Y-12

**OAK RIDGE
Y-12
PLANT**

LOCKHEED MARTIN

RECEIVED

JUL 21 1998

OSTI

**SITE STATUS MONITORING
REPORT
FOR UNDERGROUND
STORAGE TANK 2331-U
AT BUILDING 9201-1**

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

November 1996

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

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

ph

MASTER

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

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

**contributed to the preparation of this document and
should not be considered an eligible contractor for its review.**

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

**SITE STATUS MONITORING REPORT
FOR UNDERGROUND STORAGE TANK 2331-U
AT BUILDING 9201-1**

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

November 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**

TABLE OF CONTENTS

	Page
LIST OF FIGURES	iv
LIST OF TABLES	iv
LIST OF ACRONYMS	v
SIGNATURE PAGE	vi
CERTIFICATION PAGE	vii

SITE STATUS MONITORING REPORT

1. INTRODUCTION	1-1
1.1 Purpose and Scope	1-1
1.2 Site Description	1-1
2. 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 Groundwater Analytical Data	2-6
3. VAPOR MONITORING	3-1
3.1 Monitoring Method and Locations	3-1
3.2 Vapor Monitoring Results	3-1
REFERENCES	R-1
APPENDICES	
Appendix A Laboratory Analytical Results for Site Status Monitoring, October 1996	A-1

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1-1	Location of the Building 9201-1 Site at the Y-12 Plant	1-2
1-2	Building 9201-1 Site Map	1-3
2-1	Building 9201-1 Site Monitoring Well Location Map	2-2
2-2	Building 9201-1 Site Groundwater Potentiometric Contour Map April 1996	2-4
2-3	Building 9201-1 Site Groundwater Potentiometric Contour Map October 1996	2-5
3-1	Building 9201-1 Site Vapor Monitoring Sampling Location Map	3-2

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
2-1	Water level measurements at the Building 9201-1 Site for the periods of April 1996 and October 1996	2-3
2-2	Analytical results for groundwater samples collected during site status and comprehensive monitoring	2-6
3-1	Vapor monitoring results for the Building 9201-1 Site, October 10, 1996	3-3

LIST OF ACRONYMS

BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
BTOC	below top of casing
CAP	Corrective Action Plan
GRO	gasoline range organic
LEL	lower explosive limit
MSL	mean sea level
OVM	organic vapor meter
TDEC	Tennessee Department of Environment and Conservation
TPH	total petroleum hydrocarbon
TWA	time weighted average
UEFPC	Upper East Fork Poplar Creek
UST	underground storage tank

SIGNATURE PAGE FOR THE
SITE STATUS MONITORING REPORT
FOR THE UNDERGROUND STORAGE TANK 2331-U,
AT BUILDING 9201-1

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

C. Allison Bailey
P.E. or P.G. (Print)

Signature TN Lic./Reg. #

11/12/96
Date

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

(Print or Type)

County of Knox State of Tennessee

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

Subscribed and Sworn to before me this

20th day of November, 1996

Notary Public

My Commission expires: May 30, 2000 (Notary Seal)

CERTIFICATION STATEMENT FOR THE
SITE STATUS MONITORING REPORT
FOR
THE UNDERGROUND STORAGE TANK 2331-U,
AT BUILDING 9201-1

I certify that this document and all enclosures were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

U.S. Department of Energy
Owner and Operator

By:

R.J. Spence
Department of Energy, Y-12 Site Manager

11/13/96
Date Signed

Lockheed Martin Energy Systems, Inc.
Co-Operator

By:

T.R. Butz
Lockheed Martin Energy Systems, Inc.
Y-12 Plant Manager

11/14/96
Date Signed

Note: Both signatures have been notarized per requirements.

NOTARY
(Stamp/Seal)

1. INTRODUCTION

1.1 Purpose and Scope

The purpose of this document is to present potentiometric, groundwater quality and vapor monitoring data required for site status monitoring of underground storage tank (UST) 2331-U at the Building 9201-1 Site. Site status monitoring has been conducted at the site as part of a Monitoring Only program approved by the Tennessee Department of Environment and Conservation (TDEC) based on review and approval of Site Ranking (Site Ranking Form approved May 23, 1994). This document presents the results of the fifth semiannual site status monitoring that was performed in October 1996. Site status monitoring and preparation of this report have been conducted in accordance with the requirements of TDEC Rule 1200-1-15 and the TDEC *UST Reference Handbook, Second Edition* (TDEC 1994) Technical Guidance Document (TGD) 007.

This document is organized into three sections with two Appendices. Section 1 presents introductory information relative to the site including the regulatory initiative and a site description. Section 2 includes the results of measurement and sampling of monitoring wells GW-193, GW-657, GW-707, GW-708, GW-808, GW-809, and GW-810. 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.

1.2 Site Description

The Building 9201-1 Site is located within the south central portion of the Oak Ridge Y-12 Plant in Oak Ridge, Tennessee (Figure 1-1). This area is within the Exclusion Zone of the Y-12 Plant, which is access restricted. The site is generally defined as the area directly south of the Building 9201-1 concrete ramp/loading dock (Figure 1-2). The site was previously the location of a gasoline UST used to fuel gasoline-powered equipment in the area. The tank has been excavated and removed from the site.

The UST was a 560-gallon gasoline UST that was first suspected of leaking in 1988. Tightness testing confirmed that the tank was leaking and the tank was subsequently excavated and removed. An Initial Site Characterization and Environmental Assessment identified the presence of petroleum contamination above applicable TDEC Closure Action Levels. A Corrective Action Plan (CAP) was prepared and approved and Baseline Monitoring was performed in support of corrective action (11/93). However, site ranking performed in accordance with the newly issued TGD-014 (1/94) indicated that contaminant concentrations were sufficiently low and contaminant exposure sufficiently limited in extent to qualify for a monitoring only program in lieu of active remediation.

The topography of the Building 9201-1 Site gently decreases in elevation from north to south across the facility. A surface water and groundwater divide coincident with the trace of Upper East Fork Poplar Creek (UEFPC) lies approximately 230 ft south of the site. Given the nature of the surface topography at the Building 9201-1 Site, any petroleum contamination resulting from past UST operations would be expected to migrate south/southeast away from the source area.

0 300 600 900 1200
SCALE IN FEET

Y-12 PLANT SITE

BUILDING 9201-1 SITE

MARTIN MARIETTA ENERGY SYSTEMS, INC.
ENVIRONMENTAL MANAGEMENT DEPARTMENT
LOCATION OF THE BUILDING 9201-1 SITE
AT THE Y-12 PLANT

Figure 1-1. Location of the Building 9201-1 Site at the Y-12 Plant

E 59,500

E 59,600

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 5 10 20 40

SCALE: 1" = 20'

Y-12 PLANT NORTH

Legend

Building

Fence

Lockheed Martin Energy Systems, Inc.
Environmental Management Department

FIGURE 1-2
Building 9201-1 Site
Site Map

2. GROUNDWATER MONITORING

2.1 Groundwater Measurement, Sample Collection, and Analysis

2.1.1 Well Locations

Seven wells identified by TDEC have been measured and sampled as part of the Monitoring Only program for the site. These wells include GW-193, GW-657, GW-707, GW-708, GW-808, GW-809, and GW-810. The locations of these wells are presented in Figure 2-1. Well installation reports and construction details for monitoring wells GW-193, GW-657, GW-707, and GW-708 are presented in the CAP for the Site [*Corrective Action Plan for Underground Storage Tank 2331-U at the Building 9201-1 Site, Appendix C, Y/SUB-92-99928C/3* (Energy Systems 1992)]. Well installation reports and construction details for monitoring wells GW-808, GW-809, and GW-810 that were installed in July 1993 are presented in the Corrective Action Baseline Report for the Site [*Corrective Action Baseline Report for Underground Storage Tank 2331-U, Building 9201-1, Appendix A, Y/SUB/94-99069C/Y15/2* (Energy Systems 1994)].

2.1.2 Groundwater Measurement and Sampling

Current groundwater level measurement and sampling of the monitoring wells at the Building 9201-1 Site occurred on October 22, 1996. The previous round of site status monitoring occurred on April 18, 1996. Water levels were measured to the nearest 0.01 ft using an electronic water level indicator. Each well was then purged of three well volumes prior to sampling. Field measurement of pH, conductivity, temperature, and dissolved oxygen was conducted during purging to ensure representativeness for sampling. No measurable free product was noted during water level measurement or sampling in any of these wells. However, a slight sheen along with a petroleum odor was noted to be present in GW-708 and a strong petroleum odor was noted in GW-193. Samples were collected using a bailer and transferred into pre-cleaned glass containers with zero headspace.

2.1.3 Sample Analysis

Groundwater samples were analyzed for total petroleum hydrocarbons-gasoline range organics (TPH-GRO), and for benzene, toluene, ethylbenzene, and xylenes (BTEX) at the Y-12 Plant Environmental Laboratory (a TDEC Division of UST approved laboratory).

2.2 Potentiometric Data

Potentiometric data for monitoring wells at the Building 9201-1 Site from the two most recent site status monitoring measurement events are presented in Table 2-1. Figures 2-2 and 2-3 present potentiometric contour maps from these two events. These figures indicate an irregular potentiometric surface with locally variable groundwater flow directions. A localized water table high southeast of the former UST site (around wells GW-707 and GW-657) appears to be reasonably persistent. This water table high may be related to a subsurface feature (e.g., fracture) or may reflect a small difference in head between unconsolidated and bedrock wells.

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.

REV 4 - 11/12/96 SAIC FILE 96015/DWGS/395F2-1

Y-12 PLANT NORTH

LEGEND:

- ▲ GW-193 Groundwater Monitor
(18.4 BGS) Total Depth Below C

Well Location
and Surface (BGS)

Lockheed Martin Energy Systems, Inc.
Environmental Management Department

FIGURE 2-1
Building 9201-1 Site
Monitoring Well Location Map

**Table 2-1. Water level measurements at the Building 9201-1 Site
for the periods of April 1996 and November 1996**

Monitoring well number	Date measured	Well depth (from TOC)	Top of casing (ft-MSL)	Top of casing to water level (ft-BTOC)	Potentiometric surface elevation (ft-MSL)
GW-193	04/18/96	21.0	934.00	9.50	924.50
	10/22/96	21.0	934.00	9.36	924.64
GW-657	04/18/96	15.2	930.53	6.23	924.30
	10/22/96	15.2	930.53	7.20	923.33
GW-707	04/18/96	16.6	930.91	8.60	922.31
	10/22/96	16.6	930.91	6.18	924.73
GW-708	04/18/96	13.1	930.87	4.70	926.17
	10/22/96	13.1	930.87	5.11	925.76
GW-808	04/18/96	36.1	930.75	7.61	923.14
	10/22/96	36.1	930.75	9.79	920.96
GW-809	04/18/96	36.0	931.04	7.82	923.22
	10/22/96	36.0	931.04	8.30	922.74
GW-810	04/18/96	26.1	931.44	9.53	921.91
	10/22/96	26.1	931.44	9.84	921.60

Notes:

MSL = mean sea level
 BTOC = below top of casing
 TOC = top of casing

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.

REV 4 - 11/12/96 SAIC FILE 96015/DWGS/396FIG22

Y-12 PLANT NORTH

LEGEND:

- ▲ GW-193 Groundwater Mon
- (924.50) Water Level Meas
- 923 — Groundwater Pote
- (Feet Above MSL)
- - - 923 - - - Inferred Groundw
- (Feet Above MSL)

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.

REV 4 - 11/12/96 SAIC FILE 96015/DWGS/396FIG23

Y-12 PLANT NORTH

LEGEND:

- ▲ GW-193 . . . Groundwater Monitor
- (924.50) . . . Water Level Measurement
- 922 — . . . Groundwater Potential (Feet Above MSL)
- - - 922 - - - Inferred Groundwater Potential (Feet Above MSL)

E 59,700

N 29,300

GW-810
(921.60)

Building
9105

Building
9201-2

E 59,700

g Well Location
ent October 1996
netric Contour
Potentiometric Contour

Lockheed Martin Energy Systems, Inc.
Environmental Management Department

FIGURE 2-3

Building 9201-1 Site Groundwater
Potentiometric Contour Map October 1996

Studies of the Y-12 Plant hydrogeology indicate that an overall south/southeasterly hydraulic gradient is present in the unconsolidated and bedrock intervals at the Building 9201-1 Site (HSW 1994). Seasonal variation in groundwater elevations is relatively small, but does produce an apparent northeasterly deflection of the water table in the vicinity of GW-707 and GW-810. However, the overall flow direction, for any petroleum contaminants entering groundwater from the former UST depicted for both periods of measurement, is from north to south/southeast across the site.

2.3 Groundwater Analytical Data

Analytical data for groundwater sampled at the site during site status monitoring are presented in Table 2-2. Original analytical laboratory results for environmental and quality control samples are presented in Appendix A. Quality control sampling (trip blank) for this round of site status monitoring indicate no cross-contamination of the samples for the analytes of interest occurred. Analytical results for this round of site status monitoring did not indicate any significant change in the level of contamination as compared to historical monitoring data. Contaminant levels in GW-708 were considerably less than the last round of site status monitoring data however, contaminant levels in GW-193 were slightly higher than found during the previous round of sampling.

Benzene and TPH-GRO values for GW-193 and GW-708 continued to exceed the applicable Closure Action Levels of 0.07 ppm for benzene and 1.0 ppm for TPH. Both of these wells have historically produced values in excess of these Closure Action Limits. These results produce no change in the horizontal area of groundwater contamination as defined by the comprehensive monitoring data. Analytical results for GW-657, GW-707, GW-808, GW-809, and GW-810 show no groundwater contamination detected above analytical quantitation limits, which are below the applicable Closure Action Levels. These data indicate that groundwater contamination has not migrated downgradient to the location of these wells, and suggest that the area of groundwater contamination is relatively stable over time.

These results are consistent with previous monitoring results and the calculated hydraulic gradient, velocity, and conductivity from slug testing of wells GW-193 and GW-707 (Energy Systems 1992). It is expected that contaminant levels will generally fall off because of natural attenuation. The processes of natural attenuation (dilution/dispersion and degradation) result in decreases in contaminant concentrations. However, the rate of the concentration decreases will likely be slow because site specific conditions limit dispersion and mixing with uncontaminated groundwater.

Table 2-2. Analytical results for groundwater samples collected during site status monitoring

Sampling event	Sampling date	TPH-GRO ¹ (ppm)	Benzene (ppm)	Ethylbenzene (ppm)	Toluene (ppm)	Xylenes (ppm)
<i>GW-193</i>						
Site status monitoring	10/22/96	*2.000	*0.310	0.190	0.040	0.120
Site status monitoring	04-18-96	*1.800	*0.220	0.200	0.030	0.120
Site status monitoring	10-19-95	*3.900	*0.520	0.480	0.045	0.300
Site status monitoring	05-04-95	*2.400	*0.350	0.280	0.077	0.200
Site status monitoring	12-14-94	*3.000	*0.620	0.320	0.230B ²	0.360B
<i>GW-657</i>						
Site status monitoring	10-22-96	<0.100	0.010U ⁴	0.010U ⁴	0.010U ⁴	0.010U ⁴
Site status monitoring	04-18-96	<0.100	0.010U ⁴	0.010U	0.010U	0.010U
Site status monitoring	10-19-95	<0.100J ³	0.010U	0.010U	0.010U	0.010U
Site status monitoring	05-04-95	<0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	12-14-94	<0.100	0.010U	0.010U	0.010U	0.010U
<i>GW-707</i>						
Site status monitoring	10-22-96	<0.100	0.010U ⁴	0.010U ⁴	0.010U ⁴	0.010U ⁴
Site status monitoring	04-18-96	<0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	10-19-95	0.100J	0.010U	0.010U	0.010U	0.010U
Site status monitoring	05-04-95	0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	12-14-94	0.100	0.010U	0.010U	0.010U	0.010U

Table 2.2 (continued)

Sampling event	Sampling date	TPH-GRO ¹ (ppm)	Benzene (ppm)	Ethylbenzene (ppm)	Toluene (ppm)	Xylenes (ppm)
<i>GW-708</i>						
Site status monitoring	10-22-96	*4.400	*0.590	0.670	0.059	0.260
Site status monitoring	04-18-96	*9.600	*0.680	0.590	0.068	0.760
Site status monitoring	10-19-95	*6.700	*0.670	0.620	0.075	0.630
Site status monitoring	05-04-95	*6.400	*0.500	0.430	0.062	0.930
Site status monitoring	12-14-94	*5.300	*0.820	0.610	0.094B	1.200B
<i>GW-808</i>						
Site status monitoring	10-22-96	<0.100	0.010U ⁴	0.010U ⁴	0.010U ⁴	0.010U ⁴
Site status monitoring	04-18-96	<0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	10-19-95	<0.100J	0.010U	0.010U	0.010U	0.010U
Site status monitoring	05-04-95	0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	12-14-94	0.100	0.010U	0.010U	0.010U	<.010B
<i>GW-809</i>						
Site status monitoring	10-22-96	<0.100	0.010U ⁴	0.010U ⁴	0.010U ⁴	0.010U ⁴
Site status monitoring	04-18-96	<0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	10-19-95	<0.100J	0.010U	0.010U	0.010U	0.010U
Site status monitoring	05-04-95	0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	12-14-94	0.100	0.010U	0.010U	0.010U	0.010U

Table 2.2 (continued)

Sampling event	Sampling date	TPH-GRO ¹ (ppm)	Benzene (ppm)	Ethylbenzene (ppm)	Toluene (ppm)	Xylenes (ppm)
<i>GW-810</i>						
Site status monitoring	10-22-96	<0.100	0.010U ⁴	0.010U ⁴	0.010U ⁴	0.010U ⁴
Site status monitoring	04-18-96	<0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	10-19-95	<0.100J	0.010U	0.010U	0.010U	0.010U
Site status monitoring	05-04-95	0.100	0.010U	0.010U	0.010U	0.010U
Site status monitoring	12-14-94	0.100	0.010U	0.010U	0.010U	0.010U

¹ TPH-GRO = Total Petroleum Hydrocarbons-Gasoline Range Organics.

² B = Indicates the analyte was found in the associated blank as well as in the sample.

³ J = Value estimated for contaminant.

⁴ U = Contaminant was not detected above quantitation limit during the analysis.

* Denotes contamination above the applicable closure action levels for the site.

3. VAPOR MONITORING

3.1 Monitoring Methods and Locations

Site status vapor monitoring has been conducted as part of the Monitoring Only program at seven access points along subsurface stormwater and sewer drainage lines that cross the Building 9201-1 Site. However, none of the subsurface utilities present at the site crosses the groundwater plume defined by the most recent data. The locations of vapor monitoring locations are illustrated in Figure 3-1.

At each utility location, the internal atmosphere was monitored using direct reading instruments. Organic vapors were measured using a Thermo Environmental™ organic vapor meter (OVM) (serial number M249366). Oxygen and lower explosive limit (LEL) were monitored with an MSA-260 combination meter (serial number M249536).

3.2 Vapor Monitoring Results

The results of site status vapor monitoring conducted October 10, 1996 at the Building 9201-1 Site are presented in Table 3-1. Measured oxygen percentages are within the range of normal air concentrations. LEL readings of 0% indicate that an explosion hazard does not exist within any of the monitored utilities. Organic vapor readings were all at 0.0 ppm.

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.

REV. 4 - 11/12/96 SAIC FILE: 96015/DWGS/396F3-1

Y-12 PLANT NORTH

Legend

- FTL — Fuel Transfer
- === CWL === Chilled Water
- EC — Electrical Cond

- SDL — Underground Stormwater
Drainage Line
- SSL — Sanitary Underground
Sewer Line
- ⊗ Vapor Monitoring Location

Lockheed Martin Energy Systems, Inc.
Environmental Management Department

FIGURE 3-1

Building 9201-1 Site
Vapor Monitoring Sampling
Location Map

Table 3-1. Vapor monitoring results for the Building 9201-1 Site,
October 10, 1996

Sampling location	O ₂ %	LEL %	Organic vapors (ppm)
402A	20.8	0	0.0
409	20.8	0	0.0
C-4019	20.8	0	0.0
C-4021	20.8	0	0.0
C-4112	20.8	0	0.0
C-4111	20.8	0	0.0
C-4024	20.8	0	0.0

REFERENCES

Energy Systems (Martin Marietta Energy Systems, Inc.) 1992. *Corrective Action Plan for Underground Storage Tank 2331-U at the Building 9201-1 Site*, Y/SUB-92-99928C/3.

Energy Systems 1994. *Corrective Action Baseline Report for Underground Storage Tank 2331-U, Building 9201-1*, Y/SUB/94-99069C/Y15/2.

HSW Environmental Consultants, Inc. 1994. *Calendar Year 1993 Groundwater Quality Report for the Upper East Fork Poplar Creek Hydrogeologic Regime, Y-12 Plant, Oak Ridge, Tennessee*, Y/SUB/94-EAQ10C/2/P1.

TDEC (Tennessee Department of Environment and Conservation) 1994. *Underground Storage Tank Reference Handbook*, Second Edition.

APPENDIX A
LABORATORY ANALYTICAL RESULTS FOR
SITE STATUS MONITORING

UNCLASSIFIED

OFFICIAL REPORT

30/96 17:53:30

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

MITTER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
ram, Edward M	Building 9115 Room 0128 M.S.8219	199610090009		E962840156	8601	APPROVED
E SAMPLED: 10/22/96 13:31:00		DATE NEEDED: 11/21/96	LOCATION: GW657	CHARGE #: S1300107		
E RECEIVED: 10/22/96		DATE COMPLETED: 10/30/96	PROJECT CODE:	CASE: U03130		
PLER:		SAMPLE DESCRIPTION:	FINAL APPROVAL:			

MENTS: FACILITY I.D.# 0-010117

: GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 10/24/96 14:16:00	APPROVER: E030124
MENTS: MTBE= 50 U			
LRL=50ug/L			
RESULTS BY PID			

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

: MEBT	Special analysis of MEBT (EPA 624)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

: VOABTEX	VOA Analysis, BTEX Compounds (SW846 8260)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8260 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

UNCLASSIFIED

*** LAST PAGE ***

UNCLASSIFIED

OFFICIAL REPORT

30/96 17:53:36

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

MITTER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
ram, Edward M	Building 9115 Room 0128 M.S.8219	199610090010		E962840157	8601	APPROVED
E SAMPLED: 10/22/96 14:05:00	DATE NEEDED: 11/21/96	LOCATION: GW707			CHARGE #:	S1300107
E RECEIVED: 10/22/96	DATE COMPLETED: 10/30/96	PROJECT CODE:			CASE:	U03130
PLER:	SAMPLE DESCRIPTION:					

FINAL APPROVAL:

MENTS: FACILITY I.D.# 0-010117

T: GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
P MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 10/24/96 14:53:00	APPROVER: E030124
MENTS: MTBE=50 U			
LRL=50ug/L			
RESULTS BY PID			

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

: MEBT	Special analysis of MEBT (EPA 624)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY W60		

: VOABTEX	VOA Analysis, BTEX Compounds (SW846 8260)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8260 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY W60		

UNCLASSIFIED

*** LAST PAGE ***

UNCLASSIFIED

OFFICIAL REPORT

30/96 18:04:16

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

MITTER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
ram, Edward M	Building 9115 Room 0128 M.S.8219	199610090011		E962840158	8601	APPROVED
E SAMPLED: 10/22/96 11:45:00	DATE NEEDED: 11/21/96	LOCATION: GW708			CHARGE #:	S1300107
E RECEIVED: 10/22/96	DATE COMPLETED: 10/30/96	PROJECT CODE:			CASE:	U03130
PLER:	SAMPLE DESCRIPTION:					

FINAL APPROVAL:

MENTS: FACILITY I.D.# 0-010117

T: GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
P MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 10/28/96 17:44:00	APPROVER: E030124
MENTS: MTBE=310 ug/L			
LRL=50ug/L			
RESULTS BY PID, RUN ON 10/28/96 @ 14:15			
BENZENE AND ETHYLBENZENE RESULTS FROM 1:5 DIL RUN ON 10/28/96 @ 16:24			
TOLUENE AND XYLENE RESULTS FROM 1:2 DIL RUN ON 10/28/96 @ 17:06			

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
4	Gasoline Range Organics		4400		ug/L
2	Benzene		590		ug/L
14	Ethylbenzene		670		ug/L
83	Toluene		59		ug/L
207	Xylene		260		ug/L
2	GRO Quantitation Limit		250		ug/L
2	BTEX Quantitation Limit		20		ug/L
1	GRO Amount in Blank		NONE		ug/L

: MEBT	Special analysis of MEBT (EPA 624)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY W60		

: VOABTEX	VOA Analysis, BTEX Compounds (SW846 8260)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8260 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY W60		

UNCLASSIFIED

*** LAST PAGE ***

UNCLASSIFIED

OFFICIAL REPORT

30/96 17:53:41

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

MITTER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
ram, Edward M	Building 9115 Room 0128 M.S.8219	199610090012		E962840159	8601	APPROVED
SAMPLED: 10/22/96 12:47:00	DATE NEEDED: 11/21/96	LOCATION: GW808			CHARGE #:	S1300107
RECEIVED: 10/22/96	DATE COMPLETED: 10/30/96	PROJECT CODE:			CASE:	U03130
PLER:	SAMPLE DESCRIPTION:					

FINAL APPROVAL:

MENTS: FACILITY I.D.# 0-010117

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 10/25/96 10:40:00	APPROVER: E030124
MENTS: MTBE=50 U			
LRL=50ug/L			
RESULTS BY PID			

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

MEBT	Special analysis of MEBT (EPA 624)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY W60		

VOABTEX	VOA Analysis, BTEX Compounds (SW846 8260)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8260 PHASE:	TIME ANALYZED:	APPROVER:
	THIS TEST WAS CANCELLED BY W60		

UNCLASSIFIED

*** LAST PAGE ***

UNCLASSIFIED

OFFICIAL REPORT

10/30/96 17:53:46

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

MITTER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
Ham, Edward M	Building 9115 Room 0128 M.S.8219	199610090013		E962840160	8601	APPROVED
SAMPLED: 10/22/96 11:55:00		DATE NEEDED: 11/21/96	LOCATION: GW809	CHARGE #: S1300107		
RECEIVED: 10/22/96		DATE COMPLETED: 10/30/96	PROJECT CODE:	CASE: U03130		
PLER:		SAMPLE DESCRIPTION:		FINAL APPROVAL:		

MENTS: FACILITY I.D.# 0-010117

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 10/25/96 11:18:00	APPROVER: E030124
MENTS: MTBE= 50 U			
LRL=50ug/L			
RESULTS BY PID			

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

MEBT	Special analysis of MEBT (EPA 624)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

VOABTEX	VOA Analysis, BTEX Compounds (SW846 8260)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8260 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

UNCLASSIFIED

*** LAST PAGE ***

UNCLASSIFIED

OFFICIAL REPORT

60/96 17:53:50

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

MITTER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
am, Edward M	Building 9115 Room 0128 M.S.8219	199610090014		E962840161	8601	APPROVED
SAMPLED: 10/22/96 13:50:00		DATE NEEDED: 11/21/96	LOCATION: GW810	CHARGE #: S1300107		
RECEIVED: 10/22/96		DATE COMPLETED: 10/30/96	PROJECT CODE:	CASE: U03130		
PLER:	SAMPLE DESCRIPTION:		FINAL APPROVAL:

MENTS: FACILITY I.D.# 0-010117

GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 10/25/96 12:51:00	APPROVER: E030124
MENTS: MTBE= 50 U			
LRL=50ug/L			
RESULTS BY PID			

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

MEBT	Special analysis of MEBT (EPA 624)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

VOABTEX	VOA Analysis, BTEX Compounds (SW846 8260)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8260 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

UNCLASSIFIED

*** LAST PAGE ***

UNCLASSIFIED

OFFICIAL REPORT

30/96 18:04:21

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

MITTER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
ram, Edward M	Building 9115 Room 0128 M.S.8219	199610090015		E962840162	8601	APPROVED
E SAMPLED: 10/22/96 11:35:00		DATE NEEDED: 11/21/96	LOCATION: GW193	CHARGE #: S1300107		
E RECEIVED: 10/22/96		DATE COMPLETED: 10/30/96	PROJECT CODE:	CASE: U03130		
PLER:		SAMPLE DESCRIPTION:	FINAL APPROVAL:			

MENTS: FACILITY I.D.# 0-010117

T: GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
P MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 10/28/96 12:18:00	APPROVER: E030124
MENTS: MTBE=210 ug/L			
LRL=50ug/L			
RESULTS BY PID			
BENZENE RESULT FROM A 1:2 DIL RUN ON 10/28/96 @ 13:31.			

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
4	Gasoline Range Organics		2000		ug/L
2	Benzene		310		ug/L
14	Ethylbenzene		190		ug/L
83	Toluene		40		ug/L
207	Xylene		120		ug/L
2	GRO Quantitation Limit		100		ug/L
2	BTEX Quantitation Limit		10		ug/L
1	GRO Amount in Blank		NONE		ug/L

: MEBT	Special analysis of MEBT (EPA 624)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

: VOABTEX	VOA Analysis, BTEX Compounds (SW846 8260)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8260 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

UNCLASSIFIED

*** LAST PAGE ***

UNCLASSIFIED

OFFICIAL REPORT

30/96 17:53:55

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

MITTER	ADDRESS	CUSTOMER ID	REQ NO	SAMPLE NO	MTC	STATUS
ram, Edward M	Building 9115 Room 0128 M.S.8219	199610090017		E962840164	8601	APPROVED
E SAMPLED: 10/22/96 12:47:00		DATE NEEDED: 11/21/96	LOCATION: GW808		CHARGE #: S1300107	
E RECEIVED: 10/22/96		DATE COMPLETED: 10/30/96	PROJECT CODE:		CASE: U03130	
PLER:		SAMPLE DESCRIPTION:		FINAL APPROVAL:

MENTS: FACILITY I.D.# 0-010117

T: GRO	TPH Gasoline Range Organics Including BTEX	REPLICATE: 1	STATUS: APPROVED
P MTH:	PROC MTH: SW846 8020 PHASE:	TIME ANALYZED: 10/25/96 13:31:00	APPROVER: E030124
MENTS: MTBE=50 U			
LRL=50ug/L			
RESULTS BY PID			

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

: MEBT	Special analysis of MEBT (EPA 624)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

: VOABTEX	VOA Analysis, BTEX Compounds (SW846 8260)	REPLICATE: 1	STATUS: CANCELLED
MTH:	PROC MTH: SW846 8260 PHASE:	TIME ANALYZED:	APPROVER:
THIS TEST WAS CANCELLED BY W60			

UNCLASSIFIED

*** LAST PAGE ***

UNCLASSIFIED

OFFICIAL REPORT

06/96 13:57:53

Y-12 ANALYTICAL SERVICES ORGANIZATION

PAGE 1 OF 1

<u>MITTER</u>	<u>ADDRESS</u>	<u>CUSTOMER ID</u>	<u>REQ NO</u>	<u>SAMPLE NO</u>	<u>MTC</u>	<u>STATUS</u>
zelka, Kimberly G	Building 9116 Room 0109 M.S.8098	199610090019		E962840166	8601	APPROVED
SAMPLED: 10/22/96 08:15:00	DATE NEEDED: 11/21/96	LOCATION: TBLANK			CHARGE #: S2211001	
RECEIVED: 10/22/96	DATE COMPLETED: 10/29/96	PROJECT CODE:			CASE: NQT001	
PLER:	SAMPLE DESCRIPTION:					

FINAL APPROVAL:

MENTS: FACILITY I.D.# 0-010117

: VOA624	Volatile Organics by GC/MS (EPA 624)	REPLICATE: 1	STATUS: APPROVED
MTH:	PROC MTH: EPA 624 PHASE:	TIME ANALYZED: 10/28/96 16:55:00	APPROVER: E030124

NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
3	Chloromethane		10U		ug/L
9	Bromomethane		10U		ug/L
4	Vinyl chloride		10U		ug/L
3	Chloroethane		10U		ug/L
4	Trichlorofluoromethane		10U		ug/L
2	Methylene chloride		10U		ug/L
4	1,1-Dichloroethene		10U		ug/L
3	1,1-Dichloroethane		10U		ug/L
05	trans-1,2-Dichloroethene		10U		ug/L
3	Chloroform		10U		ug/L
62	1,2-Dichloroethane		10U		ug/L
6	1,1,1-Trichloroethane		10U		ug/L
5	Carbon tetrachloride		10U		ug/L
4	Bromodichloromethane		10U		ug/L
58	2-Chloroethylvinyl ether		10U		ug/L
5	1,2-Dichloropropane		10U		ug/L
015	cis-1,3-Dichloropropene		10U		ug/L
6	Trichloroethene		10U		ug/L
31	Dibromochloromethane		10U		ug/L
6	1,1,2-Trichloroethane		10U		ug/L
2	Benzene		10U		ug/L
026	trans-1,3-Dichloropropene		10U		ug/L
2	Bromoform		10U		ug/L
4	Tetrachloroethene		10U		ug/L
5	1,1,2,2,-Tetrachloroethane		10U		ug/L
3	Toluene		10U		ug/L
7	Chlorobenzene		10U		ug/L
4	Ethylbenzene		10U		ug/L
8	Acrolein		10U		ug/L
1	Acrylonitrile		10U		ug/L

UNCLASSIFIED

*** LAST PAGE ***

DISTRIBUTION

HEALTH, SAFETY, ENVIRONMENT AND ACCOUNTABILITY ORGANIZATION

E.M. Ingram (3)
File - EMD -RC

MECHANICAL OPERATIONS ORGANIZATION

R.C. Wright

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

C. Head
E.C. Leming/J.D. Harless

U. S. DEPARTMENT OF ENERGY

S.L. Lee
R.J. Spence/L.M. Sparks
W.B. Mansel

DOE-OSTI/Y-12 Plant Records (2)
Y-12 Central Files