00	6.00	0.00
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	881.9	ND [631] U	857	499.9	434.2	ND [600] U	ND [581] U	ND [693] UJ
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	ND [4700] U	5700	5100	ND [4300] U	ND [4700] U	5600	ND [4600] U	8000 J
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	17000	40000	28000	15000	18000	35000	8200	24000 J
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

000396

028116

Metals in Phase II and Phase III Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	SUMP121	SUMP121	WRSUMP017	WRSUMP017	WRSUMP018	WRSUMP018
Sample Number:	SUMP121(5.5-6)	SUMP121(5.5-6)LFD	WRSUMP17(0-0.5)	WRSUMP017(3-5)	WRSUMP18(0-0.5)	WRSUMP18(6.5-7)
Date Sampled:	09/27/1998	09/27/1998	08/04/1998	08/04/1998	09/26/1998	09/26/1998
Depth (ft.):	5.50	5.50	0.00	3.00	0.00	6.50
METALS - UNITS: UG/KG						
ALUMINUM	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA
BERYLLIUM	6900 J	7410 J	653.5	623.7	ND [599] U	ND [614] U
CADMIUM	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA
NICKEL	73000 J	69000 J	ND [5400] U	ND [4600] U	8200	8600
POTASSIUM	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA
VANADIUM	86000 J	94000 J	22000	24000	17000	23000
ZINC	NA	NA	NA	NA	NA	NA

0003934

028117

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB04	47SB04	47SB05	47SB05	47SB06	47SB06	47SB07	47SB07
Sample Number:	47SB04(0-0.5)	47SB04(1-2)	47SB05(0-0.5)	47SB05(1-2)	47SB06(0-0.5)	47SB06(1-2)	47SB07(0-0.5)	47SB07(1-2)
Date Sampled:	05/30/2000	05/30/2000	05/30/2000	05/30/2000	05/31/2000	05/31/2000	05/31/2000	05/31/2000
Depth (ft.):	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
ANIONS - UNITS: UG/KG								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	48.6	ND [5.9] U	99.7	1450:*	ND [6.08] U	71.4	ND [5.8] U	ND [7.02] U

0003398

028118

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB08	47SB08	47SB09	47SB09	47SB10	47SB10	47SB11	47SB11
Sample Number:	47SB08 (0-0.5)	47SB08 (1-2)	47SB09(0-0.5)	47SB09(1-2)	47SB10(0-0.5)	47SB10(1-2)	47SB11(0-0.5)	47SB11(1-2)
Date Sampled:	05/31/2000	05/31/2000	05/31/2000	05/31/2000	05/31/2000	05/31/2000	06/01/2000	06/01/2000
Depth (ft.):	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
ANIONS - UNITS: UG/KG								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	19.6	ND [5.99] U	ND [6.35] U	ND [5.96] U	104	158	51.9 J	ND [6] U

000399

028119

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB12	47SB13	47SB13	47SB14	47SB14	47SB15	47SB15	47SB16
Sample Number:	47SB12(0-0.5)	47SB13(0-0.5)	47SB13(1-2)	47SB14(0-0.5)	47SB14(1-2)	47SB15(0-0.5)	47SB15(1-2)	47SB16(0-0.5)
Date Sampled:	06/02/2000	06/02/2000	06/02/2000	06/02/2000	06/02/2000	06/03/2000	06/03/2000	06/02/2000
Depth (ft.):	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
ANIONS - UNITS: UG/KG								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	ND [5.48] UJ	ND [5.57] U	ND [5.8] U	ND [5.63] U	ND [6.63] U	189	73.8	ND [5.76] U

000400

028120

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB16	47SB17	47SB18	47SB19	47SB19	47SB20	47SB20	47SB21
Sample Number:	47SB16(1-2)	47SB17(0-0.5)	47SB18(0-0.5)	47SB19(0-0.5)	47SB19(1-2)	47SB20(0-0.5)	47SB20(1-2)	47SB21(0-0.5)
Date Sampled:	06/02/2000	06/03/2000	06/03/2000	06/02/2000	06/02/2000	06/02/2000	06/02/2000	06/03/2000
Depth (ft.):	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00
ANIONS - UNITS: UG/KG								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	ND [6.02] U	39.5 J	ND [5.52] U	136	ND [5.91] U	ND [5.87] U	222	ND [5.6] U

0004081

0281121

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB21	47SB22	47SB22	47SB23	47SB23	47SB24	47SB24	47SB25	47SB25
Sample Number:	47SB21(1-2)	47SB22(0-0.5)	47SB22(1-2)	47SB23(0-0.5)	47SB23(1-2)	47SB24(0-0.5)	47SB24(1-2)	47SB25(0-0.5)	47SB25(1-2)
Date Sampled:	06/03/2000	06/03/2000	06/03/2000	06/03/2000	06/03/2000	06/04/2000	06/04/2000	06/04/2000	06/04/2000
Depth (ft.):	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
ANIONS - UNITS: UG/KG									
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	ND [5.66] U	ND [5.31] U	ND [5.83] U	19.6	ND [6.42] U	ND [5.6] U	ND [6.01] U	ND [5.52] U	ND [6.44] U

0281122

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB26	47SB26	47SB27	47SB27	47SB28	47SB28	47SB29	47SB29
Sample Number:	47SB26(0-0.5)	47SB26(1-2)	47SB27(0-0.5)	47SB27(1-2)	47SB28(0-0.5)	47SB28(1-2)	47SB29(0-0.5)	47SB29(1-2)
Date Sampled:	06/04/2000	06/04/2000	06/04/2000	06/04/2000	06/04/2000	06/04/2000	06/04/2000	06/04/2000
Depth (ft.):	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
ANIONS - UNITS: UG/KG								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	ND [6.37] U	ND [5.92] U	ND [5.64] U	ND [6.21] U	35.4	ND [5.74] U	ND [5.88] U	ND [5.86] U

0004003

0281123

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47SB30	47SB30	47SB31	47SB31	47SB32	47SB33	47SB33	LH-DL063-01
Sample Number:	47SB30(0-0.5)	47SB30(1-2)	47SB31(0-0.5)	47SB31(1-2)	47SB32(0-0.5)	47SB33(0-0.5)	47SB33(1-2)	LH-DL063-01
Date Sampled:	06/05/2000	06/05/2000	06/05/2000	06/05/2000	06/02/2000	06/03/2000	06/03/2000	08/05/1993
Depth (ft.):	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00
ANIONS - UNITS: UG/KG								
CYANIDE	NA	NA	NA	NA	NA	NA	NA	ND [500] U
PERCHLORATE	30.9 J	ND [5.98] U	ND [5.92] U	ND [5.76] U	ND [5.25] U	ND [6.11] U	ND [6.01] U	NA

000403

028124

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-DL064-01	LH-DL065-01	LH-DL54-01	LH-DL55-01	LH-DL55-02	LH-DL61-01	LH-S062-01	LH-S062-01	LH-S062-01
Sample Number:	LH-DL064-01	LH-DL065-01	LH-DL54-01	LH-DL55-01	LH-DL55-02	LH-DL61-01	LH-S062-01_1	LH-S062-01_2	LH-S062-01_3
Date Sampled:	08/05/1993	08/05/1993	07/12/1993	07/12/1993	07/12/1993	08/06/1993	08/05/1993	08/05/1993	08/05/1993
Depth (ft.):	2.00	1.50	2.50	2.50	2.50	2.00	0.50	2.50	3.50
ANIONS - UNITS: UG/KG									
CYANIDE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	500
PERCHLORATE	NA	NA	NA	NA	NA	NA	NA	NA	NA

028125

000405

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S062-02	LH-S062-02	LH-S063-01	LH-S063-01	LH-S063-01	LH-S064-01	LH-S064-01	LH-S064-01
Sample Number:	LH-S062-02_1	LH-S062-02_2	LH-S063-01_1	LH-S063-01_2	LH-S063-01_3	LH-S064-01_1	LH-S064-01_2	LH-S064-01_3
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993
Depth (ft.):	0.50	2.50	1.00	2.00	2.50	1.50	4.00	0.50
ANIONS - UNITS: UG/KG								
CYANIDE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	NA	NA	NA	NA	NA	NA	NA	NA

0004306

028126

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S064-02	LH-S064-02	LH-S064-02	LH-S065-01	LH-S065-01	LH-S065-01	LH-S065-02	LH-S065-02
Sample Number:	LH-S064-02_1	LH-S064-02_2	LH-S064-02_3	LH-S065-01_1	LH-S065-01_2	LH-S065-01_3	LH-S065-02_1	LH-S065-02_2
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/05/1993
Depth (ft.):	1.00	2.50	4.00	0.50	2.00	4.00	0.50	3.00
ANIONS - UNITS: UG/KG								
CYANIDE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	NA	NA	NA	NA	NA	NA	NA	NA

0028127

0005000

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S065-02	LH-S54-01	LH-S54-01	LH-S55-01	LH-S55-01	LH-S61-01	LH-S61-01	LH-S61-02	LH-S61-02
Sample Number:	LH-S065-02_3	LH-S54-01_1	LH-S54-01_2	LH-S55-01_1	LH-S55-01_2	LH-S61-01_1	LH-S61-01_2	LH-S61-02_1	LH-S61-02_2
Date Sampled:	08/05/1993	07/12/1993	07/12/1993	07/12/1993	07/12/1993	08/06/1993	08/06/1993	08/06/1993	08/06/1993
Depth (ft.):	4.00	0.00	4.00	0.00	3.50	0.50	8.00	1.00	8.00
ANIONS - UNITS: UG/KG									
CYANIDE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
PERCHLORATE	NA	NA	NA	NA	NA	NA	NA	NA	NA

0028128

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S66-01	LH-S66-01	LH-S66-02	LH-S66-02	LH-S67-01	LH-S67-01	LH-S70-01	LH-S70-01	LH-S70-02
Sample Number:	LH-S66-01_1	LH-S66-01_2	LH-S66-02_1	LH-S66-02_2	LH-S67-01_1	LH-S67-01_2	LH-S70-01_1	LH-S70-01_2	LH-S70-02_1
Date Sampled:	08/05/1993	08/05/1993	08/05/1993	08/05/1993	08/06/1993	08/06/1993	07/24/1993	07/24/1993	07/24/1993
Depth (ft.):	0.50	4.00	0.50	4.00	0.50	3.00	0.50	7.00	0.50
ANIONS - UNITS: UG/KG									
CYANIDE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA	NA	NA
PERCHLORATE	NA	NA	NA	NA	NA	NA	NA	NA	NA

0004[illegible]

028129

Anions in Soil Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LH-S70-02	LHS-MW-47	LHS-MW-48	LHS-MW-49
Sample Number:	LH-S70-02_2	LHS-MW47	LHS-MW48	LHS-MW49
Date Sampled:	07/24/1993	10/05/1994	10/05/1994	10/05/1994
Depth (ft.):	7.00	0.00	0.00	0.00
ANIONS - UNITS: UG/KG				
CYANIDE	NA	1300	ND [440] U	ND [530] U
PERCHLORATE	NA	NA	NA	NA

000419

028130

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	105	105	105	47WW01	47WW01	47WW01	47WW01	47WW02	47WW03
Sample Number:	MW-105	105	LHS-MW-105	47WW01	47WW01DLFD	47WW01	47WW01DLFD	47WW02	47WW03
Date Sampled:	02/13/1996	05/18/1998	08/22/1996	09/29/1998	09/29/1998	11/07/1998	11/07/1998	11/04/1998	11/05/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [0.65] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [0.51] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [0.32] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
1,2-DICHLOROETHANE	ND [1] U	ND [1] U	ND [0.31] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
1,2-DICHLOROPROPANE	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
ACETONE	NA	ND [5] U	NA	200 U	230 U	410	340	ND [5] U	ND [5] U
BENZENE	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
CARBON DISULFIDE	NA	ND [1] U	NA	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
CHLOROFORM	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [1] U	ND [0.36] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
M,P-XYLENE (SUM OF ISOMERS)	ND [2] U	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	ND [1] U	ND [1] U	ND [0.22] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1] U	ND [1.3] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	ND [1] U	NA	NA	NA	NA	NA	NA	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [0.25] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	1.2	1.2	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	0.96
TRICHLOROFLUOROMETHANE	ND [1] U	ND [2] U	ND [1] U	ND [2] U	ND [8] U	ND [2] U	ND [20] U	ND [2] U	ND [2] U
VINYL CHLORIDE	ND [1] U	ND [1] U	0.48	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	2	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
n-PROPYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	ND [0.29] U	ND [1] U	ND [4] U	ND [1] U	ND [10] U	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U
4-CHLOROANILINE	ND [1.3] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U

0028131

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	105	105	105	47WW01	47WW01	47WW01	47WW01	47WW02	47WW03
Sample Number:	MW-105	105	LHS-MW-105	47WW01	47WW01DLFD	47WW01	47WW01DLFD	47WW02	47WW03
Date Sampled:	02/13/1996	05/18/1998	08/22/1996	09/29/1998	09/29/1998	11/07/1998	11/07/1998	11/04/1998	11/05/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U
DIBENZOFURAN	ND [0.83] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U
FLUORENE	ND [0.8] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U
NAPHTHALENE	ND [0.53] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U
PENTACHLOROPHENOL	ND [4.4] U	ND [5] U	NA	ND [5] U	NA	ND [5] U	NA	ND [5] U	ND [5] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U

0004132

0281132

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW04	47WW05	47WW06	47WW07	47WW08	47WW09	47WW09	47WW11	47WW11
Sample Number:	47WW04	47WW05	47WW06	47WW07	47WW08	47WW09	47WW09DLFD	47WW11D	47WW11
Date Sampled:	11/05/1998	11/09/1998	11/06/1998	11/06/1998	11/04/1998	11/04/1998	11/04/1998	05/24/2000	05/24/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
1,1-DICHLOROETHENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	0.87	ND [20] U	ND [1] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
1,2-DICHLOROETHANE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
1,2-DICHLOROPROPANE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
ACETONE	ND [5] U	ND [200] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [100] U	53	ND [5] U
BENZENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
BROMODICHLOROMETHANE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	0.72	ND [20] U	ND [1] U	ND [1] U
CARBON DISULFIDE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	NA	NA
CHLOROFORM	ND [1] U	ND [40] U	4.6	0.93	ND [1] U	3.2	10	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [2] U	ND [2] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [2] U	ND [2] U
NAPHTHALENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	7.7	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	2.4	ND [20] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	2300	1.8	ND [1] U	ND [1] U	830	560	ND [1] U	ND [1] U
TRICHLOROFLUOROMETHANE	ND [2] U	ND [80] U	ND [2] U	ND [2] U	ND [2] U	ND [2] U	ND [40] U	ND [1] U	ND [1] U
VINYL CHLORIDE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	92	81	6.3 J	ND [1] U
n-PROPYLBENZENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [20] U	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA	NA
4-CHLOROANILINE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA	NA

0281133

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW04	47WW05	47WW06	47WW07	47WW08	47WW09	47WW09	47WW11	47WW11
Sample Number:	47WW04	47WW05	47WW06	47WW07	47WW08	47WW09	47WW09DLFD	47WW11D	47WW11
Date Sampled:	11/05/1998	11/09/1998	11/06/1998	11/06/1998	11/04/1998	11/04/1998	11/04/1998	05/24/2000	05/24/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA	NA
DI-n-OCTYLPHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA	NA
DIBENZOFURAN	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA	NA
DIETHYL PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA	NA
FLUORENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA	NA
NAPHTHALENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA	NA
PENTACHLOROPHENOL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	NA	NA	NA
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	7.4	NA	NA	NA

000413

028134

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW11	47WW12	47WW13	47WW13	47WW14	47WW14	47WW15	47WW16	47WW17
Sample Number:	47WW11	47WW12	47WW13	47WW13DLFD	47WW14	47WW14DLFD	47WW15	47WW16	47WW17
Date Sampled:	11/07/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/09/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	ND [4] U	0.51	2	ND [40] U	6.4	ND [40] U	ND [1] U	ND [1] U	ND [1] U
1,1-DICHLOROETHENE	ND [4] U	0.56	7.9	ND [40] U	6.3	ND [40] U	ND [1] U	ND [1] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	4.4	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
1,2-DICHLOROETHANE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
1,2-DICHLOROPROPANE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
ACETONE	ND [20] U	ND [5] U	ND [5] U	ND [200] U	ND [5] U	ND [200] U	ND [5] U	ND [5] U	ND [5] U
BENZENE	ND [4] U	0.55	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
BROMODICHLOROMETHANE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	0.73	ND [40] U	16	ND [1] U	ND [1] U
CARBON DISULFIDE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
CHLOROFORM	ND [4] U	ND [1] U	ND [1] U	ND [40] U	4.1	24	62	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
NAPHTHALENE	190	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	0.75
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	NA	NA	NA	NA	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	0.67
TETRACHLOROETHYLENE(PCE)	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [4] U	12	1900	740	1300	610	ND [1] U	7.9	ND [1] U
TRICHLOROFLUOROMETHANE	ND [8] U	ND [2] U	ND [2] U	ND [80] U	ND [2] U	ND [80] U	ND [2] U	ND [2] U	ND [2] U
VINYL CHLORIDE	ND [4] U	6.9	42	ND [40] U	ND [1] U	78	ND [1] U	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [4] U	51	1600	890	1300	730	ND [1] U	1.4	ND [1] U
n-PROPYLBENZENE	ND [4] U	ND [1] U	ND [1] U	ND [40] U	ND [1] U	ND [40] U	ND [1] U	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [4] U	0.75	21	ND [40] U	2.4	ND [40] U	ND [1] U	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	31	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U
4-CHLOROANILINE	18	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U

0028135

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW11	47WW12	47WW13	47WW13	47WW14	47WW14	47WW15	47WW16	47WW17
Sample Number:	47WW11	47WW12	47WW13	47WW13DLFD	47WW14	47WW14DLFD	47WW15	47WW16	47WW17
Date Sampled:	11/07/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/09/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	24	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U
DI-n-OCTYLPHTHALATE	ND [10] U	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U
DIBENZOFURAN	11	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U
DIETHYL PHTHALATE	ND [10] U	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U
FLUORENE	8.8	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U
NAPHTHALENE	47	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U
PENTACHLOROPHENOL	ND [5] U	ND [5] U	ND [5] U	NA	ND [5] U	NA	ND [5] U	ND [5] U	ND [5] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	ND [10] U	NA	ND [10] U	NA	ND [10] U	ND [10] U	ND [10] U

000436

028136

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW18	47WW18	47WW19	47WW20	47WW21	47WW22	47WW23	47WW23	47WW24	47WW25
Sample Number:	47WW18	47WW18	47WW19	47WW20	47WW21	47WW22	47WW23	47WW23	47WW24	47WW25
Date Sampled:	09/29/1998	11/06/1998	11/06/1998	11/05/1998	11/05/1998	11/05/1998	09/29/1998	11/05/1998	12/20/2000	12/20/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L										
1,1,1-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.1] U	1.45
1,1,2-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.1] U	ND [0.1] U
1,1-DICHLOROETHANE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	0.52	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	17.1
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
1,2-DICHLOROETHANE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.1] U	ND [0.1] U
1,2-DICHLOROPROPANE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
ACETONE	31 U	ND [5] U	2.8 U	ND [10] U	ND [5] U	ND [5] U	34 U	ND [5] U	ND [14] U	ND [14] U
BENZENE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.4] U	0.62 U
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	4.1	27	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.1] U	ND [0.1] U
CARBON DISULFIDE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [2.5] U	ND [2.5] U
CHLOROFORM	ND [1] U	ND [1] U	22	120	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.1] U	ND [0.1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	NA	NA	NA	NA	NA	ND [0.1] U	0.17 J
METHYLENE CHLORIDE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	0.53	ND [1] U	ND [1] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	NA	NA	NA	NA	NA	ND [0.1] U	0.19 J
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.1] U	ND [0.1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	40	38	0.93	ND [2] U	9.7	ND [1] U	30	0.64	ND [0.1] U	9280
TRICHLOROFLUOROMETHANE	ND [2] U	ND [2] U	ND [2] U	ND [4] U	ND [2] U	ND [2] U	ND [2] U	ND [2] U	ND [0.2] U	ND [0.2] U
VINYL CHLORIDE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.2] U	88.6
cis-1,2-DICHLOROETHYLENE	2.1	1.6	ND [1] U	ND [2] U	7.1	ND [1] U	21	ND [1] U	ND [0.1] U	1310 J
n-PROPYLBENZENE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	ND [1] U	ND [2] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.1] U	5.48 J
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L										
2-METHYLNAPHTHALENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA
4-CHLOROANILINE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA

0028137

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW18	47WW18	47WW19	47WW20	47WW21	47WW22	47WW23	47WW23	47WW24	47WW25
Sample Number:	47WW18	47WW18	47WW19	47WW20	47WW21	47WW22	47WW23	47WW23	47WW24	47WW25
Date Sampled:	09/29/1998	11/06/1998	11/06/1998	11/05/1998	11/05/1998	11/05/1998	09/29/1998	11/05/1998	12/20/2000	12/20/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA
DI-n-OCTYLPHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA
DIBENZOFURAN	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA
DIETHYL PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA
FLUORENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA
NAPHTHALENE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA
PENTACHLOROPHENOL	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	NA	NA
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	NA

000453

028138

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW26	47WW27	LHSMW28	LHSMW28	LHSMW28	LHSMW28	LHSMW29	LHSMW29	LHSMW29
Sample Number:	47WW26	47WW27	MW-28	LHS-MW-28	LHS-MW-28	LHS-MW-28	MW-29	LHS-MW-29	LHS-MW-29DLFD
Date Sampled:	12/20/2000	12/19/2000	02/11/1996	05/16/1998	08/20/1996	12/07/1994	02/11/1996	05/16/1998	05/16/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [0.1] U	ND [0.1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
1,1,2-TRICHLOROETHANE	ND [0.1] U	ND [0.1] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
1,1-DICHLOROETHANE	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
1,1-DICHLOROETHENE	ND [0.2] U	ND [0.2] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
1,2,3-TRICHLOROBENZENE	NA	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [2] U
1,2,4-TRICHLOROBENZENE	NA	NA	ND [1] U	ND [1] U	0.63	NA	ND [1] U	ND [1] U	ND [2] U
1,2,4-TRIMETHYLBENZENE	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [2] U
1,2-DICHLOROETHANE	ND [0.1] U	ND [0.1] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
1,2-DICHLOROPROPANE	NA	NA	ND [1] U	ND [1] U	0.46	ND [5] U	ND [1] U	ND [1] U	ND [2] U
ACETONE	ND [14] U	ND [14] U	NA	20	NA	ND [10] U	NA	150	140
BENZENE	ND [0.4] U	ND [0.4] U	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [2] U
BROMODICHLOROMETHANE	ND [0.1] U	ND [0.1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
CARBON DISULFIDE	ND [2.5] U	ND [2.5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	ND [2] U
CHLOROFORM	ND [0.1] U	ND [0.1] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
DICHLORODIFLUOROMETHANE	NA	NA	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [2] U
M,P-XYLENE (SUM OF ISOMERS)	ND [0.1] U	ND [0.1] U	ND [2] U	NA	NA	NA	ND [2] U	NA	NA
METHYLENE CHLORIDE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
NAPHTHALENE	NA	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [2] U
O-XYLENE (1,2-DIMETHYLBENZENE)	ND [0.1] U	ND [0.1] U	ND [1] U	NA	NA	NA	ND [1] U	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [2] U
TETRACHLOROETHYLENE(PCE)	ND [0.1] U	ND [0.1] U	ND [1] U	ND [1] U	ND [0.25] U	3 J	ND [1] U	ND [1] U	ND [2] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	ND [5] U	NA	NA	NA
TRICHLOROETHYLENE (TCE)	1.78	ND [0.1] U	ND [1] U	0.69	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [2] U
TRICHLOROFLUOROMETHANE	ND [0.2] U	ND [0.2] U	ND [1] U	ND [2] U	2.1	NA	ND [1] U	ND [2] U	ND [4] U
VINYL CHLORIDE	ND [0.2] U	ND [0.2] U	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [2] U
cis-1,2-DICHLOROETHYLENE	ND [0.1] U	ND [0.1] U	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [2] U
n-PROPYLBENZENE	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [2] U
trans-1,2-DICHLOROETHENE	ND [0.1] U	ND [0.1] U	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [2] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	NA	NA	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	NA
4-CHLOROANILINE	NA	NA	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	NA

0004229

0281139

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW26	47WW27	LHSMW28	LHSMW28	LHSMW28	LHSMW28	LHSMW29	LHSMW29	LHSMW29
Sample Number:	47WW26	47WW27	MW-28	LHS-MW-28	LHS-MW-28	LHS-MW-28	MW-29	LHS-MW-29	LHS-MW-29DLFD
Date Sampled:	12/20/2000	12/19/2000	02/11/1996	05/16/1998	08/20/1996	12/07/1994	02/11/1996	05/16/1998	05/16/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	NA	NA	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	NA
DI-n-OCTYLPHTHALATE	NA	NA	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	NA
DIBENZOFURAN	NA	NA	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	NA
DIETHYL PHTHALATE	NA	NA	ND [1] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U	NA
FLUORENE	NA	NA	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	NA
NAPHTHALENE	NA	NA	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	NA
PENTACHLOROPHENOL	NA	NA	ND [4.4] U	ND [5] U	ND [4.4] U	ND [50] U	ND [4.4] U	ND [5] U	NA
bis(2-ETHYLHEXYL) PHTHALATE	NA	NA	ND [0.92] U	ND [10] U	ND [0.92] U	3 J	0.74 J	ND [10] U	NA

028140

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW29	LHSMW29	LHSMW30	LHSMW30	LHSMW30	LHSMW30	LHSMW31	LHSMW31	LHSMW31
Sample Number:	LHS-MW-29	LHS-MW-29	MW-30	LHS-MW-30	LHS-MW-30	LHS-MW-30	MW-31	LHS-MW-31	LHS-MW-31
Date Sampled:	08/20/1996	12/07/1994	02/12/1996	05/16/1998	08/20/1996	12/07/1994	02/12/1996	05/16/1998	08/20/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
1,1,2-TRICHLOROETHANE	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U
1,1-DICHLOROETHANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
1,1-DICHLOROETHENE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
1,2,3-TRICHLOROBENZENE	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [0.51] U
1,2,4-TRICHLOROBENZENE	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
1,2-DICHLOROETHANE	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U
1,2-DICHLOROPROPANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
ACETONE	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA
BENZENE	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [0.2] U
BROMODICHLOROMETHANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
CARBON DISULFIDE	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA
CHLOROFORM	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
DICHLORODIFLUOROMETHANE	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	ND [2] U	NA	NA	NA	ND [2] U	NA	NA
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U
NAPHTHALENE	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	ND [1] U	NA	NA	NA	ND [1] U	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
TETRACHLOROETHYLENE(PCE)	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	9	ND [1] U	ND [1] U	ND [0.25] U
TOTAL 1,2-DICHLOROETHENE	NA	ND [5] U	NA	NA	NA	ND [5] U	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U
TRICHLOROFLUOROMETHANE	2.3	NA	ND [1] U	ND [2] U	2.2	NA	ND [1] U	ND [2] U	ND [1] U
VINYL CHLORIDE	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U
cis-1,2-DICHLOROETHYLENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
n-PROPYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
trans-1,2-DICHLOROETHENE	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U
4-CHLOROANILINE	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	ND [1.3] U

0004226

0281141

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW29	LHSMW29	LHSMW30	LHSMW30	LHSMW30	LHSMW30	LHSMW31	LHSMW31	LHSMW31
Sample Number:	LHS-MW-29	LHS-MW-29	MW-30	LHS-MW-30	LHS-MW-30	LHS-MW-30	MW-31	LHS-MW-31	LHS-MW-31
Date Sampled:	08/20/1996	12/07/1994	02/12/1996	05/16/1998	08/20/1996	12/07/1994	02/12/1996	05/16/1998	08/20/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	1 J	ND [10] U	ND [1.2] U
DIBENZOFURAN	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U
FLUORENE	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U
NAPHTHALENE	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	ND [0.53] U
PENTACHLOROPHENOL	ND [4.4] U	ND [50] U	ND [4.4] U	ND [5] U	ND [4.4] U	ND [50] U	ND [4.4] U	ND [5] U	ND [4.4] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	ND [0.92] U	ND [10] U	ND [0.92] U	12	1.1	ND [10] U	ND [0.92] U

0281142

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW31	LHSMW32	LHSMW32	LHSMW32	LHSMW32	LHSMW33	LHSMW33	LHSMW33
Sample Number:	LHS-MW-31	MW-32	LHS-MW-32	LHS-MW-32	LHS-MW-32	MW-33	LHS-MW-33	LHS-MW-33DLFD
Date Sampled:	12/06/1994	02/12/1996	05/17/1998	08/20/1996	12/05/1994	02/13/1996	05/17/1998	05/17/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
1,1,2-TRICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
1,1-DICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
1,1-DICHLOROETHENE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
1,2,3-TRICHLOROBENZENE	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [10] U
1,2,4-TRICHLOROBENZENE	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [10] U
1,2,4-TRIMETHYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [10] U
1,2-DICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
1,2-DICHLOROPROPANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
ACETONE	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	720	600
BENZENE	ND [5] U	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [10] U
BROMODICHLOROMETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
CARBON DISULFIDE	2 J	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	ND [10] U
CHLOROFORM	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
DICHLORODIFLUOROMETHANE	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	8.4	10	5.8
M,P-XYLENE (SUM OF ISOMERS)	NA	ND [2] U	NA	NA	NA	ND [2] U	NA	NA
METHYLENE CHLORIDE	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
NAPHTHALENE	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [10] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	ND [1] U	NA	NA	NA	ND [1] U	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [10] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [1] U	ND [1] U	0.57	ND [5] U	ND [1] U	ND [1] U	ND [10] U
TOTAL 1,2-DICHLOROETHENE	ND [5] U	NA	NA	NA	ND [5] U	NA	NA	NA
TRICHLOROETHYLENE (TCE)	NA	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
TRICHLOROFLUOROMETHANE	NA	ND [1] U	ND [2] U	2.1	NA	ND [1] U	ND [2] U	ND [20] U
VINYL CHLORIDE	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [10] U
cis-1,2-DICHLOROETHYLENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [10] U
n-PROPYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [10] U
trans-1,2-DICHLOROETHENE	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [10] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	NA
4-CHLOROANILINE	ND [10] U	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	NA

0004[illegible]

028143

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW31	LHSMW32	LHSMW32	LHSMW32	LHSMW32	LHSMW33	LHSMW33	LHSMW33
Sample Number:	LHS-MW-31	MW-32	LHS-MW-32	LHS-MW-32	LHS-MW-32	MW-33	LHS-MW-33	LHS-MW-33DLFD
Date Sampled:	12/06/1994	02/12/1996	05/17/1998	08/20/1996	12/05/1994	02/13/1996	05/17/1998	05/17/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	NA
DI-n-OCTYLPHTHALATE	ND [10] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	NA
DIBENZOFURAN	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	NA
DIETHYL PHTHALATE	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U	NA
FLUORENE	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	NA
NAPHTHALENE	ND [10] U	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	NA
PENTACHLOROPHENOL	ND [50] U	ND [4.4] U	ND [5] U	ND [4,4] U	ND [50] U	ND [4.4] U	ND [5] U	NA
bis(2-ETHYLHEXYL) PHTHALATE	3 J	ND [0.92] U	ND [10] U	ND [0.92] U	6 J	0.63 J	ND [10] U	NA

0028144

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW33	LHSMW33	LHSMW34	LHSMW34	LHSMW34	LHSMW34	LHSMW34	LHSMW35
Sample Number:	LHS-MW-33	LHS-MW-33	MW-34	LHS-MW-34	LHS-MW-34DLFD	LHS-MW-34	LHS-MW-34	MW-35
Date Sampled:	08/20/1996	12/05/1994	02/13/1996	05/17/1998	05/17/1998	08/20/1996	12/05/1994	02/08/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.65] U	ND [5] U	ND [1] U
1,1-DICHLOROETHANE	ND [0.2] U	ND [5] U	ND [1] U	3	ND [50] U	1.8	ND [5] U	ND [1] U
1,1-DICHLOROETHENE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.51] U	NA	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.32] U	NA	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [50] U	0.25	NA	ND [1] U
1,2-DICHLOROETHANE	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.31] U	ND [5] U	ND [1] U
1,2-DICHLOROPROPANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	ND [1] U
ACETONE	NA	ND [10] U	NA	4900	2600	NA	ND [10] U	NA
BENZENE	ND [0.2] U	ND [5] U	NA	1.4	ND [50] U	1.4	ND [5] U	NA
BROMODICHLOROMETHANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	ND [1] U
CARBON DISULFIDE	NA	ND [5] U	NA	ND [1] U	ND [50] U	NA	ND [5] U	NA
CHLOROFORM	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	0.27	ND [5] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [0.36] U	ND [20] U	69	92	150	ND [0.36] U	ND [20] U	59.0
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	ND [2] U	NA	NA	NA	NA	ND [2] U
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	ND [1] U	2.1	ND [50] U	ND [0.22] U	ND [5] U	ND [1] U
NAPHTHALENE	ND [1.3] U	NA	ND [1] U	3	ND [50] U	ND [1.3] U	NA	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	ND [1] U	NA	NA	NA	NA	ND [1] U
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	NA	ND [1] U
TETRACHLOROETHYLENE(PCE)	0.39	ND [5] U	13.6	13	ND [50] U	18	6	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	ND [5] U	NA	NA	NA	NA	25	NA
TRICHLOROETHYLENE (TCE)	ND [0.25] U	ND [5] U	7.5	22	ND [50] U	14.7	NA	ND [1] U
TRICHLOROFLUOROMETHANE	2.1	NA	ND [1] U	ND [2] U	ND [100] U	2.1	NA	ND [1] U
VINYL CHLORIDE	ND [0.24] U	NA	ND [1] U	7	ND [50] U	3.3	NA	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [0.2] U	NA	35.9	89	90	59.3	NA	ND [1] U
n-PROPYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	NA	ND [1] U
trans-1,2-DICHLOROETHENE	ND [0.29] U	NA	ND [1] U	0.68	ND [50] U	ND [0.29] U	NA	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	NA	ND [0.67] U	ND [10] U	ND [0.67] U
4-CHLOROANILINE	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	NA	ND [1.3] U	ND [10] U	ND [1.3] U

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028145

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW33	LHSMW33	LHSMW34	LHSMW34	LHSMW34	LHSMW34	LHSMW34	LHSMW35
Sample Number:	LHS-MW-33	LHS-MW-33	MW-34	LHS-MW-34	LHS-MW-34DLFD	LHS-MW-34	LHS-MW-34	MW-35
Date Sampled:	08/20/1996	12/05/1994	02/13/1996	05/17/1998	05/17/1998	08/20/1996	12/05/1994	02/08/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	NA	ND [0.75] U	ND [10] U	ND [0.75] U
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	NA	ND [1.2] U	ND [10] U	ND [1.2] U
DIBENZOFURAN	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	NA	ND [0.83] U	ND [10] U	ND [0.83] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	ND [1] U	ND [10] U	NA	ND [1] U	ND [10] U	ND [1] U
FLUORENE	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	NA	ND [0.8] U	ND [10] U	ND [0.8] U
NAPHTHALENE	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	NA	ND [0.53] U	ND [10] U	1.6
PENTACHLOROPHENOL	ND [4.4] U	ND [50] U	ND [4.4] U	ND [5] U	NA	ND [4.4] U	ND [50] U	ND [4.4] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	12	ND [0.92] U	ND [10] U	NA	ND [0.92] U	19	ND [0.92] U

000426

028146

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW35	LHSMW35	LHSMW35	LHSMW35	LHSMW36	LHSMW36	LHSMW36	LHSMW36
Sample Number:	LHS-MW-35	LHS-MW-35DLFD	LHS-MW-35	LHS-MW-35	MW-36	LHS-MW-36	LHS-MW-36	LHS-MW-36
Date Sampled:	05/17/1998	05/17/1998	08/20/1996	12/05/1994	02/13/1996	05/17/1998	08/22/1996	12/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [1] U	ND [20] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,1,2-TRICHLOROETHANE	ND [1] U	ND [20] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U
1,1-DICHLOROETHANE	ND [1] U	ND [20] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,1-DICHLOROETHENE	6.4	ND [20] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [20] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [0.51] U	NA
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [20] U	ND [0.32] U	NA	ND [1] U	ND [1] U	0.56	NA
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [20] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
1,2-DICHLOROETHANE	ND [1] U	ND [20] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U
1,2-DICHLOROPROPANE	ND [1] U	ND [20] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
ACETONE	21000	4400	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U
BENZENE	ND [1] U	ND [20] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [0.2] U	ND [5] U
BROMODICHLOROMETHANE	ND [1] U	ND [20] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
CARBON DISULFIDE	ND [1] U	ND [20] U	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U
CHLOROFORM	0.6	ND [20] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
DICHLORODIFLUOROMETHANE	81	110	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	NA	ND [2] U	NA	NA	NA
METHYLENE CHLORIDE	5	ND [20] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U
NAPHTHALENE	1.6	ND [20] U	1.5	NA	ND [1] U	ND [1] U	ND [1.3] U	NA
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	NA	ND [1] U	NA	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [20] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
TETRACHLOROETHYLENE(PCE)	0.64	ND [20] U	0.92	1 J	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	ND [5] U	NA	NA	NA	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [20] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U
TRICHLOROFLUOROMETHANE	5.2	ND [40] U	9.8	NA	ND [1] U	ND [2] U	ND [1] U	NA
VINYL CHLORIDE	ND [1] U	ND [20] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA
cis-1,2-DICHLOROETHYLENE	0.82	ND [20] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
n-PROPYLBENZENE	ND [1] U	ND [20] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
trans-1,2-DICHLOROETHENE	ND [1] U	ND [20] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	ND [10] U	NA	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	NA	ND [10] U
4-CHLOROANILINE	ND [10] U	NA	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	NA	ND [10] U

0281147

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW35	LHSMW35	LHSMW35	LHSMW35	LHSMW36	LHSMW36	LHSMW36	LHSMW36
Sample Number:	LHS-MW-35	LHS-MW-35DLFD	LHS-MW-35	LHS-MW-35	MW-36	LHS-MW-36	LHS-MW-36	LHS-MW-36
Date Sampled:	05/17/1998	05/17/1998	08/20/1996	12/05/1994	02/13/1996	05/17/1998	08/22/1996	12/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	NA	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	NA	ND [10] U
DI-n-OCTYLPHTHALATE	ND [10] U	NA	ND [1.2] U	ND [10] U	0.78 J	ND [10] U	NA	ND [10] U
DIBENZOFURAN	ND [10] U	NA	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	NA	ND [10] U
DIETHYL PHTHALATE	ND [10] U	NA	ND [1] U	ND [10] U	ND [1] U	ND [10] U	NA	ND [10] U
FLUORENE	ND [10] U	NA	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	NA	ND [10] U
NAPHTHALENE	ND [10] U	NA	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	NA	ND [10] U
PENTACHLOROPHENOL	ND [5] U	NA	ND [4.4] U	ND [50] U	ND [4.4] U	ND [5] U	NA	ND [50] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	NA	ND [0.92] U	8 J	ND [0.92] U	ND [10] U	NA	4 J

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028148

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW37	LHSMW37	LHSMW37	LHSMW37	LHSMW37	LHSMW37	LHSMW38	LHSMW38
Sample Number:	MW-37	LHS-MW-37	LHS-MW-37REFD	LHS-MW-37	LHS-MW-37	LHS-MW-37	MW-38	LHS-MW-38
Date Sampled:	02/08/1996	05/17/1998	05/17/1998	05/28/1998	08/22/1996	12/05/1994	02/12/1996	05/17/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [1] U	ND [1] U	NA	NA	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [1] U	NA	NA	ND [0.51] U	NA	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	NA	NA	ND [0.32] U	NA	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	NA	ND [1] U	ND [1] U
1,2-DICHLOROETHANE	ND [1] U	ND [1] U	NA	NA	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U
1,2-DICHLOROPROPANE	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
ACETONE	NA	ND [5] U	NA	NA	NA	ND [10] U	NA	ND [5] U
BENZENE	NA	ND [1] U	NA	NA	ND [0.2] U	ND [5] U	NA	ND [1] U
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
CARBON DISULFIDE	NA	ND [1] U	NA	NA	NA	ND [5] U	NA	ND [1] U
CHLOROFORM	ND [1] U	ND [1] U	NA	NA	ND [1] U	ND [5] U	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [1] U	NA	NA	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U
M,P-XYLENE (SUM OF ISOMERS)	ND [2] U	NA	NA	NA	NA	NA	ND [2] U	NA
METHYLENE CHLORIDE	ND [1] U	ND [1] U	NA	NA	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1] U	NA	NA	ND [1.3] U	NA	ND [1] U	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	ND [1] U	NA	NA	NA	NA	NA	ND [1] U	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	NA	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	NA	NA	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	ND [5] U	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [1] U	NA	NA	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U
TRICHLOROFLUOROMETHANE	ND [1] U	ND [2] U	NA	NA	ND [1] U	NA	ND [1] U	ND [2] U
VINYL CHLORIDE	ND [1] U	ND [1] U	NA	NA	ND [0.24] U	NA	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	NA	ND [1] U	ND [1] U
n-PROPYLBENZENE	ND [1] U	ND [1] U	NA	NA	ND [0.2] U	NA	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	NA	NA	ND [0.29] U	NA	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] UJ	ND [10] UJ	ND [10] U	NA	ND [10] U	ND [0.67] U	ND [10] U
4-CHLOROANILINE	ND [1.3] U	ND [10] UJ	ND [10] UJ	ND [10] U	NA	ND [10] U	ND [1.3] U	ND [10] U

0004300

0281149

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW37	LHSMW37	LHSMW37	LHSMW37	LHSMW37	LHSMW37	LHSMW38	LHSMW38
Sample Number:	MW-37	LHS-MW-37	LHS-MW-37REFD	LHS-MW-37	LHS-MW-37	LHS-MW-37	MW-38	LHS-MW-38
Date Sampled:	02/08/1996	05/17/1998	05/17/1998	05/28/1998	08/22/1996	12/05/1994	02/12/1996	05/17/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] UJ	ND [10] UJ	ND [10] U	NA	ND [10] U	ND [0.75] U	ND [10] U
DI-n-OCTYLPHTHALATE	1.2 J	ND [10] UJ	ND [10] UJ	ND [10] U	NA	ND [10] U	0.74 J	ND [10] U
DIBENZOFURAN	ND [0.83] U	ND [10] UJ	ND [10] UJ	ND [10] U	NA	ND [10] U	ND [0.83] U	ND [10] U
DIETHYL PHTHALATE	ND [1] U	ND [10] UJ	ND [10] UJ	ND [10] U	NA	ND [10] U	ND [1] U	ND [10] U
FLUORENE	ND [0.8] U	ND [10] UJ	ND [10] UJ	ND [10] U	NA	ND [10] U	ND [0.8] U	ND [10] U
NAPHTHALENE	ND [0.53] U	ND [10] UJ	ND [10] UJ	ND [10] U	NA	ND [10] U	ND [0.53] U	ND [10] U
PENTACHLOROPHENOL	ND [4.4] U	ND [5] UJ	ND [5] UJ	ND [5] U	NA	ND [50] U	ND [4.4] U	ND [5] U
bis(2-ETHYLHEXYL) PHTHALATE	1.1	ND [10] UJ	ND [10] UJ	6.9	NA	ND [10] U	1.1	ND [10] U

0281150

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW38	LHSMW38	LHSMW39	LHSMW39	LHSMW39	LHSMW39	LHSMW39	LHSMW41
Sample Number:	LHS-MW-38	LHS-MW-38	MW-39	LHS-MW-39	LHS-MW-39DLFD	LHS-MW-39	LHS-MW-39	MW-41
Date Sampled:	08/21/1996	12/06/1994	02/10/1996	05/18/1998	05/18/1998	08/22/1996	12/06/1994	02/09/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	9.9	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.65] U	ND [5] U	ND [1] U
1,1-DICHLOROETHANE	ND [0.2] U	ND [5] U	7.0	4.8	ND [50] U	7.2	ND [5] U	ND [1] U
1,1-DICHLOROETHENE	ND [0.2] U	ND [5] U	29.0	28	40	ND [0.2] U	ND [5] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.51] U	NA	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.32] U	NA	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	NA	ND [1] U
1,2-DICHLOROETHANE	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.31] U	ND [5] U	ND [1] U
1,2-DICHLOROPROPANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	ND [1] U
ACETONE	NA	ND [10] U	NA	2800	2000	NA	ND [10] U	NA
BENZENE	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	NA
BROMODICHLOROMETHANE	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	ND [1] U
CARBON DISULFIDE	NA	ND [5] U	NA	ND [1] U	ND [50] U	NA	ND [5] U	NA
CHLOROFORM	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	ND [5] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [0.36] U	ND [20] U	ND [1] U	6.1	ND [50] U	ND [0.36] U	ND [20] U	ND [1] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	ND [2] U	NA	NA	NA	NA	ND [2] U
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.22] U	ND [5] U	ND [1] U
NAPHTHALENE	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [1.3] U	NA	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	ND [1] U	NA	NA	NA	NA	ND [1] U
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	NA	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [50] U	ND [0.25] U	ND [5] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	ND [5] U	NA	NA	NA	NA	ND [5] U	NA
TRICHLOROETHYLENE (TCE)	ND [0.25] U	NA	2.0	1.4	ND [50] U	1.9	NA	8.0
TRICHLOROFLUOROMETHANE	ND [1] U	NA	ND [1] U	ND [2] U	ND [100] U	ND [1] U	NA	ND [1] U
VINYL CHLORIDE	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.24] U	NA	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [0.2] U	NA	ND [1] U	1	ND [50] U	1.1	NA	8.0
n-PROPYLBENZENE	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.2] U	NA	ND [1] U
trans-1,2-DICHLOROETHENE	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [50] U	ND [0.29] U	NA	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	NA	NA	ND [10] U	ND [0.67] U
4-CHLOROANILINE	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	NA	NA	ND [10] U	ND [1.3] U

0281151

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW38	LHSMW38	LHSMW39	LHSMW39	LHSMW39	LHSMW39	LHSMW39	LHSMW41
Sample Number:	LHS-MW-38	LHS-MW-38	MW-39	LHS-MW-39	LHS-MW-39DLFD	LHS-MW-39	LHS-MW-39	MW-41
Date Sampled:	08/21/1996	12/06/1994	02/10/1996	05/18/1998	05/18/1998	08/22/1996	12/06/1994	02/09/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	NA	NA	ND [10] U	ND [0.75] U
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	NA	NA	ND [10] U	ND [1.2] U
DIBENZOFURAN	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	NA	NA	ND [10] U	ND [0.83] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	ND [1] U	ND [10] U	NA	NA	ND [10] U	ND [1] U
FLUORENE	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	NA	NA	ND [10] U	ND [0.8] U
NAPHTHALENE	ND [0.53] U	ND [10] U	0.39 J	ND [10] U	NA	NA	ND [10] U	ND [0.53] U
PENTACHLOROPHENOL	ND [4.4] U	ND [50] U	ND [4.4] U	ND [5] U	NA	NA	ND [50] U	ND [4.4] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	4 J	ND [0.92] U	ND [10] U	NA	NA	1 J	ND [0.92] U

028152

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW41	LHSMW41	LHSMW41	LHSMW42	LHSMW42	LHSMW42	LHSMW42	LHSMW43	LHSMW43
Sample Number:	LHS-MW-41	LHS-MW-41	LHS-MW-41	MW-42	LHS-MW-42	LHS-MW-42	LHS-MW-42	MW-43	LHS-MW-43
Date Sampled:	05/18/1998	08/22/1996	12/08/1994	02/11/1996	05/18/1998	08/22/1996	12/06/1994	02/09/1996	05/18/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	4.9
1,1-DICHLOROETHANE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	3
1,1-DICHLOROETHENE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	18	17
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
1,2-DICHLOROETHANE	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U
1,2-DICHLOROPROPANE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
ACETONE	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U
BENZENE	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U
BROMODICHLOROMETHANE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
CARBON DISULFIDE	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U
CHLOROFORM	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	4	4.6
DICHLORODIFLUOROMETHANE	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	ND [2] U	NA	NA	NA	ND [2] U	NA
METHYLENE CHLORIDE	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	ND [1] U	NA	NA	NA	ND [1] U	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	168	97
TOTAL 1,2-DICHLOROETHENE	NA	NA	ND [5] U	NA	NA	NA	ND [5] U	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	29410	27000
TRICHLOROFLUOROMETHANE	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U
VINYL CHLORIDE	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	9	6.9
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	1840	1400
n-PROPYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	3.8
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [10] U	NA	ND [10] U	ND [0.67] U	ND [10] U	NA	ND [10] U	ND [0.67] U	ND [10] U
4-CHLOROANILINE	ND [10] U	NA	ND [10] U	ND [1.3] U	ND [10] U	NA	ND [10] U	ND [1.3] U	ND [10] U

000433

028153

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW41	LHSMW41	LHSMW41	LHSMW42	LHSMW42	LHSMW42	LHSMW42	LHSMW43	LHSMW43
Sample Number:	LHS-MW-41	LHS-MW-41	LHS-MW-41	MW-42	LHS-MW-42	LHS-MW-42	LHS-MW-42	MW-43	LHS-MW-43
Date Sampled:	05/18/1998	08/22/1996	12/08/1994	02/11/1996	05/18/1998	08/22/1996	12/06/1994	02/09/1996	05/18/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	NA	ND [10] U	ND [0.75] U	ND [10] U	NA	ND [10] U	ND [0.75] U	ND [10] U
DI-n-OCTYLPHTHALATE	ND [10] U	NA	ND [10] U	ND [1.2] U	ND [10] U	NA	ND [10] U	ND [1.2] U	ND [10] U
DIBENZOFURAN	ND [10] U	NA	ND [10] U	ND [0.83] U	ND [10] U	NA	ND [10] U	ND [0.83] U	ND [10] U
DIETHYL PHTHALATE	ND [10] U	NA	ND [10] U	ND [1] U	ND [10] U	NA	1 J	ND [1] U	ND [10] U
FLUORENE	ND [10] U	NA	ND [10] U	ND [0.8] U	ND [10] U	NA	ND [10] U	ND [0.8] U	ND [10] U
NAPHTHALENE	ND [10] U	NA	ND [10] U	ND [0.53] U	ND [10] U	NA	ND [10] U	ND [0.53] U	ND [10] U
PENTACHLOROPHENOL	ND [5] U	NA	ND [50] U	ND [4.4] U	ND [5] U	NA	ND [50] U	ND [4.4] U	ND [5] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	NA	ND [10] U	0.52 J	ND [10] U	NA	3 J	ND [0.92] U	ND [10] U

028154

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW43	LHSMW43	LHSMW43	LHSMW43	LHSMW44	LHSMW44	LHSMW44	LHSMW44
Sample Number:	LHS-MW-43DLFD	LHS-MW-43	LHS-MW-43	LHS-MW-43FD	MW-44	LHS-MW-44	LHS-MW-44	LHS-MW-44
Date Sampled:	05/18/1998	08/22/1996	12/08/1994	12/08/1994	02/08/1996	05/18/1998	08/22/1996	12/08/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [400] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,1,2-TRICHLOROETHANE	ND [400] U	2.6	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U
1,1-DICHLOROETHANE	ND [400] U	2	1 J	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,1-DICHLOROETHENE	ND [400] U	12.7	27	NA	2.0	3.3	ND [0.2] U	ND [5] U
1,2,3-TRICHLOROBENZENE	ND [400] U	ND [0.51] U	NA	NA	ND [1] U	ND [1] U	ND [0.51] U	NA
1,2,4-TRICHLOROBENZENE	ND [400] U	ND [0.32] U	NA	NA	ND [1] U	ND [1] U	ND [0.32] U	NA
1,2,4-TRIMETHYLBENZENE	ND [400] U	ND [0.2] U	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
1,2-DICHLOROETHANE	ND [400] U	0.33	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U
1,2-DICHLOROPROPANE	ND [400] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
ACETONE	ND [2000] U	NA	ND [10] U	NA	NA	ND [5] U	NA	ND [10] U
BENZENE	ND [400] U	ND [0.2] U	ND [5] U	NA	NA	ND [1] U	ND [0.2] U	ND [5] U
BROMODICHLOROMETHANE	ND [400] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
CARBON DISULFIDE	ND [400] U	NA	ND [5] U	NA	NA	ND [1] U	NA	ND [5] U
CHLOROFORM	ND [400] U	2.3	3 J	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
DICHLORODIFLUOROMETHANE	ND [400] U	ND [0.36] U	ND [20] U	NA	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	NA	ND [2] U	NA	NA	NA
METHYLENE CHLORIDE	ND [400] U	ND [0.22] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U
NAPHTHALENE	ND [400] U	ND [1.3] U	NA	NA	ND [1] U	ND [1] U	ND [1.3] U	NA
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	NA	ND [1] U	NA	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [400] U	ND [0.2] U	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
TETRACHLOROETHYLENE(PCE)	ND [400] U	51.7	57	NA	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	1400	1000	NA	NA	NA	7
TRICHLOROETHYLENE (TCE)	5500	12700	21000	22000	83.0	89	151	NA
TRICHLOROFLUOROMETHANE	ND [800] U	ND [1] U	NA	NA	ND [1] U	ND [2] U	ND [1] U	NA
VINYL CHLORIDE	ND [400] U	4.5	NA	NA	ND [1] U	ND [1] U	0.92	NA
cis-1,2-DICHLOROETHYLENE	1400	2020	NA	NA	21.0	28	37.4	NA
n-PROPYLBENZENE	ND [400] U	ND [0.2] U	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
trans-1,2-DICHLOROETHENE	ND [400] U	3.9	NA	NA	ND [1] U	ND [1] U	ND [0.29] U	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	NA	NA	ND [10] U	NA	ND [0.67] U	ND [10] U	NA	ND [10] U
4-CHLOROANILINE	NA	NA	ND [10] U	NA	ND [1.3] U	ND [10] U	NA	ND [10] U

0281555

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW43	LHSMW43	LHSMW43	LHSMW43	LHSMW44	LHSMW44	LHSMW44	LHSMW44
Sample Number:	LHS-MW-43DLFD	LHS-MW-43	LHS-MW-43	LHS-MW-43FD	MW-44	LHS-MW-44	LHS-MW-44	LHS-MW-44
Date Sampled:	05/18/1998	08/22/1996	12/08/1994	12/08/1994	02/08/1996	05/18/1998	08/22/1996	12/08/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	NA	NA	ND [10] U	NA	ND [0.75] U	ND [10] U	NA	ND [10] U
DI-n-OCTYLPHTHALATE	NA	NA	ND [10] U	NA	ND [1.2] U	ND [10] U	NA	ND [10] U
DIBENZOFURAN	NA	NA	ND [10] U	NA	ND [0.83] U	ND [10] U	NA	ND [10] U
DIETHYL PHTHALATE	NA	NA	ND [10] U	NA	ND [1] U	ND [10] U	NA	ND [10] U
FLUORENE	NA	NA	ND [10] U	NA	ND [0.8] U	ND [10] U	NA	ND [10] U
NAPHTHALENE	NA	NA	ND [10] U	NA	ND [0.53] U	ND [10] U	NA	ND [10] U
PENTACHLOROPHENOL	NA	NA	ND [50] U	NA	ND [4.4] U	ND [5] U	NA	ND [50] U
bis(2-ETHYLHEXYL) PHTHALATE	NA	NA	ND [10] U	NA	ND [0.92] U	ND [10] U	NA	5 J

000435

028156

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW45	LHSMW45	LHSMW45	LHSMW45	LHSMW46	LHSMW46	LHSMW46	LHSMW46	LHSMW47
Sample Number:	MW-45	LHS-MW-45	LHS-MW-45	LHS-MW-45	MW-46	LHS-MW-46	LHS-MW-46	LHS-MW-46	MW-47
Date Sampled:	02/10/1996	05/18/1998	08/22/1996	12/08/1994	02/08/1996	05/18/1998	08/22/1996	12/08/1994	02/08/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U
1,1-DICHLOROETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	0.41	ND [5] U	ND [1] U	1.1	ND [0.2] U	ND [5] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
1,2-DICHLOROETHANE	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U
1,2-DICHLOROPROPANE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U
ACETONE	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA
BENZENE	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [0.2] U	ND [5] U	NA
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U
CARBON DISULFIDE	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA
CHLOROFORM	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U
M,P-XYLENE (SUM OF ISOMERS)	ND [2] U	NA	NA	NA	ND [2] U	NA	NA	NA	ND [2] U
METHYLENE CHLORIDE	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	ND [1] U	NA	NA	NA	ND [1] U	NA	NA	NA	ND [1] U
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	31	NA	NA	NA	13	NA
TRICHLOROETHYLENE (TCE)	4.0	36	22.1	NA	23.0	21	30.4	NA	20.0
TRICHLOROFLUOROMETHANE	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U
VINYL CHLORIDE	ND [1] U	ND [1] U	0.56	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U
cis-1,2-DICHLOROETHYLENE	16.0	93	63.7	NA	15.0	13	15.1	NA	4.0
n-PROPYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	NA	ND [10] U	ND [0.67] U	ND [10] U	NA	ND [10] U	ND [0.67] U
4-CHLOROANILINE	ND [1.3] U	ND [10] U	NA	ND [10] U	ND [1.3] U	ND [10] U	NA	ND [10] U	ND [1.3] U

028157

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW45	LHSMW45	LHSMW45	LHSMW45	LHSMW46	LHSMW46	LHSMW46	LHSMW46	LHSMW47
Sample Number:	MW-45	LHS-MW-45	LHS-MW-45	LHS-MW-45	MW-46	LHS-MW-46	LHS-MW-46	LHS-MW-46	MW-47
Date Sampled:	02/10/1996	05/18/1998	08/22/1996	12/08/1994	02/08/1996	05/18/1998	08/22/1996	12/08/1994	02/08/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] U	NA	ND [10] U	ND [0.75] U	ND [10] U	NA	ND [10] U	ND [0.75] U
DI-n-OCTYLPHTHALATE	2.1	ND [10] U	NA	ND [10] U	ND [1.2] U	ND [10] U	NA	ND [10] U	ND [1.2] U
DIBENZOFURAN	ND [0.83] U	ND [10] U	NA	ND [10] U	ND [0.83] U	ND [10] U	NA	ND [10] U	ND [0.83] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	NA	ND [10] U	ND [1] U	ND [10] U	NA	ND [10] U	ND [1] U
FLUORENE	ND [0.8] U	ND [10] U	NA	ND [10] U	ND [0.8] U	ND [10] U	NA	ND [10] U	ND [0.8] U
NAPHTHALENE	ND [0.53] U	ND [10] U	NA	ND [10] U	ND [0.53] U	ND [10] U	NA	ND [10] U	ND [0.53] U
PENTACHLOROPHENOL	ND [4.4] U	ND [5] U	NA	ND [50] U	ND [4.4] U	ND [5] U	NA	ND [50] U	7.5
bis(2-ETHYLHEXYL) PHTHALATE	0.63 J	ND [10] U	NA	21	ND [0.92] U	ND [10] U	NA	ND [10] U	ND [0.92] U

000423

028158

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW47	LHSMW47	LHSMW47	LHSMW48	LHSMW48	LHSMW48	LHSMW48	LHSMW48
Sample Number:	LHS-MW-47	LHS-MW-47	LHS-MW-47	LHS-MW-48	LHS-MW-48DLFD	LHS-MW-48FD	LHS-MW-48	LHS-MW-48
Date Sampled:	05/18/1998	08/22/1996	12/07/1994	05/19/1998	05/19/1998	05/19/1998	05/28/1998	08/22/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.2] U
1,1,2-TRICHLOROETHANE	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.65] U
1,1-DICHLOROETHANE	ND [1] U	ND [0.2] U	ND [5] U	3.2	3.2	ND [1] U	NA	18.8
1,1-DICHLOROETHENE	ND [1] U	0.43	ND [5] U	2.9	3	ND [1] U	NA	32.2
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.51] U
1,2,4-TRICHLOROBENZENE	ND [1] U	0.49	NA	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.32] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.2] U
1,2-DICHLOROETHANE	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [2.5] U	ND [1] U	NA	5.7
1,2-DICHLOROPROPANE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.2] U
ACETONE	ND [5] U	NA	ND [10] U	ND [5] U	ND [12] U	NA	NA	NA
BENZENE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [2.5] U	NA	NA	0.41
BROMODICHLOROMETHANE	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.2] U
CARBON DISULFIDE	ND [1] U	NA	ND [5] U	ND [1] U	ND [2.5] U	NA	NA	NA
CHLOROFORM	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.2] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.36] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	NA	NA	ND [2] U	NA	NA
METHYLENE CHLORIDE	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.22] U
NAPHTHALENE	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [1.3] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	NA	NA	ND [1] U	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.2] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.25] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	4 J	NA	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	17	35.9	19	230	220	ND [1] U	NA	398
TRICHLOROFLUOROMETHANE	ND [2] U	ND [1] U	NA	ND [2] U	ND [5] U	ND [1] U	NA	ND [1] U
VINYL CHLORIDE	ND [1] U	0.26	NA	ND [1] U	ND [2.5] U	ND [1] U	NA	2.8
cis-1,2-DICHLOROETHYLENE	3.4	4.3	NA	35	35	ND [1] U	NA	554.00
n-PROPYLBENZENE	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [2.5] U	ND [1] U	NA	ND [0.2] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [2.5] U	ND [1] U	NA	5.7
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA
4-CHLOROANILINE	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA

0281559

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW47	LHSMW47	LHSMW47	LHSMW48	LHSMW48	LHSMW48	LHSMW48	LHSMW48
Sample Number:	LHS-MW-47	LHS-MW-47	LHS-MW-47	LHS-MW-48	LHS-MW-48DLFD	LHS-MW-48FD	LHS-MW-48	LHS-MW-48
Date Sampled:	05/18/1998	08/22/1996	12/07/1994	05/19/1998	05/19/1998	05/19/1998	05/28/1998	08/22/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA
DI-n-OCTYLPHTHALATE	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA
DIBENZOFURAN	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA
DIETHYL PHTHALATE	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA
FLUORENE	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA
NAPHTHALENE	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA
PENTACHLOROPHENOL	7.9	NA	4 J	NA	NA	ND [5] U	ND [5] U	NA
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	ND [10] U	NA

0028160
000440

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW48	LHSMW48	LHSMW49	LHSMW49	LHSMW49	LHSMW49	LHSMW50	LHSMW50	LHSMW50
Sample Number:	LHS-MW-48	LHS-MW-48FD	MW-49	LHS-MW-49	LHS-MW-49	LHS-MW-49	MW-50	LHS-MW-50	LHS-MW-50
Date Sampled:	12/09/1994	12/09/1994	02/09/1996	05/19/1998	08/22/1996	12/07/1994	02/09/1996	05/19/1998	08/22/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
1,1,2-TRICHLOROETHANE	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U
1,1-DICHLOROETHANE	13	NA	ND [1] U	ND [1] U	0.51	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
1,1-DICHLOROETHENE	28	NA	ND [1] U	0.79	1.5	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
1,2,3-TRICHLOROBENZENE	NA	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [0.51] U
1,2,4-TRICHLOROBENZENE	NA	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U
1,2,4-TRIMETHYLBENZENE	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
1,2-DICHLOROETHANE	4 J	NA	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U
1,2-DICHLOROPROPANE	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
ACETONE	ND [10] U	NA	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA
BENZENE	ND [5] U	NA	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [0.2] U
BROMODICHLOROMETHANE	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
CARBON DISULFIDE	6	NA	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA
CHLOROFORM	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U
DICHLORODIFLUOROMETHANE	ND [20] U	NA	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	ND [2] U	NA	NA	NA	ND [2] U	NA	NA
METHYLENE CHLORIDE	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U
NAPHTHALENE	NA	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	ND [1] U	NA	NA	NA	ND [1] U	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U
TOTAL 1,2-DICHLOROETHENE	370	340	NA	NA	NA	49	NA	NA	NA
TRICHLOROETHYLENE (TCE)	460	NA	115.0	67	127	110	ND [1] U	ND [1] U	0.96
TRICHLOROFLUOROMETHANE	NA	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U
VINYL CHLORIDE	NA	NA	ND [1] U	ND [1] U	0.72	NA	ND [1] U	ND [1] U	ND [0.24] U
cis-1,2-DICHLOROETHYLENE	NA	NA	28.0	19	29	NA	ND [1] U	ND [1] U	ND [0.2] U
n-PROPYLBENZENE	NA	NA	ND [1] U	ND [1] U	0.24	NA	ND [1] U	ND [1] U	ND [0.2] U
trans-1,2-DICHLOROETHENE	NA	NA	ND [1] U	ND [1] U	0.34	NA	ND [1] U	ND [1] U	ND [0.29] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [10] U	NA	ND [0.67] U	ND [10] U	NA	ND [10] U	ND [0.67] U	ND [10] U	NA
4-CHLOROANILINE	ND [10] U	NA	ND [1.3] U	ND [10] U	NA	ND [10] U	ND [1.3] U	ND [10] U	NA

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW48	LHSMW48	LHSMW49	LHSMW49	LHSMW49	LHSMW49	LHSMW50	LHSMW50	LHSMW50
Sample Number:	LHS-MW-48	LHS-MW-48FD	MW-49	LHS-MW-49	LHS-MW-49	LHS-MW-49	MW-50	LHS-MW-50	LHS-MW-50
Date Sampled:	12/09/1994	12/09/1994	02/09/1996	05/19/1998	08/22/1996	12/07/1994	02/09/1996	05/19/1998	08/22/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	NA	ND [0.75] U	ND [10] U	NA	ND [10] U	ND [0.75] U	ND [10] U	NA
DI-n-OCTYLPHTHALATE	ND [10] U	NA	ND [1.2] U	ND [10] U	NA	ND [10] U	3.1	ND [10] U	NA
DIBENZOFURAN	ND [10] U	NA	ND [0.83] U	ND [10] U	NA	ND [10] U	ND [0.83] U	ND [10] U	NA
DIETHYL PHTHALATE	ND [10] U	NA	ND [1] U	ND [10] U	NA	ND [10] U	ND [1] U	ND [10] U	NA
FLUORENE	ND [10] U	NA	ND [0.8] U	ND [10] U	NA	ND [10] U	ND [0.8] U	ND [10] U	NA
NAPHTHALENE	ND [10] U	NA	ND [0.53] U	ND [10] U	NA	ND [10] U	ND [0.53] U	ND [10] U	NA
PENTACHLOROPHENOL	5 J	NA	ND [4.4] U	ND [5] U	NA	ND [50] U	ND [4.4] U	ND [5] U	NA
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	NA	0.85 J	ND [10] U	NA	ND [10] U	1.1	ND [10] U	NA

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW50	LHSMW51	LHSMW51	LHSMW51	LHSMW51	LHSMW52	LHSMW52	LHSMW52	LHSMW52
Sample Number:	LHS-MW-50	MW-51	LHS-MW-51	LHS-MW-51	LHS-MW-51	MW-52	LHS-MW-52	LHS-MW-52	LHS-MW-52
Date Sampled:	12/09/1994	02/13/1996	05/19/1998	08/22/1996	12/11/1994	02/09/1996	05/19/1998	08/22/1996	12/11/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,1,2-TRICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U
1,1-DICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,1-DICHLOROETHENE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
1,2,3-TRICHLOROBENZENE	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [0.51] U	NA
1,2,4-TRICHLOROBENZENE	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [0.32] U	NA
1,2,4-TRIMETHYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
1,2-DICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U
1,2-DICHLOROPROPANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
ACETONE	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	NA	ND [10] U
BENZENE	ND [5] U	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [0.2] U	ND [5] U
BROMODICHLOROMETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
CARBON DISULFIDE	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	NA	ND [5] U
CHLOROFORM	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U
DICHLORODIFLUOROMETHANE	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U
M,P-XYLENE (SUM OF ISOMERS)	NA	ND [2] U	NA	NA	NA	ND [2] U	NA	NA	NA
METHYLENE CHLORIDE	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U
NAPHTHALENE	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [1.3] U	NA
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	ND [1] U	NA	NA	NA	ND [1] U	NA	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U
TOTAL 1,2-DICHLOROETHENE	ND [5] U	NA	NA	NA	ND [5] U	NA	NA	NA	ND [5] U
TRICHLOROETHYLENE (TCE)	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U	ND [0.25] U	NA
TRICHLOROFLUOROMETHANE	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [1] U	NA
VINYL CHLORIDE	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [0.24] U	NA
cis-1,2-DICHLOROETHYLENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
n-PROPYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA
trans-1,2-DICHLOROETHENE	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [0.29] U	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [10] U	ND [0.67] U	ND [10] U	NA	ND [10] U	ND [0.67] U	ND [10] U	NA	ND [10] U
4-CHLOROANILINE	ND [10] U	ND [1.3] U	ND [10] U	NA	ND [10] U	ND [1.3] U	ND [10] U	NA	ND [10] U

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VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW50	LHSMW51	LHSMW51	LHSMW51	LHSMW51	LHSMW52	LHSMW52	LHSMW52	LHSMW52
Sample Number:	LHS-MW-50	MW-51	LHS-MW-51	LHS-MW-51	LHS-MW-51	MW-52	LHS-MW-52	LHS-MW-52	LHS-MW-52
Date Sampled:	12/09/1994	02/13/1996	05/19/1998	08/22/1996	12/11/1994	02/09/1996	05/19/1998	08/22/1996	12/11/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	ND [0.75] U	ND [10] U	NA	ND [10] U	ND [0.75] U	ND [10] U	NA	ND [10] U
DI-n-OCTYLPHTHALATE	ND [10] U	ND [1.2] U	ND [10] U	NA	ND [10] U	ND [1.2] U	ND [10] U	NA	ND [10] U
DIBENZOFURAN	ND [10] U	ND [0.83] U	ND [10] U	NA	ND [10] U	ND [0.83] U	ND [10] U	NA	ND [10] U
DIETHYL PHTHALATE	ND [10] U	ND [1] U	ND [10] U	NA	ND [10] U	ND [1] U	ND [10] U	NA	ND [10] U
FLUORENE	ND [10] U	ND [0.8] U	ND [10] U	NA	ND [10] U	ND [0.8] U	ND [10] U	NA	ND [10] U
NAPHTHALENE	ND [10] U	ND [0.53] U	ND [10] U	NA	ND [10] U	ND [0.53] U	ND [10] U	NA	ND [10] U
PENTACHLOROPHENOL	ND [50] U	ND [4.4] U	ND [5] U	NA	ND [50] U	ND [4.4] U	ND [5] U	NA	ND [50] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [0.92] U	ND [10] U	NA	12	0.46 J	ND [10] U	NA	ND [10] U

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW53	LHSMW53	LHSMW53	LHSMW53	LHSMW54	LHSMW54	LHSMW54	LHSMW54
Sample Number:	MW-53	LHS-MW-53	LHS-MW-53	LHS-MW-53	MW-54	LHS-MW-54	LHS-MW-54DLFD	LHS-MW-54
Date Sampled:	02/10/1996	05/20/1998	08/22/1996	12/07/1994	02/12/1996	05/20/1998	05/20/1998	08/21/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	1.7
1,1,2-TRICHLOROETHANE	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.65] U
1,1-DICHLOROETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.2] U
1,1-DICHLOROETHENE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.2] U
1,2,3-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [4] U	ND [0.51] U
1,2,4-TRICHLOROBENZENE	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [4] U	ND [0.32] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [4] U	ND [0.2] U
1,2-DICHLOROETHANE	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.31] U
1,2-DICHLOROPROPANE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.2] U
ACETONE	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	ND [20] U	NA
BENZENE	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [4] U	ND [0.2] U
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.2] U
CARBON DISULFIDE	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	ND [4] U	NA
CHLOROFORM	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.2] U
DICHLORODIFLUOROMETHANE	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [4] U	ND [0.36] U
M,P-XYLENE (SUM OF ISOMERS)	ND [2] U	NA	NA	NA	ND [2] U	NA	NA	NA
METHYLENE CHLORIDE	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.22] U
NAPHTHALENE	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [4] U	ND [1.3] U
O-XYLENE (1,2-DIMETHYLBENZENE)	ND [1] U	NA	NA	NA	ND [1] U	NA	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [4] U	ND [0.2] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [4] U	ND [0.25] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	ND [5] U	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	11.0	210	210	15.7
TRICHLOROFLUOROMETHANE	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [8] U	ND [1] U
VINYL CHLORIDE	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U	ND [4] U	ND [0.24] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	0.7	ND [4] U	ND [0.2] U
n-PROPYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [4] U	ND [0.2] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U	ND [4] U	ND [0.29] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	NA	ND [10] U	ND [0.67] U	ND [20] U	NA	ND [0.67] U
4-CHLOROANILINE	ND [1.3] U	ND [10] U	NA	ND [10] U	ND [1.3] U	ND [20] U	NA	ND [1.3] U

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VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW53	LHSMW53	LHSMW53	LHSMW53	LHSMW54	LHSMW54	LHSMW54	LHSMW54
Sample Number:	MW-53	LHS-MW-53	LHS-MW-53	LHS-MW-53	MW-54	LHS-MW-54	LHS-MW-54DLFD	LHS-MW-54
Date Sampled:	02/10/1996	05/20/1998	08/22/1996	12/07/1994	02/12/1996	05/20/1998	05/20/1998	08/21/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] U	NA	ND [10] U	ND [0.75] U	ND [20] U	NA	ND [0.75] U
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	NA	ND [10] U	2.3	ND [20] U	NA	ND [1.2] U
DIBENZOFURAN	ND [0.83] U	ND [10] U	NA	ND [10] U	ND [0.83] U	ND [20] U	NA	ND [0.83] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	NA	ND [10] U	ND [1] U	ND [20] U	NA	ND [1] U
FLUORENE	ND [0.8] U	ND [10] U	NA	ND [10] U	ND [0.8] U	ND [20] U	NA	ND [0.8] U
NAPHTHALENE	ND [0.53] U	ND [10] U	NA	ND [10] U	ND [0.53] U	ND [20] U	NA	ND [0.53] U
PENTACHLOROPHENOL	ND [4.4] U	ND [5] U	NA	ND [50] U	ND [4.4] U	ND [10] U	NA	ND [4.4] U
bis(2-ETHYLHEXYL) PHTHALATE	0.58 J	ND [10] U	NA	1 J	ND [0.92] U	ND [20] U	NA	ND [0.92] U

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VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW54	LHSMW55	LHSMW55	LHSMW55	LHSMW55	LHSMW56	LHSMW56	LHSMW56
Sample Number:	LHS-MW-54	MW-55	LHS-MW-55	LHS-MW-55	LHS-MW-55	MW-56	LHS-MW-56	LHS-MW-56DLFD
Date Sampled:	12/09/1994	02/10/1996	05/20/1998	08/22/1996	12/09/1994	02/09/1996	05/20/1998	05/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
1,1,2-TRICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
1,1-DICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	74	70
1,1-DICHLOROETHENE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	30.0	3.5	ND [10] U
1,2,3-TRICHLOROBENZENE	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U	ND [10] U
1,2,4-TRICHLOROBENZENE	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U	ND [10] U
1,2,4-TRIMETHYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [10] U
1,2-DICHLOROETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
1,2-DICHLOROPROPANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
ACETONE	ND [10] U	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U	ND [50] U
BENZENE	ND [5] U	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	1.1	ND [10] U
BROMODICHLOROMETHANE	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
CARBON DISULFIDE	ND [5] U	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U	ND [10] U
CHLOROFORM	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
DICHLORODIFLUOROMETHANE	ND [20] U	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U	ND [10] U
M,P-XYLENE (SUM OF ISOMERS)	NA	ND [1] U	NA	NA	NA	ND [1] U	NA	NA
METHYLENE CHLORIDE	ND [5] U	ND [2] U	ND [1] U	ND [0.22] U	ND [5] U	ND [2] U	ND [1] U	ND [10] U
NAPHTHALENE	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U	ND [10] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	ND [1] U	NA	NA	NA	ND [1] U	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [10] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [10] U
TOTAL 1,2-DICHLOROETHENE	ND [5] U	NA	NA	NA	ND [5] U	NA	NA	NA
TRICHLOROETHYLENE (TCE)	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	13.0	17	16
TRICHLOROFLUOROMETHANE	NA	ND [1] U	ND [2] U	ND [1] U	NA	ND [1] U	ND [2] U	ND [20] U
VINYL CHLORIDE	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	100.0	99	110
cis-1,2-DICHLOROETHYLENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	738.0	670	670
n-PROPYLBENZENE	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [10] U
trans-1,2-DICHLOROETHENE	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	6.0	7	6.4
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	ND [10] U	ND [0.67] U	ND [10] U	NA	ND [10] U	ND [0.67] U	ND [10] U	NA
4-CHLOROANILINE	ND [10] U	ND [1.3] U	ND [10] U	NA	ND [10] U	ND [1.3] U	ND [10] U	NA

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VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW54	LHSMW55	LHSMW55	LHSMW55	LHSMW55	LHSMW56	LHSMW56	LHSMW56
Sample Number:	LHS-MW-54	MW-55	LHS-MW-55	LHS-MW-55	LHS-MW-55	MW-56	LHS-MW-56	LHS-MW-56DLFD
Date Sampled:	12/09/1994	02/10/1996	05/20/1998	08/22/1996	12/09/1994	02/09/1996	05/20/1998	05/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [10] U	ND [0.75] U	ND [10] U	NA	ND [10] U	ND [0.75] U	ND [10] U	NA
DI-n-OCTYLPHTHALATE	6 J	ND [1.2] U	ND [10] U	NA	ND [10] U	ND [1.2] U	ND [10] U	NA
DIBENZOFURAN	ND [10] U	ND [0.83] U	ND [10] U	NA	ND [10] U	ND [0.83] U	ND [10] U	NA
DIETHYL PHTHALATE	ND [10] U	ND [1] U	ND [10] U	NA	ND [10] U	ND [1] U	ND [10] U	NA
FLUORENE	ND [10] U	ND [0.8] U	ND [10] U	NA	ND [10] U	ND [0.8] U	ND [10] U	NA
NAPHTHALENE	ND [10] U	ND [0.53] U	ND [10] U	NA	ND [10] U	ND [0.53] U	ND [10] U	NA
PENTACHLOROPHENOL	ND [50] U	ND [4.4] U	ND [5] U	NA	ND [50] U	ND [4.4] U	ND [5] U	NA
bis(2-ETHYLHEXYL) PHTHALATE	3 J	0.73 J	ND [10] U	NA	ND [10] U	0.49 J	ND [10] U	NA

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW56	LHSMW56	LHSMW56	LHSMW57	LHSMW57	LHSMW57	LHSMW57	LHSMW60	LHSMW60
Sample Number:	LHS-MW-56	LHS-MW-56	LHS-MW-56FD	MW-57	LHS-MW-57	LHS-MW-57	LHS-MW-57	MW-60	LHS-MW-60
Date Sampled:	08/21/1996	12/07/1994	12/07/1994	02/08/1996	05/20/1998	08/21/1996	12/09/1994	02/09/1996	05/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
1,1,1-TRICHLOROETHANE	10.8	ND [5] U	NA	ND [1] U	ND [1] U	10	ND [5] U	ND [1] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [0.65] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	70.1	15	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,1-DICHLOROETHENE	3.4	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [0.51] U	NA	NA	ND [1] U	ND [1] U	ND [0.51] U	NA	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [0.32] U	NA	NA	ND [1] U	ND [1] U	ND [0.32] U	NA	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
1,2-DICHLOROETHANE	ND [0.31] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U
1,2-DICHLOROPROPANE	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
ACETONE	NA	ND [10] U	NA	NA	ND [5] U	NA	ND [10] U	NA	ND [5] U
BENZENE	1.9	2 J	NA	NA	ND [1] U	ND [0.2] U	ND [5] U	NA	ND [1] U
BROMODICHLOROMETHANE	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
CARBON DISULFIDE	NA	ND [5] U	NA	NA	ND [1] U	NA	ND [5] U	NA	ND [1] U
CHLOROFORM	ND [0.2] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [0.36] U	ND [20] U	NA	ND [1] U	ND [1] U	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	ND [1] U	NA	NA	NA	ND [1] U	NA
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U
NAPHTHALENE	ND [1.3] U	NA	NA	ND [1] U	ND [1] U	ND [1.3] U	NA	ND [1] U	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	ND [1] U	NA	NA	NA	ND [1] U	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [0.2] U	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [0.25] U	ND [5] U	NA	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	890	530	NA	NA	NA	ND [5] U	NA	NA
TRICHLOROETHYLENE (TCE)	6.2	2 J	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U
TRICHLOROFLUOROMETHANE	ND [1] U	NA	NA	ND [1] U	ND [2] U	2.1	NA	ND [1] U	ND [2] U
VINYL CHLORIDE	127.00	NA	NA	ND [1] U	ND [1] U	ND [0.24] U	NA	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	716	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
n-PROPYLBENZENE	ND [0.2] U	NA	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	10.5	NA	NA	ND [1] U	ND [1] U	ND [0.29] U	NA	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	NA	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U
4-CHLOROANILINE	ND [1.3] U	ND [10] U	NA	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U

028169

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VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW56	LHSMW56	LHSMW56	LHSMW57	LHSMW57	LHSMW57	LHSMW57	LHSMW60	LHSMW60
Sample Number:	LHS-MW-56	LHS-MW-56	LHS-MW-56FD	MW-57	LHS-MW-57	LHS-MW-57	LHS-MW-57	MW-60	LHS-MW-60
Date Sampled:	08/21/1996	12/07/1994	12/07/1994	02/08/1996	05/20/1998	08/21/1996	12/09/1994	02/09/1996	05/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] U	NA	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	NA	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U
DIBENZOFURAN	ND [0.83] U	ND [10] U	NA	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	NA	ND [1] U	ND [10] U	ND [1] U	ND [10] U	ND [1] U	ND [10] U
FLUORENE	ND [0.8] U	ND [10] U	NA	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U
NAPHTHALENE	ND [0.53] U	ND [10] U	NA	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U
PENTACHLOROPHENOL	ND [4.4] U	ND [50] U	NA	ND [4.4] U	ND [5] U	ND [4.4] U	ND [50] U	ND [4.4] U	ND [5] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	NA	ND [0.92] U	ND [10] U	ND [0.92] U	2 J	ND [0.92] U	ND [10] U

0028170

000459

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW61	LHSMW61
Sample Number:	LHSMW60D	LHSMW60DRA1FD	LHSMW60	LHSMW60RA1FD	LHS-MW-60	LHS-MW-60	MW-61	LHS-MW-61
Date Sampled:	05/23/2000	05/23/2000	05/23/2000	05/23/2000	08/21/1996	12/11/1994	02/11/1996	05/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,1-TRICHLOROETHANE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	8.7	ND [5] U	ND [1] U	ND [1] U
1,1,2-TRICHLOROETHANE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.65] U	ND [5] U	ND [1] U	ND [1] U
1,1-DICHLOROETHANE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,1-DICHLOROETHENE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
1,2,3-TRICHLOROBENZENE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.51] U	NA	ND [1] U	ND [1] U
1,2,4-TRICHLOROBENZENE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.32] U	NA	ND [1] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	NA	ND [1] U	ND [1] U
1,2-DICHLOROETHANE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.31] U	ND [5] U	ND [1] U	ND [1] U
1,2-DICHLOROPROPANE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
ACETONE	ND [5] UJ	ND [500] U	ND [5] UJ	ND [500] UJ	NA	ND [10] U	NA	ND [5] U
BENZENE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	ND [5] U	NA	ND [1] U
BROMODICHLOROMETHANE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
CARBON DISULFIDE	NA	NA	NA	NA	NA	ND [5] U	NA	ND [1] U
CHLOROFORM	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
DICHLORODIFLUOROMETHANE	ND [2] UJ	ND [200] U	ND [2] UJ	ND [200] UJ	ND [0.36] U	ND [20] U	ND [1] U	ND [1] U
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA	NA	NA	NA	ND [1] U	NA
METHYLENE CHLORIDE	ND [2] UJ	ND [200] U	ND [2] UJ	ND [200] UJ	ND [0.22] U	ND [5] U	ND [1] U	ND [1] U
NAPHTHALENE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [1.3] U	NA	ND [1] U	ND [1] U
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA	NA	NA	NA	ND [1] U	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	NA	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U
TOTAL 1,2-DICHLOROETHENE	NA	NA	NA	NA	NA	ND [5] U	NA	NA
TRICHLOROETHYLENE (TCE)	ND [1] UJ	ND [100] U	2.8 J	100 J	ND [0.25] U	NA	ND [1] U	ND [1] U
TRICHLOROFLUOROMETHANE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	2	NA	ND [1] U	ND [2] U
VINYL CHLORIDE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.24] U	NA	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] UJ	ND [100] U	1.7 J	630 J*	ND [0.2] U	NA	ND [1] U	ND [1] U
n-PROPYLBENZENE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.2] U	NA	ND [1] U	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] UJ	ND [100] U	ND [1] UJ	ND [100] UJ	ND [0.29] U	NA	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
2-METHYLNAPHTHALENE	NA	NA	NA	NA	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U
4-CHLOROANILINE	NA	NA	NA	NA	ND [1.3] U	ND [10] U	ND [1.3] U	ND [10] U

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028171

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW61	LHSMW61
Sample Number:	LHSMW60D	LHSMW60DRA1FD	LHSMW60	LHSMW60RA1FD	LHS-MW-60	LHS-MW-60	MW-61	LHS-MW-61
Date Sampled:	05/23/2000	05/23/2000	05/23/2000	05/23/2000	08/21/1996	12/11/1994	02/11/1996	05/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ACENAPHTHENE	NA	NA	NA	NA	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U
DI-n-OCTYLPHTHALATE	NA	NA	NA	NA	ND [1.2] U	ND [10] U	ND [1.2] U	ND [10] U
DIBENZOFURAN	NA	NA	NA	NA	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U
DIETHYL PHTHALATE	NA	NA	NA	NA	ND [1] U	ND [10] U	ND [1] U	ND [10] U
FLUORENE	NA	NA	NA	NA	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U
NAPHTHALENE	NA	NA	NA	NA	ND [0.53] U	ND [10] U	ND [0.53] U	ND [10] U
PENTACHLOROPHENOL	NA	NA	NA	NA	ND [4.4] U	ND [50] U	ND [4.4] U	ND [5] U
bis(2-ETHYLHEXYL) PHTHALATE	NA	NA	NA	NA	ND [0.92] U	4 J	ND [0.92] U	ND [10] U

0028172

0002552

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW61	LHSMW61	LHSMW61
Sample Number:	LHS-MW-61	LHS-MW-61	LHS-MW-61FD
Date Sampled:	08/15/1996	12/10/1994	12/10/1994
Depth (ft.):	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L			
1,1,1-TRICHLOROETHANE	ND [0.2] U	ND [5] U	NA
1,1,2-TRICHLOROETHANE	ND [0.65] U	ND [5] U	NA
1,1-DICHLOROETHANE	ND [0.2] U	ND [5] U	NA
1,1-DICHLOROETHENE	ND [0.2] U	ND [5] U	NA
1,2,3-TRICHLOROBENZENE	0.56	NA	NA
1,2,4-TRICHLOROBENZENE	ND [0.32] U	NA	NA
1,2,4-TRIMETHYLBENZENE	ND [0.2] U	NA	NA
1,2-DICHLOROETHANE	ND [0.31] U	ND [5] U	NA
1,2-DICHLOROPROPANE	ND [0.2] U	ND [5] U	NA
ACETONE	NA	ND [10] U	NA
BENZENE	ND [0.2] U	ND [5] U	NA
BROMODICHLOROMETHANE	ND [0.2] U	ND [5] U	NA
CARBON DISULFIDE	NA	ND [5] U	NA
CHLOROFORM	ND [0.2] U	ND [5] U	NA
DICHLORODIFLUOROMETHANE	ND [0.36] U	ND [20] U	NA
M,P-XYLENE (SUM OF ISOMERS)	NA	NA	NA
METHYLENE CHLORIDE	ND [0.22] U	ND [5] U	NA
NAPHTHALENE	ND [1.3] U	NA	NA
O-XYLENE (1,2-DIMETHYLBENZENE)	NA	NA	NA
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [0.2] U	NA	NA
TETRACHLOROETHYLENE(PCE)	ND [0.25] U	ND [5] U	NA
TOTAL 1,2-DICHLOROETHENE	NA	ND [5] U	NA
TRICHLOROETHYLENE (TCE)	ND [0.25] U	NA	NA
TRICHLOROFLUOROMETHANE	ND [1] U	NA	NA
VINYL CHLORIDE	ND [0.24] U	NA	NA
cis-1,2-DICHLOROETHYLENE	ND [0.2] U	NA	NA
n-PROPYLBENZENE	ND [0.2] U	NA	NA
trans-1,2-DICHLOROETHENE	ND [0.29] U	NA	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L			
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	ND [10] U
4-CHLOROANILINE	ND [1.3] U	ND [10] U	ND [10] U

0281173

VOCs and SVOCs in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW61	LHSMW61	LHSMW61
Sample Number:	LHS-MW-61	LHS-MW-61	LHS-MW-61FD
Date Sampled:	08/15/1996	12/10/1994	12/10/1994
Depth (ft.):	0.00	0.00	0.00
ACENAPHTHENE	ND [0.75] U	ND [10] U	ND [10] U
DI-n-OCTYLPHTHALATE	ND [1.2] U	ND [10] U	ND [10] U
DIBENZOFURAN	ND [0.83] U	ND [10] U	ND [10] U
DIETHYL PHTHALATE	ND [1] U	ND [10] U	ND [10] U
FLUORENE	ND [0.8] U	ND [10] U	ND [10] U
NAPHTHALENE	ND [0.53] U	ND [10] U	ND [10] U
PENTACHLOROPHENOL	ND [4.4] U	ND [50] U	ND [50] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	7 J	1 J

000450

028174

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	105	105	105	47WW01	47WW01	47WW01	47WW01	47WW02	47WW03
Sample Number:	MW-105	105	LHS-MW-105	47WW01	47WW01	47WW01QC	47WW01QCFD	47WW02	47WW03
Date Sampled:	02/13/1996	05/18/1998	08/22/1996	09/29/1998	11/07/1998	11/07/1998	11/07/1998	11/04/1998	11/05/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA			NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA			NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	20.266	NA	29.909 U	20.279 J	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	ND [1.883] U	NA	ND [1.269] U	1.256	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.39] U	ND [0.39] U	NA	NA	ND [0.39] U	ND [0.39] U
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	NA	NA	ND [0.13] U	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	NA	NA	ND [0.13] U	ND [0.13] U
4-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U
TETRYL	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.26] U	ND [0.26] U	NA	NA	ND [0.26] U	ND [0.26] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW04	47WW05	47WW06	47WW07	47WW07	47WW08	47WW09	47WW11	47WW12
Sample Number:	47WW04	47WW05	47WW06	47WW07	47WW07REFD	47WW08	47WW09	47WW11	47WW12
Date Sampled:	11/05/1998	11/09/1998	11/06/1998	11/06/1998	11/06/1998	11/04/1998	11/04/1998	11/07/1998	11/04/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	18.224 U	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	ND [1.397] U	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.39] U	ND [0.39] U	ND [0.39] U	ND [0.39] UJ	ND [0.39] UJ	ND [0.39] U	ND [0.39] U	ND [0.39] U	ND [0.39] UJ
2,4,6-TRINITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ
2,4-DINITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	1.4	ND [0.26] UJ
2,6-DINITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	1.4	ND [0.26] UJ
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] UJ	ND [0.13] UJ	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] UJ
2-NITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ
3-NITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] UJ	ND [0.13] UJ	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] UJ
4-NITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ
NITROBENZENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ
TETRYL	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ

0028176

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW12	47WW13	47WW14	47WW15	47WW16	47WW17	47WW18	47WW18	47WW19
Sample Number:	47WW12REFD	47WW13	47WW14	47WW15	47WW16	47WW17	47WW18	47WW18	47WW19
Date Sampled:	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/09/1998	09/29/1998	11/06/1998	11/06/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.39] U	ND [0.39] U	ND [0.39] U	ND [0.39] UJ	ND [0.39] U	ND [0.39] U	ND [0.39] U	ND [0.39] U	ND [0.39] U
2,4,6-TRINITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
2,4-DINITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
2,6-DINITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] UJ	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] UJ	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
4-NITROTOLUENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
NITROBENZENE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U
TETRYL	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] UJ	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW20	47WW20	47WW21	47WW22	47WW23	47WW23	47WW23	47WW24	47WW25
Sample Number:	47WW20	47WW20FD	47WW21	47WW22	47WW23	47WW23REFD	47WW23	47WW24	47WW25
Date Sampled:	11/05/1998	11/05/1998	11/05/1998	11/05/1998	09/29/1998	09/29/1998	11/05/1998	12/20/2000	12/20/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	8.469 UJ	22.714 U	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [1.495] U	ND [2.212] U	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.39] U	NA	ND [0.39] U	ND [0.39] U	ND [0.39] U	ND [0.39] U	ND [0.39] U	ND [0.1] U	ND [0.1] U
2,4,6-TRINITROTOLUENE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.3] U	ND [0.3] U
2,4-DINITROTOLUENE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.2] U	ND [0.2] U
2,6-DINITROTOLUENE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.3] U	ND [0.3] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	NA	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.3] U	ND [0.3] U
2-NITROTOLUENE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.2] U	ND [0.2] U
3-NITROTOLUENE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.3] U	ND [0.3] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	NA	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.3] U	ND [0.3] U
4-NITROTOLUENE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.3] U	ND [0.3] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [1.1] U	ND [1.1] U
NITROBENZENE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.3] U	ND [0.3] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.2] UJ	ND [0.2] UJ
TETRYL	ND [0.26] U	NA	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.26] U	ND [0.2] U	ND [0.2] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW26	47WW27	LHSMW28	LHSMW28	LHSMW28	LHSMW28	LHSMW29	LHSMW29	LHSMW29
Sample Number:	47WW26	47WW27	MW-28	LHS-MW-28	LHS-MW-28	LHS-MW-28	MW-29	LHS-MW-29	LHS-MW-29
Date Sampled:	12/20/2000	12/19/2000	02/11/1996	05/16/1998	08/20/1996	12/07/1994	02/11/1996	05/16/1998	08/20/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA		NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.1] U	ND [0.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
2,4,6-TRINITROTOLUENE	ND [0.3] U	ND [0.3] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2,4-DINITROTOLUENE	ND [0.2] U	ND [0.2] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2,6-DINITROTOLUENE	ND [0.3] U	ND [0.3] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.3] U	ND [0.3] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U
2-NITROTOLUENE	ND [0.2] U	ND [0.2] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
3-NITROTOLUENE	ND [0.3] U	ND [0.3] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.13 J	ND [2.6] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.3] U	ND [0.3] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U
4-NITROTOLUENE	ND [0.3] U	ND [0.3] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [1.1] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	0.52	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
NITROBENZENE	ND [0.3] U	ND [0.3] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.2] UJ	ND [0.2] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
TETRYL	ND [0.2] U	ND [0.2] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U

0281179

000459

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW29	LHSMW30	LHSMW30	LHSMW30	LHSMW30	LHSMW31	LHSMW31	LHSMW31
Sample Number:	LHS-MW-29	MW-30	LHS-MW-30	LHS-MW-30	LHS-MW-30	MW-31	LHS-MW-31	LHS-MW-31REFD
Date Sampled:	12/07/1994	02/12/1996	05/16/1998	08/20/1996	12/07/1994	02/12/1996	05/16/1998	05/16/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L								
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L								
1,3,5-TRINITROBENZENE	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] UJ	ND [1.3] UJ
2,4,6-TRINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	0.82	ND [1.3] UJ	ND [1.3] UJ
2,4-DINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] UJ	ND [1.3] UJ
2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] UJ	ND [2.6] UJ
2-AMINO-4,6-DINITROTOLUENE	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] UJ	ND [2.6] UJ
2-NITROTOLUENE	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] UJ	ND [2.6] UJ
3-NITROTOLUENE	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] UJ	ND [2.6] UJ
4-AMINO-2,6-DINITROTOLUENE	ND [0.25] U	0.69	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] UJ	ND [2.6] UJ
4-NITROTOLUENE	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] UJ	ND [2.6] UJ
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] UJ	ND [1.3] UJ
NITROBENZENE	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] UJ	ND [1.3] UJ
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] UJ	ND [1.3] UJ
TETRYL	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] UJ	ND [2.6] UJ

000460

028130

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW31	LHSMW31	LHSMW32	LHSMW32	LHSMW32	LHSMW32	LHSMW33	LHSMW33	LHSMW33
Sample Number:	LHS-MW-31	LHS-MW-31	MW-32	LHS-MW-32	LHS-MW-32	LHS-MW-32	MW-33	LHS-MW-33	LHS-MW-33
Date Sampled:	08/20/1996	12/06/1994	02/12/1996	05/17/1998	08/20/1996	12/05/1994	02/13/1996	05/17/1998	08/20/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U
2-NITROTOLUENE	2.9	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U
4-NITROTOLUENE	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	0.32	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
TETRYL	ND [0.13] U	ND [0.37] U	0.32	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U

000463

0281181

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW33	LHSMW34	LHSMW34	LHSMW34	LHSMW34	LHSMW35	LHSMW35	LHSMW35	LHSMW35
Sample Number:	LHS-MW-33	MW-34	LHS-MW-34	LHS-MW-34	LHS-MW-34	MW-35	LHS-MW-35	LHS-MW-35	LHS-MW-35
Date Sampled:	12/05/1994	02/13/1996	05/17/1998	08/20/1996	12/05/1994	02/08/1996	05/17/1998	08/20/1996	12/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U
2,4,6-TRINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,4-DINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA
2-NITROTOLUENE	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
3-NITROTOLUENE	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.34	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U
4-NITROTOLUENE	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.54] U	ND [0.26] U	ND [1.3] U	0.62	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
NITROBENZENE	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U
TETRYL	ND [0.37] U	0.15	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U

000465

028182

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW36	LHSMW36	LHSMW36	LHSMW36	LHSMW37	LHSMW37	LHSMW37	LHSMW37	LHSMW38
Sample Number:	MW-36	LHS-MW-36	LHS-MW-36	LHS-MW-36	MW-37	LHS-MW-37	LHS-MW-37	LHS-MW-37	MW-38
Date Sampled:	02/13/1996	05/17/1998	08/22/1996	12/05/1994	02/08/1996	05/17/1998	08/22/1996	12/05/1994	02/12/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U
4-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U
TETRYL	0.23	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U

0004632

0281183

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW38	LHSMW38	LHSMW38	LHSMW39	LHSMW39	LHSMW39	LHSMW39	LHSMW41	LHSMW41
Sample Number:	LHS-MW-38	LHS-MW-38	LHS-MW-38	MW-39	LHS-MW-39	LHS-MW-39	LHS-MW-39	MW-41	LHS-MW-41
Date Sampled:	05/17/1998	08/21/1996	12/06/1994	02/10/1996	05/18/1998	08/22/1996	12/06/1994	02/09/1996	05/18/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U
2,4,6-TRINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U
2,4-DINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	0.1 J	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U
2,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U
2-AMINO-4,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U
2-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U
3-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U
4-AMINO-2,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U
4-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [1.5] U	0.47	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U
NITROBENZENE	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U
TETRYL	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW41	LHSMW41	LHSMW42	LHSMW42	LHSMW42	LHSMW42	LHSMW43	LHSMW43	LHSMW43
Sample Number:	LHS-MW-41	LHS-MW-41	MW-42	LHS-MW-42	LHS-MW-42	LHS-MW-42	MW-43	LHS-MW-43	LHS-MW-43
Date Sampled:	08/22/1996	12/08/1994	02/11/1996	05/18/1998	08/22/1996	12/06/1994	02/09/1996	05/18/1998	08/22/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA		NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA		NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA		NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [0.5] U	0.18 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [0.5] U	0.2 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U
4-NITROTOLUENE	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [0.13] U	0.2	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U
TETRYL	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U

000185

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Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW43	LHSMW44	LHSMW44	LHSMW44	LHSMW44	LHSMW45	LHSMW45	LHSMW45	LHSMW45
Sample Number:	LHS-MW-43	MW-44	LHS-MW-44	LHS-MW-44	LHS-MW-44	MW-45	LHS-MW-45	LHS-MW-45	LHS-MW-45
Date Sampled:	12/08/1994	02/08/1996	05/18/1998	08/22/1996	12/08/1994	02/10/1996	05/18/1998	08/22/1996	12/08/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U
2,4,6-TRINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,4-DINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA
2-NITROTOLUENE	ND [0.5] U	0.16 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
3-NITROTOLUENE	ND [0.5] U	0.15 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	0.94	ND [2.6] U	ND [0.13] U	ND [0.25] U
4-NITROTOLUENE	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.54] U	0.25 J	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
NITROBENZENE	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U
TETRYL	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U

000466

028186

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW46	LHSMW46	LHSMW46	LHSMW46	LHSMW47	LHSMW47	LHSMW47	LHSMW47	LHSMW48
Sample Number:	MW-46	LHS-MW-46	LHS-MW-46	LHS-MW-46	MW-47	LHS-MW-47	LHS-MW-47	LHS-MW-47	LHS-MW-48
Date Sampled:	02/08/1996	05/18/1998	08/22/1996	12/08/1994	02/08/1996	05/18/1998	08/22/1996	12/07/1994	05/19/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [1.3] UJ
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [1.3] UJ
2,4-DINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [1.3] UJ
2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [2.6] UJ
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [2.6] UJ
2-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [2.6] UJ
3-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [2.6] UJ
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [2.6] UJ
4-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [2.6] UJ
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [1.3] UJ
NITROBENZENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [1.3] UJ
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [1.3] UJ
TETRYL	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [2.6] UJ

0028187

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW48	LHSMW48	LHSMW48	LHSMW48	LHSMW49	LHSMW49	LHSMW49	LHSMW49
Sample Number:	LHS-MW-48REFD	LHS-MW-48	LHS-MW-48	LHS-MW-48FD	MW-49	LHS-MW-49	LHS-MW-49	LHS-MW-49
Date Sampled:	05/28/1998	08/22/1996	12/09/1994	12/09/1994	02/09/1996	05/19/1998	08/22/1996	12/07/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L								
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L								
1,3,5-TRINITROBENZENE	ND [1.3] UJ	ND [0.26] U	ND [0.12] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U
2,4,6-TRINITROTOLUENE	ND [1.3] UJ	ND [0.13] U	ND [0.12] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,4-DINITROTOLUENE	ND [1.3] UJ	ND [0.13] U	ND [0.12] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,6-DINITROTOLUENE	ND [2.6] UJ	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [2.6] UJ	ND [0.13] U	NA	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA
2-NITROTOLUENE	ND [2.6] UJ	ND [0.26] U	ND [0.5] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
3-NITROTOLUENE	ND [2.6] UJ	ND [0.26] U	ND [0.5] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-AMINO-2,6-DINITROTOLUENE	ND [2.6] UJ	ND [0.13] U	ND [0.25] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U
4-NITROTOLUENE	ND [2.6] UJ	ND [0.26] U	ND [1.5] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [1.3] UJ	ND [0.26] U	ND [0.54] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
NITROBENZENE	ND [1.3] UJ	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.3] UJ	ND [0.26] U	ND [1.1] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	0.76	ND [1.1] U
TETRYL	ND [2.6] UJ	ND [0.13] U	ND [0.37] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	1.3	ND [0.37] U

000457

028188

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW50	LHSMW50	LHSMW50	LHSMW50	LHSMW51	LHSMW51	LHSMW51	LHSMW51	LHSMW52
Sample Number:	MW-50	LHS-MW-50	LHS-MW-50	LHS-MW-50	MW-51	LHS-MW-51	LHS-MW-51	LHS-MW-51	MW-52
Date Sampled:	02/09/1996	05/19/1998	08/22/1996	12/09/1994	02/13/1996	05/19/1998	08/22/1996	12/11/1994	02/09/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA		NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA		NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA		NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U
2,4-DINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U
2-NITROTOLUENE	0.25 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U
3-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.2 J
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U
4-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U
TETRYL	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U

000465

028189

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW52	LHSMW52	LHSMW52	LHSMW53	LHSMW53	LHSMW53	LHSMW53	LHSMW53
Sample Number:	LHS-MW-52	LHS-MW-52	LHS-MW-52	MW-53	LHS-MW-53	LHS-MW-53REFD	LHS-MW-53	LHS-MW-53
Date Sampled:	05/19/1998	08/22/1996	12/11/1994	02/10/1996	05/20/1998	05/20/1998	08/22/1996	12/07/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L								
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L								
1,3,5-TRINITROBENZENE	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [1.3] U	ND [0.26] U	ND [0.12] U
2,4,6-TRINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,4-DINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	ND [0.13] U	0.2	ND [2.6] U	ND [2.6] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	NA	0.33	ND [2.6] U	ND [2.6] U	ND [0.13] U	NA
2-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
3-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-AMINO-2,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [2.6] U	ND [0.13] U	ND [0.25] U
4-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [2.6] U	ND [0.26] U	ND [1.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
NITROBENZENE	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [1.3] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [1.3] U	ND [0.26] U	ND [1.1] U
TETRYL	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [2.6] U	ND [0.13] U	ND [0.37] U

25000

028190

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW54	LHSMW54	LHSMW54	LHSMW54	LHSMW55	LHSMW55	LHSMW55	LHSMW55	LHSMW56
Sample Number:	MW-54	LHS-MW-54	LHS-MW-54	LHS-MW-54	MW-55	LHS-MW-55	LHS-MW-55	LHS-MW-55	MW-56
Date Sampled:	02/12/1996	05/20/1998	08/21/1996	12/09/1994	02/10/1996	05/20/1998	08/22/1996	12/09/1994	02/09/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U
2,4,6-TRINITROTOLUENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U
2,4-DINITROTOLUENE	0.59	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	0.56	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	0.86	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U
2-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U
3-NITROTOLUENE	0.17 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.15 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	0.11 J	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U
4-NITROTOLUENE	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	0.15 J	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U
NITROBENZENE	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U
TETRYL	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U

0281191

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW56	LHSMW56	LHSMW56	LHSMW57	LHSMW57	LHSMW57	LHSMW57	LHSMW57	LHSMW60
Sample Number:	LHS-MW-56	LHS-MW-56	LHS-MW-56	MW-57	LHS-MW-57	LHS-MW-57	LHS-MW-57	LHS-MW-57FD	MW-60
Date Sampled:	05/20/1998	08/21/1996	12/07/1994	02/08/1996	05/20/1998	08/21/1996	12/09/1994	12/09/1994	02/09/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
1,3,5-TRINITROBENZENE	ND [1.3] U	ND [0.26] U	ND [0.12] U	0.21 J	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.12] U	ND [0.26] U
2,4,6-TRINITROTOLUENE	ND [1.3] U	6.8	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.12] U	ND [0.13] U
2,4-DINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.12] U	ND [0.13] U
2,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	NA	ND [0.13] U
2-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.5] U	ND [0.26] U
3-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	0.19 J	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.5] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.25] U	ND [0.13] U
4-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [1.5] U	ND [0.26] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.54] U	ND [0.26] U
NITROBENZENE	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [1.1] U	ND [0.26] U
TETRYL	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.37] U	ND [0.13] U

0028192

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW60	LHSMW60	LHSMW60	LHSMW61	LHSMW61	LHSMW61	LHSMW61
Sample Number:	LHS-MW-60	LHS-MW-60	LHS-MW-60	MW-61	LHS-MW-61	LHS-MW-61	LHS-MW-61
Date Sampled:	05/20/1998	08/21/1996	12/11/1994	02/11/1996	05/20/1998	08/15/1996	12/10/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L							
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L							
1,3,5-TRINITROBENZENE	ND [1.3] U	ND [0.26] U	ND [0.12] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.12] U
2,4,6-TRINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,4-DINITROTOLUENE	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA
2-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	0.39	ND [0.5] U
3-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-AMINO-2,6-DINITROTOLUENE	ND [2.6] U	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U
4-NITROTOLUENE	ND [2.6] U	ND [0.26] U	ND [1.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [1.5] U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	ND [1.3] U	ND [0.26] U	ND [0.54] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [0.54] U
NITROBENZENE	ND [1.3] U	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.13] U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	ND [1.3] U	ND [0.26] U	ND [1.1] U	ND [0.26] U	ND [1.3] U	ND [0.26] U	ND [1.1] U
TETRYL	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U

028193

Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	105	105	47WW01	47WW01	47WW01	47WW01	47WW02	47WW03	47WW04	47WW05	47WW06
Sample Number:	LHS-MW-105	105	47WW01	47WW01AFD	47WW01LFD	47WW01	47WW02	47WW03	47WW04	47WW05	47WW06
Date Sampled:	02/13/1996	05/18/1998	09/29/1998	09/29/1998	09/29/1998	11/07/1998	11/04/1998	11/05/1998	11/05/1998	11/09/1998	11/06/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	3550 J	800	5200 J	NA	5100 J	4300	1100	1100	4200	1300	430 J
ANTIMONY	ND [60] U	ND [5] U	8	NA	ND [25] U	ND [5] U	ND [5] U	ND [5] U	12	ND [5] U	ND [5] U
ARSENIC	ND [2] U	ND [10] U	ND [10] U	NA	ND [50] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	37 J
BARIUM	41	ND [200] U	ND [200] U	NA	ND [1000] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U
BERYLLIUM	ND [5] U	1.4	0.5	NA	ND [2.5] U	ND [0.5] U	0.6	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U
CADMIUM	ND [10] U	1.3	ND [0.8] U	NA	ND [4] U	ND [0.8] U	ND [0.8] U	1.5	2.1	ND [0.8] U	0.8 J
CALCIUM	317000	290000	57000	NA	60000	55000	7300	130000	220000	89000	35000 J
CHROMIUM, TOTAL	ND [10] U	10 J	50	NA	ND [50] U	40 J	80	50	70	450 J	20 J
COBALT	ND [10] U	ND [50] U	ND [50] U	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
COPPER	30	ND [25] U	26	NA	ND [125] U	ND [25] U	ND [25] U	ND [25] U	ND [25] U	29	ND [25] U
IRON	3970 J	2200	5600	NA	5800	5000 J	16000	2200	5500	3200 J	1400 J
LEAD	ND [30] U	ND [3] U	7	NA	24	ND [3] U	6	ND [3] U	15	ND [3] U	ND [3] U
MAGNESIUM	211000	210000	43000	NA	45000	39000	7100	93000	160000	54000	18000 J
MANGANESE	323	374	237	NA	245	201	248	288	995	677	175 J
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	NA	NA	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	18	ND [40] UJ	60	NA	ND [200] U	50	50	60	70	330	40 J
POTASSIUM	2820 J	ND [5000] U	ND [5000] U	NA	ND [25000] U	ND [5000] U	ND [5000] U	7700	ND [5000] U	ND [5000] U	10000 J
SELENIUM	ND [2] U	ND [5] U	ND [5] U	NA	40 U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SILVER	ND [10] U	ND [10] U	ND [10] U	NA	ND [50] U	ND [10] U	ND [10] U	ND [10] R	ND [10] R	ND [10] U	ND [10] R
SODIUM	NA	1100000	510000	NA	480000	450000	89000	720000	1000000	630000	260000 J
STRONTIUM	7190 J	15000	1800	NA	1600	2000	210	4600	6600	3100	920 J
THALLIUM	ND [90] U	ND [1] UJ	ND [1] U	34.2	NA	ND [1] UJ	1.3	ND [1] U	ND [1] U	1.2 J	ND [1] U
TIN	NA	ND [100] U	ND [100] U	NA	ND [500] U	110	120000	ND [100] U	ND [100] U	100	ND [100] U
VANADIUM	ND [10] U	ND [50] U	ND [50] U	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
ZINC	63	40	40	NA	ND [100] U	30	50	20	30	40	20 J

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Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW06	47WW06	47WW07	47WW08	47WW09	47WW11	47WW12	47WW13	47WW14	47WW15	47WW15	47WW15
Sample Number:	47WW06AFD	47WW06LFD	47WW07	47WW08	47WW09	47WW11	47WW12	47WW13	47WW14	47WW15	47WW15AFD	47WW15LFD
Date Sampled:	11/06/1998	11/06/1998	11/06/1998	11/04/1998	11/04/1998	11/07/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L												
ALUMINUM	NA	ND [1000] U	9600	2200	ND [200] U	1700	6300	3300	ND [200] U	1900	NA	1800
ANTIMONY	NA	ND [25] U	ND [5] U	18	5	ND [5] U	8	32	ND [5] U	ND [5] U	NA	ND [25] U
ARSENIC	NA	137 J	28	17	11	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	ND [50] U
BARIUM	NA	ND [1000] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	NA	ND [1000] U
BERYLLIUM	NA	ND [2.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	0.6	ND [0.5] U	ND [0.5] U	ND [0.5] U	NA	ND [2.5] U
CADMIUM	NA	4.4 J	1	ND [0.8] U	ND [0.8] U	3.5	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	NA	ND [4] U
CALCIUM	NA	36000 J	14000	150000	200000	160000	7800	53000	43000	17000	NA	ND [25000] U
CHROMIUM, TOTAL	NA	60 J	150	430	220	380 J	20	2300	ND [10] U	40	NA	ND [50] U
COBALT	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	110	ND [50] U	ND [50] U	NA	ND [250] U
COPPER	NA	ND [125] U	ND [25] U	ND [25] U	121	ND [25] U	ND [25] U	ND [25] U	ND [25] U	ND [25] U	NA	ND [125] U
IRON	NA	1700 J	9700	7000	1400	4200 J	7600	16000	550	2900	NA	3300
LEAD	NA	ND [15] U	5	5	6	4	ND [3] U	ND [3] U	4	4	NA	ND [15] U
MAGNESIUM	NA	ND [25000] U	7200	95000	140000	120000	ND [5000] U	41000	29000	ND [5000] U	NA	ND [25000] U
MANGANESE	NA	155 J	222	2530	322	1900	269	4560	141	69	NA	ND [75] U
MERCURY	NA	NA	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	NA	NA
NICKEL	NA	ND [200] U	120	1100	160	530	50	1800	50	70	NA	ND [200] U
POTASSIUM	NA	45000 J	12000	5300	5900	ND [5000] U	ND [5000] U	5600	5100	7600	NA	ND [25000] U
SELENIUM	NA	ND [25] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	NA	ND [25] U
SILVER	NA	ND [50] R	ND [10] R	ND [10] U	ND [10] U	ND [10] U	ND [10] U	40	ND [10] U	ND [10] U	NA	ND [50] U
SODIUM	NA	250000 J	280000	980000	600000	800000	110000	380000	210000	70000	NA	69000
STRONTIUM	NA	550 J	730	5700	7200	4900	140	1400	1600	380	NA	260
THALLIUM	51.1 J	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] UJ	1.6	1.1	ND [1] U	1.4	44.2	NA
TIN	NA	ND [500] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	110	NA	ND [500] U
VANADIUM	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	NA	ND [250] U
ZINC	NA	ND [100] U	50	30	ND [20] U	60	40	40	30	50	NA	ND [100] U

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Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW16	47WW17	47WW18	47WW18	47WW19	47WW20	47WW21	47WW22	47WW23	47WW23	47WW24	47WW25
Sample Number:	47WW16	47WW17	47WW18	47WW18	47WW19	47WW20	47WW21	47WW22	47WW23	47WW23	47WW24	47WW25
Date Sampled:	11/04/1998	11/09/1998	09/29/1998	11/06/1998	11/06/1998	11/05/1998	11/05/1998	11/05/1998	09/29/1998	11/05/1998	12/20/2000	12/20/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L												
ALUMINUM	6100	1100	2200 J	1700	ND [200] U	980	310	2100	ND [200] UJ	ND [200] U	ND [50] U	179
ANTIMONY	30	7	7	ND [5] U	ND [5] U	ND [5] U	21	16	ND [5] U	ND [5] U	ND [5] U	ND [5] U
ARSENIC	ND [10] U	ND [10] U	ND [10] U	ND [10] U	11	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [7] U	ND [7] U
BARIUM	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	141	52.7
BERYLLIUM	0.5	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.8] U	ND [0.8] U
CADMIUM	ND [0.8] U	3.1	ND [0.8] U	1.4	1.5	ND [0.8] U	ND [0.8] U	1.8	ND [0.8] U	1	ND [1] U	ND [1] U
CALCIUM	230000	460000	95000	89000	120000	17000	ND [5000] U	420000	43000	38000	355000	10000
CHROMIUM, TOTAL	890	200 J	440	460	180	220	10	130	10	ND [10] U	ND [5] U	ND [5] U
COBALT	80	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	30.2	ND [10] U
COPPER	ND [25] U	ND [25] U	ND [25] U	ND [25] U	ND [25] U	52	ND [25] U	ND [25] U	ND [25] U	ND [25] U	ND [10] UJ	ND [10] UJ
IRON	18000	4300 J	4700	3800	1700	2900	380	3900	450	280	113	204
LEAD	9	7	4	7	5	7	ND [3] U	14	ND [3] U	7	ND [3] U	ND [3] U
MAGNESIUM	160000	280000	75000	71000	65000	ND [5000] U	ND [5000] U	310000	26000	24000 J	157000	9060
MANGANESE	7750	5560	1030	958	855	54	65	468	163	122	3350	81.6
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.3	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	1400	480	320	530	130	160	ND [40] U	210	ND [40] U	ND [40] U	61.8 J	ND [10] UJ
POTASSIUM	6400	ND [5000] U	ND [5000] U	ND [5000] U	32000	7600	ND [5000] U	6200	ND [5000] U	ND [5000] U	3990 J	1350 J
SELENIUM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	11 U	ND [5] U	17.5	ND [10] U
SILVER	ND [10] U	ND [10] U	10	ND [10] R	ND [10] R	ND [10] R	10 J	ND [10] R	ND [10] U	ND [10] R	ND [2] U	ND [2] U
SODIUM	1200000	1200000	600000	530000	250000	44000	75000	930000	130000	100000	987000 J	89800
STRONTIUM	9500	19000	2700	2600	3100	230	ND [50] U	9000	680	500	4970	278
THALLIUM	1.4	1.1 J	ND [1] U	ND [1] U	1.4	ND [1] U	1.3	ND [1] U	ND [1] U	1.2	ND [5] U	ND [5] U
TIN	ND [100] U	120	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	NA	NA
VANADIUM	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [10] U	ND [10] U
ZINC	40	30	40	30	30	30	20	40	30	ND [20] U	13.8 J	ND [10] UJ

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Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW26	47WW27	LHSMW28	LHSMW28	LHSMW28	LHSMW28	LHSMW29	LHSMW29	LHSMW29	LHSMW29	LHSMW30
Sample Number:	47WW26	47WW27	MW-28	LHS-MW-28	LHS-MW-28	LHS-MW-28	LHS-MW-29	LHS-MW-29	LHS-MW-29	LHS-MW-29	LHS-MW-30
Date Sampled:	12/20/2000	12/19/2000	02/11/1996	05/16/1998	08/20/1996	12/07/1994	02/11/1996	05/16/1998	08/20/1996	12/07/1994	02/12/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	193	857 J	6500	4100	10900 J	23900	3590 J	300	17000 J	39300	3180 J
ANTIMONY	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [40] U	ND [100] U	ND [60] U	ND [5] U	ND [40] U	ND [100] U	ND [60] U
ARSENIC	ND [7] U	ND [7] U	5	ND [10] U	ND [1] U	2.3	5	ND [10] U	1.7 J	12	2.4
BARIUM	52.2	84.2	160	ND [200] U	255	370	70	ND [200] U	162	320	82
BERYLLIUM	ND [0.8] U	ND [0.8] U	0.3	ND [0.5] U	ND [6] U	NA	ND [5] U	ND [0.5] U	ND [6] U	NA	ND [5] U
CADMIUM	ND [1] U	ND [1] U	0.3	ND [0.8] U	ND [6] U	ND [10] U	ND [10] U	ND [0.8] U	ND [6] U	ND [10] U	ND [10] U
CALCIUM	14300	4560	5400	ND [5000] U	9250 J	8800	171000 J	120000	179000	210000	114000 J
CHROMIUM, TOTAL	ND [5] U	ND [5] U	500	590	2240 J	74	58	80	864	58	194
COBALT	ND [10] U	ND [10] U	8.8	ND [50] U	ND [20] U	34	ND [10] U	ND [50] U	ND [20] U	41	17
COPPER	ND [10] UJ	ND [10] U	22	ND [25] U	57 J	27	40	ND [25] U	44 J	50	25
IRON	452	952 J	12300	6600	30400 J	38300	4080 J	1600	28300 J	58000	6290 J
LEAD	ND [3] U	ND [3] U	6.8	ND [3] U	95 J	24	ND [30] U	ND [3] U	248 J	26	ND [30] U
MAGNESIUM	8810	2630	3600	ND [5000] U	6260 J	5800	80900 J	59000	86200 J	96800	83700 J
MANGANESE	83.7	71.9	380	206	633	1000	71	365	981	2600	1000 J
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.18	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.087 J	ND [0.2] U	ND [0.2] U
NICKEL	ND [10] UJ	ND [10] U	240	560	395	NA	137	140	612	NA	902
POTASSIUM	2060 J	ND [1000] U	840	ND [5000] U	1260 J	2300	1190 J	ND [5000] U	3200 J	4100	1910 J
SELENIUM	ND [10] U	ND [10] UJ	ND [2] U	ND [5] U	1.2 J	ND [2] U	4.1	ND [5] U	4.8 J	4	ND [2] U
SILVER	ND [2] U	ND [2] U	ND [0.4] U	30	ND [6] U	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U	ND [10] U
SODIUM	87100	38200	NA	48000	NA	NA	NA	550000	NA	NA	NA
STRONTIUM	288	76.9	94	130	189 J	140	3250 J	4100	3120 J	3900	2840 J
THALLIUM	ND [5] U	ND [5] U	ND [1.7] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U
TIN	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA
VANADIUM	ND [10] U	ND [10] U	17	ND [50] U	29 J	NA	ND [10] U	ND [50] U	39 J	NA	ND [10] U
ZINC	ND [10] UJ	ND [10] UJ	48	30	68 J	NA	33	30	89 J	NA	31

25000

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Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW30	LHSMW30	LHSMW30	LHSMW31	LHSMW31	LHSMW31	LHSMW31	LHSMW32	LHSMW32	LHSMW32	LHSMW32
Sample Number:	LHS-MW-30	LHS-MW-30	LHS-MW-30	LHS-MW-31	LHS-MW-31	LHS-MW-31	LHS-MW-31	LHS-MW-32	LHS-MW-32	LHS-MW-32	LHS-MW-32
Date Sampled:	05/16/1998	08/20/1996	12/07/1994	02/12/1996	05/16/1998	08/20/1996	12/06/1994	02/12/1996	05/17/1998	08/20/1996	12/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	3700	10300 J	15000	1130 J	ND [200] U	515 J	17100	4030 J	340	7800 J	14000
ANTIMONY	ND [5] U	ND [40] U	ND [100] U	ND [60] U	ND [5] U	ND [40] U	ND [100] U	ND [60] U	ND [5] U	ND [40] U	ND [100] U
ARSENIC	ND [10] U	ND [1] U	ND [2] U	4.8	ND [10] U	ND [1] U	4.4	ND [2] U	ND [10] U	ND [1] U	ND [2] U
BARIUM	440	201	240	51	ND [200] U	44 J	150	88	ND [200] U	181	200
BERYLLIUM	0.8	ND [6] U	NA	ND [5] U	ND [0.5] U	ND [6] U	NA	ND [5] U	ND [0.5] U	ND [6] U	NA
CADMIUM	ND [0.8] U	ND [6] U	ND [10] U	ND [10] U	ND [0.8] U	ND [6] U	ND [10] U	ND [10] U	ND [0.8] U	ND [6] U	ND [10] U
CALCIUM	37000	137000 J	114000	42400 J	40000	52200 J	49800	3140 J	ND [5000] U	3920 J	7500
CHROMIUM, TOTAL	50	342	91	62	10	12 J	40	25	40	713	31
COBALT	ND [50] U	60 J	28	ND [10] U	ND [50] U	ND [20] U	ND [20] U	11	ND [50] U	21 J	22
COPPER	ND [25] U	39 J	33	31	ND [25] U	ND [7] U	ND [20] U	24	ND [25] U	40 J	30
IRON	4000	37400 J	39300	4400 J	500	1140 J	35600	5640 J	1300	16400 J	28900
LEAD	ND [3] U	247 J	17	ND [30] U	ND [3] U	143 J	15	ND [30] U	ND [3] U	ND [90] U	17
MAGNESIUM	26000	94500 J	78900	36100 J	38000	43100 J	42800	2000 J	ND [5000] U	3440 J	3000
MANGANESE	740	1710 J	1300	12	49	94 J	390	201	64	290	950
MERCURY	ND [0.2] U	ND [0.02] U	ND [0.2] U	0.3	ND [0.2] U	ND [0.02] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.029 J	ND [0.2] U
NICKEL	660	2940 J	NA	113	130	56 J	NA	40	ND [40] U	338	NA
POTASSIUM	ND [5000] U	3710 J	3200	1790 J	ND [5000] U	1630 J	3100	876	ND [5000] U	1570 J	2300
SELENIUM	ND [5] U	1.7 J	ND [4] U	ND [2] U	ND [5] U	ND [1] U	ND [2] U	ND [2] U	ND [5] U	ND [1] U	2.1
SILVER	ND [10] U	ND [6] U	ND [10] U	ND [10] U	ND [10] U	7 J	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U
SODIUM	180000	NA	NA	NA	350000	NA	NA	NA	8800	NA	NA
STRONTIUM	1700	3030 J	2900	1100 J	2000	1210 J	1200	49	ND [50] U	84 J	ND [100] U
THALLIUM	ND [1] U	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U
TIN	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	ND [50] U	36 J	NA	ND [10] U	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA
ZINC	30	82 J	NA	27	ND [20] U	ND [20] U	110	46	40	62 J	NA

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Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW33	LHSMW33	LHSMW33	LHSMW34	LHSMW34	LHSMW34	LHSMW34	LHSMW35	LHSMW35	LHSMW35	LHSMW35
Sample Number:	LHS-MW-33	LHS-MW-33	LHS-MW-33	LHS-MW-34	LHS-MW-34	LHS-MW-34	LHS-MW-34	MW-35	LHS-MW-35	LHS-MW-35	LHS-MW-35
Date Sampled:	02/13/1996	05/17/1998	12/05/1994	02/13/1996	05/17/1998	08/20/1996	12/05/1994	02/08/1996	05/17/1998	08/20/1996	12/05/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	1250 J	400	19500	1000 J	ND [200] U	711 J	13900	690	440	3830 J	9000
ANTIMONY	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [40] U	ND [100] U	ND [25] U	ND [5] U	ND [40] U	ND [100] U
ARSENIC	ND [2] U	ND [10] U	2.8	ND [2] U	ND [10] U	ND [1] U	2.5	2.1	ND [10] U	ND [1] U	2.3
BARIUM	97	ND [200] U	290	228	ND [200] U	149	440	74	ND [200] U	105	160
BERYLLIUM	ND [5] U	ND [0.5] U	NA	ND [5] U	ND [0.5] U	ND [6] U	NA	ND [0.2] U	0.6	ND [6] U	NA
CADMIUM	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	0.8	ND [6] U	ND [10] U	ND [0.2] U	1.2	ND [6] U	ND [10] U
CALCIUM	34100 J	18000	25300	25200 J	6600	13000 J	31600	16600	13000	16500 J	19500
CHROMIUM, TOTAL	2720 J	40	99	49	ND [10] U	20 J	30	170	20	346	26
COBALT	46	ND [50] U	ND [20] U	ND [10] U	ND [50] U	ND [20] U	ND [20] U	ND [2.5] U	ND [50] U	ND [20] U	ND [20] U
COPPER	50	ND [25] U	40	32	ND [25] U	ND [7] U	ND [20] U	6.7	ND [25] U	8 J	ND [20] U
IRON	17800 J	2300	31400	1900 J	220	1480 J	24700	2500	1100	10600 J	19400
LEAD	ND [30] U	ND [3] U	21	ND [30] U	ND [3] U	ND [90] U	14	ND [1] U	ND [3] U	ND [90] U	12
MAGNESIUM	29400 J	18000	18900	17500 J	ND [5000] U	9240 J	22400	12100	10000	12400 J	14000
MANGANESE	989	188	740	158	169	218	500	120	58	98 J	300
MERCURY	ND [0.2] U	0.4	ND [0.2] U	0.4	ND [0.2] U	ND [0.02] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.02] U	ND [0.2] U
NICKEL	2690 J	490	NA	47	ND [40] U	39 J	NA	81	ND [40] U	81 J	NA
POTASSIUM	2030 J	ND [5000] U	3600	939	ND [5000] U	871 J	2600	4100	ND [5000] U	2740 J	2400
SELENIUM	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [1] U	ND [2] U	ND [2] U	ND [5] U	ND [1] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U	ND [0.4] U	ND [10] U	ND [6] U	ND [10] U
SODIUM	NA	360000	NA	NA	93000	NA	NA	NA	190000	NA	NA
STRONTIUM	743	790	440	765	460	356	920	520	980	480	550
THALLIUM	ND [90] U	ND [1] U	ND [500] U	ND [90] U	ND [1] U	ND [90] U	ND [500] U	ND [1.7] U	ND [1] U	ND [90] U	ND [500] U
TIN	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	10	ND [50] U	NA	ND [10] U	ND [50] U	ND [20] U	NA	ND [1.7] U	ND [50] U	ND [20] U	NA
ZINC	35	20	NA	28	30	ND [20] U	NA	24	20	32 J	NA

0028199

00042500

Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW36	LHSMW36	LHSMW36	LHSMW37	LHSMW37	LHSMW37	LHSMW38	LHSMW38	LHSMW38	LHSMW38	LHSMW39
Sample Number:	LHS-MW-36	LHS-MW-36	LHS-MW-36	MW-37	LHS-MW-37	LHS-MW-37	LHS-MW-38	LHS-MW-38	LHS-MW-38	LHS-MW-38	LHS-MW-39
Date Sampled:	02/13/1996	05/17/1998	12/05/1994	02/08/1996	05/17/1998	12/05/1994	02/12/1996	05/17/1998	08/21/1996	12/06/1994	02/10/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	1700 J	ND [200] U	2800	1040 J	260	3800	3010 J	220	1590 J	4400	1330 J
ANTIMONY	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [40] U	ND [100] U	ND [60] U
ARSENIC	ND [2] U	ND [10] U	ND [2] U	ND [2] U	ND [10] U	ND [2] U	ND [2] U	ND [10] U	ND [1] U	ND [2] U	ND [2] U
BARIUM	133	ND [200] U	150	57	ND [200] U	92	81	ND [200] U	48 J	88	39
BERYLLIUM	ND [5] U	ND [0.5] U	NA	ND [5] U	0.6	NA	ND [5] U	0.5	ND [6] U	NA	ND [5] U
CADMIUM	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [6] U	ND [10] U	ND [10] U
CALCIUM	30500 J	21000	22900	32300 J	56000	44000	4490 J	ND [5000] U	3400 J	3400	59500 J
CHROMIUM, TOTAL	14	50	ND [20] U	ND [10] U	300 J	ND [20] U	30	20 J	20 J	ND [20] U	16
COBALT	ND [10] U	ND [50] U	ND [20] U	14	ND [50] U	ND [20] U	ND [10] U	ND [50] U	ND [20] U	ND [20] U	13
COPPER	27	ND [25] U	ND [20] U	15	ND [25] U	ND [20] U	29	ND [25] U	10 J	ND [20] U	25
IRON	2500 J	640	6500	1040 J	1700 J	3900	6330 J	500	2520	10600	2240 J
LEAD	ND [30] U	ND [3] U	4.3	52	ND [3] U	7	ND [30] U	ND [3] U	ND [90] U	11	78
MAGNESIUM	10900 J	17000	12900	20400 J	35000	32500	2810 J	ND [5000] U	1930 J	1500	43600 J
MANGANESE	161	264	250	727	1370	1100	139	22	90 J	290	641
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.03 J	ND [0.2] U	ND [0.2] U
NICKEL	26	90	NA	27	180 J	NA	40	ND [40] UJ	42 J	NA	47
POTASSIUM	2700 J	ND [5000] U	2100	1800 J	ND [5000] U	3500	833	ND [5000] U	873 J	ND [2000] U	2350 J
SELENIUM	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [1] U	ND [2] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U	ND [10] U
SODIUM	NA	100000	NA	NA	110000	NA	NA	8100	NA	NA	NA
STRONTIUM	774	970	570	828	2600	880	90	60	55 J	ND [100] U	1200 J
THALLIUM	ND [90] U	ND [1] U	ND [500] U	ND [90] U	ND [1] UJ	ND [500] U	ND [90] U	ND [1] UJ	ND [90] U	ND [500] U	ND [90] U
TIN	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	NA
VANADIUM	ND [10] U	ND [50] U	NA	ND [10] U	ND [50] U	NA	ND [10] U	ND [50] U	ND [20] U	NA	ND [10] U
ZINC	31	20	NA	36	40	NA	30	20	24 J	35	42

000488

028200

Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW39	LHSMW39	LHSMW41	LHSMW41	LHSMW41	LHSMW42	LHSMW42	LHSMW42	LHSMW43	LHSMW43	LHSMW43
Sample Number:	LHS-MW-39	LHS-MW-39	LHS-MW-41	LHS-MW-41	LHS-MW-41	LHS-MW-42	LHS-MW-42	LHS-MW-42	MW-43	LHS-MW-43	LHS-MW-43
Date Sampled:	05/18/1998	12/06/1994	02/09/1996	05/18/1998	12/08/1994	02/11/1996	05/18/1998	12/06/1994	02/09/1996	05/18/1998	12/08/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	ND [200] U	38900	251	ND [200] U	1100	1390 J	460	5500	230	ND [200] U	16600
ANTIMONY	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [100] U	ND [25] U	ND [5] U	ND [100] U
ARSENIC	ND [10] U	9.1	ND [2] U	ND [10] U	ND [2] U	ND [2] U	ND [10] U	3.4	ND [2] U	ND [10] U	5.5
BARIUM	ND [200] U	290	241	ND [200] U	120	49	ND [200] U	100	31	ND [200] U	180
BERYLLIUM	0.8	NA	ND [5] U	0.8	NA	ND [5] U	0.9	NA	ND [0.2] U	1.2	NA
CADMIUM	1	ND [10] U	ND [10] U	0.9	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	0.8	0.8	ND [10] U
CALCIUM	57000	69100	99900 J	80000	73200	89200 J	89000	117000	48100	41000	57300
CHROMIUM, TOTAL	90 J	60	ND [10] U	30 J	ND [20] U	86	30 J	ND [20] U	70	530 J	140
COBALT	ND [50] U	45	ND [10] U	ND [50] U	ND [20] U	29	ND [50] U	34	22	ND [50] U	25
COPPER	ND [25] U	47	28	ND [25] U	ND [20] U	37	ND [25] U	ND [20] U	11	ND [25] U	ND [20] U
IRON	1000	58400	367	520	2200	1900 J	1500	6900	1400	2900	18800
LEAD	ND [3] U	22	36	ND [3] U	3.2	85	ND [3] U	5	ND [1] U	ND [3] U	13
MAGNESIUM	47000	52800	39300 J	36000	34600	40400 J	44000	47000	42400	41000	47100
MANGANESE	471	1600	73	70	200	968	630	1200	1300	932	1700
MERCURY	ND [0.2] U	0.28	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.24	ND [0.2] U	0.24
NICKEL	100 J	NA	25	80 J	NA	452	280 J	NA	420	310 J	NA
POTASSIUM	ND [5000] U	4800	6750 J	ND [5000] U	8100	832	ND [5000] U	ND [2000] U	1400	ND [5000] U	3200
SELENIUM	ND [5] U	ND [4] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	2.3
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [0.4] U	10	ND [10] U
SODIUM	700000	NA	NA	450000	NA	NA	640000	NA	NA	450000	NA
STRONTIUM	2500	1400	5600 J	6300	3100	1210 J	2600	1400	990	1900	1100
THALLIUM	ND [1] UJ	ND [500] U	ND [90] U	ND [1] UJ	ND [500] U	ND [90] U	ND [1] UJ	ND [500] U	ND [1.7] U	ND [1] UJ	ND [500] U
TIN	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U	NA
VANADIUM	ND [50] U	NA	ND [10] U	ND [50] U	NA	ND [10] U	ND [50] U	NA	ND [1.7] U	ND [50] U	NA
ZINC	30	270	21	ND [20] U	11	48	30	49	34	30	93

00048

028201

Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW44	LHSMW44	LHSMW44	LHSMW45	LHSMW45	LHSMW45	LHSMW46	LHSMW46	LHSMW46	LHSMW47	LHSMW47
Sample Number:	MW-44	LHS-MW-44	LHS-MW-44	LHS-MW-45	LHS-MW-45	LHS-MW-45	MW-46	LHS-MW-46	LHS-MW-46	MW-47	LHS-MW-47
Date Sampled:	02/08/1996	05/18/1998	12/08/1994	02/10/1996	05/18/1998	12/08/1994	02/08/1996	05/18/1998	12/08/1994	02/08/1996	05/18/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	6770 J	730	1200	489	ND [200] U	2100	9410 J	2800	19100	1120 J	430
ANTIMONY	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U
ARSENIC	3.9	ND [10] U	2.4	ND [2] U	ND [10] U	ND [2] U	ND [2] U	ND [10] U	6.5	ND [2] U	ND [10] U
BARIUM	293	210	150	96	ND [200] U	ND [50] U	69	ND [200] U	240	37	ND [200] U
BERYLLIUM	ND [5] U	0.8	NA	ND [5] U	ND [0.5] U	NA	ND [5] U	ND [0.5] U	NA	ND [5] U	ND [0.5] U
CADMIUM	ND [10] U	0.9	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U
CALCIUM	46800 J	43000	78800	61700 J	51000	47200	2800 J	ND [5000] U	10700	40200 J	30000
CHROMIUM, TOTAL	26	50 J	ND [20] U	ND [10] U	ND [10] UJ	ND [20] U	31	1200 J	44	39	340 J
COBALT	18	ND [50] U	ND [20] U	ND [10] U	ND [50] U	ND [20] U	12	ND [50] U	33	29	ND [50] U
COPPER	11	ND [25] U	ND [20] U	26	36	ND [20] U	24	ND [25] U	38	61	ND [25] U
IRON	8010 J	1200	2700	771	230	2900	8550 J	8200	30000	1670 J	3000
LEAD	109	ND [3] U	3	88	ND [3] U	3.4	67	4	17	136	ND [3] U
MAGNESIUM	18400 J	6700	46000	37400 J	37000	33500	2000 J	ND [5000] U	5300	29800 J	22000
MANGANESE	838	233	1500	1100 J	171	250	170	105	570	960	811
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	33	ND [40] UJ	NA	21	50 J	NA	72	110 J	NA	196	420 J
POTASSIUM	5920 J	ND [5000] U	10100	1400 J	ND [5000] U	ND [2000] U	1390 J	ND [5000] U	3000	1080 J	ND [5000] U
SELENIUM	ND [2] U	ND [5] U	2.4	3.2	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	10	ND [10] U	ND [10] U	40	ND [10] U	ND [10] U	10
SODIUM	NA	130000	NA	NA	530000	NA	NA	52000	NA	NA	360000
STRONTIUM	2900 J	3900	2700	1320 J	1900	1300	50	ND [50] U	120	759	700
THALLIUM	ND [90] U	ND [1] UJ	ND [500] U	ND [90] U	ND [1] UJ	ND [500] U	ND [90] U	ND [1] UJ	ND [500] U	93	ND [1] UJ
TIN	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U
VANADIUM	18	ND [50] U	NA	ND [10] U	ND [50] U	NA	18	ND [50] U	NA	ND [10] U	ND [50] U
ZINC	49	20	27	52	ND [20] U	30	48	20	130	30	30

028202
00048

Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW47	LHSMW48	LHSMW48	LHSMW49	LHSMW49	LHSMW49	LHSMW50	LHSMW50	LHSMW50	LHSMW51	LHSMW51
Sample Number:	LHS-MW-47	LHS-MW-48	LHS-MW-48	LHS-MW-49	LHS-MW-49	LHS-MW-49	LHS-MW-50	LHS-MW-50	LHS-MW-50	MW-51	LHS-MW-51
Date Sampled:	12/07/1994	05/19/1998	12/09/1994	02/09/1996	05/19/1998	12/07/1994	02/09/1996	05/19/1998	12/09/1994	02/13/1996	05/19/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	20700	86000	11700	21500 J	29000	61200	2210 J	ND [200] U	7600	3100	29000
ANTIMONY	ND [100] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] U	ND [100] U	ND [25] U	ND [5] U
ARSENIC	3.4	ND [10] U	4.3	ND [2] U	ND [10] U	5	2.7	ND [10] U	3.1	ND [2] U	ND [10] U
BARIUM	270	420	160	288	430	930	47	ND [200] U	79	110	410
BERYLLIUM	NA	3.9	NA	ND [5] U	1.8	NA	ND [5] U	ND [0.5] U	NA	ND [0.2] U	ND [0.5] U
CADMIUM	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.2] U	ND [0.8] U
CALCIUM	46100	13000	21300	3000 J	ND [5000] U	12800	66600 J	86000	70700	304000	270000
CHROMIUM, TOTAL	110	7900 J	48	41	80 J	790	260	30 J	ND [20] U	1700	43000 J
COBALT	36	180	36	13	ND [50] U	63	11	ND [50] U	ND [20] U	23	130
COPPER	39	185	120	13	ND [25] U	68	26	ND [25] U	ND [20] U	13	306
IRON	28100	110000	16100	17700 J	26000	85300	6840 J	830	13200	12200	10000
LEAD	22	55	10	ND [30] U	16	47	63	ND [3] U	8.6	ND [1] U	8
MAGNESIUM	31800	14000	11500	3010 J	ND [5000] U	10000	48600 J	62000	48700	235000	220000
MANGANESE	1500	1150	1200	138	193	1100	288	166	410	2200	3820
MERCURY	ND [0.2] U	ND [0.2] U	0.51	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.27	ND [0.2] U	0.2
NICKEL	NA	1200 J	NA	44	50 J	NA	270	200 J	NA	1800	8000 J
POTASSIUM	3100	11000	ND [2000] U	1480 J	5800	4100	1540 J	ND [5000] U	2100	2100	6800
SELENIUM	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [20] U	ND [2] U	ND [5] U	ND [2] U	ND [2] U	ND [5] U
SILVER	ND [10] U	190	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [0.4] U	1000
SODIUM	NA	25000	NA	NA	26000	NA	NA	510000	NA	NA	780000
STRONTIUM	810	180	260	69	70	260	1890 J	3200	1800	5800	7700
THALLIUM	ND [500] U	ND [1] UJ	ND [500] U	ND [90] U	ND [1] UJ	ND [500] U	ND [90] U	ND [1] UJ	ND [500] U	ND [1.7] U	ND [1] UJ
TIN	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U
VANADIUM	NA	130	NA	29	ND [50] U	NA	ND [10] U	ND [50] U	NA	7.7	80
ZINC	NA	330	100	79	110	NA	47	ND [20] U	49	21	ND [20] U

028203

000585

Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW51	LHSMW52	LHSMW52	LHSMW52	LHSMW53	LHSMW53	LHSMW53	LHSMW54	LHSMW54	LHSMW54	LHSMW54
Sample Number:	LHS-MW-51	LHS-MW-52	LHS-MW-52	LHS-MW-52	LHS-MW-53	LHS-MW-53	LHS-MW-53	LHS-MW-54	LHS-MW-54	LHS-MW-54	LHS-MW-54
Date Sampled:	12/11/1994	02/09/1996	05/19/1998	12/11/1994	02/10/1996	05/20/1998	12/07/1994	02/12/1996	05/20/1998	08/21/1996	12/09/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	63800	3370 J	1700	27600	620	29000	19800	300	ND [200] U	172 J	2600
ANTIMONY	ND [100] U	ND [60] U	ND [5] U	ND [100] U	ND [60] U	ND [5] R	ND [100] U	ND [60] U	ND [5] R	62	ND [100] U
ARSENIC	8.8	ND [2] U	ND [10] U	5.8	3.7	ND [10] U	8.7	ND [2] U	ND [10] U	ND [1] U	ND [2] U
BARIUM	770	78	ND [200] U	280	194	370	450	231	ND [200] U	208	210
BERYLLIUM	NA	ND [5] U	ND [0.5] U	NA	ND [5] U	2.5	NA	ND [5] U	ND [0.5] U	ND [6] U	NA
CADMIUM	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [0.8] U	ND [6] U	ND [10] U
CALCIUM	295000	8210 J	6300	19700	146000 J	6400	156000	54600 J	75000	61700 J	56100
CHROMIUM, TOTAL	1100	36	20 J	58	713	8400	240	11	20	25 J	36
COBALT	35	ND [10] U	ND [50] U	26	311	80	110	ND [10] U	ND [50] U	ND [20] U	ND [20] U
COPPER	62	29	ND [25] U	52	74	222	49	30	ND [25] U	11 J	ND [20] U
IRON	12800	4520 J	3000	40500	10200 J	82000	47100	471	510	387	5700
LEAD	28	47	ND [3] U	18	41	18	29	ND [30] U	ND [3] U	ND [90] U	6
MAGNESIUM	227000	4270 J	ND [5000] U	9200	125000 J	8100	130000	28400 J	39000	32500 J	29400
MANGANESE	2600	267	124	890	5710 J	719	3500	429	505	480	530
MERCURY	ND [0.2] U	0.22	ND [0.2] U	0.41	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.02] U	ND [0.2] U
NICKEL	NA	93	ND [40] UJ	NA	4810 J	780	NA	88	240	249	NA
POTASSIUM	5300	1060 J	ND [5000] U	3000	1040 J	7200	3300	7870 J	ND [5000] U	6800 J	4600
SELENIUM	ND [2] U	ND [2] U	ND [5] U	ND [2] U	15.6	10	ND [4] U	2.4	ND [5] U	ND [1] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	220	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U
SODIUM	NA	NA	64000	NA	NA	41000	NA	NA	150000	NA	NA
STRONTIUM	5700	158	130	300	2230 J	100	2500	1100 J	1600	996	870
THALLIUM	ND [500] U	ND [90] U	ND [1] UJ	ND [500] U	ND [90] U	ND [1] R	ND [500] U	ND [90] U	ND [1] R	ND [90] U	ND [500] U
TIN	NA	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	ND [100] U	NA	NA
VANADIUM	NA	ND [10] U	ND [50] U	NA	ND [10] U	ND [50] U	NA	ND [10] U	ND [50] U	ND [20] U	NA
ZINC	290	33	ND [20] U	120	114	120	NA	43	ND [20] U	46 J	83

00048

028204

Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW55	LHSMW55	LHSMW55	LHSMW56	LHSMW56	LHSMW56	LHSMW56	LHSMW57	LHSMW57	LHSMW57	LHSMW57
Sample Number:	LHS-MW-55	LHS-MW-55	LHS-MW-55	MW-56	LHS-MW-56	LHS-MW-56	LHS-MW-56	MW-57	LHS-MW-57	LHS-MW-57	LHS-MW-57
Date Sampled:	02/10/1996	05/20/1998	12/09/1994	02/09/1996	05/20/1998	08/21/1996	12/07/1994	02/08/1996	05/20/1998	08/21/1996	12/09/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	825	ND [200] U	24500	300	460	1110 J	17000	583	15000	145 J	2200
ANTIMONY	ND [60] U	ND [5] R	ND [100] U	ND [25] U	ND [5] R	ND [40] U	ND [100] U	ND [60] U	ND [5] R	56 J	ND [100] U
ARSENIC	ND [2] U	ND [10] U	7.7	4.4	ND [10] U	ND [1] U	ND [4] U	ND [2] U	ND [10] U	ND [1] U	ND [2] U
BARIUM	118	ND [200] U	340	78	ND [200] U	102	260	34	ND [200] U	34 J	ND [50] U
BERYLLIUM	ND [5] U	ND [0.5] U	NA	ND [0.2] U	ND [0.5] U	ND [6] U	NA	ND [5] U	0.5	ND [6] U	NA
CADMIUM	ND [10] U	ND [0.8] U	ND [10] U	0.6	ND [0.8] U	ND [6] U	ND [10] U	ND [10] U	200.1	ND [6] U	ND [10] U
CALCIUM	60300 J	42000	90200	16500	15000	20900 J	25800	1660 J	ND [5000] U	1190 J	1400
CHROMIUM, TOTAL	207	1600	320	18	30	217	62	ND [10] U	270	ND [10] U	ND [20] U
COBALT	19	ND [50] U	ND [20] U	ND [2.5] U	ND [50] U	ND [20] U	26	ND [10] U	ND [50] U	ND [20] U	ND [20] U
COPPER	25	65	40	2.5	ND [25] U	11 J	ND [20] U	14	39	7 J	ND [20] U
IRON	3300 J	5600	36500	860	960	2320 J	24900	891	14000	502	2800
LEAD	ND [30] U	ND [3] U	24	1.2	ND [3] U	ND [90] U	15	ND [30] U	16	ND [90] U	2.1
MAGNESIUM	27100 J	26000	29600	10200	11000	14500 J	15000	1050 J	ND [5000] U	902 J	1100
MANGANESE	1490 J	1310	1400	360	427	540	2100	27	82	26 J	87
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.02] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	0.02 J	ND [0.2] U
NICKEL	1840 J	3600	NA	130	80	190	NA	ND [15] U	70	22 J	NA
POTASSIUM	2190 J	ND [5000] U	6100	1100	ND [5000] U	1640 J	2900	525	ND [5000] U	785 J	ND [2000] U
SELENIUM	24.4	ND [5] U	ND [2] U	ND [2] U	ND [5] U	ND [1] U	ND [2] U	ND [2] U	ND [5] U	ND [1] U	ND [2] U
SILVER	ND [10] U	40	ND [10] U	ND [0.4] U	ND [10] U	ND [6] U	ND [10] U	ND [10] U	ND [10] U	ND [6] U	ND [10] U
SODIUM	NA	330000	NA	NA	170000	NA	NA	NA	18000	NA	NA
STRONTIUM	776	960	1100	260	350	349	390	ND [10] U	ND [50] U	18.8 J	ND [100] U
THALLIUM	ND [90] U	ND [1] R	ND [500] U	ND [1.7] U	ND [1] R	ND [90] U	ND [500] U	ND [90] U	ND [1] R	ND [90] U	ND [500] U
TIN	NA	ND [100] U	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	ND [10] U	ND [50] U	NA	ND [1.7] U	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA
ZINC	40	ND [20] U	150	12	ND [20] U	26 J	NA	32	120	25 J	19

0285000

028205

Metals in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW61	LHSMW61	LHSMW61	LHSMW61
Sample Number:	LHS-MW-60	LHS-MW-60	LHS-MW-60	LHS-MW-60	LHS-MW-61	LHS-MW-61	LHS-MW-61	LHS-MW-61
Date Sampled:	02/09/1996	05/20/1998	08/21/1996	12/11/1994	02/11/1996	05/20/1998	08/15/1996	12/10/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L								
ALUMINUM	1010 J	ND [200] U	509 J	3800	1520 J	860	1440 J	66000
ANTIMONY	ND [60] U	ND [5] R	76 J	ND [100] U	ND [60] U	ND [5] R	ND [60] U	ND [100] U
ARSENIC	ND [2] U	ND [10] U	ND [1] U	ND [2] U	ND [2] U	ND [10] U	ND [2] U	4
BARIUM	35	ND [200] U	30 J	53	149	240	199	480
BERYLLIUM	ND [5] U	ND [0.5] U	ND [6] U	NA	ND [5] U	ND [0.5] U	ND [10] U	NA
CADMIUM	ND [10] U	ND [0.8] U	ND [6] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U
CALCIUM	28000 J	29000	34400 J	31200	18900 J	28000	22600 J	36400
CHROMIUM, TOTAL	ND [10] U	90	15 J	ND [20] U	517	1600	596	82
COBALT	ND [10] U	ND [50] U	ND [20] U	ND [20] U	26	ND [50] U	20	44
COPPER	16	ND [25] U	15 J	ND [20] U	33	ND [25] U	14	66
IRON	2320 J	660	898	5800	4780 J	3600	4150 J	78600
LEAD	ND [30] U	ND [3] U	ND [90] U	5.2	ND [30] U	ND [3] U	ND [90] U	34
MAGNESIUM	17400 J	20000	22600 J	18800	12900 J	24000	17100 J	24100
MANGANESE	136	59	89 J	330	953	681	862	1700
MERCURY	ND [0.2] U	ND [0.2] U	0.04 J	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U	0.23
NICKEL	166	100	84 J	NA	533	590	616	NA
POTASSIUM	1180 J	ND [5000] U	1650 J	ND [2000] U	3280 J	ND [5000] U	3950 J	9900
SELENIUM	ND [2] U	ND [5] U	1 J	ND [2] U	6.3	ND [5] U	5.8	7.2
SILVER	ND [10] U	ND [10] U	ND [6] U	ND [10] U	ND [10] U	40	ND [10] U	ND [10] U
SODIUM	NA	200000	NA	NA	NA	300000	NA	NA
STRONTIUM	491	800	614	540	412	980	439	530
THALLIUM	ND [90] U	ND [1] R	ND [90] U	ND [500] U	ND [90] U	ND [1] R	ND [90] U	ND [500] U
TIN	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	ND [10] U	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U	NA
ZINC	35	ND [20] U	45 J	27	34	30	46	270

000486

028206

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	105	47WW01	47WW02	47WW03	47WW04	47WW05	47WW06	47WW07	47WW08	47WW09
Sample Number:	LHS-MW-105	47WW01	47WW02	47WW03	47WW04	47WW05	47WW06	47WW07	47WW08	47WW09
Date Sampled:	02/13/1996	11/07/1998	11/04/1998	11/05/1998	11/05/1998	11/09/1998	11/06/1998	11/06/1998	11/04/1998	11/04/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	833000	NA	NA	NA	NA	NA	NA	NA	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	ND [500] U	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRITE	ND [500] U	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	NA	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
SULFATE (AS SO4)	2029000	NA	NA	NA	NA	NA	NA	NA	NA	NA

0282071

0004871

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW11	47WW11	47WW11	47WW11	47WW12	47WW13	47WW14	47WW15	47WW16	47WW17
Sample Number:	47WW11	47WW11D	47WW11	47WW11	47WW12	47WW13	47WW14	47WW15	47WW16	47WW17
Date Sampled:	02/12/2001	05/24/2000	05/24/2000	11/07/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/04/1998	11/09/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRITE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	394	936 J	146 J	2400	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
SULFATE (AS SO4)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

028208
000488

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	47WW18	47WW19	47WW20	47WW21	47WW22	47WW23	47WW24	47WW25	47WW26	47WW27
Sample Number:	47WW18	47WW19	47WW20	47WW21	47WW22	47WW23	47WW24	47WW25	47WW26	47WW27
Date Sampled:	11/06/1998	11/06/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998	12/20/2000	12/20/2000	12/20/2000	12/19/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRITE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PERCHLORATE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [0.3] U	ND [0.3] U	871	2460
SULFATE (AS SO4)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

028209

028209

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW28	LHSMW28	LHSMW28	LHSMW29	LHSMW29	LHSMW29	LHSMW30	LHSMW30	LHSMW31	LHSMW31
Sample Number:	LHS-MW-28	MW-28	LHS-MW-28	LHS-MW-29	LHSMW29	LHS-MW-29	LHS-MW-30	LHS-MW-30	LHS-MW-31	LHSMW31
Date Sampled:	02/11/1996	02/11/1996	08/20/1996	02/11/1996	05/19/2000	08/20/1996	02/12/1996	08/20/1996	02/12/1996	05/21/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	73000	NA	53000	1168000 J	NA	914000	980000	824000	263000	NA
CYANIDE	NA	ND [10] U	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	1000	NA	1000	ND [500] U	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA
NITROGEN, NITRITE	ND [500] U	NA	ND [500] U	ND [500] U	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA
PERCHLORATE	NA	NA	NA	NA	ND [1] U	NA	NA	NA	NA	ND [1] U
SULFATE (AS SO4)	9600	NA	9000	301000	NA	322000	269000	288000	258000	NA

000429

028210

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW31	LHSMW32	LHSMW32	LHSMW32	LHSMW32	LHSMW33	LHSMW34	LHSMW34	LHSMW35	LHSMW35
Sample Number:	LHS-MW-31	LHS-MW-32	LHSMW32	LHSMW32	LHS-MW-32	LHS-MW-33	LHS-MW-34	LHS-MW-34	LHS-MW-35	MW-35
Date Sampled:	08/20/1996	02/12/1996	02/12/2001	05/19/2000	08/20/1996	02/13/1996	02/13/1996	08/20/1996	02/08/1996	02/08/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	290000	15000	NA	NA	36000	560000	245000	175000	159000	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND [10] U
NITROGEN, NITRATE (AS N)	ND [500] U	ND [500] U	NA	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA
NITROGEN, NITRITE	ND [500] U	ND [500] U	NA	NA	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	NA
PERCHLORATE	NA	NA	ND [0.71] U	ND [1] U	NA	NA	NA	NA	NA	NA
SULFATE (AS SO4)	279000	12000	NA	NA	10000	88000	16000	27000	46000	NA

028211

000492

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW35	LHSMW36	LHSMW37	LHSMW38	LHSMW38	LHSMW39	LHSMW41	LHSMW42	LHSMW42	LHSMW42
Sample Number:	LHS-MW-35	LHS-MW-36	LHS-MW-37	LHS-MW-38	LHS-MW-38	LHS-MW-39	LHS-MW-41	LHS-MW-42	LHSMW42	LHSMW42
Date Sampled:	08/20/1996	02/13/1996	02/08/1996	02/12/1996	08/21/1996	02/10/1996	02/09/1996	02/11/1996	02/12/2001	05/19/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	169000	38000	5000	6900	ND [2000] U	692000	248000	795000	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	ND [500] U	ND [500] U	ND [500] U	790	600	1000	ND [500] U	ND [500] U	NA	NA
NITROGEN, NITRITE	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U	1900	ND [500] U	NA	NA
PERCHLORATE	NA	NA	NA	NA	NA	NA	NA	NA	85	25
SULFATE (AS SO4)	67000	18000	226000	5100	9000	486000	308000	390000	NA	NA

0028212

000439

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW43	LHSMW43	LHSMW43	LHSMW43	LHSMW44	LHSMW45	LHSMW46	LHSMW46	LHSMW47	LHSMW47
Sample Number:	MW-43	LHSMW43	LHSMW43	LHS-MW-43	LHS-MW-44	LHS-MW-45	LHS-MW-46	LHSMW46	LHS-MW-47	LHSMW47
Date Sampled:	02/09/1996	02/12/2001	05/20/2000	08/22/1996	02/08/1996	02/10/1996	02/08/1996	05/20/2000	02/08/1996	05/20/2000
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	NA	NA	NA	NA	305000	492000	14000	NA	604000	NA
CYANIDE	ND [10] U	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	NA	NA	NA	NA	ND [500] U	ND [500] U	ND [500] U	NA	ND [500] U	NA
NITROGEN, NITRITE	NA	NA	NA	NA	ND [500] U	ND [500] U	ND [500] U	NA	ND [500] U	NA
PERCHLORATE	NA	ND [1.4] U	3.6	NA	NA	NA	NA	ND [1] U	NA	ND [1] U
SULFATE (AS SO4)	NA	NA	NA	NA	242000	477000	64000	NA	419000	NA

000429

028213

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW47	LHSMW48	LHSMW48	LHSMW49	LHSMW49	LHSMW50	LHSMW51	LHSMW51	LHSMW52	LHSMW53
Sample Number:	**LHS-MW-47**	**LHSMW48**	**LHS-MW-48**	**LHS-MW-49**	**LHS-MW-49**	**LHS-MW-50**	**LHS-MW-51**	**MW-51**	**LHS-MW-52**	**LHS-MW-53**
Date Sampled:	**12/09/1994**	**05/20/2000**	**12/09/1994**	**02/09/1996**	**12/07/1994**	**02/09/1996**	**02/13/1996**	**02/13/1996**	**02/09/1996**	**02/10/1996**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	NA	NA	NA	5000	NA	483000	620000	NA	46000	1773000 J
CYANIDE	ND [10] U	NA	ND [10] U	NA	ND [10] U	NA	NA	ND [10] U	NA	NA
NITROGEN, NITRATE (AS N)	NA	NA	NA	ND [500] U	NA	ND [500] U	ND [500] U	NA	ND [500] U	ND [500] U
NITROGEN, NITRITE	NA	NA	NA	ND [500] U	NA	ND [500] U	ND [500] U	NA	ND [500] U	2000
PERCHLORATE	NA	ND [1] U	NA	NA	NA	NA	NA	NA	NA	NA
SULFATE (AS SO4)	NA	NA	NA	18000	NA	330000	465000	NA	53000	128000

00049

028214

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW53	LHSMW53	LHSMW53	LHSMW54	LHSMW54	LHSMW54	LHSMW55	LHSMW56	LHSMW56	LHSMW56
Sample Number:	**LHSMW53**	**LHSMW53**	**LHS-MW-53**	**LHS-MW-54**	**LHSMW54**	**LHS-MW-54**	**LHS-MW-55**	**LHS-MW-56**	**MW-56**	**LHS-MW-56**
Date Sampled:	**02/12/2001**	**05/20/2000**	**10/22/1998**	**02/12/1996**	**05/21/2000**	**08/21/1996**	**02/10/1996**	**02/09/1996**	**02/09/1996**	**08/21/1996**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	NA	NA	NA	267000	NA	311000	548000	185000	NA	236000
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	ND [10] U	NA
NITROGEN, NITRATE (AS N)	NA	NA	NA	ND [500] U	NA	ND [500] U	ND [500] U	ND [500] U	NA	ND [500] U
NITROGEN, NITRITE	NA	NA	NA	ND [500] U	NA	ND [500] U	ND [500] U	ND [500] U	NA	ND [500] U
PERCHLORATE	ND [0.71] U	0.97 J	42.9	NA	ND [1] U	NA	NA	NA	NA	NA
SULFATE (AS SO4)	NA	NA	NA	89000	NA	93000	215000	36000	NA	39000

0028215

000649

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW57	LHSMW57	LHSMW57	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW60	LHSMW61
Sample Number:	**LHS-MW-57**	**LHSMW57**	**LHS-MW-57**	**LHS-MW-60**	**LHSMW60**	**LHSMW60D**	**LHSMW60**	**LHS-MW-60**	**LHS-MW-60**	**LHS-MW-61**
Date Sampled:	**02/08/1996**	**05/20/2000**	**08/21/1996**	**02/09/1996**	**02/10/2001**	**05/23/2000**	**05/23/2000**	**08/21/1996**	**10/22/1998**	**02/11/1996**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	17000	NA	20000	152000	NA	NA	NA	143000	NA	384000
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	ND [500] U	NA	ND [500] U	ND [500] U	NA	NA	NA	ND [500] U	NA	ND [500] U
NITROGEN, NITRITE	ND [500] U	NA	ND [500] U	ND [500] U	NA	NA	NA	ND [500] U	NA	ND [500] U
PERCHLORATE	NA	ND [1] U	NA	NA	71000	24400	23500	NA	82900	NA
SULFATE (AS SO4)	11000	NA	ND [2000] U	293000	NA	NA	NA	20000	NA	54000

000596

028216

Anions in Groundwater Samples at Site 47
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW61
Sample Number:	LHS-MW-61
Date Sampled:	08/15/1996
Depth (ft.):	0.00
ANIONS - UNITS: UG/L	
CHLORIDE (AS CL)	510000
CYANIDE	NA
NITROGEN, NITRATE (AS N)	ND [500] U
NITROGEN, NITRITE	ND [500] U
PERCHLORATE	NA
SULFATE (AS SO4)	54400

0028217

000497

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	48SB01	48SB01	48SB01	LH-DL95-01	LH-S100-01	LH-S100-01	LH-S101-01	LH-S101-01
Sample Number:	48SB01(0-0.5)	48SB01(1-3)	48SB01(3-5)	LH-DL95-01	LH-S100-01_1	LH-S100-01_2	LH-S101-01_1	LH-S101-01_2
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.00	1.00	3.00	2.00	0.50	1.50	0.50	3.80
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1-DICHLOROETHENE	ND [5.3] U	ND [5.4] U	ND [5.6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U
ACETONE	5.1	ND [21] U	ND [22] U	ND [32] U	ND [43] U	ND [29] U	ND [48] U	ND [60] U
CARBON DISULFIDE	ND [5.3] U	ND [5.4] U	ND [5.6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	17
ETHYLBENZENE	ND [5.3] U	ND [5.4] U	ND [5.6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [21] U	ND [21] U	ND [22] U	ND [63] U	ND [58] U	ND [62] U	ND [61] U	ND [50] U
STYRENE	ND [5.3] U	ND [5.4] U	ND [5.6] U	3	ND [6] U	ND [6] U	ND [6] U	ND [5] U
TETRACHLOROETHYLENE(PCE)	ND [5.3] U	ND [5.4] U	ND [5.6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U
TOLUENE	ND [5.3] U	ND [5.4] U	ND [5.6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [11] U	ND [11] U	ND [11] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U
VINYL CHLORIDE	ND [11] U	ND [11] U	ND [11] U	ND [32] U	ND [29] U	ND [31] U	ND [30] U	ND [25] U
XYLENES, TOTAL	ND [5.3] U	ND [5.4] U	ND [5.6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U
trans-1,3-DICHLOROPROPENE	ND [5.3] U	ND [5.4] U	ND [5.6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [360] U	ND [360] U	ND [370] U	ND [381] U	ND [348] U	ND [370] U	ND [366] U	ND [375] U
ACENAPHTHENE	ND [360] U	ND [360] U	ND [370] U	ND [381] U	ND [348] U	ND [370] U	ND [366] U	ND [375] U
ANTHRACENE	ND [360] U	ND [360] U	ND [370] U	ND [635] U	ND [580] U	ND [617] U	ND [610] U	ND [625] U
BENZO(a)ANTHRACENE	250	ND [360] U	ND [370] U	ND [381] U	ND [348] U	ND [370] U	ND [366] U	ND [375] U
BENZO(a)PYRENE	ND [180] U	ND [180] U	ND [190] U	ND [635] U	ND [580] U	ND [617] U	ND [610] U	ND [625] U
BENZO(b)FLUORANTHENE	290	ND [360] U	ND [370] U	ND [1269] U	ND [1160] U	ND [1235] U	ND [1220] U	ND [1250] U
BENZO(g,h,i)PERYLENE	ND [360] U	ND [360] U	ND [370] U	ND [2538] U	ND [2320] U	ND [2469] U	ND [2439] U	ND [2500] U
BENZO(k)FLUORANTHENE	ND [360] U	ND [360] U	ND [370] U	ND [1269] U	ND [1160] U	ND [1235] U	ND [1220] U	ND [1250] U
BENZOIC ACID	ND [890] U	ND [890] U	ND [930] U	NA	NA	NA	NA	NA
BENZYL BUTYL PHTHALATE	ND [360] U	ND [360] U	ND [370] U	ND [635] U	ND [580] U	ND [617] U	ND [610] U	ND [625] U
CHRYSENE	270	ND [360] U	ND [370] U	ND [6345] U	ND [5800] U	ND [6173] U	ND [6098] U	ND [6250] U
DI-n-BUTYL PHTHALATE	ND [360] U	ND [360] U	ND [370] U	ND [2995] U	ND [3770] U	ND [3679] U	ND [4098] U	ND [3150] U
DIBENZ(a,h)ANTHRACENE	ND [360] U	ND [360] U	ND [370] U	ND [2538] U	ND [2320] U	ND [2469] U	ND [2439] U	ND [2500] U
DIBENZOFURAN	ND [360] U	ND [360] U	ND [370] U	ND [1269] U	ND [1160] U	ND [1235] U	ND [1220] U	ND [1250] U
DIETHYL PHTHALATE	ND [360] U	ND [360] U	ND [370] U	ND [635] U	139 J	ND [617] U	244	125 J
DIMETHYL PHTHALATE	ND [360] U	ND [360] U	ND [370] U	ND [635] U	ND [580] U	ND [617] U	ND [610] U	ND [625] U
FLUORANTHENE	600	ND [360] U	ND [370] U	ND [635] U	ND [580] U	ND [617] U	ND [610] U	ND [625] U
FLUORENE	ND [360] U	ND [360] U	ND [370] U	ND [635] U	ND [580] U	ND [617] U	ND [610] U	ND [625] U

028218

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	48SB01	48SB01	48SB01	LH-DL95-01	LH-S100-01	LH-S100-01	LH-S101-01	LH-S101-01
Sample Number:	48SB01(0-0.5)	48SB01(1-3)	48SB01(3-5)	LH-DL95-01	LH-S100-01_1	LH-S100-01_2	LH-S101-01_1	LH-S101-01_2
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.00	1.00	3.00	2.00	0.50	1.50	0.50	3.80
INDENO(1,2,3-c,d)PYRENE	200	ND [360] U	ND [370] U	ND [1269] U	ND [1160] U	ND [1235] U	ND [1220] U	ND [1250] U
NAPHTHALENE	ND [360] U	ND [360] U	ND [370] U	ND [381] U	ND [348] U	ND [370] U	ND [366] U	ND [375] U
PHENANTHRENE	430	ND [360] U	ND [370] U	ND [635] U	ND [580] U	ND [617] U	ND [610] U	ND [625] U
PYRENE	390	ND [360] U	ND [370] U	ND [635] U	ND [580] U	ND [617] U	ND [610] U	ND [625] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [360] U	ND [360] U	ND [370] U	ND [228] U	ND [197] U	ND [185] U	ND [610] U	ND [625] U

028219

65000

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S123-01	LH-S123-01	LH-S94-01	LH-S94-01	LH-S95-01	LH-S95-01	LH-S95-01	LH-S95-02
Sample Number:	LH-S123-01_1	LH-S123-01_2	LH-S94-01_1	LH-S94-01_2	LH-S95-01_1	LH-S95-01_2	LH-S95-01_3	LH-S95-02_1
Date Sampled:	06/26/1993	06/26/1993	08/20/1993	08/20/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	11.00	0.50	2.90	0.50	5.50	11.30	0.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1-DICHLOROETHENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [6] U
ACETONE	ND [40] U	ND [22] U	ND [59] U	ND [17] U	ND [268] U	ND [118] U	ND [111] U	ND [135] U
CARBON DISULFIDE	ND [6] U	ND [6] U	ND [6] U	42	ND [7] U	1	4	14
ETHYLBENZENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [58] U	ND [62] U	ND [62] U	ND [63] U	ND [66] U	ND [60] U	ND [62] U	ND [60] U
STYRENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [6] U
TOLUENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [6] U
TRICHLOROETHYLENE (TCE)	1 J	ND [6] U	ND [6] U	ND [6] U	ND [7] U	5	ND [6] U	ND [6] U
VINYL CHLORIDE	ND [29] U	ND [31] U	ND [31] U	ND [31] U	ND [33] U	ND [30] U	ND [31] U	ND [30] U
XYLENES, TOTAL	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [6] U
trans-1,3-DICHLOROPROPENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [347] U	ND [372] U	ND [369] U	ND [375] U	ND [395] U	ND [333] U	ND [370] U	ND [361] U
ACENAPHTHENE	ND [347] U	ND [372] U	ND [369] U	ND [375] U	ND [395] U	ND [333] U	ND [370] U	ND [361] U
ANTHRACENE	ND [578] U	ND [620] U	ND [614] U	ND [626] U	ND [658] U	ND [500] U	ND [617] U	ND [602.4] U
BENZO(a)ANTHRACENE	ND [347] U	ND [372] U	ND [369] U	ND [375] U	ND [395] U	ND [300] U	ND [370] U	ND [361.4] U
BENZO(a)PYRENE	ND [578] U	ND [620] U	ND [614] U	ND [626] U	ND [658] U	ND [500] U	ND [617] U	ND [602.4] U
BENZO(b)FLUORANTHENE	ND [1156] U	ND [1241] U	ND [1229] U	ND [1252] U	ND [1316] U	ND [1000] U	ND [1235] U	ND [1204.8] U
BENZO(g,h,i)PERYLENE	ND [2312] U	ND [2481] U	ND [2457] U	ND [2503] U	ND [2632] U	ND [2000] U	ND [2469] U	ND [2409.6] U
BENZO(k)FLUORANTHENE	ND [1156] U	ND [1241] U	ND [1229] U	ND [1252] U	ND [1316] U	ND [1000] U	ND [1235] U	ND [1204.8] U
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL BUTYL PHTHALATE	162	223 J	ND [614] U	ND [626] U	ND [658] U	ND [500] U	ND [617] U	ND [602.4] U
CHRYSENE	ND [5780] U	ND [6203] U	ND [6142] U	ND [6258] U	ND [6579] U	ND [5000] U	ND [6173] U	ND [6024] U
DI-n-BUTYL PHTHALATE	ND [347] U	ND [372] U	ND [369] U	ND [375] U	ND [3724] U	ND [3350] U	ND [3420] U	ND [2481.9] U
DIBENZ(a,h)ANTHRACENE	ND [2312] U	ND [2481] U	ND [2457] U	ND [2503] U	ND [2632] U	ND [2000] U	ND [2469] U	ND [2409.6] U
DIBENZOFURAN	ND [1156] U	ND [1241] U	ND [1229] U	ND [1252] U	ND [1316] U	ND [1000] U	ND [1235] U	ND [1204.8] U
DIETHYL PHTHALATE	ND [197] U	ND [161] U	ND [221] U	ND [225] U	ND [658] U	100 J	123 J	120.5 J
DIMETHYL PHTHALATE	ND [578] U	ND [620] U	ND [614] U	ND [626] U	ND [658] U	ND [556] U	ND [617] U	ND [602] U
FLUORANTHENE	ND [578] U	ND [620] U	ND [614] U	ND [626] U	ND [658] U	ND [500] U	ND [617] U	ND [602.4] U
FLUORENE	ND [578] U	ND [620] U	ND [614] U	ND [626] U	ND [658] U	ND [500] U	ND [617] U	ND [602.4] U

0028220

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S123-01	LH-S123-01	LH-S94-01	LH-S94-01	LH-S95-01	LH-S95-01	LH-S95-01	LH-S95-02
Sample Number:	LH-S123-01_1	LH-S123-01_2	LH-S94-01_1	LH-S94-01_2	LH-S95-01_1	LH-S95-01_2	LH-S95-01_3	LH-S95-02_1
Date Sampled:	06/26/1993	06/26/1993	08/20/1993	08/20/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	11.00	0.50	2.90	0.50	5.50	11.30	0.50
INDENO(1,2,3-c,d)PYRENE	ND [1156] U	ND [1241] U	ND [1229] U	ND [1252] U	ND [1316] U	ND [1000] U	ND [1235] U	ND [1204.8] U
NAPHTHALENE	ND [347] U	ND [372] U	ND [369] U	ND [375] U	ND [395] U	ND [333] U	ND [370] U	ND [361] U
PHENANTHRENE	ND [578] U	ND [620] U	ND [614] U	ND [626] U	ND [658] U	ND [500] U	ND [617] U	ND [602.4] U
PYRENE	ND [578] U	ND [620] U	ND [614] U	ND [626] U	ND [658] U	ND [500] U	ND [617] U	ND [602.4] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [382] U	ND [261] U	ND [209] U	ND [275] U	ND [171] U	ND [130] U	ND [123] U	ND [192.8] U

0282221

705000

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S95-02	LH-S95-02	LH-S96-01	LH-S96-01	LH-S96-01	LH-S97-01	LH-S97-01	LH-S97-01
Sample Number:	LH-S95-02_2	LH-S95-02_3	LH-S96-01_1	LH-S96-01_2	LH-S96-01_3	LH-S97-01_1	LH-S97-01_2	LH-S97-01_3
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	4.00	5.50	0.50	2.00	11.00	0.50	3.90	11.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
1,1-DICHLOROETHENE	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
ACETONE	ND [233] U	ND [76] U	ND [31] U	ND [30] U	ND [20] U	ND [30] U	ND [44] U	ND [39] U
CARBON DISULFIDE	145	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
ETHYLBENZENE	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	9	ND [62] U	ND [56] U	ND [60] U	ND [63] U	ND [58] U	ND [60] U	ND [63] U
STYRENE	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
TOLUENE	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
TRICHLOROETHYLENE (TCE)	20:*	ND [6] U	ND [6] U	ND [6] U	ND [6] U	2	ND [6] U	ND [6] U
VINYL CHLORIDE	ND [25] U	ND [31] U	ND [28] U	ND [30] U	ND [32] U	ND [29] U	ND [30] U	ND [32] U
XYLENES, TOTAL	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
trans-1,3-DICHLOROPROPENE	ND [5] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
2-METHYLNAPHTHALENE	ND [385] U	ND [370] U	1635	ND [356] U	1835	ND [346] U	ND [363] U	ND [378] U
ACENAPHTHENE	ND [385] U	ND [370] U	ND [338] U	ND [356] U	ND [380] U	ND [346] U	ND [363] U	ND [378] U
ANTHRACENE	ND [641] U	ND [617] U	ND [563.7] U	ND [593.8] U	ND [632.9] U	ND [577] U	ND [605] U	ND [631] U
BENZO(a)ANTHRACENE	ND [641] U	ND [370] U	ND [338.2] U	ND [356.3] U	ND [379.7] U	ND [346] U	ND [363] U	ND [378] U
BENZO(a)PYRENE	ND [3846] U	ND [617] U	ND [563.7] U	ND [593.8] U	ND [632.9] U	ND [577] U	ND [605] U	ND [631] U
BENZO(b)FLUORANTHENE	ND [1282] U	ND [1233] U	ND [1127.4] U	ND [1187.6] U	ND [1265.8] U	ND [1155] U	ND [1209] U	ND [1261] U
BENZO(g,h,i)PERYLENE	ND [1282] U	ND [2466] U	ND [2254.8] U	ND [2375.3] U	ND [2531.6] U	ND [2309] U	ND [2418] U	ND [2522] U
BENZO(k)FLUORANTHENE	ND [385] U	ND [1233] U	ND [1127.4] U	ND [1187.6] U	ND [1265.8] U	ND [1155] U	ND [1209] U	ND [1261] U
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA	NA
BENZYL BUTYL PHTHALATE	ND [3846] U	ND [617] U	ND [563.7] U	ND [593.8] U	ND [632.9] U	ND [577] U	ND [605] U	ND [631] U
CHRYSENE	ND [385] U	ND [6165] U	ND [5636.9] U	ND [5938.2] U	ND [6329.1] U	ND [5774] U	ND [6046] U	ND [6305] U
DI-n-BUTYL PHTHALATE	ND [3244] U	ND [6227] U	ND [2998.8] U	ND [1615.2] U	ND [4784.8] U	ND [2275] U	ND [3531] U	ND [1690] U
DIBENZ(a,h)ANTHRACENE	ND [641] U	ND [2466] U	ND [2254.8] U	ND [2375.3] U	ND [2531.6] U	ND [2309] U	ND [2418] U	ND [2522] U
DIBENZOFURAN	ND [641] U	ND [1233] U	ND [1127.4] U	ND [1187.6] U	ND [1265.8] U	ND [1155] U	ND [1209] U	ND [1261] U
DIETHYL PHTHALATE	ND [1282] U	160 J	ND [563.7] U	ND [593.8] U	ND [632.9] U	ND [577] U	ND [605] U	ND [631] U
DIMETHYL PHTHALATE	ND [641] U	ND [617] U	868	ND [594] U	975	ND [577] U	ND [605] U	ND [631] U
FLUORANTHENE	ND [1282] U	ND [617] U	180.4 J	ND [593.8] U	ND [632.9] U	ND [577] U	ND [605] U	ND [631] U
FLUORENE	ND [641] U	ND [617] U	ND [563.7] U	ND [593.8] U	ND [632.9] U	ND [577] U	ND [605] U	ND [631] U

000502

028222

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S95-02	LH-S95-02	LH-S96-01	LH-S96-01	LH-S96-01	LH-S97-01	LH-S97-01	LH-S97-01
Sample Number:	LH-S95-02_2	LH-S95-02_3	LH-S96-01_1	LH-S96-01_2	LH-S96-01_3	LH-S97-01_1	LH-S97-01_2	LH-S97-01_3
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	4.00	5.50	0.50	2.00	11.00	0.50	3.90	11.00
INDENO(1,2,3-c,d)PYRENE	ND [641] U	ND [1233] U	ND [1127.4] U	ND [1187.6] U	ND [1265.8] U	ND [1155] U	ND [1209] U	ND [1261] U
NAPHTHALENE	ND [385] U	ND [370] U	3912	ND [356] U	4392	ND [346] U	ND [363] U	ND [378] U
PHENANTHRENE	ND [1282] U	ND [617] U	ND [563.7] U	ND [593.8] U	ND [632.9] U	ND [577] U	ND [605] U	ND [631] U
PYRENE	ND [385] U	ND [617] U	180.4 J	ND [593.8] U	ND [632.9] U	ND [577] U	ND [605] U	ND [631] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [128] U	ND [617] U	ND [135.3] U	ND [118.8] U	ND [265.8] U	ND [115] U	ND [605] U	ND [189] U

028223

05000

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S98-01	LH-S98-01	LH-S99-01	LH-S99-01	LH-S99-01	LH-WRS1-01	LH-WRS1-01
Sample Number:	LH-S98-01_1	LH-S98-01_2	LH-S99-01_1	LH-S99-01_2	LH-S99-01_3	LH-WRS1-01_1	LH-WRS1-01_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	1.50	0.50	2.00	12.00	0.50	3.50
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
1,1-DICHLOROETHENE	ND [6] U	ND [6] U	ND [6] U	2	ND [7] U	ND [6] U	ND [6] U
ACETONE	ND [6] U	ND [58] U	ND [15] U	ND [254] U	ND [31] U	ND [39] U	ND [117] U
CARBON DISULFIDE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U
ETHYLBENZENE	ND [6] U	ND [6] U	ND [6] U	2	ND [7] U	ND [6] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [57] U	ND [60] U	ND [60] U	ND [65] U	ND [66] U	ND [60] U	ND [60] U
STYRENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U	ND [6] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	14	204:*	9	ND [6] U	ND [6] U
TOLUENE	ND [6] U	ND [6] U	ND [6] U	2	ND [7] U	ND [6] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [6] U	87:*	24:*	ND [7] U	ND [6] U	ND [6] U
VINYL CHLORIDE	ND [29] U	ND [30] U	ND [30] U	497:*	ND [33] U	ND [30] U	ND [30] U
XYLENES, TOTAL	ND [6] U	ND [6] U	ND [6] U	18	ND [7] U	ND [6] U	ND [6] U
trans-1,3-DICHLOROPROPENE	ND [6] U	ND [6] U	3	10	ND [7] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
2-METHYLNAPHTHALENE	ND [344] U	ND [358] U	ND [345] U	ND [389] U	ND [395] U	ND [353] U	ND [361] U
ACENAPHTHENE	ND [344] U	ND [358] U	ND [345] U	ND [389] U	ND [395] U	ND [353] U	ND [361] U
ANTHRACENE	ND [572.7] U	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	ND [602] U
BENZO(a)ANTHRACENE	ND [343.6] U	ND [358] U	ND [345] U	ND [389] U	ND [395] U	ND [353] U	ND [361] U
BENZO(a)PYRENE	ND [572.7] U	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	ND [602] U
BENZO(b)FLUORANTHENE	ND [1145.5] U	ND [1192] U	ND [1149] U	ND [1295] U	ND [1316] U	ND [1176] U	ND [1205] U
BENZO(g,h,i)PERYLENE	ND [2290.9] U	ND [2384] U	ND [2299] U	ND [2591] U	ND [2632] U	ND [2353] U	ND [2410] U
BENZO(k)FLUORANTHENE	ND [1145.5] U	ND [1192] U	ND [1149] U	ND [1295] U	ND [1316] U	ND [1176] U	ND [1205] U
BENZOIC ACID	NA	NA	NA	NA	NA	NA	NA
BENZYL BUTYL PHTHALATE	ND [572.7] U	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	ND [602] U
CHRYSENE	ND [5727.4] U	ND [5959] U	ND [5747] U	ND [6477] U	ND [6579] U	ND [5882] U	ND [6024] U
DI-n-BUTYL PHTHALATE	ND [1534.9] U	ND [4410] U	ND [2161] U	ND [2759] U	ND [329] U	ND [2518] U	ND [361] U
DIBENZ(a,h)ANTHRACENE	ND [2290.9] U	ND [2384] U	ND [2299] U	ND [2591] U	ND [2632] U	ND [2353] U	ND [2410] U
DIBENZOFURAN	ND [1145.5] U	ND [1192] U	ND [1149] U	ND [1295] U	ND [1316] U	ND [1176] U	ND [1205] U
DIETHYL PHTHALATE	ND [572.7] U	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	145 J
DIMETHYL PHTHALATE	ND [573] U	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	ND [602] U
FLUORANTHENE	183.3 J	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	ND [602] U
FLUORENE	ND [572.7] U	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	ND [602] U

05000

028224

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S98-01	LH-S98-01	LH-S99-01	LH-S99-01	LH-S99-01	LH-WRS1-01	LH-WRS1-01
Sample Number:	LH-S98-01_1	LH-S98-01_2	LH-S99-01_1	LH-S99-01_2	LH-S99-01_3	LH-WRS1-01_1	LH-WRS1-01_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	1.50	0.50	2.00	12.00	0.50	3.50
INDENO(1,2,3-c,d)PYRENE	ND [1145.5] U	ND [1192] U	ND [1149] U	ND [1295] U	ND [1316] U	ND [1176] U	ND [1205] U
NAPHTHALENE	ND [344] U	ND [358] U	ND [345] U	ND [389] U	ND [395] U	ND [353] U	ND [361] U
PHENANTHRENE	126 J	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	ND [602] U
PYRENE	126 J	ND [596] U	ND [575] U	ND [648] U	ND [658] U	ND [588] U	ND [602] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [206.2] U	ND [226] U	ND [287] U	ND [181] U	ND [132] U	ND [118] U	ND [181] U

028225

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VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS1-01	LH-WRS2-01	LH-WRS2-01	LH-WRS3-01	LH-WRS3-01	LH-WRS3-01	LHS-MW-62
Sample Number:	**LH-WRS1-01_3**	**LH-WRS2-01_1**	**LH-WRS2-01_2**	**LH-WRS3-01_1**	**LH-WRS3-01_2**	**LH-WRS3-01_3**	**LHS-MW62**
Date Sampled:	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**06/26/1993**	**10/05/1994**
Depth (ft.):	**11.00**	**0.50**	**3.00**	**0.50**	**3.50**	**10.50**	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
1,1-DICHLOROETHENE	ND [6] U	ND [6] U	ND [7] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
ACETONE	ND [24] U	ND [18] U	ND [110] U	ND [34] U	ND [70] U	ND [27] U	ND [12] U
CARBON DISULFIDE	ND [6] U	3	11	ND [5] U	ND [6] U	ND [6] U	ND [6] U
ETHYLBENZENE	ND [6] U	ND [6] U	ND [7] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [62] U	36	25	ND [55] U	ND [64] U	ND [61] U	ND [12] U
STYRENE	ND [6] U	ND [6] U	ND [7] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U	ND [6] U	ND [7] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
TOLUENE	ND [6] U	ND [6] U	ND [7] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [6] U	ND [7] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
VINYL CHLORIDE	ND [31] U	ND [32] U	ND [33] U	ND [27] U	ND [32] U	ND [30] U	ND [12] U
XYLENES, TOTAL	ND [6] U	ND [6] U	ND [7] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
trans-1,3-DICHLOROPROPENE	ND [6] U	ND [6] U	ND [7] U	ND [5] U	ND [6] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
2-METHYLNAPHTHALENE	1786	ND [380] U	ND [400] U	ND [328] U	ND [384] U	ND [367] U	ND [400] U
ACENAPHTHENE	ND [369] U	ND [380] U	ND [400] U	ND [328] U	ND [384] U	ND [367] U	ND [400] U
ANTHRACENE	ND [1389] U	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [611.9] U	ND [400] U
BENZO(a)ANTHRACENE	ND [833] U	ND [380] U	ND [400] U	ND [328] U	ND [384] U	ND [367.197] U	ND [400] U
BENZO(a)PYRENE	ND [1389] U	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [611.9] U	ND [400] U
BENZO(b)FLUORANTHENE	ND [2778] U	ND [1266] U	ND [1333] U	ND [1092] U	ND [1279] U	ND [1223.9] U	ND [400] U
BENZO(g,h,i)PERYLENE	ND [5556] U	ND [2532] U	ND [2667] U	ND [2183] U	ND [2558] U	ND [2447.9] U	ND [400] U
BENZO(k)FLUORANTHENE	ND [2778] U	ND [1266] U	ND [1333] U	ND [1092] U	ND [1279] U	ND [1223.9] U	ND [400] U
BENZOIC ACID	NA	NA	NA	NA	NA	NA	ND [2000] U
BENZYL BUTYL PHTHALATE	ND [1389] U	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [611.9] U	ND [400] U
CHRYSENE	ND [13889] U	ND [6329] U	ND [6667] U	ND [5459] U	ND [6394] U	ND [6119.9] U	ND [400] U
DI-n-BUTYL PHTHALATE	ND [5917] U	ND [3418] U	ND [1693] U	ND [4727] U	ND [1918] U	ND [2435.7] U	ND [400] U
DIBENZ(a,h)ANTHRACENE	ND [5556] U	ND [2532] U	ND [2667] U	ND [2183] U	ND [2558] U	ND [2447.9] U	ND [400] U
DIBENZOFURAN	ND [2778] U	ND [1266] U	ND [1333] U	ND [1092] U	ND [1279] U	ND [1223.9] U	ND [400] U
DIETHYL PHTHALATE	1833	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [611.9] U	ND [400] U
DIMETHYL PHTHALATE	948	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [612] U	ND [400] U
FLUORANTHENE	ND [1389] U	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [611.9] U	ND [400] U
FLUORENE	ND [1389] U	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [611.9] U	ND [400] U

028226

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS1-01	LH-WRS2-01	LH-WRS2-01	LH-WRS3-01	LH-WRS3-01	LH-WRS3-01	LHS-MW-62
Sample Number:	LH-WRS1-01_3	LH-WRS2-01_1	LH-WRS2-01_2	LH-WRS3-01_1	LH-WRS3-01_2	LH-WRS3-01_3	LHS-MW62
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	10/05/1994
Depth (ft.):	11.00	0.50	3.00	0.50	3.50	10.50	0.00
INDENO(1,2,3-c,d)PYRENE	ND [2778] U	ND [1266] U	ND [1333] U	ND [1092] U	ND [1279] U	ND [1223.9] U	ND [400] U
NAPHTHALENE	4273	ND [380] U	ND [400] U	ND [328] U	ND [384] U	ND [367] U	ND [400] U
PHENANTHRENE	1944	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [611.9] U	ND [400] U
PYRENE	ND [1389] U	ND [633] U	ND [667] U	ND [546] U	ND [639] U	ND [611.9] U	ND [400] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [7556] U	ND [127] U	ND [413] U	ND [546] U	ND [639] U	ND [134.6] U	450

028227

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-63	LHS-MW-64	LHS-MW-65	LHS-MW-66	LHS-Y-01	LHS-Y-02	LHS-Y-03	LHS-Y-04	LHS-Y-05
Sample Number:	**LHS-MW63**	**LHS-MW64**	**LHS-MW65**	**LHS-MW66**	**LHS-Y-01**	**LHS-Y-02**	**LHS-Y-03**	**LHS-Y-04**	**LHS-Y-05**
Date Sampled:	**10/05/1994**	**10/05/1994**	**10/05/1994**	**10/05/1994**	**01/11/1995**	**01/11/1995**	**01/11/1995**	**01/11/1995**	**01/11/1995**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
1,1-DICHLOROETHENE	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
ACETONE	ND [11] U	ND [12] U	ND [11] U	ND [11] U	ND [14] U	ND [14] U	ND [22] U	ND [18] U	ND [17] U
CARBON DISULFIDE	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
ETHYLBENZENE	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [11] U	ND [12] U	ND [11] U	ND [11] U	ND [14] U	ND [14] U	ND [22] U	ND [18] U	ND [17] U
STYRENE	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
TETRACHLOROETHYLENE(PCE)	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
TOLUENE	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
TRICHLOROETHYLENE (TCE)	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
VINYL CHLORIDE	ND [11] U	ND [12] U	ND [11] U	ND [11] U	ND [14] U	ND [14] U	ND [22] U	ND [18] U	ND [17] U
XYLENES, TOTAL	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
trans-1,3-DICHLOROPROPENE	ND [5] U	ND [6] U	ND [5] U	ND [5] U	ND [7] U	ND [7] U	ND [11] U	ND [9] U	ND [8] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
2-METHYLNAPHTHALENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
ACENAPHTHENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
ANTHRACENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
BENZO(a)ANTHRACENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	75 J
BENZO(a)PYRENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	87 J
BENZO(b)FLUORANTHENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	190 J	ND [570] U	320 J
BENZO(g,h,i)PERYLENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
BENZO(k)FLUORANTHENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	98 J
BENZOIC ACID	ND [1800] U	ND [1900] U	ND [1800] U	ND [1800] U	ND [2300] U	ND [2300] U	ND [3600] U	ND [2800] U	ND [2700] U
BENZYL BUTYL PHTHALATE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
CHRYSENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	180 J
DI-n-BUTYL PHTHALATE	83 J	77 J	67 J	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
DIBENZ(a,h)ANTHRACENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
DIBENZOFURAN	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
DIETHYL PHTHALATE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
DIMETHYL PHTHALATE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	460	ND [460] U	ND [720] U	ND [570] U	ND [550] U
FLUORANTHENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	110 J	ND [570] U	210 J
FLUORENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U

000550

0288228

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-63	LHS-MW-64	LHS-MW-65	LHS-MW-66	LHS-Y-01	LHS-Y-02	LHS-Y-03	LHS-Y-04	LHS-Y-05
Sample Number:	**LHS-MW63**	**LHS-MW64**	**LHS-MW65**	**LHS-MW66**	**LHS-Y-01**	**LHS-Y-02**	**LHS-Y-03**	**LHS-Y-04**	**LHS-Y-05**
Date Sampled:	**10/05/1994**	**10/05/1994**	**10/05/1994**	**10/05/1994**	**01/11/1995**	**01/11/1995**	**01/11/1995**	**01/11/1995**	**01/11/1995**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
INDENO(1,2,3-c,d)PYRENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
NAPHTHALENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	ND [550] U
PHENANTHRENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	ND [720] U	ND [570] U	97 J
PYRENE	ND [360] U	ND [390] U	ND [360] U	ND [360] U	ND [460] U	ND [460] U	80 J	ND [570] U	260 J
bis(2-ETHYLHEXYL) PHTHALATE	42 J	45 J	150 J	80 J	61 J	ND [460] U	ND [720] U	ND [570] U	130 J

028229

05000

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHS-Y-06
Sample Number:	LHS-Y-06
Date Sampled:	01/11/1995
Depth (ft.):	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG	
1,1-DICHLOROETHENE	ND [6] U
ACETONE	ND [12] U
CARBON DISULFIDE	ND [6] U
ETHYLBENZENE	ND [6] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [12] U
STYRENE	ND [6] U
TETRACHLOROETHYLENE(PCE)	ND [6] U
TOLUENE	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U
VINYL CHLORIDE	ND [12] U
XYLENES, TOTAL	ND [6] U
trans-1,3-DICHLOROPROPENE	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG	
2-METHYLNAPHTHALENE	ND [410] U
ACENAPHTHENE	300 J
ANTHRACENE	590
BENZO(a)ANTHRACENE	1900
BENZO(a)PYRENE	1600
BENZO(b)FLUORANTHENE	2900
BENZO(g,h,i)PERYLENE	670
BENZO(k)FLUORANTHENE	1100
BENZOIC ACID	340 J
BENZYL BUTYL PHTHALATE	290 J
CHRYSENE	2200
DI-n-BUTYL PHTHALATE	ND [410] U
DIBENZ(a,h)ANTHRACENE	230 J
DIBENZOFURAN	170 J
DIETHYL PHTHALATE	ND [410] U
DIMETHYL PHTHALATE	970
FLUORANTHENE	3600
FLUORENE	250 J

000231

028230

VOCs and SVOCs in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHS-Y-06
Sample Number:	LHS-Y-06
Date Sampled:	01/11/1995
Depth (ft.):	0.00
INDENO(1,2,3-c,d)PYRENE	750
NAPHTHALENE	110 J
PHENANTHRENE	2900
PYRENE	2400
bis(2-ETHYLHEXYL) PHTHALATE	170 J

0028231

00052

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	48SB01	48SB01	48SB01	48SB01	LH-DL95-01	LH-S100-01	LH-S100-01	LH-S101-01
Sample Number:	48SB01(0-0.5)	48SB01(1-3)	48SB01(1-3)FD	48SB01(3-5)	LH-DL95-01	LH-S100-01_1	LH-S100-01_2	LH-S101-01_1
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	07/28/1998	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.00	1.00	1.00	3.00	2.00	0.50	1.50	0.50
PESTICIDES - UNITS: UG/KG								
p,p'-DDD	ND [3.6] U	ND [3.6] U	NA	ND [3.7] U	NA	NA	NA	NA
p,p'-DDE	ND [3.6] U	ND [3.6] U	NA	ND [3.7] U	NA	NA	NA	NA
p,p'-DDT	ND [3.6] U	ND [3.6] U	NA	ND [3.7] U	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	66	ND [36] U	NA	ND [37] U	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	321.192	36.438	NA	3.497	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	59.918	4.061	NA	0.362	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	1.61	ND [0.188] U	NA	ND [0.152] U	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	5.042	0.405	NA	ND [0.185] U	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	6.398	0.508	NA	ND [0.091] U	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	13.723	1.03	NA	ND [0.171] U	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	4.603	0.278	NA	ND [0.088] U	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	10.279	0.749	NA	ND [0.164] U	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	0.815	ND [0.16] U	NA	ND [0.191] U	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	10.457	ND [0.089] U	NA	ND [0.139] U	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	3.765	ND [0.118] U	NA	ND [0.099] U	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.556	ND [0.09] U	NA	ND [0.141] U	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	0.393	ND [0.13] U	NA	ND [0.153] U	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.288] U	ND [0.124] U	0.284	ND [0.284] U	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	557.635	67.049	NA	6.532	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	61.528	4.061	NA	ND [0.122] U	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	103.709	7.596	NA	ND [0.171] U	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	76.732	3.679	NA	ND [0.088] U	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	2578.666	2440.99	NA	137.899 J	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	93.385	7.522	NA	ND [0.216] U	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.235] U	ND [0.16] U	NA	ND [0.191] U	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	34.905	ND [0.09] U	NA	ND [0.141] U	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.111] U	ND [0.13] U	NA	ND [0.153] U	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	24.171	ND [0.124] U	NA	ND [0.284] U	NA	NA	NA	NA

000541

0282232

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	48SB01	48SB01	48SB01	48SB01	LH-DL95-01	LH-S100-01	LH-S100-01	LH-S101-01
Sample Number:	48SB01(0-0.5)	48SB01(1-3)	48SB01(1-3)FD	48SB01(3-5)	LH-DL95-01	LH-S100-01_1	LH-S100-01_2	LH-S101-01_1
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	07/28/1998	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.00	1.00	1.00	3.00	2.00	0.50	1.50	0.50
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS			NA		NA	NA	NA	NA

0028233

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S101-01	LH-S123-01	LH-S123-01	LH-S94-01	LH-S94-01	LH-S95-01	LH-S95-01	LH-S95-01
Sample Number:	LH-S101-01_2	LH-S123-01_1	LH-S123-01_2	LH-S94-01_1	LH-S94-01_2	LH-S95-01_1	LH-S95-01_2	LH-S95-01_3
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	08/20/1993	08/20/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	3.80	0.50	11.00	0.50	2.90	0.50	5.50	11.30
PESTICIDES - UNITS: UG/KG								
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA

0282234

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S101-01	LH-S123-01	LH-S123-01	LH-S94-01	LH-S94-01	LH-S95-01	LH-S95-01	LH-S95-01
Sample Number:	LH-S101-01_2	LH-S123-01_1	LH-S123-01_2	LH-S94-01_1	LH-S94-01_2	LH-S95-01_1	LH-S95-01_2	LH-S95-01_3
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	08/20/1993	08/20/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	3.80	0.50	11.00	0.50	2.90	0.50	5.50	11.30
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA

0028235

000545

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S95-02	LH-S95-02	LH-S95-02	LH-S96-01	LH-S96-01	LH-S96-01	LH-S97-01	LH-S97-01
Sample Number:	LH-S95-02_1	LH-S95-02_2	LH-S95-02_3	LH-S96-01_1	LH-S96-01_2	LH-S96-01_3	LH-S97-01_1	LH-S97-01_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	4.00	5.50	0.50	2.00	11.00	0.50	3.90
PESTICIDES - UNITS: UG/KG								
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA

075000

028236

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S95-02	LH-S95-02	LH-S95-02	LH-S96-01	LH-S96-01	LH-S96-01	LH-S97-01	LH-S97-01
Sample Number:	LH-S95-02_1	LH-S95-02_2	LH-S95-02_3	LH-S96-01_1	LH-S96-01_2	LH-S96-01_3	LH-S97-01_1	LH-S97-01_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.50	4.00	5.50	0.50	2.00	11.00	0.50	3.90
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA

0282237

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S97-01	LH-S98-01	LH-S98-01	LH-S99-01	LH-S99-01	LH-S99-01	LH-WRS1-01	LH-WRS1-01
Sample Number:	LH-S97-01_3	LH-S98-01_1	LH-S98-01_2	LH-S99-01_1	LH-S99-01_2	LH-S99-01_3	LH-WRS1-01_1	LH-WRS1-01_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	11.00	0.50	1.50	0.50	2.00	12.00	0.50	3.50
PESTICIDES - UNITS: UG/KG								
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA

0028238
0028238

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S97-01	LH-S98-01	LH-S98-01	LH-S99-01	LH-S99-01	LH-S99-01	LH-WRS1-01	LH-WRS1-01
Sample Number:	LH-S97-01_3	LH-S98-01_1	LH-S98-01_2	LH-S99-01_1	LH-S99-01_2	LH-S99-01_3	LH-WRS1-01_1	LH-WRS1-01_2
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	11.00	0.50	1.50	0.50	2.00	12.00	0.50	3.50
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA

025000

028239

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS1-01	LH-WRS2-01	LH-WRS2-01	LH-WRS3-01	LH-WRS3-01	LH-WRS3-01	LHS-MW-62	LHS-MW-63
Sample Number:	LH-WRS1-01_3	LH-WRS2-01_1	LH-WRS2-01_2	LH-WRS3-01_1	LH-WRS3-01_2	LH-WRS3-01_3	LHS-MW62	LHS-MW63
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	10/05/1994	10/05/1994
Depth (ft.):	11.00	0.50	3.00	0.50	3.50	10.50	0.00	0.00
PESTICIDES - UNITS: UG/KG								
p,p'-DDD	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA

028240

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS1-01	LH-WRS2-01	LH-WRS2-01	LH-WRS3-01	LH-WRS3-01	LH-WRS3-01	LHS-MW-62	LHS-MW-63
Sample Number:	LH-WRS1-01_3	LH-WRS2-01_1	LH-WRS2-01_2	LH-WRS3-01_1	LH-WRS3-01_2	LH-WRS3-01_3	LHS-MW62	LHS-MW63
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	10/05/1994	10/05/1994
Depth (ft.):	11.00	0.50	3.00	0.50	3.50	10.50	0.00	0.00
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA		

0225000

0282241

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-64	LHS-MW-65	LHS-MW-66	SUMP094	SUMP094	SUMP095	SUMP095	SUMP098
Sample Number:	LHS-MW64	LHS-MW65	LHS-MW66	SUMP094(0-0.5)	SUMP094(3-5)	SUMP095(0-0.5)	SUMP095(3-5)	SUMP098(0-0.5)
Date Sampled:	10/05/1994	10/05/1994	10/05/1994	08/07/1998	08/07/1998	08/04/1998	08/04/1998	08/04/1998
Depth (ft.):	0.00	0.00	0.00	0.00	3.00	0.00	3.00	0.00
PESTICIDES - UNITS: UG/KG								
p,p'-DDD	NA	NA	NA	ND [3.6] U	ND [3.7] U	ND [3.5] U	ND [3.6] U	NA
p,p'-DDE	NA	NA	NA	ND [3.6] U	ND [3.7] U	ND [3.5] U	ND [3.6] U	NA
p,p'-DDT	NA	NA	NA	ND [3.6] U	ND [3.7] U	ND [3.5] U	ND [3.6] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	ND [36] U	ND [37] U	ND [35] U	ND [37] U	NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	504.751	0.666	366.06	10.126	118.442
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	55.647	0.487 U	91.159	0.429	118.977
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	ND [8.4] U	ND [0.233] U	ND [20.356] U	ND [0.34] U	ND [16.626] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	ND [4.665] U	ND [0.429] U	ND [1.425] U	ND [0.522] U	ND [0.708] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	22.923	ND [0.223] U	14.042	ND [0.381] U	ND [9.538] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	15.399	ND [0.24] U	14.63	ND [0.291] U	9.26
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	ND [4.054] U	ND [0.149] U	ND [3.651] U	ND [0.254] U	ND [6.357] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	ND [3.095] U	ND [0.285] U	10.442	ND [0.346] U	ND [0.469] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	ND [3.338] U	ND [0.358] U	ND [0.458] U	ND [0.466] U	ND [0.433] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	11.341	ND [0.24] U	ND [0.412] U	ND [0.25] U	ND [0.772] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	ND [5.938] U	ND [0.218] U	ND [5.958] U	ND [0.414] U	ND [10.374] U
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	ND [4.14] U	ND [0.251] U	ND [0.431] U	ND [0.261] U	ND [0.807] U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	NA	NA	NA	ND [2.317] U	ND [0.421] U	ND [0.447] U	ND [0.415] U	ND [0.29] U
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	ND [3.241] U	2.293	1.935	2.01	1.652
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	1140.321	0.666	355.689	28.449	225.387
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	55.647	ND [0.175] U	91.159	ND [0.254] U	118.977
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	141.579	ND [0.24] U	104.885	ND [0.291] U	44.559
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	98.154	ND [0.149] U	115.756	ND [0.254] U	209.993
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	5370.28	20.392	8678.074	359.675	2143.501
OCTACHLORODIBENZOFURAN	NA	NA	NA	144.758	ND [0.195] U	607.443	1.461	151.114
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	ND [3.338] U	ND [0.358] U	2.248	ND [0.466] U	ND [0.433] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	37.393	ND [0.251] U	14.945	ND [0.261] U	17.403
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	ND [2.317] U	1.431	ND [0.447] U	ND [0.415] U	ND [0.29] U
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	27.082	3.897	4.232	3.471	1.36

0005000

0282242

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-64	LHS-MW-65	LHS-MW-66	SUMP094	SUMP094	SUMP095	SUMP095	SUMP098
Sample Number:	LHS-MW64	LHS-MW65	LHS-MW66	SUMP094(0-0.5)	SUMP094(3-5)	SUMP095(0-0.5)	SUMP095(3-5)	SUMP098(0-0.5)
Date Sampled:	10/05/1994	10/05/1994	10/05/1994	08/07/1998	08/07/1998	08/04/1998	08/04/1998	08/04/1998
Depth (ft.):	0.00	0.00	0.00	0.00	3.00	0.00	3.00	0.00
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS				NA	NA	NA	NA	NA

325000

028243

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	SUMP098	SUMP098	SUMP098	SUMP100	SUMP100	WRSUMP001	WRSUMP001
Sample Number:	SUMP098(3-5)	SUMP098(0-0.5)	SUMP098(3-5)	SUMP100(0-0.5)	SUMP100(3-5)	WRSUMP001(0-.5)	WRSUMP01(0-0.5)
Date Sampled:	08/04/1998	08/06/1998	08/06/1998	08/07/1998	08/07/1998	08/06/1998	08/06/1998
Depth (ft.):	3.00	0.00	3.00	0.00	3.00	0.00	0.00
PESTICIDES - UNITS: UG/KG							
p,p'-DDD	NA	ND [3.6] U	6.5	ND [4.1] U	ND [3.8] U	NA	ND [3.6] U
p,p'-DDE	NA	ND [3.6] U	ND [3.9] U	ND [4.1] U	ND [3.8] U	NA	ND [3.6] U
p,p'-DDT	NA	ND [3.6] U	ND [3.9] U	ND [4.1] U	ND [3.8] U	NA	ND [3.6] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	NA	ND [36] U	ND [39] U	ND [41] U	ND [38] U	NA	ND [35] U
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	ND [0.709] U	NA	NA	14.732	128.853	18.198	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ND [0.345] U	NA	NA	ND [1.446] U	ND [1.151] U	12.775	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.461] U	NA	NA	ND [1.931] U	ND [1.536] U	1.703	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.461] U	NA	NA	ND [2.798] U	ND [2.604] U	ND [0.595] U	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [0.413] U	NA	NA	ND [1.606] U	ND [1.303] U	2.969	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.257] U	NA	NA	ND [1.562] U	ND [1.454] U	ND [0.346] U	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.276] U	NA	NA	ND [1.071] U	ND [0.868] U	1.92	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.306] U	NA	NA	ND [1.856] U	ND [1.727] U	ND [0.399] U	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.415] U	NA	NA	ND [2.024] U	ND [1.695] U	ND [0.38] U	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.247] U	NA	NA	ND [1.67] U	ND [1.553] U	ND [0.298] U	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.45] U	NA	NA	ND [1.568] U	ND [1.272] U	ND [0.414] U	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.258] U	NA	NA	ND [1.744] U	ND [1.622] U	ND [0.297] U	NA
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	ND [0.317] U	NA	NA	ND [2.742] U	ND [1.771] U	ND [0.399] U	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	1.71	NA	NA	ND [1.971] U	ND [1.47] U	1.953	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	3.083	NA	NA	ND [3.588] U	268.206	37.729	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.345] U	NA	NA	ND [1.446] U	ND [1.151] U	12.775	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	1.454	NA	NA	ND [1.562] U	ND [1.454] U	1.953	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.276] U	NA	NA	ND [1.071] U	ND [0.868] U	6.35	NA
OCTACHLORODIBENZO-p-DIOXIN	72.013	NA	NA	2666.482	34472.518	1131.512	NA
OCTACHLORODIBENZOFURAN	ND [0.304] U	NA	NA	ND [1.814] U	4.526	12.107	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.415] U	NA	NA	ND [2.024] U	ND [1.695] U	ND [0.38] U	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.258] U	NA	NA	ND [1.744] U	ND [1.622] U	0.7	NA
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.317] U	NA	NA	ND [2.742] U	ND [1.771] U	ND [0.399] U	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	1.71	NA	NA	ND [1.971] U	ND [1.47] U	ND [0.366] U	NA

0028244

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	SUMP098	SUMP098	SUMP098	SUMP100	SUMP100	WRSUMP001	WRSUMP001
Sample Number:	SUMP098(3-5)	SUMP098(0-0.5)	SUMP098(3-5)	SUMP100(0-0.5)	SUMP100(3-5)	WRSUMP001(0-.5)	WRSUMP01(0-0.5)
Date Sampled:	08/04/1998	08/06/1998	08/06/1998	08/07/1998	08/07/1998	08/06/1998	08/06/1998
Depth (ft.):	3.00	0.00	3.00	0.00	3.00	0.00	0.00
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

0028245

0028245

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP001	WRSUMP003	WRSUMP003	WRSUMP003
Sample Number:	WRSUMP001(3-5)	WRSUMP003(0-.5)	WRSUMP03(0-0.5)	WRSUMP003(3-5)
Date Sampled:	08/06/1998	08/06/1998	08/06/1998	08/06/1998
Depth (ft.):	3.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG				
p,p'-DDD	ND [3.6] U	NA	ND [3.6] U	ND [3.6] U
p,p'-DDE	ND [3.6] U	NA	12	ND [3.6] U
p,p'-DDT	ND [3.6] U	NA	24	ND [3.6] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG				
PCB-1254 (AROCHLOR 1254)	ND [35] U	NA	190	ND [36] U
DIOXINS AND FURANS - UNITS: NG/KG				
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	22.575	9.679	NA	170.246
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	11.94	1.464	NA	31.916
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	1.681	ND [0.27] U	NA	ND [3.146] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	ND [0.861] U	ND [0.503] U	NA	ND [0.584] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	3.482	ND [0.37] U	NA	5.052
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.501] U	1.127	NA	5.474
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	2.132	0.537	NA	1.182
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.577] U	ND [0.337] U	NA	3.765
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	ND [0.55] U	ND [0.368] U	NA	ND [0.609] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	2.026	ND [0.287] U	NA	2.639
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [1.161] U	ND [0.34] U	NA	1.75
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.419] U	ND [0.286] U	NA	ND [0.747] U
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	ND [0.646] U	ND [0.571] U	NA	ND [0.579] U
2,3,7,8-TETRACHLORODIBENZOFURAN	1.88	2.286	NA	4.933
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	48.988	21.328	NA	296.372
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	11.94	ND [0.188] U	NA	31.916
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.501] U	1.127	NA	43.064
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	8.355	0.537	NA	39.984
OCTACHLORODIBENZO-p-DIOXIN	1275.541	616.526	NA	1736.362
OCTACHLORODIBENZOFURAN	13.497	3.233	NA	72.002
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.55] U	ND [0.368] U	NA	ND [0.609] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	3.467	ND [0.286] U	NA	19.719
TETRACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.646] U	ND [0.571] U	NA	0.856
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	2.254	5.321	NA	18.841

028246

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP001	WRSUMP003	WRSUMP003	WRSUMP003
Sample Number:	WRSUMP001(3-5)	WRSUMP003(0-.5)	WRSUMP03(0-0.5)	WRSUMP003(3-5)
Date Sampled:	08/06/1998	08/06/1998	08/06/1998	08/06/1998
Depth (ft.):	3.00	0.00	0.00	3.00
EXPLOSIVES - UNITS: UG/KG				
NO DETECTED COMPOUNDS	NA	NA	NA	NA

000528

028247

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	48SB01	48SB01	48SB01	48SB01	LH-DL95-01	LH-S100-01	LH-S100-01	LH-S101-01	LH-S101-01	LH-S123-01
Sample Number:	48SB01(0-0.5)	48SB01(1-3)	48SB01(3-5)	48SB01(3-5)LFD	LH-DL95-01	LH-S100-01_1	LH-S100-01_2	LH-S101-01_1	LH-S101-01_2	LH-S123-01_1
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	07/28/1998	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	0.00	1.00	3.00	3.00	2.00	0.50	1.50	0.50	3.80	0.50
METALS - UNITS: UG/KG										
ALUMINUM	8700000	11000000	6900000	7200000	13300000	13400000	12500000	7200000	12800000	6700000
ANTIMONY	ND [6420] R	ND [6440] R	ND [6700] R	ND [33600] R	ND [8980] U	ND [6900] U	ND [5540] U	5120:00:00	ND [7780] U	ND [6840] U
ARSENIC	3500	3890	2460	ND [5590] U	1750	2070	1250	6280	2960	1370
BARIUM	86000	120000	100000	ND [110000] U	251000:	119000	71200	36800	54800	1620000
BERYLLIUM	ND [535] U	643	ND [559] U	ND [2790] U	NA	NA	NA	NA	NA	NA
CADMIUM	ND [535] U	ND [536] U	ND [559] U	ND [2790] U	3460	3590	2130	5550	4550	4410
CALCIUM	1500000	1200000	560000	ND [2800000] U	1770000	1750000	1010000	655000	1330000	332000
CHROMIUM, TOTAL	15000	18000	11000	12000	13000	14400	10800	19800	13100	12900
COBALT	6900	11000	6700	ND [28000] U	3640	4830	4160	2600	3540	8340
COPPER	6030	10600	ND [2790] U	ND [14000] U	9740	8140	6090	3200	10600	8760
IRON	14000000	15000000	7300000	7800000	13500000	12500000	7590000	25000000	11000000	8080000
LEAD	13600	12800	9450	12400	20200	24300	19000	14200	20100	12900:
MAGNESIUM	620000	810000	570000	ND [2800000] U	1580000	523000	490000	316000	534000	338000
MANGANESE	287000	519000	727000	776000	11500	89300	91700	71200	40600	384000
MERCURY	ND [110] U	ND [110] U	ND [110] U	NA	ND [27] U	34	ND [26] U	ND [28] U	ND [39] U	53
NICKEL	7700	12000	5400	ND [22000] U	NA	NA	NA	NA	NA	NA
POTASSIUM	800000	1100000	770000	ND [2800000] U	493000	775000	784000	299000	783000	369000
SELENIUM	ND [1070] U	1650	1340	ND [5590] U	ND [898] U	ND [690] U	ND [554] U	ND [500] U	ND [778] U	ND [445] U
SILVER	ND [1100] U	ND [1100] U	ND [1100] U	ND [5600] U	ND [45] U	ND [34] U	36	ND [25] U	ND [39] U	1060
SODIUM	ND [540000] U	ND [540000] U	ND [560000] U	ND [2800000] U	NA	NA	NA	NA	NA	NA
STRONTIUM	8400	7700	6900	ND [28000] U	291000	14900	45500	7100	13200	514000
THALLIUM	ND [535] U	ND [536] U	ND [559] U	ND [2790] U	NA	NA	NA	NA	NA	NA
VANADIUM	26000	28000	17000	ND [28000] U	NA	NA	NA	NA	NA	NA
ZINC	49000	24000	13000	14000	49800	27600	10700	109000	30900	19300

325000

0282248

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S123-01	LH-S94-01	LH-S94-01	LH-S95-01	LH-S95-01	LH-S95-01	LH-S95-02	LH-S95-02	LH-S95-02	LH-S96-01
Sample Number:	LH-S123-01_2	LH-S94-01_1	LH-S94-01_2	LH-S95-01_1	LH-S95-01_2	LH-S95-01_3	LH-S95-02_1	LH-S95-02_2	LH-S95-02_3	LH-S96-01_1
Date Sampled:	06/26/1993	08/20/1993	08/20/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	11.00	0.50	2.90	0.50	5.50	11.30	0.50	4.00	5.50	0.50
METALS - UNITS: UG/KG										
ALUMINUM	6320000	10100000	13000000	15600000	10600000	5400000	12500000	13200000	10300000	7590000
ANTIMONY	ND [5660] U	ND [5080] U	ND [5180] U	ND [13000] U	ND [10700] U	11000:	ND [6120] U	ND [12000] U	ND [8820] U	ND [5280] U
ARSENIC	1500	660	1010	3760	2740	2190	1990	3000	1940	2300
BARIUM	32200	100000	224000:	943000:	179000	90300	327000	121000	190000	66800
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	5550	3910	4250	5960	4350	ND [2540] U	3400	4440	2690	2220
CALCIUM	1530000	1720000	1870000	1390000	1130000	992000	774000	1370000	870000	1120000
CHROMIUM, TOTAL	8380	29400	14900	22500	10400	ND [5650] U	12400	16000	10300	11100
COBALT	5010	3250	2460	8620	8810	8300	3180	14600	7190	3120
COPPER	9820	8000	8830	9910	10600	8960	5630	12600	9530	6440
IRON	14700000	7080000	8500000	19100000	13900000	8860000	11900000	12800000	11900000	8280000
LEAD	12100	17500	17700	37900	22000:	ND [15300] U	17500:	25100:	ND [13200] U	28200
MAGNESIUM	1230000	644000	819000	1730000	1440000	849000	985000	968000	1240000	368000
MANGANESE	118000	119000	150000	316000	130000	95700	43100	418000	82200	89900
MERCURY	55	60	57	ND [29] U	ND [28] U	ND [28] U	ND [28] U	ND [60] U	ND [30] U	ND [24] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	408000	590000	816000	712000	589000	334000	554000	658000	546000	431000
SELENIUM	ND [368] U	ND [330] U	ND [337] U	ND [1300] U	ND [1070] U	ND [1020] U	ND [612] U	ND [1200] U	ND [882] U	ND [528] U
SILVER	269	1200	31	ND [65] U	ND [54] U	ND [51] U	ND [31] U	72	ND [44] U	50
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	27200	20300	32400	458000	41700	27500	149000	19000	24200	16400
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	56500	28800	207000	60100	45500	29400	24100	35000	37000	20600

000529

028249

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-S96-01	LH-S96-01	LH-S97-01	LH-S97-01	LH-S97-01	LH-S98-01	LH-S98-01	LH-S99-01	LH-S99-01	LH-S99-01
Sample Number:	LH-S96-01_2	LH-S96-01_3	LH-S97-01_1	LH-S97-01_2	LH-S97-01_3	LH-S98-01_1	LH-S98-01_2	LH-S99-01_1	LH-S99-01_2	LH-S99-01_3
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993
Depth (ft.):	2.00	11.00	0.50	3.90	11.00	0.50	1.50	0.50	2.00	12.00
METALS - UNITS: UG/KG										
ALUMINUM	7910000	5400000	6720000	11600000	7340000	6140000	4680000	12300000	15300000	6520000
ANTIMONY	ND [6520] U	ND [5740] U	ND [5500] U	ND [11300] U	ND [6960] U	7960	ND [10100] U	ND [5380] U	ND [6940] U	ND [7680] U
ARSENIC	1790	1380	1680	1640	1530	9920	10700	1240	798	2150
BARIUM	76400	65500	68400	41700	64700	43100	83800	74900	85400	131000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	1760	1460	2120	3230	2820	11400	ND [2520] U	2560	2220	4920
CALCIUM	1220000	1310000	640000	1160000	1070000	804000	751000	2360000	1270000	2040000
CHROMIUM, TOTAL	12500	7690	10200	9530	9710	22000	8620	11800	12500	8950
COBALT	3360	2270	12100	6630	8040	3850	6550	5510	3370	5720
COPPER	8800	6690	4950	7990	6860	ND [1280] U	3530	5680	8320	8680
IRON	7340000	7710000	7800000	13100000	11200000	51800000	9480000	11100000	8830000	19900000
LEAD	20300	10900	15000	23300	13300	21900:	ND [15100] U	22700:	20500	13600
MAGNESIUM	431000	1100000	300000	1070000	1310000	277000	206000	462000	779000	1490000
MANGANESE	153000	24700	214000	32700	183000	155000	743000	164000	74900	272000
MERCURY	ND [29] U	ND [27] U	ND [25] U	ND [25] U	ND [28] U	ND [25] U	ND [26] U	ND [24] U	ND [30] U	ND [27] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	405000	346000	557000	569000	459000	225000	556000	456000	495000	469000
SELENIUM	ND [652] U	ND [574] U	ND [550] U	ND [1130] U	696	ND [551] U	ND [1010] U	ND [538] U	694	ND [768] U
SILVER	85	ND [29] U	ND [28] U	ND [57] U	35	ND [26] U	ND [50] U	43	66	ND [38] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	16200	25700	7150	20200	22000	5740	18700	30000	22500	30200
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	16900	28000	14800	29400	36400	35900	6400	15800	20100	55700

0282250
0282250

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LH-WRS1-01	LH-WRS1-01	LH-WRS1-01	LH-WRS2-01	LH-WRS2-01	LH-WRS3-01	LH-WRS3-01	LH-WRS3-01	LHS-MW-62
Sample Number:	LH-WRS1-01_1	LH-WRS1-01_2	LH-WRS1-01_3	LH-WRS2-01_1	LH-WRS2-01_2	LH-WRS3-01_1	LH-WRS3-01_2	LH-WRS3-01_3	LHS-MW62
Date Sampled:	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	06/26/1993	10/05/1994
Depth (ft.):	0.50	3.50	11.00	0.50	3.00	0.50	3.50	10.50	0.00
METALS - UNITS: UG/KG									
ALUMINUM	6140000	12600000	5730000	6830000	1420000	3550000	12200000	5030000	15600000
ANTIMONY	ND [5900] U	ND [10300] U	ND [12600] U	ND [12100] U	ND [9620] U	ND [4800] U	ND [5180] U	ND [10600] U	ND [7500] U
ARSENIC	2270	2320	2020	6870	ND [625] U	1440	337	2390	3300
BARIUM	121000	77900	108000	58500	6590	18500	152000	195000	120000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	1980	2730	ND [3160] U	5170	ND [2400] U	3550	3420	ND [2660] U	ND [750] U
CALCIUM	1130000	2300000	963000	2340000	776000	719000	1530000	1680000	1090000
CHROMIUM, TOTAL	8730	12300	8340	41500	3900	6740	11300	6010	17600
COBALT	14300	11400	11400	3650	ND [818] U	290	3060	84600	8000
COPPER	7700	9370	13300	13000	4380	3910	5100	10300	7300
IRON	6540000	12200000	8080000	17000000	4280000	6700000	6350000	8120000	17100000
LEAD	24400	26000	ND [19000] U	151000	14400:	ND [7200] U	19100	ND [16000] U	15500
MAGNESIUM	368000	705000	1210000	402000	65300	104000	947000	1010000	1240000
MANGANESE	828000	214000	42700	97500	8560	13000	111000	1310000	191000
MERCURY	42	ND [26] U	ND [28] U	312	ND [28] U	51	57	ND [27] U	ND [85] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	386000	650000	519000	430000	92200	203000	401000	463000	884000
SELENIUM	ND [590] U	ND [1030] U	ND [1260] U	ND [1220] U	ND [962] U	ND [312] U	ND [337] U	ND [1060] U	520
SILVER	47	ND [52] U	ND [63] U	85	ND [48] U	ND [24] U	ND [26] U	ND [53] U	ND [750] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	25900	14200	21200	15900	5730	7420	31400	25100	20100
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	ND [37300] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	49100	30500	42700	190000	8420	10400	17700	36500	44100

0282251
0282251

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHS-MW-63	LHS-MW-64	LHS-MW-65	LHS-MW-66	LHS-Y-01	LHS-Y-02	LHS-Y-03	LHS-Y-04	LHS-Y-05	LHS-Y-06
Sample Number:	LHS-MW63	LHS-MW64	LHS-MW65	LHS-MW66	LHS-Y-01	LHS-Y-02	LHS-Y-03	LHS-Y-04	LHS-Y-05	LHS-Y-06
Date Sampled:	10/05/1994	10/05/1994	10/05/1994	10/05/1994	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995	01/11/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG										
ALUMINUM	12400000	8290000	5920000	10000000	13400000	19300000	14600000	7810000	10300000	9570000
ANTIMONY	ND [7200] U	ND [6200] U	ND [6800] U	ND [6700] U	ND [10700] UJ	ND [13700] UJ	ND [19000] UJ	ND [15200] UJ	ND [15600] UJ	ND [9800] UJ
ARSENIC	3800	7600	1800	1700	2700 J	4700 J	6500 J	2700 J	570 J	3000
BARIUM	98200	149000	77600	66000	422000	143000	112000	126000	83100	2510000
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	ND [720] U	ND [620] U	ND [680] U	ND [670] U	ND [1100] U	ND [1400] U	ND [1900] U	ND [1500] U	ND [1600] U	ND [980] U
CALCIUM	1410000	749000	324000	226000	701000	1590000	1020000	1080000	964000	2330000
CHROMIUM, TOTAL	15000	19800	9300	12900	21000 J	22000 J	19200 J	12100 J	13400 J	20600
COBALT	5900	21300	8800	7900	12100	9400	8300	10100	3300	6600
COPPER	6700	4600	2600	2800	102000	8500	99200	7700	23900	8800
IRON	16200000	20700000	6860000	8500000	18500000	22700000	10400000	10100000	7190000	17400000
LEAD	14400	20800	11800	10500	41000	15300:	28300:	19200:	15100:	21800
MAGNESIUM	788000	403000	263000	403000	1100000	1830000	712000	516000	494000	1030000
MANGANESE	164000	1420000	507000	325000	209000	69500	116000	504000	60800	257000
MERCURY	ND [100] U	ND [86] U	ND [77] U	ND [87] U	ND [130] U	ND [130] U	ND [180] U	ND [130] U	ND [120] U	ND [91] U
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	541000	372000	334000	536000	708000	1070000	717000	490000	497000	433000
SELENIUM	550	490	220	200	450 J	560 J	1000 J	550 J	ND [270] UJ	300 J
SILVER	ND [720] U	740	ND [680] U	ND [670] U	ND [1100] U	ND [1400] U	ND [1900] U	ND [1500] U	ND [1600] U	ND [980] U
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	12900	6700	ND [6800] U	ND [6700] U	118000	41700	ND [19000] U	ND [15200] U	ND [15600] U	405000
THALLIUM	ND [35800] U	ND [31100] U	ND [33800] U	ND [33600] U	ND [53600] U	ND [68300] U	ND [94800] U	ND [75900] U	ND [78200] U	ND [49000] U
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	35600	188000	14700	16400	76300	62600	101000	53400	62400	38200 J

0282252

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	SUMP094	SUMP094	SUMP095	SUMP095	SUMP096	SUMP096	SUMP097	SUMP097
Sample Number:	SUMP094(0-0.5)	SUMP094(3-5)	SUMP095(0-0.5)	SUMP095(3-5)	SUMP096(0-0.5)	SUMP096(9.5-10)	SUMP097(0-0.5)	SUMP097(5.5-6)
Date Sampled:	08/07/1998	08/07/1998	08/04/1998	08/04/1998	09/25/1998	09/25/1998	09/25/1998	09/25/1998
Depth (ft.):	0.00	3.00	0.00	3.00	0.00	9.50	0.00	5.50
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [537] U	951	541.3	725.6	ND [605] U	1790	ND [585] U	ND [588] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	8900	11000	ND [4200] U	9200	6600	23000	ND [4700] U	5200
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	46000 J	16000 J	22000	20000	30000	24000	18000	28000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

028253

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	SUMP098	SUMP098	SUMP099	SUMP099	SUMP100	SUMP100	SUMP101	SUMP101
Sample Number:	SUMP098(0-0.5)	SUMP098(3-5)	SUMP099(0-0.5)	SUMP099(9.5-10)	SUMP100(0-0.5)	SUMP100(3-5)	SUMP101(0-0.5)	SUMP101(9.5-10)
Date Sampled:	08/06/1998	08/06/1998	09/25/1998	09/25/1998	08/07/1998	08/07/1998	09/25/1998	09/25/1998
Depth (ft.):	0.00	3.00	0.00	9.50	0.00	3.00	0.00	9.50
METALS - UNITS: UG/KG								
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	ND [540] U	760	ND [559] U	58	ND [617] U	601	ND [646] U	1110
CADMIUM	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	11000	12000	ND [4500] U	25000	12000	12000	ND [5200] U	19000
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	35000	24000	12000	26000	49000 J	33000 J	24000	24000
ZINC	NA	NA	NA	NA	NA	NA	NA	NA

0028254
0028254

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	SUMP123	SUMP123	SUMP123	WRSUMP001	WRSUMP001	WRSUMP002	WRSUMP002
Sample Number:	SUMP123(0-0.5)	SUMP123(7.5-8)	SUMP123(7.5-8)LFD	WRSUMP01(0-0.5)	WRSUMP001(3-5)	WRSUMP02(0-0.5)	WRSUMP02(0-0.5)FD
Date Sampled:	09/25/1998	09/25/1998	09/25/1998	08/06/1998	08/06/1998	09/25/1998	09/25/1998
Depth (ft.):	0.00	7.50	7.50	0.00	3.00	0.00	0.00
METALS - UNITS: UG/KG							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	3290 J:	2350 J:	3320 J:	ND [531] U	661	ND [592] U	ND [2960] U
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA
NICKEL	5000 J	30000 J	51000 J	6100	11000	ND [4700] U	ND [24000] U
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	5800 J	32000 J	45000 J	15000	30000	10000	ND [30000] U
ZINC	NA	NA	NA	NA	NA	NA	NA

0282550

0282555

Metals in Soil Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	WRSUMP002	WRSUMP003	WRSUMP003
Sample Number:	WRSUMP02(5-5.5)	WRSUMP03(0-0.5)	WRSUMP003(3-5)
Date Sampled:	09/25/1998	08/06/1998	08/06/1998
Depth (ft.):	5.00	0.00	3.00
METALS - UNITS: UG/KG			
ALUMINUM	NA	NA	NA
ANTIMONY	NA	NA	NA
ARSENIC	NA	NA	NA
BARIUM	NA	NA	NA
BERYLLIUM	ND [678] U	617	678
CADMIUM	NA	NA	NA
CALCIUM	NA	NA	NA
CHROMIUM, TOTAL	NA	NA	NA
COBALT	NA	NA	NA
COPPER	NA	NA	NA
IRON	NA	NA	NA
LEAD	NA	NA	NA
MAGNESIUM	NA	NA	NA
MANGANESE	NA	NA	NA
MERCURY	NA	NA	NA
NICKEL	5600	12000	13000
POTASSIUM	NA	NA	NA
SELENIUM	NA	NA	NA
SILVER	NA	NA	NA
SODIUM	NA	NA	NA
STRONTIUM	NA	NA	NA
THALLIUM	NA	NA	NA
VANADIUM	16000	45000	20000
ZINC	NA	NA	NA

025000

028256

VOCs and SVOCs in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW62	LHSMW62	LHSMW62	LHSMW62	LHSMW63	LHSMW63	LHSMW63	LHSMW63	LHSMW64
Sample Number:	MW-62	LHS-MW-62	LHS-MW-62	LHS-MW-62	MW-63	LHS-MW-63	LHS-MW-63	LHS-MW-63	MW-64
Date Sampled:	02/11/1996	05/20/1998	08/15/1996	12/10/1994	02/11/1996	05/27/1998	08/15/1996	12/10/1994	02/11/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
CHLOROFORM	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	2	0.81	2.5	5	ND [1] U
SEC-BUTYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U
TRICHLOROETHYLENE (TCE)	9	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U
t-BUTYLBENZENE	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	2
1,1,1-TRICHLOROETHANE	2	ND	ND	ND	ND [1] U	ND	ND	ND	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	0.77
ACENAPHTHENE	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	0.92
BENZOIC ACID	NA	ND [50] R	NA	ND [50] U	NA	ND [50] U	NA	ND [50] U	NA
DIBENZOFURAN	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	2
FLUORENE	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	2.9
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U	ND [0.92] U	ND [10] U	0.92 J	ND [10] U	ND [0.92] U	ND [10] U	0.64 J

028257

028257

VOCs and SVOCs in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW64	LHSMW64	LHSMW64	LHSMW65	LHSMW65	LHSMW65	LHSMW65	LHSMW66	LHSMW66
Sample Number:	LHS-MW-64	LHS-MW-64	LHS-MW-64	MW-65	LHS-MW-65	LHS-MW-65	LHS-MW-65	MW-66	LHS-MW-66
Date Sampled:	05/27/1998	08/15/1996	12/10/1994	02/11/1996	05/27/1998	08/15/1996	12/10/1994	02/11/1996	05/27/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
CHLOROFORM	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U	ND [0.2] U	ND [5] U	ND [1] U	ND [1] U
SEC-BUTYLBENZENE	0.52	0.55	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U	ND [0.25] U	ND [5] U	ND [1] U	ND [1] U
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U	ND [0.25] U	NA	ND [1] U	ND [1] U
t-BUTYLBENZENE	1.2	1.9	NA	ND [1] U	ND [1] U	ND [0.2] U	NA	ND [1] U	ND [1] U
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND [1] U	ND	ND	ND	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
2-METHYLNAPHTHALENE	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U	ND [0.67] U	ND [10] U
ACENAPHTHENE	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U	ND [0.75] U	ND [10] U
BENZOIC ACID	7.2	NA	ND [50] U	NA	ND [50] U	NA	ND [50] U	NA	ND [50] U
DIBENZOFURAN	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U	ND [0.83] U	ND [10] U
FLUORENE	ND [10] U	2.7	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U	ND [0.8] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [0.92] U	1 J	ND [0.92] U	ND [10] U	ND [0.92] U	ND [10] U	ND [0.92] U	7.7

028258

VOCs and SVOCs in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW66	LHSMW66
Sample Number:	LHS-MW-66	LHS-MW-66
Date Sampled:	08/15/1996	12/10/1994
Depth (ft.):	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L		
CHLOROFORM	ND [0.2] U	ND [5] U
SEC-BUTYLBENZENE	ND [0.2] U	NA
TETRACHLOROETHYLENE(PCE)	ND [0.25] U	2 J
TRICHLOROETHYLENE (TCE)	0.91	NA
t-BUTYLBENZENE	ND [0.2] U	NA
1,1,1-TRICHLOROETHANE	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L		
2-METHYLNAPHTHALENE	ND [0.67] U	ND [10] U
ACENAPHTHENE	ND [0.75] U	ND [10] U
BENZOIC ACID	NA	ND [50] U
DIBENZOFURAN	ND [0.83] U	ND [10] U
FLUORENE	ND [0.8] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	ND [0.92] U	ND [10] U

25000

028259

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW62	LHSMW62	LHSMW62	LHSMW62	LHSMW62	LHSMW62	LHSMW62	LHSMW63	LHSMW63
Sample Number:	MW-62	LHS-MW-62	LHS-MW-62REFD	LHS-MW-62	LHS-MW-62	LHS-MW-62FD	LHS-MW-62	MW-63	LHS-MW-63
Date Sampled:	02/11/1996	05/20/1998	05/20/1998	08/15/1996	08/25/1998	08/25/1998	12/10/1994	02/11/1996	05/27/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA		NA	NA		NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA		NA	NA		NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA		NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [4.444] U	12.468	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	ND [4.444] U	12.468	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	ND [9.335] U	13.675	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	73.945	41.856	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4-DINITROTOLUENE	0.094 J	ND [1.3] U	ND [1.3] U	ND [0.13] U	NA	NA	ND [0.12] U	ND [0.13] U	ND [1.3] U
2,6-DINITROTOLUENE	0.26	ND [2.6] U	ND [2.6] U	ND [0.13] U	NA	NA	ND [0.13] U	ND [0.13] U	ND [2.6] U
2-AMINO-4,6-DINITROTOLUENE	0.44	ND [2.6] U	ND [2.6] U	ND [0.13] U	NA	NA	NA	ND [0.13] U	ND [2.6] U
3-NITROTOLUENE	0.15 J	ND [2.6] U	ND [2.6] U	0.7	NA	NA	ND [0.5] U	ND [0.26] U	ND [2.6] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [2.6] U	ND [2.6] U	ND [0.13] U	NA	NA	ND [0.25] U	ND [0.13] U	ND [2.6] U
TETRYL	ND [0.13] U	ND [2.6] U	ND [2.6] U	ND [0.13] U	NA	NA	ND [0.37] U	1	ND [2.6] U

028260

028260

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW63	LHSMW63	LHSMW64	LHSMW64	LHSMW64	LHSMW64	LHSMW65	LHSMW65	LHSMW65
Sample Number:	LHS-MW-63	LHS-MW-63	MW-64	LHS-MW-64	LHS-MW-64	LHS-MW-64	MW-65	LHS-MW-65	LHS-MW-65
Date Sampled:	08/15/1996	12/10/1994	02/11/1996	05/27/1998	08/15/1996	12/10/1994	02/11/1996	05/27/1998	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
2,4-DINITROTOLUENE	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U	0.089 J	ND [2.6] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	ND [0.13] U	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA	0.64	ND [2.6] U	ND [0.13] U
3-NITROTOLUENE	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U	ND [0.5] U	ND [0.26] U	ND [2.6] U	ND [0.26] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.13] U	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U	0.13 J	ND [2.6] U	ND [0.13] U
TETRYL	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U

028261

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW65	LHSMW66	LHSMW66	LHSMW66	LHSMW66
Sample Number:	LHS-MW-65	MW-66	LHS-MW-66	LHS-MW-66	LHS-MW-66
Date Sampled:	12/10/1994	02/11/1996	05/27/1998	08/15/1996	12/10/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L					
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L					
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/L					
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L					
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L					
2,4-DINITROTOLUENE	ND [0.12] U	ND [0.13] U	ND [1.3] U	ND [0.13] U	ND [0.12] U
2,6-DINITROTOLUENE	ND [0.13] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.13] U
2-AMINO-4,6-DINITROTOLUENE	NA	ND [0.13] U	ND [2.6] U	ND [0.13] U	NA
3-NITROTOLUENE	ND [0.5] U	0.24 J	ND [2.6] U	ND [0.26] U	ND [0.5] U
4-AMINO-2,6-DINITROTOLUENE	ND [0.25] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.25] U
TETRYL	ND [0.37] U	ND [0.13] U	ND [2.6] U	ND [0.13] U	ND [0.37] U

028262
00547

Metals in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW62	LHSMW62	LHSMW62	LHSMW62	LHSMW63	LHSMW63	LHSMW63	LHSMW63	LHSMW64	LHSMW64	LHSMW64
Sample Number:	MW-62	LHS-MW-62	LHS-MW-62	LHS-MW-62	MW-63	LHS-MW-63	LHS-MW-63	LHS-MW-63	LHS-MW-64	LHS-MW-64	LHS-MW-64
Date Sampled:	02/11/1996	05/20/1998	08/15/1996	12/10/1994	02/11/1996	05/27/1998	08/15/1996	12/10/1994	02/11/1996	05/27/1998	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	1300	7900	1440 J	161000	4000	14000	2570 J	17400	532	ND [200] U	603
ANTIMONY	ND [25] U	ND [5] R	ND [60] U	ND [100] U	ND [25] U	ND [5] U	51 J	ND [100] U	ND [60] U	ND [5] U	ND [60] U
ARSENIC	ND [2] U	ND [10] U	ND [2] U	6.2	ND [2] U	ND [10] U	ND [2] U	3	5.8	12	9.9
BARIUM	53	ND [200] U	35	1600	110	220	69	170	251	260	258
BERYLLIUM	ND [0.2] U	ND [0.5] U	ND [10] U	NA	ND [0.2] U	ND [0.5] U	ND [10] U	NA	ND [5] U	ND [0.5] U	ND [10] U
CADMIUM	ND [0.2] U	ND [0.8] U	ND [10] U	ND [10] U	0.4	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U
CALCIUM	12300	14000	6740 J	60400	3100	ND [5000] U	1780 J	8500	9140 J	9000	9180 J
CHROMIUM, TOTAL	13	130	10	430	3200	54000	7410 J	130	ND [10] U	30	ND [10] U
COBALT	4	ND [50] U	ND [20] U	120	13	ND [50] U	ND [20] U	ND [20] U	ND [10] U	ND [50] U	ND [20] U
COPPER	80	ND [25] U	19	210	40	484	61	30	18	ND [25] U	ND [10] U
IRON	2200	9300	2460 J	256000	14900	370000	38000 J	24000	23800 J	25000	29800 J:
LEAD	1.6	ND [3] U	ND [90] U	150	4.7	ND [3] U	ND [90] U	9.4	96	ND [3] U	ND [90] U
MAGNESIUM	7200	9700	3760 J	55200	1800	ND [5000] U	1230 J	3200	8590 J	9700	9290 J
MANGANESE	320	295	163	1900	1500	159	77	300	446	516	448
MERCURY	ND [0.2] U	ND [0.2] U	0.325	1.5	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.1] U
NICKEL	170	170	80	NA	580	3200	436	NA	ND [15] U	ND [40] U	23
POTASSIUM	600	ND [5000] U	668	10600	840	ND [5000] U	730	2400	361	ND [5000] U	403
SELENIUM	ND [2] U	ND [5] U	ND [2] U	ND [10] U	ND [2] U	35	ND [2] U	ND [2] U	ND [2] U	ND [5] U	ND [2] U
SILVER	ND [0.4] U	ND [10] U	ND [10] U	ND [10] U	1.2	1400	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	NA	150000	NA	NA	NA	49000	NA	NA	NA	130000	NA
STRONTIUM	160	310	87	980	41	ND [50] U	28	ND [100] U	206	310	216
THALLIUM	ND [1.7] U	ND [1] R	ND [90] U	ND [500] U	ND [1.7] U	ND [1] UJ	ND [90] U	ND [500] U	178	ND [1] UJ	205
TIN	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA
VANADIUM	2.7	ND [50] U	ND [20] U	NA	17	ND [50] U	ND [20] U	NA	ND [10] U	ND [50] U	ND [20] U
ZINC	26	40	34	940	41	ND [20] U	37	87	18	ND [20] U	26

028263

25500

Metals in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW64	LHSMW65	LHSMW65	LHSMW65	LHSMW65	LHSMW66	LHSMW66	LHSMW66	LHSMW66
Sample Number:	LHS-MW-64	LHS-MW-65	LHS-MW-65	LHS-MW-65	LHS-MW-65	LHS-MW-66	LHS-MW-66	LHS-MW-66	LHS-MW-66
Date Sampled:	12/10/1994	02/11/1996	05/27/1998	08/15/1996	12/10/1994	02/11/1996	05/27/1998	08/15/1996	12/10/1994
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L									
ALUMINUM	139000	15000 J	7800	10600 J	32900	6340 J	3600	16400 J:	39300
ANTIMONY	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U	ND [60] U	ND [5] U	ND [60] U	ND [100] U
ARSENIC	6	ND [2] U	ND [10] U	ND [2] U	3	ND [2] U	ND [10] U	ND [2] U	2
BARIUM	1400	125	ND [200] U	105	300	130	ND [200] U	323	270
BERYLLIUM	NA	ND [5] U	ND [0.5] U	ND [10] U	NA	ND [5] U	ND [0.5] U	ND [10] U	NA
CADMIUM	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [0.8] U	ND [10] U	ND [10] U
CALCIUM	22500	3240 J	ND [5000] U	2490 J	11500	2690 J	ND [5000] U	5380 J	5400
CHROMIUM, TOTAL	260	510	1900	183	180	45	50	84	78
COBALT	84	10	ND [50] U	ND [20] U	28	ND [10] U	ND [50] U	25	35
COPPER	130	53	ND [25] U	14	30	24	ND [25] U	29	38
IRON	195000	20900 J:	16000	14900 J:	51500	9270 J	5000	28700 J:	48700
LEAD	97	ND [30] U	ND [3] U	244	21:00	ND [30] U	ND [3] U	367	17
MAGNESIUM	28200	2180 J	ND [5000] U	1650 J	4700	1880 J	ND [5000] U	4530 J	4000
MANGANESE	1400	220	98	186	720	97	38	201	350
MERCURY	0.38	ND [0.2] U	ND [0.2] U	0.132	0.29	ND [0.2] U	ND [0.2] U	ND [0.1] U	ND [0.2] U
NICKEL	NA	162	400	99	NA	44	ND [40] U	86	NA
POTASSIUM	10600	2200 J	ND [5000] U	1930 J	3900	1380 J	ND [5000] U	2930 J	3700
SELENIUM	ND [10] U	ND [2] U	ND [5] U	ND [2] U	2.9	6.5	ND [5] U	ND [2] U	ND [2] U
SILVER	ND [10] U	ND [10] U	50	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	NA	NA	25000	NA	NA	NA	10000	NA	NA
STRONTIUM	520	49	ND [50] U	37	110	45	ND [50] U	109	ND [100] U
THALLIUM	ND [500] U	92	ND [1] UJ	ND [90] U	ND [500] U	ND [90] U	ND [1] UJ	ND [90] U	ND [500] U
TIN	NA	NA	ND [100] U	NA	NA	NA	ND [100] U	NA	NA
VANADIUM	NA	25	ND [50] U	20	NA	ND [10] U	ND [50] U	25	NA
ZINC	610	72	20	59	140	44	ND [20] U	97	140

000547

028264

Anions in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW62	LHSMW62	LHSMW62	LHSMW62	LHSMW62	LHSMW63	LHSMW63	LHSMW63	LHSMW63	LHSMW63
Sample Number:	LHS-MW-62	MW-62	LHSMW62	LHSMW62	LHS-MW-62	LHS-MW-63	MW-63	LHSMW63	LHSMW63	LHS-MW-63
Date Sampled:	02/11/1996	02/11/1996	02/13/2001	05/20/2000	08/15/1996	02/11/1996	02/11/1996	02/13/2001	05/20/2000	08/15/1996
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	130000	NA	NA	NA	67300	20000	NA	NA	NA	22400
CYANIDE	NA	ND [10] U	NA	NA	NA	NA	ND [10] U	NA	NA	NA
NITROGEN, NITRATE (AS N)	ND [500] U	NA	NA	NA	ND [500] U	740	NA	NA	NA	ND [500] U
NITROGEN, NITRITE	ND [500] U	NA	NA	NA	ND [500] U	ND [500] U	NA	NA	NA	ND [500] U
PERCHLORATE	NA	NA	ND [0.71] U	160	NA	NA	NA	ND [0.71] U	ND [1] U	NA
SULFATE (AS SO4)	132000	NA	NA	NA	160000	29000	NA	NA	NA	37500

0282650

0282650

Anions in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW64	LHSMW64	LHSMW64	LHSMW64	LHSMW65	LHSMW65	LHSMW65	LHSMW65	LHSMW66	LHSMW66
Sample Number:	LHS-MW-64	LHSMW64	LHSMW64	LHS-MW-64	LHS-MW-65	LHSMW65	LHSMW65	LHS-MW-65	LHS-MW-66	LHSMW66
Date Sampled:	02/11/1996	02/12/2001	05/20/2000	08/15/1996	02/11/1996	02/12/2001	05/20/2000	08/15/1996	02/11/1996	02/13/2001
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L										
CHLORIDE (AS CL)	16700	NA	NA	19500	6500	NA	NA	9420	4700	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITROGEN, NITRATE (AS N)	ND [500] U	NA	NA	ND [500] U	ND [500] U	NA	NA	ND [500] U	ND [500] U	NA
NITROGEN, NITRITE	ND [500] U	NA	NA	ND [500] U	ND [500] U	NA	NA	ND [500] U	ND [500] U	NA
PERCHLORATE	NA	ND [0.71] UJ	ND [1] U	NA	NA	ND [0.71] U	ND [1] U	NA	NA	ND [0.71] U
SULFATE (AS SO4)	2800	NA	NA	1750 J	8000	NA	NA	12800	4900	NA

000541

028266

Anions in Groundwater Samples at Site 48
Longhorn Army Ammunition Plant, Texas

Location:	LHSMW66	LHSMW66
Sample Number:	LHSMW66	LHS-MW-66
Date Sampled:	05/20/2000	08/15/1996
Depth (ft.):	0.00	0.00
ANIONS - UNITS: UG/L		
CHLORIDE (AS CL)	NA	6650
CYANIDE	NA	NA
NITROGEN, NITRATE (AS N)	NA	ND [500] U
NITROGEN, NITRITE	NA	ND [500] U
PERCHLORATE	ND [1] U	NA
SULFATE (AS SO4)	NA	7290

45000
00954
028267

VOCs and SVOCs in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB01	50SB01	50SB01	50SB02	50SB02	50SB02
Sample Number:	LH50SB01(10-12)	LH50SB01(15-17)	LH50SB01(5-7)	LH50SB02(10-12)	LH50SB02(15-17)	LH50SB02(5-7)
Date Sampled:	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995
Depth (ft.):	10.00	15.00	5.00	10.00	15.00	5.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
1,2,3-TRICHLOROBENZENE	ND [6] U	ND [6] U	4	ND [6] U	ND [6] U	ND [6] U
ACETONE	ND [11] U	ND [12] U	ND [12] U	ND [12] U	ND [12] U	ND [12] U
NAPHTHALENE	ND [6] U	ND [6] U	9	ND [6] U	ND [6] U	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [6] U	6	ND [6] U	ND [6] U	519:*	ND [6] U
cis-1,2-DICHLOROETHYLENE	ND [6] U	ND [6] U	ND [6] U	ND [6] U	156 J	ND [6] U
n-BUTYLBENZENE	ND [6] U	ND [6] U	4	ND [6] U	ND [6] U	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
BENZOIC ACID	ND [380] U	ND [390] U	ND [390] U	ND [390] U	ND [410] U	ND [390] U
BENZYL BUTYL PHTHALATE	ND [380] U	ND [390] U	817	ND [390] U	589	ND [390] U
DI-n-BUTYL PHTHALATE	2098 U	1029 U	1242 U	2772 U	2566 U	2448 U
bis(2-ETHYLHEXYL) PHTHALATE	ND [380] U	307	398	ND [390] U	241	ND [390] U

0028268
000541

VOCs and SVOCs in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB03	50SB03	50SB03	50SB04	50SB04	50SB04
Sample Number:	LH50SB03(10-12)	LH50SB03(15-17)	LH50SB03(5-7)	LH50SB04(10-12)	LH50SB04(15-17)	LH50SB04(5-7)
Date Sampled:	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995
Depth (ft.):	10.00	15.00	5.00	10.00	15.00	5.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
1,2,3-TRICHLOROBENZENE	ND [6] U	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U
ACETONE	ND [12] U	ND [12] U	ND [11] U	ND [11] U	ND [12] U	ND [11] U
NAPHTHALENE	ND [6] U	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U
cis-1,2-DICHLOROETHYLENE	ND [6] U	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U
n-BUTYLBENZENE	ND [6] U	ND [6] U	ND [5] U	ND [6] U	ND [6] U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
BENZOIC ACID	ND [390] U	ND [400] U	ND [360] U	ND [380] U	ND [390] U	ND [360] U
BENZYL BUTYL PHTHALATE	ND [390] U	200	ND [360] U	671	ND [390] U	475
DI-n-BUTYL PHTHALATE	2098 U	3121 U	2020 U	2205 U	2558 U	2730 U
bis(2-ETHYLHEXYL) PHTHALATE	273	ND [400] U	ND [360] U	200	ND [390] U	195

0028269

00054

VOCs and SVOCs in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB06	50SB06	50SB06	50SS01	50SS02	50SS03	50SS04
Sample Number:	50SB06(0-0.5)	50SB06(1-3)	50SB06(3-5)	LH50SS01(000.0)	LH50SS02(000.0)	LH50SS03(000.0)	LH50SS04(000.0)
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	10/13/1995	10/13/1995	10/13/1995	10/13/1995
Depth (ft.):	0.00	1.00	3.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
1,2,3-TRICHLOROBENZENE	ND [5.3] U	ND [5.3] U	ND [5.3] U	ND [5] U	ND [6] UJ	ND [5] UJ	ND [6] U
ACETONE	6.3	ND [21] U	ND [21] U	ND [10] U	ND [11] UJ	ND [11] UJ	ND [11] U
NAPHTHALENE	ND [5.3] U	ND [5.3] U	ND [5.3] U	ND [5] U	ND [6] UJ	ND [5] UJ	ND [6] U
TRICHLOROETHYLENE (TCE)	ND [11] U	5.7	5.9	ND [5] U	3 J	ND [5] UJ	5
cis-1,2-DICHLOROETHYLENE	ND [5.3] U	ND [5.3] U	ND [5.3] U	ND [5] U	ND [6] UJ	ND [5] UJ	ND [6] U
n-BUTYLBENZENE	ND [5.3] U	ND [5.3] U	ND [5.3] U	ND [5] U	ND [6] UJ	ND [5] UJ	ND [6] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG							
BENZOIC ACID	ND [890] U	ND [880] U	ND [890] U	ND [340] U	ND [390] U	ND [360] U	ND [370] U
BENZYL BUTYL PHTHALATE	ND [360] U	ND [350] U	ND [360] U	ND [340] U	386	ND [360] U	949
DI-n-BUTYL PHTHALATE	ND [360] U	ND [350] U	ND [360] U	1545 U	3502 U	1488 U	2188 U
bis(2-ETHYLHEXYL) PHTHALATE	ND [360] U	ND [350] U	ND [360] U	ND [340] U	214	ND [360] U	240

000551

028270

VOCs and SVOCs in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SS05	50SS07
Sample Number:	LH50SS05(000.0)	50SS07(0-0.5)
Date Sampled:	10/13/1995	07/28/1998
Depth (ft.):	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
1,2,3-TRICHLOROBENZENE	ND [6] U	ND [5.4] U
ACETONE	ND [12] U	ND [21] U
NAPHTHALENE	ND [6] U	ND [5.4] U
TRICHLOROETHYLENE (TCE)	ND [6] U	ND [11] U
cis-1,2-DICHLOROETHYLENE	ND [6] U	ND [5.4] U
n-BUTYLBENZENE	ND [6] U	ND [5.4] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG		
BENZOIC ACID	388	ND [900] U
BENZYL BUTYL PHTHALATE	531	ND [360] U
DI-n-BUTYL PHTHALATE	3561 U	ND [360] U
bis(2-ETHYLHEXYL) PHTHALATE	206	ND [360] U

00055

028271

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB01	50SB01	50SB01	50SB02	50SB02	50SB02
Sample Number:	LH50SB01(10-12)	LH50SB01(15-17)	LH50SB01(5-7)	LH50SB02(10-12)	LH50SB02(15-17)	LH50SB02(5-7)
Date Sampled:	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995
Depth (ft.):	10.00	15.00	5.00	10.00	15.00	5.00
PESTICIDES - UNITS: UG/KG						
p,p'-DDD	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS						

00055

028272

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB03	50SB03	50SB03	50SB04	50SB04	50SB04	50SB06
Sample Number:	LH50SB03(10-12)	LH50SB03(15-17)	LH50SB03(5-7)	LH50SB04(10-12)	LH50SB04(15-17)	LH50SB04(5-7)	50SB06(0-0.5)
Date Sampled:	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995	07/28/1998
Depth (ft.):	10.00	15.00	5.00	10.00	15.00	5.00	0.00
PESTICIDES - UNITS: UG/KG							
p,p'-DDD	NA	NA	NA	NA	NA	NA	ND [3.6] U
p,p'-DDE	NA	NA	NA	NA	NA	NA	10
p,p'-DDT	NA	NA	NA	NA	NA	NA	13
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA	79
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	174.641
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	25.687
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	1.313
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	1.362
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	22.331
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	5.608
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	2.131
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	3.097
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	0.507
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	0.758
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	10.89 J
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	3.112
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	421.545
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	27
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	53.46
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	48.373
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	2295.8
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	69.725
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	1.102
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	28.595
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS							

00055

0282273

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB06	50SB06	50SB06	50SB06	50SB06	50SS01	50SS01
Sample Number:	50SB06(0-0.5)DLFD	50SB06(0-0.5)FD	50SB06(1-3)	50SB06(3-5)	50SB06(3-5)DLFD	LH50SS01(000.0)	LH50SS01(000.0)
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	07/28/1998	07/28/1998	02/20/1996	10/13/1995
Depth (ft.):	0.00	0.00	1.00	3.00	3.00	0.00	0.00
PESTICIDES - UNITS: UG/KG							
p,p'-DDD	ND [3.6] U	NA	7.1	18	16	NA	NA
p,p'-DDE	ND [3.6] U	NA	25	43	45	NA	NA
p,p'-DDT	ND [3.6] U	NA	9	41	31	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
PCB-1254 (AROCHLOR 1254)	NA	NA	130	430	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	173.056	60.155	23.842	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	22.571	12.273	4.704	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	ND [5.88] U	ND [2.759] U	ND [1.378] U	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	ND [1.204] U	ND [1.05] U	ND [1.037] U	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	23.435	12.218	1.918	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	3.329	1.32	ND [0.579] U	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [2.56] U	ND [0.632] U	ND [0.244] U	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	ND [0.799] U	ND [0.696] U	ND [0.688] U	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	ND [4.178] U	ND [1.032] U	ND [0.399] U	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	ND [0.967] U	ND [0.603] U	ND [0.752] U	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	ND [0.727] UJ	ND [0.339] U	ND [0.293] U	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	ND [3.75] U	ND [0.926] U	ND [0.358] U	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	432.182	118.274	23.842	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	22.571	12.273	4.704	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	32.604	4.625	ND [0.579] U	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	5.914	17.6	4.024	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	3177.872	3066.433	1327.937	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	78.892	57.872	17.897	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [0.967] U	ND [0.603] U	ND [0.752] U	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	32.695	9.479	1.524	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA			NA		

0028274

00055

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SS02	50SS02	50SS03	50SS03	50SS04	50SS04
Sample Number:	LH50SS02(000.0)	LH50SS02(000.0)	LH50SS03(000.0)	LH50SS03(000.0)	LH50SS04(000.0)	LH50SS04(000.0)
Date Sampled:	02/20/1996	10/13/1995	02/20/1996	10/13/1995	02/20/1996	10/13/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG						
p,p'-DDD	NA	NA	NA	NA	NA	NA
p,p'-DDE	NA	NA	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG						
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG						
NO DETECTED COMPOUNDS						

028275

000553

Pesticides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SS05	50SS05	50SS07
Sample Number:	LH50SS05(000.0)	LH50SS05(000.0)	50SS07(0-0.5)
Date Sampled:	02/20/1996	10/13/1995	07/28/1998
Depth (ft.):	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG			
p,p'-DDD	NA	NA	ND [3.6] U
p,p'-DDE	NA	NA	ND [3.6] U
p,p'-DDT	NA	NA	ND [3.6] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG			
PCB-1254 (AROCHLOR 1254)	NA	NA	ND [36] U
DIOXINS AND FURANS - UNITS: NG/KG			
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	10.885
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	1.393
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	ND [0.48] U
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	NA	NA	ND [0.629] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	0.622
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	ND [0.351] U
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	ND [0.206] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	ND [0.417] U
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	NA	ND [0.337] U
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	NA	NA	ND [0.389] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	ND [0.269] U
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	ND [0.302] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	10.885
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	1.393
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	ND [0.351] U
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	1.434
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	437.213
OCTACHLORODIBENZOFURAN	NA	NA	2.927
PENTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	ND [0.389] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	ND [0.281] U
EXPLOSIVES - UNITS: UG/KG			
NO DETECTED COMPOUNDS			

000553

028276

Metals in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB01	50SB01	50SB01	50SB02	50SB02	50SB02	50SB03	50SB03
Sample Number:	LH50SB01(10-12)	LH50SB01(15-17)	LH50SB01(5-7)	LH50SB02(10-12)	LH50SB02(15-17)	LH50SB02(5-7)	LH50SB03(10-12)	LH50SB03(15-17)
Date Sampled:	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995	10/13/1995
Depth (ft.):	10.00	15.00	5.00	10.00	15.00	5.00	10.00	15.00
METALS - UNITS: UG/KG								
ALUMINUM	6120000	6060000	8710000	6310000	9990000	5520000	8120000	8100000
ANTIMONY	ND [6800] U	ND [6900] U	ND [7000] U	ND [7000] U	ND [7400] U	ND [6900] U	ND [6900] U	ND [7200] U
ARSENIC	2500	ND [600] U	1900	590	4900	3000	1400	900
BARIUM	283000	68100	86800	69000	129000	871000	109000	121000
BERYLLIUM	1900	940	840	1700	2700	1200	1800	830
CADMIUM	ND [570] U	ND [580] U	ND [580] U	ND [590] U	ND [620] U	ND [580] U	ND [580] U	ND [600] U
CALCIUM	1780000	1880000	1370000	1760000	2370000	1240000	1720000	1850000
CHROMIUM, TOTAL	11000	14200	12000	15700	27200	7400	14700	14800
COBALT	18100	8600	12600	11000	45100	32600	22200	13000
COPPER	15000	9000	6700	16000	26500	6200	12000	15000
IRON	14400000	10700000	9940000	15500000	47800000	8040000	14500000	16200000
LEAD	25100	4860	7320	9140 J	33000 J	8440 J	9610 J	10500 J
MAGNESIUM	1930000	2070000	1560000	2210000	2540000	1570000	2250000	2590000
MANGANESE	354000	54600	71700	68200	420000	196000	126000	125000
MERCURY	ND [110] U	ND [120] U	ND [120] U	ND [120] U	ND [120] U	ND [120] U	ND [120] U	ND [120] U
NICKEL	26200	23100	15900	26100	59500	16400	26200	29400
POTASSIUM	630000	650000	630000	640000	900000	ND [578000] U	780000	880000
SELENIUM	ND [600] U	ND [600] U	ND [600] U	ND [600] U	ND [600] U	ND [600] U	ND [600] U	ND [600] U
SILVER	ND [1100] U	ND [1200] U	ND [1200] U	ND [1200] U	ND [1200] U	ND [1200] U	ND [1200] U	ND [1200] U
SODIUM	560000	650000	300000	590000	780000	270000	500000	630000
STRONTIUM	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	ND [600] U	ND [600] U	ND [600] U	ND [600] U	ND [600] U	ND [600] U	ND [600] U	ND [600] U
VANADIUM	28800	10000	16900	27200	49900	15900	21800	22300
ZINC	39000	47000	32000	47000	103000	33000	53000	68100

Metals in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB03	50SB04	50SB04	50SB04	50SB06	50SB06	50SB06	50SS01	50SS02
Sample Number:	LH50SB03(5-7)	LH50SB04(10-12)	LH50SB04(15-17)	LH50SB04(5-7)	50SB06(0-0.5)	50SB06(1-3)	50SB06(3-5)	LH50SS01(000.0)	LH50SS02(000.0)
Date Sampled:	10/13/1995	10/13/1995	10/13/1995	10/13/1995	07/28/1998	07/28/1998	07/28/1998	10/13/1995	10/13/1995
Depth (ft.):	5.00	10.00	15.00	5.00	0.00	1.00	3.00	0.00	0.00
METALS - UNITS: UG/KG									
ALUMINUM	9310000	5330000	4450000	11400000	6600000	6000000	11000000	290000	6310000
ANTIMONY	ND [6500] U	ND [6800] U	ND [7000] U	ND [6500] U	ND [6420] R	ND [6340] R	ND [6410] R	ND [6200] U	ND [6800] U
ARSENIC	2300	ND [600] U	ND [600] U	2300	5440	3290	6100	ND [500] U	5300
BARIUM	52500	161000	456000	43200	58000	69000	140000	4100	73900
BERYLLIUM	ND [550] U	910	ND [590] U	ND [540] U	ND [535] U	ND [529] U	966	ND [520] U	ND [570] U
CADMIUM	ND [550] U	ND [570] U	ND [590] U	ND [540] U	ND [535] U	ND [529] U	ND [534] U	ND [520] U	ND [570] U
CALCIUM	1100000	1520000	1710000	960000	3100000	1500000	2100000	ND [103000] U	1820000
CHROMIUM, TOTAL	11000	8300	7000	12400	23000	14000	25000	2500	17000
COBALT	7300	10000	9000	8000	ND [5300] U	ND [5300] U	13000	ND [1000] U	3100
COPPER	5800	7400	7400	7500	4300	5550	11400	ND [2100] U	4300
IRON	9640000	5140000	4340000	11000000	25000000	13000000	22000000	1050000	18400000
LEAD	7630 J	8960 J	8400 J	5840 J	29600	25300	26200	3100 J	18100 J
MAGNESIUM	1310000	1340000	1590000	1720000	740000	ND [530000] U	850000	ND [103000] U	310000
MANGANESE	30400	165000	257000	30200	224000	149000	562000	3300	187000
MERCURY	ND [110] U	ND [110] U	ND [120] U	ND [110] U	ND [110] U	ND [110] U	ND [110] U	ND [100] U	ND [110] U
NICKEL	11000	11200	13400	13500	6000	5600	10000	1100	4000
POTASSIUM	ND [545000] U	610000	600000	720000	ND [530000] U	540000	1000000	ND [516000] U	ND [566000] U
SELENIUM	ND [500] U	ND [600] U	ND [600] U	ND [500] U	2140	1450	2610	ND [500] U	ND [600] U
SILVER	ND [1100] U	ND [1100] U	ND [1170] U	ND [1100] U	ND [1100] U	ND [1000] U	ND [1100] U	ND [1000] U	ND [1100] U
SODIUM	170000	520000	560000	130000	ND [530000] U	ND [530000] U	ND [530000] U	ND [103000] U	ND [113000] U
STRONTIUM	NA	NA	NA	NA	6200	6100	12000	NA	NA
THALLIUM	ND [500] U	ND [600] U	ND [600] U	ND [500] U	ND [535] U	ND [529] U	ND [534] U	ND [500] U	ND [600] U
VANADIUM	16800	14300	9200	21000	44000	24000	39000	3300	32300
ZINC	25000	17000	28000	36000	24000	24000	38000	ND [5200] U	22000

0028278

00055

Metals in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SS03	50SS04	50SS05	50SS07
Sample Number:	LH50SS03(000.0)	LH50SS04(000.0)	LH50SS05(000.0)	50SS07(0-0.5)
Date Sampled:	10/13/1995	10/13/1995	10/13/1995	07/28/1998
Depth (ft.):	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG				
ALUMINUM	6880000	5310000	11100000	4900000
ANTIMONY	ND [6600] U	ND [6700] U	ND [7100] U	ND [6450] R
ARSENIC	3600	4800	4500	6530
BARIUM	69600	82500	109000	53000
BERYLLIUM	ND [550] U	570	ND [600] U	594
CADMIUM	ND [550] U	ND [560] U	ND [600] U	ND [538] U
CALCIUM	1920000	1000000	2160000	1100000
CHROMIUM, TOTAL	23300	13500	14000	38000
COBALT	5300	8500	6000	5600
COPPER	5900	6900	7900	ND [2690] U
IRON	19000000	10100000	12300000	31000000
LEAD	30000 J	28600 J	15000 J	15400
MAGNESIUM	470000	320000	990000	ND [540000] U
MANGANESE	300000	463000	108000	381000
MERCURY	ND [110] U	ND [110] U	ND [120] U	ND [110] U
NICKEL	6500	5100	9900	5100
POTASSIUM	ND [546000] U	ND [561000] U	670000	ND [540000] U
SELENIUM	ND [500] U	ND [600] U	ND [600] U	2920
SILVER	ND [1100] U	ND [1100] U	ND [1200] U	ND [1100] U
SODIUM	ND [109000] U	ND [112000] U	ND [119000] U	ND [540000] U
STRONTIUM	NA	NA	NA	ND [5400] U
THALLIUM	ND [500] U	ND [600] U	ND [600] U	ND [538] U
VANADIUM	31000	22200	25600	60000
ZINC	30000	26000	30000	13000

Anions in Soil Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SB08	50SB08	50SB09	50SB09
Sample Number:	50SB08(0-0.5)	50SB08(1-2)	50SB09(0-0.5)	50SB09(1-2)
Date Sampled:	05/30/2000	05/30/2000	05/30/2000	05/30/2000
Depth (ft.):	0.00	1.00	0.00	1.00
ANIONS - UNITS: UG/KG				
PERCHLORATE	ND [5.56] U	33	30	36.1

028280

95056

VOCs and SVOCs in Sediment Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SD01	50SD02	50SD03	50SD04	50SD05	50SD06	50SD07	50SD08
Sample Number:	LH50SD01(0-1)	LH50SD02(0-1)	50SD03	50SD04	50SD05	50SD06	50SD07	50SD08
Date Sampled:	11/29/1995	11/29/1995	11/12/1998	11/11/1998	11/11/1998	11/10/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
ACETONE	ND [13] U	ND [13] U	ND [29] U	5.2	1.7	ND [28] U	ND [29] U	11
METHYL ETHYL KETONE (2-BUTANONE)	NA	NA	ND [29] U	ND [31] U	ND [27] U	ND [28] U	ND [29] U	2.4
METHYLENE CHLORIDE	ND [6] U	ND [7] U	ND [7.2] U	ND [7.8] U	5.4	ND [6.9] U	4.4	5.7
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [6] U	ND [7] U	ND [7.2] U	ND [7.8] U	14	ND [6.9] U	ND [7.3] U	ND [8.1] U
TRICHLOROETHYLENE (TCE)	ND [6] U	33	ND [14] U	ND [16] U	ND [14] U	0.77	ND [15] U	ND [16] U
cis-1,2-DICHLOROETHYLENE	ND [6] U	115	ND [7.2] U	ND [7.8] U	ND [6.8] U	ND [6.9] U	ND [7.3] U	ND [8.1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
NO DETECTED COMPOUNDS								

00056

0282281

Pesticides, PCBs, Dioxins/Furans, and Explosives in Sediment Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SD01	50SD02	50SD03	50SD04	50SD05	50SD06	50SD06	50SD07	50SD08
Sample Number:	LH50SD01(0-1)	LH50SD02(0-1)	50SD03	50SD04	50SD05	50SD06	50SD06	50SD07	50SD08
Date Sampled:	11/29/1995	11/29/1995	11/12/1998	11/11/1998	11/11/1998	11/10/1998	11/11/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG									
p,p'-DDD	NA	NA	NA	NA	NA	ND [4.6] U	NA	NA	2.7
p,p'-DDT	NA	NA	NA	NA	NA	ND [4.6] U	NA	NA	3
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG									
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA		NA	NA	
DIOXINS AND FURANS - UNITS: NG/KG									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	2.141	NA	2.015
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	0.31	NA	ND [0.105] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	0.53	NA	0.22
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	ND [0.128] U	NA	0.299
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	4.568	NA	6.63
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	0.75	NA	ND [0.105] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	ND [0.118] UJ	NA	0.73
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	0.74	NA	ND [0.09] U
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	114.239	NA	44.351
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	0.752	NA	0.391
EXPLOSIVES - UNITS: UG/KG									
NO DETECTED COMPOUNDS							NA		

95000
00056
028282

Pesticides, PCBs, Dioxins/Furans, and Explosives in Sediment Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SD08
Sample Number:	50SD08FD
Date Sampled:	11/11/1998
Depth (ft.):	0.00
PESTICIDES - UNITS: UG/KG	
p,p'-DDD	NA
p,p'-DDT	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG	
NO DETECTED COMPOUNDS	NA
DIOXINS AND FURANS - UNITS: NG/KG	
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	0.386
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA
OCTACHLORODIBENZO-p-DIOXIN	NA
OCTACHLORODIBENZOFURAN	NA
EXPLOSIVES - UNITS: UG/KG	
NO DETECTED COMPOUNDS	NA

95000

028283

Metals in Sediment Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SD01	50SD02	50SD03	50SD04	50SD05	50SD06	50SD07	50SD08	50SD08
Sample Number:	LH50SD01(0-1)	LH50SD02(0-1)	50SD03	50SD04	50SD05	50SD06	50SD07	50SD08	50SD08LFD
Date Sampled:	11/29/1995	11/29/1995	11/12/1998	11/11/1998	11/11/1998	11/10/1998	11/11/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG									
ALUMINUM	5040000	2600000	5600000	9200000	7700000	7100000	8600000	7600000	8500000
ANTIMONY	ND [7800] UJ	ND [7900] UJ	ND [8680] R	ND [9360] R	ND [8130] R	ND [8300] UJ	ND [8770] R	ND [9740] R	ND [48700] R
ARSENIC	1200	2900	3510	6990	5630	2640	2250	14200	19300
BARIUM	88000	19800	91000	200000	310000	78000	270000	160000	200000
BERYLLIUM	1900	ND [660] U	ND [724] U	938	1530	ND [692] U	985	2660	ND [4060] U
CADMIUM	ND [650] U	ND [660] U	ND [724] U	923	ND [678] U	ND [692] U	ND [731] U	ND [812] U	ND [4060] U
CALCIUM	1750000	480000	1500000	1500000	2300000	870000	5500000	4900000	5600000
CHROMIUM, TOTAL	8200	17600	10000	31000	59000	11000	18000	18000 J	20000 J
COBALT	7700	4100	12000	10000	31000	ND [6900] U	16000	22000	ND [41000] U
COPPER	14000	3800	10000	24200	10200	5660	17600	10200	ND [20300] U
IRON	15500000	13000000	13000000	19000000	40000000	10000000	15000000	28000000	33000000
LEAD	8020 J	7740 J	38400	28600	71700	10400	12600	59200 J	70200 J
MAGNESIUM	1660000	450000	ND [720000] U	ND [780000] U	1800000	1100000	5000000	930000	ND [4100000] U
MANGANESE	131000 J	72800 J	482000 J	435000	1120000	95000 J	336000	528000	605000
MERCURY	ND [130] U	ND [130] U	ND [140] U	ND [160] U	ND [140] U	ND [140] U	ND [150] U	ND [160] U	NA
NICKEL	24000	6400	ND [5800] U	11000	24000	ND [5600] U	37000	20000	ND [32000] U
POTASSIUM	ND [647000] U	ND [656000] U	1400000 J	950000	2900000	1100000 J	2300000	2100000	ND [4100000] U
SELENIUM	ND [600] U	ND [600] U	2540	3440	1500	ND [1380] U	ND [1460] U	2060	ND [8120] U
SILVER	ND [1300] U	ND [1300] U	ND [1400] U	ND [1600] U	ND [1300] U	ND [1400] U	ND [1500] U	ND [1600] U	ND [8100] U
SODIUM	230000	ND [131000] U	ND [720000] U	900000	780000	ND [690000] U	ND [730000] U	ND [810000] U	ND [4100000] U
STRONTIUM	NA	NA	ND [7200] U	12000	31000	ND [6900] U	82000	22000	ND [41000] U
THALLIUM	ND [600] U	ND [1300] U	ND [724] U	ND [780] U	ND [678] U	ND [692] U	ND [731] U	ND [812] U	ND [4060] U
TIN	NA	NA	ND [14000] U	NA	NA	NA	NA	NA	NA
VANADIUM	22000	21400	22000	31000	54000	19000	23000	71000	81000
ZINC	40000	32000	32000	570000	63000	30000	80000	36000	42000

00056

0282284

Anions and Physical Properties in Sediment Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SD03	50SD04	50SD05	50SD06	50SD07	50SD08
Sample Number:	50SD03	50SD04	50SD05	50SD06	50SD07	50SD08
Date Sampled:	11/12/1998	11/11/1998	11/11/1998	11/10/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/KG						
CYANIDE	ND [723.8] U	ND [780.4] U	947.9	ND [691.5] UJ	ND [731.4] U	ND [812] U
PHYSICAL PROPERTIES - UNITS: MG/KG						
TOTAL ORGANIC CARBON	201000	345000	785000	509000	397000	511000

00056

028285

VOCs and SVOCs in Surface Water Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SW03	50SW04	50SW05	50SW06	50SW07	50SW08
Sample Number:	50SW03	50SW04	50SW05	50SW06	50SW07	50SW08
Date Sampled:	11/12/1998	11/11/1998	11/11/1998	11/10/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L						
ACETONE	2.9	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	4.4	ND [1] U	12	ND [1] U	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	3.3	ND [1] U	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L						
2,6-DINITROTOLUENE	ND [10] U	ND [10] UJ	11	ND [10] U	ND [10] U	ND [10] U
bis(2-ETHYLHEXYL) PHTHALATE	7.3	ND [10] UJ	ND [10] U	ND [10] U	ND [10] U	ND [10] U

00596

028286

Pesticides, PCBs, Dioxins/Furans, and Explosives in Surface Water Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SW03	50SW04	50SW05	50SW06	50SW06	50SW06	50SW07	50SW08	50SW08	50SW08
Sample Number:	50SW03	50SW04	50SW05	50SW06	50SW06	50SW06FD	50SW07	50SW08	50SW08FD	50SW08REFD
Date Sampled:	11/12/1998	11/11/1998	11/11/1998	11/10/1998	11/11/1998	11/11/1998	11/11/1998	11/11/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L										
NO DETECTED COMPOUNDS	NA	NA	NA		NA	NA	NA		NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L										
NO DETECTED COMPOUNDS	NA	NA	NA		NA	NA	NA		NA	NA
DIOXINS AND FURANS - UNITS: PG/L										
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	9.8	8.043 J	NA	ND [1.181] U	ND [3.765] UJ	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	17.74 J	15.647	NA	2.691	ND [3.765] U	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	369.214	320.267 J	NA	63.162	68.698 J	NA
EXPLOSIVES - UNITS: UG/L										
NO DETECTED COMPOUNDS					NA	NA			NA	

0282287

00056

Metals in Surface Water Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SW03	50SW04	50SW05	50SW06	50SW07	50SW08	50SW08	50SW08
Sample Number:	50SW03	50SW04	50SW05	50SW06	50SW07	50SW08	50SW08AFD	50SW08LFD
Date Sampled:	11/12/1998	11/11/1998	11/11/1998	11/10/1998	11/11/1998	11/11/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L								
ALUMINUM	11000	1100	1800	4600	1700	3300	NA	3400
ANTIMONY	54	15	5	9	29	ND [5] U	NA	57
ARSENIC	13	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	ND [50] U
BARIUM	290	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	NA	ND [1000] U
BERYLLIUM	1.4	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	NA	ND [2.5] U
CADMIUM	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	NA	ND [4] U
CALCIUM	11000	7200	11000	9400	11000	15000	NA	ND [25000] U
CHROMIUM, TOTAL	10	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	ND [50] U
COBALT	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	NA	ND [250] U
COPPER	44	ND [25] U	ND [25] U	ND [25] U	29	ND [25] U	NA	ND [125] U
IRON	12000	1500	2700	4900	2800	1800	NA	1800
LEAD	69	5	5	3	6	4	NA	42
MAGNESIUM	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	NA	ND [25000] U
MANGANESE	1200	205	35	100	44	19	NA	ND [75] U
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	NA	NA
NICKEL	ND [40] U	ND [40] U	ND [40] U	ND [40] U	ND [40] U	ND [40] U	NA	ND [200] U
POTASSIUM	ND [5000] U	ND [5000] UJ	ND [5000] UJ	ND [5000] UJ	ND [5000] UJ	ND [5000] UJ	NA	ND [25000] UJ
SELENIUM	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	NA	ND [25] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	NA	ND [50] U
SODIUM	ND [5000] U	ND [5000] U	8400	7600	9000	ND [5000] U	NA	ND [25000] U
STRONTIUM	ND [50] U	ND [50] U	80	60	80	ND [50] U	NA	ND [250] U
THALLIUM	1.7 J	ND [1] U	ND [1] U	1.6	ND [1] U	1.7	46	NA
TIN	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	NA	ND [500] U
VANADIUM	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	NA	ND [250] U
ZINC	140	470	20	30	30	ND [20] U	NA	ND [100] U

95000
00056
0282288

Anions and Physical Properties in Surface Water Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50SW03	50SW04	50SW05	50SW06	50SW07	50SW08
Sample Number:	50SW03	50SW04	50SW05	50SW06	50SW07	50SW08
Date Sampled:	11/12/1998	11/11/1998	11/11/1998	11/10/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L						
CYANIDE	ND [10] UJ	ND [10] UJ	11	ND [10] UJ	ND [10] UJ	ND [10] UJ
PHYSICAL PROPERTIES - UNITS: MG/L						
HARDNESS (AS CaCO3)	56	36	58	42	56	68

0028289

95000

VOCs and SVOCs in Groundwater Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50WW01	50WW02	50WW02	50WW02	50WW02	50WW02	50WW02	50WW03
Sample Number:	50WW01	50WW02D	50WW02DDL1FD	50WW02	50WW02DL1FD	50WW02	50WW02DLFD	50WW03
Date Sampled:	09/30/1998	05/24/2000	05/24/2000	05/24/2000	05/24/2000	09/30/1998	09/30/1998	09/30/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
1,1,2-TRICHLOROETHANE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	3.6	ND [500] U	ND [1] U
1,1-DICHLOROETHANE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	32	ND [500] U	ND [1] U
1,1-DICHLOROETHENE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	50	ND [500] U	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	3.9	ND [500] U	ND [1] U
1,2-DICHLOROBENZENE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	8.5	ND [500] U	ND [1] U
1,2-DICHLOROETHANE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	98	ND [500] U	ND [1] U
1,4-DICHLOROBENZENE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	1.2	ND [500] U	ND [1] U
ACETONE	39 U	ND [500] U	ND [1000] U	ND [1800] U	NA	67 U	ND [2500] U	ND [5] U
BENZENE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	2.2	ND [500] U	ND [1] U
CHLOROFORM	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	25	ND [500] U	ND [1] U
ISOPROPYLBENZENE (CUMENE)	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	0.9	ND [500] U	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [5] U	440 J	ND [1000] U	ND [1800] U	ND [500] U	ND [5] U	ND [2500] U	ND [5] U
METHYLENE CHLORIDE	ND [1] U	ND [200] U	ND [400] U	ND [700] U	NA	1	ND [500] U	ND [1] U
NAPHTHALENE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	1.3	ND [500] U	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	35	ND [500] U	ND [1] U
TOLUENE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	0.69	ND [500] U	ND [1] U
TRICHLOROETHYLENE (TCE)	ND [1] U	8600	11000	22000	18000	19000	2900:00:00	0.57
VINYL CHLORIDE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	100	ND [500] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	2300 J	2200 J	4100	4100	4400	2100	ND [1] U
trans-1,2-DICHLOROETHENE	ND [1] U	ND [100] U	ND [200] U	ND [350] U	NA	15	ND [500] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L								
NO DETECTED COMPOUNDS		NA	NA	NA	NA		NA	

025000

028290

VOCs and SVOCs in Groundwater Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	**50WW04**
Sample Number:	**50WW04**
Date Sampled:	**09/30/1998**
Depth (ft.):	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L	
1,1,2-TRICHLOROETHANE	ND [1] U
1,1-DICHLOROETHANE	ND [1] U
1,1-DICHLOROETHENE	ND [1] U
1,2,4-TRIMETHYLBENZENE	ND [1] U
1,2-DICHLOROBENZENE	ND [1] U
1,2-DICHLOROETHANE	ND [1] U
1,4-DICHLOROBENZENE	ND [1] U
ACETONE	ND [5] U
BENZENE	ND [1] U
CHLOROFORM	0.63
ISOPROPYLBENZENE (CUMENE)	ND [1] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [5] U
METHYLENE CHLORIDE	ND [1] U
NAPHTHALENE	ND [1] U
TETRACHLOROETHYLENE(PCE)	ND [1] U
TOLUENE	ND [1] U
TRICHLOROETHYLENE (TCE)	9.4:
VINYL CHLORIDE	ND [1] U
cis-1,2-DICHLOROETHYLENE	0.64
trans-1,2-DICHLOROETHENE	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L	
NO DETECTED COMPOUNDS	

00057

028291

Pesticides, PCBs, Dioxins/Furans, and Explosives in Groundwater Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50WW01	50WW01	50WW02	50WW03	50WW04
Sample Number:	50WW01	50WW01REFD	50WW02	50WW03	50WW04
Date Sampled:	09/30/1998	09/30/1998	09/30/1998	09/30/1998	09/30/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L					
NO DETECTED COMPOUNDS		NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L					
NO DETECTED COMPOUNDS		NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: PG/L					
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	25.672	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	63.387	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	275.671	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/L					
NO DETECTED COMPOUNDS					

0028292

00057

Metals in Groundwater Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50WW01	50WW02	50WW03	50WW04
Sample Number:	50WW01	50WW02	50WW03	50WW04
Date Sampled:	09/30/1998	09/30/1998	09/30/1998	09/30/1998
Depth (ft.):	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L				
ALUMINUM	9600 J	2400 J	3100 J	2700 J
ANTIMONY	ND [5] UJ	14	11	9
ARSENIC	ND [10] U	ND [10] U	ND [10] U	ND [10] U
BARIUM	ND [200] U	ND [200] U	ND [200] U	ND [200] U
BERYLLIUM	0.8	ND [0.5] U	ND [0.5] U	ND [0.5] U
CADMIUM	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U
CALCIUM	12000	36000	140000	200000
CHROMIUM, TOTAL	30 J	40	200	80
COBALT	ND [50] U	ND [50] U	ND [50] U	ND [50] U
COPPER	ND [25] UJ	ND [25] U	41	ND [25] U
IRON	11000	3600	6300	5800
LEAD	8	ND [3] U	7	7
MAGNESIUM	9600	22000	76000	100000
MANGANESE	98 J	305	1110	737
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	ND [40] U	60	690	180
POTASSIUM	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U
SELENIUM	12 U	6 U	7 U	ND [5] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	140000	240000	550000	790000
STRONTIUM	250	630	3300	3400
THALLIUM	ND [1] U	ND [1] U	ND [1] U	ND [1] U
TIN	ND [100] U	ND [100] U	ND [100] U	ND [100] U
VANADIUM	ND [50] U	ND [50] U	ND [50] U	ND [50] U
ZINC	50	30	30	40

025000

028293

Anions in Groundwater Samples at Site 50
Longhorn Army Ammunition Plant, Texas

Location:	50WW01	50WW01	50WW01	50WW02	50WW02	50WW02	50WW02	50WW03	50WW03	50WW04	50WW04
Sample Number:	50WW01	50WW01	50WW01	50WW02	50WW02D	50WW02	50WW02	50WW03	50WW03	50WW04	50WW04
Date Sampled:	02/10/2001	05/22/2000	10/22/1998	02/09/2001	05/24/2000	05/24/2000	10/22/1998	02/09/2001	05/22/2000	05/22/2000	10/22/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/L											
PERCHLORATE	ND [0.71] U	1.6	ND [1] U	10000	4190 J	3210 J	18000	ND [1.4] U	810	ND [1] U	ND [1] U

028294

00057

VOCs and SVOCs in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SB22	60SB22	60SB22	LH-S122-01	LH-S122-01	LH-S122-02	LH-S122-02	LH-S122-02
Sample Number:	60SB22(0-0.5)	60SB22(1-3)	60SB22(3-5)	LH-S122-01_1	LH-S122-01_2	LH-S122-02_1	LH-S122-02_2	LH-S122-02_3
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	08/03/1993	08/03/1993	08/03/1993	08/03/1993	08/03/1993
Depth (ft.):	0.00	1.00	3.00	0.50	4.00	0.50	4.00	5.40
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
NO DETECTED COMPOUNDS								
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG								
DI-n-BUTYL PHTHALATE	ND [370] U	ND [360] U	ND [370] U	ND [330] U	ND [330] U	347	ND [330] U	ND [330] U

25000

028295

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SB01	60SB01	60SB01	60SB02	60SB02	60SB02	60SB03
Sample Number:	LH60SB01(7-9)	LH60SB01(1-3)	LH60SB01(3-5)	LH60SB02(1-3)	LH60SB02(3-5)	LH60SB02(7-9)	LH60SB03(1-3)
Date Sampled:	10/14/1995	10/14/1995	10/14/1995	10/14/1995	10/14/1995	10/14/1995	10/14/1995
Depth (ft.):	7.00	1.00	3.00	1.00	3.00	7.00	1.00
PESTICIDES - UNITS: UG/KG							
ALDRIN	ND [2.1] U	ND [2] U	ND [2] UJ	ND [1.9] U	ND [2] U	ND [1.9] U	ND [1.9] U
DIELDRIN	ND [4.2] U	ND [4] U	ND [4.1] UJ	ND [3.7] U	ND [3.9] U	ND [3.9] U	11.55
ENDOSULFAN SULFATE	ND [4.2] U	ND [4] U	ND [4.1] UJ	ND [3.7] U	ND [3.9] U	ND [3.9] U	ND [3.7] U
p,p'-DDE	ND [4.2] U	ND [4] U	ND [4.1] UJ	ND [3.7] U	ND [3.9] U	ND [3.9] U	ND [3.7] U
p,p'-DDT	ND [4.2] U	ND [4] U	ND [4.1] UJ	ND [3.7] U	ND [3.9] U	ND [3.9] U	ND [3.7] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
HERBICIDES - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

000517

028296

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SB03	60SB03	60SB06	60SB06	60SB06	60SB07	60SB07
Sample Number:	LH60SB03(3-5)	LH60SB03(7-9)	LH60SB06(1-3)	LH60SB06(3-5)	LH60SB06(7-9)	LH60SB07(1-3)	LH60SB07(3-5)
Date Sampled:	10/14/1995	10/14/1995	10/14/1995	10/14/1995	10/14/1995	10/14/1995	10/14/1995
Depth (ft.):	3.00	7.00	1.00	3.00	7.00	1.00	3.00
PESTICIDES - UNITS: UG/KG							
ALDRIN	ND [2] U	ND [1.9] U	ND [2] U	ND [1.9] U	ND [2.1] U	ND [2] U	ND [2.2] U
DIELDRIN	6.3	ND [3.9] U	ND [3.9] U	ND [3.9] U	ND [4.2] U	ND [4] U	ND [4.3] U
ENDOSULFAN SULFATE	ND [4.1] U	ND [3.9] U	ND [3.9] U	ND [3.9] U	ND [4.2] U	ND [4] U	ND [4.3] U
p,p'-DDE	ND [4.1] U	ND [3.9] U	ND [3.9] U	ND [3.9] U	ND [4.2] U	ND [4] U	ND [4.3] U
p,p'-DDT	ND [4.1] U	ND [3.9] U	ND [3.9] U	ND [3.9] U	ND [4.2] U	ND [4] U	ND [4.3] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
HERBICIDES - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

00057

028297

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SB07	60SB08	60SB08	60SB08	60SB11	60SB11	60SB11
Sample Number:	LH60SB07(7-9)	LH60SB08(1-3)	LH60SB08(3-5)	LH60SB08(7-9)	LH60SB11(1-3)	LH60SB11(3-5)	LH60SB11(7-9)
Date Sampled:	10/14/1995	10/15/1995	10/15/1995	10/15/1995	10/15/1995	10/15/1995	10/15/1995
Depth (ft.):	7.00	1.00	3.00	7.00	1.00	3.00	7.00
PESTICIDES - UNITS: UG/KG							
ALDRIN	ND [2.2] U	ND [2] U	ND [2] U	ND [2.1] U	ND [2] UJ	ND [2.1] U	ND [2.1] U
DIELDRIN	ND [4.5] U	ND [4] U	ND [3.9] U	ND [4.2] U	ND [4] UJ	ND [4.1] U	ND [4.2] U
ENDOSULFAN SULFATE	ND [4.5] U	ND [4] U	ND [3.9] U	ND [4.2] U	ND [4] UJ	ND [4.1] U	ND [4.2] U
p,p'-DDE	ND [4.5] U	ND [4] U	ND [3.9] U	ND [4.2] U	ND [4] UJ	ND [4.1] U	ND [4.2] U
p,p'-DDT	ND [4.5] U	ND [4] U	ND [3.9] U	ND [4.2] U	ND [4] UJ	ND [4.1] U	ND [4.2] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
HERBICIDES - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

25000

028298

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SB12	60SB12	60SB12	60SB13	60SB13	60SB13	60SB22	60SB22
Sample Number:	LH60SB12(1-3)	LH60SB12(3-5)	LH60SB12(7-9)	LH60SB13(1-3)	LH60SB13(3-5)	LH60SB13(7-9)	60SB22(0-0.5)	60SB22(1-3)
Date Sampled:	10/15/1995	10/15/1995	10/15/1995	10/15/1995	10/15/1995	10/15/1995	07/28/1998	07/28/1998
Depth (ft.):	1.00	3.00	7.00	1.00	3.00	7.00	0.00	1.00
PESTICIDES - UNITS: UG/KG								
ALDRIN	ND [2] U	ND [2] U	ND [2.1] U	2.4 J	ND [2] U	ND [2] U	ND [1.8] U	ND [1.8] U
DIELDRIN	ND [4] U	ND [4] U	ND [4.1] U	ND [3.8] UJ	ND [3.9] U	ND [3.9] U	ND [3.6] U	ND [3.6] U
ENDOSULFAN SULFATE	ND [4] U	ND [4] U	ND [4.1] U	0.7 J	ND [3.9] U	ND [3.9] U	ND [3.6] U	ND [3.6] U
p,p'-DDE	ND [4] U	ND [4] U	ND [4.1] U	ND [3.8] UJ	ND [3.9] U	ND [3.9] U	ND [3.6] U	ND [3.6] U
p,p'-DDT	ND [4] U	ND [4] U	ND [4.1] U	ND [3.8] UJ	ND [3.9] U	ND [3.9] U	ND [3.6] U	ND [3.6] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
NO DETECTED COMPOUNDS								
HERBICIDES - UNITS: UG/KG								
NO DETECTED COMPOUNDS								NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	18.557	10.506
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	1.386	ND [0.241] U
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	0.695	0.966
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	ND [0.267] U	ND [0.233] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	ND [0.317] U	ND [0.276] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	ND [0.268] U	ND [0.24] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	69.698	28.663
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	ND [0.356] U	ND [0.241] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	3.661	1.234
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	2.729	ND [0.187] U
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	902.863	1168.575
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	2.048	ND [0.316] U
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	ND [0.28] U	ND [0.251] U
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA		

25000

028299

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SB22	60SS01	60SS02	60SS03	60SS04	60SS05	60SS06
Sample Number:	60SB22(3-5)	LH60SS01(000.0)	LH60SS02(000.0)	LH60SS03(000.0)	LH60SS04(000.0)	LH60SS05(000.0)	LH60SS06(000.0)
Date Sampled:	07/28/1998	10/14/1995	10/14/1995	10/14/1995	10/14/1995	10/14/1995	10/14/1995
Depth (ft.):	3.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG							
ALDRIN	ND [1.9] U	ND [1.8] U	ND [1.9] U	ND [88] U	ND [1.8] U	ND [1.9] U	ND [2] U
DIELDRIN	ND [3.7] U	ND [3.7] U	ND [3.8] U	25404	ND [3.7] U	ND [3.8] U	ND [4.1] U
ENDOSULFAN SULFATE	ND [3.7] U	ND [3.7] U	ND [3.8] U	ND [176] U	ND [3.7] U	ND [3.8] U	ND [4.1] U
p,p'-DDE	ND [3.7] U	40	ND [3.8] U	ND [176] U	ND [3.7] U	ND [3.8] U	ND [4.1] U
p,p'-DDT	ND [3.7] U	458 J	ND [3.8] U	ND [176] U	ND [3.7] U	ND [3.8] U	ND [4.1] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
HERBICIDES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA						
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	2.622	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ND [0.212] U	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ND [0.288] U	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ND [0.301] U	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ND [0.358] U	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.299] U	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	6.596	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.212] U	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [0.301] U	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.192] U	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	225.256	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	ND [0.335] U	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.313] U	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS		NA	NA	NA	NA	NA	NA

35000

028300

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SS07	60SS08	60SS09	60SS10	60SS11	60SS11	60SS12
Sample Number:	LH60SS07(000.0)	LH60SS08(000.0)	LH60SS09(000.0)	LH60SS10(000.0)	60SS11(0-0.5)	LH60SS11(000.0)	60SS12(0-0.5)
Date Sampled:	10/14/1995	10/15/1995	10/14/1995	10/14/1995	07/28/1998	10/15/1995	07/28/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG							
ALDRIN	ND [2] U	ND [1.8] UJ	ND [1.9] U	ND [1.7] UJ	ND [1.8] U	ND [2] U	ND [1.8] U
DIELDRIN	ND [3.9] U	ND [3.7] UJ	ND [3.7] U	ND [3.5] UJ	ND [3.6] U	ND [4.1] U	ND [3.6] U
ENDOSULFAN SULFATE	ND [3.9] U	ND [3.7] UJ	ND [3.7] U	ND [3.5] UJ	ND [3.6] U	ND [4.1] U	ND [3.6] U
p,p'-DDE	ND [3.9] U	ND [3.7] UJ	ND [3.7] U	ND [3.5] UJ	ND [3.6] U	126.09 J	ND [3.6] U
p,p'-DDT	ND [3.9] U	ND [3.7] UJ	ND [3.7] U	ND [3.5] UJ	ND [3.6] U	ND [4.1] U	ND [3.6] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
NO DETECTED COMPOUNDS					NA		NA
HERBICIDES - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

00058

0283301

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SS12	60SS13	60SS13	60SS14	60SS14	60SS15	60SS15
Sample Number:	LH60SS12(000.0)	60SS13(0-0.5)	LH60SS13(000.0)	60SS14(0-0.5)	LH60SS14(000.0)	60SS15(0-0.5)	LH60SS15(000.0)
Date Sampled:	10/15/1995	07/28/1998	10/15/1995	07/28/1998	10/15/1995	07/28/1998	10/15/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG							
ALDRIN	ND [2] U	ND [1.9] U	ND [1.8] U	ND [1.9] U	ND [2] U	ND [1.9] U	ND [1.9] U
DIELDRIN	ND [4] U	ND [3.8] U	ND [3.5] U	ND [3.7] U	ND [4] U	ND [3.8] U	ND [3.8] U
ENDOSULFAN SULFATE	ND [4] U	ND [3.8] U	ND [3.5] U	ND [3.7] U	ND [4] U	ND [3.8] U	ND [3.8] U
p,p'-DDE	203	ND [3.8] U	ND [3.5] U	ND [3.7] U	31.63	ND [3.8] U	18.73 J
p,p'-DDT	185 J	ND [3.8] U	ND [3.5] U	ND [3.7] U	ND [4] U	ND [3.8] U	16.07 J
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG							
NO DETECTED COMPOUNDS		NA		NA		NA	
HERBICIDES - UNITS: UG/KG							
NO DETECTED COMPOUNDS							
DIOXINS AND FURANS - UNITS: NG/KG							
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG							
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA

00053

0283302

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SS16	60SS17	60SS18	60SS19	60SS20	60SS21	60SS23	60SS24
Sample Number:	60SS16(0-0.5)	60SS17(0-0.5)	60SS18(0-0.5)	60SS19(0-0.5)	60SS20(0-0.5)	60SS21(0-0.5)	60SS23(0-0.5)	60SS24(0-0.5)
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	07/28/1998	07/28/1998	07/28/1998	07/28/1998	07/28/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG								
ALDRIN	ND [1.8] U	ND [1.9] U	ND [4.9] U	ND [1.8] U	ND [1.8] U	ND [1.8] UJ	ND [1.8] U	ND [1.8] U
DIELDRIN	ND [3.7] U	ND [3.8] U	ND [9.8] U	ND [3.6] U	ND [3.6] U	ND [3.7] UJ	ND [3.7] U	ND [3.7] U
ENDOSULFAN SULFATE	ND [3.7] U	ND [3.8] U	ND [9.8] U	ND [3.6] U	ND [3.6] U	ND [3.7] UJ	ND [3.7] U	ND [3.7] U
p,p'-DDE	ND [3.7] U	ND [3.8] U	25	ND [3.6] U	ND [3.6] U	ND [3.7] UJ	ND [3.7] U	ND [3.7] U
p,p'-DDT	ND [3.7] U	ND [3.8] U	ND [9.8] U	ND [3.6] U	ND [3.6] U	ND [3.7] UJ	ND [3.7] U	ND [3.7] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA
HERBICIDES - UNITS: UG/KG								
NO DETECTED COMPOUNDS								
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA

00053

028303

Pesticides, Herbicides, PCBs, Dioxins/Furans, and Explosives in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SS25	60SS26	SUMP122	SUMP122
Sample Number:	60SS25(0-0.5)	60SS26(0-0.5)	SUMP122(0-0.5)	SUMP122(3-5)
Date Sampled:	07/28/1998	07/28/1998	08/12/1998	08/12/1998
Depth (ft.):	0.00	0.00	0.00	3.00
PESTICIDES - UNITS: UG/KG				
ALDRIN	ND [1.9] U	ND [1.8] U	ND [1.9] U	ND [2] U
DIELDRIN	ND [3.7] U	ND [3.7] U	ND [3.8] U	ND [3.9] U
ENDOSULFAN SULFATE	ND [3.7] U	ND [3.7] U	ND [3.8] U	ND [3.9] U
p,p'-DDE	ND [3.7] U	ND [3.7] U	ND [3.8] U	ND [3.9] U
p,p'-DDT	ND [3.7] U	ND [3.7] U	ND [3.8] U	ND [3.9] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG				
NO DETECTED COMPOUNDS	NA	NA		
HERBICIDES - UNITS: UG/KG				
NO DETECTED COMPOUNDS			NA	NA
DIOXINS AND FURANS - UNITS: NG/KG				
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	62.824	19.172 J
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	9.686	0.877 J
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	18.717	ND [0.294] U
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	1.442	ND [0.281] U
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	NA	NA	1.904	ND [0.333] U
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	2.002	ND [0.177] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	132.396	58.589 J
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	9.686	ND [0.294] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	1.904	1.026 J
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	21.008	ND [0.196] U
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	1364.517	304.405 J
OCTACHLORODIBENZOFURAN	NA	NA	26.55	2.526 J
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	12.124	ND [0.184] U
EXPLOSIVES - UNITS: UG/KG				
NO DETECTED COMPOUNDS	NA	NA	NA	NA

0028304

00055

Metals in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SB22	60SB22	60SB22	LH-S122-01	LH-S122-01	LH-S122-02	LH-S122-02	LH-S122-02	SUMP122
Sample Number:	60SB22(0-0.5)	60SB22(1-3)	60SB22(3-5)	LH-S122-01_1	LH-S122-01_2	LH-S122-02_1	LH-S122-02_2	LH-S122-02_3	SUMP122(0-0.5)
Date Sampled:	07/28/1998	07/28/1998	07/28/1998	08/03/1993	08/03/1993	08/03/1993	08/03/1993	08/03/1993	08/12/1998
Depth (ft.):	0.00	1.00	3.00	0.50	4.00	0.50	4.00	5.40	0.00
METALS - UNITS: UG/KG									
ALUMINUM	4400000	3200000	2900000	17800000	17200000	14900000	14300000	16800000	NA
ANTIMONY	ND [6580] R	ND [6420] R	ND [6720] R	ND [3000] U	ND [3000] U	ND [1000] U	ND [3000] U	ND [3000] U	NA
ARSENIC	3370	1540	2030	4200	3900	4600	3800	4300	NA
BARIUM	57000	53000	46000	110000	76600	86000	92800	169000	NA
BERYLLIUM	ND [548] U	ND [535] U	ND [560] U	NA	NA	NA	NA	NA	ND [567] U
CADMIUM	ND [548] U	ND [535] U	ND [560] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	NA
CALCIUM	730000	ND [530000] U	ND [560000] U	540000	1050000	1080000	1520000	1350000	NA
CHROMIUM, TOTAL	7900	5900	6100	20600	19000	19300	16300	18300	NA
COBALT	ND [5500] U	ND [5300] U	ND [5600] U	6500	10200	6000	5800	8000	NA
COPPER	3800	ND [2670] U	ND [2800] U	7200	4500	5000	5600	5700	NA
IRON	8200000	4700000	5000000	16700000	18000000	16200000	15400000	16900000	NA
LEAD	7720	5760	5250	11200	9900	11500	10100	14100	NA
MAGNESIUM	ND [550000] U	ND [530000] U	ND [560000] U	1290000	1220000	951000	1120000	1230000	NA
MANGANESE	276000	173000	238000	190000	332000	294000	219000	610000	NA
MERCURY	ND [110] U	ND [110] U	ND [110] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	ND [100] U	NA
NICKEL	4800	ND [4300] U	ND [4500] U	NA	NA	NA	NA	NA	12000
POTASSIUM	590000	ND [530000] U	ND [560000] U	1910000	710000	617000	631000	679000	NA
SELENIUM	1780	ND [1070] U	ND [1120] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	NA
SILVER	ND [1100] U	ND [1100] U	ND [1100] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	ND [1000] U	NA
SODIUM	ND [550000] U	ND [530000] U	ND [560000] U	NA	NA	NA	NA	NA	NA
STRONTIUM	ND [5500] U	ND [5300] U	ND [5600] U	40100	19300	18500	21000	21600	NA
THALLIUM	ND [548] U	ND [535] U	ND [560] U	NA	NA	NA	NA	NA	NA
VANADIUM	16000	10000	10000	NA	NA	NA	NA	NA	25000
ZINC	14000	7600	6400	33900	28000	26300	26900	30500	NA

00058

028305

Metals in Soil Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	SUMP122
Sample Number:	SUMP122(3-5)
Date Sampled:	08/12/1998
Depth (ft.):	3.00
METALS - UNITS: UG/KG	
ALUMINUM	NA
ANTIMONY	NA
ARSENIC	NA
BARIUM	NA
BERYLLIUM	ND [590] U
CADMIUM	NA
CALCIUM	NA
CHROMIUM, TOTAL	NA
COBALT	NA
COPPER	NA
IRON	NA
LEAD	NA
MAGNESIUM	NA
MANGANESE	NA
MERCURY	NA
NICKEL	13000
POTASSIUM	NA
SELENIUM	NA
SILVER	NA
SODIUM	NA
STRONTIUM	NA
THALLIUM	NA
VANADIUM	37000
ZINC	NA

35000

028306

Pesticides and Herbicides in Sediment Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SD01	60SD02
Sample Number:	60SD01	60SD02
Date Sampled:	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00
PESTICIDES - UNITS: UG/KG		
NO DETECTED COMPOUNDS		
HERBICIDES - UNITS: UG/KG		
NO DETECTED COMPOUNDS		

000586

028307

Pesticides and Herbicides in Surface Water Samples at Site 60
Longhorn Army Ammunition Plant, Texas

Location:	60SW01	60SW02
Sample Number:	60SW01	60SW02
Date Sampled:	11/10/1998	11/10/1998
Depth (ft.):	0.00	0.00
PESTICIDES - UNITS: UG/L		
NO DETECTED COMPOUNDS		
HERBICIDES - UNITS: UG/L		
NO DETECTED COMPOUNDS		

000585

028308

VOCs and SVOCs in Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSD01	GPCSD02	GPCSD03	GPCSD04	GPCSD05	GPCSD06	GPCSD07	GPCSD08	GPCSD09
Sample Number:	GPCSD01	GPCSD02	GPCSD03	GPCSD04	GPCSD05	GPCSD06	GPCSD07	GPCSD08	GPCSD09
Date Sampled:	11/18/1998	11/18/1998	11/17/1998	11/16/1998	11/16/1998	11/16/1998	11/16/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
ACETONE	ND [38] U	21	ND [25] U	4.4	6.9	ND [28] U	ND [26] U	ND [26] U	3.6
CARBON DISULFIDE	ND [9.6] U	1.7	ND [6.2] U	ND [6.6] U	ND [6.8] U	ND [6.9] U	ND [6.6] U	ND [6.6] U	ND [7.1] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [38] U	5.8	ND [25] U	ND [26] U	1.6	ND [28] U	ND [26] U	ND [26] U	ND [29] U
METHYLENE CHLORIDE	ND [9.6] U	ND [7.7] U	ND [6.2] U	ND [6.6] U	ND [6.8] U	1.4	ND [6.6] U	ND [6.6] U	ND [7.1] U
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [9.6] U	ND [7.7] U	ND [6.2] U	ND [6.6] U	ND [6.8] U	ND [6.9] U	ND [6.6] U	ND [6.6] U	ND [7.1] U
TRICHLOROETHYLENE (TCE)	ND [19] U	ND [15] U	ND [13] U	ND [13] U	2.6	ND [14] U	ND [13] U	ND [13] U	1.2
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG									
NO DETECTED COMPOUNDS									

000590

028309

VOCs and SVOCs in Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSD10	GPSD01	LHS-GPC-02	LHS-GPC-04	LHS-GPC-06	LHS-GPC-08
Sample Number:	GPCSD10	GPSD01	LHS-GPC-02	LHS-GPC-04	LHS-GPC-06	LHS-GPC-08
Date Sampled:	11/11/1998	09/17/1998	01/12/1995	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
ACETONE	4	18	ND [12] U	ND [12] U	ND [13] U	ND [13] U
CARBON DISULFIDE	ND [6.8] U	ND [6.4] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U
METHYL ETHYL KETONE (2-BUTANONE)	ND [27] U	ND [26] U	ND [12] U	ND [12] U	ND [13] U	ND [13] U
METHYLENE CHLORIDE	ND [6.8] U	ND [6.4] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [6.8] U	5.9	NA	NA	NA	NA
TRICHLOROETHYLENE (TCE)	ND [14] U	ND [13] U	ND [6] U	ND [6] U	ND [6] U	ND [7] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG						
NO DETECTED COMPOUNDS						

000591

028310

Pesticides, PCBs, Dioxins/Furans, and Explosives in Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSD01	GPCSD01	GPCSD02	GPCSD02	GPCSD03	GPCSD03	GPCSD04	GPCSD04	GPCSD05	GPCSD05
Sample Number:	GPCSD01	GPCSD01	GPCSD02	GPCSD02	GPCSD03	GPCSD03FD	GPCSD04	GPCSD04	GPCSD05	GPCSD05
Date Sampled:	11/18/1998	12/02/1998	11/18/1998	12/02/1998	11/17/1998	11/17/1998	11/16/1998	12/02/1998	11/16/1998	12/02/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG										
DIELDRIN	NA	ND [5.6] U	NA	ND [3.8] U	ND [6.3] U	NA	NA	ND [3.8] U	NA	ND [4.6] U
p,p'-DDD	NA	ND [5.6] U	NA	ND [3.8] U	ND [6.3] U	NA	NA	ND [3.8] U	NA	ND [4.6] U
p,p'-DDT	NA	ND [5.6] U	NA	ND [3.8] U	ND [6.3] U	NA	NA	ND [3.8] U	NA	ND [4.6] U
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG										
PCB-1254 (AROCHLOR 1254)	NA	ND [56] U	NA	ND [38] U	ND [42] U	NA	NA	39	NA	ND [45] U
DIOXINS AND FURANS - UNITS: NG/KG										
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	3.029	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	0.339	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.108] U	NA	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	0.506	NA	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.124] U	NA	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.156] U	NA	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.104] U	NA	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.14] U	NA	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.106] U	NA	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [0.238] U	ND [0.241] U	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	6.919	NA	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	0.657	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	1.379	NA	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	0.6	NA	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	90.22	NA	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	0.608	NA	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	ND [0.106] U	NA	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA	ND [0.238] U	NA	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS		NA		NA		NA		NA		NA

000592

028311

Pesticides, PCBs, Dioxins/Furans, and Explosives in Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSD06	GPCSD07	GPCSD07	GPCSD08	GPCSD09	GPCSD09	GPCSD10	GPCSD10	GPSD01	GPSD01
Sample Number:	GPCSD06	GPCSD07	GPCSD07	GPCSD08	GPCSD09	GPCSD09	GPCSD10	GPCSD10	GPSD01	GPSD01FD
Date Sampled:	11/16/1998	11/16/1998	12/03/1998	11/11/1998	11/11/1998	12/03/1998	11/11/1998	12/03/1998	09/17/1998	09/17/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG										
DIELDRIN	2.6	NA	ND [4.6] U	ND [4.4] U	NA	ND [4.1] U	NA	ND [4.2] U	ND [4.3] U	NA
p,p'-DDD	1.6	NA	ND [4.6] U	ND [4.4] U	NA	ND [4.1] U	NA	ND [4.2] U	ND [4.3] U	NA
p,p'-DDT	3.4	NA	3.4	ND [4.4] U	NA	ND [4.1] U	NA	ND [4.2] U	ND [4.3] U	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG										
PCB-1254 (AROCHLOR 1254)	ND [46] U	NA	ND [46] U	ND [44] U	NA	ND [41] U	NA	ND [42] U	ND [43] U	NA
DIOXINS AND FURANS - UNITS: NG/KG										
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	7.716	NA	NA	16.519 J	NA	NA	NA	NA	5.89	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.976	NA	NA	3.303	NA	NA	NA	NA	84.4 J	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ND [0.254] U	NA	NA	ND [0.63] U	NA	NA	NA	NA	24.3 J	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1.498	NA	NA	ND [0.357] U	NA	NA	NA	NA	26.3 J	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.222] U	NA	NA	ND [0.238] U	NA	NA	NA	NA	11.9 J	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	ND [0.362] U	NA	NA	ND [0.388] U	NA	NA	NA	NA	4.18 J	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.241] U	NA	NA	ND [0.27] U	NA	NA	NA	NA	4.18 J	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ND [0.325] U	NA	NA	ND [0.349] U	NA	NA	NA	NA	7.52 J	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ND [0.252] U	NA	NA	ND [0.282] U	NA	NA	NA	NA	2.47 J	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ND [0.282] U	NA	NA	ND [0.399] U	NA	NA	NA	NA	3.73 J	2.008
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	16.57	NA	NA	92.209	NA	NA	NA	NA	5.89	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	2.818	NA	NA	3.303	NA	NA	NA	NA	153	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	1.067	NA	NA	1.587	NA	NA	NA	NA	ND [0.841] U	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	0.969	NA	NA	1.918	NA	NA	NA	NA	65	NA
OCTACHLORODIBENZO-p-DIOXIN	235.638	NA	NA	324.705 J	NA	NA	NA	NA	289	NA
OCTACHLORODIBENZOFURAN	1.119	NA	NA	10.993	NA	NA	NA	NA	936 J	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	1.02	NA	NA	ND [0.282] U	NA	NA	NA	NA	15.6	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.282] U	NA	NA	ND [0.399] U	NA	NA	NA	NA	12.8	NA
EXPLOSIVES - UNITS: UG/KG										
NO DETECTED COMPOUNDS			NA			NA		NA		NA

000593

028312

Pesticides, PCBs, Dioxins/Furans, and Explosives in Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	LHS-GPC-02	LHS-GPC-04	LHS-GPC-06	LHS-GPC-08
Sample Number:	LHS-GPC-02	LHS-GPC-04	LHS-GPC-06	LHS-GPC-08
Date Sampled:	01/12/1995	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG				
DIELDRIN	NA	NA	NA	NA
p,p'-DDD	NA	NA	NA	NA
p,p'-DDT	NA	NA	NA	NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG				
PCB-1254 (AROCHLOR 1254)	NA	NA	NA	NA
DIOXINS AND FURANS - UNITS: NG/KG				
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	NA	NA	NA	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	NA	NA	NA	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	NA	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	NA	NA	NA	NA
EXPLOSIVES - UNITS: UG/KG				
NO DETECTED COMPOUNDS				

000594

028313

Metals in Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSD01	GPCSD02	GPCSD03	GPCSD03	GPCSD04	GPCSD05	GPCSD06	GPCSD07	GPCSD08
Sample Number:	GPCSD01	GPCSD02	GPCSD03	GPCSD03LFD	GPCSD04	GPCSD05	GPCSD06	GPCSD07	GPCSD08
Date Sampled:	11/18/1998	11/18/1998	11/17/1998	11/17/1998	11/16/1998	11/16/1998	11/16/1998	11/16/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG									
ALUMINUM	4500000	4000000	4500000	4600000	1800000	2200000	3600000	4100000	11000000
ANTIMONY	ND [11400] R	ND [9220] R	ND [7510] R	ND [37600] R	ND [7830] R	ND [8200] R	ND [8320] R	ND [7990] R	ND [7870] R
ARSENIC	2210	5860	2180	ND [6260] U	ND [1310] U	ND [1370] U	5250	1880	3940
BARIUM	88000	95000	62000	ND [130000] U	39000	44000	46000	82000	240000
BERYLLIUM	ND [951] U	1150:00:00	815	ND [3130] U	ND [653] U	ND [683] U	876	ND [666] U	1590
CADMIUM	ND [951] U	ND [768] U	ND [626] U	ND [3130] U	ND [653] U	ND [683] U	ND [693] U	ND [666] U	ND [656] U
CALCIUM	1100000	1200000	740000	ND [3100000] U	ND [650000] U	ND [680000] U	840000	1200000	6300000
CHROMIUM, TOTAL	12000	39000	45000	47000	5700	5700	29000	8700	34000
COBALT	ND [9600] U	11000	8300	ND [31000] U	ND [6600] U	ND [6800] U	8700	ND [6600] U	18000
COPPER	7600	6510	5340	ND [15600] U	4310	ND [3420] U	5820	5500	17800
IRON	6500000	24000000	19000000	20000000	4700000	4700000	26000000	8100000	37000000
LEAD	18600	20100	13900	14900	6100	6190	17200	9300	20700
MAGNESIUM	ND [950000] U	ND [770000] U	ND [630000] U	ND [3100000] U	ND [650000] U	ND [680000] U	ND [690000] U	940000	6400000
MANGANESE	85400 J	285000 J	183000 J	193000 J	72100 J	109000 J	200000 J	162000 J	694000
MERCURY	ND [190] U	ND [150] U	130	NA	ND [130] U	ND [140] U	ND [140] U	ND [130] U	ND [130] U
NICKEL	ND [7600] U	ND [6100] U	ND [5000] U	ND [25000] U	ND [5200] U	ND [5500] U	6000	8400	49000
POTASSIUM	ND [950000] UJ	870000 J	ND [630000] UJ	ND [3100000] UJ	ND [650000] UJ	ND [680000] UJ	ND [690000] UJ	750000 J	1400000
SELENIUM	ND [1900] U	4090	3090	ND [6260] U	ND [1310] U	ND [1370] U	4970	1570	2620
SILVER	2400	ND [1600] U	1600	ND [6200] U	1300	ND [1400] U	ND [1400] U	ND [1300] U	ND [1300] U
SODIUM	ND [950000] U	ND [770000] U	ND [630000] U	ND [3100000] U	ND [650000] U	ND [680000] U	ND [690000] U	ND [670000] U	ND [660000] U
STRONTIUM	ND [9600] U	ND [7700] U	ND [6200] U	ND [31000] U	ND [6600] U	ND [6800] U	ND [6900] U	8200	73000
THALLIUM	ND [951] U	ND [768] U	ND [626] U	ND [3130] U	ND [653] U	ND [683] U	ND [693] U	ND [666] U	ND [656] U
VANADIUM	17000	43000	34000	35000	8100	9900	42000	14000	35000
ZINC	70000	91000	50000	54000	19000	22000	42000	28000	93000

0283 14

000595

Metals in Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSD09	GPCSD10	GPSD01	GPSD01	LHS-GPC-02	LHS-GPC-04	LHS-GPC-06	LHS-GPC-08
Sample Number:	GPCSD09	GPCSD10	GPSD01	GPSD01LFD	LHS-GPC-02	LHS-GPC-04	LHS-GPC-06	LHS-GPC-08
Date Sampled:	11/11/1998	11/11/1998	09/17/1998	09/17/1998	01/12/1995	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG								
ALUMINUM	2400000	4800000	800000	790000	750000	840000	1530000	2060000
ANTIMONY	ND [8580] R	ND [8140] R	ND [7670] U	ND [38300] U	ND [9500] UJ	ND [8100] UJ	ND [8900] UJ	ND [11000] UJ
ARSENIC	2130	4040	ND [1280] U	ND [6390] U	520 J	360 J	4300 J	1000 J
BARIUM	58000	52000	ND [26000] U	ND [130000] U	21500	14700	20100	35300
BERYLLIUM	ND [715] U	694	ND [639] U	ND [3200] U	NA	NA	NA	NA
CADMIUM	ND [715] U	ND [678] U	ND [639] U	ND [3200] U	ND [950] U	ND [810] U	ND [890] U	ND [1100] U
CALCIUM	1000000	1700000	ND [640000] U	ND [3200000] U	180000	162000	369000	556000
CHROMIUM, TOTAL	6600	19000	2800	ND [6400] U	2800	3200	13000	5800
COBALT	ND [7100] U	8700	ND [6400] U	ND [32000] U	ND [1900] U	ND [1600] U	4400	3200
COPPER	ND [3580] U	7630	ND [3200] U	ND [16000] U	ND [1900] U	ND [1600] U	3200	3200
IRON	5900000	18000000	2400000	2500000	1950000	2120000	9800000	4240000
LEAD	8760	14400	5500	8760	4100	2700	7800	7300
MAGNESIUM	ND [720000] U	1600000	ND [640000] U	ND [3200000] U	111000	125000	212000	319000
MANGANESE	140000	205000	24600	24800	22200	44700	103000	115000
MERCURY	ND [140] U	ND [140] U	ND [130] U	NA	ND [81] U	ND [81] U	ND [87] U	ND [120] U
NICKEL	ND [5700] U	15000	ND [5100] U	ND [26000] U	NA	NA	NA	NA
POTASSIUM	ND [720000] U	840000	ND [640000] U	ND [3200000] U	ND [191000] U	ND [162000] U	ND [178000] U	ND [221000] U
SELENIUM	ND [1430] U	ND [1360] U	ND [1280] U	ND [6390] U	ND [200] U	ND [190] U	280	ND [210] U
SILVER	ND [1400] U	ND [1300] U	ND [1300] U	ND [6400] U	ND [950] U	ND [810] U	ND [890] U	ND [1100] U
SODIUM	ND [720000] U	ND [680000] U	ND [640000] U	ND [3200000] U	NA	NA	NA	NA
STRONTIUM	7600	22000	ND [6400] U	ND [32000] U	ND [9500] U	ND [8100] U	ND [8900] U	ND [11000] U
THALLIUM	ND [715] U	ND [678] U	ND [639] U	5520	ND [47600] U	ND [40600] U	ND [44500] U	ND [55200] U
VANADIUM	11000	27000	ND [6400] U	ND [32000] U	NA	NA	NA	NA
ZINC	16000	39000	8800	ND [13000] U	9600	5600	16600	24400

000596

028315

Anions and Physical Properties of Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSD01	GPCSD02	GPCSD03	GPCSD04	GPCSD05	GPCSD06	GPCSD07	GPCSD08	GPCSD09	GPCSD10
Sample Number:	GPCSD01	GPCSD02	GPCSD03	GPCSD04	GPCSD05	GPCSD06	GPCSD07	GPCSD08	GPCSD09	GPCSD10
Date Sampled:	11/18/1998	11/18/1998	11/17/1998	11/16/1998	11/16/1998	11/16/1998	11/16/1998	11/11/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/KG										
CYANIDE	ND [950.4] U	ND [767.5] U	ND [625.5] U	ND [652.8] U	ND [682.6] U	ND [693.1] U	ND [666.1] U	ND [656.1] U	ND [715.7] U	ND [678.6] U
PHYSICAL PROPERTIES - UNITS: MG/KG										
TOTAL ORGANIC CARBON	338000	163000	NA	218000	243000	376000	126000	499000	216000	362000

028316

000597

Anions and Physical Properties of Sediment Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPSD01
Sample Number:	GPSD01
Date Sampled:	09/17/1998
Depth (ft.):	0.00
ANIONS - UNITS: UG/KG	
CYANIDE	NA
PHYSICAL PROPERTIES - UNITS: MG/KG	
TOTAL ORGANIC CARBON	88200 J

365000

0283171

VOCs and SVOCs in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSW01	GPCSW02	GPCSW03	GPCSW04	GPCSW05	GPCSW06	GPCSW07	GPCSW08	GPCSW09	GPCSW10
Sample Number:	**GPCSW01**	**GPCSW02**	**GPCSW03**	**GPCSW04**	**GPCSW05**	**GPCSW06**	**GPCSW07**	**GPCSW08**	**GPCSW09**	**GPCSW10**
Date Sampled:	**11/18/1998**	**11/18/1998**	**11/17/1998**	**11/16/1998**	**11/16/1998**	**11/16/1998**	**11/16/1998**	**11/11/1998**	**11/11/1998**	**11/11/1998**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L										
ACETONE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
CHLOROFORM	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
TOLUENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
TRICHLOROETHYLENE (TCE)	0.97	1.5	1.2 U	2.3	2.6	2.8	ND [1] U	ND [1] U	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	ND [1] U	0.67	0.69	0.77	ND [1] U	ND [1] U	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L										
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U

VOCs and SVOCs in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPSW01	GPSW01	GPSW02	GPSW02	LHS-GPC-01	LHS-GPC-03	LHS-GPC-03	LHS-GPC-05	LHS-GPC-07
Sample Number:	GPSW01	GPSW01	GPSW02	GPSW02	LHS-GPC-01	LHS-GPC-03	LHS-GPC-03FD	LHS-GPC-05	LHS-GPC-07
Date Sampled:	09/16/1998	12/04/1998	09/16/1998	12/04/1998	01/11/1995	01/12/1995	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
ACETONE	ND [5] U	2.8	ND [5] U	3.3	ND [10] U	ND [10] U	NA	ND [10] U	ND [10] U
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [5] U	ND [5] U	NA	ND [5] U	2 J
CHLOROFORM	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [5] U	ND [5] U	NA	ND [5] U	4 J
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	ND [1] U	1.4	NA	NA	NA	NA	NA
TOLUENE	ND [1] U	0.86	ND [1] U	1.6	ND [5] U	ND [5] U	NA	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA	NA	NA	NA
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA	NA	NA	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	1 J	530	340	ND [10] U	ND [10] U

028319

VOCs and SVOCs in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSW01	GPCSW02	GPCSW03	GPCSW04	GPCSW05	GPCSW06	GPCSW07	GPCSW08	GPCSW09	GPCSW10
Sample Number:	GPCSW01	GPCSW02	GPCSW03	GPCSW04	GPCSW05	GPCSW06	GPCSW07	GPCSW08	GPCSW09	GPCSW10
Date Sampled:	11/18/1998	11/18/1998	11/17/1998	11/16/1998	11/16/1998	11/16/1998	11/16/1998	11/11/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L										
ACETONE	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
CHLOROFORM	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
TOLUENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [1] U
TRICHLOROETHYLENE (TCE)	0.97	1.5	1.2 U	2.3	2.6	2.8	ND [1] U	ND [1] U	ND [1] U	ND [1] U
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	ND [1] U	0.67	0.69	0.77	ND [1] U	ND [1] U	ND [1] U	ND [1] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L										
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U

0028320

000601

VOCs and SVOCs in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPSW01	GPSW01	GPSW02	GPSW02	LHS-GPC-01	LHS-GPC-03	LHS-GPC-03	LHS-GPC-05	LHS-GPC-07
Sample Number:	GPSW01	GPSW01	GPSW02	GPSW02	LHS-GPC-01	LHS-GPC-03	LHS-GPC-03FD	LHS-GPC-05	LHS-GPC-07
Date Sampled:	09/16/1998	12/04/1998	09/16/1998	12/04/1998	01/11/1995	01/12/1995	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
ACETONE	ND [5] U	2.8	ND [5] U	3.3	ND [10] U	ND [10] U	NA	ND [10] U	ND [10] U
BROMODICHLOROMETHANE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [5] U	ND [5] U	NA	ND [5] U	2 J
CHLOROFORM	ND [1] U	ND [1] U	ND [1] U	ND [1] U	ND [5] U	ND [5] U	NA	ND [5] U	4 J
P-CYMENE (p-ISOPROPYLTOLUENE)	ND [1] U	ND [1] U	ND [1] U	1.4	NA	NA	NA	NA	NA
TOLUENE	ND [1] U	0.86	ND [1] U	1.6	ND [5] U	ND [5] U	NA	ND [5] U	ND [5] U
TRICHLOROETHYLENE (TCE)	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA	NA	NA	NA
cis-1,2-DICHLOROETHYLENE	ND [1] U	ND [1] U	ND [1] U	ND [1] U	NA	NA	NA	NA	NA
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L									
bis(2-ETHYLHEXYL) PHTHALATE	ND [10] U	ND [10] U	ND [10] U	ND [10] U	1 J	530	340	ND [10] U	ND [10] U

000602

028321

Pesticides, PCBs, Dioxins/Furans, and Explosives in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSW01	GPCSW01	GPCSW02	GPCSW02	GPCSW03	GPCSW04	GPCSW04	GPCSW05	GPCSW05	GPCSW06
Sample Number:	GPCSW01	GPCSW01	GPCSW02	GPCSW02	GPCSW03	GPCSW04	GPCSW04	GPCSW05	GPCSW05	GPCSW06
Date Sampled:	11/18/1998	12/02/1998	11/18/1998	12/02/1998	11/17/1998	11/16/1998	12/02/1998	11/16/1998	12/02/1998	11/16/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L										
NO DETECTED COMPOUNDS	NA		NA			NA		NA		
POLYCHLORINATED BIPHENYLS - UNITS: UG/L										
NO DETECTED COMPOUNDS	NA		NA			NA		NA		
DIOXINS AND FURANS - UNITS: PG/L										
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	ND [3.162] U	NA	NA	NA	NA	ND [2.758] U
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [1.983] U	NA	NA	NA	NA	ND [1.255] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	ND [3.162] U	NA	NA	NA	NA	ND [2.758] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	ND [1.889] U	NA	NA	NA	NA	ND [2.953] U
OCTACHLORODIBENZO-p-DIOXIN	NA	NA	NA	NA	181.271	NA	NA	NA	NA	114.202
OCTACHLORODIBENZOFURAN	NA	NA	NA	NA	ND [2.351] U	NA	NA	NA	NA	ND [3.5] U
EXPLOSIVES - UNITS: UG/L										
NO DETECTED COMPOUNDS		NA		NA			NA		NA	

000303

028322

Pesticides, PCBs, Dioxins/Furans, and Explosives in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSW06	GPCSW06	GPCSW07	GPCSW07	GPCSW07	GPCSW08	GPCSW09	GPCSW09	GPCSW10
Sample Number:	GPCSW06FD	GPCSW06REFD	GPCSW07	GPCSW07	GPCSW07	GPCSW08	GPCSW09	GPCSW09	GPCSW10
Date Sampled:	11/16/1998	11/16/1998	11/16/1998	12/03/1998	12/07/1998	11/11/1998	11/11/1998	12/03/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA				NA		NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA	NA	NA				NA		NA
DIOXINS AND FURANS - UNITS: PG/L									
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	ND [2.625] UJ	NA	NA	NA	NA	5.063	NA	NA	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ND [3.179] U	NA	NA	NA	NA	ND [0.998] U	NA	NA	NA
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	NA	NA	NA	NA	5.683	NA	NA	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	ND [3.279] U	NA	NA	NA	NA	ND [1.713] U	NA	NA	NA
OCTACHLORODIBENZO-p-DIOXIN	93.434 J	NA	NA	NA	NA	239.835	NA	NA	NA
OCTACHLORODIBENZOFURAN	ND [3.401] U	NA	NA	NA	NA	ND [3.818] U	NA	NA	NA
EXPLOSIVES - UNITS: UG/L									
NO DETECTED COMPOUNDS	NA			NA	NA			NA	

000604

028323

Pesticides, PCBs, Dioxins/Furans, and Explosives in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSW10	GPSW01	GPSW01	GPSW01	GPSW02	GPSW02
Sample Number:	GPCSW10	GPSW01	GPSW01FD	GPSW01	GPSW02	GPSW02
Date Sampled:	12/03/1998	09/16/1998	09/16/1998	12/04/1998	09/16/1998	12/04/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L						
NO DETECTED COMPOUNDS			NA			
POLYCHLORINATED BIPHENYLS - UNITS: UG/L						
NO DETECTED COMPOUNDS			NA			
DIOXINS AND FURANS - UNITS: PG/L						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	NA	ND [10.69] U	ND [4.147] UJ	45.062	ND [1.679] U	4.146
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	NA	ND [6.27] U	37.602	5.578	ND [1.406] U	ND [1.905] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [10.7] U	ND [4.147] U	42.746	ND [1.679] U	ND [2.505] U
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	NA	ND [8.49] U	ND [3.855] U	2.589	ND [2.327] U	ND [2.159] U
OCTACHLORODIBENZO-p-DIOXIN	NA	49.1	56.166 J	858.408	17.605	303.143 U
OCTACHLORODIBENZOFURAN	NA	ND [10.5] U	707.709	26.338	22.15	ND [3.184] U
EXPLOSIVES - UNITS: UG/L						
NO DETECTED COMPOUNDS	NA		NA			

000605

028324

Metals in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSW01	GPCSW02	GPCSW03	GPCSW03	GPCSW03	GPCSW04	GPCSW05	GPCSW06	GPCSW07	GPCSW08	GPCSW09
Sample Number:	GPCSW01	GPCSW02	GPCSW03	GPCSW03AFD	GPCSW03LFD	GPCSW04	GPCSW05	GPCSW06	GPCSW07	GPCSW08	GPCSW09
Date Sampled:	11/18/1998	11/18/1998	11/17/1998	11/17/1998	11/17/1998	11/16/1998	11/16/1998	11/16/1998	11/16/1998	11/11/1998	11/11/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	890	830	980	NA	ND [1000] U	830	770	910	820	1300	2300
ANTIMONY	12	10	16 J	NA	ND [25] U	18	31	22	42	6	ND [5] U
ARSENIC	ND [10] U	ND [10] U	ND [10] U	NA	ND [50] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
BARIUM	ND [200] U	ND [200] U	ND [200] U	NA	ND [1000] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U	ND [200] U
BERYLLIUM	ND [0.5] U	ND [0.5] U	ND [0.5] U	NA	ND [2.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U
CADMIUM	ND [0.8] U	ND [0.8] U	ND [0.8] U	NA	ND [4] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [0.8] U
CALCIUM	8800	8600	7500	NA	ND [25000] U	7400	7300	7700	6800	11000	7500
CHROMIUM, TOTAL	ND [10] U	ND [10] U	ND [10] U	NA	ND [50] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
COBALT	ND [50] U	ND [50] U	ND [50] U	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
COPPER	ND [25] U	ND [25] U	ND [25] U	NA	ND [125] U	ND [25] U	ND [25] U	ND [25] U	ND [25] U	ND [25] U	ND [25] U
IRON	2100	1900	2000	NA	1900	1600	2200	1600	1700	2700	3200
LEAD	4	5	5 J	NA	22	3	5	4	6	5	7
MAGNESIUM	ND [5000] U	ND [5000] U	ND [5000] U	NA	ND [25000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U
MANGANESE	309	230	183	NA	181	164	262	47	48	79	73
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	NA	NA	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	ND [40] U	ND [40] U	ND [40] U	NA	ND [200] U	ND [40] U	ND [40] U	ND [40] U	ND [40] U	ND [40] U	ND [40] U
POTASSIUM	ND [5000] U	ND [5000] U	ND [5000] U	NA	ND [25000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] U	ND [5000] UJ	ND [5000] UJ
SELENIUM	6	ND [5] U	ND [5] U	NA	35	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U	ND [5] U
SILVER	ND [10] U	ND [10] U	ND [10] U	NA	ND [50] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	8800	7700	5700	NA	ND [25000] U	5700	6200	5300	5100	9800	7600
STRONTIUM	50	ND [50] U	ND [50] U	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	100	70
THALLIUM	3.1 J	2.9 J	ND [1] UJ	49 J	NA	ND [1] UJ	ND [1] UJ	1.4 J	ND [1] UJ	1.7	ND [1] U
TIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND [100] U	ND [100] U
VANADIUM	ND [50] U	ND [50] U	ND [50] U	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U	ND [50] U
ZINC	20	20	30	NA	ND [100] U	20	ND [20] U	ND [20] U	ND [20] U	ND [20] U	ND [20] U

000606

028325

Metals in Surface Water Samples at Goose Prairie Creek
Longhorn Army Ammunition Plant, Texas

Location:	GPCSW10	GPSW01	GPSW01	GPSW01	GPSW02	GPSW02	GPSW02	LHS-GPC-01	LHS-GPC-03	LHS-GPC-05	LHS-GPC-07
Sample Number:	GPCSW10	GPSW01	GPSW01	GPSW01LFD	GPSW02	GPSW02LFD	GPSW02	LHS-GPC-01	LHS-GPC-03	LHS-GPC-05	LHS-GPC-07
Date Sampled:	11/11/1998	09/16/1998	12/04/1998	12/04/1998	09/16/1998	09/16/1998	12/04/1998	01/11/1995	01/12/1995	01/12/1995	01/12/1995
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L											
ALUMINUM	1600	760	5400 J	7100 J	340	ND [1000] U	390	850	970	820	800
ANTIMONY	8	ND [5] U	10	42	30	ND [25] U	17	ND [100] U	ND [100] U	ND [100] U	ND [100] U
ARSENIC	ND [10] U	ND [10] U	10	93	ND [10] U	ND [50] U	ND [10] U	ND [2] U	ND [2] U	ND [2] U	ND [2] U
BARIUM	ND [200] U	ND [200] U	210	ND [1000] U	ND [200] U	ND [1000] U	ND [200] U	82	90	89	76
BERYLLIUM	ND [0.5] U	0.5	0.7	ND [2.5] U	ND [0.5] U	ND [2.5] U	ND [0.5] U	NA	NA	NA	NA
CADMIUM	ND [0.8] U	ND [0.8] U	ND [0.8] U	ND [4] U	ND [0.8] U	ND [4] U	ND [0.8] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
CALCIUM	10000	7500	16000	ND [25000] U	5900	ND [25000] U	7900	11400	11200	11900	10600
CHROMIUM, TOTAL	ND [10] U	ND [10] U	ND [10] U	ND [50] U	ND [10] U	ND [50] U	ND [10] U	ND [20] U	ND [20] U	ND [20] U	ND [20] U
COBALT	ND [50] U	ND [50] U	ND [50] U	ND [250] U	ND [50] U	ND [250] U	ND [50] U	ND [20] U	ND [20] U	ND [20] U	ND [20] U
COPPER	ND [25] U	ND [25] U	ND [25] U	ND [125] U	ND [25] U	ND [125] U	ND [25] U	ND [20] U	ND [20] U	ND [20] U	ND [20] U
IRON	2700	4200	29000	38000	1400	1400	8800	2000	2400	2200	1700
LEAD	ND [3] U	ND [3] U	52	85	ND [3] U	ND [15] U	5	ND [2] U	ND [2] U	ND [2] U	2.6
MAGNESIUM	ND [5000] U	ND [5000] U	ND [5000] U	ND [25000] U	ND [5000] U	ND [25000] U	ND [5000] U	5100	5300	5600	4400
MANGANESE	60	478	639	830	94	84	898	190	220	230	160
MERCURY	ND [0.2] U	ND [0.2] U	ND [0.2] U	NA	ND [0.2] U	NA	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	ND [40] U	ND [40] U	ND [40] U	ND [200] U	ND [40] U	ND [200] U	ND [40] U	NA	NA	NA	NA
POTASSIUM	ND [5000] UJ	ND [5000] U	ND [5000] UJ	ND [25000] UJ	ND [5000] U	ND [25000] U	ND [5000] UJ	ND [2000] U	ND [2000] U	ND [2000] U	2200
SELENIUM	ND [5] U	ND [5] U	ND [5] U	ND [25] U	ND [5] U	ND [25] U	ND [5] U	ND [2] U	2.3	ND [2] U	ND [2] U
SILVER	ND [10] U	ND [10] U	ND [10] U	ND [50] U	ND [10] U	ND [50] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	8300	5800	6300	ND [25000] U	5900	ND [25000] U	6400	NA	NA	NA	NA
STRONTIUM	80	70	530	ND [250] U	ND [50] U	ND [250] U	70	150	160	170	140
THALLIUM	1.1	ND [1] U	ND [1] U	NA	ND [1] U	NA	ND [1] U	ND [500] U	ND [500] U	ND [500] U	ND [500] U
TIN	ND [100] U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	ND [50] U	ND [50] U	ND [50] U	ND [250] U	ND [50] U	ND [250] U	ND [50] U	NA	NA	NA	NA
ZINC	ND [20] U	60	100	130	550	ND [100] U	30	12	30	12	25

028326

009007

VOCs and SVOCs in Sediment Samples at Goose Prairie Creek Wetlands
Longhorn Army Ammunition Plant, Texas

Location:	GPWSD01	GPWSD02	GPWSD03	GPWSD04
Sample Number:	GPWSD01	GPWSD02	GPWSD03	GPWSD04
Date Sampled:	11/19/1998	12/01/1998	12/01/1998	11/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG				
ACETONE	9.2	ND [38] U	ND [33] U	ND [24] U
METHYL ETHYL KETONE (2-BUTANONE)	3.6	ND [38] U	ND [33] U	ND [24] U
TRICHLOROETHYLENE (TCE)	0.91	ND [19] U	ND [17] U	ND [12] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/KG				
NO DETECTED COMPOUNDS				

028327

000908

Pesticides, PCBs, Dioxins/Furans, and Explosives in Sediment Samples at Goose Prairie Creek Wetland
Longhorn Army Ammunition Plant, Texas

Location:	GPWSD01	GPWSD01	GPWSD02	GPWSD02	GPWSD03	GPWSD03	GPWSD04	GPWSD04
Sample Number:	GPWSD01	GPWSD01FD	GPWSD02	GPWSD02	GPWSD03	GPWSD03	GPWSD04	GPWSD04FD
Date Sampled:	11/19/1998	11/19/1998	12/01/1998	12/02/1998	12/01/1998	12/02/1998	11/20/1998	11/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/KG								
NO DETECTED COMPOUNDS		NA	NA		NA			NA
POLYCHLORINATED BIPHENYLS - UNITS: UG/KG								
NO DETECTED COMPOUNDS		NA	NA		NA			NA
DIOXINS AND FURANS - UNITS: NG/KG								
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	33.725	NA	NA	NA	NA	NA	36.454	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1.59	NA	NA	NA	NA	NA	2.318	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	2.812	NA	NA	NA	NA	NA	5.636	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.693	NA	NA	NA	NA	NA	1.157	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	1.29	NA	NA	NA	NA	NA	1.39	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ND [0.201] U	NA	NA	NA	NA	NA	0.913	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	0.643	0.578	NA	NA	NA	NA	0.722	0.689
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	90.846	NA	NA	NA	NA	NA	87.107	NA
HEPTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.278] U	NA	NA	NA	NA	NA	2.318	NA
HEXACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	26.634	NA	NA	NA	NA	NA	9.316	NA
HEXACHLORINATED DIBENZOFURANS, (TOTAL)	2.882	NA	NA	NA	NA	NA	6.614	NA
OCTACHLORODIBENZO-p-DIOXIN	1339.652	NA	NA	NA	NA	NA	1237.604	NA
OCTACHLORODIBENZOFURAN	6.514	NA	NA	NA	NA	NA	4.598	NA
PENTACHLORINATED DIBENZOFURANS, (TOTAL)	ND [0.205] U	NA	NA	NA	NA	NA	4.436	NA
TETRACHLORINATED DIBENZOFURANS, (TOTAL)	1.107	NA	NA	NA	NA	NA	2.104	NA
EXPLOSIVES - UNITS: UG/KG								
NO DETECTED COMPOUNDS		NA		NA		NA		NA

028328

009000

Metals in Sediment Samples at Goose Prairie Creek Wetlands
Longhorn Army Ammunition Plant, Texas

Location:	GPWSD01	GPWSD02	GPWSD03	GPWSD03	GPWSD04
Sample Number:	GPWSD01	GPWSD02	GPWSD03	GPWSD03LFD	GPWSD04
Date Sampled:	11/19/1998	12/01/1998	12/01/1998	12/01/1998	11/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/KG					
ALUMINUM	3800000	8100000	6600000	6800000	6400000
ANTIMONY	ND [10300] UJ	ND [11400] U	ND [9970] U	ND [49800] U	ND [8310] UJ
ARSENIC	3390	4090	3440	ND [8310] U	3000
BARIUM	94000	170000	120000	ND [170000] U	230000
BERYLLIUM	ND [856] U	1100	ND [831] U	ND [4150] U	1150
CADMIUM	ND [856] U	ND [949] U	ND [831] U	ND [4150] U	ND [693] U
CALCIUM	960000	3000000	2800000	ND [4200000] U	950000
CHROMIUM, TOTAL	10000	23000 J	71000 J	74000 J	12000
COBALT	ND [8600] U	11000	19000	ND [42000] U	20000
COPPER	9910	22300	18100	21900	8860
IRON	6500000	13000000	9200000	9800000	6200000
LEAD	16700	97200:	60000 J	64000 J	41800
MAGNESIUM	ND [860000] U	1300000	1300000	ND [4200000] U	ND [690000] U
MANGANESE	104000	175000	583000	618000	641000
MERCURY	220	270	550	NA	ND [140] U
NICKEL	ND [6800] U	12000	8600	ND [33000] U	7900
POTASSIUM	970000 J	1200000 J	890000 J	ND [4200000] UJ	1600000 J
SELENIUM	ND [1710] U	ND [1900] U	ND [1660] U	ND [8310] U	ND [1390] U
SILVER	3500	7000 J	15000 J	15000 J	3700
SODIUM	ND [860000] U	ND [950000] U	ND [830000] U	ND [4200000] U	ND [690000] U
STRONTIUM	ND [8600] U	20000	20000	ND [42000] U	11000
THALLIUM	ND [856] U	ND [949] U	ND [831] U	ND [4150] U	ND [693] U
VANADIUM	15000	27000	19000	ND [42000] U	19000
ZINC	100000	140000	73000	79000	31000

019000

028329

Anions and Physical Properties of Sediment Samples at Goose Prairie Creek Wetlands
Longhorn Army Ammunition Plant, Texas

Location:	GPWSD01	GPWSD02	GPWSD03	GPWSD04
Sample Number:	GPWSD01	GPWSD02	GPWSD03	GPWSD04
Date Sampled:	11/19/1998	12/01/1998	12/01/1998	11/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00
ANIONS - UNITS: UG/KG				
CYANIDE	ND [855.4] U	ND [995.8] U	ND [829.9] U	ND [692.7] U
PHYSICAL PROPERTIES - UNITS: MG/KG				
TOTAL ORGANIC CARBON	219000	403000	241000	219000

0006111

0283330

VOCs and SVOCs Surface Water Samples at Goose Prairie Creek Wetlands
Longhorn Army Ammunition Plant, Texas

Location:	GPWSW01	GPWSW02	GPWSW03	GPWSW04
Sample Number:	GPWSW01	GPWSW02	GPWSW03	GPWSW04
Date Sampled:	11/19/1998	12/01/1998	12/01/1998	11/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00
VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L				
ACETONE	ND [5] UJ	ND [5] U	2.2 U	ND [5] U
SEMI-VOLATILE ORGANIC COMPOUNDS - UNITS: UG/L				
NO DETECTED COMPOUNDS				

028331

000612

Pesticides, PCBs, Dioxins/Furans, and Explosives in Surface Water Samples at Goose Prairie Creek Wetland
Longhorn Army Ammunition Plant, Texas

Location:	GPWSW01	GPWSW02	GPWSW02	GPWSW03	GPWSW03	GPWSW04
Sample Number:	GPWSW01	GPWSW02	GPWSW02	GPWSW03	GPWSW03	GPWSW04
Date Sampled:	11/19/1998	12/01/1998	12/02/1998	12/01/1998	12/02/1998	11/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
PESTICIDES - UNITS: UG/L						
NO DETECTED COMPOUNDS		NA		NA		
POLYCHLORINATED BIPHENYLS - UNITS: UG/L						
NO DETECTED COMPOUNDS		NA		NA		
DIOXINS AND FURANS - UNITS: PG/L						
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	13.095	NA	NA	NA	NA	ND [3.477] U
HEPTACHLORINATED DIBENZO-p-DIOXINS, (TOTAL)	26.25	NA	NA	NA	NA	ND [3.477] U
OCTACHLORODIBENZO-p-DIOXIN	600.311	NA	NA	NA	NA	162.116
EXPLOSIVES - UNITS: UG/L						
NO DETECTED COMPOUNDS			NA		NA	

0283332

000613

Metals in Surface Water Samples at Goose Prairie Creek wetlands
Longhorn Army Ammunition Plant, Texas

Location:	GPWSW01	GPWSW01	GPWSW01	GPWSW02	GPWSW03	GPWSW04
Sample Number:	GPWSW01	GPWSW01AFD	GPWSW01LFD	GPWSW02	GPWSW03	GPWSW04
Date Sampled:	11/19/1998	11/19/1998	11/19/1998	12/01/1998	12/01/1998	11/20/1998
Depth (ft.):	0.00	0.00	0.00	0.00	0.00	0.00
METALS - UNITS: UG/L						
ALUMINUM	1400 J	NA	1400 J	1200	1600	950 J
ANTIMONY	25	NA	61	10	12	68
ARSENIC	ND [10] U	NA	ND [50] U	ND [10] U	ND [10] U	17:00
BARIUM	ND [200] U	NA	ND [1000] U	ND [200] U	ND [200] U	ND [200] U
BERYLLIUM	ND [0.5] U	NA	ND [2.5] U	ND [0.5] U	ND [0.5] U	ND [0.5] U
CADMIUM	ND [0.8] U	NA	ND [4] U	ND [0.8] U	ND [0.8] U	ND [0.8] U
CALCIUM	5600	NA	ND [25000] U	9600	9700	8100
CHROMIUM, TOTAL	ND [10] U	NA	ND [50] U	ND [10] U	ND [10] U	ND [10] U
COBALT	ND [50] U	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U
COPPER	ND [25] U	NA	ND [125] U	ND [25] U	ND [25] U	ND [25] U
IRON	2200 J	NA	2300 J	2900	3600	1900 J
LEAD	5	NA	ND [15] U	4	7	ND [3] U
MAGNESIUM	ND [5000] U	NA	ND [25000] U	ND [5000] U	ND [5000] U	ND [5000] U
MANGANESE	136	NA	134	849	254	981
MERCURY	ND [0.2] U	NA	NA	ND [0.2] U	ND [0.2] U	ND [0.2] U
NICKEL	ND [40] U	NA	ND [200] U	ND [40] U	ND [40] U	ND [40] U
POTASSIUM	ND [5000] UJ	NA	ND [25000] UJ	ND [5000] UJ	ND [5000] UJ	ND [5000] UJ
SELENIUM	ND [5] U	NA	ND [25] U	ND [5] U	ND [5] U	ND [5] U
SILVER	ND [10] U	NA	ND [50] U	ND [10] U	ND [10] U	ND [10] U
SODIUM	5600	NA	ND [25000] U	12000	8700	10000
STRONTIUM	ND [50] U	NA	ND [250] U	70	70	50
THALLIUM	ND [1] U	45.6:	NA	ND [1] U	1.5	ND [1] U
VANADIUM	ND [50] U	NA	ND [250] U	ND [50] U	ND [50] U	ND [50] U
ZINC	40	NA	ND [100] U	110	30	70

000614

028333

Table 13-19
Anions and Physical Properties in Surface Water Samples at Goose Prairie Creek Wetlands
Longhorn Army Ammunition Plant, Texas

Location:	GPWSW01	GPWSW02	GPWSW03	GPWSW04
Sample Number:	**GPWSW01**	**GPWSW02**	**GPWSW03**	**GPWSW04**
Date Sampled:	**11/19/1998**	**12/01/1998**	**12/01/1998**	**11/20/1998**
Depth (ft.):	**0.00**	**0.00**	**0.00**	**0.00**
ANIONS - UNITS: UG/L				
CYANIDE	ND [10] U	ND [10] U	ND [10] U	ND [10] U
PHYSICAL PROPERTIES - UNITS: MG/L				
HARDNESS (AS CaCO3)	58	52	56	50

028334

000615

Goose Prairie Creek / Site 47 -- Groundwater Sample Summary

	LOCATION 47PB																
Compound (ug/l)	**1**	**2**	**2A**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**11A**	**12**	**13**	**14**	**15**
Xylene	2.07 J				1.07 J					1.11 J							5.33 J
Benzene																	
1,1-Dichloroethene							56	169	152	22.4		11.1	6.2		5.28		120
1,1-Dichloroethane					2.2 J				14.2	1.75 J		3.29 J	2.98 J		1.03 J		
1,2-Dichloroethane							10.1			1.74 J							16.9
cis-1,2-Dichloroethene		140	144	79.8	46.7	8.89	960 E	2,000 E	1,100 E	58.1	35	600 E	530 E	75.5	290 E	4.83 J	14,000 E
trans-1,2-Dichloroethene			1.33 J					6.08				2.26 J	1.47 J		2.38 J		4.87 J
Tetrachloroethene									2.08 J				2.08 J				
Trichloroethene	63.2	331 E	105	312 E	221 E	70.4	7,900 E	14,000 E	14,000 E	7,500 E	70.1	3,300 E	3,200 E	570 E	43,000 E	142	12,000 E
Toluene	2.68 J								1.45 J				1.45 J				1.88 J
1,1,2-Trichloroethane									6.59	13.8							5.49
Naphthalene					1.7 J				2.35 J		1.18 J			1.08 J			2.33 JB
1,1,1-Trichloroethane							9.56	19.6	16.3			19.6	16.3				
Vinyl Chloride		121	130		4.85 J		22	72.7	34		15.2	16.8	14.7	5.92	57.7		62
1,2,3-Trichlorobenzene																	
1,2,4-Trichlorobenzene					1.75 J												
Total VOCs	68	592	380	392	279	79	8,958	16,267	15,329	7,599	121	3,953	3,775	653	43,356	147	26,219

	LOCATION 47PB															
Compound (ug/l)	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**26A**	**27**	**28**	**29**	**30**
Xylene	1.08	1.49 J									3.87 J	3.17 J	10.69 J			
Benzene	1.54 J															
1,1-Dichloroethene	38	57.1	27.7	2.81 J							151	94.5	83.4			
1,1-Dichloroethane		1.32 J	1.71 J								27.4	20.1	5.85			
1,2-Dichloroethane																
cis-1,2-Dichloroethene	33	30.2	283 E	116						84.7	2,900 E	2,300 E	1,300 E	25.8		
trans-1,2-Dichloroethene			2.42 J								6.01	5.06	6.82			
Tetrachloroethene													3.88 J			
Trichloroethene	3,500 E	7,000 E	4,100 E	1,100 E	3.76 J	1.75 J		6.28	7.36	240 E	11,000 E	7,300 E	26,000 E	405 E	5.8	9.81
Toluene	1.19 J										2.46 J	2.45 J	3.79 J			
1,1,2-Trichloroethane	2.78 J	6.57									6.95	5.69	26.8			
Naphthalene	1.88 JB	2.41 JB			1.17 JB	1.37 JB					1.72 J	1.39 J	1.27 J		1.15 J	1.04 J
1,1,1-Trichloroethane											19.5	9.98				
Vinyl Chloride			26.6	12.4							183	128	109			
1,2,3-Trichlorobenzene		1.55 J									1.11 J					
1,2,4-Trichlorobenzene		1.57 J														
Total VOCs	3,579	7,102	4,441	1,231	5	3	0	6	7	325	14,303	9,870	27,552	431	7	11

Notes:

B - Analyte was detected in the associated blank as well as in the sample.
E - Concentrations exceed the calibration range of the instrument; analyte values should be considered estimated.
J - Data indicates presence of analyte below quanitation limit.
ug/l - micrograms per liter

0028335

0006216

VOCs in Sediment Samples at Goose Prairie Creek
North Cove

VOLATILE ORGANIC COMPOUNDS (ug/kg) (Method 8260B)						
Compound Name	**CL-GPSN-1 (1)**	**CL-GPSN-1 (2)**	**CL-GPSN-1 (3)**	**CL-GPSN-2 (1)**	**CL-GPSN-2 (2)**	**CL-GPSN-2 (3)**
Acetone	500	276	50	739	253	< 114
Carbon Disulfide	36.6	40.8	1.88 J	13.2	3.71 J	3.48 J
Ethylbenzene	3.53 J	< 3.34	< 2	< 7.4	< 4.88	< 5.72
Compound Name	**CL-GPSN-3 (1)**	**CL-GPSN-3 (2)**	**CL-GPSN-3 (3)**	**CL-GPSN-4 (1)**	**CL-GPSN-4 (2)**	**CL-GPSN-4 (3)**
Acetone	582	242	109	1,350	218	76.7
Carbon Disulfide	18.4	2.92 J	8.91	47.9	7.39	< 2
Trichlorofluoromethane	< 6.66	< 5.12	< 2.9	< 11.1	10.7	6.81

Notes:

J - estimated value

ug/kg - micrograms per kilogram

028336

000637

SVOCs in Sediment Samples at Goose Prairie Creek
North Cove

SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg) (Method 8270C)							
Compound Name	**CL-GPSN-1 (1)**	**CL-GPSN-1 (2)**	**CL-GPSN-1 (3)**	**CL-GPSN-2 (1)**	**CL-GPSN-2 (2)**	**CL-GPSN-2 (3)**	**TBC TRRP Tier 1 PCL [30 TAC 350.75 (b)]**
Phenol	< 530	< 284	< 170	< 629	66.2 J	66.8 J	57,000
Compound Name	**CL-GPSN-3 (1)**	**CL-GPSN-3 (2)**	**CL-GPSN-3 (3)**	**CL-GPSN-4 (1)**	**CL-GPSN-4 (2)**	**CL-GPSN-4 (3)**	**TBC TRRP Tier 1 PCL [30 TAC 350.75 (b)]**
Phenanthrene	< 223	38.7 J	< 97.2	< 373	< 105	< 67	620,000
Phenol	< 566	< 435	< 247	< 945	<265	41.5 J	57,000

Notes:

J - estimated value
ug/kg - micrograms per kilogram
PCL - protective concentration level
TAC - Texas Administrative Code
TBC - "to be considered"
TRRP - Texas Risk Reduction Program

0028337
000618

Perchlorate and TOC in Sediment Samples at Goose Prairie Creek
North Cove

MOISTURE CONTENT (Method ASTM D2216) PERCHLORATE (Method E300) TOTAL ORGANIC CARBON (TOC) (Method SW9060)						
	CL-GPSN-1 (1)	CL-GPSN-1 (2)	CL-GPSN-1 (3)	CL-GPSN-2 (1)	CL-GPSN-2 (2)	CL-GPSN-2 (3)
Moisture (%)	56	57.7	28.5	55.8	28.8	60.2
Perchlorate (ug/kg)	< 45	< 47	< 28	< 45	< 28	< 50
TOC (Max) (mg/kg)	47,500	73,400	7,330	51,700	19,800	6,490
TOC (Min) (mg/kg)	40,100	64,500	6,280	33,000	10,500	4,400
TOC (Avg) (mg/kg)	43,000	66,800	6,810	43,100	16,200	5,130
	CL-GPSN-3 (1)	CL-GPSN-3 (2)	CL-GPSN-3 (3)	CL-GPSN-4 (1)	CL-GPSN-4 (2)	CL-GPSN-4 (3)
Moisture (%)	76.9	70.2	16.7	84.4	43.1	22.5
Perchlorate (ug/kg)	< 87	< 67	< 24	< 130	< 35	< 26
TOC (Max) (mg/kg)	100,000	89,000	5,030	115,000	33,400	4,430
TOC (Min) (mg/kg)	75,000	85,700	3,240	99,600	19,500	3,580
TOC (Avg) (mg/kg)	88,300	86,900	4,090	103,000	24,300	4,080

Notes:

mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
% - percent
Avg - average
Max - maximum
Min - minimum
TOC - total organic carbon

0028338

000619

Metals in Sediment Samples at Goose Prairie Creek
North Cove

METALS (mg/kg)						
Compound Name	**CL-GPSN-1 (1)**	**CL-GPSN-1 (2)**	**CL-GPSN-1 (3)**	**CL-GPSN-2 (1)**	**CL-GPSN-2 (2)**	**CL-GPSN-2 (3)**
Aluminum	20,900	14,000	4,440	30,400	16,900	9,020
Antimony	< 5	< 5	< 5	< 5	< 5	< 5
Arsenic	6.85	3.51	1.19	6.88	4.45	2.7
Barium	342	168	56.5	285	226	246
Beryllium	1.09	0.781	0.415	0.994	0.882	1.47
Cadmium	0.882	0.49	0.041 J	0.76	0.739	0.156
Calcium	2,990	1,650	523	2,910	1,940	1,840
Chromium	56.6	20.3	7.21	59.1	38.7	15.6
Cobalt	10.1	6.12	2.6	9.85	7.32	6.85
Copper	30.9	11.3	3.59	35	18.4	10.6
Iron	18,200	15,200	3,540	19,500	17,300	11,800
Lead	542	167	8.77	165	229	57.4
Magnesium	1,610	1,110	266	1,790	1,240	826
Manganese	286	155	49.6	295	197	172
Mercury	1.08	0.434	0.031	1.02	0.978	0.241
Nickel	22.7	14.3	3.22	23.8	18.2	11
Potassium	1,290	931	259	2,100	1,180	730
Selenium	1.1	< 0.5	< 0.5	0.842	0.617	0.53
Silver	12	< 0.5	< 0.5	17.6	9.26	0.865
Strontium	47.7	26.9	8.67	43.2	35.4	28.2
Thallium	1.29	1.07	< 1	1.51	1.41	0.899 J
Vanadium	35.7	22	10.6	43.1	25.7	21
Zinc	178	62.8	15.5	128	126	66.5

Notes:

J - estimated value
mg/kg - milligrams per kilogram
NA - not analyzed
ND - not detected

029000

028339

Dioxin/Furans in Sediment Samples at Goose Prairie Creek North and South Coves

DIOXINS AND FURANS (pg/g) (Method 8290)		
Compound Name	**CL-GPSN-3 (1)**	**CL-GPSS-3 (1)**
OCDD	6,900	5,600
1,2,3,4,6,7,8-HpCDD	240	210
Total HpCDD	500	590
1,2,3,7,8,9-HxCDD	< 7.5	8.4 J
Total HxCDD	53	95
Total TCDD	< 1.8	7
OCDF	46	26 J
1,2,3,4,6,7,8-HpCDF	17 J	9.4 J
Total HpCDF	48	28
Total HxCDF	26	22
Total PeCDF	33	27
2,3,7,8-TCDF	4.2	< 1.4
Total TCDF	62	22

Notes:

J - estimated value

pg/g - picograms per gram

0283340

0006221

VOCs in Sediment Samples at Goose Prairie Creek
South Cove

VOLATILE ORGANIC COMPOUNDS (ug/kg) (Method 8260B)							
Compound Name	**CL-GPSS-1 (1)**	**CL-GPSS-1 (2)**	**CL-GPSS-1 (3)**	**CL-GPSS-2 (1)**	**CL-GPSS-2 (2)**	**CL-GPSS-2 (3)**	**TBC TRRP Tier 1 PCL [30 TAC 350.75 (b)]**
Acetone	175	132	< 40	459	314	77.9	7,100
Carbon Disulfide	59.9	15.7	1.12 J	9.32	10.2	2.44	20,000
Compound Name	**CL-GPSS-3 (1)**	**CL-GPSS-3 (2)**	**CL-GPSS-3 (3)**	**CL-GPSS-4 (1)**	**CL-GPSS-4 (2)**	**CL-GPSS-4 (3)**	**TBC TRRP Tier 1 PCL [30 TAC 350.75 (b)]**
Acetone	214	71	53.8	377	54.2	< 40	7,100
Carbon Disulfide	7.33	8.82	3	29.7	2.11	< 2	20,000
Trichlorofluoromethane	< 3.84	3.21	< 2	< 4.16	< 2	< 2	190,000

Notes:

J - estimated value
ug/kg - micrograms per kilogram
PCL - protective concentration level
TAC - Texas Administrative Code
TBC - "to be considered"
TRRP - Texas Risk Reduction Program

0283411

0009622

SVOCs in Sediment Samples at Goose Prairie Creek
South Cove

SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg) (Method 8270C)						
Compound Name	**CL-GPSS-1 (1)**	**CL-GPSS-1 (2)**	**CL-GPSS-1 (3)**	**CL-GPSS-2 (1)**	**CL-GPSS-2 (2)**	**CL-GPSS-2 (3)**
Phenol	< 547	42.6 J	31 J	< 459	< 340	< 170

Compound Name	**CL-GPSS-3 (1)**	**CL-GPSS-3 (2)**	**CL-GPSS-3 (3)**	**CL-GPSS-4 (1)**	**CL-GPSS-4 (2)**	**CL-GPSS-4 (3)**
3-Methylphenol	< 326	< 258	< 170	83.2 J	< 170	< 170
4-Methylphenol	< 326	< 258	< 170	83.2 J	< 170	< 170
Acenaphthylene	< 129	< 102	< 67	94.3 J	< 67	< 67
Anthracene	< 129	< 102	< 67	1,440	< 67	< 67
Benzo(a)anthracene	< 129	< 129	< 67	2,980	< 67	< 67
Benzo(a)pyrene	< 129	< 102	< 67	2,590	< 67	< 67
Benzo(b)fluoranthene	< 129	< 102	< 67	3,020	< 67	< 67
Benzo(g,h,i)perylene	< 129	< 102	< 67	2,720	< 67	< 67
Benzo(k)fluoranthene	< 129	< 102	< 67	1,090	< 67	< 67
Chrysene	< 129	< 102	< 67	2,870	< 67	< 67
Dibenzo(a,h)anthracene	< 129	< 102	< 67	885	< 67	< 67
Dibenzofuran	< 326	< 258	< 170	78.1 J	< 170	< 170
Fluoranthene	< 129	< 102	< 67	5,930	< 67	< 67
Fluorene	< 129	< 102	< 67	453	< 67	< 67
Phenanthrene	< 129	< 102	< 67	4,670	< 67	< 67

Notes:

J - estimated value

ug/kg - micrograms per kilogram

0283423

000623

Perchlorate and TOC in Sediment Samples at Goose Prairie Creek South Cove

MOISTURE CONTENT (Method ASTM D2216) PERCHLORATE (Method E300) TOTAL ORGANIC CARBON (TOC) (Method SW9060)						
	CL-GPSS-1 (1)	**CL-GPSS-1 (2)**	**CL-GPSS-1 (3)**	**CL-GPSS-2 (1)**	**CL-GPSS-2 (2)**	**CL-GPSS-2 (3)**
Moisture (%)	55.7	34.7	18.7	82.6	35.4	21.9
Perchlorate (ug/kg)	< 45	< 31	< 25	< 120	< 31	< 26
TOC (Max) (mg/kg)	60,800	18,800	1,300	104,000	12,300	3,950
TOC (Min) (mg/kg)	30,200	15,300	590	81,000	10,700	2,790
TOC (Avg) (mg/kg)	40,100	17,500	1,000	97,100	11,300	3,360

	CL-GPSS-3 (1)	**CL-GPSS-3 (2)**	**CL-GPSS-3 (3)**	**CL-GPSS-4 (1)**	**CL-GPSS-4 (2)**	**CL-GPSS-4 (3)**
Moisture (%)	35.2	29.3	22.6	70.7	38.3	18.6
Perchlorate (ug/kg)	< 31	< 28	< 26	< 68	< 32	< 25
TOC (Max) (mg/kg)	16,800	12,100	2,000	7,850	16,900	2,980
TOC (Min) (mg/kg)	13,000	11,000	1,400	5,600	15,200	1,400
TOC (Avg) (mg/kg)	14,300	11,600	1,600	6,700	15,900	2,000

Notes:

mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
% - percent
Avg - average
Max - maximum
Min - minimum
TOC - total organic carbon

0028343

0029000

Metals in Sediment Samples at Goose Prairie Creek
South Cove

METALS (mg/kg)						
Compound Name	**CL-GPSS-1 (1)**	**CL-GPSS-1 (2)**	**CL-GPSS-1 (3)**	**CL-GPSS-2 (1)**	**CL-GPSS-2 (2)**	**CL-GPSS-2 (3)**
Aluminum	23,900	11,100	4,860	12,900	13,600	8,460
Antimony	< 5	< 5	< 5	< 5	< 5	< 5
Arsenic	4.43	2.12	1.22	4	4.06	1.67
Barium	230	96.8	47	124	172	123
Beryllium	1.14	0.596	0.324	0.573	0.911	0.765
Cadmium	0.568	0.242	< 0.1	0.318	0.392	0.116
Calcium	2,460	829	411	1,370	1,520	863
Chromium	34.4	15.1	7.68	19.8	19.8	10.8
Cobalt	7.83	3.53	1.55	4.71	9.66	4.33
Copper	38.7	8.97	3.19	13.6	13.2	5.63
Iron	16,800	7,510	3,950	10,400	12,600	6,890
Lead	145	29.7	6.86	53.4	108	11
Magnesium	1,750	688	263	872	1,070	565
Manganese	233	81.9	39.8	133	163	92.1
Mercury	0.279	0.061	0.014 J	0.351	0.459	0.043
Nickel	20.3	7.67	2.51	10.7	13.6	6.39
Potassium	1,790	805	298	929	1,000	569
Selenium	< 0.5	0.291 J	0.285 J	0.505	0.599	0.306 J
Silver	1.26	0.192 J	< 0.5	3.09	0.444 J	< 0.5
Strontium	43.4	17.3	9.77	22.5	27.9	17.2
Thallium	1.03	0.557 J	< 1	0.9 J	0.967 J	0.53 J
Vanadium	35.5	16	10.8	21.5	23.3	13.4
Zinc	80	44.4	12.5	63.3	73.6	36.2

Notes:

J - estimated value
mg/kg - milligrams per kilogram
NA - not analyzed
ND - not detected

0283444

000625

Metals in Sediment Samples at Goose Prairie Creek
South Cove

METALS (mg/kg)						
Compound Name	CL-GPSS-3 (1)	CL-GPSS-3 (2)	CL-GPSS-3 (3)	CL-GPSS-4 (1)	CL-GPSS-4 (2)	CL-GPSS-4 (3)
Aluminum	7,680	9,180	2,130	11,200	6,440	13,900
Antimony	< 5	< 5	< 5	< 5	< 5	< 5
Arsenic	1.84	2.14	1.02	2.64	1.56	1.95
Barium	82.1	97.4	37.8	104	43.6	38.9
Beryllium	0.399	0.607	0.252	0.605	0.282	0.311
Cadmium	0.066 J	0.128	< 0.1	0.295	0.114	0.419
Calcium	780	779	775	1,350	517	711
Chromium	11.1	13.4	3.09	14.6	10.7	14.2
Cobalt	3.16	4.22	1.64	6.25	2.5	2.65
Copper	7.14	6.92	2.89	8.19	2.9	3.77
Iron	5,270	7,070	2,720	9,560	5,590	13,100
Lead	25 *	24.6 *	6.94	19.6 *	9.57	9.81
Magnesium	541	583	212	700	359	660
Manganese	77.3	77.5	39.3	154	53.5	55.5
Mercury	0.251	0.056	0.016 J	0.132	0.028	0.031
Nickel	6.34	6.79	2.21	9.14	3.63	3.85
Potassium	562	631	151	774	360	435
Selenium	0.323 J	0.493 J	< 0.5	0.78	0.417 J	0.482 J
Silver	0.944	0.057 J	< 0.5	1.34	0.609	< 0.5
Strontium	13.8	16.3	10.3	18	9.55	16.8
Thallium	0.541 J	< 1	< 1	< 1	0.572 J	0.87 J
Vanadium	13.2	16.7	8.14	17.6	16.6	16.5
Zinc	31.7	35.1	10.1	71.7	19.1	19.3

Notes:

J - estimated value
mg/kg - milligrams per kilogram
NA - not analyzed
ND - not detected

029345

029000

VOCs in Sediment Samples at Goose Prairie Creek
Caddo Lake at Harrison Bayou

VOLATILE ORGANIC COMPOUNDS (ug/kg) (Method 8260B)							
Compound Name	**CL-HBS-1 (1)**	**CL-HBS-1 (2)**	**CL-HBS-1 (3)**	**CL-HBS-2 (1)**	**CL-HBS-2 (2)**	**CL-HBS-2 (3)**	**TBC TRRP Tier 1 PCL [30 TAC 350.75 (b)]**
Acetone	755	209	291	1,030	201	167	7,100
Carbon Disulfide	61	5.93	5.31	31.4	8.24	< 4.96	20,000

Compound Name	**CL-HBS-3 (1)**	**CL-HBS-3 (2)**	**CL-HBS-3 (3)**	**CL-HBS-4 (1)**	**CL-HBS-4 (2)**	**CL-HBS-4 (3)**	**TBC TRRP Tier 1 PCL [30 TAC 350.75 (b)]**
2-Butanone (MEK)	< 146	< 40	< 58.8	< 452	< 278	62	44,000
Acetone	353	60.9	< 58.8	909	683	298	7,100
Carbon Disulfide	20.9	6.03	6.51	26.5	35.8	< 3.62	20,000

Notes:

J - estimated value
ug/kg - micrograms per kilogram
PCL - protective concentration level
TAC - Texas Administrative Code
TBC - "to be considered"
TRRP - Texas Risk Reduction Program

0028346

0029000

SVOCs in Sediment Samples at Goose Prairie Creek
Caddo Lake at Harrison Bayou

SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg) (Method 8270C)						
Compound Name	**CL-HBS-1 (1)**	**CL-HBS-1 (2)**	**CL-HBS-1 (3)**	**CL-HBS-2 (1)**	**CL-HBS-2 (2)**	**CL-HBS-2 (3)**
Di-n-butyl phthalate	< 850	< 292	< 315	930	< 347	< 287
Compound Name	**CL-HBS-3 (1)**	**CL-HBS-3 (2)**	**CL-HBS-3 (3)**	**CL-HBS-4 (1)**	**CL-HBS-4 (2)**	**CL-HBS-4 (3)**
3-Methylphenol	< 309	< 170	< 170	< 655	< 709	189 J
4-Methylphenol	< 309	< 170	< 170	< 655	< 709	189 J

Notes:

J - estimated value

ug/kg - micrograms per kilogram

029347

329000

Metals in Sediment Samples at Goose Prairie Creek
Caddo Lake at Harrison Bayou

METALS (mg/kg)						
Compound Name	**CL-HBS-1 (1)**	**CL-HBS-1 (2)**	**CL-HBS-1 (3)**	**CL-HBS-2 (1)**	**CL-HBS-2 (2)**	**CL-HBS-2 (3)**
Aluminum	12,000	7,450	13,300	14,800	13,900	16,900
Antimony	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	4.02	1.63	2.7	4.92	5.99	2.61
Barium	156	199	223	198	190	367
Beryllium	0.939	1.02	1.31	0.963	1.47	1.3
Cadmium	< 0.1	< 0.1	< 0.1	0.135	0.051 J	< 0.1
Calcium	1,840	1,410	1,630	2,300	1,880	2,210
Chromium	12.9	9.39	15.1	15	14.7	18
Cobalt	10.2	5.96	8.99	14	27.8	6.01
Copper	10.5	8.77	9.79	12.4	10.3	12.6
Iron	14,800	12,400	14,100	16,800	14,300	12,700
Lead	17.8	15.21	13	20.8	15.8	14.7
Magnesium	1,180	1,030	1,420	1,470	1,270	1,730
Manganese	196	182	218	286	248	230
Mercury	0.138	0.101	0.088	0.121	0.115	0.06
Nickel	16.3	8.4	14.3	20.8	21.1	14.7
Potassium	992	701	1,090	1,150	1,150	1,340
Selenium	1.04	0.976	0.958	1.01	1.27	0.826
Silver	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Strontium	35	28.7	33.9	44.5	38	49.3
Thallium	< 1	< 1	< 1	< 1	< 1	< 1
Vanadium	24.2	18.5	22.7	26.7	33.4	17.6
Zinc	65.2	32.1	52.2	72.3	66.2	54.7

Notes:

J - estimated value
mg/kg - milligrams per kilogram
NA - not analyzed
ND - not detected

0028348

000623

Metals in Sediment Samples at Goose Prairie Creek
Caddo Lake at Harrison Bayou

METALS (mg/kg)						
Compound Name	**CL-HBS-3 (1)**	**CL-HBS-3 (2)**	**CL-HBS-3 (3)**	**CL-HBS-4 (1)**	**CL-HBS-4 (2)**	**CL-HBS-4 (3)**
Aluminum	8,580	9,010	10,100	7,260	13,700	13,600
Antimony	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	2.54	1.46	2.2	2.78	5.05	4.01
Barium	203	180	110	125	214	164
Beryllium	1.23	1.02	0.801	0.645	1.25	1.08
Cadmium	0.071 J	< 0.1	< 0.1	0.101	0.174	0.052 J
Calcium	1,860	1,630	1,730	1,560	2,650	1,300
Chromium	10.7	10.7	11	8.46	15.1	14.7
Cobalt	11.9	12	6.74	7.92	14.3	10.9
Copper	7.9	7.26	6.05	8.79	14.6	8.61
Iron	11,500	12,700	12,100	9,650	17,500	12,400
Lead	14	14	11.6	12.9	23.2	15.4
Magnesium	1,320	1,350	1,460	825	1,540	1,220
Manganese	394	413	305	250	396	175
Mercury	0.07	0.052	0.073	0.096	0.231	0.074
Nickel	11.6	9.76	7.04	14.1	20.7	13.6
Potassium	805	766	642	611	1,110	1,050
Selenium	0.911	0.665	0.628	< 0.5	1.28	0.936
Silver	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Strontium	38.7	35.8	41.1	28.9	50.7	28.7
Thallium	< 1	< 1	< 1	< 1	< 1	< 1
Vanadium	13.1	15.4	11.1	15.3	26.4	20.9
Zinc	44.2	33.1	26.8	52.3	82.4	49.9

Notes:

J - estimated value
mg/kg - milligrams per kilogram
NA - not analyzed
ND - not detected

0283419

000630

Dioxin/Furans in Sediment Samples at Goose Prairie Creek
Caddo Lake at Harrison Bayou

DIOXINS AND FURANS (pg/g) (Method 8290)			
Compound Name	**CL-HBS-2 (1)**	**CL-HBS-2(1)QC**	**CL-HBS-4 (1)**
1,2,3,4,6,7,8-HpCDD	600	410	560
1,2,3,7,8,9-HxCDD	21 J	16 J	19 J
OCDD	20,000	12,000	18,000
Total HpCDD	2,400	1,600	1,600
Total HxCDD	630	490	380
Total PeCDD	60	43	22
Total TCDD	48	48	21

Notes:

J - estimated value

pg/g - picograms per gram

0028350

000631

VOCs in Sediment Sam[illegible] at Goose Prairie Creek
Caddo Lake at Central Creek

VOLATILE ORGANIC COMPOUNDS (ug/kg) (Method 8260B)						
Compound Name	**CL-CCS-1 (1)**	**CL-CCS-1 (2)**	**CL-CCS-1 (3)**	**CL-CCS-2 (1)**	**CL-CCS-2 (2)**	**CL-CCS-2 (3)**
Acetone	1240	397	81	618	282	97.5 J
Carbon Disulfide	35.5	9.82	< 3.16	25.4	5.08 J	8.58

Notes:

J - estimated value
ug/kg - micrograms per kilogram

0028351

0006632

Metals in Sediment Samples at Goose Prairie Creek
Caddo Lake at Central Creek

METALS (mg/kg)						
Compound Name	**CL-CCS-1 (1)**	**CL-CCS-1 (2)**	**CL-CCS-1 (3)**	**CL-CCS-2 (1)**	**CL-CCS-2 (2)**	**CL-CCS-2 (3)**
Aluminum	17,500	12,000	10,400	19,600	6,880	11,500
Antimony	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	7.52	3.68	1.99	6.75	2.21	2.08
Barium	204	177	150	201	150	263
Beryllium	1.02	1.5	0.843	1.08	1.03	2.01
Cadmium	0.148	0.072 J	< 0.1	0.058 J	0.075 J	0.027 J
Calcium	2,210	1,150	802	1,830	950	1,090
Chromium	18.7	13.6	11.6	19.9	8.32	11.2
Cobalt	16.9	17.1	6.69	13.1	9.53	5.27
Copper	16.7	9.89	7.12	15.4	7.64	8.25
Iron	19,700	13,000	9,490	19,600	9,660	13,300
Lead	31.6	19.8	11.9	21.4	16.1	14.9
Magnesium	1,390	1,100	810	1,420	691	770
Manganese	313	178	125	267	146	164
Mercury	0.185	0.129	0.048	0.113	0.113	0.091
Nickel	23.1	20.3	8.95	20.7	11	8.3
Potassium	1,400	1,050	876	1,550	678	834
Selenium	2.31	0.668	0.757	1.43	0.596	0.925
Silver	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Strontium	40.5	26	20	37.8	20	26.1
Thallium	< 1	< 1	< 1	< 1	< 1	< 1
Vanadium	31.6	22.7	17.5	34	17.3	18.9
Zinc	81.4	74.7	32.2	78	40.7	28.8

Notes:

J - estimated value
mg/kg - milligrams per kilogram
NA - not analyzed
ND - not detected

0000633

0283352

Dioxin/Furans in Sediment Samples at Goose Prairie Creek
Caddo Lake at Central Creek

DIOXINS AND FURANS (pg/g) (Method 8290)	
Compound Name	**CL-SBS-2 (1)**
1,2,3,4,6,7,8-HpCDD	310
1,2,3,4,6,7,8-HpCDF	14 J
1,2,3,7,8,9-HxCDD	13 J
OCDD	12,000
OCDF	37 J
Total HpCDD	760
Total HpCDF	38
Total HxCDD	150
Total TCDD	5.2

Notes:

J - estimated value

pg/g - picograms per gram

028353

000633

VOCs in Sediment Samples at Goose Prairie Creek
Caddo Lake at Saunder's Branch

VOLATILE ORGANIC COMPOUNDS (ug/kg) (Method 8260B)						
Compound Name	**CL-SBS-1 (1)**	**CL-SBS-1 (2)**	**CL-SBS-1 (3)**	**CL-SBS-2 (1)**	**CL-SBS-2 (2)**	**CL-SBS-2 (3)**
Acetone	588	187	< 40	1,080	389	126
Carbon Disulfide	177	4.73	< 2	20	6.36	< 4.46

Notes:

ug/kg - micrograms per kilogram

0283354

0006355

Metals in Sediment Sam[illegible]s at Goose Prairie Creek
Caddo Lake at Saunder's Branch

METALS (mg/kg)						
Compound Name	CL-SBS-1 (1)	CL-SBS-1 (2)	CL-SBS-1 (3)	CL-SBS-2 (1)	CL-SBS-2 (2)	CL-SBS-2 (3)
Aluminum	9,330	12,200	10,300	9,450	16,300	5,670
Antimony	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	3.79	2.7	2.22	3.99	3.27	1.37
Barium	261	145	165	221	265	163
Beryllium	1.21	1.04	0.857	0.993	1.33	1.08
Cadmium	0.151 J	< 0.1	0.059 J	0.256	0.191	0.036 J
Calcium	2,340	855	707	2,120	1,680	1,040
Chromium	11.6	14.1	13.2	10.8	17.5	7.25
Cobalt	12.3	8.87	6.67	13.7	11.3	5.22
Copper	16.2	6.87	6.87	13	11.5	7.52
Iron	12,400	8,640	7,310	12,700	14,900	9,110
Lead	27.6	17.1	12.1	20.5	21.2	14.4
Magnesium	986	872	731	890	1,220	605
Manganese	450	155	122	488	292	180
Mercury	0.13	0.07	0.068	0.149	0.107	0.094
Nickel	14.8	12.2	9.25	14.9	15.1	5.4
Potassium	841	996	837	803	1,330	571
Selenium	1.73	0.768	0.567	1.72	1.17	0.781
Silver	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Strontium	42.5	19.5	18.5	39.5	34.6	19.9
Thallium	< 1	< 1	< 1	< 1	< 1	< 1
Vanadium	30.8	20.4	19.2	24.5	28.2	15.6
Zinc	49.4	42.1	40.3	60.4	60.2	20.3

Notes:

J - estimated value
mg/kg - milligrams per kilogram
NA - not analyzed
ND - not detected

0028355

0039000

Dioxin/Furans in Sediment Sampling at Goose Prairie Creek
Caddo Lake at Saunder's Branch

DIOXINS AND FURANS (pg/g) (Method 8290)	
Compound Name	**CL-SBS-2 (1)**
1,2,3,4,6,7,8-HpCDD	260
1,2,3,4,6,7,8-HpCDF	13 J
OCDD	9,400
OCDF	25 J
Total HpCDD	640
Total HpCDF	31
Total HxCDD	110
Total TCDD	5.7

Notes:

J - estimated value

pg/g - picograms per gram

028356

000637