RMT Integrated Environmental Solutions

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October 24, 2003

Mr. Barney Chan
Project Manager
Alameda County Department of Environmental Health
1131 Harbor Way Parkway
Alameda, CA 94502

Subject: Summary of Excavation Work
762 Stewart Court, Alameda, California

Dear Mr. Chan:

The property located at 762 Stewart Court (property) in Alameda, California is a mixed-use property, i.e., it is zoned for commercial and residential use. The residential portion of the property is a two-story structure that abuts Stewart Court. The lower level is used for storage, and the upper level can be used as an apartment. The remaining attached structure is single story and is used by Thomas Means Construction, a remodeling contractor.

Excavation work commenced at the 762 Stewart Court property (property) on August 19, 2003. Based on prior investigations conducted at the property, elevated concentrations of total petroleum hydrocarbons (TPH) as gasoline, diesel and motor oil were detected in soil at four areas: excavation area A and excavation areas B, C and D inside the single story structures (Figure 1). Based on discussions with Eva Chu of your office, recommended soil cleanup levels are as follows:

- maximum allowable diesel and motor oil concentrations in soil – 500 mg/kg Res / Comm 1000
- maximum allowable gasoline concentration in soil – 400 mg/kg Commerc. / Res / 100 mg/kg
- maximum allowable lead concentration in soil – 250 mg/kg 200 Res. / 750 Commercial
- maximum allowable benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentration in soil – 0.180 mg/kg Res / .38 commerc

Soil excavation work is complete at the four excavation areas with chemically-impacted soil. Confirmation soil sample results are summarized in Table 1. Confirmation soil samples were collected in brass liners and sealed with plastic caps and Teflon liners. Soil samples were transported under chain-of-custody to Curtis & Tompkins, a state-certified analytical laboratory for analysis.

All excavation work completed inside the workshop building was performed using the largest equipment that would fit through the access doors. To date, approximately 40 tons of soil have been excavated and transported to the East Carbon Development Corporation landfill in East Carbon, Utah.

Excavation Area A

A total of 7 confirmation soil samples (RS-A-3 through RS-A-7) were collected on October 2, 2003 to document residual soil concentrations after excavation work was completed. All confirmation soil sample results were below the maximum allowable levels previously discussed, except for soil sample RS-A-3. Additional soil was excavated and another confirmation soil sample was collected at sample location RS-A-8 (Table 1). The latest confirmation soil sample results for Excavation Area A are now below the maximum allowable levels previously discussed.

Excavation Area B

One confirmation soil sample (RS-B-1) was collected on August 22, 2003. All confirmation soil sample results for Excavation Area B are below the maximum allowable levels previously discussed.

Excavation Area C

Two confirmation soil samples (RS-C-1 and RS-C-2) were collected on August 22, 2003. All confirmation soil samples results for Excavation Area C are below the maximum allowable levels previously discussed.

Excavation Area D

Three confirmation soil samples (RS-D-1, RS-D-2 and RS-D-3) were collected on August 25, 2003. The confirmation soil samples were analyzed for TPH as diesel, TPH as gasoline and BTEX . All reported concentrations of TPH as gasoline and BTEX in the confirmation soil samples for Excavation Area D are below the maximum allowable levels previously discussed. Detected concentrations of TPH as diesel in the Excavation Area D confirmation soil samples range from 3,600 mg/kg to 17,000 mg/kg; however, the analytical laboratory commented that the chromatogram resembles hydrocarbons that are heavier that diesel. Reference chromatograms of diesel, lubricating fluid (mineral oil) and motor oil are attached for comparison purposes.

The chromatograms for RS-D-1, RS-D-2 and RS-D-3 have distinct relative chromatogram peaks at 10 minutes and 17 minutes. The diesel reference standard has a relative chromatogram peak at 6 minutes, and the motor oil reference standard has a distinct chromatogram peak at 16 minute of elution time. For comparison purposes, a chromatogram of lubricating fluid (mineral oil) is also attached. Mineral oil has a characteristic chromatogram peak at approximately 14 minutes. A review of the chromatograms indicates that the detected compounds in confirmation soil samples RS-D-1, RS-D-2 and RS-D-3 are not diesel, but rather medium to higher molecular weight hydrocarbons, similar to mineral oil or lubricating fluids.

The excavation at Area D cannot be extended laterally or vertically without causing damage to the structure and its foundation. The excavation is approximately 6 feet deep, which is the depth limit for the size of excavation equipment that will fit through the garage door near Excavation D (Figure 1).

Recommendations

Based on the analytical data for all of the confirmation soil samples, and the chromatograms for Excavation D, I would recommend that permission be granted to fill all open excavations and that no further action is warranted at this time.

Thank you for your time, and if you have and questions or comments, please call me at 408-368-7796.

Sincerely,

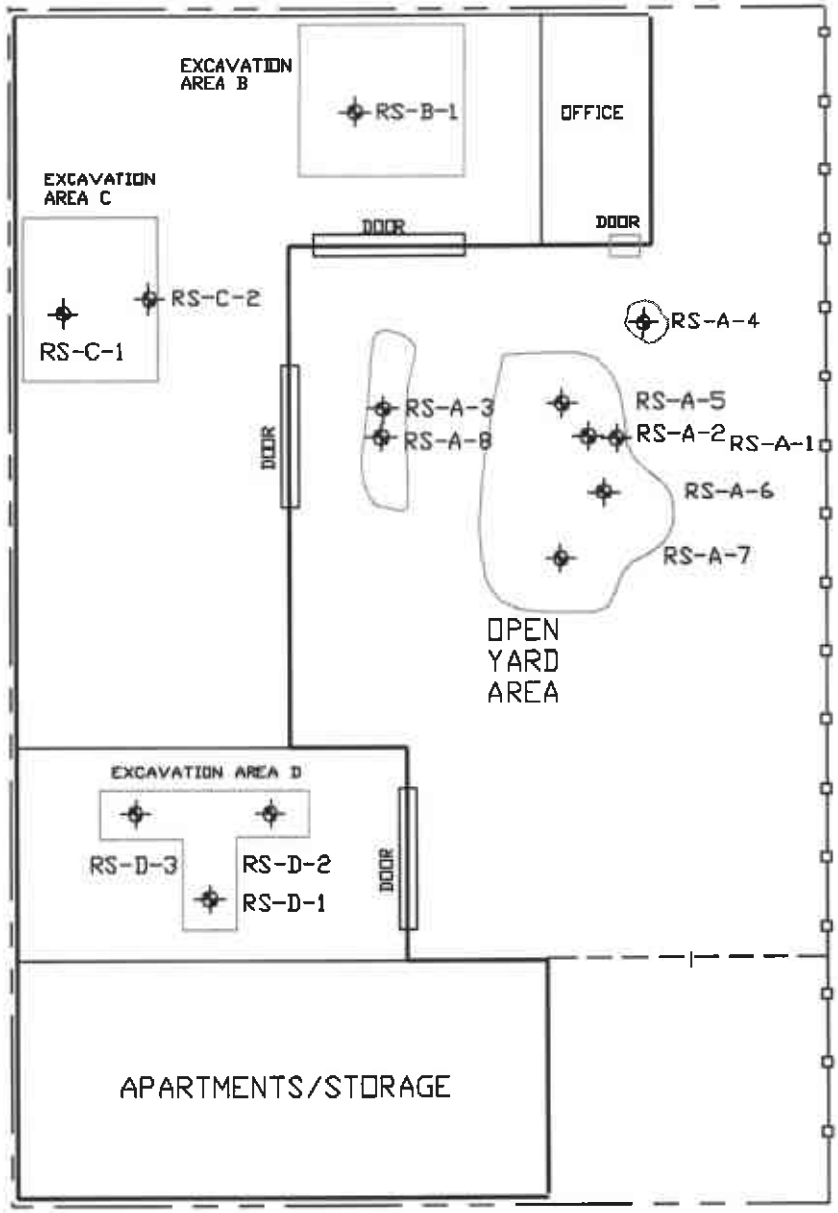
RMT, Inc.

Alan Lui

Alan Lui, PE
Senior Project Manager

Attachments: Confirmation Sample Locations, Figure 1
Residual Diesel, Gasoline, BTEX Concentrations in Soil, Table 1
Laboratory Analytical Data Sheets
Chromatograms for RS-D-1, RS-D-2 and RS-D-3
Reference Chromatograms for Diesel, Motor Oil and Lubricating Fluid

cc: Patricia Santanna
Judith Bright
Kevin Bate, RMT



LEGEND:

- BORING LOCATION
- WOODEN FENCE
- CHAIN-LINK GATE
- ASSUMED PROPERTY LINE

PROJECT:

762 STEWART COURT, ALAMEDA, CALIFORNIA

SHEET TITLE:

CONFIRMATION SOIL SAMPLE LOCATIONS
(THREE OF FOUR EXCAVATION AREAS)

DRAWN BY: AL	PROJ. NO. 00-90225.02
CHECKED BY: KB	FILE NO. 90225.02-2.DWG
APPROVED BY: AL	FIGURE 1
DATE: JUNE 2003	

RMT Inc. – Sunnyvale
Phone: 408-744-8505
1153 Bordeaux Drive
Suite 208
Sunnyvale, CA 94089

TABLE 1

Residual Diesel, Gasoline, BTEX Concentrations in Soil

762 Stewart Court
Alameda, California

Sample Location	Date Sampled	TPH as Diesel (C10-C24) mg/kg	TPH as Gasoline (C7-C12) mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Total Xylenes mg/kg	Lead
RS-A-3	10/2/03	540 (H) (Y)	<0.97	<0.0049	<0.0049	<0.0049	<0.0049	--
RS-A-4	10/2/03	10 (H) (Y)	<1.0	<0.0052	<0.0052	<0.0052	<0.0052	--
RS-A-5	10/2/03	380 (H) (Y)	<1.1	<0.0053	<0.0053	<0.0053	<0.0053	--
RS-A-6	10/2/03	130 (H) (Y)	<1.1	<0.0053	<0.0053	<0.0053	<0.0053	--
RS-A-7	10/2/03	6.4 (H) (Y)	<0.95	<0.0048	<0.0048	<0.0048	<0.0048	--
RS-A-8	10/13/03	55 (H) (Y)	<1.0	<0.0052	<0.0052	<0.0052	<0.0052	--
RS-B-1	8/22/03	5.2 (H) (Y)	<1.0	<0.0052	0.031	<0.0052	<0.0052	--
RS-C-1	8/22/03	160 (H) (Y)	<1.0	<0.0051	<0.0051	<0.0051	<0.0051	12
RS-C-2	8/22/03	99 (H) (Y)	6.3 (H) (Y)	<0.0054	0.028	<0.0054	<0.0054	48
RS-D-1	8/25/03	17,000 (H) (Y)	<1.0	<0.0051	0.011	<0.0051	<0.0051	--
RS-D-2	8/25/03	9,800 (H) (Y)	3.1 (H) (Y)	<0.0056	0.024	<0.0056	<0.0056	--
RS-D-3	8/25/03	3,600 (H) (Y)	3.4 (H) (Y)	<0.0056	0.011	<0.0056	<0.0056	--

Notes:

H = Heavier hydrocarbons contributed to the detected diesel concentration in the soil sample

Y = Chromatogram resembles heavier hydrocarbons

1. The maximum allowable concentration for diesel in soil is 500 mg/kg.
2. The maximum allowable concentration for gasoline in soil is 400 mg/kg.
3. The maximum allowable concentration for lead in soil is 250 mg/kg.
4. The maximum allowable concentration for benzene, toluene, ethylbenzene and/or xylene is 0.180 mg/kg.
5. The first round of confirmation soil samples were collected on October 2, 2003 in the outdoor excavation (Excavation A). Detected chemical concentrations were below maximum allowable levels in four of the five confirmation soil samples collected on October 2, 2003.
6. Additional soil was excavated from the outdoor excavation (Excavation A) and another confirmation soil sample was collected on October 13, 2003, and the detected chemical concentrations were below maximum allowable levels.
7. Soil Sample RS-A-8 was collected after additional soil was excavated from Excavation A from soil sample location RS-A-3 where the detected diesel concentration was above the 500 mg/kg maximum allowable level.

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167113	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	EPA 5030B
Project#:	STANDARD		
Matrix:	Soil	Sampled:	08/21/03
Basis:	as received	Received:	08/22/03
Diln Fac:	1.000	Analyzed:	08/22/03
Batch#:	83918		

Field ID: RS-A-1 Lab ID: 167113-001
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.2	ug/Kg	EPA 8021B
Toluene	53	5.2	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.2	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.2	ug/Kg	EPA 8021B
o-Xylene	ND	5.2	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	103	56-144	8015B
Bromofluorobenzene (FID)	107	51-142	8015B
Trifluorotoluene (PID)	95	45-150	EPA 8021B
Bromofluorobenzene (PID)	101	42-138	EPA 8021B

Field ID: RS-A-2 Lab ID: 167113-002
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	0.98	mg/Kg	8015B
Benzene	ND	4.9	ug/Kg	EPA 8021B
Toluene	57	4.9	ug/Kg	EPA 8021B
Ethylbenzene	ND	4.9	ug/Kg	EPA 8021B
m,p-Xylenes	ND	4.9	ug/Kg	EPA 8021B
o-Xylene	ND	4.9	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	102	56-144	8015B
Bromofluorobenzene (FID)	104	51-142	8015B
Trifluorotoluene (PID)	93	45-150	EPA 8021B
Bromofluorobenzene (PID)	99	42-138	EPA 8021B

Type: BLANK Lab ID: QC223256

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.0	ug/Kg	EPA 8021B
Toluene	ND	5.0	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.0	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.0	ug/Kg	EPA 8021B
o-Xylene	ND	5.0	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	96	56-144	8015B
Bromofluorobenzene (FID)	97	51-142	8015B
Trifluorotoluene (PID)	88	45-150	EPA 8021B
Bromofluorobenzene (PID)	94	42-138	EPA 8021B

ND= Not Detected
RL= Reporting Limit

1.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Total Extractable Hydrocarbons

Lab #:	167113	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	SHAKER TABLE
Project#:	3001-01-001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	08/21/03
Units:	mg/Kg	Received:	08/22/03
Basis:	as received	Prepared:	08/24/03
Batch#:	83947	Analyzed:	08/25/03

Field ID: RS-A-1 Lab ID: 167113-001
Type: SAMPLE Diln Fac: 1.000

Analyte	Result	RL
Diesel C10-C24	13 H Y	1.0

Surrogate	%REC	Limits
Hexacosane	90	36-141

Field ID: RS-A-2 Lab ID: 167113-002
Type: SAMPLE Diln Fac: 5.000

Analyte	Result	RL
Diesel C10-C24	1,000 H Y	5.0

Surrogate	%REC	Limits
Hexacosane	122	36-141

Type: BLANK Diln Fac: 1.000
Lab ID: QC223404 Cleanup Method: EPA 3630

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
Hexacosane	80	36-141

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

7.0

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Curtis & Tompkins Laboratories Analytical Report

Lab #:	168178	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	EPA 5030B
Project#:	3001-01-001		
Field ID:	RS-A-8	Batch#:	85297
Matrix:	Soil	Sampled:	10/13/03
Basis:	as received	Received:	10/13/03
Dil'n Fac:	1.000		

Type: SAMPLE Analyzed: 10/15/03
Lab ID: 168178-001

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.2	ug/Kg	EPA 8021B
Toluene	ND	5.2	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.2	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.2	ug/Kg	EPA 8021B
o-Xylene	ND	5.2	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	102	56-144	8015B
Bromofluorobenzene (FID)	110	51-142	8015B
Trifluorotoluene (PID)	80	45-150	EPA 8021B
Bromofluorobenzene (PID)	86	42-138	EPA 8021B

Type: BLANK Analyzed: 10/14/03
Lab ID: QC228783

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.0	ug/Kg	EPA 8021B
Toluene	ND	5.0	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.0	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.0	ug/Kg	EPA 8021B
o-Xylene	ND	5.0	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	99	56-144	8015B
Bromofluorobenzene (FID)	104	51-142	8015B
Trifluorotoluene (PID)	80	45-150	EPA 8021B
Bromofluorobenzene (PID)	85	42-138	EPA 8021B

ND= Not Detected
RL= Reporting Limit

1.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Total Extractable Hydrocarbons

Lab #:	168178	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	SHAKER TABLE
Project#:	3001-01-001	Analysis:	EPA 8015B
Field ID:	RS-A-8	Batch#:	85287
Matrix:	Soil	Sampled:	10/13/03
Units:	mg/Kg	Received:	10/13/03
Basis:	as received	Prepared:	10/13/03

Type:	SAMPLE	Diln Fac:	2.000
Lab ID:	168178-001	Analyzed:	10/15/03

Analyte	Result	RL
Diesel C10-C24	55 H Y	2.0

Surrogate	%REC	Limits
Hexacosane	91	36-141

Type:	BLANK	Analyzed:	10/14/03
Lab ID:	QC228744	Cleanup Method:	EPA 3630C
Diln Fac:	1.000		

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
Hexacosane	69	36-141

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

6.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167961	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	EPA 5030B
Project#:	3001-01-001		
Matrix:	Soil	Sampled:	10/02/03
Basis:	as received	Received:	10/02/03
Dil'n Fac:	1.000	Analyzed:	10/03/03
Batch#:	85063		

Field ID: RS-A-3 Lab ID: 167961-001
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	0.97	mg/Kg	8015B
Benzene	ND	4.9	ug/Kg	EPA 8021B
Toluene	ND	4.9	ug/Kg	EPA 8021B
Ethylbenzene	ND	4.9	ug/Kg	EPA 8021B
m,p-Xylenes	ND	4.9	ug/Kg	EPA 8021B
o-Xylene	ND	4.9	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	103	56-144	8015B
Bromofluorobenzene (FID)	107	51-142	8015B
Trifluorotoluene (PID)	90	45-150	EPA 8021B
Bromofluorobenzene (PID)	91	42-138	EPA 8021B

Field ID: RS-A-4 Lab ID: 167961-002
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.2	ug/Kg	EPA 8021B
Toluene	ND	5.2	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.2	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.2	ug/Kg	EPA 8021B
o-Xylene	ND	5.2	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	104	56-144	8015B
Bromofluorobenzene (FID)	109	51-142	8015B
Trifluorotoluene (PID)	89	45-150	EPA 8021B
Bromofluorobenzene (PID)	92	42-138	EPA 8021B

Field ID: RS-A-5 Lab ID: 167961-003
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.1	mg/Kg	8015B
Benzene	ND	5.3	ug/Kg	EPA 8021B
Toluene	ND	5.3	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.3	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.3	ug/Kg	EPA 8021B
o-Xylene	ND	5.3	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	105	56-144	8015B
Bromofluorobenzene (FID)	104	51-142	8015B
Trifluorotoluene (PID)	90	45-150	EPA 8021B
Bromofluorobenzene (PID)	91	42-138	EPA 8021B

ND= Not Detected
RL= Reporting Limit

1.0

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Curtis & Tompkins Laboratories Analytical Report

Lab #:	167961	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	EPA 5030B
Project#:	3001-01-001		
Matrix:	Soil	Sampled:	10/02/03
Basis:	as received	Received:	10/02/03
Diln Fac:	1.000	Analyzed:	10/03/03
Batch#:	85063		

Field ID: RS-A-6 Lab ID: 167961-004
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.1	mg/Kg	8015B
Benzene	ND	5.3	ug/Kg	EPA 8021B
Toluene	ND	5.3	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.3	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.3	ug/Kg	EPA 8021B
o-Xylene	ND	5.3	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	104	56-144	8015B
Bromofluorobenzene (FID)	107	51-142	8015B
Trifluorotoluene (PID)	90	45-150	EPA 8021B
Bromofluorobenzene (PID)	93	42-138	EPA 8021B

Field ID: RS-A-7 Lab ID: 167961-005
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	0.95	mg/Kg	8015B
Benzene	ND	4.8	ug/Kg	EPA 8021B
Toluene	ND	4.8	ug/Kg	EPA 8021B
Ethylbenzene	ND	4.8	ug/Kg	EPA 8021B
m,p-Xylenes	ND	4.8	ug/Kg	EPA 8021B
o-Xylene	ND	4.8	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	103	56-144	8015B
Bromofluorobenzene (FID)	108	51-142	8015B
Trifluorotoluene (PID)	89	45-150	EPA 8021B
Bromofluorobenzene (PID)	92	42-138	EPA 8021B

Type: BLANK Lab ID: QC227862

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.0	ug/Kg	EPA 8021B
Toluene	ND	5.0	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.0	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.0	ug/Kg	EPA 8021B
o-Xylene	ND	5.0	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	98	56-144	8015B
Bromofluorobenzene (FID)	103	51-142	8015B
Trifluorotoluene (PID)	83	45-150	EPA 8021B
Bromofluorobenzene (PID)	87	42-138	EPA 8021B

ND= Not Detected
RL= Reporting Limit

1.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Total Extractable Hydrocarbons

Lab #:	167961	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	SHAKER TABLE
Project#:	3001-01-001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	10/02/03
Units:	mg/Kg	Received:	10/02/03
Basis:	as received	Prepared:	10/04/03
Batch#:	85081		

Field ID: RS-A-3 Diln Fac: 5.000
Type: SAMPLE Analyzed: 10/07/03
Lab ID: 167961-001

Analyte	Result	RL
Diesel C10-C24	540 H Y	5.0

Surrogate	%REC	Limits
Hexacosane	99	36-141

Field ID: RS-A-4 Diln Fac: 1.000
Type: SAMPLE Analyzed: 10/06/03
Lab ID: 167961-002

Analyte	Result	RL
Diesel C10-C24	10 H Y	1.0

Surrogate	%REC	Limits
Hexacosane	89	36-141

Field ID: RS-A-5 Diln Fac: 5.000
Type: SAMPLE Analyzed: 10/07/03
Lab ID: 167961-003

Analyte	Result	RL
Diesel C10-C24	380 H Y	5.0

Surrogate	%REC	Limits
Hexacosane	90	36-141

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.
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Total Extractable Hydrocarbons

Lab #:	167961	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	SHAKER TABLE
Project#:	3001-01-001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	10/02/03
Units:	mg/Kg	Received:	10/02/03
Basis:	as received	Prepared:	10/04/03
Batch#:	85081		

Field ID: RS-A-6 Diln Fac: 2.000
Type: SAMPLE Analyzed: 10/07/03
Lab ID: 167961-004

Analyte	Result	RL
Diesel C10-C24	130 H Y	2.0

Surrogate	%REC	Limits
Hexacosane	85	36-141

Field ID: RS-A-7 Diln Fac: 1.000
Type: SAMPLE Analyzed: 10/06/03
Lab ID: 167961-005

Analyte	Result	RL
Diesel C10-C24	6.4 H Y	1.0

Surrogate	%REC	Limits
Hexacosane	87	36-141

Type: BLANK Analyzed: 10/05/03
Lab ID: QC227926 Cleanup Method: EPA 3630C
Diln Fac: 1.000

Analyte	Result	RL
Diesel C10-C24	ND	0.99

Surrogate	%REC	Limits
Hexacosane	99	36-141

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

5.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167131	Location:	762 Stewart Court
Client:	Remediation Services, Inc.	Prep:	EPA 5030B
Project#:	STANDARD		
Matrix:	Soil	Sampled:	08/22/03
Basis:	as received	Received:	08/22/03
Dil'n Fac:	1.000	Analyzed:	08/23/03
Batch#:	83941		

Field ID: RS-C-1 Lab ID: 167131-001
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.1	ug/Kg	EPA 8021B
Toluene	23	5.1	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.1	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.1	ug/Kg	EPA 8021B
o-Xylene	ND	5.1	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	99	56-144	8015B
Bromofluorobenzene (FID)	102	51-142	8015B
Trifluorotoluene (PID)	88	45-150	EPA 8021B
Bromofluorobenzene (PID)	95	42-138	EPA 8021B

Field ID: RS-C-2 Lab ID: 167131-002
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	6.3 H Y	1.1	mg/Kg	8015B
Benzene	ND	5.4	ug/Kg	EPA 8021B
Toluene	28	5.4	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.4	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.4	ug/Kg	EPA 8021B
o-Xylene	ND	5.4	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	98	56-144	8015B
Bromofluorobenzene (FID)	107	51-142	8015B
Trifluorotoluene (PID)	89	45-150	EPA 8021B
Bromofluorobenzene (PID)	97	42-138	EPA 8021B

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

1.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167131	Location:	762 Stewart Court
Client:	Remediation Services, Inc.	Prep:	EPA 5030B
Project#:	STANDARD		
Matrix:	Soil	Sampled:	08/22/03
Basis:	as received	Received:	08/22/03
Dil'n Fac:	1.000	Analyzed:	08/23/03
Batch#:	83941		

Field ID: RS-B-1 Lab ID: 167131-003
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.2	ug/Kg	EPA 8021B
Toluene	31	5.2	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.2	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.2	ug/Kg	EPA 8021B
o-Xylene	ND	5.2	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	100	56-144	8015B
Bromofluorobenzene (FID)	102	51-142	8015B
Trifluorotoluene (PID)	90	45-150	EPA 8021B
Bromofluorobenzene (PID)	96	42-138	EPA 8021B

Type: BLANK Lab ID: QC223372

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	0.20	mg/Kg	8015B
Benzene	ND	1.0	ug/Kg	EPA 8021B
Toluene	ND	1.0	ug/Kg	EPA 8021B
Ethylbenzene	ND	1.0	ug/Kg	EPA 8021B
m,p-Xylenes	ND	1.0	ug/Kg	EPA 8021B
o-Xylene	ND	1.0	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	101	56-144	8015B
Bromofluorobenzene (FID)	106	51-142	8015B
Trifluorotoluene (PID)	90	45-150	EPA 8021B
Bromofluorobenzene (PID)	99	42-138	EPA 8021B

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

1.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Total Extractable Hydrocarbons

Lab #:	167131	Location:	762 Stewart Court
Client:	Remediation Services, Inc.	Prep:	SHAKER TABLE
Project#:	STANDARD	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	08/22/03
Units:	mg/Kg	Received:	08/22/03
Basis:	as received	Prepared:	08/24/03
Batch#:	83947	Analyzed:	08/25/03

Field ID: RS-C-1 Lab ID: 167131-001
Type: SAMPLE Diln Fac: 20.00

Analyte	Result	RL
Diesel C10-C24	160 H Y	20

Surrogate	%REC	Limits
Hexacosane	DO	36-141

Field ID: RS-C-2 Lab ID: 167131-002
Type: SAMPLE Diln Fac: 1.000

Analyte	Result	RL
Diesel C10-C24	99 H Y	1.0

Surrogate	%REC	Limits
Hexacosane	113	36-141

Field ID: RS-B-1 Lab ID: 167131-003
Type: SAMPLE Diln Fac: 1.000

Analyte	Result	RL
Diesel C10-C24	5.2 H Y	0.99

Surrogate	%REC	Limits
Hexacosane	92	36-141

Type: BLANK Diln Fac: 1.000
Lab ID: QC223404 Cleanup Method: EPA 3630

Analyte	Result	RL
Diesel C10-C24	ND	1.0

Surrogate	%REC	Limits
Hexacosane	80	36-141

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

8.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Lead

Lab #:	167131	Location:	762 Stewart Court
Client:	Remediation Services, Inc.	Prep:	EPA 3050
Project#:	STANDARD	Analysis:	EPA 6010B
Analyte:	Lead	Batch#:	83948
Matrix:	Soil	Sampled:	08/22/03
Units:	mg/Kg	Received:	08/22/03
Basis:	as received	Prepared:	08/25/03
Diln Fac:	1.000	Analyzed:	08/25/03

Field ID	Type	Lab ID	Result	RL
RS-C-1	SAMPLE	167131-001	12	0.13
RS-C-2	SAMPLE	167131-002	48	0.11
	BLANK	QC223408	ND	0.15

ND= Not Detected
RL= Reporting Limit

5-0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167150	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	EPA 5030B
Project#:	3001-01-001		
Matrix:	Soil	Sampled:	08/25/03
Basis:	as received	Received:	08/25/03
Dil'n Fac:	1.000	Analyzed:	08/25/03
Batch#:	83957		

Field ID: RS-D-1 Lab ID: 167150-001
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.1	ug/Kg	EPA 8021B
Toluene	11	5.1	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.1	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.1	ug/Kg	EPA 8021B
o-Xylene	ND	5.1	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	102	56-144	8015B
Bromofluorobenzene (FID)	106	51-142	8015B
Trifluorotoluene (PID)	91	45-150	EPA 8021B
Bromofluorobenzene (PID)	96	42-138	EPA 8021B

Field ID: RS-D-3 Lab ID: 167150-002
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	3.4 H Y	1.1	mg/Kg	8015B
Benzene	ND	5.6	ug/Kg	EPA 8021B
Toluene	11	5.6	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.6	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.6	ug/Kg	EPA 8021B
o-Xylene	ND	5.6	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	91	56-144	8015B
Bromofluorobenzene (FID)	87	51-142	8015B
Trifluorotoluene (PID)	84	45-150	EPA 8021B
Bromofluorobenzene (PID)	79	42-138	EPA 8021B

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

1.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins Laboratories Analytical Report

Lab #:	167150	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	EPA 5030B
Project#:	3001-01-001		
Matrix:	Soil	Sampled:	08/25/03
Basis:	as received	Received:	08/25/03
Diln Fac:	1.000	Analyzed:	08/25/03
Batch#:	83957		

Field ID: RS-D-2 Lab ID: 167150-003
Type: SAMPLE

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	3.1 H Y	1.1	mg/Kg	8015B
Benzene	ND	5.6	ug/Kg	EPA 8021B
Toluene	24	5.6	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.6	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.6	ug/Kg	EPA 8021B
o-Xylene	ND	5.6	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	89	56-144	8015B
Bromofluorobenzene (FID)	86	51-142	8015B
Trifluorotoluene (PID)	81	45-150	EPA 8021B
Bromofluorobenzene (PID)	78	42-138	EPA 8021B

Type: BLANK Lab ID: QC223450

Analyte	Result	RL	Units	Analysis
Gasoline C7-C12	ND	1.0	mg/Kg	8015B
Benzene	ND	5.0	ug/Kg	EPA 8021B
Toluene	ND	5.0	ug/Kg	EPA 8021B
Ethylbenzene	ND	5.0	ug/Kg	EPA 8021B
m,p-Xylenes	ND	5.0	ug/Kg	EPA 8021B
o-Xylene	ND	5.0	ug/Kg	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	97	56-144	8015B
Bromofluorobenzene (FID)	102	51-142	8015B
Trifluorotoluene (PID)	88	45-150	EPA 8021B
Bromofluorobenzene (PID)	97	42-138	EPA 8021B

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

1.0

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Total Extractable Hydrocarbons

Lab #:	167150	Location:	762 Steward Court
Client:	Remediation Services, Inc.	Prep:	SHAKER TABLE
Project#:	3001-01-001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	08/25/03
Units:	mg/Kg	Received:	08/25/03
Basis:	as received	Prepared:	08/25/03
Batch#:	83984	Analyzed:	08/26/03

Field ID: RS-D-1 Lab ID: 167150-001
Type: SAMPLE Diln Fac: 50.00

Analyte	Result	RL
Diesel C10-C24	17,000 H Y q	50

Surrogate	%REC	Limits
Hexacosane	DO q	36-141

Field ID: RS-D-3 Lab ID: 167150-002
Type: SAMPLE Diln Fac: 50.00

Analyte	Result	RL
Diesel C10-C24	3,600 H Y q	50

Surrogate	%REC	Limits
Hexacosane	DO q	36-141

Field ID: RS-D-2 Lab ID: 167150-003
Type: SAMPLE Diln Fac: 50.00

Analyte	Result	RL
Diesel C10-C24	9,800 H Y q	50

Surrogate	%REC	Limits
Hexacosane	DO q	36-141

Type: BLANK Diln Fac: 1.000
Lab ID: QC223563 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND q	1.0

Surrogate	%REC	Limits
Hexacosane	110 q	36-141

H= Heavier hydrocarbons contributed to the quantitation
Y= Sample exhibits chromatographic pattern which does not resemble standard
q= Draft result - ending CCV not yet analyzed
DO= Diluted Out
ND= Not Detected
RL= Reporting Limit

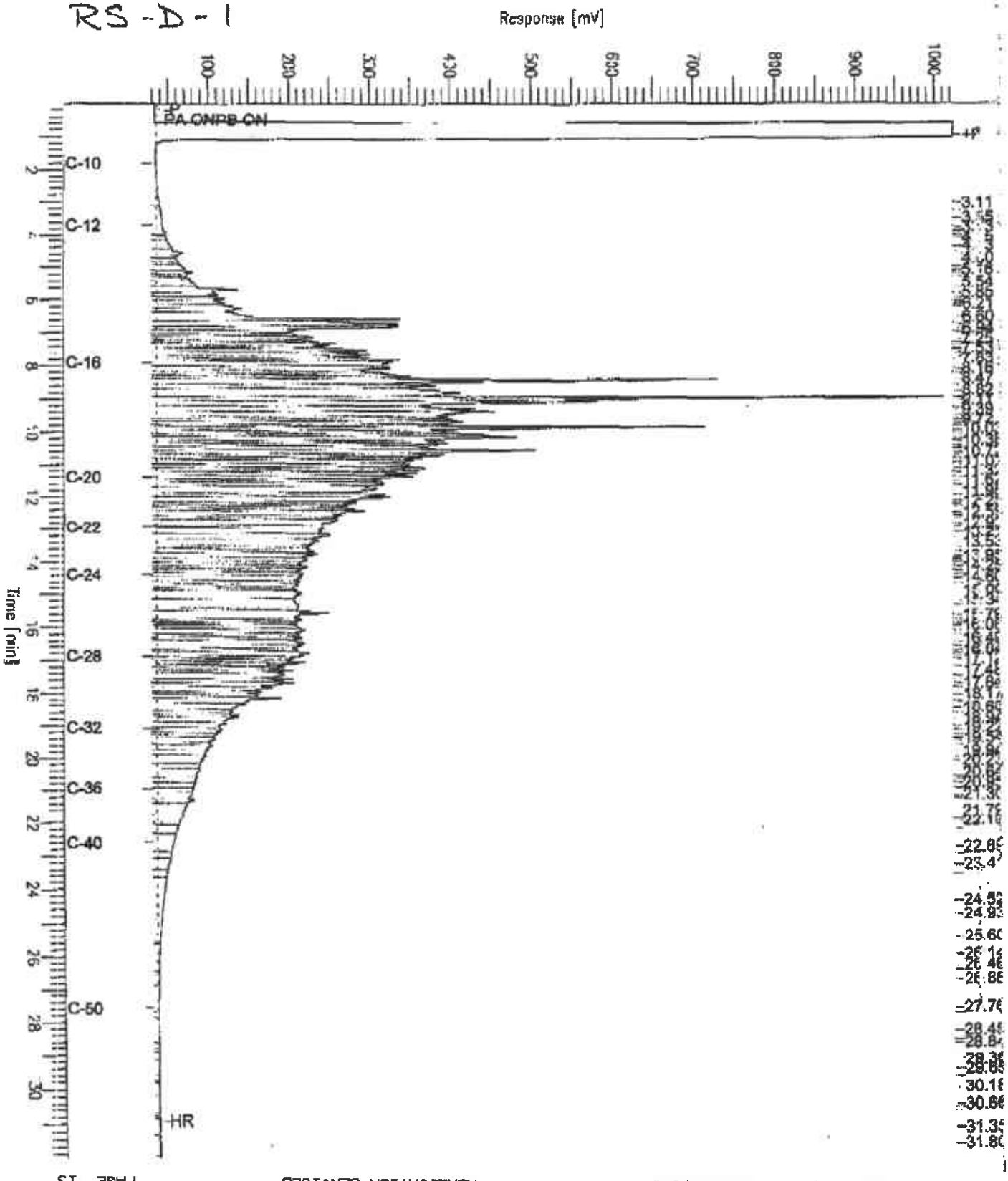
5.0

Chromatogram

Sample Name : 167150-001,83984
FileName : G:\GC13\CHB\2368065.RAW
Method : BTEX231.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 30 mV

Sample #: 83984 Page 1 of 1
Date : 8/26/03 04:45 PM
Time of Injection: 8/26/03 04:07 PM
Low Point : 29.56 mV High Point : 1024.00 mV
Plot Scale: 994.4 mV

RS-D-1

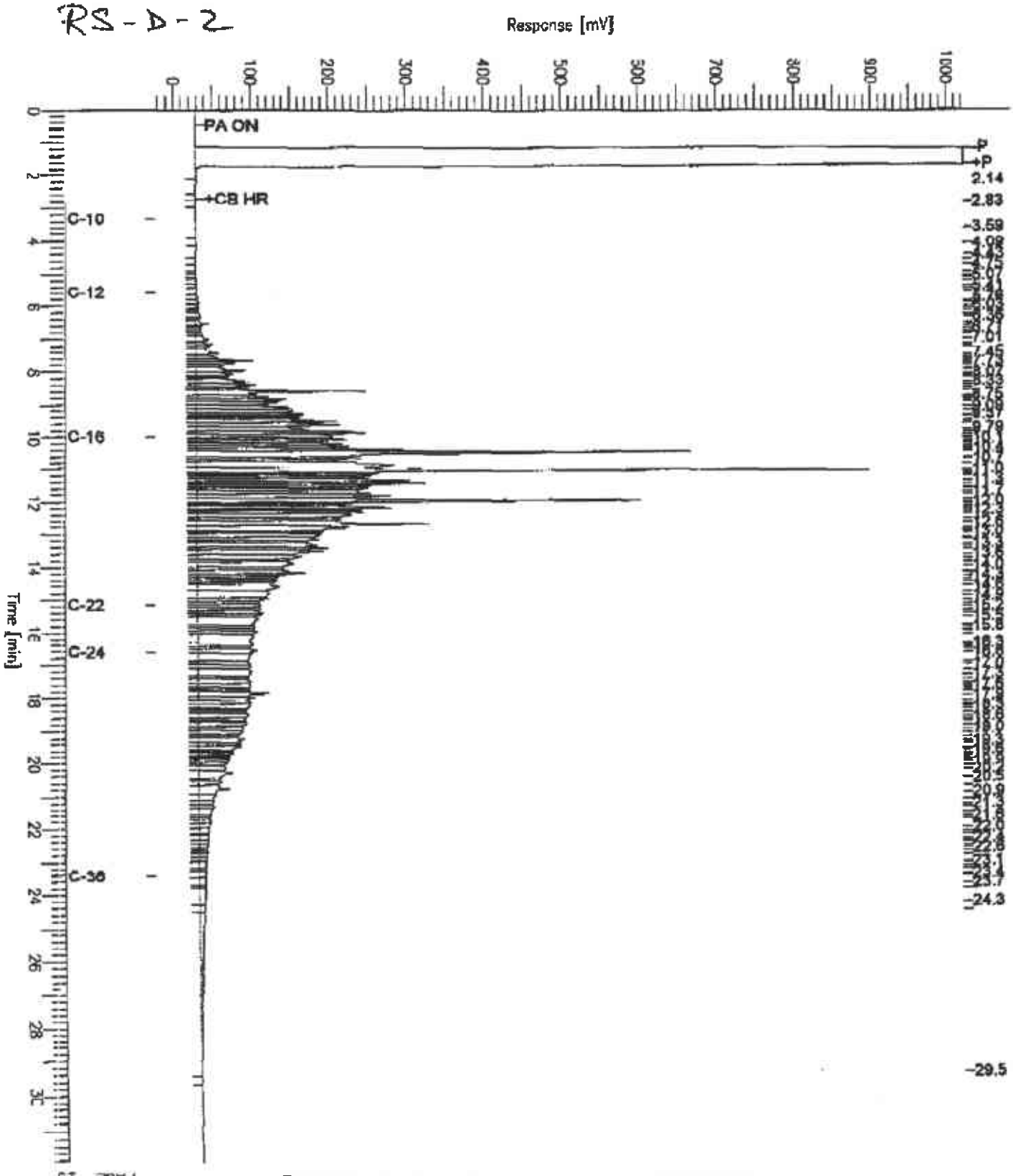


Chromatogram

Sample Name : 167150-003,83984
FileName : G:\GC17\CBA\237A026.RAW
Method : ATEH234.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Factor: 0.0 Plot Offset: -23 mV

Sample #: 83984 Page 1 of 1
Date : 8/26/03 01:25 PM
Time of Injection: 8/26/03 12:51 PM
Low Point : -22.99 mV High Point : 1024.00 mV
Plot Scale: 1047.0 mV

RS-A-2

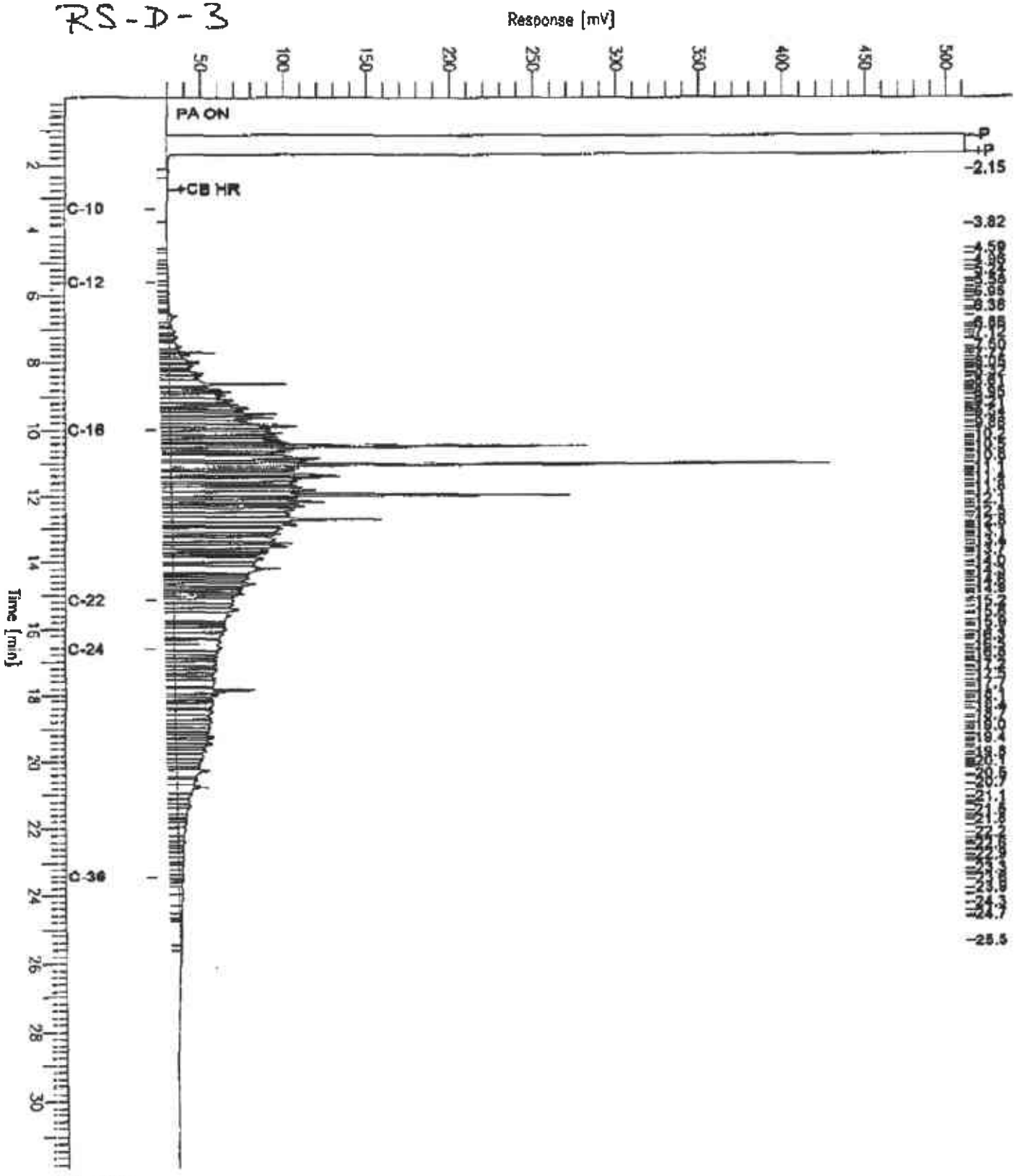


Chromatogram

Sample Name : 167150-002,83984
Filename : G:\GC17\CHA\237A025.RAW
Method : ATEH234.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 23 mV

Sample #: 83984 Page 1 of 1
Date : 8/26/03 12:45 PM
Time of Injection: 8/26/03 12:11 PM
Low Point : 22.58 mV High Point : 512.02 mV
Plot Scale: 489.4 mV

RS-D-3

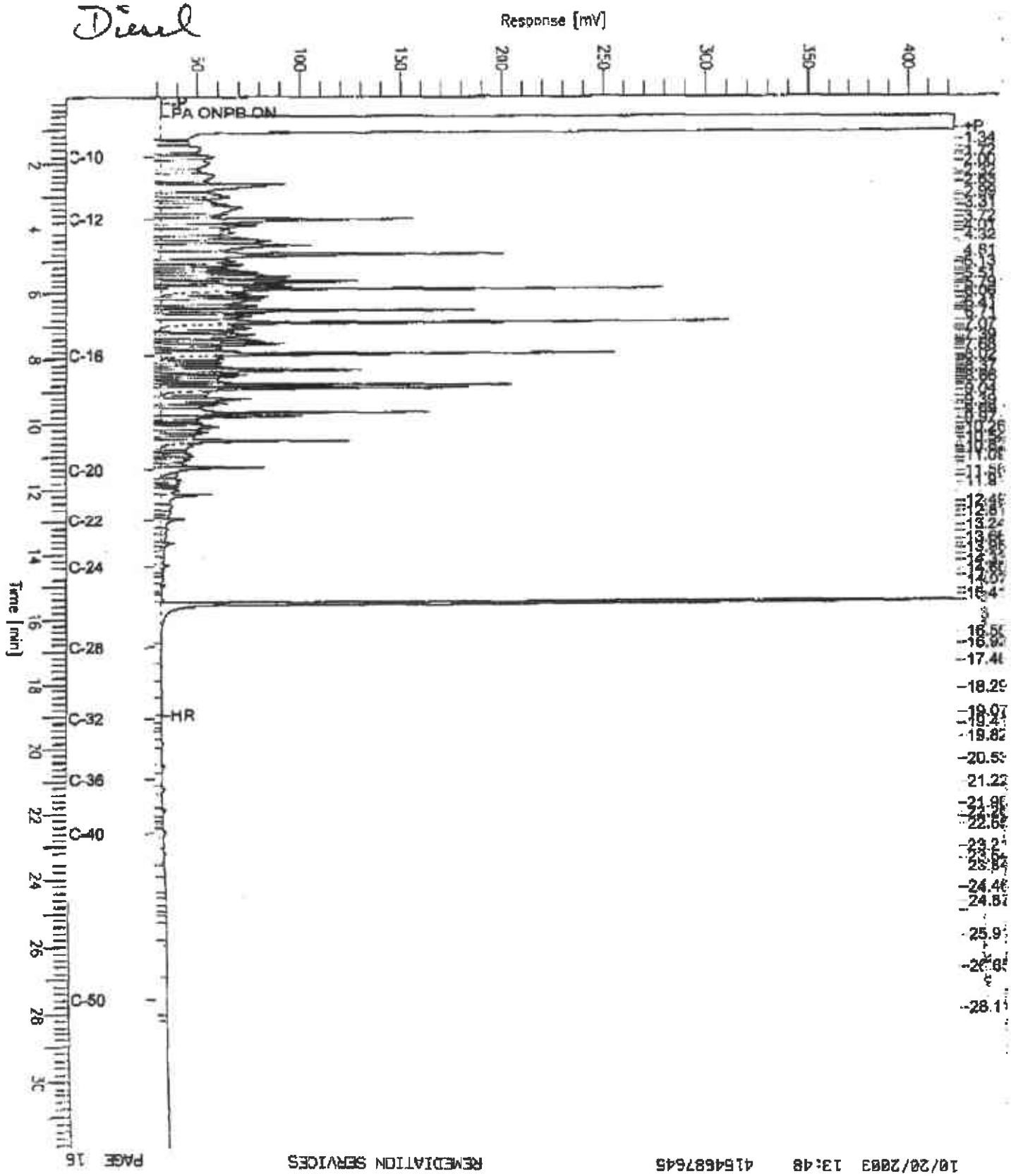


Chromatogram

Sample Name : ccv,03us1153,ds1
FileName : G:\GC13\CHB\2368002.RAW
Method :
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 29 mV

Sample $: 500mg/L Page 1 of 1
Date : 8/27/03 01:43 PM
Time of Injection: 8/24/03 03:51 PM
Low Point : 28.50 mV High Point : 422.92 mV
Plot Scale: 394.4 mV

Diesel

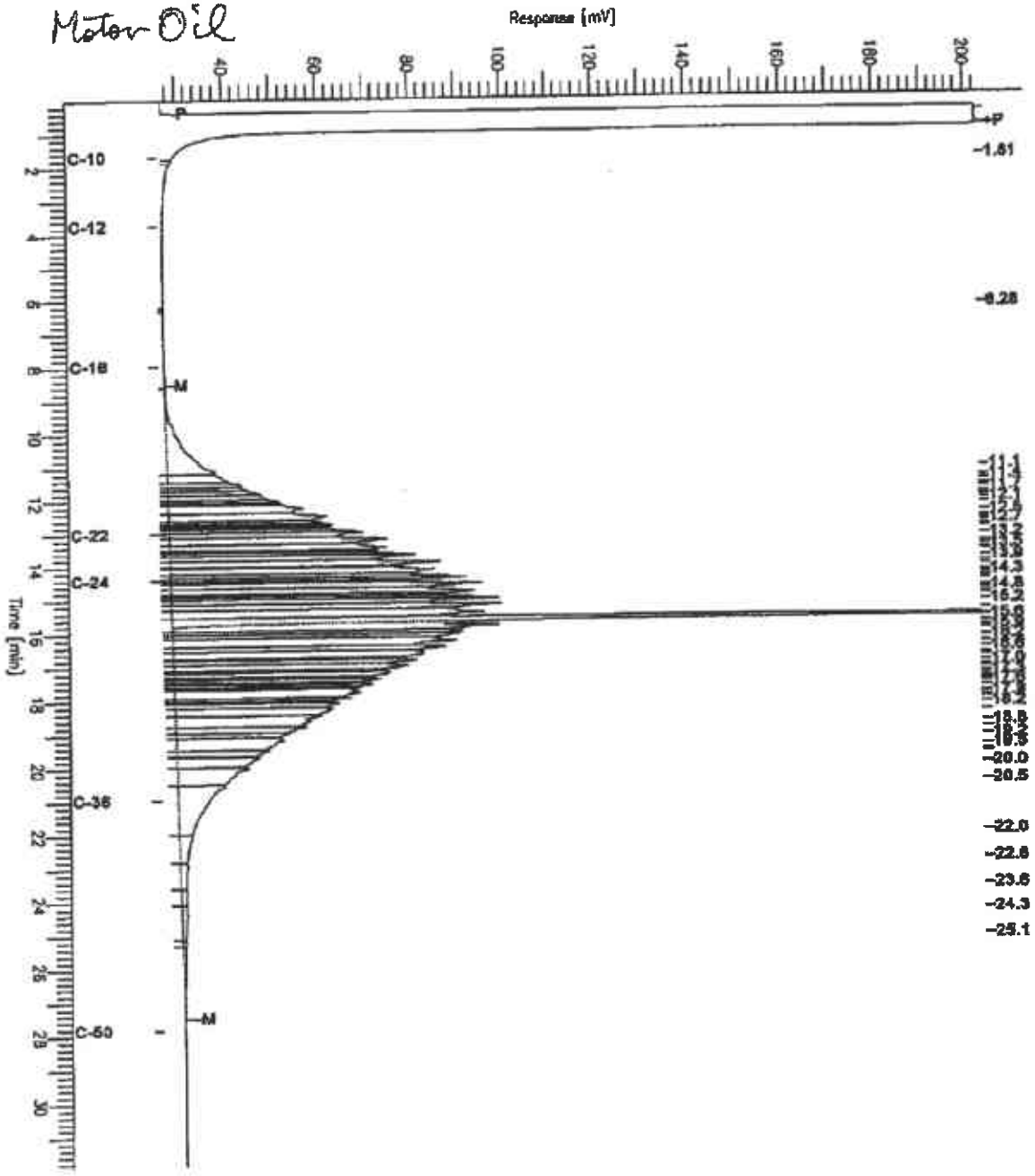


Chromatogram

Sample Name : ccv,03ma1225,ms
FileName : G:\SC11\CHA\236A003.RAW
Method :
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 26 mV

Sample 1: 500mg/L Page 1 of 1
Date : 8/28/03 11:03 AM
Time of Injection: 8/24/03 04:48 PM
Low Point : 26.25 mV High Point : 202.49 mV
Plot Scale: 176.2 mV

Motor Oil



CALIBRATION STANDARD – SET

for the determination of

mineral oil hydrocarbons
in environmental matrices

by means of gas chromatography

BAM	**KS**	**5002**	**Diesel Fuel**
BAM	**KS**	**5003**	**Lubricating Oil**
BAM	**CRM**	**5004**	**Diesel Fuel/Lubricating Oil (1:1)**

March 2000

The calibration standard – set contains 3 samples:

BAM KS 5002 diesel fuel (DK 1037, Deutsche Shell AG)
BAM KS 5003 lubricating oil (HVI 50, Deutsche Shell AG)
BAM CRM 5004 diesel fuel / lubricating oil (1:1), certified on the basis of mass ratio

Characterization of diesel fuel and lubricating oil:

BAM KS 5002 Diesel Fuel

Deutsche Shell AG	**result**	**method**
Density at 15°C	840,1 kg/m^3	DIN 51 757
Kinematic viscosity at 40°C	2,955 mm^2/s	DIN EN ISO 3104
Sulfur	0,044 % m/m	DIN EN ISO 14596
High Friquency Reciprocating Rig (HFRR)	363 µm	CEC F-06-A-96
Cetane number	51	DIN 51773
Cloudpoint	-2° C	DIN EN 23 015
Cold Filter Plugging Point (CFPP)	-17° C	DIN EN 116
BAM I.2	**result**	**method**
Water content (Karl Fischer)	0,004 ± 0.005 %	DIN 51 777
CHN	C: 86,44 ± 0,07 % H: 13,62 ± 0,32 % N: not detectable	BAM 1.2901/6.9
PCB	0,18 mg/kg	DIN 51527
EOX	< 10 mg/kg	BAM 1.2902/6.05
Sulfur	0,383 ± 0,003 g/kg	BAM 1.2902/6.13
$\leq C_{10}$-fraction	5,90 ± 0,21 %	GC/FID

The GC/FID-chromatogram is shown in fig.1.

BAM KS 5003 Lubricating Oil

Deutsche Shell AG	**result**	**method**
Density at 15°C	857,8 kg/m^3	DIN 51 757
Kinematic viscosity at 40°C	17,33 mm^2/s	DIN 51 562
Kinematic viscosity at 100°C	3,704 mm^2/s	DIN 51 562
Sulfur	0,136 % m/m	DIN EN ISO 14596
BAM I.2	**result**	**method**
Water content (Karl Fischer)	0,004 ± 0.005 %	DIN 51 777
CHN	C: 86,05 ± 0,78 % H: 14,13 ± 0,19 % N: not detectable	BAM 1.2901/6.9
PCB	0,12 mg/kg	DIN 51527
EOX	< 10 mg/kg	BAM 1.2902/6.05
Sulfur	1,212 ± 0,028 g/kg	BAM 1.2902/6.13
$\geq C_{40}$-fraction	0,17 ± 0,03 %	GC/FID

The GC/FID-chromatogram is shown in fig.2.

Preparation and characterization of the diesel fuel/lubricating oil mixture:

The mineral oils were weighed in the relation 1:1 (w/w) and the mass ratio was certified.

Certified values:

Diesel fuel / lubricating oil mass ratio: **1,00003**
Uncertainty of the dieseloil/lubricating oil mass ratio: **0,00006**
Relative uncertainty: **0,006 %**

Additional informations:

$\leq C_{10}$ – fraction	2,95 ± 0,11 %	GC/FID
$\geq C_{40}$ – fraction	0,09 ± 0,02 %	GC/FID

The GC/FID-chromatogram of the mixture is shown in fig.3.

GC-conditions for fig.1-3:

Injection technique:	on-column
Column:	BPX-5 (5m x 0,32mm ID x 1µm); deactivated precolumn (2m x 0,53mm ID)
Carrier gas:	Helium (1,5 ml/min)
Detector:	Flame ionization detector (FID), 360°C
Oven program:	50°C (isotherm: 3 min) up to 360°C (isotherm: 2 min); rate: 20°C/min

The calibration standard – set was prepared by BAM and checked on homogeneity and for loss of evaporation during storage. It is to be stored in darkness at room temperature. A certificate can be received on request.

Supplier of calibration standard – sets:

Federal institute for materials research and –testing (BAM)
Devision I.2
Richard-Willstätter-Str. 11
12489 Berlin
Tel.: +49 30 8104 1120
Fax.: +49 30 8104 1127

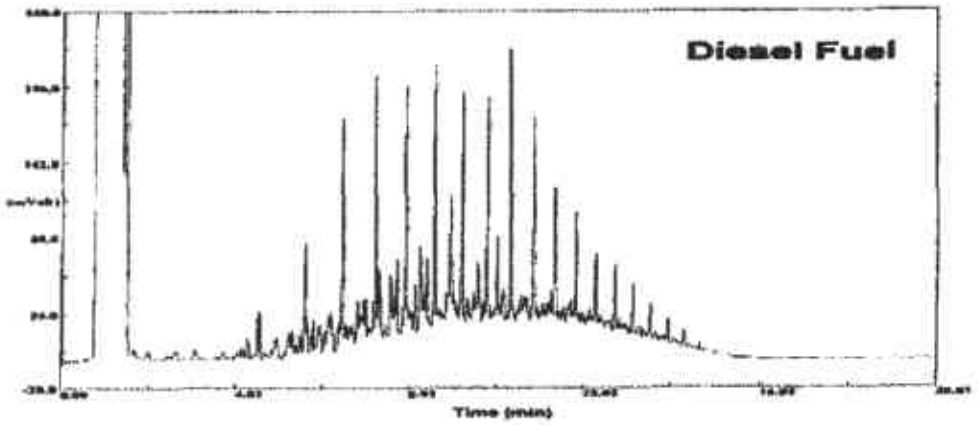


Fig.1: GC/FID-chromatogram of BAM KS 5002 Diesel Fuel

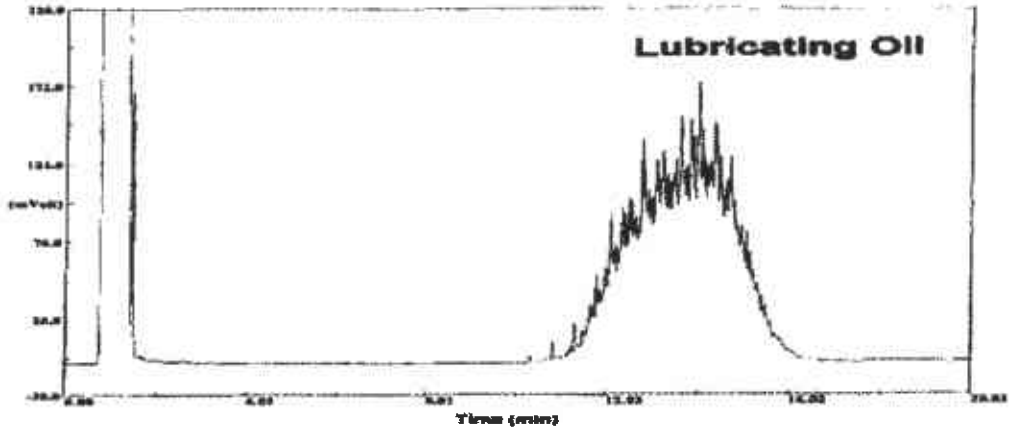


Fig.2: GC/FID-chromatogram of BAM KS 5003 Lubricating Oil

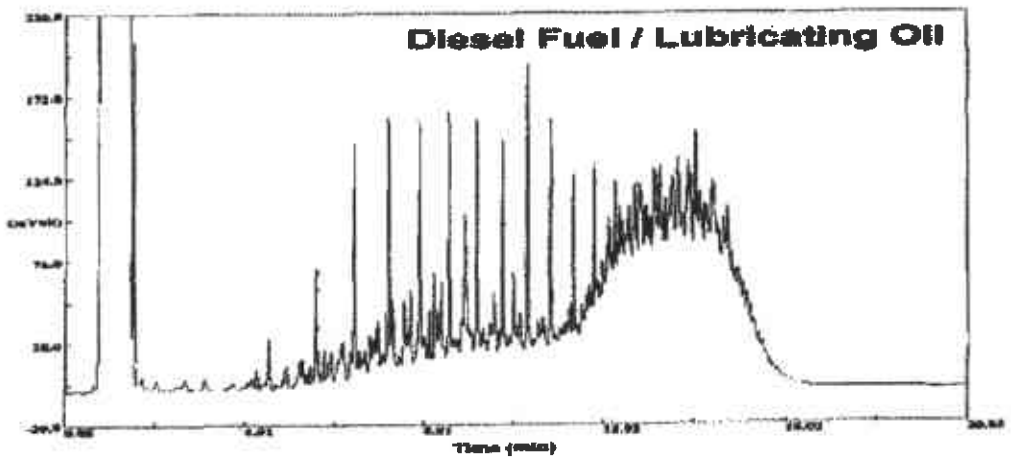


Fig.3: GC/FID-chromatogram of BAM CRM 5004 Diesel Fuel / Lubricating Oil (1:1)