MARTIN MARIETTA

**COMPREHENSIVE MONITORING
REPORT FOR UNDERGROUND
STORAGE TANKS 0439-U, 0440-U,
2073-U, 2074-U, AND 2075-U
AT THE EAST END FUEL STATION,
BUILDINGS 9754 AND 9754-2**

**OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE
FACILITY ID #0-010117**

June 1996

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MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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FACILITY ID #0-010117**

June 1996

**Environmental Management Department
Health, Safety, Environment,
and Accountability Organization**

Prepared by

**Science Applications International Corporation
Under Subcontract 22B-99069C
for the
Oak Ridge Y-12 Plant
Oak Ridge, Tennessee 37831**

Managed by

**Lockheed Martin Energy Systems, Inc.
for the
U.S. Department of Energy
Under Contract No. DE-AC05-84OR21400**

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TABLE OF CONTENTS

	Page
LIST OF FIGURES	iv
LIST OF TABLES	iv
LIST OF ACRONYMS	v

COMPREHENSIVE MONITORING REPORT

1.0 INTRODUCTION	1-1
1.1 Purpose and Scope	1-1
1.2 Site Description	1-1
2.0 GROUNDWATER MONITORING	2-1
2.1 Groundwater Measurement, Sample Collection and Analysis	2-1
2.1.1 Well Locations	2-1
2.1.2 Groundwater Measurement and Sampling	2-1
2.1.3 Sample Analysis	2-1
2.2 Potentiometric Data	2-1
2.3 Analytical Data	2-6
3.0 VAPOR MONITORING	3-1
3.1 Monitoring Method and Locations	3-1
3.2 Vapor Monitoring Results	3-1

REFERENCES

APPENDICES

Appendix A	Laboratory Analytical Results for Comprehensive Monitoring.	A-1
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LIST OF FIGURES

Figure	Title	Page
1-1	Location of the East End Fuel Station at the Y-12 Plant	1-2
1-2	East End Fuel Station Site Map	1-3
2-1	East End Fuel Station Site Monitoring Well Location Map	2-2
2-2	East End Fuel Station Groundwater Potentiometric Contour Map, May 1995	2-4
2-3	East End Fuel Station Groundwater Potentiometric Contour Map, December 1993	2-5
2-4	Horizontal Extent of Benzene Contamination in Groundwater at the East End Fuel Station	2-11
2-5	Horizontal Extent of TPH Contamination in Groundwater at the East End Fuel Station	2-12
2-6	Maximum Analytical Results for TPH and BTEX in Soils at the East End Fuel Station	2-13
3-1	East End Fuel Station Vapor Monitoring Sampling Point Location Map	3-2

TABLES

Table	Title	Page
1-1	Tank contents and capacities at the East End Fuel Station	1-4
2-1	Water Level Measurements at the East End Fuel Station for the Periods of December 1993 and May 1996	2-3
2-2	Analytical Results for Groundwater Samples Collected During Comprehensive Monitoring and Corrective Action Baseline Sampling	2-7
3-1	Vapor Monitoring Results for the East End Fuel Station	3-3

LIST OF ACRONYMS

BGL	below ground level
BTEX	benzene, toluene, ethylbenzene, and xylene
BTOC	below top of casing
CAP	Corrective Action Plan
LEL	lower explosive limit
MSL	mean sea level
TDEC	Tennessee Department of Environment and Conservation
TOC	top of casing
TPH-DRO	total petroleum hydrocarbons - diesel range organics
TPH-GRO	total petroleum hydrocarbons - gasoline range organics
UST	underground storage tank

SIGNATURE PAGE FOR THE
COMPREHENSIVE MONITORING REPORT
FOR UNDERGROUND STORAGE TANKS 0439-U, 0440-U, 2073-U, 2074-7, AND
2068-U AT THE EAST END FUEL STATION, BUILDINGS 9754 AND 9754-2

I certify under penalty of law, including but not limited to penalties for perjury, that the information contained in this report and on any attachments, is true, accurate, and complete to the best of my knowledge, information, and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional violations.

See Attached Certification

Owner/Operator (Print)

Signature

Date

William D. Keefer

P.E. or P.G. (Print)

William D. Keefer / TN3328
Signature TN Lic./Reg. #

6/12/96

Date

If a P.E. signs this report, please indicate the area of expertise.

(Print or Type)

(P.E./P.G. Stamp/Seal)

County of Anderson State of Tennessee

Subscribed and Sworn to before me this

12 day of June, 1996.

Suzanne Knott
Notary Public

NOTARY PUBLIC STATE OF TENNESSEE AT LARGE.

MY COMMISSION EXPIRES: Dec. 22, 1999.

My Commission expires: _____ (Notary Seal)

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this document is to provide hydrogeologic, geochemical, and vapor monitoring data required for comprehensive monitoring of underground storage tanks (UST) 0439-U, 0440-U, 2073-U, 2074-U, and 2075-U at the East End Fuel Station. Comprehensive monitoring was conducted at the site in May 1996 at the direction of the Tennessee Department of Environment and Conservation (TDEC) based on review and notice of deficiencies in the Site-specific Standard Request (letter from Jeffrey Fields to Robert Spence, dated May 6, 1996). Comprehensive monitoring and preparation of this report have been conducted in accordance with the requirements of the TDEC Rule 1200-1-15 and the TDEC UST Reference Handbook, Second Edition (TDEC 1994).

This document is organized into three sections. Section 1 presents introductory information relative to the site including regulatory initiative and a description of the site. Section 2 includes the results of water level measurement and sampling of monitoring wells at the site. Section 3 presents data from vapor monitoring conducted in subsurface utilities present at the site. Appendix A contains the original analytical laboratory results for environmental and quality control samples collected during comprehensive monitoring.

1.2 SITE DESCRIPTION

The East End Fuel Station is located at the eastern edge of the Oak Ridge Y-12 Plant in Oak Ridge, Tennessee (Figure 1-1). The site occurs in a moderately industrialized area on the north side of First Street between "A" Road and Agate Road (Figure 1-2). The site includes Building 9754-2 and the former Building 9754. Tanks 0439-U and 0440-U were located adjacent to Building 9754-2, and tanks 2073-U, 2074-U, and 2075-U serviced pump islands adjacent to the former Building 9754. The tank contents and capacities are summarized in Table 1-1. This area is characterized by a gentle slope stepping down to the south toward Upper East Fork Poplar Creek.

The East End Fuel Station has been in use as a primary fueling point for the Y-12 Plant since 1944. The holding tanks at former Building 9754 facility were in use until 1978 when they were emptied and taken out of service. At that time, the piping associated with the holding tanks and two emergency dispensing pumps were capped at a valving station and abandoned in place. In 1993, tanks 2073-U, 2074-U, 2075-U and associated piping were excavated and removed. The USTs at the Building 9754-2 facility were put into service in 1979 and taken out of service and removed in June 1989. The East End Fuel Station is still in use and is currently supplied by two aboveground storage tanks.

Y-12 PLANT SITE

Y-12 PLANT EAST END FUEL STATION
BUILDINGS 9754 and 9754-2

Figure 1-1.

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ENVIRONMENTAL MANAGEMENT DEPARTMENT

LOCATION OF THE EAST END FUEL STATION
BUILDINGS 9754 AND 9754-2 AT THE Y-12 PLANT

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Environmental Management Department

Figure 1-2.

**East End Fuel Station
Site Map**

All location information presented in this figure is based upon MMES engineering drawings, results of previous MMES investigations, and/or field determinations of feature and sampling locations. No representation or warranty, expressed or implied, is made as to the accuracy of the information or statements presented in this figure.

SCALE
1"=70'

Legend

Buildings

Supply Lines

93016R1\DWGS\561SITE.DWG

Table 1-1. Tank contents and capacities at the East End Fuel Station

Tank	Capacity (gallons)	Contents
0439-U	20,000	Gasoline
0440-U	10,000	Diesel
2073-U	1,000	Gasoline
2074-U	1,000	Gasoline
2068-U	1,000	Diesel

2.0 GROUNDWATER MONITORING

2.1 GROUNDWATER MEASUREMENT, SAMPLE COLLECTION, AND ANALYSIS

2.1.1 Well Locations

Twelve monitoring wells at the site, including GW-183, GW-281, GW-282, GW-283, GW-284, GW-285, GW-658, GW-659, GW-767, GW-802, GW-803, and GW-804 were sampled during comprehensive monitoring. The locations of these wells are presented in Figure 2-1. Well installation reports and construction details for these wells are presented in the Corrective Action Plan (CAP) for the Site (*Corrective Action Plan for Underground Storage Tanks 0439-U, 0440-U, 2073-U, 2074-U, and 2075-U at the East End Fuel Station, Buildings 9754 and 9754-2*, Appendix E, Lockheed Martin Energy Systems, Inc., Y/SUB/92-99928C/2) (Energy Systems 1992) and in the Corrective Action Baseline Report (*Corrective Action Baseline Report for Underground Storage Tanks 0439-U, 0440-U, 2073-U, 2074-U, and 2075-U at the East End Fuel Station, Buildings 9754 and 9754-2*, Appendix A, Lockheed Martin Energy Systems, Inc., Y/SUB/94-99069C/Y15/1) (Energy Systems 1994).

2.1.2 Groundwater Measurement and Sampling

Groundwater level measurement and analytical sampling were conducted for the specified monitoring wells at the East End Fuel Station on May 12, 1996. Prior to sampling, water levels were measured to the nearest 0.01 ft using an electronic water level indicator. The wells were then purged of approximately three well volumes. Field measurements of pH, conductivity, temperature, and dissolved oxygen were conducted during purging to ensure representativeness for sampling. The wells were allowed to recover and analytical samples were collected using a bailer. Samples were placed into pre-cleaned containers with no headspace. During water level measurement and purging, an oily sheen was noted as visible in GW-658 and as slightly visible in GW-183. Purge water from well GW-658 was noted as muddy/sandy and recovery in monitoring wells GW-281 and GW-282 was slow.

2.1.3 Sample Analysis

Samples were analyzed for total petroleum hydrocarbons (TPH) gasoline range organics (TPH-GRO), diesel range organics (TPH-DRO), and for benzene, toluene, ethylbenzene, and xylene (BTEX).

2.2 POTENTIOMETRIC DATA

Potentiometric data collected during baseline sampling (conducted December 18, 1993) and comprehensive monitoring are presented in Table 2-1. Figures 2-2 and 2-3 present potentiometric maps from these two periods of sampling. These figures illustrate that

**Table 2-1. Water Level Measurements at the East End Fuel Station
for the Periods of December 1993 and May 1996**

Monitoring Well #	Date Measured	Total Well Depth (BGL) ¹	Top of Casing (MSL) ²	Top of Casing to Water Level (BTOC) ³	Potentiometric Surface (MSL)
GW-183	12/18/93	30.6 ft	946.02 ft	9.9 ft	936.12 ft
	05/12/96	30.6 ft	946.02 ft	10.5 ft	935.52 ft
GW-281	12/18/93	17.5 ft	946.08 ft	5.7 ft	940.38 ft
	05/12/96	17.5 ft	946.08 ft	5.8 ft	940.28 ft
GW-282	12/18/93	16.0 ft	943.94 ft	1.9 ft	942.04 ft
	05/12/96	16.0 ft	943.94 ft	8.63 ft	935.31 ft
GW-283	12/18/93	20.0 ft	938.62 ft	5.4 ft	933.22 ft
	05/12/96	20.0 ft	938.62 ft	5.8 ft	932.82 ft
GW-284	12/18/93	18.0 ft	941.61 ft	8.2 ft	933.41 ft
	05/12/96	18.0 ft	941.61 ft	8.85 ft	932.76 ft
GW-285	12/18/93	21.0 ft	942.46 ft	9.1 ft	933.36 ft
	05/12/96	21.0 ft	942.46 ft	9.5 ft	932.96 ft
GW-658	12/18/93	19.1 ft	944.81 ft	10.6 ft	934.21 ft
	05/12/96	19.1 ft	944.81 ft	11.65 ft	933.16 ft
GW-659	12/18/93	16.7 ft	941.16 ft	6.9 ft	934.26 ft
	05/12/96	16.7 ft	941.16 ft	7.75 ft	933.41 ft
GW-767	12/18/93	18.0 ft	948.54 ft	10.9 ft	937.64 ft
	05/12/96	18.0 ft	948.54 ft	12.0 ft	936.54 ft
GW-802	12/18/93	26.5 ft	941.83 ft	4.9 ft	936.93 ft
	05/12/96	26.5 ft	941.83 ft	6.5 ft	935.33 ft
GW-803	12/18/93	25.0 ft	942.53 ft	9.2 ft	933.33 ft
	05/12/96	25.0 ft	942.53 ft	9.5 ft	933.03 ft
GW-804	12/18/93	25.0 ft	942.55 ft	9.2 ft	933.35 ft
	05/12/96	25.0 ft	942.55 ft	10.0 ft	832.55 ft

¹BGL = Below Ground Level

²MSL = Mean Sea Level

³BTOC = Below Top of Casing

ations
face Elevation

Groundwater Flow Direction

our
2 Feet

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FIGURE 2-2

East End Fuel Station
Groundwater Potentiometric
Contour Map, May 1996

All location information presented in this figure is based upon LMES engineering drawings, results of previous LMES investigations, and/or field determinations of feature and sampling locations. No representation or warranty, expressed or implied, is made as to the accuracy of the information or statements presented in this figure.

SCALE: 1"=70'

Legend

▲ GW-284

Monitoring Well Location
Potentiometric Surface
(ft. above MSL)

— 941 —

Potentiometric Contour
Contour Interval

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Environmental Management Department

FIGURE 2-3

East End Fuel Station
Groundwater Potentiometric
Contour Map, Nov. 1993

All location information presented in this figure is based upon LMES engineering drawings, results of previous LMES investigations, and/or field determinations of feature and sampling locations. No representation or warranty, expressed or implied, is made as to the accuracy of the information or statements presented in this figure.

0 70' 140 ft
SCALE: 1"=70'

Legend

▲ GW-284

Monitoring Well L
Potentiometric St
(ft. above MSL)

— 941 —

Potentiometric Co
Contour Interval

SAIC CAD FILE: 96015/DWGS/EASTEND/407POTD.DWG

REV 0 - 06/10/96

groundwater movement is generally from the north to south across the site with little seasonal variability.

2.3 ANALYTICAL DATA

Analytical data for groundwater sampled at the site during the 1992 and 1993 Y-12 Plant Groundwater Quality Assessment Sampling (Energy Systems 1993 and 1994a), corrective action baseline sampling (August 1993), and comprehensive monitoring (May 1996), are summarized in Table 2-2. Because monitoring wells GW-802, GW-803, and GW-804 were installed as part of the corrective action baseline investigation, only two rounds of analytical data are available for these wells. Laboratory analytical sheets for the samples collected during comprehensive monitoring are presented in Appendix A. Except where otherwise noted, sample values in Table 2-2 for total TPH represent summations of TPH-GRO and TPH-DRO values. Where a TPH-GRO or TPH-DRO result is qualified as a non-detect (U qualifier), and the detection limit is given, the detection limit is used in the summation.

The delineation of the horizontal extent of benzene contamination in groundwater, based on the results of comprehensive monitoring, is presented in Figure 2-4. The horizontal extent of TPH contamination is presented in Figure 2-5. Maximum analytical results for TPH and BTEX in soil, determined during several investigations at the site, are illustrated on Figure 2-6. Analytical data for soil are summarized in the *Site-specific Standard Request for Underground Storage Tanks 0439-U, 0440-U, 2073-U, 2074-U, and 2075-U at the East End Fuel Station, Buildings 9754 and 9754-2*, Table B-1, Lockheed Martin Energy Systems, Inc., (Energy Systems 1994b).

Table 2-2 and Figures 2-4 and 2-5 demonstrate that petroleum contamination remains present in monitoring wells GW-183 and GW-658 above TDEC non-drinking water Closure Action Limits 0.07 ppm for benzene and 1.0 ppm for TPH. Both of these wells have historically produced values in excess of these closure limits. Comprehensive monitoring analytical results from GW-659 illustrate that contamination, at a level exceeding these closure limits, has not migrated downgradient to the location of this well.

**Table 2-2. Analytical Results for Groundwater Samples Collected During
Comprehensive Monitoring and Corrective Action Baseline Sampling and
Y-12 Plant Groundwater Quality Assessments**

Sample Date	TPH-DRO (ppm)	TPH-GRO (ppm)	Total TPH (ppm)	Benzene (ppm)	Ethylbenzene (ppm)	Toluene (ppm)	Xylene (ppm)
GW-183							
05/12/96 ¹	0.340	5.30 ⁸	5.64	1.30* ⁸	0.140 ⁸	0.990 ⁸	0.390 ⁸
11/16/93 ²	--	--	< 0.1 ⁹	0.007 ¹⁰	0.001 ¹⁰	0.006 ¹⁰	0.005 ¹⁰
08/3-4/93 ³	0.39 ⁷	5.20 ⁸	5.59*	1.30* ⁸	0.61 ⁸	0.034 ⁸	0.15 ⁸
06/21/93 ²	--	--	--	0.032 ¹⁰	0.002 ¹⁰	0.025 ¹⁰	0.011 ¹⁰
GW-281							
05/12/96 ¹	0.120	< 0.100 ⁸	< 0.220	< 0.010 ⁸	0.010U ⁸	< 0.010 ⁸	< 0.010 ⁸
10/14/93 ²	--	--	< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
08/3-4/93 ³	0.10U ^{4,7}	0.10U ⁸	0.20U	0.001U ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸
04/16/93 ²	--	--	< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
GW-282							
05/12/96 ¹	< 0.100	< 0.100 ⁸	< 0.200	< 0.010 ⁸	< 0.010 ⁸	0.012 ⁸	< 0.010 ⁸
08/3-4/93 ³	0.16 ^{5,7}	0.10U ⁸	0.16	0.001U ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸
07/29/92 ²	--	--	0.005 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
04/14/92 ²	--	--	0.02 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
GW-283							
05/12/96 ¹	< 0.100	< 0.100 ⁸	< 0.200	0.010U ⁸	0.010U ⁸	0.010U ⁸	0.010U ⁸
10/14/93 ²	--	--	< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰

Table 2-2 (continued)

Sample Date	TPH-DRO (ppm)	TPH-GRO (ppm)	Total TPH (ppm)	Benzene (ppm)	Ethylbenzene (ppm)	Toluene (ppm)	Xylene (ppm)
08/3-4/93 ³	0.40 ^{5,7}	0.10U ⁸	0.50 ⁵	0.001U ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸
04/19/93 ²	--		< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
GW-284							
05/12/96 ¹	< 0.100	< 0.100 ⁸	< 0.200	0.010U ⁸	0.010U ⁸	0.010U ⁸	0.010U ⁸
10/14/93 ²	--	--	< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
08/3-4/93 ³	0.10U ⁷	0.10U ⁸	0.20U	0.002 ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸
04/16/93 ²	--	--	< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
GW-285							
05/12/96 ¹	< 0.100	< 0.100 ⁸	< 0.200 ⁸	0.010U ⁸	0.010U ⁸	0.010U ⁸	0.010U ⁸
10/14/93 ²	--	--	< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
08/3-4/93 ³	0.32 ⁷	0.10U ⁸	0.42	0.002 ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸
04/19/93 ²	--	--	< 0.01 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
GW-658							
05/12/96 ¹	140.000	48.000 ⁸	188.000	13.000 ⁸	1.900 ⁸	9.400 ⁸	11.000 ⁸
11/19/93 ²	--	--	64.65*, ⁹	4.8*, ¹⁰	0.760 ¹⁰	3.400 ¹⁰	4.000 ¹⁰
08/3-4/93 ³	48.0 ⁷	78.0 ⁸	126.0*	18.0*, ⁸	12.0 ⁸	1.30 ⁸	6.10 ⁸
06/23/93 ²	--	--	9.81*, ⁹	13.0*, ¹⁰	1.400 ¹⁰	8.400 ¹⁰	6.400 ¹⁰
GW-659							
05/12/96 ¹	0.540	0.280 ⁸	0.820	0.048 ⁸	0.027 ⁸	< 0.010 ⁸	0.010 ⁸
11/15/93 ²	--	--	0.015 ⁹	0.002 ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.006 ¹⁰

Table 2-2 (continued)

Sample Date	TPH-DRO (ppm)	TPH-GRO (ppm)	Total TPH (ppm)	Benzene (ppm)	Ethylbenzene (ppm)	Toluene (ppm)	Xylene (ppm)
08/3-4/93 ³	0.51 ⁷	0.42 ⁸	0.93	0.10* ⁸	0.005 ⁸	0.084 ⁸	0.015 ⁸
06/18/93 ²	--	--	--	0.027 ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.009 ¹⁰
GW-767							
05/12/96 ¹	0.130	< 0.100 ⁸	0.230	0.010U ⁸	0.010U ⁸	0.010U ⁸	0.010U ⁸
10/13/93 ²	--	--	< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
08/3-4/93 ³	0.20 ^{5,7}	0.10U ⁸	0.20	0.001U ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸
04/15/93 ²	--	--	< 0.1 ⁹	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰	0.005U ¹⁰
GW-802							
05/12/96 ¹	0.170	< 0.100 ⁸	< 0.270	0.010U ⁸	0.010U ⁸	0.010U ⁸	0.010U ⁸
08/3-4/93 ³	1.30 ^{5,7}	0.10U ⁸	1.40 ¹¹	0.001U ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸
GW-803							
05/12/96 ¹	< 0.100	< 0.100 ⁸	< 0.200	0.010U ⁸	0.010U ⁸	0.010U ⁸	0.010U ⁸
08/3-4/93 ³	0.10U ⁷	0.10U ⁸	0.20U	0.001U ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸
GW-804							
05/12/96 ¹	< 0.100	< 0.100 ⁸	< 0.200	0.010U ⁸	0.010U ⁸	0.010U ⁸	0.010U ⁸
08/3-4/93 ³	0.57 ^{5,7}	0.10U ⁸	0.67	0.001U ⁸	0.001U ⁸	0.001U ⁸	0.001U ⁸

NOTES:

¹ Sample collected during Comprehensive Monitoring.² Sample collected as part of Y-12 Plant Groundwater Quality Assessment.³ Sample collected during Corrective Action Baseline Investigation.⁴ U - Contaminant not detected above quantitation limit during analysis.⁵ Analytical notation indicating a significant fraction of the detected compounds did not have a hydrocarbon pattern.⁶ ND - Contaminant not detected.

Table 2-2 (continued)

- ⁷ Analyzed by SW-846/8015: Gas Chromatography for Nonhalogenated Volatile Organic Compounds (Modified for TPH/DRO).
- ⁸ Analyzed by SW-846/8020: Gas Chromatography for Aromatic Volatile Organic Compounds (Modified for TPH-GRO).
- ⁹ Methods 8015-8020, Gas Chromatography, Modified California Method (EPA November 1986).
- ¹⁰ Analyzed by Gas Chromatography/Mass Spectrometry, Modified Contract Laboratory Program Protocol (EPA, February 1988).
- * Indicates contaminant level greater than applicable TDEC closure action level for the East End Fuel Station, Benzene 0.070 ppm, TPH 1.0 ppm.

Notes:

- 1.) Soil contamination data illustrated on Figure 2-6.
- 2.) U indicates analyte not detected above quantitation limit.
- 3.) During sampling free product noted as visible in GW-658 and as slightly visible in GW-183.

- SDL — Underground Stormwater Drainage Line
- SSL — Sanitary Underground Sewer Line
- PWL — Underground Potable Water Line
- A-3401 Air Monitoring Location

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Environmental Management Department

FIGURE 2-4

**Horizontal Extent of Benzene
Contamination in Groundwater at
the East End Fuel Station, May 1996**

All location information presented in this figure is based upon LMES engineering drawings, results of previous LMES investigations, and/or field determinations of feature and sampling locations. No representation or warranty, expressed or implied, is made as to the accuracy of the information or statements presented in this figure.

0 70' 140 ft

SCALE: 1"=70'

Legend

- ▲ GW-183
1.30 ppm
Monitoring Well Locations
Benzene Concentrations
- ▨ Groundwater Contaminant
> 0.07 ppm Benzene

Notes:

- 1.) Soil contamination data illustrated on Figure 2-6.
- 2.) U indicates analyte not detected above quantitation limit.
- 3.) During sampling free product noted as visible in GW-658 and as slightly visible in GW-183.

--- SDL --- Underground Stormwater Drainage Line
 --- SSL --- Sanitary Underground Sewer Line
 --- PWL --- Underground Potable Water Line
 ● A-3401 Air Monitoring Location

Lockheed Martin Energy Systems, Inc.
Environmental Management Department

FIGURE 2-5

Horizontal Extent of Total TPH
Contamination in Groundwater at
the East End Fuel Station

All location information presented in this figure is based upon LMES engineering drawings, results of previous LMES investigations, and/or field determinations of feature and sampling locations. No representation or warranty, expressed or implied, is made as to the accuracy of the information or statements presented in this figure.

SCALE: 1"=70'

Legend

- ▲ GW-183
5.64 ppm Monitoring Well Location
TPH Concentrations
- ▨ Groundwater Contaminant
> 1.0 ppm Total TPH

- Underground Stormwater Drainage Line
- Sanitary Underground Sewer Line
- Underground Potable Water Line

s in ppm
in ppm

Lockheed Martin Energy Systems, Inc.
Environmental Management Department

Figure 2-6
Maximum Analytical Results for
TPH & BTEX in Soils at the
East End Fuel Station

E 61,300

E 61,900

F 62,000

3.0 VAPOR MONITORING

3.1 MONITORING METHOD AND LOCATIONS

Vapor monitoring as part of comprehensive monitoring was conducted on May 14, 1996. Eight access points along an interconnected stormwater drainage line network that runs across the site were monitored. The locations of sampling points are illustrated on Figure 3-1. Locations A3401 are the only accessible substructures within the delineated groundwater contamination plume.

At each location, the internal atmosphere was monitored using direct-reading instruments. Organic vapors were monitored using a Thermo Environmental™ organic vapor meter (OVM) (serial number M249385). Oxygen and lower explosive limit (LEL) were monitored using an MSA-260 combination meter (serial number M205333).

3.2 VAPOR MONITORING RESULTS

The results of vapor monitoring at the East End Fuel Station are presented in Table 3-1. Measured oxygen percentages are within the range of normal air concentrations. LEL readings of 0 % at all the monitored sites indicate that an explosion hazard does not exist within the monitored utilities. Organic vapor readings are all equal to 0.0 ppm.

rmwater
 ound

— PWL — Underground Potable Water Line
 ● A-3401 Vapor Monitoring Location

Lockheed Martin Energy Systems, Inc.
Environmental Management Department

FIGURE 3-1
East End Fuel Station
Vapor Monitoring Locations

All location information presented in this figure is based upon LMES engineering drawings, results of previous LMES investigations, and/or field determinations of feature and sampling locations. No representation or warranty, expressed or implied, is made as to the accuracy of the information or statements presented in this figure.

SCALE: 1"=70'

Legend

- SDL --- Underground Storm Drainage Line
- SSL --- Sanitary Underground Sewer Line

SAIC CAD FILE: 96015/DWGS/EASTEND/407AIR.DWG

REV. 0 - 06/10/96

**Table 3-1. Vapor Monitoring Results for Rust Garage Facility
Site Status Monitoring, May 14, 1996**

Sampling Location	O₂ (%)	LEL (%)	Maximum Organic Vapors (ppm)	Background Organic Vapors (ppm)
A-3302	20.8	0	0.000	0.000
A-3401	20.8	0	0.000	0.000
A-3404	20.8	0	0.000	0.000
B-3400	20.8	0	0.000	0.000
B-3450	20.8	0	0.000	0.000
B-3451	20.8	0	0.000	0.000
B-3453	20.8	0	0.000	0.000
B-3462	20.8	0	0.000	0.000
F-305C	20.8	0	0.000	0.000
F-305C	20.8	0	0.000	0.000
F-3100	20.8	0	0.000	0.000
F-3109	20.8	0	0.000	0.000

REFERENCES

Energy Systems (Martin Marietta Energy Systems) 1992. Corrective Action Plan for Underground Storage Tanks 1219-U, 1222-U, 2082-U, and 2068-U at the Rust Garage Facility, Buildings 9720-15 and 9754-1, Appendix E, Martin Marietta Energy Systems, Inc. Y/SUB/9299928C/1.

Energy Systems 1994. Calendar Year 1993 Groundwater Quality Report for the Upper East Fork Poplar Creek Hydrologic Regime, Y-12 Plant, Oak Ridge, Tennessee: 1993 Groundwater Quality Data and Calculated Rate of Contaminant Migration.

Energy Systems 1994. Comprehensive Monitoring Report for Underground Storage Tanks 1219-U, 1222-U, 2082-U, and 2068-U at the Rust Garage Facility, Buildings 9720-15 and 9754-1.

Harless, J., personal communication to R. Spence, March 7, 1994.

Jeffrey F., personal communication to R. Spence, May 6, 1996.

TDEC (Tennessee Department of Conservation) 1994. The TDEC UST Reference Handbook, 2nd ed.

APPENDIX A

**LABORATORY ANALYTICAL RESULTS FOR
COMPREHENSIVE MONITORING (5/12/96)**

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96 13:49:49

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

TER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
, Edward M	Building 9115 Room 0128 M.S.8219			E961330000	8601	APPROVED
AMPLED: 05/12/96 09:23:00	DATE NEEDED: 05/20/96	LOCATION: GW-183			CHARGE #:	S2205F03
ECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
R: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

TS: FACILITY ID. 0-010117 9754 AND 9754-2 (UST)

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
TH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
TH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/21/96 13:15:00	APPROVER: E030124

MBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Diesel Range Organics		340		ug/L
03	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
TH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/13/96 12:46:00	APPROVER: E030124
TS:	BENZENE RESULTS FROM A 1:10 DIL. ON 5/13/96 @ 13:25		

MBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Gasoline Range Organics		5300		ug/L
	Benzene		1300		ug/L
	Ethylbenzene		140		ug/L
	Toluene		990		ug/L
7	Xylene		390		ug/L
	GRO Quantitation Limit		500		ug/L
	BTEX Quantitation Limit		50		ug/L
	GRO Amount in Blank		NONE		ug/L

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*** LAST PAGE ***

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OFFICIAL REPORT

/96 13:50:09

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>TTER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
m, Edward M	Building 9115 Room 0128 M.S.8219			E961330001	8601	APPROVED
SAMPLED: 05/12/96 11:55:00	DATE NEEDED: 05/20/96	LOCATION: GW-281			CHARGE #: S2205F03	
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
ER: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

NTS: FACILITY ID. 0-010117 9754 AND 9752-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/21/96 13:56:00	APPROVER: E030124

<u>UMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
	Diesel Range Organics		120		ug/L
003	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/13/96 14:32:00	APPROVER: E030124

<u>UMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
	Gasoline Range Organics		<100		ug/L
	Benzene		<10		ug/L
4	Ethylbenzene		10 U		ug/L
13	Toluene		<10		ug/L
107	Xylene		<10		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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OFFICIAL REPORT

76 13:50:24

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>TER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
, Edward M	Building 9115 Room 0128 M.S.8219			E961330002	8601	APPROVED
AMPLED: 05/12/96 10:39:00	DATE NEEDED: 05/20/96	LOCATION: GW-282			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
R: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

TS: FACILITY ID. 0-10117 9754 AND 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
TH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
TH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/21/96 14:38:00	APPROVER: E030124

<u>MBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
	Diesel Range Organics		<100		ug/L
03	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
TH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/14/96 10:19:00	APPROVER: E030124

<u>MBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
	Gasoline Range Organics		<100		ug/L
	Benzene		<10		ug/L
	Ethylbenzene		<10		ug/L
	Toluene		12		ug/L
17	Xylene		<10		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

ITER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
n, Edward M	Building 9115 Room 0128 M.S.8219			E961330003	8601	APPROVED
SAMPLED: 05/12/96 09:05:00	DATE NEEDED: 05/20/96	LOCATION: GW-283			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
ER: 013303	SAMPLE DESCRIPTION: GRAB			FINAL APPROVAL:		

NTS: FACILITY ID. 0-010117

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/21/96 15:17:00	APPROVER: E030124

UMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Diesel Range Organics		<100		ug/L
003	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/14/96 10:53:00	APPROVER: E030124

UMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Gasoline Range Organics		<100		ug/L
	Benzene		10 U		ug/L
4	Ethylbenzene		10 U		ug/L
3	Toluene		10 U		ug/L
07	Xylene		10 U		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

TER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
1, Edward M	Building 9115 Room 0128 M.S.8219			E961330004	8601	APPROVED
SAMPLED: 05/12/96 09:41:00	DATE NEEDED: 05/20/96	LOCATION: GW-284			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
IR: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

ITS: FACILITY ID. 0-010117 9754 & 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
ITH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
ITH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/21/96 15:53:00	APPROVER: E030124

JMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Diesel Range Organics		<100		ug/L
03	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
ITH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/15/96 09:54:00	APPROVER: E030124

JMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Gasoline Range Organics		<100		ug/L
	Benzene		10 U		ug/L
4	Ethylbenzene		10 U		ug/L
5	Toluene		10 U		ug/L
07	Xylene		10 U		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

TER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
1, Edward M	Building 9115 Room 0128 M.S.8219			E961330005	8601	APPROVED
SAMPLED: 05/12/96 10:32:00	DATE NEEDED: 05/20/96	LOCATION: GW-285			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
IR: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

ITS: FACILITY ID. 0-010117 9754 & 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
4TH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
4TH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/21/96 16:30:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Diesel Range Organics		<100		ug/L
003	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
4TH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/15/96 10:59:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Gasoline Range Organics		<100		ug/L
	Benzene		10 U		ug/L
4	Ethylbenzene		10 U		ug/L
3	Toluene		10 U		ug/L
07	Xylene		10 U		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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OFFICIAL REPORT

4/96 13:52:08

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>ITTER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
am, Edward M	Building 9115 Room 0128 M.S.8219			E961330006	8601	APPROVED
SAMPLED: 05/12/96 14:04:00	DATE NEEDED: 05/20/96	LOCATION: GW-658			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
ER: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

ENTS: FACILITY ID. 0-010117 9754 & 9754-2 UST

: BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

: DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 12:03:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
8	Diesel Range Organics		140000		ug/L
S003	QUANTITATION LIMITS		5000		ug/L
9	DRO in Blank		NONE		ug/L

: GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/15/96 12:19:00	APPROVER: E030124

ENTS: ETHYLBENZENE RESULTS FROM A 1:10 DIL. ON 5/15/96 @ 11:34
 BENZENE RESULTS FROM A 1:100 DIL. ON 5/15/96 12:55

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
4	Gasoline Range Organics		48000		ug/L
2	Benzene		13000		ug/L
14	Ethylbenzene		1900		ug/L
83	Toluene		9400		ug/L
207	Xylene		11000		ug/L
2	GRO Quantitation Limit		5000		ug/L
2	BTEX Quantitation Limit		100		ug/L
.1	GRO Amount in Blank		NONE		ug/L

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*** LAST PAGE ***

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OFFICIAL REPORT

96 13:52:21

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

TER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
I, Edward M	Building 9115 Room 0128 M.S.8219			E961330007	8601	APPROVED
AMPLED: 05/12/96 14:20:00	DATE NEEDED: 05/20/96	LOCATION: GW-659			CHARGE #:	S2205F03
ECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
R: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

ITS: FACILITY ID. 0-010117 9754 & 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
ITH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
ITH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 12:53:00	APPROVER: E030124

IMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Diesel Range Organics		540		ug/L
103	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
ITH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/15/96 13:30:00	APPROVER: E030124

IMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Gasoline Range Organics		280		ug/L
	Benzene		48		ug/L
	Ethylbenzene		27		ug/L
	Toluene		<10		ug/L
17	Xylene		10		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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4/96 13:52:28

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>ITTER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
am, Edward M	Building 9115 Room 0128 M.S.8219			E961330008	8601	APPROVED
SAMPLED: 05/12/96 15:42:00	DATE NEEDED: 05/20/96	LOCATION: GW-767			CHARGE #: S2205F03	
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
LER: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

ENTS: FACILITY ID. 0-010117 9754 & 9754-2 UST

: BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

: DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 13:36:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
8	Diesel Range Organics		130		ug/L
S003	QUANTITATION LIMITS		100		ug/L
9	DRO in Blank		NONE		ug/L

: GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/15/96 14:11:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
4	Gasoline Range Organics		<100		ug/L
2	Benzene		10 U		ug/L
14	Ethylbenzene		10 U		ug/L
83	Toluene		10 U		ug/L
207	Xylene		10 U		ug/L
2	GRO Quantitation Limit		100		ug/L
2	BTEX Quantitation Limit		10		ug/L
1	GRO Amount in Blank		NONE		ug/L

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/96 13:52:36

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>TIER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
m, Edward M	Building 9115 Room 0128 M.S.8219			E961330009	8601	APPROVED
SAMPLED: 05/12/96 15:42:00	DATE NEEDED: 05/20/96	LOCATION: GW-802			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
ER: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

NTS: FACILITY ID. 0-010117 9754 & 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 14:36:00	APPROVER: E030124

UMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Diesel Range Organics		170		ug/L
003	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/15/96 14:51:00	APPROVER: E030124

UMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Gasoline Range Organics		<100		ug/L
	Benzene		10 U		ug/L
4	Ethylbenzene		10 U		ug/L
13	Toluene		10 U		ug/L
107	Xylene		10 U		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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*** LAST PAGE ***

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OFFICIAL REPORT

/96 13:52:53

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>TIER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
m, Edward M	Building 9115 Room 0128 M.S.8219			E961330010	8601	APPROVED
SAMPLED: 05/12/96 16:20:00	DATE NEEDED: 05/20/96	LOCATION: GW-803			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
ER: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

NTS: FACILITY ID. 0-010117 9754 & 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 15:26:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
1	Diesel Range Organics		<100		ug/L
1003	QUANTITATION LIMITS		100		ug/L
1	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/15/96 15:25:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
1	Gasoline Range Organics		<100		ug/L
2	Benzene		10 U		ug/L
14	Ethylbenzene		10 U		ug/L
33	Toluene		10 U		ug/L
207	Xylene		10 U		ug/L
2	GRO Quantitation Limit		100		ug/L
2	BTEX Quantitation Limit		10		ug/L
1	GRO Amount in Blank		NONE		ug/L

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*** LAST PAGE ***

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OFFICIAL REPORT

5/96 13:53:03

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>ANALYST</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
Smith, Edward M	Building 9115 Room 0128 M.S.8219			E961330011	8601	APPROVED
SAMPLED: 05/12/96 15:10:00	DATE NEEDED: 05/20/96	LOCATION: GW-804			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
LABOR: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

FACILITY ID. 0-010117 9754 & 9754-2 UST

<u>BTEX</u>	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
<u>MTH:</u>	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

<u>DRO_W</u>	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
<u>MTH:</u>	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 16:03:00	APPROVER: E030124

<u>NUMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
3	Diesel Range Organics		100		ug/L
3003	QUANTITATION LIMITS		100		ug/L
7	DRO in Blank		NONE		ug/L

<u>GRO</u>	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
<u>MTH:</u>	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/16/96 11:17:00	APPROVER: E030124

<u>NUMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
4	Gasoline Range Organics		<100		ug/L
2	Benzene		10 U		ug/L
14	Ethylbenzene		10 U		ug/L
83	Toluene		10 U		ug/L
207	Xylene		10 U		ug/L
2	GRO Quantitation Limit		100		ug/L
2	BTEX Quantitation Limit		10		ug/L
1	GRO Amount in Blank		NONE		ug/L

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*** LAST PAGE ***

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OFFICIAL REPORT

96 13:53:11

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

TER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
, Edward M	Building 9115 Room 0128 M.S.8219			E961330012	8601	APPROVED
AMPLED: 05/12/96 09:23:00	DATE NEEDED: 05/20/96	LOCATION: GW-183			CHARGE #:	S2205F03
ECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
R: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

TS: FACILITY ID. 0-010117 9754 & 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
TH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
TH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 19:31:00	APPROVER: E030124

MBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Diesel Range Organics		380		ug/L
03	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
TH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/16/96 12:06:00	APPROVER: E030124
TS:	BENZENE RESULTS ARE FROM A 1:10 DIL. ON 5/16/96 @ 12:40		

MBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Gasoline Range Organics		4900		ug/L
	Benzene		1300		ug/L
	Ethylbenzene		140		ug/L
	Toluene		950		ug/L
7	Xylene		360		ug/L
	GRO Quantitation Limit		500		ug/L
	BTEX Quantitation Limit		50		ug/L
	GRO Amount in Blank		NONE		ug/L

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*** LAST PAGE ***

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OFFICIAL REPORT

/96 13:53:20

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>TTER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
m, Edward M	Building 9115 Room 0128 M.S.8219			E961330013	8601	APPROVED
SAMPLED: 05/12/96 16:20:00	DATE NEEDED: 05/20/96	LOCATION: GW-803			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
ER: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

NTS: FACILITY ID. 0-010117 9754 & 9754-2 UST

<u>BTEX</u>	<u>VOA Analysis, BTEX Compounds (SW846 8020)</u>	<u>REPLICATE: 1</u>	<u>STATUS: CANCELLED</u>
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY 4RW			

<u>DRO_W</u>	<u>TPH Diesel Range Organics Water (TN UST METHOD)</u>	<u>REPLICATE: 1</u>	<u>STATUS: APPROVED</u>
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 16:53:00	APPROVER: E030124

<u>UMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
	Diesel Range Organics		<100		ug/L
.003	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

<u>GRO</u>	<u>TPH Gasoline Range Organics Including BTEX</u>	<u>REPLICATE: 1</u>	<u>STATUS: APPROVED</u>
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/16/96 13:20:00	APPROVER: E030124

<u>UMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
	Gasoline Range Organics		<100		ug/L
	Benzene		10 U		ug/L
4	Ethylbenzene		10 U		ug/L
13	Toluene		10 U		ug/L
107	Xylene		10 U		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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*** LAST PAGE ***

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OFFICIAL REPORT

/96 13:53:28

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

OWNER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
m, Edward M	Building 9115 Room 0128 M.S.8219			E961330014	8601	APPROVED
SAMPLED: 05/12/96 08:30:00		DATE NEEDED: 05/20/96		LOCATION: GW-183-B		CHARGE #: S2205F03
RECEIVED: 05/13/96		DATE COMPLETED: 05/24/96		PROJECT CODE:		CASE:
ER: 013303		SAMPLE DESCRIPTION: GRAB		FINAL APPROVAL:		

NTS: FACILITY ID. 0-010117 9754 & 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY 4RW			

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 17:30:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
1	Diesel Range Organics		140		ug/L
1003	QUANTITATION LIMITS		100		ug/L
1	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/16/96 13:55:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
1	Gasoline Range Organics		<100		ug/L
2	Benzene		10 U		ug/L
14	Ethylbenzene		10 U		ug/L
33	Toluene		10 U		ug/L
207	Xylene		10 U		ug/L
2	GRO Quantitation Limit		100		ug/L
2	BTEX Quantitation Limit		10		ug/L
1	GRO Amount in Blank		NONE		ug/L

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*** LAST PAGE ***

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OFFICIAL REPORT

/96 13:53:42

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>ITER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
m, Edward M	Building 9115 Room 0128 M.S.8219			E961330015	8601	APPROVED
SAMPLED: 05/12/96 08:45:00	DATE NEEDED: 05/20/96	LOCATION: GW-183-R			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/24/96	PROJECT CODE:			CASE:	
ER: 013303	SAMPLE DESCRIPTION: GRAB					

FINAL APPROVAL:

NTS: FACILITY ID. 0-010117 9754 & 9754-2 UST

BTEX	VOA Analysis, BTEX Compounds (SW846 8020)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY 4RW		

DRO_W	TPH Diesel Range Organics Water (TN UST METHOD)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: TN UST METH PHASE:	TIME ANALYZED: 05/22/96 18:06:00	APPROVER: E030124

<u>UMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
003	Diesel Range Organics		<100		ug/L
	QUANTITATION LIMITS		100		ug/L
	DRO in Blank		NONE		ug/L

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 05/16/96 14:30:00	APPROVER: E030124

<u>UMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
	Gasoline Range Organics		<100		ug/L
	Benzene		10 U		ug/L
4	Ethylbenzene		10 U		ug/L
3	Toluene		10 U		ug/L
07	Xylene		10 U		ug/L
	GRO Quantitation Limit		100		ug/L
	BTEX Quantitation Limit		10		ug/L
	GRO Amount in Blank		NONE		ug/L

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OFFICIAL REPORT

'96 10:26:27

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>ITER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
n, Edward M	Building 9115 Room 0128 M.S.8219			E961330016	8601	APPROVED
SAMPLED: 05/12/96 07:30:00	DATE NEEDED: 06/12/96	LOCATION: 9207			CHARGE #:	S2205F03
RECEIVED: 05/13/96	DATE COMPLETED: 05/15/96	PROJECT CODE:			CASE:	
IR: 013303	SAMPLE DESCRIPTION: TRIP BLANK	FINAL APPROVAL:				

ITS: FACILITY ID. 0-010117 9754 & 9754-2 UST

UE Ready

VOA624	Volatile Organics by GC/MS (EPA 624)	REPLICATE: 1	STATUS: APPROVED
ATH: EPA624	PROC MTH: EPA 624	PHASE:	TIME ANALYZED: 05/13/96 10:54:00
			APPROVER: E030124

<u>NUMBER</u>	<u>DETERMINATION</u>	<u>DT</u>	<u>RESULT</u>	<u>CONFIDENCE</u>	<u>UNIT</u>
	Chloromethane		10 U		ug/L
	Bromomethane		10 U		ug/L
	Vinyl chloride		10 U		ug/L
	Chloroethane		10 U		ug/L
	Trichlorofluoromethane		10 U		ug/L
	Methylene chloride		10 U		ug/L
	1,1-Dichloroethene		10 U		ug/L
	1,1-Dichloroethane		10 U		ug/L
5	trans-1,2-Dichloroethene		10 U		ug/L
	Chloroform		10 U		ug/L
2	1,2-Dichloroethane		10 U		ug/L
	1,1,1-Trichloroethane		10 U		ug/L
	Carbon tetrachloride		10 U		ug/L
	Bromodichloromethane		10 U		ug/L
8	2-Chloroethylvinyl ether		10 U		ug/L
	1,2-Dichloropropane		10 U		ug/L
015	cis-1,3-Dichloropropene		10 U		ug/L
	Trichloroethene		10 U		ug/L
1	Dibromochloromethane		10 U		ug/L
	1,1,2-Trichloroethane		10 U		ug/L
	Benzene		10 U		ug/L
026	trans-1,3-Dichloropropene		10 U		ug/L
	Bromoform		10 U		ug/L
4	Tetrachloroethene		10 U		ug/L
	1,1,2,2,-Tetrachloroethane		10 U		ug/L
3	Toluene		10 U		ug/L
7	Chlorobenzene		10 U		ug/L
4	Ethylbenzene		10 U		ug/L

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