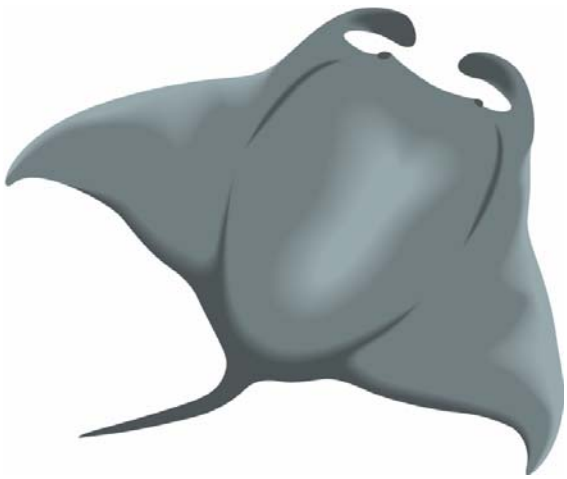
United States Air Force
15th Airlift Wing
Environmental Restoration Program

Final

TPH Action Level Derivation Report

Johnston Atoll



January 21, 2004

DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES

18 MAR 2005

MEMORANDUM FOR MR JEFF SCOTT
Waste Management Division
U. S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105

FROM: 15 CES/CEV
75 H Street
Hickam AFB HI 96853-5233

SUBJECT: Submittal of Final 2004 TPH Action Level Derivation Report, Johnston Atoll

1. The Air Force originally submitted a *Draft 2004 TPH Action Level Derivation Report* dated 21 January 2004. The draft version of the report was accepted by EPA as is, but a final version was never produced. To avoid confusion, we are submitting replacement pages to show that the document is final. The replacement pages will reflect the 21 January 2004 date as the date the report was finalized. Also included is a replacement for the CD that indicates the document on that disk is final.

2. Should you have any questions, please contact Mr. Jeffrey Klein Project Manager at (808) 449-1584, ext 225 or by email at jeffrey.klein@hickam.af.mil.

Ronnie D. Lanier
RONNIE LANIER
Acting Chief, Environmental Flight

2. Attachments:
1. Replacement pages for 2004 TPH Action Level Derivation Report
2. Replacement CD of 2004 Action Level Derivation Report

cc:
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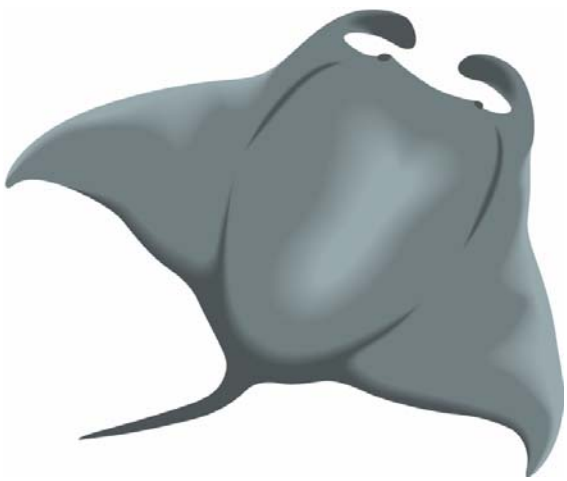
EXECUTIVE SUMMARY



January 21, 2004

Executive Summary

This TPH Action Level Derivation Report (Report) documents the development of site-specific action levels for total petroleum hydrocarbons (TPH) in soil and groundwater at solid waste management units (SWMUs) and areas of concern (AOCs) on Johnston Island where TPH has been identified as a constituent of concern (COC). This Report was prepared for the 15th Airlift Wing (15 AW) through the Air Force Center for Environmental Excellence (AFCEE) under Contract No. F41624-01-D-8545, Task Order No. 0051.

The approach used to develop site specific action levels for TPH was described in *Technical Memorandum No. 0051-01: Sampling and Analysis of Total Petroleum Hydrocarbons in Support of Deriving Action Levels for Johnston Island*. The TPH action levels recommended in this Report were developed using a systematic, risk-based approach on analytical data from soil and groundwater samples collected at Johnston Island between October 31 and November 2, 2003.

The *Hazardous Waste Corrective Action Permit Johnston Atoll Facility, EPA I.D. TT9 570 090 002* (the Permit) does not list an action level for TPH in groundwater. The Permit only addresses constituents associated with TPH (polycyclic aromatic hydrocarbons [PAHs] and benzene, ethylbenzene, toluene and xylenes [BTEX]) and specifies that mobile free product be removed. In addition, the U.S. Environmental Protection Agency (EPA) expressed concern that high levels of dissolved TPH constituents in groundwater other than PAHs and BTEX may pose an unacceptable risk to human and ecological receptors on Johnston Island through discharge to surface water in the lagoon.

As a result, an action level for dissolved TPH in groundwater protective of the surrounding marine environment has been developed in this Report. EPA's suggested value of 0.640 milligram per liter (mg/L) was found to be suitable for use at Johnston Island. This value has a relevant biological basis and appears to provide a sensitive indication of potential risk to the nearby marine ecosystem. Pursuant to EPA guidance, groundwater concentration data should be adjusted using a dilution attenuation factor to estimate groundwater concentrations at the shoreline. This overall approach should still be considered conservative, because it does not account for the dilution once groundwater mixes with seawater at the shoreline.

For soil, the current Permit lists TPH action levels of 2,000 milligrams per kilogram (mg/kg) in surface soil and 5,000 mg/kg in subsurface soil at SWMU No. 16/AOC No. 1. These soil TPH action levels are default values, rather than risk-based, and do not consider site-specific TPH characteristics. Recent soil investigation data indicate that the TPH action levels for surface and subsurface soil are likely overly restrictive for TPH constituents at Johnston Island. The soil data show that, although some relatively large areas of subsurface soil contain elevated TPH concentrations, the more soluble and toxic components of petroleum (that is, PAHs and BTEX) are not present in the soil or groundwater at concentrations greater than their risk-based action levels. Because of this, EPA has recently indicated that BTEX constituents may be dropped as COCs for soil on the island.

This Report recommends replacing the default TPH action levels with site-specific action levels that account for groundwater protection, potential impacts from direct soil contact by wildlife and people, and potential free product mobility. The range of site-specific TPH action levels developed for each potential migration or exposure pathway is as follows:

- Groundwater Protection—30,000 to 40,000 mg/kg
- Direct Soil Contact by Ecological Receptors—73,000 to 161,000 mg/kg
- Direct Soil Contact by Human Receptors—33,000 to 71, 000 mg/kg
- Free Product Mobility Limit—13,074 to 22,560 mg/kg

The action levels based on prevention of free product migration are the lowest of the pathways evaluated. As a result of site-specific characteristics (fuel types released, soil characteristics, and fuel weathering), the TPH in soil has both low toxicity and low potential for leaching to underlying groundwater (based on synthetic precipitation leaching procedure results for soil samples collected in areas with high TPH concentrations). Considering all these issues collectively, it is recommended that the free product mobility limit serve as a protective action level for TPH in soil at Johnston Island. The free product mobility limit selected for use as the action level, **17,181 mg/kg**, is based on input parameters representative of measured and observed subsurface conditions on Johnston Island. Given that there is no ongoing release of petroleum at any of the SWMUs or AOCs and historical product recovery efforts have depleted the amount of product to the point where it is unrecoverable, it is unlikely that there is sufficient driving force (head) to cause free product to migrate even at levels above this calculated value.

The Permit does not identify the analytical method to be used to quantify TPH in groundwater or soil at Johnston Island. Historically, EPA Method 8015, which uses gas chromatograph/flame ionization detector (GC/FID) techniques, has been employed. Although this analytical method is an adequate indicator for petroleum contamination, the results are not considered reliable for use in a regulatory decision-making context (for example, comparison to a specific action level). The difficulty of reliable quantitation stems from the fact that TPH is a complex mixture of hundreds of aliphatic and aromatic hydrocarbons of widely varying molecular weights and chemical properties. Because of the number of these compounds, traditional GC/FID methods, such as EPA Method 8015, have relied on aggregate integration of all gas chromatographic peaks within a relatively broad range of retention times, using a single and somewhat coarse analytical method. As a result, the TPH results can be biased by (1) incomplete peak resolution and (2) potential interferences from polar nonhydrocarbon compounds that may be naturally occurring or that, like carboxylic acids, may be the result of degradation and detoxification of the hydrocarbons. Because risk-based action levels are now going to be used in corrective action decisions for TPH in water and soil at Johnston Island, it is important that the data compared to these values reliably represent only petroleum compounds. The NWTPH-extractable petroleum hydrocarbon (EPH) and volatile petroleum hydrocarbons (VPH) analyses, which quantify petroleum as specific carbon-chain fractions linked to potential toxicity and mobility, are recommended for future sampling and data evaluation efforts.

The sum of EPH and VPH fractions in a sample would then serve as the overall TPH concentrations used in comparison to action levels.

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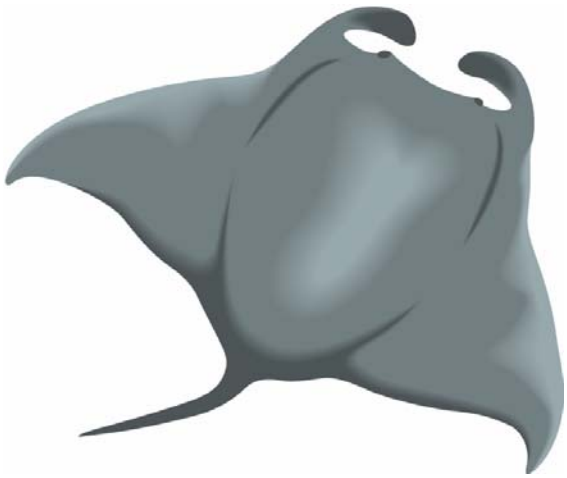

Prepared for: 15th Airlift Wing, Hickam Air Force Base, Oahu, Hawaii

Prepared by: CH2M HILL Constructors Inc., Honolulu, Hawaii

Contract No. F41624-01-D-8545
Task Order No. 0051

January 21, 2004

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Acronyms and Abbreviations

15 AW	15th Airlift Wing
AFCEE	U.S. Air Force Center for Environmental Excellence
AOC	Area of Concern
API	American Petroleum Institute
AVGAS	aviation gasoline
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
°C	degree Celsius
CAS	Chemical Abstracts Service
cm^2	square centimeter
COC	constituent of concern
CRWQCB	California Regional Water Quality Control Board
CSM	conceptual site model
d	Day
DAF	dilution attenuation factor
DO	dissolved oxygen
EC	elemental carbon
Ecology	Washington Department of Ecology
EFA	Engineering Field Activity
EPA	U.S. Environmental Protection Agency
ERBC	environmental risk-based concentration
FD	field duplicate
ft	foot
g/m^3	gram per cubic meter
gpm	gallon per minute
IC25	growth inhibition in 25 percent of the tested organisms
kg	kilogram
kg/d	kilogram per day
LD50	dose having 50 percent probability of causing death
LNAPL	light nonaqueous-phase liquid
LOAEL	lowest observed adverse effect level
m^3	cubic meter

MADEP	Massachusetts Department of Environmental Protection
mg/kg	milligram per kilogram
mg/kg-d	milligram per kilogram per day
mg/kg bw-d	milligram per kilogram body weight per day
µg/L	microgram per liter
mg/L	milligram per liter
mL	milliliter
MOGAS	motor gasoline
MS	matrix spike
mS/cm	milliSiemen per centimeter
MSD	matrix spike duplicate
MV	millivolt
N	normal sample
NAPL	nonaqueous-phase liquid
NOAEL	no observed adverse effect level
NTU	nephelometric turbidity unit
ODEQ	Oregon Department of Environmental Quality
OHM	OHM Remediation Services Corporation
ORP	oxidation-reduction potential
%	percent
PAH	polycyclic aromatic hydrocarbon
QA/QC	quality assurance/quality control
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation Report
RSN	Raytheon Services Nevada
SGCU	silica gel cleanup
SPLP	synthetic precipitation leaching procedure
SWMU	Solid Waste Management Unit
TB	trip blank
TPH	total petroleum hydrocarbons
TRV	toxicity reference value
USFWS	U.S. Fish and Wildlife Service
wk	week

1.0 Introduction

This TPH Action Level Derivation Report (Report) documents the development of site-specific action levels for total petroleum hydrocarbons (TPH) in soil and groundwater at Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) on Johnston Island where TPH has been identified as a constituent of concern (COC). This Report was prepared for the 15th Airlift Wing (15 AW) through the Air Force Center for Environmental Excellence (AFCEE) under Contract No. F41624-01-D-8545, Task Order No. 0051.

The units where TPH has been identified as a COC are listed in Module III of the *Hazardous Waste Corrective Action Permit Johnston Atoll Facility, EPA I.D. TT9 570 090 002* (the Permit) (U.S. Environmental Protection Agency [U.S. EPA], April 2003 [Effective May 30, 2002]). These units are as follows:

- SWMU No. 16/AOC No. 1—Power Plant Spill Site /Motor Gasoline [MOGAS] Area
- AOC No. 2/No. 3—Swimming Pool/Taxiway Area
- SWMU No. 15—Above-Ground JP-5 Storage Tanks

The TPH action levels proposed in this report are specifically linked to TPH composition information unique to soil and groundwater at Johnston Island and are intended only to support regulatory decision-making about future corrective action at Johnston Island. The action levels are not meant for use at other locations or for other purposes.

The approach used to develop site-specific action levels for TPH at Johnston Island was presented in *Technical Memorandum No. 0051-01: Sampling and Analysis of Total Petroleum Hydrocarbons in Support of Deriving Action Levels for Johnston Island* (CH2M HILL, October 2003). The TPH action levels presented in this report were developed using analytical data from soil and groundwater samples collected at SWMU No. 16/AOC No. 1 and AOC No. 2/No. 3 between October 31 and November 2, 2003.

1.1 Background and Objectives

Petroleum products were stored and used at the three units listed above. Petroleum releases have been identified at SWMU No. 16/AOC No. 1 and at AOC No. 2/No. 3. Consequently, TPH and possibly mobile free petroleum product are of concern in soil and groundwater at these units. Conditions at SWMU No. 15 have not been fully assessed because the unit is active.

The Permit does not list an action level for TPH in groundwater. Instead, the permit addresses constituents associated with TPH (that is, polycyclic aromatic hydrocarbons [PAHs] and benzene, toluene, ethylbenzene, and xylenes [BTEX]) and specifies that mobile free product be removed. However, there is concern that high levels of dissolved TPH constituents in groundwater (other than PAHs and BTEX) may pose an unacceptable risk to

ecological receptors on Johnston Island through discharge to surface water in the lagoon. As a result, EPA Region 9 has requested development of a risk-based action level for dissolved TPH in groundwater that is protective of the surrounding marine environment. In addition, because of the age and weathered nature of the petroleum at the units, EPA suggested that TPH concentrations in groundwater may be used to indicate whether elevated levels of TPH in subsurface soil are available to leach to groundwater and mobilize to the surrounding environment. To confirm this assumption, EPA suggested that soil leaching tests be conducted (that is, the synthetic precipitation leaching procedure [SPLP]), and the results compared with what is directly observed in groundwater.

The Permit does not identify the analytical method to be used to quantify TPH in groundwater or soil at Johnston Island. Historically, EPA Method 8015, which uses gas chromatograph/flame ionization detector (GC/FID) techniques, has been employed. According to Zemo and Foote (2003) and the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG, 1998), this analytical method can provide an adequate indication of the general nature and extent of petroleum contamination, but the results are not considered reliable enough for use in a regulatory decision-making context (for example, comparison to a specific action level). The difficulty of reliable quantitation stems from the fact that TPH is a complex mixture of hundreds of aliphatic and aromatic hydrocarbons of widely varying molecular weights and chemical properties. Because of the number of these compounds, traditional GC/FID methods, such as EPA Method 8015, have relied on aggregate integration of all gas chromatographic peaks within a relatively broad range of retention times, using a single and somewhat coarse analytical method. As a result, the TPH results can be biased by (1) incomplete peak resolution and (2) potential interferences from polar nonhydrocarbon compounds that may be naturally occurring or that, like carboxylic acids, may be the result of degradation and detoxification of the hydrocarbons. Because risk-based action levels are now going to be used in corrective action decisions for TPH in water and soil at Johnston Island, it is important that the data compared to these values reliably represent only petroleum compounds.

For soil, the Permit lists TPH action levels of 2,000 milligrams per kilogram (mg/kg) in surface soil and 5,000 mg/kg in subsurface soil at SWMU No. 16/AOC No. 1. These soil TPH action levels are default values, rather than risk based, and do not consider site-specific TPH characteristics. Recent soil investigation data for SWMU No. 16/AOC No. 1 and AOC No. 2/No. 3 indicate that the default TPH values for surface and subsurface soil are likely overly restrictive for TPH constituents at Johnston Island. The soil data show that, although some relatively large areas of subsurface soil contain elevated TPH concentrations, the more soluble and toxic components of petroleum (that is, PAHs and BTEX) are not present in the soil or groundwater at concentrations greater than their risk-based action levels (because of this, the EPA has recently indicated that BTEX constituents may be dropped as COCs for soil on the island). EPA agreed to consider replacing these default TPH values with site-specific action levels that account for potential impacts from direct contact by wildlife and people and that also consider free product mobility.

The objective of this report is to address and resolve issues that are crucial to making risk-based decisions about the need for and adequacy of remediation at Johnston Island SWMUs and AOCs where TPH is a COC. These crucial issues are as follows:

- Development of risk-based action levels and evaluation methods that take into account potential human and ecological exposure pathways on the island
- Identification of appropriate and unbiased analytical methods for quantifying TPH in groundwater and soil

1.2 Report Organization

This report is organized as follows:

- **Section 1, Introduction**—Presents the report background and objectives and describes the report organization.
- **Section 2, Conceptual Site Model**—Presents a generalized conceptual site model (CSM) that describes the potential human and ecological exposure pathways that were considered in the development of TPH action levels.
- **Section 3, Field Sampling Program**—Summarizes the field sampling activities for the collection of the soil and groundwater data used to develop action levels.
- **Section 4, TPH Analytical Methods**—Provides information about the sample preparation and analytical methods used to determine TPH concentrations in soil and groundwater.
- **Section 5, Groundwater Evaluation Results**—Presents the groundwater analytical data, identifies the risk-based action level, and describes the approach for evaluating TPH in groundwater at Johnston Island.
- **Section 6, Soil Evaluation Results**—Presents the soil analytical data, identifies risk-based action levels for relevant exposure pathways, and describes the approach for analyzing and evaluating TPH in soil at Johnston Island.
- **Section 7, Recommended TPH Action Levels and Evaluation Approaches**—Presents the recommended action levels for TPH in soil and groundwater and the approaches for analysis and evaluation of TPH results at Johnston Island.
- **Section 8, References**—Lists references cited in the report text and tables.
- **Tables**—Presents the tables cited in Sections 1.0 through 7.0.
- **Figures**—Presents the figures cited in Sections 1.0 through 7.0.
- **Appendices A and B**—Provide the test pit logs and sample records for soil and groundwater samples collected in support of TPH action level development.
- **Appendix C**— Contains the analytical results, including chromatograms, for soil and groundwater samples collected in support of TPH action level development.

2.0 Conceptual Site Model

Developing protective TPH action levels requires understanding of free product releases and the potential pathways of migration and exposure that exist for free product and TPH in groundwater and soil at Johnston Island. This section provides a generalized conceptual site model (CSM) for potential human and ecological exposure pathways. A schematic representation of the CSM is presented in Figure 2-1. The CSM provides a current understanding of the sources of contamination, physical setting, future island use, and groundwater and surface water beneficial uses and identifies potentially complete human and ecological exposure pathways for these sites.

2.1 Free Product Releases

Regulatory decision-making for petroleum-contaminated sites involves not only the petroleum hydrocarbons sorbed to soil or dissolved in groundwater, but also free product, or light nonaqueous-phase liquid (LNAPL), that has accumulated in the soil on top of the water table. Given a large enough release and under the right conditions, LNAPL could spread out laterally and begin to dissolve in the groundwater, creating a dissolved plume or discharge to surface water as free product. LNAPL is of concern, both as a separate phase that could affect surface water if discharged at the lagoon, and as potential continuing source of petroleum hydrocarbon compounds that could be leached to groundwater. The following subsections describe the current understanding of releases of petroleum at SWMU No. 16/AOC No. 1 and at AOC No. 2/No. 3.

2.1.1 SWMU No. 16/AOC No. 1

According to the Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (the RFI) (Raytheon Services Nevada [RSN], September 1994), between 20,000 and 100,000 gallons of hydrocarbon product, primarily diesel fuel, are estimated to have been lost to the subsurface in the Tank 49 area at SWMU No. 16. Product recovery systems, including wells, trenches, and a bioslurper system, were installed in the area to remove the product. According to the Draft Comprehensive Corrective Measures Study (OHM Remediation Services Corporation [OHM], January 2000), these systems recovered approximately 15,000 gallons of product through January 2000. Product removal slowed and eventually stopped as the amount of product in the area was depleted, even though measurable product remained in several wells at the site. Such behavior is typical of product recovery operations where there is no ongoing release; the near-zero recovery rates typically reflect depletion of free product saturation to the point at which the remaining free product is largely present as a discontinuous immobile residual with no driving force to cause it to migrate (American Petroleum Institute [API], 2003). Product was skimmed from open excavations during 2002 and 2003 soil remediation efforts, with approximately 1,678 gallons recovered during these operations. Product did not return to the excavations following skimming, providing further evidence that the driving force (head) behind the

free product is insufficient to overcome capillary pressure and allow migration. Although sheens have been observed in groundwater purged from monitoring wells on occasion, measurable free product has not been observed in wells at SWMU No. 16/AOC No. 1 since 2000.

2.1.2 AOC No. 2/No. 3

According to the RFI (RSN, September 1994), no documented spills occurred at the unit; however, evidence of releases has been observed in the soil at the site. Petroleum sheens have been observed in monitoring wells on occasion, but no evidence of a mobile or recoverable free product layer has been observed at AOC No. 2/No. 3.

2.2 Exposure Pathways

An exposure pathway can be described as the physical course that a chemical of potential concern (in this case, TPH) takes from the point of release to a receptor. For an exposure pathway to be complete, all of the following components must be present:

- Source
- Mechanism of chemical release and transport
- Environmental transport medium
- Exposure point
- Exposure route
- Receptor or exposed population

In the absence of any one of these components, an exposure pathway is considered incomplete and, by definition, there is no risk or hazard.

2.2.1 Sources, Release Mechanisms, and Environmental Transport Media

Sources of petroleum at SWMU No. 16/AOC No. 1 include releases of diesel fuel, JP-5, and possibly motor gasoline (MOGAS) from leaking above-ground storage tanks and piping. Sources of petroleum at AOC No. 2/No. 3 include possible releases of aviation gasoline (AVGAS) and diesel fuel from leaking tanks and pipelines.

The following are the suspected release mechanisms for transporting the TPH from the source, via environmental media, to potential receptors:

- Infiltration, percolation, and leaching of contaminants from each release area to shallow groundwater, with subsequent discharge to surface water (that is, Pacific Ocean lagoon areas)
- Migration of LNAPL, if present above the residual saturation levels indicative of free product mobility

- Direct contact with soil containing TPH (receptor contact with onsite surface or subsurface soil)

2.2.2 Potentially Complete Human Exposure Pathways and Receptors

Based on a current understanding of future land and water uses at Johnston Island, potentially complete human health exposure pathways considered most plausible are as follows:

- Incidental ingestion of and dermal contact with onsite surface soil[1] by future workers (for example, the Refuge Manager) that live on island year round
- Incidental ingestion of and dermal contact with onsite surface soil[1] by future site visitors, on an intermittent basis

It is not anticipated that small children (such as included in a standard default residential exposure scenario) will live on island in the future. Rather, any residents would be limited to adults (Refuge Manager and other U.S. Fish and Wildlife Service [USFWS] staff).

2.2.3 Potentially Complete Ecological Exposure Pathways and Receptors

Based on a current understanding of present and future terrestrial and marine ecosystems at Johnston Island, the potentially complete ecological exposure pathways considered most plausible for the site are the following:

- Direct exposure of aquatic resources (for example, fish and invertebrates) to TPH present in groundwater that could move and discharge to the nearby lagoons
- Incidental ingestion of and dermal contact with onsite surface soil[1] by piscivorous birds using upland areas

[1] Although surface soil exposure was assumed, analytical data from subsurface samples were also evaluated under this exposure scenario to ensure conservatism. Note that the highest concentrations of TPH occur predominantly in subsurface soil at the capillary fringe (typically 4 to 7 feet below ground surface [bgs]). Most surface soil is unaffected by TPH.

3.0 Field Sampling Program

The soil and groundwater sampling program proposed in *Technical Memorandum No. 0051-01: Sampling and Analysis of Total Petroleum Hydrocarbons in Support of Deriving Action Levels for Johnston Island* (CH2MHILL, October 2003) was conducted by CH2M HILL personnel October 31 through November 2, 2003. All samples were collected as planned (monitoring well T49-MW05 was found to be usable for sampling; therefore, no surface water sample was collected from the excavation at SWMU No. 16). Sample locations at SWMU No. 16/AOC No. 1 and AOC No. 2/No. 3 are shown in Figures 3-1 and 3-2, respectively.

Sample identification numbers, sample dates, and requested preparation and analytical methods for each groundwater and soil sample are listed in Tables 3-1 (groundwater samples) and 3-2 (soil samples). Field parameters monitored during groundwater sampling are listed in Table 3-3. Test pit logs and sample records are provided in Appendices A and B.

4.0 TPH Analytical Methods

The analytical measurement of TPH has evolved considerably in recent years. The difficulty of reliable quantitation stems from the fact that TPH is a complex mixture of hundreds of aliphatic and aromatic hydrocarbons of widely varying molecular weights and chemical properties. Because of the number of these compounds, traditional GC/FID methods such as EPA Method 8015 have relied on aggregate integration of all gas chromatographic peaks within a relatively broad range of retention times, using a single and somewhat coarse analytical method. As noted in *Guidance for Petroleum Hydrocarbon Analysis* (California Environmental Protection Agency, October 1999), any organic compound will cause an FID response and will be included in the petroleum hydrocarbon result derived from the total chromatographic peak area if it elutes in the GC retention time window (carbon range) defined by the method. Polar biogenic compounds such as carboxylic acids can be significant interferences in hydrocarbon chromatography and may be present due to biodegradation of the petroleum contamination (California State Water Control Board, April 2002).

As a result, these traditional GC/FID methods can be biased by (1) incomplete peak resolution and (2) potential interferences from polar nonhydrocarbon compounds that may be naturally occurring or that may be the result of degradation and detoxification of the hydrocarbons (Zemo and Foote, 2003). Use of such TPH data can be misleading in decisions about the need for, or adequacy of, remediation. More recent methods have attempted to address these biasing influences by using sample cleanup protocols (for example, silica gel) and better chromatographic protocols to segregate hydrocarbon fractions of interest (for example, solvent exchange methods). An added benefit of these newer approaches is that the relative abundance of carbon fractions can be quantified. Because aged petroleum contains fewer of the higher toxicity components (that is, shorter chain aliphatics and aromatics), these fractionation methods can provide more realistic and informed risk assessments to support more reliable cleanup decisions.

To evaluate applicable action levels for TPH in groundwater and soil samples at Johnston Island, the following three TPH preparation and analytical methods were used:

1. The traditional TPH methods for diesel and gasoline-range organics (Methods NWTPH-Dx and NWTPH-Gx) using GC/FID.
2. These same TPH methods, except using a silica gel cleanup protocol to remove polar nonpetroleum interferences prior to GC/FID analysis (used only for NWTPH-Dx analysis), as recommended by Zemo and Foote (2003).
3. TPH using a carbon-chain fractionation approach for volatile and extractable petroleum hydrocarbons (Methods NWTPH-VPH and NWTPH-EPH). The NWTPH-EPH method requires use of silica gel treatment prior to GC/FID analysis in order to separate and quantify the different carbon chain fractions.

The first of these methods was included to provide comparability with historic EPA Method 8015 TPH measurements during past Johnston Island site investigations. The second method was employed to provide a more accurate quantification of actual petroleum constituents by removing the confounding influence of polar nonhydrocarbon interferences. Recent studies by Zemo and Foote (2003) indicate that nontarget polar compounds are included in traditional measurements of TPH, due to the nonspecificity of the protocol and lack of cleanup procedures to remove these compounds. These interfering nontarget compounds include natural organic compounds and petroleum biodegradation products. Zemo and Foote showed that TPH analysis following the silica gel cleanup step provided a more technically appropriate representation of actual aliphatic and aromatic hydrocarbons in a sample.

The third type of analytical method employed (the fractionation methods VPH and EPH) was included to provide the most realistic quantification of specific carbon fractions, allowing specific application of surrogate toxicity factors for human and ecological risk assessment. Several state agencies, such as the Oregon Department of Environmental Quality (ODEQ) (September 2003), Washington Department of Ecology (Ecology) (June 1997), and Massachusetts Department of Environmental Protection (MADEP) (October 2002) use results from these fractionation methods in regulating petroleum releases. In general, these agencies consider the total sum of hydrocarbon fractions using these newer methods to serve in the same way as the historic TPH has.

5.0 Groundwater Evaluation Results

Groundwater samples from four wells were collected at SWMU No. 16/AOC No. 1 (plus one duplicate), and four wells at AOC No. 2/No. 3. Sample locations are shown in Figures 3-1 and 3-2. The samples were analyzed using the preparation and analytical methods listed in Table 3-1. Groundwater analytical results reported by the laboratory were reviewed and validated according to AFCEE protocols. The results for groundwater samples are listed in Table 5-1. Copies of the laboratory reports are provided in Appendix C.

The analytical data for groundwater were compiled and evaluated in several different ways in order to better understand the results. These evaluations provided information about the key issues related to TPH in groundwater, including the effects of different preparation/analytical methods on sample results (Section 5.1), TPH compositions at each unit (Section 5.2), action level development (Section 5.3), and the approach for evaluating groundwater data using the action level (Section 5.4).

5.1 Comparison of TPH Preparation/Analytical Methods for Groundwater

As expected, the different preparation and analytical methods yielded a variety of TPH results. The following summarizes the findings of the evaluation of methods:

- NWTPH-Dx results for diesel-range organics without silica gel cleanup were typically higher than NWTPH-Dx results for diesel-range organics with silica gel cleanup. The "background sample" collected at T49-MW05 also exhibited a reduced concentration with silica gel cleanup preparation. In one case, T49-MW06, the silica gel cleanup result for diesel-range organics (1.49 mg/L) was slightly higher than the result without silica gel cleanup (1.36 mg/L), but these two results are within normal analytical variance and therefore indistinguishable.
- NWTPH-Dx lube oil range organics were detected in all samples without silica gel cleanup preparation, but were not detected in most of the samples prepared with silica gel cleanup. In cases where lube oil was detected in samples with silica gel cleanup preparation, the values were less than the values without silica gel cleanup preparation.
- Filtering with a 0.45-micron glass filter prior to NWTPH-Dx analysis, both with and without silica gel cleanup, was conducted on samples from four monitoring wells. Although filtering tended to reduce the concentration of diesel-range organics in most samples (both with and without silica gel cleanup), the results were variable and inconclusive and are not considered further in the evaluation of groundwater TPH reported in this document.

- Total NWTPH-EPH results (calculated as the total of the detected carbon fractions in the diesel and lube oil range; see Table 5-1) for most samples were very similar to the results reported for NWTPH-Dx with silica gel cleanup. Exceptions include the sample collected at T49-MW15 (and its duplicate) and the sample collected at T49-MW06; in both cases the NWTPH-Dx with silica gel cleanup results were more than two times the total EPH values. The differences seen in these three samples can be explained by the greater efficiency of the EPH method in removing the influence from nonpetroleum interferences.[2]

- Total NWTPH-VPH results (calculated as the total of the detected carbon fractions in the gasoline range; see Table 5-1) varied in comparison to the NWTPH-Gx results. Gasoline-range organics were detected using the NWTPH-VPH method in all nine samples, whereas they were detected in only four of the nine samples using the NWTPH-Gx method. In some cases the VPH results were higher than the detected results for NWTPH-Gx; in other cases the values were lower, but the results were generally in the same range.

- TPH concentrations calculated as the sum of EPH and VPH (see Table 5-1) were all less than or similar to corresponding TPH concentrations calculated as the sum of NWTPH-Gx and NWTPH-Dx .

The groundwater TPH results are consistent with the findings of Zemo and Foote (2003) and indicate that some biasing interferences exist when measuring TPH in groundwater using the traditional method (without silica gel cleanup). Chromatograms for the NWTPH-Dx analyses both without and with silica gel cleanup and NWTPH-EPH analyses for groundwater samples collected at two of the wells (T49-MW07 and SWM-MW22) are presented in Figure 5-1. In both samples, the "TPH-Dx Without Silica Gel Cleanup" chromatograms include large, unresolved, complex-mixture humps. According to Zemo and Foote (2003), such humps typically indicate interference by polar nonhydrocarbons resulting from natural organics or biodegradation products. The humps are significantly reduced on the "NWTPH-Dx With Silica Gel Cleanup" chromatograms and are absent on the "NWTPH-EPH" chromatograms. The removal of the unresolved complex mixture hump through silica gel cleanup is not a phenomenon that is limited to samples collected at T49-MW07 and SWM-MW22; similar changes were observed in chromatograms for all groundwater samples collected as part of this study (see Appendix C). The humps are largest in samples collected from wells where high concentrations of TPH, but low levels of BTEX and PAHs, have been reported in the soil, indicating that significant weathering and biodegradation of the petroleum has occurred.

Diesel spike recovery results for groundwater samples analyzed under the NWTPH-Dx protocols (both without and with silica gel cleanup) were obtained from the laboratory in order to confirm that the silica gel cleanup procedure was not inadvertently removing petroleum hydrocarbon compounds that should be included in the TPH concentration for a sample. The premise behind this comparison is that, if silica gel removes target petroleum

[2] The silica gel cleanup step during the EPH procedure incorporates about 30 grams of silica gel, whereas the NWTPH-Dx method used less than 1 gram. The three samples noted contained the highest concentrations of "diesel and lube oil range" as measured by NWTPH-Dx, suggesting "breakthrough" of polar nonhydrocarbon compounds through the more limited amount of silica gel used for cleanup during analysis.

compounds, then the recovery of a petroleum spike will be lower when using silica gel than when not. Diesel spike recovery data for the laboratory over the last 6 months show that the mean percent recovery for 104 samples treated with silica gel (79.1 percent) was statistically indistinguishable from the mean percent recovery for 73 samples that were not treated with silica gel (80.2 percent). These results are consistent with the spike recovery results from the current investigation, where the recovery without silica gel averaged 77.0 percent and the recovery with silica gel averaged 79.5 percent. This means that the silica gel cleanup step does not remove petroleum hydrocarbons that should be measured during NWTPH-Dx analysis.

TPH concentrations for samples subjected to silica gel cleanup are most suitable for determining the amount of dissolved TPH in groundwater at a site. Because of the improved resolution of chromatographic peaks and the greater treatment capacity of silica gel cleanup in the fractionation method (using 30 grams silica gel versus 1 gram used for the NWTPH-Dx analysis), the results of TPH calculated as the sum of EPH and VPH likely provide the most reliable representation of TPH and should be used in comparison to action levels. Such an approach to calculating the overall TPH concentration for a sample is supported by ODEQ, Ecology, and MADEP. In general, these agencies consider the total sum of hydrocarbon fractions using fractionation methods to serve in the same way for regulating as the historic TPH has.

5.2 Evaluation of TPH Composition in Groundwater

Because the history of petroleum uses and releases are reported to be somewhat different between SWMU No. 16/AOC No. 1 and AOC No. 2/No. 3, the TPH fractionation results were initially evaluated to define the relative composition of specific aliphatic and aromatic fractions for each of these areas. The purpose was to determine the relative uniformity of composition at a given release area. The relative composition of the groundwater TPH is influenced by the types of fuels released and the degree of weathering since release.

For each well, the analytical result for each aliphatic and aromatic fraction was plotted as the percent contribution of each fraction to the TPH (calculated as the sum of VPH and EPH). The results for groundwater samples from SWMU No. 16/AOC No. 1 (wells T49-MW05, -MW06, -MW07, and -MW15) are shown in Figure 5-2. The pattern of TPH composition was slightly variable between wells in the SWMU No. 16/AOC No. 1 area. For wells T49-MW06 and T49-MW15, the aromatic hydrocarbons comprised more than half of the TPH (ranging from 66 to 78 percent of the total), whereas for T49-MW05 and T49-MW07 the aromatic hydrocarbons comprised less than half of the TPH (ranging from 45 to 47 percent of the total). The C12-C13 aromatic fraction notably constituted the primary fraction in all wells in this area. There was a general absence of the more toxic C5-C6, C6-C8, and C8-C10 aliphatics in these wells.

The results for well samples at AOC No. 2/No. 3 are shown in Figure 5-3. The pattern of TPH composition in this area was different from that seen at SWMU No. 16/AOC No. 1, with the exception of FW-MW03D (which is located upgradient from the former tank farm at the Swimming Pool), where the pattern was very comparable (low-range aliphatics

absent, dominant contribution for C12-C13 aromatic fraction). The remaining wells (SWM-MW20, -MW21, and -MW22) all showed a greater contribution from the C5-C6 and C6-C8 aliphatic fractions than what was seen at SWMU No. 16/AOC No. 1.

The groundwater TPH fraction patterns seen indicate that the types of releases at SWMU No. 16/AOC No. 1 were somewhat different from those at AOC No. 2/No. 3 (except at FW-MW03D) and/or have undergone a different degree of degradation. The general absence of the more toxic shorter chain aliphatic hydrocarbons at the SWMU No. 16/AOC No. 1 area is fortunate, considering the proximity of this area to the lagoon shoreline.

5.3 Groundwater Action Level

During a September 17, 2003, teleconference between EPA and the Air Force, EPA suggested that a TPH concentration value of 640 micrograms per liter (µg/L) (0.640 mg/L) could serve as a suitable action level for groundwater TPH. This value was derived as a Final Groundwater Screening Level by the California Regional Water Quality Control Board (CRWQCB), San Francisco Bay Region, in *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, Interim Final, July 2003. The basis of this value is marine bioassay testing conducted during investigation of the San Francisco International Airport under Regional Water Quality Board Order No. 99-045. These testing results were reviewed to determine their applicability for Johnston Island.

The toxicity testing supporting the value included a chronic 7-day exposure of the marine shrimp *Mysidopsis bahia* to six concentrations of fresh Jet Fuel A. The toxic endpoints evaluated included survival and growth over the duration of exposure. A concentration of 640 µg/L was identified as the IC25 (growth inhibition in 25 percent of the tested organisms). Based on the bioassay endpoints and the type of fuel tested, it is believed that the derived value of 640 µg/L provides a suitable action level for Johnston Island, based on the following considerations:

- The test organism (*Mysidopsis bahia*) is an invertebrate, representing a potentially sensitive indicator of invertebrates existing in the offshore lagoon areas at Johnston Island.
- The toxicity test used chronic conditions of exposure.
- The toxic endpoint included a sensitive sublethal effect (growth).
- The test organisms were exposed to fresh Jet Fuel A, rather than the weathered (and likely less toxic) petroleum that exists at Johnston Island.

5.4 Groundwater Evaluation Approach

Because the samples collected at the monitoring wells are groundwater and the action level is intended to be protective of surface water, evaluation of groundwater data must consider the potential effects of dilution and attenuation on the TPH concentration in groundwater as

it migrates to surface water. The groundwater evaluation approach developed for Johnston Island includes use of dilution attenuation factors (DAFs) that are based on the distance between the sampled well and the nearest shoreline to approximate changes in TPH concentration as the plume travels to the shoreline. For well points that are less than 100 feet to the island shoreline, a DAF of 1 was conservatively assumed (that is, no attenuation). For those greater than 100 feet away, a DAF equal to one percent of the distance to the shoreline was assumed (for example, if a well was 300 feet from the shoreline, groundwater TPH concentrations at the sediment interface were assumed to be one-third the level measured at the well, giving a DAF of 3). This method for estimating a DAF was identified in CRWQCB San Francisco Bay Region Order No. 99-045 and recommended by EPA in an October 17, 2003, e-mail to the Air Force.

As an example of how DAF would be employed at Johnston Island, the overall TPH results for each groundwater sample collected as part of the TPH study are compared to the surface water-based action level in Table 5-2.

- Dissolved TPH values determined using the traditional TPH method (without silica gel cleanup prior to analysis) exceeded the action level in three samples (T49-MW15, its duplicate, and T49-MW07) when DAF is accounted for.
- Dissolved TPH values that were determined using the traditional TPH method including silica gel cleanup preparation prior to NWTPH-Dx analysis exceeded the action level in only one of the nine samples (the duplicate collected at T49-MW15, but not the original sample) when DAF is accounted for.
- All total dissolved TPH values that were determined using the sum of EPH and VPH results reported from fractionation analysis were lower than the action level.

As previously noted, the results of TPH calculated as the sum of EPH and VPH (that is, TPH C as listed in Table 5-2) likely provide the most reliable representation of dissolved TPH in groundwater. This is due to the improved resolution of chromatographic peaks and the more efficient silica gel cleanup used during the EPH analysis. Under the assumptions made for this evaluation (for example, action level used, DAFs used), these results show that the reported TPH concentrations in groundwater at SWMU No. 16/AOC No. 1 and AOC No. 2/No. 3 are not likely to have adverse effects on the nearby marine ecosystem.

Future groundwater monitoring for TPH at Johnston Island should use NWTPH-EPH and NWTPH-VPH for analysis of TPH and incorporate the appropriate DAF when comparing the overall TPH concentration to the recommended action level.

6.0 Soil Evaluation Results

Soil samples from four locations were collected at SWMU No. 16/AOC No. 1 (plus one duplicate), and four locations at AOC No. 2/No. 3. The SPLP extraction was conducted on two of the soil samples from SWMU No. 16/AOC No. 1 at locations near the lagoon. Sample locations are shown in Figures 3-1 and 3-2. All samples were collected at depths corresponding to the capillary fringe, the interval where most of the elevated concentrations of TPH are reported. Table 3-2 lists sample depths, preparation, and analytical methods. Soil analytical results reported by the laboratory were reviewed and validated according to AFCEE protocols. The results for soil samples are listed in Table 6-1. The results for SPLP leachate samples are listed in Table 6-2. Copies of the laboratory reports are provided in Appendix C.

The analytical data for soil were compiled and assessed using several evaluation methods. These evaluations provided information about the key issues related to TPH in soil, including the effects of different preparation/analytical methods on sample results (Section 6.1), TPH compositions at each unit (Section 6.2), action level development (Section 6.3), and the approach for evaluating soil data using the action level (Section 6.4).

6.1 Comparison of TPH Preparation/Analytical Methods for Soil

As shown by the results summarized in Table 6-1, TPH concentrations in soil were similar when measured by any of the three analytical methods used. This consistency contrasts with the results seen for groundwater, likely due to the apparent absence of significant interferences from polar nonhydrocarbon compounds in soil. Because of the weathered condition of TPH releases at Johnston Island, any polar compounds have likely already leached to groundwater; the effect of polar nonhydrocarbons on groundwater results was described in Section 5.0.

6.2 Evaluation of TPH Composition in Soil

The history of petroleum uses and releases is reported to be somewhat different between SWMU No. 16/AOC No. 1 (mostly diesel) and AOC No. 2/No. 3 (diesel and AVGAS). The TPH fractionation results were initially evaluated to define the relative composition of specific aliphatic and aromatic fractions for each of these areas. The purpose was to determine the relative uniformity of composition at a given release area, and to compare the composition between the two areas. The relative composition of the soil TPH is determined by the types of fuels released and the degree of weathering since the fuel was released to the environment.

The analytical result for each aliphatic and aromatic fraction was plotted as the percent contribution of each fraction to the TPH (calculated as the sum of VPH and EPH). The results for soil samples from SWMU No. 16/AOC No. 1 (samples T49-TP101, -TP102, -TP102 (duplicate), -TP103, and -TP104) are shown in Figure 6-1 . The pattern of TPH composition is relatively consistent across the SWMU No. 16/AOC No. 1 area. As expected, the results indicate that the TPH is predominantly composed of the less mobile and less toxic longer chain fractions (C12-C16, C16-C21, and C21-C34). The aliphatics comprised 77 to 84 percent of the TPH. The patterns seen indicate that the releases at this location were heavy-range fuels and/or have undergone significant weathering. There is an absence of the more mobile and toxic short-chain fractions.

The results for soil samples at AOC No. 2/No. 3 are shown in Figure 6-2. Because two of the samples had very low concentrations of TPH (samples SWM-TP103 and -TP105), only samples with TPH concentrations exceeding 100 mg/kg (samples SWM-TP101, -TP102, and -TP104) were plotted. As seen at SWMU No. 16/AOC No. 1, the pattern of TPH composition is predominantly composed of the longer chain fractions. A notable difference is the contribution of the aromatic C12-C13 fraction in samples SWM-TP101 and -TP102 (the two highest TPH samples). In these two samples, the aliphatics comprised about 65 percent of the TPH, slightly lower than seen at SWMU No. 16/AOC No. 1.

6.3 Soil Action Level

The most plausible migration and exposure pathways for TPH in soil, as identified in the CSM (Section 2), were evaluated to identify protective action levels for soil TPH at Johnston Island. These exposure pathways are as follows:

- Potential TPH leaching from soil to underlying groundwater
- Potential direct contact by ecological receptors (seabirds) using Johnston Island in the future
- Potential direct contact by human receptors (refuge workers) living on Johnston Island in the future
- Potential migration of NAPL to the surrounding lagoon

These pathways are evaluated in the following subsections. An action level was derived for each of these pathways, and the lowest (most protective) action level was recommended as the action level for soil TPH at these sites.

6.3.1 TPH Leaching from Soil to Groundwater

The potential for leaching of TPH from soil to groundwater was empirically determined by extracting soil using the SPLP test and analyzing the extract using the same procedures as used for groundwater samples. This extraction procedure is specifically intended to evaluate the potential for leaching, under natural conditions, from infiltration of precipitation into the underlying shallow groundwater. The use of this procedure for petroleum, however, could overestimate the soluble portion of soil TPH as a result of

possible physical suspension of oil during the 18-hour tumbling of the soil sample with extraction fluid during the procedure. The results should therefore be considered for screening purposes.

The SPLP extraction was conducted on two soil samples from the SWMU No. 16/AOC No. 1 area (samples T49-TP101 and -TP104) because of the proximity of this area to the nearby shoreline. Because one of these samples (T49-TP104) was determined to contain the maximum detected soil TPH of 39,460 mg/kg (calculated as the sum of VPH and EPH), the results are considered to represent high-end conditions for Johnston Island. The results, provided in Table 6-2, indicate that the extract TPH concentrations (calculated as the sum of VPH and EPH) for both samples were below the surface water action level of 0.640 mg/L. The extract TPH concentrations were higher when analyzed using the traditional TPH method, both with and without silica gel cleanup.

The SPLP extraction results (Table 6-2) are supported by the analytical results seen from direct measurement of TPH in groundwater (Table 5-1). The range of soluble TPH in the SPLP extracts was 0.085 to 0.515 mg/L, compared to the soluble TPH levels seen in groundwater at the SWMU No. 16/AOC No. 1 area, ranging from 0.227 to 1.016 mg/L.

To estimate the extractable percentage of TPH from soil, the concentration in the extract from the maximum TPH soil at location T49-TP104 was multiplied by 20 (the liquid-to-solid ratio implicit in the extraction procedure) to calculate the mass of TPH extracted. The mass of TPH extracted was calculated to be 12.8 grams from each kilogram of soil (0.515 mg TPH/liter x 20 liter extract/kilogram soil) at this sample location. These results indicate that only a very small percentage (0.026 percent) of the TPH (calculated as the sum of VPH and EPH) in soil is extractable:

$$12.8 \text{ mg/kg} \div 39{,}460 \text{ mg/kg} = 0.026\%$$

For the SPLP TPH result measured using the traditional TPH method (plus silica gel cleanup), the extractable amount is only slightly higher, estimated to be 0.04 percent. This low percentage of extractable TPH indicates that levels of soil TPH as high as 39,460 mg/kg are still protective of groundwater when TPH is defined as the sum of VPH and EPH. Even if the traditional method of measuring TPH (with silica gel cleanup) is considered to yield a reliable TPH result, the amount of extractable TPH (0.834 mg/L at location T49-TP104) only exceeds the surface water action level of 0.640 mg/L by 30 percent. If a soil TPH concentration of 39,460 mg/kg yields an extract TPH concentration of 0.834 mg/L, then, by prorating this result (that is, multiplying the groundwater to surface water action level of 0.640 mg/L by the result of 39,460 mg/kg ÷ 0.834 mg/L), a soil TPH concentration of 30,000 mg/kg would be expected to be protective of groundwater (assuming that the extractable percentage is constant over a range of higher soil TPH concentrations).

6.3.2 Direct Contact by Ecological Receptors

Once buildings and other structures at Johnston Island are demolished, upland areas will become more accessible to seabird populations**.** Therefore, a TPH action level was calculated based on protection of these receptors. Potential ecological risk to the brown booby (*Sula leucogaster*) was used in the development of the TPH action level for ecological exposure. The brown booby was selected because this avian receptor was identified as a

receptor of ecological concern for SWMU-specific risk assessments prepared for Johnston Island.

The following equation was used to estimate the ecological risk-based concentration (ERBC) as a potential action level for TPH:

$$ERBC = \frac{BW \times TRV}{\sum\left[\left(Frac_s \times DFI\right) + \left(Frac_p \times DFI \times B_{s/p}\right)\right] \times AUF}$$

where:

ERBC	=	Ecological risk-based concentration in soil (mg/kg)
BW	=	Body weight of wildlife receptor (kg)
TRV	=	Toxicity reference value (mg/kg body weight-day)
$Frac_s$	=	Fraction of diet represented by incidentally ingested soil (unitless)
DFI	=	Daily ingestion rate of all food items (kg/day wet weight)
$Frac_P$	=	Fraction of diet represented by prey (unitless)
$B_{s/P}$	=	Soil-to-prey biotransfer factor (mg/kg per mg/kg wet weight)
AUF	=	Area use factor; fraction of home range occupied by site (unitless)

Because the brown booby is 100 percent piscivorous and obtains food from locations away from the upland areas, that portion of intake coming from prey items (in the denominator of the equation) was not included in the calculation of the upland soil protective concentrations. In addition, the area use factor was conservatively assumed to be 100 percent.[3]

The toxicity reference value (TRV) denotes the level of toxicity of TPH. Because there are no toxicity studies available from literature sources for specific aliphatic and aromatic TPH fractions, their toxicity was interpolated from structurally similar surrogate chemicals. This surrogate approach is consistent with the approach customarily used to estimate human health risk from TPH fractions. The available toxicological studies for surrogate chemicals, identified from a literature search, are summarized in Table 6-3. From these, the most representative and conservative representatives of aliphatic and aromatic fractions were selected as surrogates for the calculation of the ecological risk-based concentrations. Table 6-4 provides a list of the surrogate chemicals selected for each petroleum fraction, and the corresponding toxicity data. The ecological risk-based concentrations were calculated using these data and the above equation and are listed in Table 6-5.

Site-specific ecological action levels for each of the SWMU No. 16/AOC No. 1 and AOC No. 2/No. 3 areas were calculated by first adjusting (prorating) each of the fraction-specific ERBCs (Table 9) to account for the mass fraction of each TPH fraction relative to the total TPH. The adjustment was made as follows:

$$ERBC_{ss} = \frac{ERBC}{\left(C_{frac} / C_{TPH}\right)}$$

[3] These are the same assumptions made for derivation of ecological-based action levels for nonpetroleum constituents as used in the current Permit for Johnston Atoll.

where:

$ERBC_{ss}$ = Site-specific ecological risk-based concentration in soil (mg/kg)
ERBC = Generic ecological risk-based concentration in soil (mg/kg)
C_{frac} = Soil concentration of petroleum fraction (mg/kg)
C_{TPH} = Sum of EPH and VPH in soil (mg/kg)

From these adjusted values, the site-specific ecological action level was calculated using the following equation:

$$Ecol.ActionLevel = \frac{1}{\left(1/ERBC_{ss}\right)_{frac1} + \left(1/ERBC_{ss}\right)_{frac2} + \ldots \left(1/ERBC_{ss}\right)_{fracN}}$$

where:

$(ERBC_{ss})_{frac1}$ = Site-specific ERBC for specific TPH fraction 1, 2,….n (mg/kg)

Table 6-6 provides the results of these calculations for each soil sample analyzed.[4] For the SWMU No. 16/AOC No. 1 area, the calculated sample-specific TPH action levels ranged from 116,000 mg/kg to 160,000 mg/kg. For the AOC No. 2/No. 3 area, the range was from 73,000 mg/kg to 131,000 mg/kg TPH.

The very high ecological action levels calculated for TPH in soil are a reflection of the generally low oral toxicity of petroleum to birds. The available toxicity studies identified where birds were exposed to petroleum mixtures (summarized in Table 6-3) indicate that, even with acute oral exposures, the toxic levels are often over 2,000 mg/kg body weight pure petroleum. One chronic study showed no adverse effects on mallards orally exposed to 5,000 mg/kg No. 2 fuel oil for 18 weeks. It is more likely that TPH concentrations as high as those calculated in Table 6-6 could be detrimental to birds from direct contact (that is, from oiled feathers) rather than causing systemic toxicity from ingestion exposure.

6.3.3 Direct Contact by Human Receptors

Under future conditions at Johnston Island, the most plausible human exposure scenarios are for workers who live on island year round (the Refuge Manager) and intermittent site visitors. The most health-conservative of these scenarios is the year-round worker (due to the maximum exposure frequency), and this scenario was used to estimate human health-based action levels for TPH. The potential routes of exposure considered include incidental soil ingestion, dermal contact with soil, and inhalation of ambient vapors or dust generated from wind. It was conservatively assumed that the potentially exposed individual would contact soil daily year round (365 days per year), and that the individual resides on the island continuously for 30 years.

[4] The two samples at the AOC No. 2/No. 3 area that contained less than 100 mg/kg TPH were not included in the evaluation due to the lack of reliable precision at these low levels.

The methodology used for calculating human health-based TPH action levels for soil was consistent with methods developed by the TPHCWG (June 1999), and by several state agencies, including ODEQ (September 2003), Ecology (June 1997), and MADEP (October 2002). These approaches use surrogate toxicity factors to evaluate potential toxicity from aliphatic and aromatic fractions. The calculation spreadsheet developed by the State of Oregon was used to develop the action levels because this reflects the most current guidance: http://www.deq.state.or.us/wmc/tank/documents/TPHRisk03.xls (ODEQ, September 2003). The default "occupational scenario" exposure assumptions were modified to include an exposure frequency of 365 days per year for 30 years, and the adult residential dermal surface area was used. All of the default toxicity factors for surrogate chemicals were used, as well as the default chemical properties.

The following equation was used to calculate the risk-based concentration (RBC) for each aliphatic and aromatic TPH fraction:

$$RBC = \frac{THQ \times BW_a \times ATN \times 365\ days/year}{EF \times ED_a \left[\left[\frac{1}{RfD_o} \times CF \times IR_a \right] + \left[\frac{1}{RfD_d} \times CF \times SA_a \times AF \times ABS_d \right] + \left[\left(\frac{1}{VF} \text{ or } \frac{1}{PEF} \right) \times Inh_a \times \frac{1}{RfD_i} \right] \right]}$$

where:

ABS_d	=	Skin absorption fraction (unitless)
AF	=	Soil-to-skin adherence factor (mg/cm^2)
ATN	=	Averaging time for noncarcinogens (years)
BW_a	=	Adult body weight (kg)
CF	=	Unit conversion factor (10^{-6} mg/kg)
ED_a	=	Adult exposure duration (years)
EF	=	Exposure frequency (days/year)
Inh_a	=	Adult inhalation rate (m^3/day)
IR_a	=	Adult soil ingestion rate (mg/day)
PEF	=	Particulate emission factor (m^3/kg)
RBC	=	Human health risk-based cleanup level for soil (mg/kg)
RfD_d	=	Dermal reference dose (adjusted oral reference dose) (mg/kg-day)
RfD_I	=	Inhalation reference dose (mg/kg-day)
RfD_o	=	Oral reference dose (mg/kg-day)
SA_a	=	Adult skin surface area exposed (cm^2)
THQ	=	Target hazard quotient (unitless)
VF	=	Volatilization factor (m^3/kg)

Notes:

cm^2 = square centimeter
m^3 = cubic meter

Site-specific human health action levels for each of the SWMU No. 16/AOC No. 1 and AOC No. 2/No. 3 areas were calculated in a manner similar to that described for ecological action levels, using equations similar to the last two provided in Section 6.3.2.

The results, summarized in Table 6-7, indicate that the calculated action levels using samples collected at the AOC No. 2/No. 3 area (ranging from 33,480 to 38,818 mg/kg) are somewhat lower than those calculated for the SWMU No. 16/AOC No. 1 (ranging from 43,341 to 70,837 mg/kg). As described for ecological pathways, the relatively high TPH action levels based on direct contact by humans are a reflection of the low toxicity of the residual petroleum types currently present in Johnston Island soil at these two areas. The likelihood that concentration below these human health-based action levels could result in potential migration of free product is evaluated in the next section.

6.3.4 Potential Migration of NAPL to the Surrounding Lagoon

In addition to potential direct contact exposure to birds and people, and potential leaching of TPH to groundwater, it is possible that residual petroleum in soil could be high enough to migrate as free product (that is, NAPL). Of primary concern is bulk fluid migration of free petroleum that could seep out to lagoon areas adjacent to the SWMU and AOCs. To address this concern, an action level was derived by calculating the highest soil TPH concentration that would preclude migration of NAPL. This concentration is termed the "residual saturation" of the TPH in soil. Residual saturation can vary widely depending on soil type and petroleum type.

The methodology for determining the residual saturation concentration (that is, the concentration at which petroleum product in open pore spaces in soil will be immobile) is detailed in Brost and DeVaull (June 2000). The residual saturation concentration calculation takes into account the density of the NAPL, soil porosity, soil density, and the fraction of residual nonaqueous-phase filled void space in a variety of grain size and petroleum product combinations, as measured in a laboratory. Site specific inputs to the calculation are bulk dry soil density, soil porosity, and NAPL density. These values are available in existing Johnston Island documents and have been used to calculate a residual saturation concentration.

This residual saturation concentration was determined by the following equation:

$$C_{res,soil} = ((\Theta_o \times \rho_o)/\rho_s) \times 10^6$$

with:

$$\Theta_o = S_r \times \Theta_T$$

where:

$C_{res,soil}$ = residual NAPL concentration in soil
Θ_o = residual nonaqueous-phase volume fraction
ρ_o = density of chemical residual nonaqueous-phase liquid
ρ_s = dry soil density
Θ_T = soil porosity
S_r = fraction of residual nonaqueous-phase filled void

The following site-specific values were used to calculate the residual NAPL concentration for soil at Johnston Island:

Parameter	Range of Values	Sources	Selected Value	Comment
ρ_o	0.79 to 0.88 g/cm^3	0.79 to 0.85 = fresh jet fuel and diesel (Chevron, 1998) 0.88 = average of API gravity measurements for NAPL samples collected from wells at SWMU No. 16 as reported in the RCRA Facility Investigation (RSN, September 1994)	0.88	Site-specific value for weathered product
ρ_s	1.05 to 1.17 g/cm^3	1.05 = calculated dry bulk density (using wet density and moisture content) 1.17 = measured wet bulk density (OHM, January 2000)	1.05	Calculation specifies that dry bulk density should be used
Θ_T	0.39 to 0.42	Estimated from grain size analysis and slug test data in RCRA Facility Investigation (RSN, September 1994)	0.41	Average value

Notes:

API = American Petroleum Institute
g/cm^3 = gram per cubic centimeter
OHM = OHM Remediation Services Corporation
RCRA = Resource Conservation and Recovery Act
RSN = Raytheon Services Nevada

The residual NAPL volume fraction, S_r, was taken from tables of laboratory measurement data provided in Brost and DeVaull (2000). These measurements are available for a number of organic liquids and soil types and represent the residual amount of hydrocarbon remaining in soil pore volume after the soil was saturated with hydrocarbon and then allowed to drain. Based on TPH analysis conducted to date, the predominant types of petroleum at Johnston Island are JP-5, diesel, and fuel oil. Sieve analysis and boring logs for Johnston Island soil indicate a range in grain size between fine sand and gravel. For the purpose of selecting a conservative S_r, the soil was assumed to be medium-grained sand. The most conservative S_r value for a medium-grained sand and middle distillate fuel combination is 0.05. This value was interpolated from information provided in Table 2 of the paper; a value for medium grained sand is not listed, but conservative values for fine-to-medium and medium-to-coarse grained sand are listed at 0.06 and 0.04, respectively.

Using the selected values identified above, the calculated residual NAPL concentration for Johnston Island is 17,181 mg/kg. If the full range of valid input values for each parameter is considered, the residual saturation concentrations range from 13,074 to 22,560 mg/kg.

Despite the calculations, it is unlikely that TPH at a concentration greater than 17,181 mg/kg in soil will actually migrate. For petroleum to migrate laterally, there must be sufficient driving force (head) to overcome capillary pressures at the margins of the NAPL plume. Current conditions at Johnston Island are not conducive to development of such a force. There is no ongoing release of petroleum to the subsurface, product recovery at

SWMU No. 16 depleted the product to the point at which recovery was no longer feasible, and measurable product has not been recently observed in any monitoring wells.

In order to calculate the driving force needed to cause LNAPL migration, there must be a measurable LNAPL gradient (API, 2003), as shown in the following equation:

Seepage velocity = $(k \times k_{LNAPL} \times \square_{LNAPL} \times g)/(\square_{LNAPL} \times n \times S_{LNAPL}) \times (dh_{LNAPL}/dl_{LNAPL})$

where:

k =	Permeability of porous media
k_{rLNAPL} =	Relative permeability of the porous media to LNAPL
$\square_{LNAPL}$ =	Density of the LNAPL
g =	Gravitational constant
$\square_{LNAPL}$ =	Viscosity of the LNAPL
N =	Porosity
S_{LNAPL} =	Fraction of the pore space filled with LNAPL
dh_{LNAPL}/dl_{LNAPL} =	LNAPL head, using LNAPL thickness in 3 wells

Such a gradient does not exist at either Johnston Island SWMU/AOC. Even if one were to assume that soil at some part of the island was fully saturated with LNAPL, the maximum seepage velocity for the LNAPL would be less than one foot during the first year of saturated conditions and would be reduced every year afterward, given the conservative input parameters presented for the residual NAPL calculations.

6.4 Soil Evaluation Approach

The distribution (that is, the areal and vertical extent) of TPH in soil at SWMU No. 16/AOC No. 1 and AOC No. 2/No. 3 has been documented in numerous reports and memoranda. For the most part, the distribution was determined using Method 8015. As reported in Section 6.1, TPH concentrations in soil were similar when measured by any of the three analytical methods used in this study. This means that the existing Method 8015 results provide reasonable approximation of the amount of TPH in soil and can be used for direct comparison to the proposed action level when making decisions about the need for and adequacy of remediation; resampling and analysis using fractionation methods is not needed.

7.0 Conclusions and Recommendations

A systematic approach was used to identify site-specific action levels and evaluation approaches for TPH in groundwater and soil at Johnston Island. TPH was analyzed using three different methods. Although significant differences in these methods were not observed for soil analyses, considerable differences were observed for groundwater results. The greater beneficial effects that occurred with silica gel cleanup for groundwater was expected due to the potential interferences from polar nonpetroleum compounds co-occurring with the petroleum. Due to the greater efficiency in quantifying TPH using the fractionation methodology, it is recommended that results using this approach (calculated as the sum of EPH and VPH) be considered the most reliable representation of total TPH for both groundwater and soil.

A concentration of 0.640 mg/L dissolved TPH is recommended as a suitable action level for groundwater. Although based on fresh product toxicity, this number has a relevant biological basis and appears to provide a sensitive indication of potential risk to the nearby marine ecosystem. The approach for assessing TPH in groundwater at Johnston Island is shown in Figure 7-1. As shown in the figure, groundwater concentration data from wells greater than 100 feet from shore should be adjusted using a DAF to estimate groundwater concentrations at the shoreline. This overall approach should still be considered conservative because it does not account for the dilution once groundwater mixes with seawater at the shoreline.

For soil, action levels were estimated considering four potential migration or exposure pathways: leaching to groundwater, direct contact by birds, direct contact by people, and potential migration of NAPL. The approach for assessing TPH in soil at Johnston Island is shown in Figure 7-2. The range of site-specific TPH action levels is as follows:

- Groundwater Protection—30,000 to 40,000 mg/kg
- Direct Soil Contact by Ecological Receptors—73,000 to 161,000 mg/kg
- Direct Soil Contact by Human Receptors—33,000 to 71, 000 mg/kg
- Free Product Mobility Limit—13,074 to 22,560 mg/kg

The action levels based on prevention of free product migration are the lowest of the pathways evaluated. As a result of the site-specific characteristics (that is, fuel types released and fuel weathering), the TPH in soil at these areas has low toxicity and low potential for leaching to underlying groundwater. The SPLP results indicated that a very small percentage of the soil TPH is leachable. Considering all these issues collectively, it is recommended that the free product mobility limit (that is, the residual NAPL concentration) serve as a protective action level for TPH in soil at Johnston Island. The free product mobility limit selected for use as the action level, **17,181 mg/kg**, is based on input parameters representative of measured and observed subsurface conditions on Johnston Island. Given that there is no ongoing release of petroleum at any of the SWMUs/AOCs and historical product recovery efforts have depleted the amount of product to the point of

being unrecoverable, it unlikely that there is sufficient driving force to cause free product to migrate even at levels above this concentration.

8.0 References

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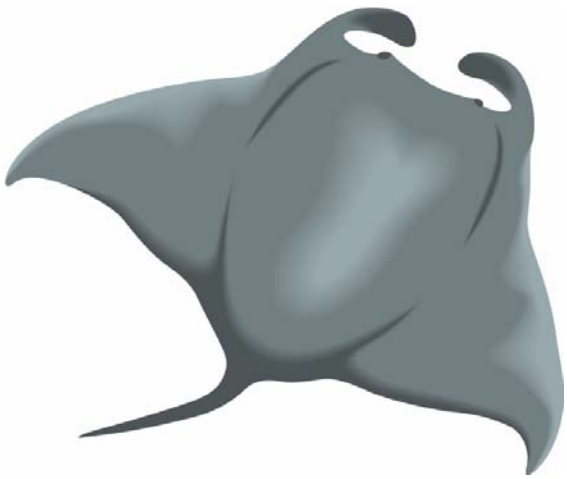
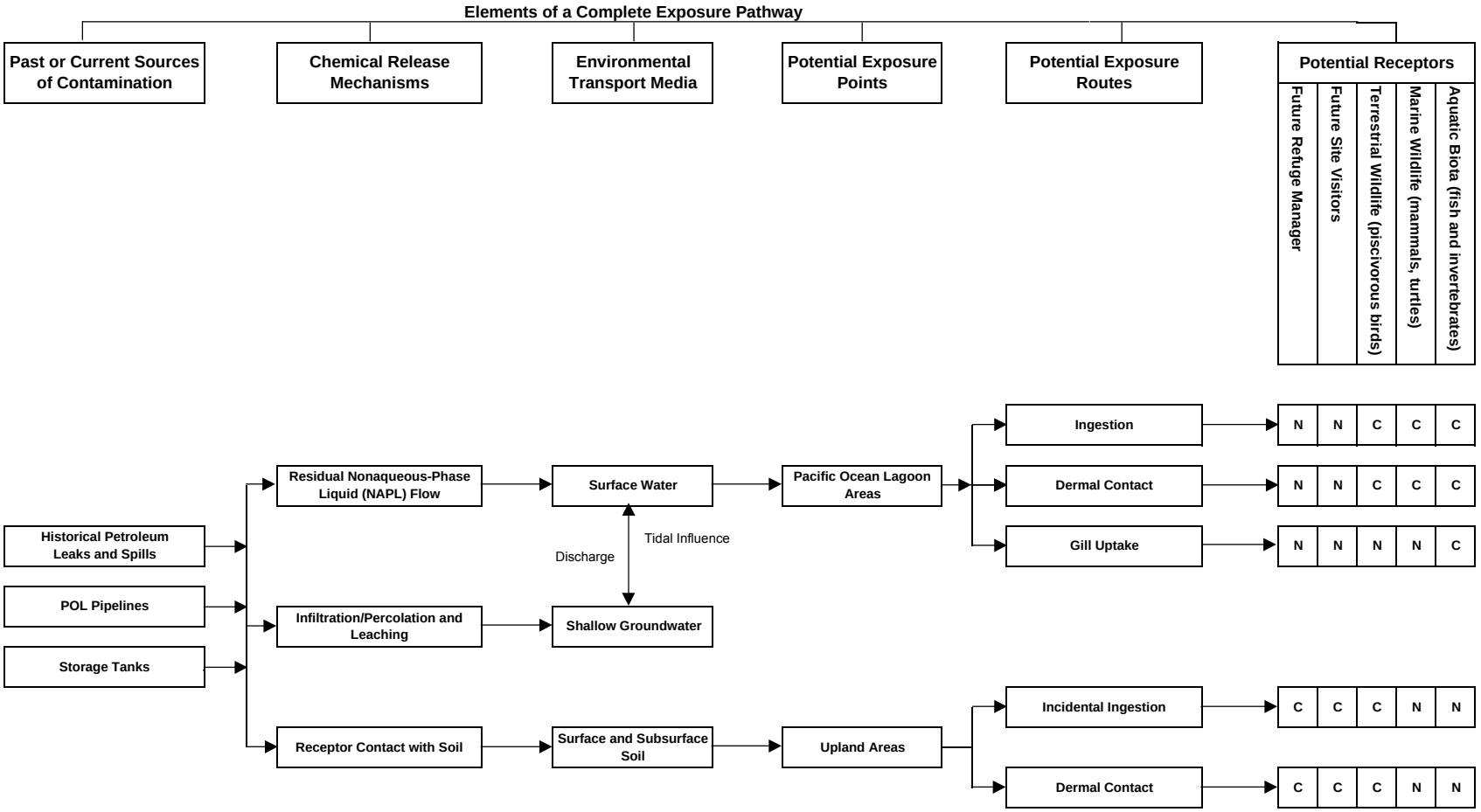
Johnston Atoll



Figures



Notes:

C = potentially complete pathway
N = incomplete pathway
POL = petroleum, oil, and lubricants

Figure 2-1
Conceptual Exposure Model for Potential Human Health and Ecological Receptors
Johnston Island POL Areas
TPH ACTION LEVEL DERIVATION REPORT, JOHNSTON ATOLL

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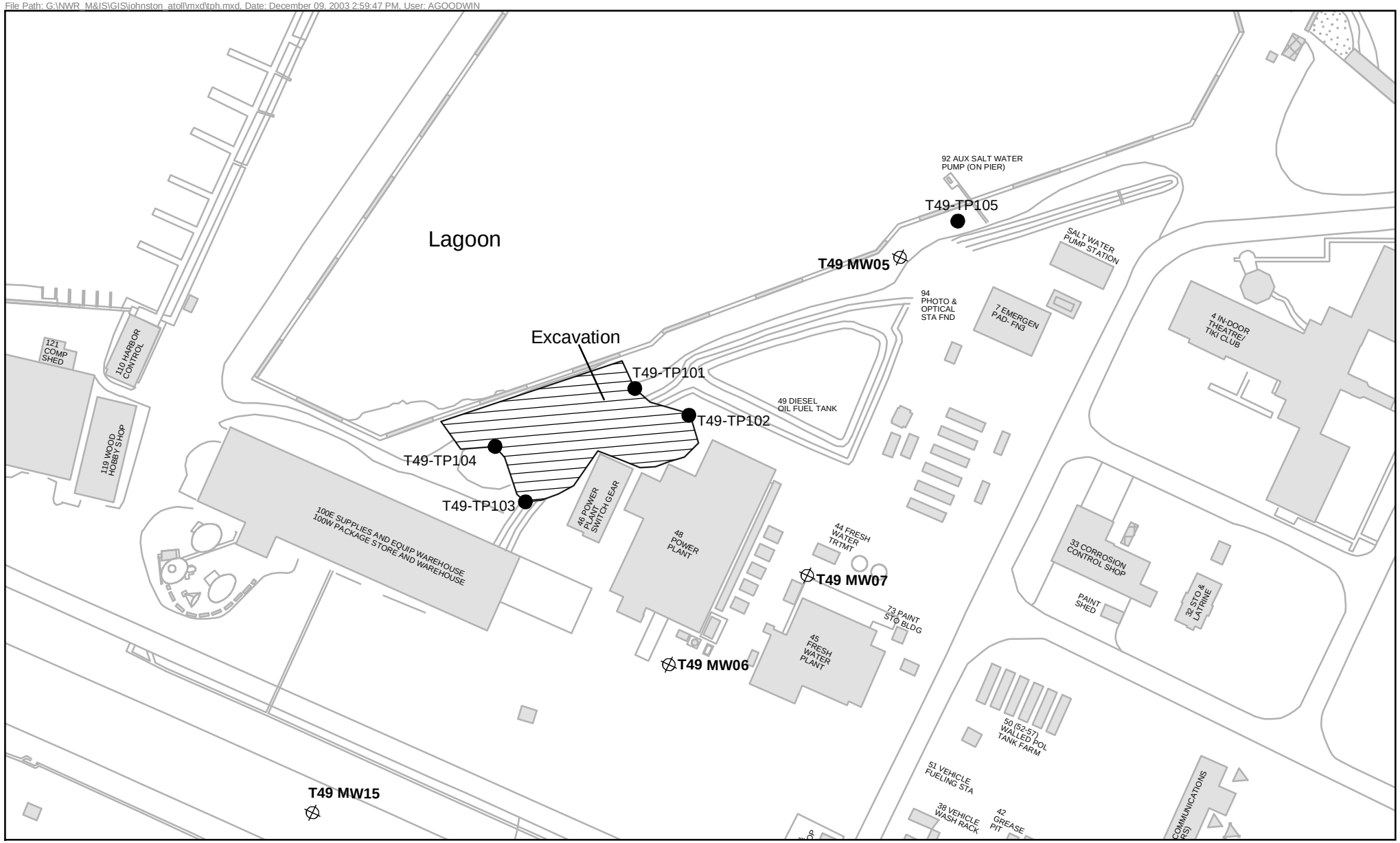

Legend

- Monitoring Well Sampled for TPH
- TPH Soil Sample (Test Pit)

N

0 25 50 100 150 200 Feet

Figure 3-1

TPH Sample Locations at SWMU No. 16/AOC No. 1

TPH ACTION LEVEL DERIVATION REPORT
JOHNSTON ATOLL

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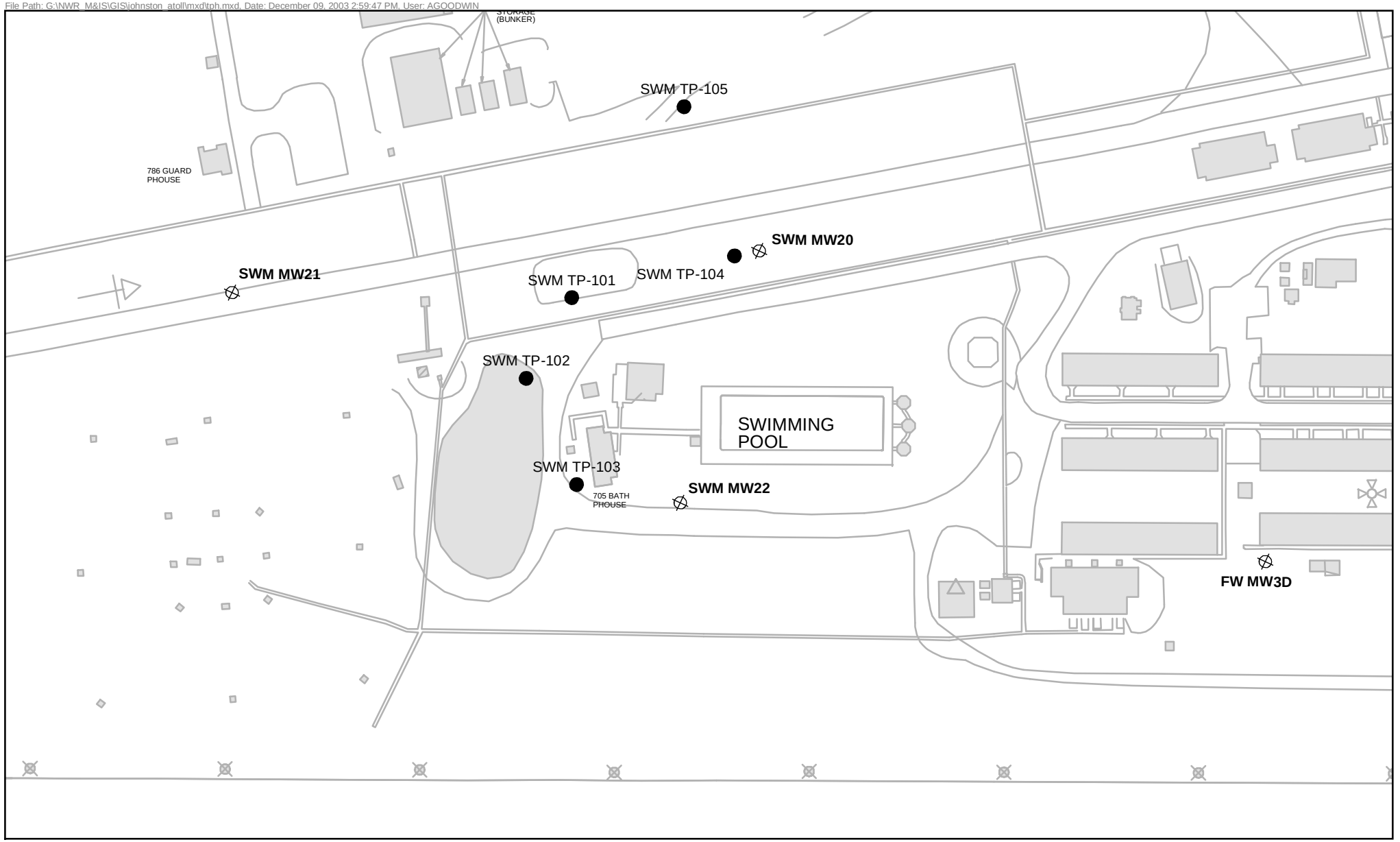


Legend

- Monitoring Well Sampled for TPH
- TPH Soil Sample (Test Pit)

N

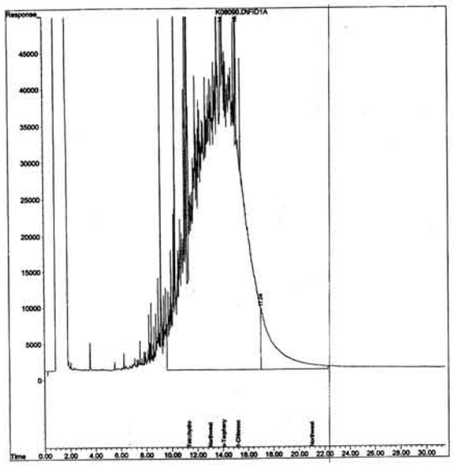
0 25 50 100 150 200 Feet

Figure 3-2

TPH Sample Locations at AOC No. 2/No. 3

TPH ACTION LEVEL DERIVATION REPORT
JOHNSTON ATOLL

T49-MW07



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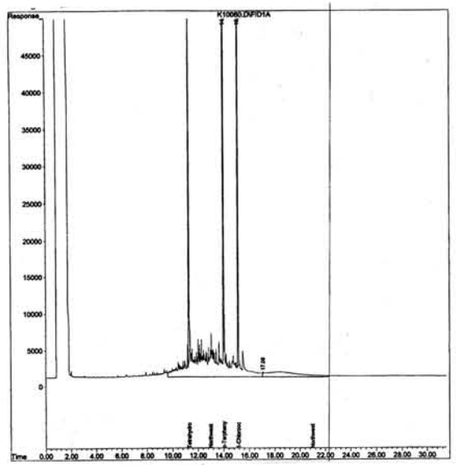

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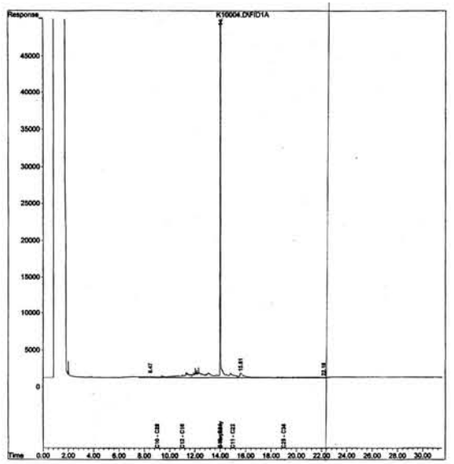
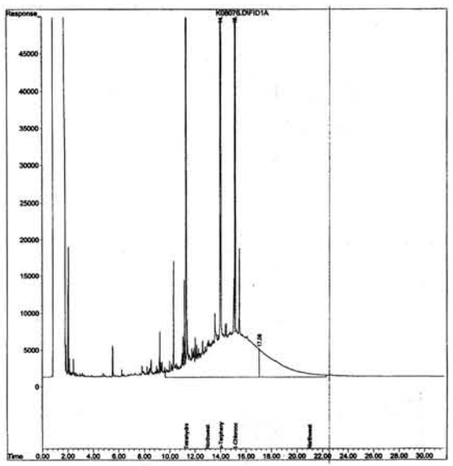


NWTPH-EPH

SWM-MW22



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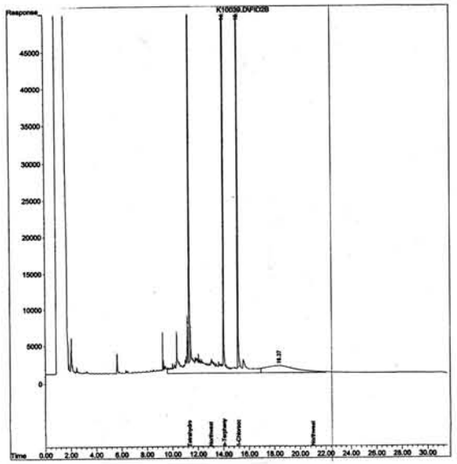

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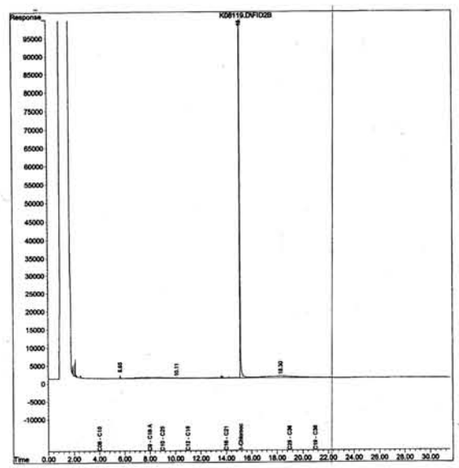
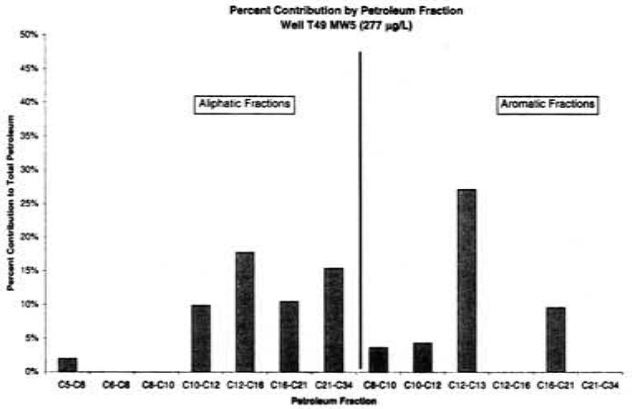
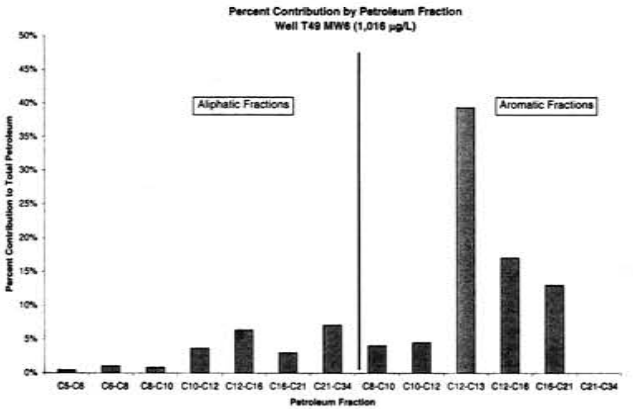


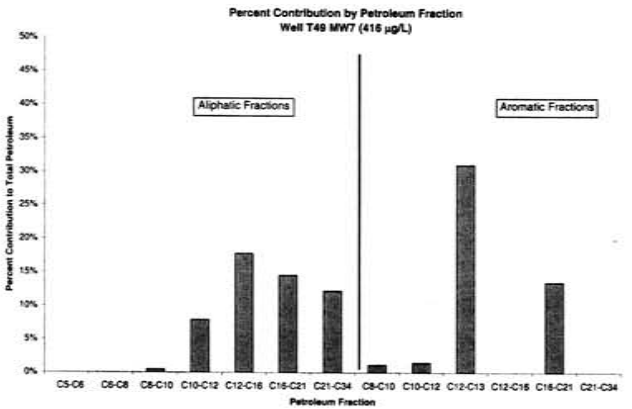
NWTPH-EPH

Figure 5-1

Chromatograms for NWTPH-DX (With and Without Silica Gel Cleanup) and NWTPH-EPH Analyses, T49-MW07 and SWM-MW22







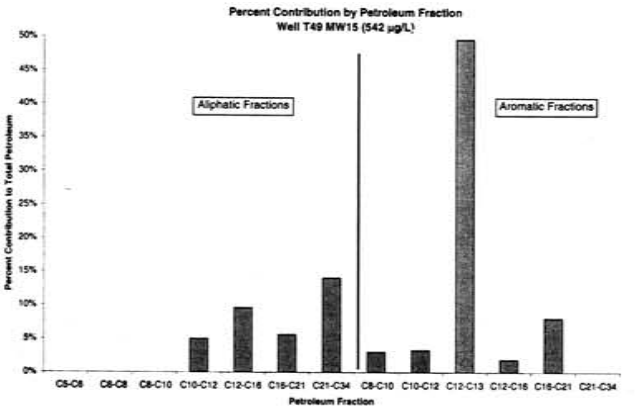
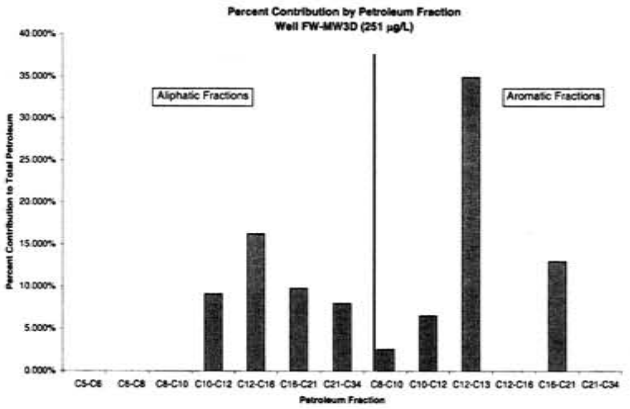
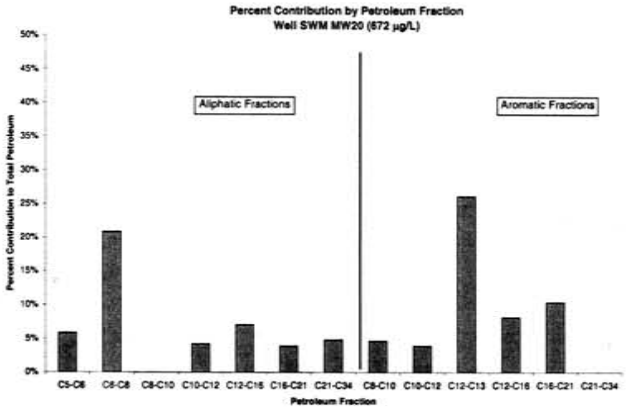


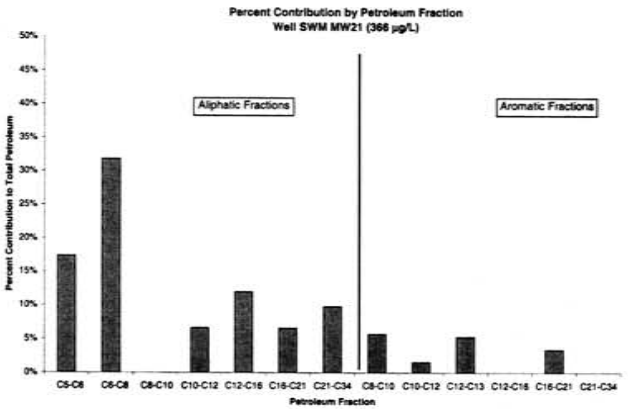
Figure 5-2

Percent Contribution by Petroleum Hydrocarbon Fraction

TPH ACTION LEVEL DERIVATION REPORT
JOHNSTON ATOLL







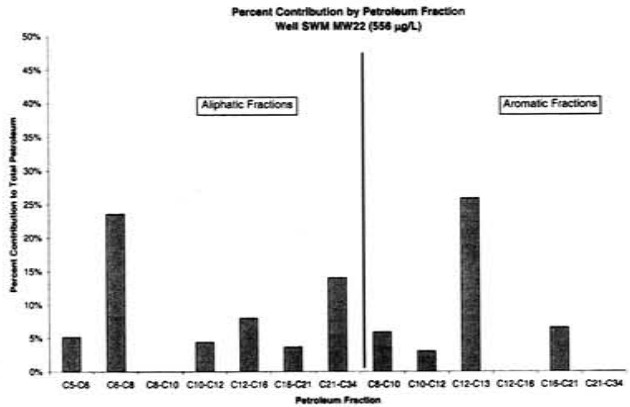
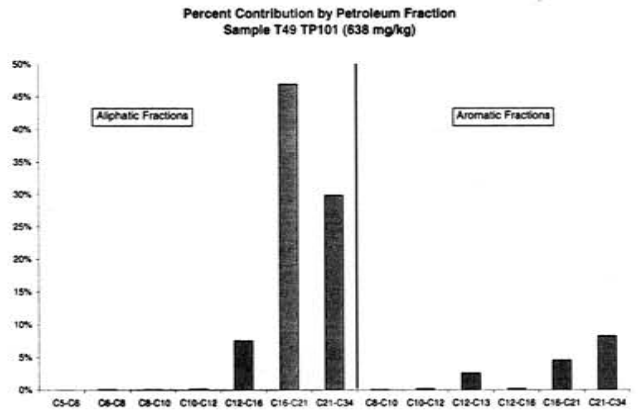
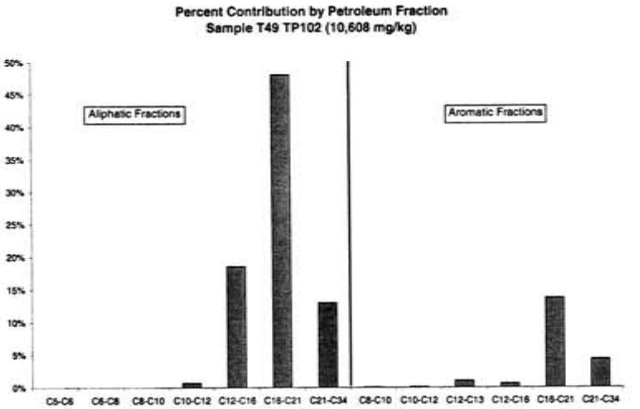
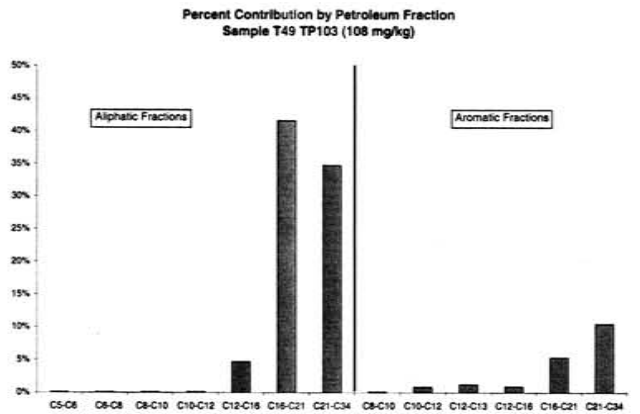


Figure 5-3

Percent Contribution by Petroleum Hydrocarbon Fraction
AOC No. 2/No. 3 Groundwater
TPH ACTION LEVEL DERIVATION REPORT
JOHNSTON ATOLL







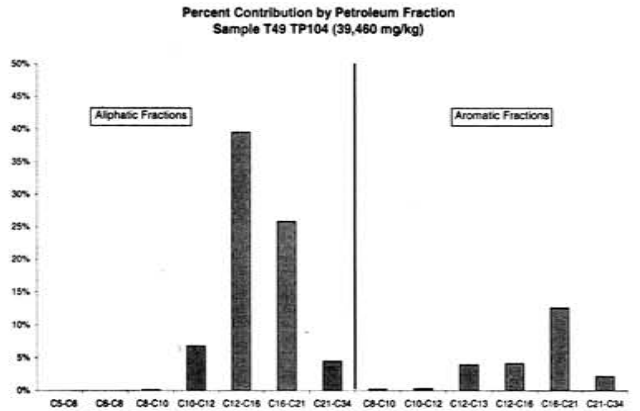
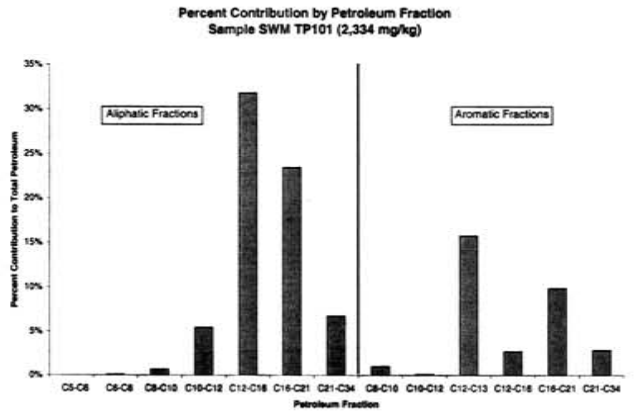
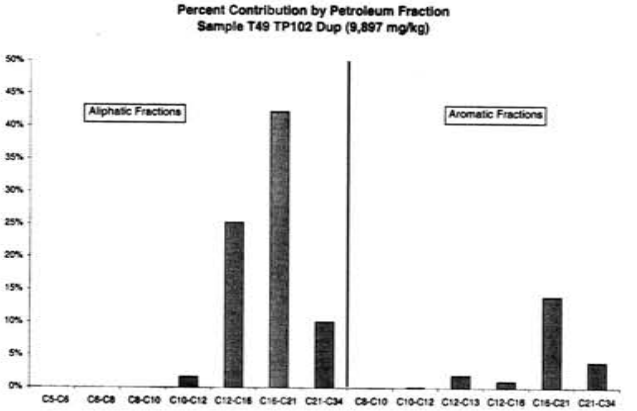


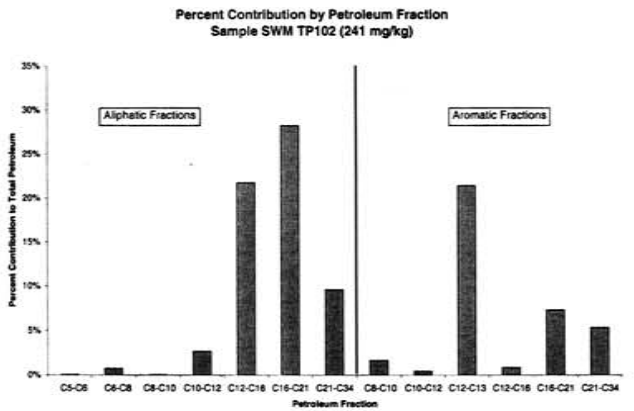
Figure 6-1

Percent Contribution by Petroleum Hydrocarbon Fraction SWMU No. 16/AOC No. 1 Soil

TPH ACTION LEVEL DERIVATION REPORT
JOHNSTON ATOLL







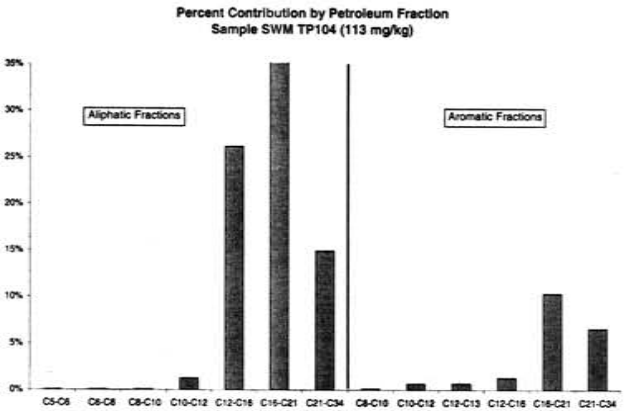


Figure 6-2

Percent Contribution by Petroleum Hydrocarbon Fraction AOC No. 2/No. 3 Soil

TPH ACTION LEVEL DERIVATION REPORT
JOHNSTON ATOLL

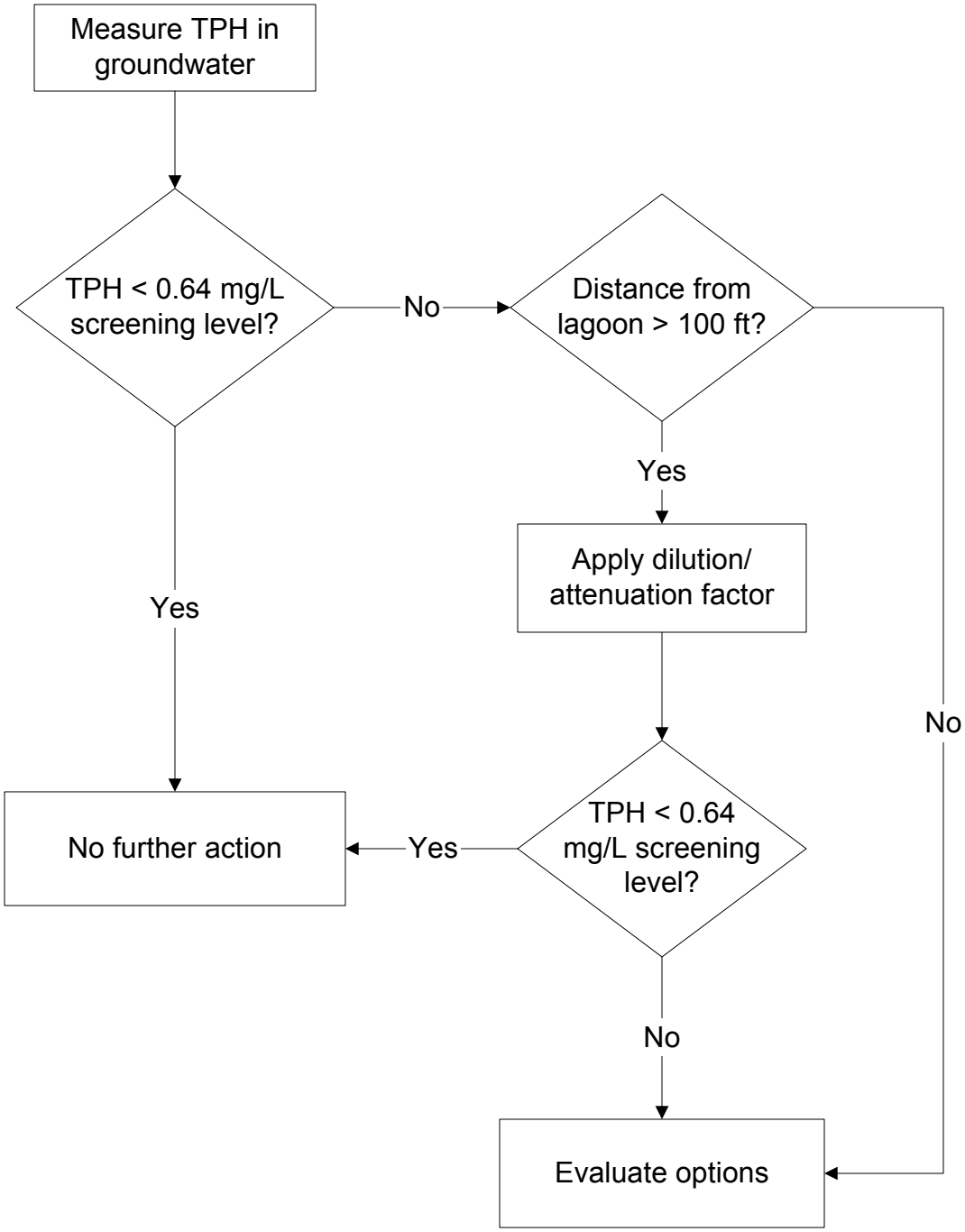


Figure 7-1
Decision Process for Groundwater TPH
TPH ACTION LEVEL DERIVATION REPORT, JOHNSTON ATOLL

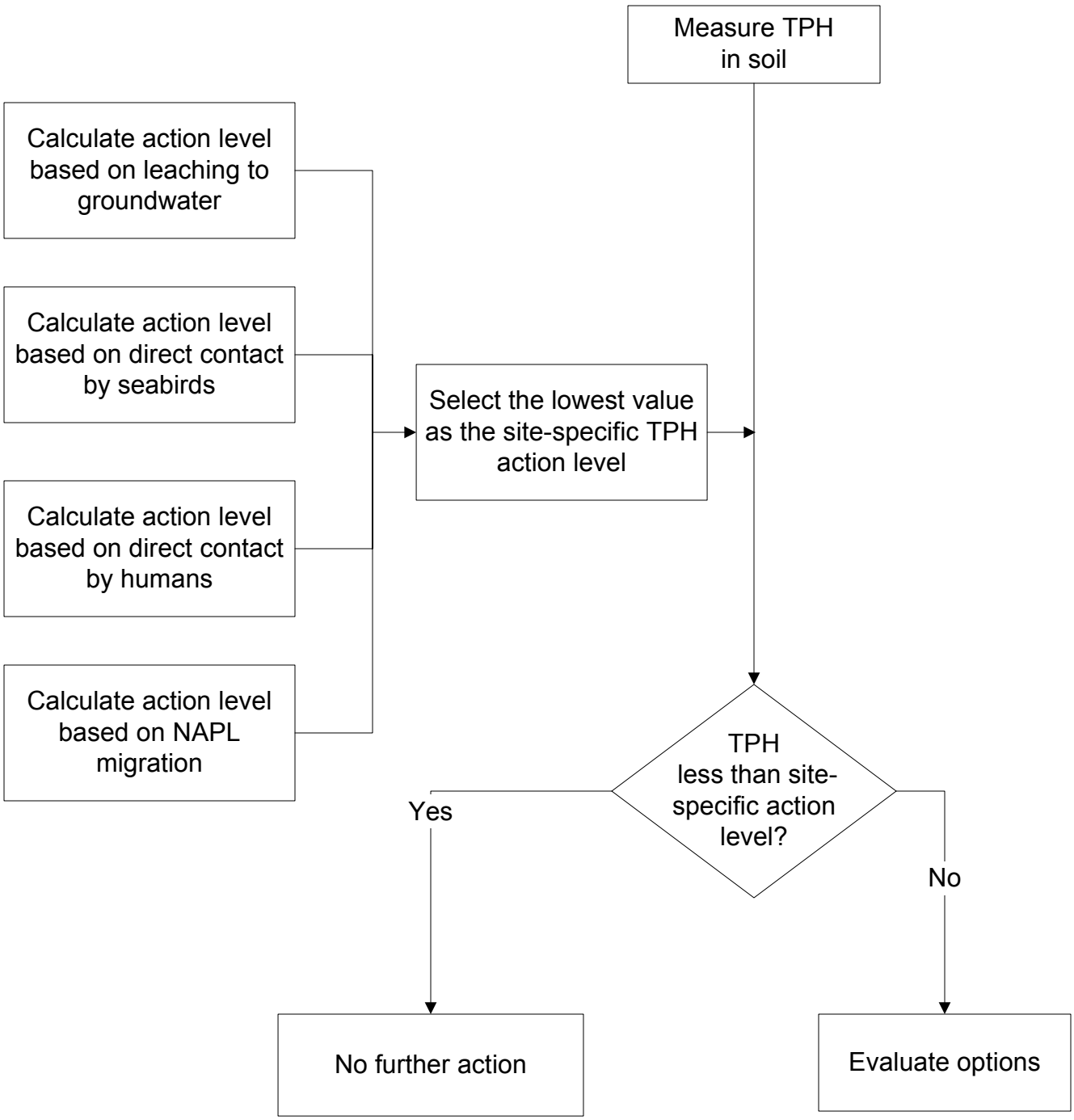


Figure 7-2
Decision Process for Soil TPH
TPH ACTION LEVEL DERIVATION REPORT, JOHNSTON ATOLL

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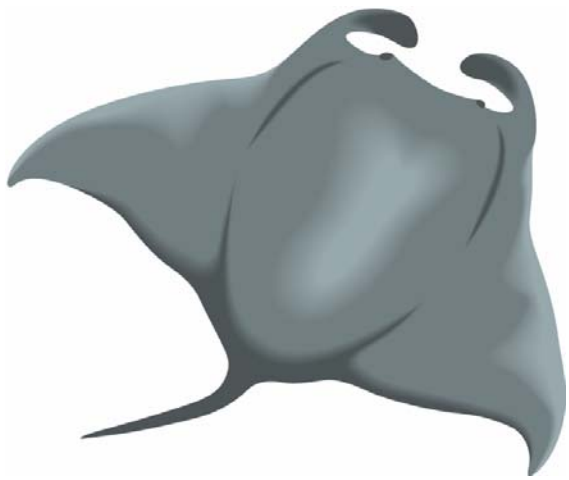

Tables

TABLE 3-1
Summary of Groundwater Sampling and Analysis Program
TPH Action Level Derivation Report, Johnston Atoll

					Method/Target Analyte					
Unit	**Well ID**	**Sample ID**	**Sample Date**	**Sample Type**	**NWTPH-Dx TPH-Diesel w/o Silica Gel Cleanup**	**NWTPH-Dx TPH-Diesel w/ Silica Gel Cleanup**	**NWTPH-Dx TPH-Diesel w/ Filtration[a] and Silica Gel Cleanup**	**NWTPH-EPH TPH-Diesel Fractionation**	**NWTPH-GX TPH-Gas**	**NWTPH-VPH TPH-Gas Fractionation**
SWMU No. 16/AOC No. 1	T49 MW06	T49-MW06-1103	11/02/2003	N	X	X	X	X	X	X
SWMU No. 16/AOC No. 1	T49 MW07	T-49-MW07-1103	11/02/2003	N	X	X	X	X	X	X
SWMU No. 16/AOC No. 1	T49 MW15	T49-MW15-1103	11/02/2003	N	X	X		X	X	X
SWMU No. 16/AOC No. 1	T49 MW15	T49-FD1-1103	11/02/2003	FD	X	X		X	X	X
SWMU No. 16/AOC No. 1	T49 MW05	T49-MW05-1103	11/02/2003	N	X	X	X	X	X	X
AOC No. 2/No. 3	FW MW03D	FW-MW03D-1103	11/02/2003	N	X	X		X	X	X
AOC No. 2/No. 3	SWM MW20	SWM-MW20-1103	11/02/2003	N	X	X	X	X	X	X
AOC No. 2/No. 3	SWM MW 21	SWM-MW21-1103	11/02/2003	N	X	X		X	X	X
AOC No. 2/No. 3	SWM MW 21	SWM-MW21-1103	11/02/2003	MS	X	X		X	X	X
AOC No. 2/No. 3	SWM MW 21	SWM-MW21-1103	11/02/2003	MSD	X	X		X	X	X
AOC No. 2/No. 3	SWM MW 22	SWM-MW22-1103	11/01/2003	N	X	X		X	X	X
QA/QC	Trip Blank	SWM-TB21-1103	11/02/2003	TB					X	
QA/QC	Trip Blank	T49-TB5-1103	11/02/2003	TB					X	
QA/QC	Trip Blank	FW-TB3D-1103	11/02/2003	TB					X	
QA/QC	Trip Blank	T49-TB15-1103	11/02/2003	TB					X	

Notes:

[a] Samples were filtered at the laboratory.

FD = field duplicate
MS = matrix spike
MSD = matrix spike duplicate
N = normal sample
QA/QC = quality assurance quality control sample
TB = trip blank
TPH = total petroleum hydrocarbons

TABLE 3-2
Summary of Soil Sampling and Analysis Program
TPH Action Level Derivation Report, Johnston Atoll

						Method/Target Analyte							
Unit	Station ID	Sample ID	Sample Date	Sample Type	Sample Depth (ft bgs)	SPLP Extraction	Fraction Organic Carbon	NWTPH-Dx TPH-Diesel w/o Silica Gel Cleanup	NWTPH-Dx TPH-Diesel w/ Silica Gel Cleanup	NWTPH-EPH TPH-Diesel Fractionation	NWTPH-Gx TPH-Gas	NWTPH-VPH TPH-Gas Fractionation	Comment
SWMU No. 16/AOC No. 1	T49-TP101	T49-TP101	10/31/2003	N	4 to 4.5	X		X	X	X	X	X	Fresh wall, east side of excavation
SWMU No. 16/AOC No. 1	T49-TP102	T49-TP102	10/31/2003	N	4 to 4.5			X	X	X	X	X	Fresh wall, southeast side of excavation
SWMU No. 16/AOC No. 1	T49-TP102	T49-TPFD1	10/31/2003	FD	4 to 4.5			X	X	X	X	X	Fresh wall, southeast side of excavation
SWMU No. 16/AOC No. 1	T49-TP103	T49-TP103	10/31/2003	N	4 to 4.5			X	X	X	X	X	Fresh wall, southwest side of excavation
SWMU No. 16/AOC No. 1	T49-TP104	T49-TP104	10/31/2003	N	4 to 4.5	X		X	X	X	X	X	Fresh wall, west side of excavation
AOC No. 2/No. 3	SWM-TP101	SWM-TP101	11/01/2003	N	6 to 6.5			X	X	X	X	X	New test pit near SP-1, west of Pool
AOC No. 2/No. 3	SWM-TP102	SWM-TP102	11/01/2003	N	6.5 to 7			X	X	X	X	X	New test pit near BH06, west of Pool
AOC No. 2/No. 3	SWM-TP102	SWM-TP102-MS	11/01/2003	MS	6.5 to 7			X	X	X	X	X	New test pit near BH06, west of Pool
AOC No. 2/No. 3	SWM-TP102	SWM-TP102-MSD	11/01/2003	MSD	6.5 to 7			X	X	X	X	X	New test pit near BH06, west of Pool
AOC No. 2/No. 3	SWM-TP103	SWM-TP-103	11/01/2003	N	7 to 7.5			X	X	X	X	X	New test pit near BH02b, north of Pool
AOC No. 2/No. 3	SWM-TP104	SWM-TP104	11/01/2003	N	5.5 to 6			X	X	X	X	X	New test pit near TP-18, northeast of Pool
SWMU No. 16/AOC No. 1	BKGD	T49-TP105	10/31/2003	N	6.5 to 7		X						Near Salt Water Pump Station
AOC No. 2/No. 3	BKGD	SWM-TP105	11/01/2003	N	5		X						Near TP-10
AOC No. 2/No. 3	BKGD	SWM-TP105	11/01/2003	N	7			X	X	X	X	X	Near TP-10

Notes:

bgs = below ground surface
FD = field duplicate
ft = foot
MS = matrix spike
MSD = matrix spike duplicate
N = normal sample
SPLP = synthetic precipitation leaching procedure
TB = trip blank
TPH = total petroleum hydrocarbons

TABLE 3-3
Groundwater Sampling Field Parameters
TPH Action Level Derivation Report, Johnston Atoll

SWMU or AOC	Well	Purge Rate (gpm)	Total Purge Volume (gallons)	pH	Temperature (°C)	Conductivity (mS/cm)	ORP (mV)	Turbidity (NTU)	Salinity (%)	DO (mg/L)	Comments
SWMU No. 16/ AOC No. 1	T49-MW05	0.13	4	6.98	30.60	26.7	NR	652	1.65	1.90	Sulfur odor
	T49-MW06	0.16	2.5	6.06	31.80	3.24	NR	-10	0.16	1.83	
	T49-MW07	0.13	2.75	6.01	31.00	42.2	NR	707	2.71	1.88	Sheen on purge water surface
	T49-MW15	0.14	2	6.16	30.40	1.59	NR	283	0.07	1.88	Slight sulfur odor
AOC No. 2/ No. 3	FW-MW3D	0.14	5	6.29	30.10	12.5	NR	276	0.72	1.90	Petroleum odor
	SWM-MW20	0.11	4	7.43	31.70	5.9	NR	175	0.3	1.79	Petroleum odor
	SWM-MW21	0.12	4	7.44	31.50	7.02	NR	-10	0.4	1.86	Sulfur odor
	SWM-MW22	0.11	4.5	7.05	30.30	6.5	NR	-10	0.3	2.10	Weathered petroleum odor

Notes:

Field parameter measurements were obtained from the final purge volume immediately prior to sampling.

°C = degree Celsius
DO = dissolved oxygen
gpm = gallon per minute
mg/L = milligram per liter
mS/cm = milliSiemens per centimeter
MV = millivolt
NR = not recorded
NTU = nephelometric turbidity unit
ORP = oxidation-reduction potential

TABLE 5-1
Groundwater TPH Analytical Results
TPH Action Level Derivation Report, Johnston Atoll

Method	Analyte	Units	FW-MW03D-1103 11/02/03		SWM-MW20-1103 11/02/03		SWM-MW21-1103 11/02/03		SWM-MW22-1103 11/01/03		T49-FD1-1103[a] 11/02/03		T49-MW15-1103 11/02/03		T49-MW05-1103 11/03/03		T49-MW06-1103 11/02/03		T49-MW07-1103 11/02/03	
NWEPH	C10-C12 Aliphatics	mg/L	0.0228	F	0.0284	F	0.0242	F	0.0243	F	0.0272	F	0.0271	F	0.0224	F	0.0367	F	0.0329	F
NWEPH	C10-C12 Aromatics	mg/L	0.0163	F	0.0263	F	0.00558	M	0.0167	F	0.021	F	0.0178	F	0.00976	F	0.0455	F	0.00603	F
NWEPH	C12-C16 Aliphatics	mg/L	0.0407	F	0.0477	F	0.0437	F	0.0445	F	0.051		0.0519		0.0402	F	0.0639		0.0741	
NWEPH	C12-C16 Aromatics	mg/L	0.0101	U	0.055		0.0106	UM	0.0101	U	0.0165	F	0.0102	F	0.0101	U	0.173		0.0101	U
NWEPH	C16-C21 Aliphatics	mg/L	0.0245	F	0.0263	F	0.024	F	0.0201	F	0.029	F	0.0304	F	0.0237	F	0.0302	F	0.0605	
NWEPH	C16-C21 Aromatics	mg/L	0.0325	F	0.0698		0.0124	F	0.0365	F	0.0452	F	0.0436	F	0.0217	F	0.132		0.0561	
NWEPH	C21-C34 Aliphatics	mg/L	0.02	F	0.0326	F	0.0357	F	0.0781		0.0531		0.0762		0.0349	F	0.0717		0.0508	
NWEPH	C21-C34 Aromatics	mg/L	0.0101	U	0.0101	U	0.0106	U	0.0101	U	0.0101	U	0.0101	U	0.0101	U	0.0105	U	0.0101	U
NWEPH	Total Extractable Petroleum Hydrocarbons	mg/L	0.157	F	0.286	F	0.146	M	0.220	F	0.243	F	0.257	F	0.153	F	0.553		0.280	F
NWVPH	C12-C13 Aromatics	mg/L	0.0874		0.176		0.0193	F	0.144		0.285		0.269		0.0616		0.400		0.129	
NWVPH	C5-C6 Aliphatics	mg/L	0.00071	U	0.0392	F	0.0632	F	0.0285	F	0.00112	F	0.00071	U	0.00444	F	0.00384	F	0.00071	U
NWVPH	C6-C8 Aliphatics	mg/L	0.00149	U	0.14		0.116		0.131		0.00149	U	0.00149	U	0.00149	U	0.01	F	0.00149	U
NWVPH	C8-C10 Aliphatics	mg/L	0.00172	U	0.00343	U	0.00343	U	0.00343	U	0.00172	U	0.00172	U	0.00172	U	0.00807	F	0.00177	F
NWVPH	C8-C10 Aromatics	mg/L	0.00635	F	0.0314	F	0.0208	F	0.0326	F	0.0486	F	0.0164	F	0.00822	F	0.0408	F	0.0047	F
NWVPH	Total Volatile Petroleum Hydrocarbons	mg/L	0.0937		0.386		0.220		0.336		0.335		0.285		0.0742		0.463		0.136	
NWTPHGx	Gasoline Range Hydrocarbons	mg/L	0.0505	U	0.561	J	0.282	J	0.622	J	0.358	U	0.122	U	0.0352	U	0.341	J	0.0501	U
NWTPHDX	Diesel Range Hydrocarbons	mg/L	1.49	J	0.823	J	1.25	J	0.83	J	10.7	J	6.66	J	0.339	J	0.832	J	4.99	J
NWTPHDX	Lube Oil Range Hydrocarbons	mg/L	0.342	F	0.236	F	0.204	F	0.292	F	1.11	J	0.732	J	0.159	F	0.186	F	0.443	F
NWTPHDX	Diesel Range Hydrocarbons with SGCU	mg/L	0.261		0.308		0.123	F	0.209	F	3.83	J	1.84	J	0.213	F	1.15		0.331	
NWTPHDX	Lube Oil Range Hydrocarbons with SGCU	mg/L	0.11	U	0.11	U	0.11	U	0.11	U	0.168	F	0.149	F	0.11	U	0.11	U	0.11	U
Total TPH Calc A (detects NWTPHDx + NWTPHGx)		mg/L	1.83		1.62		1.74		1.74		11.81		7.39		0.498		1.36		5.43	
Total TPH Calc B (detects NWTPHDx SGCU+ NWTPHGx)		mg/L	0.261		0.869		0.405		0.831		4.00		1.99		0.213		1.49		0.331	
Total TPH Calc C (detects NWEPH + NWVPH)		mg/L	0.251		0.672		0.366		0.556		0.578		0.542		0.227		1.02		0.416	

Notes:

[a] Field duplicate of sample T49-MW15-1103.

mg/L = milligram per liter
SGCU = silica gel cleanup
TPH = total petroleum hydrocarbons

U The analyte was not detected at the concentration listed.
J The analyte was positively identified; the quantitation is an estimation.
F The analyte was positively identified but the associated numerical value is below the reporting limit.
M The analyte was positively identified but with low spectral match.

TABLE 5-2
Evaluation of Groundwater TPH Analytical Results with Dilution Attenuation Factors Considered
TPH Action Level Derivation Report, Johnston Atoll

Sample	Units	Distance to Lagoon (ft)	*Dilution Attenuation Factor (distance/100)*	Total TPH A divided by DAF	Total TPH B (SGCU) divided by DAF	Total TPH C (fractionation) divided by DAF
FW-MW03D-1103	mg/L	1114	*11.14*	0.164	0.023	0.023
SWM-MW20-1103	mg/L	701	*7.01*	0.231	0.124	0.096
SWM-MW21-1103	mg/L	638	*6.38*	0.272	0.063	0.057
SWM-MW22-1103	mg/L	957	*9.57*	0.182	0.087	0.058
T49-FD1-1103[a]	mg/L	386	*3.86*	**3.060**	**1.036**	0.150
T49-MW15-1103	mg/L	386	*3.86*	**1.915**	0.515	0.140
T49-MW05-1103	mg/L	30	*1*	0.498	0.213	0.227
T49-MW06-1103	mg/L	306	*3.06*	0.444	0.487	0.332
T49-MW07-1103	mg/L	280	*2.8*	**1.940**	0.118	0.149

Notes:

[a] Field duplicate of sample T49-MW15-1103.

Bold and shading indicates value is greater than 0.64-mg/L action level.
Total TPH A = Sum of detected NWTPH-Gx, NWTPH-Dx diesel, and NWTPH-Dx lube oil
Total TPH B = Sum of detected NWTPH-Gx, NWTPH-Dx SGCU diesel, and NWTPH-Dx SGCU lube oil
Total TPH C = Sum of NWTPH-VPH and NWTPH-EPH.

mg/L = milligram per liter
SGCU = silica gel cleanup
TPH = total petroleum hydrocarbons

TABLE 6-1
Soil TPH Analytical Results
TPH Action Level Derivation Report, Johnston Atoll

Method	Analyte	Units	SWM-TP101 11/01/03	SWM-TP102 11/01/03	SWM-TP103 11/01/03	SWM-TP104 11/01/03	SWM-TP105 11/01/03	T49-TP101 10/31/03	T49-TP102 10/31/03	T49-TP103 10/31/03	T49-TP104 10/31/03	T49-TPFDI[a] 10/31/03
NWTPH-EPH	C10-C12 Aliphatics	mg/kg	126	6.45 M	0.095 U	1.42 F	0.095 U	0.62 F	70.3 J	0.095 U	2,670	159 J
NWTPH-EPH	C10-C12 Aromatics	mg/kg	1.82 F	1 M	0.94 F	0.733 F	0.768 F	0.904 F	4.52 F	0.922 F	113	4.7 F
NWTPH-EPH	C12-C16 Aliphatics	mg/kg	741	52.5 M	1 U	29.6	1 U	47.8	1,970	5.13	15,600	2,500
NWTPH-EPH	C12-C16 Aromatics	mg/kg	62.5	2.03 M	1 U	1.46 F	1 U	1 U	62.8 J	1 U	1,620	97.9 J
NWTPH-EPH	C16-C21 Aliphatics	mg/kg	546	68.2	5.71	42.8	1 U	300	5,100	45.7	10,200	4,180
NWTPH-EPH	C16-C21 Aromatics	mg/kg	229	17.7 M	2.88 F	11.7	2.63 F	28.9	1,460	5.85	4,980	1,380
NWTPH-EPH	C21-C34 Aliphatics	mg/kg	156	23.2 M	3.53 F	16.9	1 U	191	1,380	38.2	1,760	998
NWTPH-EPH	C21-C34 Aromatics	mg/kg	65.7	12.9 M	2.48 F	7.45	1.86 F	52.5	461	11.5	849	387
NWTPH-EPH	Total Extractable Petroleum Hydrocarbons	mg/kg	1,930	184 M	15.5 F	112	5.26 F	622	10,500	107	37,800	9710
NWTPH-VPH	C12-C13 Aromatics	mg/kg	366	51.7 M	3.73 F	0.754 F	0.235 F	16.2	107	1.32 F	1,540	186
NWTPH-VPH	C5-C6 Aliphatics	mg/kg	0.124 U	0.031 UM	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.31 U	0.0343 F
NWTPH-VPH	C6-C8 Aliphatics	mg/kg	1.88 F	1.74 M	0.055 U	0.055 U	0.0697 F	0.055 U	0.055 U	0.055 U	0.873 F	0.055 U
NWTPH-VPH	C8-C10 Aliphatics	mg/kg	14.5 F	0.072 UM	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U	0.072 U	38.9 F	0.072 U
NWTPH-VPH	C8-C10 Aromatics	mg/kg	22.1	3.92 M	0.122 F	0.123 F	0.134 F	0.09 U	1.08 F	0.09 U	79	0.516 F
NWTPH-VPH	Total Volatile Petroleum Hydrocarbons	mg/kg	404 J	57.3 M	3.85 F	0.877 F	0.439 F	16.2	108	1.32 F	1,660	187
NWTPH-Gx	Gasoline-Range Hydrocarbons	mg/kg	343 U	25.6 J	4.68 U	5.68 U	1.42 F	1.08 F	29.9 U	0.634 F	1,230 U	30.1 U
NWTPH-Dx	Diesel-Range Hydrocarbons	mg/kg	2,100	188 M	12.3	116	3.08 F	715 J	11,900	116 J	40,500	11,000
NWTPH-Dx	Lube Oil Range Hydrocarbons	mg/kg	93.3 U	22.4 U	25 U	17.3 U	9.33 U	291 J	961 U	65.2 J	1,870 U	933 U
NWTPH-Dx	Diesel-Range Hydrocarbons with SGCU	mg/kg	1980	181 M	14.1	109	4.66 F	557 J	11,100	103 J	38,500	10,200
NWTPH-Dx	Lube Oil Range Hydrocarbons with SGCU	mg/kg	93.3 U	16.5 U	9.33 U	12.2 U	9.33 U	132 J	779 U	43.1 J	1,870 U	591 U
Total TPH Calc A (detects NWTPH-Dx + NWTPH-Gx)		mg/kg	2,100	213.6	12.3	116.0	4.5	1,007	11,900	181.8	40,500	11,000
Total TPH Calc B (detects NWTPH-Dx SGCU+ NWTPH-Gx)		mg/kg	1,980	206.6	14.1	109.0	6.1	690.1	11,100	146.7	38,500	10,200
Total TPH Calc C (detects NWTPH-EPH + NWTPH-VPH)		mg/kg	2,334	241.3	19.4	112.9	5.7	638.2	10,608	108.3	39,460	9,897

Notes:

[a] Field duplicate of sample T49-TP102-1103.
mg/kg = milligram per kilogram
SGCU = silica gel cleanup
TPH = total petroleum hydrocarbons

U The analyte was not detected at the concentration listed.
J The analyte was positively identified; the quantitation is an estimation.
F The analyte was positively identified but the associated numerical value is below the reporting limit.
M The analyte was positively identified but with low spectral match.

TABLE 6-2
Synthetic Precipitation Leaching Procedure TPH Results
TPH Action Level Derivation Report, Johnston Atoll

Method	Analyte	Units	T49-TP101 11/13/03	T49-TP104 11/13/03
NWTPH-EPH	C10-C12 Aliphatics	mg/L	0.002 U	0.005 F
NWTPH-EPH	C10-C12 Aromatics	mg/L	0.007 F	0.069
NWTPH-EPH	C12-C16 Aliphatics	mg/L	0.010 U	0.013 F
NWTPH-EPH	C12-C16 Aromatics	mg/L	0.010 U	0.274
NWTPH-EPH	C16-C21 Aliphatics	mg/L	0.010 U	0.014 F
NWTPH-EPH	C16-C21 Aromatics	mg/L	0.010 U	0.121
NWTPH-EPH	C21-C34 Aliphatics	mg/L	0.010 U	0.011 U
NWTPH-EPH	C21-C34 Aromatics	mg/L	0.010 U	0.011 U
NWTPH-EPH	Total Extractable Petroleum Hydrocarbons	mg/L	0.071 F	0.495
NWTPH-VPH	C12-C13 Aromatics	mg/L	0.007 F	0.014 F
NWTPH-VPH	C5-C6 Aliphatics	mg/L	0.001 U	0.001 U
NWTPH-VPH	C6-C8 Aliphatics	mg/L	0.001 U	0.001 U
NWTPH-VPH	C8-C10 Aliphatics	mg/L	0.002 U	0.002 U
NWTPH-VPH	C8-C10 Aromatics	mg/L	0.003 U	0.003 U
NWTPH-VPH	Total Volatile Petroleum Hydrocarbons	mg/L	0.014 F	0.020 F
NWTPHGx	Gasoline-Range Hydrocarbons	mg/L	0.013 F	0.031 F
NWTPHDX	Diesel-Range Hydrocarbons	mg/L	0.477 J	5.51 J
NWTPHDX	Lube Oil Range Hydrocarbons	mg/L	0.309 F	0.284 F
NWTPHDX	Diesel-Range Hydrocarbons with SGCU	mg/L	0.054 U	0.693
NWTPHDX	Lube Oil Range Hydrocarbons with SGCU	mg/L	0.110 U	0.11 U
Total TPH Calc A (detects NWTPHDx + NWTPHGx)		mg/L	0.799	5.825
Total TPH Calc B (detects NWTPHDx SGCU+ NWTPHGx)		mg/L	0.1771[a]	0.8344[a]
Total TPH Calc C (detects NWTPH-EPH + NWTPH-VPH)		mg/L	0.085	0.515

Notes:

[a] Calculated assuming nondetects were present at the limit of detection.

mg/L = milligram per liter
SGCU = silica gel cleanup

U The analyte was not detected at the concentration listed.
J The analyte was positively identified; the quantitation is an estimation.
F The analyte was positively identified but the associated numerical value is below the reporting limit.

TABLE 6-3

Summary of Avian Toxicity Data for Potential Surrogate Compounds and Mixtures

TPH Action Level Derivation Report, Johnston Atoll

Analyte	CAS No.	Fraction	EC Range	Study	Test Species	Class	Dose Route	Endpoint	Duration	Test Duration	LD50	NOAEL (mg/kg-d)	LOAEL (mg/kg-d)
N-Hexane	110543	Aliphatic	>C6-C8	Abou-Donia et al., 1982	Hen	Bird	Oral Gavage	Growth, Histopathology, Neurotoxicity Index	90 d	Chronic		10	100
Paraffin (Aliphatic C10-19)	8002742	Aliphatic	>C10-C21	Patton and Dieter, 1980	Mallard	Bird	Oral Diet	Growth, Body Weight	7 mo	Chronic		813	
Paraffin (Aliphatic C10-19)	8002742	Aliphatic	>C10-C21	Coon and Dieter, 1981	Mallard	Bird	Oral Diet	Reproduction, Histopathology	26 weeks	Chronic		815	
Shell SOL 70 (98% Paraffin, 1% Naphthenes)	NA	Aliphatic	>C10-C21	Hudson et al., 1984	Mallard	Bird	Oral	Mortality	1 dose	Acute	> 2000		
Panasol AN-2 (Alkylbenzenes, Naphthalenes, Benzenes)	NA	Aromatic	>C8-C16	Hudson et al., 1984	Mallard	Bird	Oral	Mortality	1 dose	Acute	> 2000		
Xylene	1330207	Aromatic	>C8-C10	Hill and Camardese, 1986	Japanese Quail	Bird	Oral Diet	Growth, Mortality	5 d	Subacute		3,333	
Naphthalene	91203	Aromatic	>C10-C12	Wildlife International, 1985	Bobwhite	Bird	Oral Gavage	Mortality	single dose-14 d obs	Acute	2,690		
Aromatic Hydrocarbon Mixture	NA	Aromatic	>C8-C21	Patton and Dieter, 1980	Mallard	Bird	Oral Diet	Growth, Body Weight	7 mo	Chronic		325	
Benzo(a)pyrene	NA	Aromatic	>C16-C21	Rigdon and Neal, 1963	Leghorn Chicken	Bird	Oral Diet	Egg Fertility, Malformations	34 d	Subchronic		39.5	
7,12-Dimethlbenz(a)anthracene	57976	Aromatic	>C21-C44	Trust et al., 1994	Starling	Bird	Oral Gavage	Immune Function	5 d	Subacute		60	
Mixtures													
Bunker C Fuel Oil	NA	Mixture	Mixed	Ainley et al., 1981	Cassin's Auklet	Bird	Oral	Reproduction	single dose; obs through reprod.	Acute		1596	3191
Diesel Oil	NA	Mixture	Mixed	Hartung and Hunt, 1966	Mallard	Bird	Oral	Mortality	1 dose	Acute	20,448[a]		
Diesel Oil	NA	Mixture	Mixed	Hartung and Hunt, 1966	Mallard	Bird	Oral	Mortality	1 dose	Acute	3,408[b]		
Diesel Oil No. 1	NA	Mixture	Mixed	Hudson et al., 1984	Mallard	Bird	Oral	Mortality	1 dose	Acute	> 17,000[c]		
No. 2 Fuel Oil	NA	Mixture	Mixed	Szaro et al., 1981	Mallard	Bird	Oral	Growth Mortality, and Behavior	18 wk	Chronic		5,000	50,000
Weathered Santa Barbara Crude Oil	NA	Mixture	Mixed	Fry et al., 1986	Wedge-Tailed Shearwater	Bird	Oral	Reproduction	single dose; obs through reprod.	Acute			5,154[d]

Notes:

[a] Reported as 24 mL/kg for birds in optimal environmental conditions. Dose converted to mg/kg assuming density of diesel to be 0.852 g/mL.

[b] Reported as 4 mL/kg for birds in crowded conditions and temperatures of 0 to -10°C. Dose converted to mg/kg assuming density of diesel to be 0.852 g/mL.

[c] Reported as >20 mL/kg. Dose converted to mg/kg assuming density of diesel to be 0.852 g/mL.

[d] Body weights for adult shearwaters from Dunning (1993); mL crude oil converted to mg assuming density of 1,000 mg/mL.

CAS = Chemical Abstracts Services
d = day
EC = elemental carbon
g = gram
kg = kilogram
LD50 = lethal dose 50 (dose having 50 percent probability of causing death)
LOAEL = lowest observed adverse effect level
mL = milliliter
mo = month
NOAEL = no observed adverse effect level
obs = observation
wk = week

TABLE 6-4
Surrogate Avian Toxicity Data for TPH Fractions
TPH Action Level Derivation Report, Johnston Atoll

TPH Fraction	Surrogate Chemical	Test Species	Body Weight (kg)	Test Endpoint	Uncertainty Factor Applied[d]	NOAEL[e] (mg/kg-d)	Toxicity Study Source
C5-C6 Aliphatics	n-Hexane[a]	white leghorn chicken	1.7	chronic LOAEL	10	10	Abou-Donia et. al., 1982
C6-C8 Aliphatics	n-Hexane	white leghorn chicken	1.7	chronic LOAEL	10	10	Abou-Donia et. al., 1982
C8-C10 Aliphatics	n-Hexane	white leghorn chicken	1.7	chronic LOAEL	10	10	Abou-Donia et. al., 1982
C10-C12 Aliphatics	Paraffin (aliphatic C10-19)[b]	mallard duck	1.23	chronic NOAEL	1	813	Patton and Dieter, 1980
C12-C16 Aliphatics	Paraffin (aliphatic C10-19)	mallard duck	1.23	chronic NOAEL	1	813	Patton and Dieter, 1980
C16-C21 Aliphatics	Paraffin (aliphatic C10-19)	mallard duck	1.23	chronic NOAEL	1	813	Patton and Dieter, 1980
C21-C34 Aliphatics	Paraffin (aliphatic C10-19)	mallard duck	1.23	chronic NOAEL	1	813	Patton and Dieter, 1980
C8-C10 Aromatics	Benzo(a)pyrene[c]	white leghorn chicken	1.5	subchronic NOAEL	10	39.5	Rigdon and Neal, 1963
C10-C12 Aromatics	Benzo(a)pyrene	white leghorn chicken	1.5	subchronic NOAEL	10	39.5	Rigdon and Neal, 1963
C12-C13 Aromatics	Benzo(a)pyrene	white leghorn chicken	1.5	subchronic NOAEL	10	39.5	Rigdon and Neal, 1963
C12-C16 Aromatics	Benzo(a)pyrene	white leghorn chicken	1.5	subchronic NOAEL	10	39.5	Rigdon and Neal, 1963
C16-C21 Aromatics	Benzo(a)pyrene	white leghorn chicken	1.5	subchronic NOAEL	10	39.5	Rigdon and Neal, 1963
C21-C34 Aromatics	Benzo(a)pyrene	white leghorn chicken	1.5	subchronic NOAEL	10	39.5	Rigdon and Neal, 1963

Notes:

[a] The reported toxicity value for n-hexane is used as a structurally similar surrogate for all aliphatic fractions less than or equal to C10.

[b] The reported toxicity value for aliphatic paraffin (C10-C19) is used as a structurally similar surrogate for all aliphatic fractions > C10.

[c] The reported toxicity value for an aromatic hydrocarbon mixture is used as a structurally similar surrogate for all aromatic hydrocarbons C8-C34.

[d] Uncertainty factors are consistent with methods provided in EFA West, 1998; chronic LOAEL to chronic NOAEL = 10, subchronic NOAEL to chronic NOAEL = 10.

[e] Final NOAEL used to calculate receptor-specific TRVs.

EFA = Engineering Field Activity
LOAEL = lowest observed adverse effect level
mg/kg-d = milligram per kilogram per day
NOAEL = no observed adverse effect level
TPH = total petroleum hydrocarbons
TRV = toxicity reference value

TABLE 6-5

Risk-Based Concentrations for Brown Booby (*Sula leucogaster*)

TPH Action Level Derivation Report, Johnston Atoll

TPH Fraction	TRVwild (mg/kg bw-d)	Soil RBC (mg/kg)
C5-C6 Aliphatics	9.39E+00	7.80E+03
C6-C8 Aliphatics	9.39E+00	7.80E+03
C8-C10 Aliphatics	9.39E+00	7.80E+03
C10-C12 Aliphatics	8.14E+02	6.77E+05
C12-C16 Aliphatics	8.14E+02	6.77E+05
C16-C21 Aliphatics	8.14E+02	6.77E+05
C21-C34 Aliphatics	8.14E+02	6.77E+05
C8-C10 Aromatics	3.80E+01	3.16E+04
C10-C12 Aromatics	3.80E+01	3.16E+04
C12-C13 Aromatics	3.80E+01	3.16E+04
C12-C16 Aromatics	3.80E+01	3.16E+04
C16-C21 Aromatics	3.80E+01	3.16E+04
C21-C34 Aromatics	3.80E+01	3.16E+04

Notes:

[a] Wildlife Factors Handbook (U.S. EPA, 1993) - using allometric equation for seabirds (dry-weight basis).

Assumptions Used in RBC Calculation:

body weight (kg)	1.238
food ingestion rate[a] (kg/d)	0.075
site use factor	1
incidental soil ingestion fraction	0.02

kg = kilogram
kg/d = kilogram per day
mg/kg = milligram per kilogram
mg/kg bw-d = milligram per kilogram body weight per day
RBC = risk-based concentration
TRV = toxicity reference value

TABLE 6-6
Sample-Specific Ecological Risk-Based Concentrations for TPH in Soil
TPH Action Level Derivation Report, Johnston Atoll

				SWM-TP101 11/01/03			SWM-TP102 11/01/03			SWM-TP104 11/01/03			T49-TP101 10/31/03		
Method	**Analyte**	**Units**	**Fraction-Specific ERBC**	**Conc.**	**% of total**	**Adjusted RBC**	**Conc.**	**% of total**	**Adjusted RBC**	**Conc.**	**% of total**	**Adjusted RBC**	**Conc.**	**% of total**	**Adjusted RBC**
NWVPH	C5-C6 Aliphatics	mg/kg	7.80E+03	0.124 U	0.005%	1.47E+08	0.031 UM	0.013%	6.07E+07	0.031 U	0.027%	2.84E+07	0.031 U	0.005%	1.61E+08
NWVPH	C6-C8 Aliphatics	mg/kg	7.80E+03	1.88 F	0.081%	9.68E+06	1.74 M	0.721%	1.08E+06	0.055 U	0.049%	1.60E+07	0.055 U	0.009%	9.06E+07
NWVPH	C8-C10 Aliphatics	mg/kg	7.80E+03	14.5 F	0.622%	1.25E+06	0.072 UM	0.030%	2.61E+07	0.072 U	0.064%	1.22E+07	0.072 U	0.011%	6.92E+07
NWEPH	C10-C12 Aliphatics	mg/kg	6.77E+05	126	5.402%	1.25E+07	6.45 M	2.671%	2.53E+07	1.42 F	1.256%	5.39E+07	0.62 F	0.097%	6.98E+08
NWEPH	C12-C16 Aliphatics	mg/kg	6.77E+05	741	31.767%	2.13E+06	52.5 M	21.744%	3.11E+06	29.6	26.172%	2.59E+06	47.8	7.478%	9.05E+06
NWEPH	C16-C21 Aliphatics	mg/kg	6.77E+05	546	23.407%	2.89E+06	68.2	28.247%	2.40E+06	42.8	37.843%	1.79E+06	300	46.936%	1.44E+06
NWEPH	C21-C34 Aliphatics	mg/kg	6.77E+05	156	6.688%	1.01E+07	23.2 M	9.609%	7.04E+06	16.9	14.943%	4.53E+06	191	29.882%	2.26E+06
NWVPH	C8-C10 Aromatics	mg/kg	3.16E+04	22.1	0.947%	3.33E+06	3.92 M	1.624%	1.95E+06	0.123 F	0.109%	2.90E+07	0.09 U	0.014%	2.24E+08
NWEPH	C10-C12 Aromatics	mg/kg	3.16E+04	1.82 F	0.078%	4.05E+07	1 M	0.414%	7.63E+06	0.733 F	0.648%	4.87E+06	0.904 F	0.141%	2.23E+07
NWVPH	C12-C13 Aromatics	mg/kg	3.16E+04	366	15.690%	2.01E+05	51.7 M	21.413%	1.47E+05	0.754 F	0.667%	4.74E+06	16.2	2.535%	1.25E+06
NWEPH	C12-C16 Aromatics	mg/kg	3.16E+04	62.5	2.679%	1.18E+06	2.03 M	0.841%	3.76E+06	1.46 F	1.291%	2.45E+06	1 U	0.156%	2.02E+07
NWEPH	C16-C21 Aromatics	mg/kg	3.16E+04	229	9.817%	3.22E+05	17.7 M	7.331%	4.31E+05	11.7	10.345%	3.05E+05	28.9	4.521%	6.99E+05
NWEPH	C21-C34 Aromatics	mg/kg	3.16E+04	65.7	2.817%	1.12E+06	12.9 M	5.343%	5.91E+05	7.45	6.587%	4.79E+05	52.5	8.214%	3.85E+05
Total sum of all fractions (including nondetects)				2,333	100.0%		241	100.0%		113	100.0%		639	100.0%	
Sample-specific TPH ERBC (includes all fractions)						83,039			73,512			131,838			160,970

Notes:

Conc. = concentration
ERPC = environmental risk-based concentration
TPH = total petroleum hydrocarbons

U The analyte was not detected at the concentration listed.

F The analyte was positively identified but the associated numerical value is below the reporting limit.

M The analyte was positively identified but with low spectral match.

TABLE 6-6
Sample-Specific Ecological Risk-Based Concentrations for TPH in Soil
TPH Action Level Derivation Report, Johnston Atoll

				T49-TP102 10/31/03			T49-TP103 10/31/03			T49-TP104 10/31/03			T49-TPFDI* 10/31/03		
Method	Analyte	Units	Fraction-Specific ERBC	Conc.	% of total	Adjusted RBC	Conc.	% of total	Adjusted RBC	Conc.	% of total	Adjusted RBC	Conc.	% of total	Adjusted RBC
NWVPH	C5-C6 Aliphatics	mg/kg	7.80E+03	0.031 U	0.000%	2.67E+09	0.031 U	0.028%	2.77E+07	0.31 U	0.001%	9.92E+08	0.0343 F	0.000%	2.25E+09
NWVPH	C6-C8 Aliphatics	mg/kg	7.80E+03	0.055 U	0.001%	1.51E+09	0.055 U	0.050%	1.56E+07	0.873 F	0.002%	3.52E+08	0.055 U	0.001%	1.40E+09
NWVPH	C8-C10 Aliphatics	mg/kg	7.80E+03	0.072 U	0.001%	1.15E+09	0.072 U	0.065%	1.19E+07	38.9 F	0.099%	7.91E+06	0.072 U	0.001%	1.07E+09
NWEPH	C10-C12 Aliphatics	mg/kg	6.77E+05	70.3 J	0.662%	1.02E+08	0.095 U	0.086%	7.83E+08	2670	6.768%	1.00E+07	159 J	1.607%	4.21E+07
NWEPH	C12-C16 Aliphatics	mg/kg	6.77E+05	1970	18.555%	3.65E+06	5.13	4.665%	1.45E+07	15600	39.543%	1.71E+06	2500	25.270%	2.68E+06
NWEPH	C16-C21 Aliphatics	mg/kg	6.77E+05	5100	48.037%	1.41E+06	45.7	41.559%	1.63E+06	10200	25.855%	2.62E+06	4180	42.251%	1.60E+06
NWEPH	C21-C34 Aliphatics	mg/kg	6.77E+05	1380	12.998%	5.21E+06	38.2	34.738%	1.95E+06	1760	4.461%	1.52E+07	998	10.088%	6.71E+06
NWVPH	C8-C10 Aromatics	mg/kg	3.16E+04	1.08 F	0.010%	3.10E+08	0.09 U	0.082%	3.86E+07	79	0.200%	1.58E+07	0.516 F	0.005%	6.06E+08
NWEPH	C10-C12 Aromatics	mg/kg	3.16E+04	4.52 F	0.043%	7.42E+07	0.922 F	0.838%	3.77E+06	113	0.286%	1.10E+07	4.7 F	0.048%	6.65E+07
NWVPH	C12-C13 Aromatics	mg/kg	3.16E+04	107	1.008%	3.13E+06	1.32 F	1.200%	2.63E+06	1540	3.904%	8.09E+05	186	1.880%	1.68E+06
NWEPH	C12-C16 Aromatics	mg/kg	3.16E+04	62.8 J	0.592%	5.34E+06	1 U	0.909%	3.47E+06	1620	4.106%	7.69E+05	97.9 J	0.990%	3.19E+06
NWEPH	C16-C21 Aromatics	mg/kg	3.16E+04	1460	13.752%	2.30E+05	5.85	5.320%	5.94E+05	4980	12.623%	2.50E+05	1380	13.949%	2.26E+05
NWEPH	C21-C34 Aromatics	mg/kg	3.16E+04	461	4.342%	7.27E+05	11.5	10.458%	3.02E+05	849	2.152%	1.47E+06	387	3.912%	8.07E+05
Total sum of all fractions (including nondetects)				10,617	100.0%		110	100.0%		39,451	100.0%		9,893	100.0%	
Sample-specific TPH ERBC (includes all fractions)						134,411			136,297			115,861			128,981

Notes:

Conc. = concentration
ERPC = environmental risk-based concentration
TPH = total petroleum hydrocarbons

U The analyte was not detected at the concentration listed.

F The analyte was positively identified but the associated numerical value is below the reporting limit.

M The analyte was positively identified but with low spectral match.

TABLE 6-7
Estimated Human Health Risk-Based Concentrations for TPH in Soil
TPH Action Level Derivation Report, Johnston Atoll

Unit	Station ID	Risk-Based Concentration (mg/kg)
SWMU No. 16/AOC No. 1	T49-TP101	70,837
SWMU No. 16/AOC No. 1	T49-TP102	59,943
SWMU No. 16/AOC No. 1	T49-TP102 Dup.	53,509
SWMU No. 16/AOC No. 1	T49-TP103	46,843
SWMU No. 16/AOC No. 1	T49-TP104	43,341
AOC No. 2/No. 3	SWM-TP101	38,010
AOC No. 2/No. 3	SWM-TP102	33,480
AOC No. 2/No. 3	SWM-TP104	38,818

Notes:

mg/kg = milligram per kilogram

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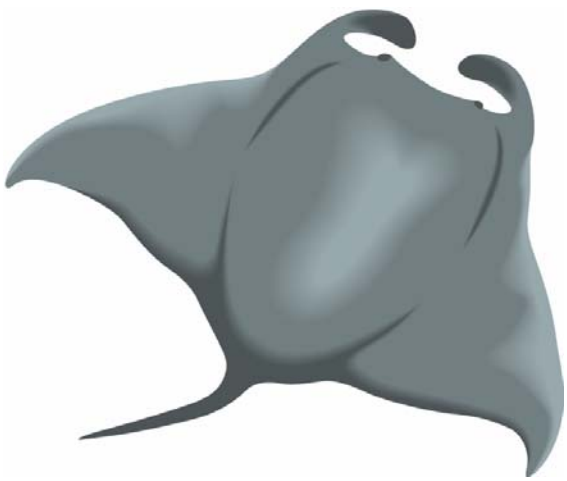

Appendix A
Test Pit Logs

Appendix A:
Test Pit Logs

This appendix presents the test pit logs that were recorded during soil sampling at AOC No. 2/No. 3. All samples collected at SWMU No. 16/AOC No. 1 were taken from fresh walls exposed in an existing excavation.

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PROJECT NUMBER	TEST PIT NUMBER Sheet: 1 of 1

TEST PIT LOG T49TP105

PROJECT JA-TOSI-TPH Sampling LOCATION SWMU 16 LOGGER ZHealy

CONTRACTOR RCI DATE EXCAVATED 10/31/03

EXCAVATION EQUIPMENT Excavator

WATER LEVEL AND DATE 7' 10/31 APPROX.DIMENSIONS: Length 5 Width 7 Max Depth 7'

DEPTH BELOW	SAMPLE INTERVAL	SAMPLE TYPE AND	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
			Ground Surface	
0			dark brown soil with roots to 6".	
1				
2			creamy white crushed coral. fine sand to 1" sized coral chunks.	
3			large chunk of concrete on North Side of test pit.	0 ppm = BZ Breathing Zone.
4			pulled up old piling from south side of the test pit.	
5				
6			creamy white crushed coral. Fine sand to 1" sized coral chunks. orange flecks of sand in matrix. moist.	BZ = 0 ppm
7			same as above. wet.	sample collected T49TP105 14:05
8				
9				
10				

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PROJECT NUMBER	TEST PIT NUMBER Sheet: 1 of 1

TEST PIT LOG SWM-TP101

PROJECT JA TOSI TPH Investigation LOCATION AOC No. 2 LOGGER RHealy

CONTRACTOR RCI DATE EXCAVATED 11/1/03

EXCAVATION EQUIPMENT Backhoe

WATER LEVEL AND DATE 6 APPROX.DIMENSIONS: Length 71 Width 2.5 Max Depth 6.5

DEPTH BELOW	SAMPLE INTERVAL	SAMPLE TYPE AND	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
			Ground Surface	
0			Asphalt - (3-inches)	
1				
2			crushed creamy white coral. Fine sands to 10-inch minus gravel	
3				
4			same as above	
5				
6			same - wet	
			Bottom	sample @ 10:50
7				
8				

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER Sheet: 1 of 1

TEST PIT LOG SWM - TP102

PROJECT JA TOSI TPH Investigation LOCATION AOC 2 LOGGER RHealy

CONTRACTOR RCI DATE EXCAVATED 11/1/03

EXCAVATION EQUIPMENT Backhoe

WATER LEVEL AND DATE 7' 10/3/03 APPROX.DIMENSIONS: Length 10 Width 2.5 Max Depth 7

DEPTH BELOW	SAMPLE INTERVAL	SAMPLE TYPE AND	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
			Ground Surface	
0			gravel fill to 6".	
1				
2			creamy white crushed ~~gravel~~ coral fine sands to 6" diameter gravel. dry.	
3				
4			same as above	
5				
6				
7			same. wet.	sample collected. 0910
			Bottom	
8				
9				
10				

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PROJECT NUMBER	TEST PIT NUMBER SWM-TP103 Sheet: 1 of 1

TEST PIT LOG

PROJECT JA TOSI TPH Investigation LOCATION AOC 2 LOGGER RHealy

CONTRACTOR RCI DATE EXCAVATED 11/1/03

EXCAVATION EQUIPMENT Backhoe

WATER LEVEL AND DATE 7' 11/1/03 APPROX.DIMENSIONS: Length 9 Width 2.5 Max Depth 7.5

DEPTH BELOW	SAMPLE INTERVAL	SAMPLE TYPE AND	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
			Ground Surface	
0			2" - grass + roots.	
1			crushed creamy white coral. fine sands to 6" minus angular gravel. dry.	
2				
3			same as above.	
4				
5				
6			same	sample collected 0955
7				
			Bottom	
8				
9				
10				

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER SWM-TP04 Sheet: 1 of 1

TEST PIT LOG

PROJECT JA-TOSI TPH Investigation LOCATION AOC 2 LOGGER RHealy

CONTRACTOR RCI DATE EXCAVATED 11/1/03

EXCAVATION EQUIPMENT Backhoe

WATER LEVEL AND DATE 6' APPROX.DIMENSIONS: Length 8 Width 2.5 Max Depth 6

DEPTH BELOW	SAMPLE INTERVAL	SAMPLE TYPE AND	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
			Ground Surface	
0			asphalt - (3 inches)	
1				
2			creamy white crushed coral. fine sand to 6-inch gravel. dry.	
3				
4			same	
5				
6			Bottom	sample collected 11:25
7				
8				
9				
10				

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PROJECT NUMBER	TEST PIT NUMBER SWM-TP105 Sheet: 1 of 1

TEST PIT LOG

PROJECT JA Tosi TPH Investigation LOCATION AOC No 2 LOGGER RHealy

CONTRACTOR PCI DATE EXCAVATED 4/1/03

EXCAVATION EQUIPMENT Backhoe

WATER LEVEL AND DATE 7.5 APPROX.DIMENSIONS: Length 10 Width 4 Max Depth 7.5

DEPTH BELOW	SAMPLE INTERVAL	SAMPLE TYPE AND	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
			Ground Surface	
0			creamy white ~~clear~~ crushed coral fine sand to 1" coral chunks. dry.	
1				
2				
3			same as above	
4				
5			same.	FOC sample collected at 5' bgs
6				
7			same ... wet.	sample collected at 13:30.
			Bottom	
8				
9				
10				

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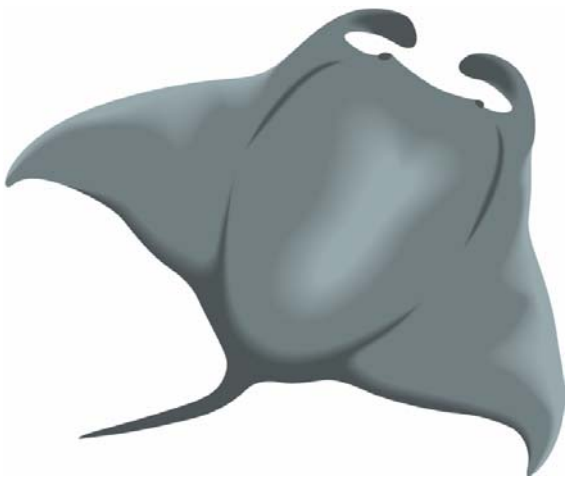

Appendix B
Sampling Records

Appendix B:
Sampling Records

This appendix contains the field sampling records for soil and groundwater samples collected as part of the TPH investigation. The records provide information about sample locations, sampling methods, and field conditions at the time the samples were collected.

CH2MHILL

AFCEE Groundwater

☒ Sample Log ☐ Development Log ☐ Purge Log

Project: JA Tosi TPH Investigation	Site: AOC 2
Project No:	Well ID: SWM-MW22
Field Crew:	Date: 11/1/03 LOGDATE

Screen Interval (ft):	to BEGDEPTH	Climatic Conditions:	☒ sunny ☐ cloudy ☐ rainy
Well Diameter (in.)	2 inches	Purge Method:	☒ peristaltic ☐ bailer ☐ waterra ☐ submersible
PID reading (ppm):	—	Pump placement (ft):	8.80
Water Level Indicator:	☐ Oil/Water Probe (INRFC) MEASMETH	Pump Rate (gal/min):	#DIV/0!
	☒ Probe (PROBE) ☐ Tape (TAPE)	Length of Saturated Zone (ft):	0 8.18
Total Well Depth (ft):	14.98 SOUNDING	Pore Volume (gal):	.16
Depth to Water (ft):	6.80' STATDEPTH		4908
Liquid in Well	☒ WATER (W) ☐ LNAPL (L) DRY/FTCODE		818 ~1.3
	☐ DNAPL (D) ☐ DRY (Y)		
Depth to Product (ft.):			

Field Parameters

1308

Time	Depth to Water (ft.)	Purge Rate (gpm)	Gallons Removed	pH	Temp (C)	Cond. (mS/cm)	ORP (mV)	Turbidity (N.T.U.)	Salinity (%)	D.O. (mg/L)	Comments
15:42	6.80	Pump on									
15:46	6.85	#DIV/0!	0.5	7.52	30.3	6.01		-10	0.31	2.2	
15:51	6.86	#DIV/0!	1.0	7.05	30.3	6.07		-10	6.32	2.12	
15:57	6.87	#DIV/0!	1.5	6.57	30.2	6.11		-10	0.32	2.13	
16:01	6.87	#DIV/0!	2.0	7.32	30.2	6.12		-10	0.32	2.11	
16:05	6.87	#DIV/0!	2.5	7.62	30.2	6.12		-10	0.32	2.11	
16:09	6.88	#DIV/0!	3.0	7.85	30.2	6.12		-10	0.32	2.11	
16:12	6.88	#DIV/0!	3.5	7.94	30.3	6.14		-10	0.32	2.12	
16:16	6.89	#DIV/0!	3.8	7.37	30.3	6.15		-10	0.32	2.10	
16:20	6.89	#DIV/0!	4.5	7.05	30.3	6.15		-10	0.32	2.10	pH not stabilizing
		#DIV/0!									
		#DIV/0!									

Sample, Development, or Purge Water Information

Color	Clear
Odor	weathered petroleum
Turbidity	0
Laboratory Analysis	☐ VOCs SW8260B ☐ TPH-e SW8015m ☐ PAHs SW8310 ☐ Pest SW8081 ☐ Metals SW6010/7000 Field Filtered? ☐ Y ☐ N ☐ SVOCs SW8270C ☐ TPH-p SW8015m ☐ PCBs SW8082 ☐ Herb SW8151 ☐ Lead SW7421 Field Filtered? ☐ Y ☐ N ☐ Other NWTPH-Dx, NWTPH-Dx w/SG, EPH, NWTPH-Gx, VPH
Sample ID	SWM-M22-1103
Total No. of Bottles	4 1L + 6 40mL
Sample Date/Time	11/1/03 16:25
Notes	
Analytical Laboratory	
Transported via	Hand Overnight
Signature/Sampler:	Robert Healy

Capacity of Casing (gal/linear feet): 1"-0.041; 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08

CH2MHILL — **AFCEE Groundwater**

☑ Sample Log ☐ Development Log ☐ Purge Log

Project: JA Tosi TPH Investigation		Site: AOC 2	
Project No:		Well ID: SWM - MW21	
Field Crew: Rob Healy, Mike Kelley		Date: 11/02/03	LOGDATE
Screen Interval (ft):	to BEGDEPTH	Climatic Conditions: ☒ sunny ☐ cloudy ☐ rainy	
Well Diameter (in.)	2"	Purge Method:	☒ peristaltic ☐ bailer ☐ waterra ☐ submersible
PID reading (ppm):	NA	Pump placement (ft):	7'
Water Level Indicator:	☐ Oil/Water Probe (INRFC) MEASMETH	Pump Rate (gal/min):	#DIV/0!
	☒ Probe (PROBE) ☐ Tape (TAPE)	Length of Saturated Zone (ft):	0 11.4 4.7 6.7
Total Well Depth (ft):	11.4 SOUNDING		
Depth to Water (ft):	~~5.70~~ 4.70 STATDEPTH	Pore Volume (gal):	1.1
Liquid in Well	☒ WATER (W) ☐ LNAPL (L) DRY/FTCODE ☐ DNAPL (D) ☐ DRY (Y)		6.7 16 402 1072
Depth to Product (ft.):	—		

Field Parameters

Time	Depth to Water (ft.)	Purge Rate (gpm)	Gallons Removed	pH	Temp (C)	Cond. (mS/cm)	ORP (mV)	Turbidity (N.T.U.)	Salinity (%)	D.O. (mg/L)	Comments
8:06	4.70										
8:10	4.71	#DIV/0!	0.25	7.08	31.2°C	6.95		94	0.37	2.24	
8:16	4.72	#DIV/0!	~~0.5~~ 1.0	6.70	31.4	7.04		-10	0.38	1.92	
8:20	4.72	#DIV/0!	1.5	7.01	31.5	7.04		-10	0.38	1.88	
8:24	4.72	#DIV/0!	2.0	6.24	31.5	7.04		-10	0.38	1.87	
8:28	4.72	#DIV/0!	2.5	6.89	31.5	7.03		-10	0.38	1.87	
8:32	4.72	#DIV/0!	3.0	7.12	31.6	7.03		-10	0.38	1.86	
8:35	4.72	#DIV/0!	3.5	7.33	31.6	7.03		-10	0.38	1.86	
8:39	4.72	#DIV/0!	4.0	7.44	31.5	7.02		-10	0.38	1.86	pH not stabilized collecting sample
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									

Sample, Development, or Purge Water Information

Color	Clear		
Odor	Sulfur smell		
Turbidity	0		
Laboratory Analysis	☐ VOCs SW8260B ☐ TPH-e SW8015m ☐ PAHs SW8310 ☐ Pest SW8081 ☐ Metals SW6010/7000 Field Filtered? ☐ Y ☐ N ☐ SVOCs SW8270C ☐ TPH-p SW8015m ☐ PCBs SW8082 ☐ Herb SW8151 ☐ Lead SW7421 Field Filtered? ☐ Y ☐ N ☐ Other NWTPH-Dx, NWTPH-Dx w/SG, NWTPH-Dx w/SG & Filtration, EPH, NWTPH-Gx, VPH		
Sample ID	SWM-MW21-1103, SWM-MW21-1103-MS, SWM-MW21-1103-MSD	Total No. of Bottles	Sample = 10 (4 1L + 6 VOA) MS = 10 " MSD = 10 "
Sample Date/Time	11/02/03 8:40		
Notes	effervescence in VOA due to HCl CaCO3 interaction. 1st bail - ball valve didn't seal. dropped bailer back in well to get a second bail.		
Analytical Laboratory		Transported via	Hand Overnight
Signature/Sampler:			

Capacity of Casing (gal/linear feet): 1"-0.041; 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08

CH2MHILL

AFCEE Groundwater

☐ Sample Log ☐ Development Log ☐ Purge Log

Project:	JA TOSI TPH Investigation	**Site:**	AOC 2
Project No:		**Well ID:**	SWM-MW20
Field Crew:	Rob Healy	**Date:**	11/2/03 LOGDATE

Screen Interval (ft):	to BEGDEPTH	**Climatic Conditions:**	☒ sunny ☐ cloudy ☐ rainy
Well Diameter (in.)	2"	**Purge Method:**	☒ peristaltic ☐ bailer ☐ waterra ☐ submersible
PID reading (ppm):	NA	**Pump placement (ft):**	7.5' BTOC
Water Level Indicator:	☐ Oil/Water Probe (INRFC) MEASMETH	**Pump Rate (gal/min):**	#DIV/0!
	☒ Probe (PROBE) ☐ Tape (TAPE)	**Length of Saturated Zone (ft):**	0 13.10 − 4.70 = 8.40
Total Well Depth (ft):	13.10 SOUNDING		
Depth to Water (ft):	4.70 STATDEPTH	**Pore Volume (gal):**	1.3 = 8.4 × .16 = 50.4
Liquid in Well	☒ WATER (W) ☐ LNAPL (L) DRY/FTCODE		
	☐ DNAPL (D) ☐ DRY (Y)		
Depth to Product (ft.):			

Field Parameters

8H
134 G

Time	Depth to Water (ft.)	Purge Rate (gpm)	Gallons Removed	pH	Temp (C)	Cond. (mS/cm)	ORP (mV)	Turbidity (N.T.U.)	Salinity (%)	D.O. (mg/L)	Comments
9:54	4.70	Started Pump									
9:58	4.70	#DIV/0!	0.5	7.22	31.5	6.00		360	0.31	~~3.72~~ 1.96	
10:02	4.70	#DIV/0!	1.0	6.88	31.6	6.01		350	0.32	1.87	
10:06	4.65	#DIV/0!	1.5	7.13	31.6	6.01		297	0.32	1.84	
10:11	4.66	#DIV/0!	2.0	7.27	31.6	6.00		245	0.31	1.82	
10:15	4.65	#DIV/0!	2.5	6.64	31.6	~~6.04~~		211	0.31	1.80	
10:19	4.64	#DIV/0!	3.0	6.97	31.6	5.96		216	0.31	1.80	
10:23	4.63	#DIV/0!	3.5	7.27	31.7	5.94		200	0.31	1.80	
10:29	4.62	#DIV/0!	4.0	7.43	31.7	5.90		175	0.31	1.79	
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									

Sample, Development, or Purge Water Information

Color	
Odor	Petroleum odor
Turbidity	
Laboratory Analysis	☐ VOCs SW8260B ☐ TPH-e SW8015m ☐ PAHs SW8310 ☐ Pest SW8081 ☐ Metals SW6010/7000 Field Filtered? ☐ Y ☐ N ☐ SVOCs SW8270C ☐ TPH-p SW8015m ☐ PCBs SW8082 ☐ Herb SW8151 ☐ Lead SW7421 Field Filtered? ☐ Y ☐ N ☐ Other NWTPH-Dx, NWTPH Dx w/SG, NWTPH Dx w/SG & filtration, EPH, NWTPH-Gx, VPH
Sample ID	SWM-MW20-1103 — **Total No. of Bottles:** 6 (4 1L + 6 VOAs)
Sample Date/Time	11/2/03 10:30
Notes	
Analytical Laboratory	— **Transported via:** Hand Overnight
Signature/Sampler:	Robert Healy

Capacity of Casing (gal/linear feet): 1"-0.041; 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08

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AFCEE Groundwater

☒ Sample Log ☐ Development Log ☐ Purge Log

Project:	JA TOSI TPH Investigation	**Site:**	AOC 2 / Airstrip
Project No:		**Well ID:**	~~SWMU~~ FW SWMU-MW3D
Field Crew:	THealy, MKelley	**Date:**	11/2/03 LOGDATE

Screen Interval (ft):		to	BEGDEPTH	**Climatic Conditions:**	☒ sunny ☐ cloudy ☐ rainy
Well Diameter (in.)	2"			**Purge Method:**	☐ peristaltic ☐ bailer ☐ waterra ☐ submersible
PID reading (ppm):	NA			**Pump placement (ft):**	
Water Level Indicator:	☐ Oil/Water Probe (INRFC)		MEASMETH	**Pump Rate (gal/min):**	#DIV/0!
	☒ Probe (PROBE) ☐ Tape (TAPE)			**Length of Saturated Zone (ft):**	0 — 35.56 − 5.49 = 30.05
Total Well Depth (ft):	35.56		SOUNDING		
Depth to Water (ft):	5.49		STATDEPTH	**Pore Volume (gal):**	4.8 gallons
Liquid in Well	☒ WATER (W) ☐ LNAPL (L)		DRY/FTCODE		30.05 × .16 = 4.808
	☐ DNAPL (D) ☐ DRY (Y)				
Depth to Product (ft.):					

Field Parameters

Time	Depth to Water (ft.)	Purge Rate (gpm)	Gallons Removed	pH	Temp (C)	Cond. (mS/cm)	ORP (mV)	Turbidity (N.T.U.)	Salinity (%)	D.O. (mg/L)	Comments
11:12	5.49	Started Pump									
11:17	5.49	#DIV/0!	0.5	6.98	30.2	11.4		443	0.65	1.93	
11:20	5.49	#DIV/0!	1.0	7.26	30.2	11.6		449	0.65	1.91	
11:23	5.49	#DIV/0!	1.5	7.55	30.2	12		380	0.66	1.91	
11:27	5.47	#DIV/0!	2.0	7.49	30.1	11.8		371	0.67	1.90	
11:32	5.46	#DIV/0!	2.5	7.65	30.1	12.0		361	0.68	1.90	
11:37	5.46	#DIV/0!	3.2	7.73	30.1	12.1		344	0.69	1.90	
11:40	5.45	#DIV/0!	4.0	7.86	30.1	12.2		286	0.70	1.9	
11:45	5.45	#DIV/0!	4.5	6.27	30.0	12.4		242	0.71	1.94	Dump bucket.
11:48	5.45	#DIV/0!	5.0	6.29	30.1	12.5		276	0.72	1.9	
		#DIV/0!									
		#DIV/0!									

Sample, Development, or Purge Water Information

Color	
Odor	petroleum odor
Turbidity	
Laboratory Analysis	☐ VOCs SW8260B ☐ TPH-e SW8015m ☐ PAHs SW8310 ☐ Pest SW8081 ☐ Metals SW6010/7000 Field Filtered? ☐ Y ☐ N ☐ SVOCs SW8270C ☐ TPH-p SW8015m ☐ PCBs SW8082 ☐ Herb SW8151 ☐ Lead SW7421 Field Filtered? ☐ Y ☐ N ☐ Other NWTPH-Dx, NWTPH-Dx w/SG, NWTPH-Dx w/SG & Filtration, EPH, NWTPH-Gx, VPH
Sample ID	FW SWMU-MW3D-1103 — **Total No. of Bottles:** 10 (4 1L + 6 VOAs)
Sample Date/Time	11/2/03 11:50
Notes	
Analytical Laboratory	**Transported via:** Hand Overnight
Signature/Sampler:	Robert Healy

Capacity of Casing (gal/linear feet): 1"-0.041; 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08

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AFCEE Groundwater

☒ Sample Log ☐ Development Log ☐ Purge Log

Project:	Site: SWMU-16
Project No:	Well ID: T49-MW15
Field Crew: RHealy, MKelley	Date: 11/2/03 LOGDATE

Screen Interval (ft):	to	BEGDEPTH	Climatic Conditions: ☑ sunny ☐ cloudy ☐ rainy
Well Diameter (in.)	2-inch		Purge Method: ☐ peristaltic ☐ bailer ☐ waterra ☐ submersible
PID reading (ppm):	NA		Pump placement (ft):
Water Level Indicator:	☐ Oil/Water Probe (INRFC) ☐ Probe (PROBE) ☐ Tape (TAPE)	MEASMETH	Pump Rate (gal/min): #DIV/0!
Total Well Depth (ft):	9.93	SOUNDING	Length of Saturated Zone (ft): 0
Depth to Water (ft):	5.44	STATDEPTH	Pore Volume (gal): 0.7
Liquid in Well	☒ WATER (W) ☐ LNAPL (L) ☐ DNAPL (D) ☐ DRY (Y)	DRY/FTCODE	
Depth to Product (ft.):			

9.93 − 5.44 = 4.49

4.49 × .16 = .7175 (3685 / 449)

Field Parameters

Time	Depth to Water (ft.)	Purge Rate (gpm)	Gallons Removed	pH	Temp (C)	Cond. (mS/cm)	ORP (mV)	Turbidity (N.T.U.)	Salinity (%)	D.O. (mg/L)	Comments
13:00	Pump on										
13:05	5.50	#DIV/0!	0.5	6.18	30.3	1.59		352	0.07	1.92	
13:08	5.49	#DIV/0!	1.0	6.17	30.3	1.59		311	0.07	1.90	
13:11	5.49	#DIV/0!	1.5	6.16	30.4	1.60		294	0.07	1.89	
13:14	5.49	#DIV/0!	2.0	6.16	30.4	1.59		283	0.07	1.88	
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									

Sample, Development, or Purge Water Information

Color	
Odor	slight Sulfur smell
Turbidity	
Laboratory Analysis	☐ VOCs SW8260B ☐ TPH-e SW8015m ☐ PAHs SW8310 ☐ Pest SW8081 ☐ Metals SW6010/7000 Field Filtered? ☐ Y ☐ N ☐ SVOCs SW8270C ☐ TPH-p SW8015m ☐ PCBs SW8082 ☐ Herb SW8151 ☐ Lead SW7421 Field Filtered? ☐ Y ☐ N ☐ Other NWTPH-Dx, NWTPH-Dx w/SG, NWTPH-Dx w/SG & filtration, NWTPH-Gx, EPH, VPH
Sample ID	T49-MW15-1103 – 13:20 T49-FD1-1103 – 12:45
Total No. of Bottles	MW15 – 10 (4 L, 6 4 VOA) FD1 – 10 N
Sample Date/Time	11/2/03 13:20
Notes	
Analytical Laboratory	
Transported via	Hand Overnight
Signature/Sampler:	Rob Healy

Capacity of Casing (gal/linear feet): 1"-0.041; 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08

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AFCEE Groundwater

☒ Sample Log ☐ Development Log ☐ Purge Log

Project: JA TOSI TPH Investigation	**Site:** SWMU 16
Project No:	**Well ID:** T49_MW6
Field Crew: ZHealy, MKelley	**Date:** 11/2/03 LOGDATE

Screen Interval (ft):	to	BEGDEPTH	**Climatic Conditions:**	☒ sunny ☐ cloudy ☐ rainy
Well Diameter (in.)	2-inch		**Purge Method:**	☐ peristaltic ☐ bailer ☐ waterra ☐ submersible
PID reading (ppm):	NA		**Pump placement (ft):**	
Water Level Indicator:	☐ Oil/Water Probe (INRFC)	MEASMETH	**Pump Rate (gal/min):**	#DIV/0!
	☐ Probe (PROBE) ☐ Tape (TAPE)		**Length of Saturated Zone (ft):**	0 / 3.93 (8.04 − 4.11 = 3.93)
Total Well Depth (ft):	8.04	SOUNDING		
Depth to Water (ft):	4.11	STATDEPTH	**Pore Volume (gal):**	0.6 (3.93 × .16 = 0.6288 ≈ 6278)
Liquid in Well	☒ WATER (W) ☐ LNAPL (L) ☐ DNAPL (D) ☐ DRY (Y)	DRY/FTCODE		
Depth to Product (ft.):				

Field Parameters

Time	Depth to Water (ft.)	Purge Rate (gpm)	Gallons Removed	pH	Temp (C)	Cond. (mS/cm)	ORP (mV)	Turbidity (N.T.U.)	Salinity (%)	D.O. (mg/L)	Comments
1416	4.11										
1419	4.41	#DIV/0!	0.5	6.03	31.8	3.28		425	0.09	1.83	
1422	4.36	#DIV/0!	1.0	6.04	31.8	3.28		360	0.16	1.80	Turned pump down
1425	4.38	#DIV/0!	1.5	6.04	31.8	3.25		330	0.16	1.80	
1428	4.38	#DIV/0!	2.0	6.05	31.8	3.25		~10	0.16	1.79	
1431	4.38	#DIV/0!	2.5	6.06	31.8	3.24		~10	0.16	1.83	
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									

Sample, Development, or Purge Water Information

Color	
Odor	
Turbidity	
Laboratory Analysis	☐ VOCs SW8260B ☐ TPH-e SW8015m ☐ PAHs SW8310 ☐ Pest SW8081 ☐ Metals SW6010/7000 Field Filtered? ☐ Y ☐ N ☐ SVOCs SW8270C ☐ TPH-p SW8015m ☐ PCBs SW8082 ☐ Herb SW8151 ☐ Lead SW7421 Field Filtered? ☐ Y ☐ N ☐ Other _____

Sample ID	T49-MW6-0103	**Total No. of Bottles**	10 (4 1L & 6 VOAs)
Sample Date/Time	11/2/03 14:35		
Notes			
Analytical Laboratory		**Transported via**	Hand Overnight
Signature/Sampler:	Rob Healy		

Capacity of Casing (gal/linear feet): 1"-0.041; 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08

CH2MHILL

AFCEE Groundwater

☒ Sample Log ☐ Development Log ☐ Purge Log

Project:	JA TOSI TPH Investigation	**Site:**	SWMU 16
Project No:		**Well ID:**	T49-MW7
Field Crew:	RHealy, MKelley	**Date:**	11/2/03 LOGDATE
Screen Interval (ft):	to BEGDEPTH	**Climatic Conditions:**	☐ sunny ☐ cloudy ☐ rainy
Well Diameter (in.)	2-inch	**Purge Method:**	☒ peristaltic ☐ bailer ☐ waterra ☐ submersible
PID reading (ppm):	NA	**Pump placement (ft):**	~9'
Water Level Indicator:	☐ Oil/Water Probe (INRFC) MEASMETH ☐ Probe (PROBE) ☐ Tape (TAPE)	**Pump Rate (gal/min):**	#DIV/0!
		Length of Saturated Zone (ft):	0
Total Well Depth (ft):	10.80 SOUNDING		5.11
Depth to Water (ft):	5.71 STATDEPTH	**Pore Volume (gal):**	~~0.55~~ 0.82
Liquid in Well	☐ WATER (W) ☐ LNAPL (L) ☐ DNAPL (D) ☐ DRY (Y) DRY/FTCODE		5.11 / .16 / 3066
Depth to Product (ft.):			5.71 / .16 / 3066

Field Parameters

Time	Depth to Water (ft.)	Purge Rate (gpm)	Gallons Removed	pH	Temp (C)	Cond. (mS/cm)	ORP (mV)	Turbidity (N.T.U.)	Salinity (%)	D.O. (mg/L)	Comments
1514	5.71	Started pump									
1517	6.67	#DIV/0!	1	6.03	30.9	33.2		758	2.09	2.97	decreased pump speed. particulate matter in purge decreased pump speed. Emptied flow through cell.
1520	6.95	#DIV/0!	1.5	6.02	30.9	33.3		756	2.10	2.05	
1524	7.48	#DIV/0!	2.0	6.02	31.0	35.6		—	2.26	2.04	
1529	7.12	#DIV/0!	2.25	Flow through cell not full yet				766			
1532	7.15	#DIV/0!	2.4	6.02	31.0	40.6		700	2.60	1.94	
1535	7.41	#DIV/0!	2.75	6.01	31.0	42.2		707	2.71	1.88	
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									

Sample, Development, or Purge Water Information

Color	
Odor	petroleum smell
Turbidity	
Laboratory Analysis	☐ VOCs SW8260B ☐ TPH-e SW8015m ☐ PAHs SW8310 ☐ Pest SW8081 ☐ Metals SW6010/7000 Field Filtered? ☐ Y ☐ N ☐ SVOCs SW8270C ☐ TPH-p SW8015m ☐ PCBs SW8082 ☐ Herb SW8151 ☐ Lead SW7421 Field Filtered? ☐ Y ☐ N ☐ Other
Sample ID	T49-MW7-1103 — **Total No. of Bottles:** 10 (4 1L + 6 VOA)
Sample Date/Time	11/2/03 15:40
Notes	sheen on water surface. pumped out well monument prior to opening J-plug.
Analytical Laboratory	— **Transported via:** Hand Overnight
Signature/Sampler:	Rob Healy

Capacity of Casing (gal/linear feet): 1"-0.041; 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08

CH2MHILL — **AFCEE Groundwater**

☑ Sample Log ☐ Development Log ☐ Purge Log

Project:	JA TOSI TPH Investigation	**Site:**	SWMU 16
Project No:		**Well ID:**	T49 - MW5
Field Crew:	THealy, MKelley	**Date:**	11/3/03 LOGDATE

Screen Interval (ft):	to BEGDEPTH	**Climatic Conditions:**	☒ sunny ☐ cloudy ☐ rainy
Well Diameter (in.)	2"	**Purge Method:**	☐ peristaltic ☐ bailer ☐ waterra ☐ submersible
PID reading (ppm):	NA	**Pump placement (ft):**	9 btoc
Water Level Indicator:	☐ Oil/Water Probe (INRFC) MEASMETH ☐ Probe (PROBE) ☐ Tape (TAPE)	**Pump Rate (gal/min):**	#DIV/0!
Total Well Depth (ft):	12.11 SOUNDING	**Length of Saturated Zone (ft):**	0 — 12.11 − 5.56 = 6.55
Depth to Water (ft):	5.56 STATDEPTH	**Pore Volume (gal):**	1.1 — 6.55 × .16 = 1.048
Liquid in Well	☒ WATER (W) ☐ LNAPL (L) ☐ DNAPL (D) ☐ DRY (Y) DRY/FTCODE		
Depth to Product (ft.):			

Field Parameters

Time	Depth to Water (ft.)	Purge Rate (gpm)	Gallons Removed	pH	Temp (C)	Cond. (mS/cm)	ORP (mV)	Turbidity (N.T.U.)	Salinity (%)	D.O. (mg/L)	Comments
9:41	5.56	Pump on									
9:44	6.00	#DIV/0!	0.5	6.88	30.4	25.0		602	1.54	2.08	
9:49	6.06	#DIV/0!	1.0	6.96	30.5	25.7		601	1.57	1.93	
9:55	6.10	#DIV/0!	2.0	7.24	30.6	26.3		613	1.62	1.91	
9:59	6.13	#DIV/0!	2.5	6.97	30.6	26.5		627	1.63	1.91	
10:03	6.13	#DIV/0!	3.0	7.30	30.6	26.6		638	1.64	1.91	
10:07	6.13	#DIV/0!	3.5	6.42	30.6	26.6		689	1.64	1.90	
10:10	6.14	#DIV/0!	4.0	6.98	30.6	26.7		652	1.65	1.90	
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									
		#DIV/0!									

Sample, Development, or Purge Water Information

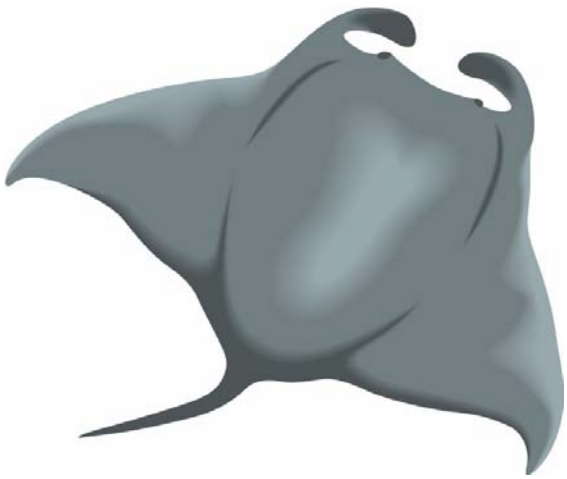
Color	Clear
Odor	Sulfur Smell
Turbidity	
Laboratory Analysis	☐ VOCs SW8260B ☐ TPH-e SW8015m ☐ PAHs SW8310 ☐ Pest SW8081 ☐ Metals SW6010/7000 Field Filtered? ☐ Y ☐ N ☐ SVOCs SW8270C ☐ TPH-p SW8015m ☐ PCBs SW8082 ☐ Herb SW8151 ☐ Lead SW7421 Field Filtered? ☐ Y ☐ N ☐ Other NWTPH-Dx, NWTPH-Dx w/SG, NWTPH-Dx w/SG & Filtration, EPH, NWTPH-Gx, VPH
Sample ID	T49-MW5-1103 — **Total No. of Bottles**
Sample Date/Time	11/3/03 10:15
Notes	
Analytical Laboratory	**Transported via** Hand Overnight
Signature/Sampler:	

Capacity of Casing (gal/linear feet): 1"-0.041; 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08

United States Air Force
15th Airlift Wing
Environmental Restoration Program

Final

TPH Action Level Derivation Report
Johnston Atoll



Appendix C
Analytical Results

Appendix C:
Analytical Results

This appendix presents the laboratory report containing the analytical results, including chromatograms, for the soil and groundwater samples collected at the SWMUs and AOCs.

Laboratory Report Forms

www.ncalabs.com

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24 November 2003

Jeff Cotter
CH2M Hill - Honolulu
1585 Kapiolani Blvd. Suite 1420
Honolulu, HI 96814

RE: Johnson Atoll TPH Investigation

Enclosed are the results of analyses for samples received by the laboratory on 11/06/03 09:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brad Meadows For John Clawson
Project Manager

www.ncalabs.com

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CH2M Hill - Honolulu
1585 Kapiolani Blvd. Suite 1420
Honolulu, HI 96814

Project: Johnson Atoll TPH Investigation
Project Number: 179600.05.01.01
Project Manager: Jeff Cotter

Reported:
11/24/03 07:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SWM-MW22-1103	B3K0154-01	Water	11/01/03 14:25	11/06/03 09:45
T49-FD1-1103	B3K0154-02	Water	11/02/03 12:45	11/06/03 09:45
T49-MW15-1103	B3K0154-03	Water	11/02/03 13:20	11/06/03 09:45
T49-TB15-1103	B3K0154-04	Water	11/02/03 15:15	11/06/03 09:45
T49-TP105	B3K0154-05	Soil	10/31/03 14:05	11/06/03 09:45
T49-TPFDI	B3K0154-06	Soil	10/31/03 14:30	11/06/03 09:45
T49-TP102	B3K0154-07	Soil	10/31/03 14:45	11/06/03 09:45
T49-TP101	B3K0154-08	Soil	10/31/03 15:05	11/06/03 09:45
Leachate of T49-TP101	B3K0154-09	Water	11/13/03 14:58	11/06/03 09:45
T49-TP103	B3K0154-10	Soil	10/31/03 15:45	11/06/03 09:45
T49-TP104	B3K0154-11	Soil	10/31/03 16:00	11/06/03 09:45
Leachate of T49-TP104	B3K0154-12	Water	11/13/03 14:58	11/06/03 09:45
SWM-TP102	B3K0154-13	Soil	11/01/03 09:10	11/06/03 09:45
SWM-TP103	B3K0154-14	Soil	11/01/03 09:55	11/06/03 09:45
SWM-TP101	B3K0154-15	Soil	11/01/03 10:50	11/06/03 09:45
SWM-TP104	B3K0154-16	Soil	11/01/03 11:25	11/06/03 09:45
SWM-TP105	B3K0154-17	Soil	11/01/03 13:30	11/06/03 09:45
SWM-MW20-1103	B3K0154-18	Water	11/02/03 10:30	11/06/03 09:45
FW-MW3D-1103	B3K0154-19	Water	11/02/03 11:50	11/06/03 09:45
FW-TB3D-1103	B3K0154-20	Water	11/02/03 12:50	11/06/03 09:45
T49-MW6-1103	B3K0154-21	Water	11/02/03 14:35	11/06/03 09:45
T49-MW7-1103	B3K0154-22	Water	11/02/03 15:40	11/06/03 09:45
T49-MW5-1103	B3K0154-23	Water	11/03/03 10:15	11/06/03 09:45
T49-TB5-1103	B3K0154-24	Water	11/03/03 11:40	11/06/03 09:45
SWM-MW21-1103	B3K0154-25	Water	11/02/03 08:40	11/06/03 09:45
SWM-TB-21-1103	B3K0154-26	Water	11/03/03 08:40	11/06/03 09:45
SWM-MW20-1103 Filtered	B3K0154-27	Water	11/02/03 10:30	11/06/03 09:45
T49-MW6-1103 Filtered	B3K0154-28	Water	11/02/03 14:35	11/06/03 09:45
T49-MW7-1103 Filtered	B3K0154-29	Water	11/02/03 15:40	11/06/03 09:45

North Creek Analytical - Bothell

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Brad Meadows For John Clawson, Project Manager

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
T49-MW5-1103 Filtered	B3K0154-30	Water	11/03/03 10:15	11/06/03 09:45

North Creek Analytical - Bothell

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Products by NWTPH-Gx
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW22-1103 (B3K0154-01) Water Sampled: 11/01/03 14:25 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**622**	100	ug/l	2	3K10007	11/11/03	11/11/03	NWTPH-Gx	D
Surrogate: 4-BFB (FID)	*126 %*	*62-127*			"	"	"	"	
T49-FD1-1103 (B3K0154-02) Water Sampled: 11/02/03 12:45 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**358**	50.0	ug/l	1	3K12053	11/12/03	11/12/03	NWTPH-Gx	G-01
Surrogate: 4-BFB (FID)	*83.5 %*	*62-127*			"	"	"	"	
T49-MW15-1103 (B3K0154-03) Water Sampled: 11/02/03 13:20 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**122**	50.0	ug/l	1	3K12053	11/12/03	11/12/03	NWTPH-Gx	G-01
Surrogate: 4-BFB (FID)	*91.9 %*	*62-127*			"	"	"	"	
T49-TB15-1103 (B3K0154-04) Water Sampled: 11/02/03 15:15 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**20.3**	50.0	ug/l	1	3K10007	11/11/03	11/11/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*102 %*	*62-127*			"	"	"	"	
T49-TPFDI (B3K0154-06) Soil Sampled: 10/31/03 14:30 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**30.1**	5.00	mg/kg dry	1	3K10012	11/10/03	11/11/03	NWTPH-Gx	G-01
Surrogate: 4-BFB (FID)	*90.6 %*	*52-123*			"	"	"	"	
T49-TP102 (B3K0154-07) Soil Sampled: 10/31/03 14:45 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**29.9**	5.00	mg/kg dry	1	3K10012	11/10/03	11/11/03	NWTPH-Gx	G-01
Surrogate: 4-BFB (FID)	*88.8 %*	*52-123*			"	"	"	"	
T49-TP101 (B3K0154-08) Soil Sampled: 10/31/03 15:05 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**1.08**	5.00	mg/kg dry	1	3K10012	11/10/03	11/11/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*88.3 %*	*52-123*			"	"	"	"	

North Creek Analytical - Bothell

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Products by NWTPH-Gx
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Leachate of T49-TP101 (B3K0154-09) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**13.1**	50.0	ug/l	1	3K20042	11/20/03	11/20/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*99.8 %*	*62-127*			"	"	"	"	
T49-TP103 (B3K0154-10) Soil Sampled: 10/31/03 15:45 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**0.633**	5.00	mg/kg dry	1	3K10012	11/10/03	11/11/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*82.6 %*	*52-123*			"	"	"	"	
T49-TP104 (B3K0154-11) Soil Sampled: 10/31/03 16:00 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**1230**	50.0	mg/kg dry	10	3K10012	11/10/03	11/11/03	NWTPH-Gx	G-01, D
Surrogate: 4-BFB (FID)	*%*	*52-123*			"	"	"	"	*S-01, D*
Leachate of T49-TP104 (B3K0154-12) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**31.4**	50.0	ug/l	1	3K20042	11/20/03	11/20/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*97.7 %*	*62-127*			"	"	"	"	
SWM-TP102 (B3K0154-13) Soil Sampled: 11/01/03 09:10 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**25.6**	5.00	mg/kg dry	1	3K10012	11/10/03	11/11/03	NWTPH-Gx	G-01
Surrogate: 4-BFB (FID)	*100 %*	*52-123*			"	"	"	"	
SWM-TP103 (B3K0154-14) Soil Sampled: 11/01/03 09:55 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**4.68**	5.00	mg/kg dry	1	3K10012	11/10/03	11/11/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*88.5 %*	*52-123*			"	"	"	"	
SWM-TP101 (B3K0154-15) Soil Sampled: 11/01/03 10:50 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**343**	20.0	mg/kg dry	4	3K10012	11/10/03	11/11/03	NWTPH-Gx	G-01, D
Surrogate: 4-BFB (FID)	*174 %*	*52-123*			"	"	"	"	*S-04, D*

North Creek Analytical - Bothell

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Brad Meadows For John Clawson, Project Manager

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Products by NWTPH-Gx
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-TP104 (B3K0154-16) Soil Sampled: 11/01/03 11:25 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**5.68**	5.00	mg/kg dry	1	3K10012	11/10/03	11/11/03	NWTPH-Gx	G-01
Surrogate: 4-BFB (FID)	*87.3 %*	*52-123*			"	"	"	"	
SWM-TP105 (B3K0154-17) Soil Sampled: 11/01/03 13:30 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**1.42**	5.00	mg/kg dry	1	3K10012	11/10/03	11/11/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*89.7 %*	*52-123*			"	"	"	"	
SWM-MW20-1103 (B3K0154-18) Water Sampled: 11/02/03 10:30 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**561**	100	ug/l	2	3K10007	11/11/03	11/11/03	NWTPH-Gx	D
Surrogate: 4-BFB (FID)	*97.7 %*	*62-127*			"	"	"	"	
FW-MW3D-1103 (B3K0154-19) Water Sampled: 11/02/03 11:50 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**50.5**	50.0	ug/l	1	3K12053	11/12/03	11/12/03	NWTPH-Gx	
Surrogate: 4-BFB (FID)	*92.1 %*	*62-127*			"	"	"	"	
FW-TB3D-1103 (B3K0154-20) Water Sampled: 11/02/03 12:50 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**20.9**	50.0	ug/l	1	3K10007	11/11/03	11/11/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*101 %*	*62-127*			"	"	"	"	
T49-MW6-1103 (B3K0154-21) Water Sampled: 11/02/03 14:35 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**341**	50.0	ug/l	1	3K12053	11/12/03	11/12/03	NWTPH-Gx	G-01
Surrogate: 4-BFB (FID)	*112 %*	*62-127*			"	"	"	"	
T49-MW7-1103 (B3K0154-22) Water Sampled: 11/02/03 15:40 Received: 11/06/03 09:45									**A-01**
Gasoline Range Hydrocarbons	**50.1**	50.0	ug/l	1	3K12053	11/12/03	11/12/03	NWTPH-Gx	
Surrogate: 4-BFB (FID)	*80.4 %*	*62-127*			"	"	"	"	

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Products by NWTPH-Gx
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-MW5-1103 (B3K0154-23) Water	**Sampled: 11/03/03 10:15**		**Received: 11/06/03 09:45**						**A-01**
Gasoline Range Hydrocarbons	**35.2**	50.0	ug/l	1	3K12053	11/12/03	11/12/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*86.0 %*	*62-127*			"	"	"	"	
T49-TB5-1103 (B3K0154-24) Water	**Sampled: 11/03/03 11:40**		**Received: 11/06/03 09:45**						**A-01**
Gasoline Range Hydrocarbons	**17.4**	50.0	ug/l	1	3K10007	11/11/03	11/11/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*99.6 %*	*62-127*			"	"	"	"	
SWM-MW21-1103 (B3K0154-25) Water	**Sampled: 11/02/03 08:40**		**Received: 11/06/03 09:45**						**A-01**
Gasoline Range Hydrocarbons	**282**	100	ug/l	2	3K10007	11/11/03	11/11/03	NWTPH-Gx	D
Surrogate: 4-BFB (FID)	*86.2 %*	*62-127*			"	"	"	"	
SWM-TB-21-1103 (B3K0154-26) Water	**Sampled: 11/03/03 08:40**		**Received: 11/06/03 09:45**						**A-01**
Gasoline Range Hydrocarbons	**21.1**	50.0	ug/l	1	3K10007	11/11/03	11/11/03	NWTPH-Gx	J
Surrogate: 4-BFB (FID)	*104 %*	*62-127*			"	"	"	"	

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW22-1103 (B3K0154-01) Water	**Sampled: 11/01/03 14:25**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	**28.5**	100	ug/l	2	3K10009	11/13/03	11/13/03	WA MTCA-VPH	D, J
C6-C8 Aliphatics	**131**	100	"	"	"	"	"	"	D
C8-C10 Aliphatics	ND	100	"	"	"	"	"	"	D, U
C8-C10 Aromatics	**32.6**	100	"	"	"	"	"	"	D, J
C12-C13 Aromatics	**144**	100	"	"	"	"	"	"	D
Total VPH (TVPH)	**336**	500	"	"	"	"	"	"	D, J
Surrogate: 4-BFB (FID)	*120 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*105 %*	*60-140*			"	"	"	"	
T49-FD1-1103 (B3K0154-02) Water	**Sampled: 11/02/03 12:45**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	**1.12**	50.0	ug/l	1	3K10009	11/13/03	11/13/03	WA MTCA-VPH	J
C6-C8 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aromatics	**48.6**	50.0	"	"	"	"	"	"	J
C12-C13 Aromatics	**285**	50.0	"	"	"	"	"	"	
Total VPH (TVPH)	**335**	250	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*90.4 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.0 %*	*60-140*			"	"	"	"	
T49-MW15-1103 (B3K0154-03) Water	**Sampled: 11/02/03 13:20**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	ND	50.0	ug/l	1	3K10009	11/13/03	11/13/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aromatics	**16.4**	50.0	"	"	"	"	"	"	J
C12-C13 Aromatics	**269**	50.0	"	"	"	"	"	"	
Total VPH (TVPH)	**285**	250	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*91.2 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.0 %*	*60-140*			"	"	"	"	

North Creek Analytical - Bothell

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-TPFDI (B3K0154-06) Soil Sampled: 10/31/03 14:30 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	**0.0343**	5.00	mg/kg dry	1	3K10012	11/10/03	11/12/03	WA MTCA-VPH	J
C6-C8 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aromatics	**0.516**	5.00	"	"	"	"	"	"	J
C12-C13 Aromatics	**186**	5.00	"	"	"	"	"	"	
Total VPH (TVPH)	**187**	25.0	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*84.1 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.7 %*	*60-140*			"	"	"	"	
T49-TP102 (B3K0154-07) Soil Sampled: 10/31/03 14:45 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	5.00	mg/kg dry	1	3K10012	11/10/03	11/12/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aromatics	**1.08**	5.00	"	"	"	"	"	"	J
C12-C13 Aromatics	**107**	5.00	"	"	"	"	"	"	
Total VPH (TVPH)	**108**	25.0	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*72.4 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*95.2 %*	*60-140*			"	"	"	"	
T49-TP101 (B3K0154-08) Soil Sampled: 10/31/03 15:05 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	5.00	mg/kg dry	1	3K10012	11/10/03	11/12/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aromatics	ND	5.00	"	"	"	"	"	"	U
C12-C13 Aromatics	**16.2**	5.00	"	"	"	"	"	"	
Total VPH (TVPH)	**16.2**	25.0	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*83.1 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.9 %*	*60-140*			"	"	"	"	

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Leachate of T49-TP101 (B3K0154-09) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	50.0	ug/l	1	3K14014	11/14/03	11/20/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aromatics	ND	50.0	"	"	"	"	"	"	U
C12-C13 Aromatics	**7.35**	50.0	"	"	"	"	"	"	J
Total VPH (TVPH)	**7.35**	250	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*84.2 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*94.8 %*	*60-140*			"	"	"	"	
T49-TP103 (B3K0154-10) Soil Sampled: 10/31/03 15:45 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	5.00	mg/kg dry	1	3K10012	11/10/03	11/12/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aromatics	ND	5.00	"	"	"	"	"	"	U
C12-C13 Aromatics	**1.32**	5.00	"	"	"	"	"	"	J
Total VPH (TVPH)	**1.32**	25.0	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*81.8 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*93.7 %*	*60-140*			"	"	"	"	
T49-TP104 (B3K0154-11) Soil Sampled: 10/31/03 16:00 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	50.0	mg/kg dry	10	3K10012	11/10/03	11/12/03	WA MTCA-VPH	D, U
C6-C8 Aliphatics	**0.873**	50.0	"	"	"	"	"	"	D, J
C8-C10 Aliphatics	**38.9**	50.0	"	"	"	"	"	"	D, J
C8-C10 Aromatics	**79.1**	50.0	"	"	"	"	"	"	D
C12-C13 Aromatics	**1540**	50.0	"	"	"	"	"	"	D
Total VPH (TVPH)	**1660**	250	"	"	"	"	"	"	D
Surrogate: 4-BFB (FID)	*%*	*60-140*			"	"	"	"	*S-01, D*
Surrogate: 4-BFB (PID)	*%*	*60-140*			"	"	"	"	*S-01, D*

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Leachate of T49-TP104 (B3K0154-12) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	50.0	ug/l	1	3K14014	11/14/03	11/21/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aromatics	ND	50.0	"	"	"	"	"	"	U
C12-C13 Aromatics	**13.5**	50.0	"	"	"	"	"	"	J
Total VPH (TVPH)	**13.5**	250	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*87.7 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*94.0 %*	*60-140*			"	"	"	"	
SWM-TP102 (B3K0154-13) Soil Sampled: 11/01/03 09:10 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	5.00	mg/kg dry	1	3K10012	11/10/03	11/12/03	WA MTCA-VPH	U
C6-C8 Aliphatics	**1.74**	5.00	"	"	"	"	"	"	J
C8-C10 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aromatics	**3.91**	5.00	"	"	"	"	"	"	J
C12-C13 Aromatics	**51.6**	5.00	"	"	"	"	"	"	
Total VPH (TVPH)	**57.3**	25.0	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*93.3 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*103 %*	*60-140*			"	"	"	"	
SWM-TP103 (B3K0154-14) Soil Sampled: 11/01/03 09:55 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	5.00	mg/kg dry	1	3K10012	11/10/03	11/12/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aromatics	**0.122**	5.00	"	"	"	"	"	"	J
C12-C13 Aromatics	**3.73**	5.00	"	"	"	"	"	"	J
Total VPH (TVPH)	**3.85**	25.0	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*75.8 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.4 %*	*60-140*			"	"	"	"	

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-TP101 (B3K0154-15) Soil Sampled: 11/01/03 10:50 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	20.0	mg/kg dry	4	3K10012	11/10/03	11/12/03	WA MTCA-VPH	D, U
C6-C8 Aliphatics	**1.88**	20.0	"	"	"	"	"	"	D, J
C8-C10 Aliphatics	**14.5**	20.0	"	"	"	"	"	"	D, J
C8-C10 Aromatics	**22.1**	20.0	"	"	"	"	"	"	D
C12-C13 Aromatics	**366**	20.0	"	"	"	"	"	"	D
Total VPH (TVPH)	**404**	100	"	"	"	"	"	"	D
Surrogate: 4-BFB (FID)	*195 %*	*60-140*			"	"	"	"	*S-04, D*
Surrogate: 4-BFB (PID)	*107 %*	*60-140*			"	"	"	"	*D*
SWM-TP104 (B3K0154-16) Soil Sampled: 11/01/03 11:25 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	5.00	mg/kg dry	1	3K10012	11/10/03	11/12/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aromatics	**0.123**	5.00	"	"	"	"	"	"	J
C12-C13 Aromatics	**0.754**	5.00	"	"	"	"	"	"	J
Total VPH (TVPH)	**0.877**	25.0	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*82.5 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*82.3 %*	*60-140*			"	"	"	"	
SWM-TP105 (B3K0154-17) Soil Sampled: 11/01/03 13:30 Received: 11/06/03 09:45									**A-01**
C5-C6 Aliphatics	ND	5.00	mg/kg dry	1	3K10012	11/10/03	11/12/03	WA MTCA-VPH	U
C6-C8 Aliphatics	**0.0697**	5.00	"	"	"	"	"	"	J
C8-C10 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C8-C10 Aromatics	**0.134**	5.00	"	"	"	"	"	"	J
C12-C13 Aromatics	**0.235**	5.00	"	"	"	"	"	"	J
Total VPH (TVPH)	**0.439**	25.0	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*78.1 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*79.6 %*	*60-140*			"	"	"	"	

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW20-1103 (B3K0154-18) Water	**Sampled: 11/02/03 10:30**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	**39.2**	100	ug/l	2	3K10009	11/13/03	11/13/03	WA MTCA-VPH	D, J
C6-C8 Aliphatics	**140**	100	"	"	"	"	"	"	D
C8-C10 Aliphatics	ND	100	"	"	"	"	"	"	D, U
C8-C10 Aromatics	**31.4**	100	"	"	"	"	"	"	D, J
C12-C13 Aromatics	**176**	100	"	"	"	"	"	"	D
Total VPH (TVPH)	**386**	500	"	"	"	"	"	"	D, J
Surrogate: 4-BFB (FID)	*81.9 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*88.1 %*	*60-140*			"	"	"	"	
FW-MW3D-1103 (B3K0154-19) Water	**Sampled: 11/02/03 11:50**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	ND	50.0	ug/l	1	3K10009	11/13/03	11/13/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aromatics	**6.35**	50.0	"	"	"	"	"	"	J
C12-C13 Aromatics	**87.4**	50.0	"	"	"	"	"	"	
Total VPH (TVPH)	**93.7**	250	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*92.3 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*99.4 %*	*60-140*			"	"	"	"	
T49-MW6-1103 (B3K0154-21) Water	**Sampled: 11/02/03 14:35**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	**3.84**	50.0	ug/l	1	3K10009	11/13/03	11/13/03	WA MTCA-VPH	J
C6-C8 Aliphatics	**10.0**	50.0	"	"	"	"	"	"	J
C8-C10 Aliphatics	**8.07**	50.0	"	"	"	"	"	"	J
C8-C10 Aromatics	**40.8**	50.0	"	"	"	"	"	"	J
C12-C13 Aromatics	**400**	50.0	"	"	"	"	"	"	
Total VPH (TVPH)	**463**	250	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*115 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*107 %*	*60-140*			"	"	"	"	

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-MW7-1103 (B3K0154-22) Water	**Sampled: 11/02/03 15:40**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	ND	50.0	ug/l	1	3K10009	11/13/03	11/13/03	WA MTCA-VPH	U
C6-C8 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aliphatics	**1.77**	50.0	"	"	"	"	"	"	J
C8-C10 Aromatics	**4.70**	50.0	"	"	"	"	"	"	J
C12-C13 Aromatics	**129**	50.0	"	"	"	"	"	"	
Total VPH (TVPH)	**136**	250	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*94.4 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*96.9 %*	*60-140*			"	"	"	"	
T49-MW5-1103 (B3K0154-23) Water	**Sampled: 11/03/03 10:15**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	**4.44**	50.0	ug/l	1	3K10009	11/13/03	11/13/03	WA MTCA-VPH	J
C6-C8 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aliphatics	ND	50.0	"	"	"	"	"	"	U
C8-C10 Aromatics	**8.22**	50.0	"	"	"	"	"	"	J
C12-C13 Aromatics	**61.6**	50.0	"	"	"	"	"	"	
Total VPH (TVPH)	**74.2**	250	"	"	"	"	"	"	J
Surrogate: 4-BFB (FID)	*80.4 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*94.6 %*	*60-140*			"	"	"	"	
SWM-MW21-1103 (B3K0154-25) Water	**Sampled: 11/02/03 08:40**		**Received: 11/06/03 09:45**						**A-01**
C5-C6 Aliphatics	**63.2**	100	ug/l	2	3K10009	11/13/03	11/13/03	WA MTCA-VPH	D, J
C6-C8 Aliphatics	**116**	100	"	"	"	"	"	"	D
C8-C10 Aliphatics	ND	100	"	"	"	"	"	"	D, U
C8-C10 Aromatics	**20.8**	100	"	"	"	"	"	"	D, J
C12-C13 Aromatics	**19.3**	100	"	"	"	"	"	"	D, J
Total VPH (TVPH)	**220**	500	"	"	"	"	"	"	D, J
Surrogate: 4-BFB (FID)	*91.5 %*	*60-140*			"	"	"	"	
Surrogate: 4-BFB (PID)	*92.3 %*	*60-140*			"	"	"	"	

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW22-1103 (B3K0154-01) Water	**Sampled: 11/01/03 14:25**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**0.830**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**0.292**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*88.6 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*91.8 %*	*60-140*			"	"	"	"	
T49-FD1-1103 (B3K0154-02) Water	**Sampled: 11/02/03 12:45**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**10.7**	1.25	mg/l	5	3K06062	11/06/03	11/09/03	NWTPH-Dx	D
Lube Oil Range Hydrocarbons	**1.11**	0.500	"	1	"	"	11/09/03	"	D-06
Surrogate: o-Terphenyl	*116 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*99.0 %*	*60-140*			"	"	"	"	
T49-MW15-1103 (B3K0154-03) Water	**Sampled: 11/02/03 13:20**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**6.66**	1.25	mg/l	5	3K06062	11/06/03	11/09/03	NWTPH-Dx	D
Lube Oil Range Hydrocarbons	**0.732**	0.500	"	1	"	"	11/09/03	"	D-06
Surrogate: o-Terphenyl	*123 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*113 %*	*60-140*			"	"	"	"	
T49-TPFDI (B3K0154-06) Soil	**Sampled: 10/31/03 14:30**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**11000**	1000	mg/kg dry	100	3K06061	11/06/03	11/09/03	NWTPH-Dx	D
Lube Oil Range Hydrocarbons	ND	2500	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*%*	*60-140*			"	"	"	"	*S-01, D*
Surrogate: 1-Chlorooctadecane	*%*	*60-140*			"	"	"	"	*S-01, D*
T49-TP102 (B3K0154-07) Soil	**Sampled: 10/31/03 14:45**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**11900**	1000	mg/kg dry	100	3K06061	11/06/03	11/09/03	NWTPH-Dx	D
Lube Oil Range Hydrocarbons	**962**	2500	"	"	"	"	"	"	D, J
Surrogate: o-Terphenyl	*114 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*%*	*60-140*			"	"	"	"	*S-01, D*

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-TP101 (B3K0154-08) Soil Sampled: 10/31/03 15:05 Received: 11/06/03 09:45									**A-01**
Diesel Range Hydrocarbons	**716**	50.0	mg/kg dry	5	3K06061	11/06/03	11/09/03	NWTPH-Dx	D
Lube Oil Range Hydrocarbons	**292**	125	"	"	"	"	"	"	D
Surrogate: o-Terphenyl	*94.3 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*79.9 %*	*60-140*			"	"	"	"	*D*
Leachate of T49-TP101 (B3K0154-09) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
Diesel Range Hydrocarbons	**0.477**	0.250	mg/l	1	3K14017	11/14/03	11/19/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**0.309**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*90.5 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*90.2 %*	*60-140*			"	"	"	"	
T49-TP103 (B3K0154-10) Soil Sampled: 10/31/03 15:45 Received: 11/06/03 09:45									**A-01**
Diesel Range Hydrocarbons	**116**	10.0	mg/kg dry	1	3K06061	11/06/03	11/09/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**65.2**	25.0	"	"	"	"	"	"	
Surrogate: o-Terphenyl	*98.2 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*97.5 %*	*60-140*			"	"	"	"	
T49-TP104 (B3K0154-11) Soil Sampled: 10/31/03 16:00 Received: 11/06/03 09:45									**A-01**
Diesel Range Hydrocarbons	**40500**	2000	mg/kg dry	200	3K06061	11/06/03	11/09/03	NWTPH-Dx	D
Lube Oil Range Hydrocarbons	ND	5000	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*%*	*60-140*			"	"	"	"	*S-01, D*
Surrogate: 1-Chlorooctadecane	*%*	*60-140*			"	"	"	"	*S-01, D*
Leachate of T49-TP104 (B3K0154-12) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
Diesel Range Hydrocarbons	**5.51**	0.500	mg/l	2	3K14017	11/14/03	11/19/03	NWTPH-Dx	D-06, D
Lube Oil Range Hydrocarbons	**0.284**	0.500	"	1	"	"	11/19/03	"	J
Surrogate: o-Terphenyl	*107 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*92.6 %*	*60-140*			"	"	"	"	

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-TP102 (B3K0154-13) Soil	**Sampled: 11/01/03 09:10 Received: 11/06/03 09:45**								**A-01**
Diesel Range Hydrocarbons	**188**	10.0	mg/kg dry	1	3K06061	11/06/03	11/07/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**22.3**	25.0	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*92.7 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*97.0 %*	*60-140*			"	"	"	"	
SWM-TP103 (B3K0154-14) Soil	**Sampled: 11/01/03 09:55 Received: 11/06/03 09:45**								**A-01**
Diesel Range Hydrocarbons	**12.3**	10.0	mg/kg dry	1	3K06061	11/06/03	11/09/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	U
Surrogate: o-Terphenyl	*94.6 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*97.6 %*	*60-140*			"	"	"	"	
SWM-TP101 (B3K0154-15) Soil	**Sampled: 11/01/03 10:50 Received: 11/06/03 09:45**								**A-01**
Diesel Range Hydrocarbons	**2100**	100	mg/kg dry	10	3K06061	11/06/03	11/09/03	NWTPH-Dx	D
Lube Oil Range Hydrocarbons	ND	250	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*109 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*126 %*	*60-140*			"	"	"	"	*D*
SWM-TP104 (B3K0154-16) Soil	**Sampled: 11/01/03 11:25 Received: 11/06/03 09:45**								**A-01**
Diesel Range Hydrocarbons	**116**	10.0	mg/kg dry	1	3K06061	11/06/03	11/09/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**17.3**	25.0	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*93.1 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*95.6 %*	*60-140*			"	"	"	"	
SWM-TP105 (B3K0154-17) Soil	**Sampled: 11/01/03 13:30 Received: 11/06/03 09:45**								**A-01**
Diesel Range Hydrocarbons	**3.08**	10.0	mg/kg dry	1	3K06061	11/06/03	11/09/03	NWTPH-Dx	J
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	U
Surrogate: o-Terphenyl	*93.2 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*93.2 %*	*60-140*			"	"	"	"	

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW20-1103 (B3K0154-18) Water	**Sampled: 11/02/03 10:30**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**0.823**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**0.236**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*94.1 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*91.1 %*	*60-140*			"	"	"	"	
FW-MW3D-1103 (B3K0154-19) Water	**Sampled: 11/02/03 11:50**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**1.49**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**0.342**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*92.1 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*92.6 %*	*60-140*			"	"	"	"	
T49-MW6-1103 (B3K0154-21) Water	**Sampled: 11/02/03 14:35**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**0.832**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**0.186**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*94.5 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*92.4 %*	*60-140*			"	"	"	"	
T49-MW7-1103 (B3K0154-22) Water	**Sampled: 11/02/03 15:40**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**4.99**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**0.443**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*99.5 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*96.0 %*	*60-140*			"	"	"	"	
T49-MW5-1103 (B3K0154-23) Water	**Sampled: 11/03/03 10:15**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**0.339**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**0.159**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*97.0 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*96.8 %*	*60-140*			"	"	"	"	

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW21-1103 (B3K0154-25) Water	**Sampled: 11/02/03 08:40**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**1.25**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**0.204**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*98.6 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*98.6 %*	*60-140*			"	"	"	"	
SWM-MW20-1103 Filtered (B3K0154-27) Water	**Sampled: 11/02/03 10:30**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**2.19**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**0.237**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*86.3 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*86.3 %*	*60-140*			"	"	"	"	
T49-MW6-1103 Filtered (B3K0154-28) Water	**Sampled: 11/02/03 14:35**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**0.589**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons	**0.136**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*87.9 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*90.5 %*	*60-140*			"	"	"	"	
T49-MW7-1103 Filtered (B3K0154-29) Water	**Sampled: 11/02/03 15:40**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**0.568**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl	*89.5 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*86.9 %*	*60-140*			"	"	"	"	
T49-MW5-1103 Filtered (B3K0154-30) Water	**Sampled: 11/03/03 10:15**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range Hydrocarbons	**1.24**	0.250	mg/l	1	3K06062	11/06/03	11/09/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarbons	**0.158**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*94.5 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*96.0 %*	*60-140*			"	"	"	"	

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW22-1103 (B3K0154-01) Water Sampled: 11/01/03 14:25 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**0.209**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	J
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*83.2 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*87.4 %*	*60-140*			"	"	"	"	
T49-FD1-1103 (B3K0154-02) Water Sampled: 11/02/03 12:45 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**3.83**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	
Lube Oil Range (SGCU)	**0.168**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl (SGCU)	*117 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*112 %*	*60-140*			"	"	"	"	
T49-MW15-1103 (B3K0154-03) Water Sampled: 11/02/03 13:20 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**1.84**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	
Lube Oil Range (SGCU)	**0.149**	0.500	"	"	"	"	"	"	J
Surrogate: o-Terphenyl (SGCU)	*87.9 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*88.6 %*	*60-140*			"	"	"	"	
T49-TPFDI (B3K0154-06) Soil Sampled: 10/31/03 14:30 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**10200**	400	mg/kg dry	40	3K06061	11/06/03	11/10/03	NWTPH-Dx	D
Lube Oil Range (SGCU)	**591**	1000	"	"	"	"	"	"	D, J
Surrogate: o-Terphenyl (SGCU)	*89.6 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane (SGCU	*101 %*	*60-140*			"	"	"	"	*D*
T49-TP102 (B3K0154-07) Soil Sampled: 10/31/03 14:45 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**11100**	400	mg/kg dry	40	3K06061	11/06/03	11/10/03	NWTPH-Dx	D
Lube Oil Range (SGCU)	**779**	1000	"	"	"	"	"	"	D, J
Surrogate: o-Terphenyl (SGCU)	*83.8 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane (SGCU	*116 %*	*60-140*			"	"	"	"	*D*

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-TP101 (B3K0154-08) Soil Sampled: 10/31/03 15:05 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**558**	20.0	mg/kg dry	2	3K06061	11/06/03	11/11/03	NWTPH-Dx	D
Lube Oil Range (SGCU)	**132**	25.0	"	1	"	"	11/10/03	"	
Surrogate: o-Terphenyl (SGCU)	*106 %*	*60-140*			*"*	*"*	*"*	*"*	
Surrogate: 1-Chlorooctadecane (SGCU	*93.7 %*	*60-140*			*"*	*"*	*"*	*"*	
Leachate of T49-TP101 (B3K0154-09) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	ND	0.250	mg/l	1	3K14017	11/14/03	11/19/03	NWTPH-Dx	U
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*81.7 %*	*60-140*			*"*	*"*	*"*	*"*	
Surrogate: 1-Chlorooctadecane (SGCU	*86.9 %*	*60-140*			*"*	*"*	*"*	*"*	
T49-TP103 (B3K0154-10) Soil Sampled: 10/31/03 15:45 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**103**	10.0	mg/kg dry	1	3K06061	11/06/03	11/10/03	NWTPH-Dx	
Lube Oil Range (SGCU)	**43.1**	25.0	"	"	"	"	"	"	
Surrogate: o-Terphenyl (SGCU)	*107 %*	*60-140*			*"*	*"*	*"*	*"*	
Surrogate: 1-Chlorooctadecane (SGCU	*108 %*	*60-140*			*"*	*"*	*"*	*"*	
T49-TP104 (B3K0154-11) Soil Sampled: 10/31/03 16:00 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**38500**	2000	mg/kg dry	200	3K06061	11/06/03	11/10/03	NWTPH-Dx	D
Lube Oil Range (SGCU)	ND	5000	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl (SGCU)	*%*	*60-140*			*"*	*"*	*"*	*"*	*S-01, D*
Surrogate: 1-Chlorooctadecane (SGCU	*%*	*60-140*			*"*	*"*	*"*	*"*	*S-01, D*
Leachate of T49-TP104 (B3K0154-12) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**0.693**	0.250	mg/l	1	3K14017	11/14/03	11/19/03	NWTPH-Dx	D-06
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*86.0 %*	*60-140*			*"*	*"*	*"*	*"*	
Surrogate: 1-Chlorooctadecane (SGCU	*91.6 %*	*60-140*			*"*	*"*	*"*	*"*	

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-TP102 (B3K0154-13) Soil Sampled: 11/01/03 09:10 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**181**	10.0	mg/kg dry	1	3K06061	11/06/03	11/10/03	NWTPH-Dx	
Lube Oil Range (SGCU)	**16.5**	25.0	"	"	"	"	"	"	J
Surrogate: o-Terphenyl (SGCU)	*92.1 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*93.9 %*	*60-140*			"	"	"	"	
SWM-TP103 (B3K0154-14) Soil Sampled: 11/01/03 09:55 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**14.1**	10.0	mg/kg dry	1	3K06061	11/06/03	11/10/03	NWTPH-Dx	
Lube Oil Range (SGCU)	ND	25.0	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*104 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*107 %*	*60-140*			"	"	"	"	
SWM-TP101 (B3K0154-15) Soil Sampled: 11/01/03 10:50 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**1980**	100	mg/kg dry	10	3K06061	11/06/03	11/11/03	NWTPH-Dx	D
Lube Oil Range (SGCU)	ND	250	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl (SGCU)	*110 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane (SGCU	*122 %*	*60-140*			"	"	"	"	*D*
SWM-TP104 (B3K0154-16) Soil Sampled: 11/01/03 11:25 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**109**	10.0	mg/kg dry	1	3K06061	11/06/03	11/11/03	NWTPH-Dx	
Lube Oil Range (SGCU)	**12.2**	25.0	"	"	"	"	"	"	J
Surrogate: o-Terphenyl (SGCU)	*95.0 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*98.1 %*	*60-140*			"	"	"	"	
SWM-TP105 (B3K0154-17) Soil Sampled: 11/01/03 13:30 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**4.65**	10.0	mg/kg dry	1	3K06061	11/06/03	11/11/03	NWTPH-Dx	J
Lube Oil Range (SGCU)	ND	25.0	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*96.3 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*94.4 %*	*60-140*			"	"	"	"	

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW20-1103 (B3K0154-18) Water	**Sampled: 11/02/03 10:30**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range (SGCU)	**0.308**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*92.3 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*93.6 %*	*60-140*			"	"	"	"	
FW-MW3D-1103 (B3K0154-19) Water	**Sampled: 11/02/03 11:50**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range (SGCU)	**0.261**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*93.8 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*94.8 %*	*60-140*			"	"	"	"	
T49-MW6-1103 (B3K0154-21) Water	**Sampled: 11/02/03 14:35**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range (SGCU)	**1.15**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*93.1 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*98.3 %*	*60-140*			"	"	"	"	
T49-MW7-1103 (B3K0154-22) Water	**Sampled: 11/02/03 15:40**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range (SGCU)	**0.331**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*94.1 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*99.5 %*	*60-140*			"	"	"	"	
T49-MW5-1103 (B3K0154-23) Water	**Sampled: 11/03/03 10:15**		**Received: 11/06/03 09:45**						**A-01**
Diesel Range (SGCU)	**0.213**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	J
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*87.6 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*88.9 %*	*60-140*			"	"	"	"	

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW21-1103 (B3K0154-25) Water Sampled: 11/02/03 08:40 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**0.123**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	J
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*110 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*118 %*	*60-140*			"	"	"	"	
SWM-MW20-1103 Filtered (B3K0154-27) Water Sampled: 11/02/03 10:30 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**0.124**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	J
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*85.9 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*90.6 %*	*60-140*			"	"	"	"	
T49-MW6-1103 Filtered (B3K0154-28) Water Sampled: 11/02/03 14:35 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**0.377**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*87.9 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*88.6 %*	*60-140*			"	"	"	"	
T49-MW7-1103 Filtered (B3K0154-29) Water Sampled: 11/02/03 15:40 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**0.0897**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	J
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*94.8 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*98.6 %*	*60-140*			"	"	"	"	
T49-MW5-1103 Filtered (B3K0154-30) Water Sampled: 11/03/03 10:15 Received: 11/06/03 09:45									**A-01**
Diesel Range (SGCU)	**0.137**	0.250	mg/l	1	3K06062	11/06/03	11/11/03	NWTPH-Dx	J
Lube Oil Range (SGCU)	ND	0.500	"	"	"	"	"	"	U
Surrogate: o-Terphenyl (SGCU)	*93.1 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane (SGCU	*93.1 %*	*60-140*			"	"	"	"	

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW22-1103 (B3K0154-01) Water	**Sampled: 11/01/03 14:25**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**220**	404	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	**24.3**	50.5	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**44.5**	50.5	"	"	"	"	"	"	D, J
C16-C21 Aliphatics	**20.1**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	**78.1**	50.5	"	"	"	"	"	"	D
C10-C12 Aromatics	**16.7**	50.5	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
C16-C21 Aromatics	**36.5**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*80.2 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*95.3 %*	*60-140*			"	"	*11/14/03*	"	*D*
T49-FD1-1103 (B3K0154-02) Water	**Sampled: 11/02/03 12:45**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**243**	404	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	**27.2**	50.5	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**51.0**	50.5	"	"	"	"	"	"	D
C16-C21 Aliphatics	**29.0**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	**53.1**	50.5	"	"	"	"	"	"	D
C10-C12 Aromatics	**21.0**	50.5	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	**16.5**	50.5	"	"	"	"	"	"	D, J
C16-C21 Aromatics	**45.2**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*90.3 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*101 %*	*60-140*			"	"	*11/14/03*	"	*D*

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-MW15-1103 (B3K0154-03) Water Sampled: 11/02/03 13:20 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**257**	404	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	**27.1**	50.5	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**51.9**	50.5	"	"	"	"	"	"	D
C16-C21 Aliphatics	**30.4**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	**76.2**	50.5	"	"	"	"	"	"	D
C10-C12 Aromatics	**17.8**	50.5	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	**10.2**	50.5	"	"	"	"	"	"	D, J
C16-C21 Aromatics	**43.6**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*88.6 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*99.5 %*	*60-140*			"	"	*11/14/03*	"	*D*
T49-TPFDI (B3K0154-06) Soil Sampled: 10/31/03 14:30 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**9710**	160	mg/kg dry wt.	4	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	D
C10-C12 Aliphatics	**159**	20.0	mg/kg dry	"	3K06061	"	"	"	D
C12-C16 Aliphatics	**2500**	20.0	"	"	"	"	"	"	D
C16-C21 Aliphatics	**4180**	20.0	"	"	"	"	"	"	D
C21-C34 Aliphatics	**998**	20.0	"	"	"	"	"	"	D
C10-C12 Aromatics	**4.70**	20.0	"	"	"	"	"	"	D, J
C12-C16 Aromatics	**97.9**	20.0	"	"	"	"	"	"	D
C16-C21 Aromatics	**1380**	20.0	"	"	"	"	"	"	D
C21-C34 Aromatics	**387**	20.0	"	"	"	"	"	"	D
Surrogate: o-Terphenyl	*94.5 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*115 %*	*60-140*			"	"	"	"	*D*

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-TP102 (B3K0154-07) Soil	**Sampled: 10/31/03 14:45**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**10500**	160	mg/kg dry wt.	4	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	D
C10-C12 Aliphatics	**70.3**	20.0	mg/kg dry	"	3K06061	"	"	"	D
C12-C16 Aliphatics	**1970**	20.0	"	"	"	"	"	"	D
C16-C21 Aliphatics	**5100**	20.0	"	"	"	"	"	"	D
C21-C34 Aliphatics	**1380**	20.0	"	"	"	"	"	"	D
C10-C12 Aromatics	**4.52**	20.0	"	"	"	"	"	"	D, J
C12-C16 Aromatics	**62.8**	20.0	"	"	"	"	"	"	D
C16-C21 Aromatics	**1460**	20.0	"	"	"	"	"	"	D
C21-C34 Aromatics	**461**	20.0	"	"	"	"	"	"	D
Surrogate: o-Terphenyl	*97.6 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*105 %*	*60-140*			"	"	"	"	*D*
T49-TP101 (B3K0154-08) Soil	**Sampled: 10/31/03 15:05**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**622**	40.0	mg/kg dry wt.	1	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	
C10-C12 Aliphatics	**0.620**	5.00	mg/kg dry	"	3K06061	"	"	"	J
C12-C16 Aliphatics	**47.8**	5.00	"	"	"	"	"	"	
C16-C21 Aliphatics	**300**	5.00	"	"	"	"	"	"	
C21-C34 Aliphatics	**191**	5.00	"	"	"	"	"	"	
C10-C12 Aromatics	**0.904**	5.00	"	"	"	"	"	"	J
C12-C16 Aromatics	ND	5.00	"	"	"	"	"	"	U
C16-C21 Aromatics	**28.9**	5.00	"	"	"	"	"	"	
C21-C34 Aromatics	**52.5**	5.00	"	"	"	"	"	"	
Surrogate: o-Terphenyl	*88.7 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*80.5 %*	*60-140*			"	"	"	"	

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Leachate of T49-TP101 (B3K0154-09) Water	**Sampled: 11/13/03 14:58**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**6.73**	417	ug/l	2	[CALC]	11/14/03	11/23/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	ND	52.1	"	"	3K14024	"	11/23/03	"	D, U
C12-C16 Aliphatics	ND	52.1	"	"	"	"	"	"	D, U
C16-C21 Aliphatics	ND	52.1	"	"	"	"	"	"	D, U
C21-C34 Aliphatics	ND	52.1	"	"	"	"	"	"	D, U
C10-C12 Aromatics	**6.73**	52.1	"	"	"	"	11/23/03	"	D, J
C12-C16 Aromatics	ND	52.1	"	"	"	"	"	"	D, U
C16-C21 Aromatics	ND	52.1	"	"	"	"	"	"	D, U
C21-C34 Aromatics	ND	52.1	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*82.0 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*90.6 %*	*60-140*			"	"	*11/23/03*	"	*D*
T49-TP103 (B3K0154-10) Soil	**Sampled: 10/31/03 15:45**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**107**	40.0	mg/kg dry wt.	1	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	
C10-C12 Aliphatics	ND	5.00	mg/kg dry	"	3K06061	"	"	"	U
C12-C16 Aliphatics	**5.13**	5.00	"	"	"	"	"	"	
C16-C21 Aliphatics	**45.7**	5.00	"	"	"	"	"	"	
C21-C34 Aliphatics	**38.2**	5.00	"	"	"	"	"	"	
C10-C12 Aromatics	**0.922**	5.00	"	"	"	"	"	"	J
C12-C16 Aromatics	ND	5.00	"	"	"	"	"	"	U
C16-C21 Aromatics	**5.85**	5.00	"	"	"	"	"	"	
C21-C34 Aromatics	**11.5**	5.00	"	"	"	"	"	"	
Surrogate: o-Terphenyl	*90.2 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*85.3 %*	*60-140*			"	"	"	"	

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-TP104 (B3K0154-11) Soil Sampled: 10/31/03 16:00 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**37800**	800	mg/kg dry wt.	20	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	D
C10-C12 Aliphatics	**2670**	100	mg/kg dry	"	3K06061	"	"	"	D
C12-C16 Aliphatics	**15600**	100	"	"	"	"	"	"	D
C16-C21 Aliphatics	**10200**	100	"	"	"	"	"	"	D
C21-C34 Aliphatics	**1760**	100	"	"	"	"	"	"	D
C10-C12 Aromatics	**113**	100	"	"	"	"	"	"	D
C12-C16 Aromatics	**1620**	100	"	"	"	"	"	"	D
C16-C21 Aromatics	**4980**	100	"	"	"	"	"	"	D
C21-C34 Aromatics	**849**	100	"	"	"	"	"	"	D
Surrogate: o-Terphenyl	*%*	*60-140*			"	"	"	"	*S-01, D*
Surrogate: 1-Chlorooctadecane	*%*	*60-140*			"	"	"	"	*S-01, D*
Leachate of T49-TP104 (B3K0154-12) Water Sampled: 11/13/03 14:58 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**495**	439	ug/l	2	[CALC]	11/14/03	11/23/03	WA MTCA-EPH	D
C10-C12 Aliphatics	**4.80**	54.9	"	"	3K14024	"	11/23/03	"	D, J
C12-C16 Aliphatics	**12.7**	54.9	"	"	"	"	"	"	D, J
C16-C21 Aliphatics	**14.1**	54.9	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	ND	54.9	"	"	"	"	"	"	D, U
C10-C12 Aromatics	**68.5**	54.9	"	"	"	"	11/23/03	"	D
C12-C16 Aromatics	**274**	54.9	"	"	"	"	"	"	D
C16-C21 Aromatics	**121**	54.9	"	"	"	"	"	"	D
C21-C34 Aromatics	ND	54.9	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*87.5 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*85.0 %*	*60-140*			"	"	*11/23/03*	"	*D*

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-TP102 (B3K0154-13) Soil Sampled: 11/01/03 09:10 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**184**	40.0	mg/kg dry wt.	1	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	
C10-C12 Aliphatics	**6.45**	5.00	mg/kg dry	"	3K06061	"	"	"	
C12-C16 Aliphatics	**52.5**	5.00	"	"	"	"	"	"	
C16-C21 Aliphatics	**68.2**	5.00	"	"	"	"	"	"	
C21-C34 Aliphatics	**23.2**	5.00	"	"	"	"	"	"	
C10-C12 Aromatics	**1.00**	5.00	"	"	"	"	"	"	J
C12-C16 Aromatics	**2.03**	5.00	"	"	"	"	"	"	J
C16-C21 Aromatics	**17.7**	5.00	"	"	"	"	"	"	
C21-C34 Aromatics	**12.9**	5.00	"	"	"	"	"	"	
Surrogate: o-Terphenyl	*89.0 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*88.4 %*	*60-140*			"	"	"	"	
SWM-TP103 (B3K0154-14) Soil Sampled: 11/01/03 09:55 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**15.5**	40.0	mg/kg dry wt.	1	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	J
C10-C12 Aliphatics	ND	5.00	mg/kg dry	"	3K06061	"	"	"	U
C12-C16 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C16-C21 Aliphatics	**5.71**	5.00	"	"	"	"	"	"	
C21-C34 Aliphatics	**3.53**	5.00	"	"	"	"	"	"	J
C10-C12 Aromatics	**0.940**	5.00	"	"	"	"	"	"	J
C12-C16 Aromatics	ND	5.00	"	"	"	"	"	"	U
C16-C21 Aromatics	**2.88**	5.00	"	"	"	"	"	"	J
C21-C34 Aromatics	**2.48**	5.00	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*85.1 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*88.1 %*	*60-140*			"	"	"	"	

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-TP101 (B3K0154-15) Soil Sampled: 11/01/03 10:50 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**1930**	40.0	mg/kg dry wt.	1	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	
C10-C12 Aliphatics	**126**	5.00	mg/kg dry	"	3K06061	"	"	"	
C12-C16 Aliphatics	**741**	5.00	"	"	"	"	"	"	
C16-C21 Aliphatics	**546**	5.00	"	"	"	"	"	"	
C21-C34 Aliphatics	**156**	5.00	"	"	"	"	"	"	
C10-C12 Aromatics	**1.82**	5.00	"	"	"	"	"	"	J
C12-C16 Aromatics	**62.5**	5.00	"	"	"	"	"	"	
C16-C21 Aromatics	**229**	5.00	"	"	"	"	"	"	
C21-C34 Aromatics	**65.7**	5.00	"	"	"	"	"	"	
Surrogate: o-Terphenyl	*98.7 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*96.2 %*	*60-140*			"	"	"	"	
SWM-TP104 (B3K0154-16) Soil Sampled: 11/01/03 11:25 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**112**	40.0	mg/kg dry wt.	1	[CALC]	11/06/03	11/08/03	WA MTCA-EPH	
C10-C12 Aliphatics	**1.42**	5.00	mg/kg dry	"	3K06061	"	"	"	J
C12-C16 Aliphatics	**29.6**	5.00	"	"	"	"	"	"	
C16-C21 Aliphatics	**42.8**	5.00	"	"	"	"	"	"	
C21-C34 Aliphatics	**16.9**	5.00	"	"	"	"	"	"	
C10-C12 Aromatics	**0.733**	5.00	"	"	"	"	"	"	J
C12-C16 Aromatics	**1.46**	5.00	"	"	"	"	"	"	J
C16-C21 Aromatics	**11.7**	5.00	"	"	"	"	"	"	
C21-C34 Aromatics	**7.45**	5.00	"	"	"	"	"	"	
Surrogate: o-Terphenyl	*93.8 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*85.6 %*	*60-140*			"	"	"	"	

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-TP105 (B3K0154-17) Soil Sampled: 11/01/03 13:30 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**5.26**	40.0	mg/kg dry wt.	1	[CALC]	11/06/03	11/09/03	WA MTCA-EPH	J
C10-C12 Aliphatics	ND	5.00	mg/kg dry	"	3K06061	"	"	"	U
C12-C16 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C16-C21 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C21-C34 Aliphatics	ND	5.00	"	"	"	"	"	"	U
C10-C12 Aromatics	**0.768**	5.00	"	"	"	"	"	"	J
C12-C16 Aromatics	ND	5.00	"	"	"	"	"	"	U
C16-C21 Aromatics	**2.63**	5.00	"	"	"	"	"	"	J
C21-C34 Aromatics	**1.86**	5.00	"	"	"	"	"	"	J
Surrogate: o-Terphenyl	*93.8 %*	*60-140*			"	"	"	"	
Surrogate: 1-Chlorooctadecane	*85.2 %*	*60-140*			"	"	"	"	
SWM-MW20-1103 (B3K0154-18) Water Sampled: 11/02/03 10:30 Received: 11/06/03 09:45									**A-01**
Extractable Petroleum Hydrocarbons	**286**	404	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	**28.4**	50.5	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**47.7**	50.5	"	"	"	"	"	"	D, J
C16-C21 Aliphatics	**26.3**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	**32.6**	50.5	"	"	"	"	"	"	D, J
C10-C12 Aromatics	**26.3**	50.5	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	**55.0**	50.5	"	"	"	"	"	"	D
C16-C21 Aromatics	**69.8**	50.5	"	"	"	"	"	"	D
C21-C34 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*88.6 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*94.1 %*	*60-140*			"	"	*11/14/03*	"	*D*

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
FW-MW3D-1103 (B3K0154-19) Water	**Sampled: 11/02/03 11:50**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**157**	404	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	**22.8**	50.5	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**40.7**	50.5	"	"	"	"	"	"	D, J
C16-C21 Aliphatics	**24.5**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	**20.0**	50.5	"	"	"	"	"	"	D, J
C10-C12 Aromatics	**16.3**	50.5	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
C16-C21 Aromatics	**32.5**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*84.7 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*92.6 %*	*60-140*			"	"	*11/14/03*	"	*D*
T49-MW6-1103 (B3K0154-21) Water	**Sampled: 11/02/03 14:35**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**553**	421	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D
C10-C12 Aliphatics	**36.7**	52.6	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**63.9**	52.6	"	"	"	"	"	"	D
C16-C21 Aliphatics	**30.2**	52.6	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	**71.7**	52.6	"	"	"	"	"	"	D
C10-C12 Aromatics	**45.5**	52.6	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	**173**	52.6	"	"	"	"	"	"	D
C16-C21 Aromatics	**132**	52.6	"	"	"	"	"	"	D
C21-C34 Aromatics	ND	52.6	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*81.5 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*93.1 %*	*60-140*			"	"	*11/14/03*	"	*D*

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-MW7-1103 (B3K0154-22) Water	**Sampled: 11/02/03 15:40**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**280**	404	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	**32.9**	50.5	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**74.1**	50.5	"	"	"	"	"	"	D
C16-C21 Aliphatics	**60.5**	50.5	"	"	"	"	"	"	D
C21-C34 Aliphatics	**50.8**	50.5	"	"	"	"	"	"	D
C10-C12 Aromatics	**6.03**	50.5	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
C16-C21 Aromatics	**56.1**	50.5	"	"	"	"	"	"	D
C21-C34 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*86.1 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*100 %*	*60-140*			"	"	*11/14/03*	"	*D*
T49-MW5-1103 (B3K0154-23) Water	**Sampled: 11/03/03 10:15**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**153**	404	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	**22.4**	50.5	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**40.2**	50.5	"	"	"	"	"	"	D, J
C16-C21 Aliphatics	**23.7**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	**34.9**	50.5	"	"	"	"	"	"	D, J
C10-C12 Aromatics	**9.76**	50.5	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
C16-C21 Aromatics	**21.7**	50.5	"	"	"	"	"	"	D, J
C21-C34 Aromatics	ND	50.5	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*89.4 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*99.5 %*	*60-140*			"	"	*11/14/03*	"	*D*

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-MW21-1103 (B3K0154-25) Water	**Sampled: 11/02/03 08:40**		**Received: 11/06/03 09:45**						**A-01**
Extractable Petroleum Hydrocarbons	**146**	426	ug/l	2	[CALC]	11/06/03	11/14/03	WA MTCA-EPH	D, J
C10-C12 Aliphatics	**24.2**	53.2	"	"	3K06062	"	11/14/03	"	D, J
C12-C16 Aliphatics	**43.7**	53.2	"	"	"	"	"	"	D, J
C16-C21 Aliphatics	**24.0**	53.2	"	"	"	"	"	"	D, J
C21-C34 Aliphatics	**35.7**	53.2	"	"	"	"	"	"	D, J
C10-C12 Aromatics	**5.58**	53.2	"	"	"	"	11/14/03	"	D, J
C12-C16 Aromatics	ND	53.2	"	"	"	"	"	"	D, U
C16-C21 Aromatics	**12.4**	53.2	"	"	"	"	"	"	D, J
C21-C34 Aromatics	ND	53.2	"	"	"	"	"	"	D, U
Surrogate: o-Terphenyl	*87.8 %*	*60-140*			"	"	"	"	*D*
Surrogate: 1-Chlorooctadecane	*97.9 %*	*60-140*			"	"	*11/14/03*	"	*D*

North Creek Analytical - Bothell

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
T49-TP105 (B3K0154-05) Soil Sampled: 10/31/03 14:05 Received: 11/06/03 09:45									**A-01**
Dry Weight	**83.7**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
Fractional Organic Carbon - Low	**0.00171**	0.00100	g/g	"	3K17042	11/07/03	11/14/03	EPA 9060	
Fractional Organic Carbon - High	**0.00852**	0.00100	"	"	"	"	"	"	
Fractional Organic Carbon - Average	**0.00462**	0.00100	"	"	"	"	"	"	
T49-TPFDI (B3K0154-06) Soil Sampled: 10/31/03 14:30 Received: 11/06/03 09:45									**A-01**
Dry Weight	**81.7**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
T49-TP102 (B3K0154-07) Soil Sampled: 10/31/03 14:45 Received: 11/06/03 09:45									**A-01**
Dry Weight	**80.0**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
T49-TP101 (B3K0154-08) Soil Sampled: 10/31/03 15:05 Received: 11/06/03 09:45									**A-01**
Dry Weight	**83.7**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
T49-TP103 (B3K0154-10) Soil Sampled: 10/31/03 15:45 Received: 11/06/03 09:45									**A-01**
Dry Weight	**81.8**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
T49-TP104 (B3K0154-11) Soil Sampled: 10/31/03 16:00 Received: 11/06/03 09:45									**A-01**
Dry Weight	**89.9**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
SWM-TP102 (B3K0154-13) Soil Sampled: 11/01/03 09:10 Received: 11/06/03 09:45									**A-01**
Dry Weight	**81.2**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
SWM-TP103 (B3K0154-14) Soil Sampled: 11/01/03 09:55 Received: 11/06/03 09:45									**A-01**
Dry Weight	**79.4**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	

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Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SWM-TP101 (B3K0154-15) Soil	**Sampled: 11/01/03 10:50**		**Received: 11/06/03 09:45**						**A-01**
Dry Weight	**85.6**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
SWM-TP104 (B3K0154-16) Soil	**Sampled: 11/01/03 11:25**		**Received: 11/06/03 09:45**						**A-01**
Dry Weight	**83.5**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
SWM-TP105 (B3K0154-17) Soil	**Sampled: 11/01/03 13:30**		**Received: 11/06/03 09:45**						**A-01**
Dry Weight	**82.5**	1.00	%	1	3K11008	11/11/03	11/12/03	BSOPSPL003R08	
Fractional Organic Carbon - Low	**0.00239**	0.00100	g/g	"	3K17042	11/07/03	11/14/03	EPA 9060	
Fractional Organic Carbon - High	**0.00354**	0.00100	"	"	"	"	"	"	
Fractional Organic Carbon - Average	**0.00289**	0.00100	"	"	"	"	"	"	

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Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Products by NWTPH-Gx - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K10007: Prepared 11/11/03 Using EPA 5030B (P/T)										
Blank (3K10007-BLK1)										
Gasoline Range Hydrocarbons	13.7	50.0	ug/l							J
Surrogate: 4-BFB (FID)	*47.1*		*"*	*48.0*		*98.1*	*62-127*			
LCS (3K10007-BS1)										
Gasoline Range Hydrocarbons	492	50.0	ug/l	500		98.4	80-120			
Surrogate: 4-BFB (FID)	*54.4*		*"*	*48.0*		*113*	*62-127*			
LCS Dup (3K10007-BSD1)										
Gasoline Range Hydrocarbons	460	50.0	ug/l	500		92.0	80-120	6.72	25	
Surrogate: 4-BFB (FID)	*52.1*		*"*	*48.0*		*109*	*62-127*			
Matrix Spike (3K10007-MS1)					**Source: B3K0154-25**					
Gasoline Range Hydrocarbons	1050	100	ug/l	1000	282	76.8	72-119			D
Surrogate: 4-BFB (FID)	*46.9*		*"*	*48.0*		*97.7*	*62-127*			
Matrix Spike Dup (3K10007-MSD1)					**Source: B3K0154-25**					
Gasoline Range Hydrocarbons	1160	100	ug/l	1000	282	87.8	72-119	9.95	25	D
Surrogate: 4-BFB (FID)	*45.5*		*"*	*48.0*		*94.8*	*62-127*			
Batch 3K10012: Prepared 11/10/03 Using EPA 5030B (MeOH)										
Blank (3K10012-BLK1)										
Gasoline Range Hydrocarbons	0.558	5.00	mg/kg							J
Surrogate: 4-BFB (FID)	*4.01*		*"*	*4.00*		*100*	*52-123*			
LCS (3K10012-BS1)										
Gasoline Range Hydrocarbons	28.4	5.00	mg/kg	27.5		103	80-120			
Surrogate: 4-BFB (FID)	*4.14*		*"*	*4.00*		*104*	*52-123*			

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Products by NWTPH-Gx - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K10012: Prepared 11/10/03 Using EPA 5030B (MeOH)										
LCS Dup (3K10012-BSD1)										
Gasoline Range Hydrocarbons	27.8	5.00	mg/kg	27.5		101	80-120	2.14	40	
Surrogate: 4-BFB (FID)	*4.03*		"	*4.00*		*101*	*52-123*			
Matrix Spike (3K10012-MS1)					**Source: B3K0154-13**					
Gasoline Range Hydrocarbons	52.4	5.00	mg/kg dry	33.9	25.6	79.1	54-120			
Surrogate: 4-BFB (FID)	*5.11*		"	*4.93*		*104*	*52-123*			
Matrix Spike Dup (3K10012-MSD1)					**Source: B3K0154-13**					
Gasoline Range Hydrocarbons	49.4	5.00	mg/kg dry	33.9	25.6	70.2	54-120	5.89	40	
Surrogate: 4-BFB (FID)	*4.97*		"	*4.93*		*101*	*52-123*			
Batch 3K12053: Prepared 11/12/03 Using EPA 5030B (P/T)										
Blank (3K12053-BLK1)										
Gasoline Range Hydrocarbons	11.6	50.0	ug/l							J
Surrogate: 4-BFB (FID)	*40.0*		"	*48.0*		*83.3*	*62-127*			
LCS (3K12053-BS1)										
Gasoline Range Hydrocarbons	416	50.0	ug/l	500		83.2	80-120			
Surrogate: 4-BFB (FID)	*42.4*		"	*48.0*		*88.3*	*62-127*			
LCS Dup (3K12053-BSD1)										
Gasoline Range Hydrocarbons	465	50.0	ug/l	500		93.0	80-120	11.1	25	
Surrogate: 4-BFB (FID)	*47.7*		"	*48.0*		*99.4*	*62-127*			
Matrix Spike (3K12053-MS1)					**Source: B3K0154-03**					
Gasoline Range Hydrocarbons	528	50.0	ug/l	500	122	81.2	72-119			
Surrogate: 4-BFB (FID)	*43.9*		"	*48.0*		*91.5*	*62-127*			

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Products by NWTPH-Gx - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K12053: Prepared 11/12/03 Using EPA 5030B (P/T)										
Matrix Spike Dup (3K12053-MSD1)					**Source: B3K0154-03**					
Gasoline Range Hydrocarbons	567	50.0	ug/l	500	122	89.0	72-119	7.12	25	
Surrogate: 4-BFB (FID)	*45.5*		*"*	*48.0*		*94.8*	*62-127*			
Batch 3K20042: Prepared 11/20/03 Using EPA 5030B (P/T)										
Blank (3K20042-BLK1)										
Gasoline Range Hydrocarbons	17.3	50.0	ug/l							J
Surrogate: 4-BFB (FID)	*47.8*		*"*	*48.0*		*99.6*	*62-127*			
LCS (3K20042-BS1)										
Gasoline Range Hydrocarbons	435	50.0	ug/l	500		87.0	80-120			
Surrogate: 4-BFB (FID)	*48.0*		*"*	*48.0*		*100*	*62-127*			
LCS Dup (3K20042-BSD1)										
Gasoline Range Hydrocarbons	414	50.0	ug/l	500		82.8	80-120	4.95	25	
Surrogate: 4-BFB (FID)	*48.9*		*"*	*48.0*		*102*	*62-127*			

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K10009: Prepared 11/13/03 Using EPA 5030B (P/T)										
Blank (3K10009-BLK1)										
C5-C6 Aliphatics	1.08	50.0	ug/l							J
C6-C8 Aliphatics	1.91	50.0	"							J
C8-C10 Aliphatics	1.94	50.0	"							J
C8-C10 Aromatics	3.25	50.0	"							J
C12-C13 Aromatics	17.7	50.0	"							J
Total VPH (TVPH)	25.9	250	"							J
Surrogate: 4-BFB (FID)	*46.8*		*"*	*48.0*		*97.5*	*60-140*			
Surrogate: 4-BFB (PID)	*44.9*		*"*	*48.0*		*93.5*	*60-140*			
LCS (3K10009-BS1)										
Total VPH (TVPH)	182	50.0	ug/l	200		91.0	70-130			
Surrogate: 4-BFB (FID)	*41.6*		*"*	*48.0*		*86.7*	*60-140*			
Surrogate: 4-BFB (PID)	*47.6*		*"*	*48.0*		*99.2*	*60-140*			
LCS Dup (3K10009-BSD1)										
Total VPH (TVPH)	184	50.0	ug/l	200		92.0	70-130	1.09	25	
Surrogate: 4-BFB (FID)	*43.2*		*"*	*48.0*		*90.0*	*60-140*			
Surrogate: 4-BFB (PID)	*47.6*		*"*	*48.0*		*99.2*	*60-140*			
Matrix Spike (3K10009-MS1)					**Source: B3K0154-25**					
Total VPH (TVPH)	605	100	ug/l	400	220	96.2	70-130			D
Surrogate: 4-BFB (FID)	*43.2*		*"*	*48.0*		*90.0*	*60-140*			
Surrogate: 4-BFB (PID)	*43.2*		*"*	*48.0*		*90.0*	*60-140*			
Matrix Spike Dup (3K10009-MSD1)					**Source: B3K0154-25**					
Total VPH (TVPH)	530	100	ug/l	400	220	77.5	70-130	13.2	25	D
Surrogate: 4-BFB (FID)	*36.6*		*"*	*48.0*		*76.2*	*60-140*			
Surrogate: 4-BFB (PID)	*43.9*		*"*	*48.0*		*91.5*	*60-140*			

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K10012: Prepared 11/10/03 Using EPA 5030B (MeOH)										
Blank (3K10012-BLK2)										
C5-C6 Aliphatics	ND	5.00	mg/kg							U
C6-C8 Aliphatics	ND	5.00	"							U
C8-C10 Aliphatics	ND	5.00	"							U
C8-C10 Aromatics	0.158	5.00	"							J
C12-C13 Aromatics	0.608	5.00	"							J
Total VPH (TVPH)	0.767	25.0	"							J
Surrogate: 4-BFB (FID)	*3.69*		*"*	*4.00*		*92.2*	*60-140*			
Surrogate: 4-BFB (PID)	*4.23*		*"*	*4.00*		*106*	*60-140*			
LCS (3K10012-BS2)										
Total VPH (TVPH)	7.93	5.00	mg/kg	10.0		79.3	70-130			
Surrogate: 4-BFB (FID)	*3.82*		*"*	*4.00*		*95.5*	*60-140*			
Surrogate: 4-BFB (PID)	*4.47*		*"*	*4.00*		*112*	*60-140*			
LCS Dup (3K10012-BSD2)										
Total VPH (TVPH)	7.42	5.00	mg/kg	10.0		74.2	70-130	6.64	25	
Surrogate: 4-BFB (FID)	*3.44*		*"*	*4.00*		*86.0*	*60-140*			
Surrogate: 4-BFB (PID)	*4.59*		*"*	*4.00*		*115*	*60-140*			
Matrix Spike (3K10012-MS2)					**Source: B3K0154-13**					
Total VPH (TVPH)	58.4	5.00	mg/kg dry	12.3	57.3	8.94	70-130			Q-02
Surrogate: 4-BFB (FID)	*4.81*		*"*	*4.93*		*97.6*	*60-140*			
Surrogate: 4-BFB (PID)	*3.89*		*"*	*4.93*		*78.9*	*60-140*			
Matrix Spike Dup (3K10012-MSD2)					**Source: B3K0154-13**					
Total VPH (TVPH)	42.5	5.00	mg/kg dry	12.3	57.3	-120	70-130	31.5	25	Q-02, Q-16
Surrogate: 4-BFB (FID)	*4.52*		*"*	*4.93*		*91.7*	*60-140*			
Surrogate: 4-BFB (PID)	*4.03*		*"*	*4.93*		*81.7*	*60-140*			

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Volatile Petroleum Hydrocarbons by WDOE TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K14014: Prepared 11/14/03 Using EPA 5030B (P/T)										
Blank (3K14014-BLK1)										
C5-C6 Aliphatics	ND	50.0	ug/l							U
C6-C8 Aliphatics	ND	50.0	"							U
C8-C10 Aliphatics	ND	50.0	"							U
C8-C10 Aromatics	ND	50.0	"							U
C12-C13 Aromatics	3.34	50.0	"							J
Total VPH (TVPH)	3.34	250	"							J
Surrogate: 4-BFB (FID)	*39.4*		*"*	*48.0*		*82.1*	*60-140*			
Surrogate: 4-BFB (PID)	*45.1*		*"*	*48.0*		*94.0*	*60-140*			
LCS (3K14014-BS1)										
Total VPH (TVPH)	162	50.0	ug/l	200		81.0	70-130			
Surrogate: 4-BFB (FID)	*43.6*		*"*	*48.0*		*90.8*	*60-140*			
Surrogate: 4-BFB (PID)	*45.9*		*"*	*48.0*		*95.6*	*60-140*			
LCS Dup (3K14014-BSD1)										
Total VPH (TVPH)	165	50.0	ug/l	200		82.5	70-130	1.83	25	
Surrogate: 4-BFB (FID)	*42.7*		*"*	*48.0*		*89.0*	*60-140*			
Surrogate: 4-BFB (PID)	*46.6*		*"*	*48.0*		*97.1*	*60-140*			

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1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K06061: Prepared 11/06/03 Using EPA 3550B										
Blank (3K06061-BLK1)										
Diesel Range Hydrocarbons	1.77	10.0	mg/kg							J
Lube Oil Range Hydrocarbons	ND	25.0	"							U
Surrogate: o-Terphenyl	*13.0*		"	*13.3*		*97.7*	*60-140*			
Surrogate: 1-Chlorooctadecane	*13.5*		"	*13.3*		*102*	*60-140*			
LCS (3K06061-BS1)										
Diesel Range Hydrocarbons	50.6	10.0	mg/kg	66.7		75.9	70-130			
Surrogate: o-Terphenyl	*12.7*		"	*13.3*		*95.5*	*60-140*			
LCS Dup (3K06061-BSD1)										
Diesel Range Hydrocarbons	53.3	10.0	mg/kg	66.7		79.9	70-130	5.20	40	
Surrogate: o-Terphenyl	*13.2*		"	*13.3*		*99.2*	*60-140*			
Matrix Spike (3K06061-MS1)					**Source: B3K0154-13**					
Diesel Range Hydrocarbons	474	20.0	mg/kg dry	82.1	188	348	50-150			Q-03, D
Surrogate: o-Terphenyl	*16.1*		"	*16.4*		*98.2*	*60-140*			*D*
Matrix Spike Dup (3K06061-MSD1)					**Source: B3K0154-13**					
Diesel Range Hydrocarbons	591	20.0	mg/kg dry	82.1	188	491	50-150	22.0	40	Q-03, D
Surrogate: o-Terphenyl	*16.3*		"	*16.4*		*99.4*	*60-140*			*D*
Batch 3K06062: Prepared 11/06/03 Using EPA 3510C										
Blank (3K06062-BLK1)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							U
Lube Oil Range Hydrocarbons	ND	0.500	"							U
Surrogate: o-Terphenyl	*0.384*		"	*0.400*		*96.0*	*60-140*			
Surrogate: 1-Chlorooctadecane	*0.403*		"	*0.400*		*101*	*60-140*			

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K06062: Prepared 11/06/03 Using EPA 3510C										
Blank (3K06062-BLK2)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							U
Lube Oil Range Hydrocarbons	ND	0.500	"							U
Surrogate: o-Terphenyl	*0.378*		"	*0.400*		*94.5*	*60-140*			
Surrogate: 1-Chlorooctadecane	*0.388*		"	*0.400*		*97.0*	*60-140*			
LCS (3K06062-BS1)										
Diesel Range Hydrocarbons	1.61	0.250	mg/l	2.00		80.5	63-107			
Surrogate: o-Terphenyl	*0.385*		"	*0.400*		*96.2*	*60-140*			
LCS Dup (3K06062-BSD1)										
Diesel Range Hydrocarbons	1.49	0.250	mg/l	2.00		74.5	63-107	7.74	40	
Surrogate: o-Terphenyl	*0.360*		"	*0.400*		*90.0*	*60-140*			
Matrix Spike (3K06062-MS1)					**Source: B3K0154-25**					
Diesel Range Hydrocarbons	2.22	0.250	mg/l	2.08	1.25	46.6	37-126			
Surrogate: o-Terphenyl	*0.369*		"	*0.417*		*88.5*	*60-140*			
Matrix Spike Dup (3K06062-MSD1)					**Source: B3K0154-25**					
Diesel Range Hydrocarbons	2.33	0.250	mg/l	2.08	1.25	51.9	37-126	4.84	40	
Surrogate: o-Terphenyl	*0.380*		"	*0.417*		*91.1*	*60-140*			
Batch 3K14017: Prepared 11/14/03 Using EPA 3520C										
Blank (3K14017-BLK1)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							U
Lube Oil Range Hydrocarbons	ND	0.500	"							U
Surrogate: o-Terphenyl	*0.379*		"	*0.400*		*94.8*	*60-140*			
Surrogate: 1-Chlorooctadecane	*0.392*		"	*0.400*		*98.0*	*60-140*			

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K14017: Prepared 11/14/03 Using EPA 3520C										
Blank (3K14017-BLK2)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							U
Lube Oil Range Hydrocarbons	ND	0.500	"							U
Surrogate: o-Terphenyl	*0.370*		*"*	*0.400*		*92.5*	*60-140*			
Surrogate: 1-Chlorooctadecane	*0.381*		*"*	*0.400*		*95.2*	*60-140*			
LCS (3K14017-BS1)										
Diesel Range Hydrocarbons	1.49	0.250	mg/l	2.00		74.5	63-107			
Surrogate: o-Terphenyl	*0.371*		*"*	*0.400*		*92.8*	*60-140*			
LCS Dup (3K14017-BSD1)										
Diesel Range Hydrocarbons	1.47	0.250	mg/l	2.00		73.5	63-107	1.35	40	
Surrogate: o-Terphenyl	*0.371*		*"*	*0.400*		*92.8*	*60-140*			

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K06061: Prepared 11/06/03 Using EPA 3550B										
Blank (3K06061-BLK1)										
Diesel Range (SGCU)	2.93	10.0	mg/kg							J
Lube Oil Range (SGCU)	ND	25.0	"							U
Surrogate: o-Terphenyl (SGCU)	*13.4*		"	*13.3*		*101*	*60-140*			
Surrogate: 1-Chlorooctadecane (SGCU)	*13.2*		"	*13.3*		*99.2*	*60-140*			
LCS (3K06061-BS1)										
Diesel Range (SGCU)	52.3	10.0	mg/kg	66.7		78.4	70-130			
Surrogate: o-Terphenyl (SGCU)	*12.8*		"	*13.3*		*96.2*	*60-140*			
LCS Dup (3K06061-BSD1)										
Diesel Range (SGCU)	56.3	10.0	mg/kg	66.7		84.4	70-130	7.37	40	
Surrogate: o-Terphenyl (SGCU)	*13.2*		"	*13.3*		*99.2*	*60-140*			
Matrix Spike (3K06061-MS1)					**Source: B3K0154-13**					
Diesel Range (SGCU)	509	20.0	mg/kg dry	82.1	181	400	50-150			Q-01, D
Surrogate: o-Terphenyl (SGCU)	*15.1*		"	*16.4*		*92.1*	*60-140*			
Matrix Spike Dup (3K06061-MSD1)					**Source: B3K0154-13**					
Diesel Range (SGCU)	460	20.0	mg/kg dry	82.1	181	340	50-150	10.1	50	Q-01, D
Surrogate: o-Terphenyl (SGCU)	*16.5*		"	*16.4*		*101*	*60-140*			
Batch 3K06062: Prepared 11/06/03 Using EPA 3510C										
Blank (3K06062-BLK1)										
Diesel Range (SGCU)	ND	0.250	mg/l							U
Lube Oil Range (SGCU)	ND	0.500	"							U
Surrogate: o-Terphenyl (SGCU)	*0.392*		"	*0.400*		*98.0*	*60-140*			
Surrogate: 1-Chlorooctadecane (SGCU)	*0.414*		"	*0.400*		*104*	*60-140*			

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K06062: Prepared 11/06/03 Using EPA 3510C										
Blank (3K06062-BLK2)										
Diesel Range (SGCU)	ND	0.250	mg/l							U
Lube Oil Range (SGCU)	ND	0.500	"							U
Surrogate: o-Terphenyl (SGCU)	*0.400*		*"*	*0.400*		*100*	*60-140*			
Surrogate: 1-Chlorooctadecane (SGCU)	*0.424*		*"*	*0.400*		*106*	*60-140*			
LCS (3K06062-BS1)										
Diesel Range (SGCU)	1.67	0.250	mg/l	2.00		83.5	45-105			
Surrogate: o-Terphenyl (SGCU)	*0.399*		*"*	*0.400*		*99.8*	*60-140*			
LCS Dup (3K06062-BSD1)										
Diesel Range (SGCU)	1.53	0.250	mg/l	2.00		76.5	45-105	8.75	50	
Surrogate: o-Terphenyl (SGCU)	*0.368*		*"*	*0.400*		*92.0*	*60-140*			
Matrix Spike (3K06062-MS1)					**Source: B3K0154-25**					
Diesel Range (SGCU)	1.74	0.250	mg/l	2.08	0.123	77.7	0-200			
Surrogate: o-Terphenyl (SGCU)	*0.401*		*"*	*0.417*		*96.2*	*60-140*			
Matrix Spike Dup (3K06062-MSD1)					**Source: B3K0154-25**					
Diesel Range (SGCU)	1.82	0.250	mg/l	2.08	0.123	81.6	0-200	4.49	200	
Surrogate: o-Terphenyl (SGCU)	*0.415*		*"*	*0.417*		*99.5*	*60-140*			
Batch 3K14017: Prepared 11/14/03 Using EPA 3520C										
Blank (3K14017-BLK1)										
Diesel Range (SGCU)	ND	0.250	mg/l							U
Lube Oil Range (SGCU)	ND	0.500	"							U
Surrogate: o-Terphenyl (SGCU)	*0.350*		*"*	*0.400*		*87.5*	*60-140*			
Surrogate: 1-Chlorooctadecane (SGCU)	*0.389*		*"*	*0.400*		*97.2*	*60-140*			

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K14017: Prepared 11/14/03 Using EPA 3520C										
Blank (3K14017-BLK2)										
Diesel Range (SGCU)	ND	0.250	mg/l							U
Lube Oil Range (SGCU)	ND	0.500	"							U
Surrogate: o-Terphenyl (SGCU)	*0.319*		"	*0.400*		*79.8*	*60-140*			
Surrogate: 1-Chlorooctadecane (SGCU)	*0.338*		"	*0.400*		*84.5*	*60-140*			
LCS (3K14017-BS1)										
Diesel Range (SGCU)	1.41	0.250	mg/l	2.00		70.5	45-105			
Surrogate: o-Terphenyl (SGCU)	*0.355*		"	*0.400*		*88.8*	*60-140*			
LCS Dup (3K14017-BSD1)										
Diesel Range (SGCU)	1.35	0.250	mg/l	2.00		67.5	45-105	4.35	50	
Surrogate: o-Terphenyl (SGCU)	*0.340*		"	*0.400*		*85.0*	*60-140*			

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K06061: Prepared 11/06/03 Using EPA 3550B										
Blank (3K06061-BLK1)										
C10-C12 Aliphatics	ND	5.00	mg/kg							U
C12-C16 Aliphatics	ND	5.00	"							U
C16-C21 Aliphatics	ND	5.00	"							U
C21-C34 Aliphatics	ND	5.00	"							U
C10-C12 Aromatics	0.729	5.00	"							J
C12-C16 Aromatics	ND	5.00	"							U
C16-C21 Aromatics	2.02	5.00	"							J
C21-C34 Aromatics	1.51	5.00	"							J
Surrogate: o-Terphenyl	*12.3*		*"*	*13.3*		*92.5*	*60-140*			
Surrogate: 1-Chlorooctadecane	*12.0*		*"*	*13.3*		*90.2*	*60-140*			
LCS (3K06061-BS2)										
C10-C12 Aliphatics	3.37	5.00	mg/kg	3.33		101	70-130			J
C12-C16 Aliphatics	5.34	5.00	"	6.67		80.1	70-130			
C16-C21 Aliphatics	6.41	5.00	"	6.67		96.1	70-130			
C21-C34 Aliphatics	21.1	5.00	"	23.3		90.6	70-130			
C10-C12 Aromatics	2.72	5.00	"	3.33		81.7	70-130			J
C12-C16 Aromatics	8.92	5.00	"	10.0		89.2	70-130			
C16-C21 Aromatics	16.6	5.00	"	16.7		99.4	70-130			
C21-C34 Aromatics	26.7	5.00	"	26.7		100	70-130			
Surrogate: o-Terphenyl	*12.4*		*"*	*13.3*		*93.2*	*60-140*			
Surrogate: 1-Chlorooctadecane	*12.4*		*"*	*13.3*		*93.2*	*60-140*			
LCS Dup (3K06061-BSD2)										
C10-C12 Aliphatics	3.00	5.00	mg/kg	3.33		90.1	70-130	11.6	25	J
C12-C16 Aliphatics	5.39	5.00	"	6.67		80.8	70-130	0.932	25	
C16-C21 Aliphatics	6.87	5.00	"	6.67		103	70-130	6.93	25	
C21-C34 Aliphatics	21.0	5.00	"	23.3		90.1	70-130	0.475	25	
C10-C12 Aromatics	2.40	5.00	"	3.33		72.1	70-130	12.5	25	J
C12-C16 Aromatics	9.01	5.00	"	10.0		90.1	70-130	1.00	25	
C16-C21 Aromatics	17.0	5.00	"	16.7		102	70-130	2.38	25	
C21-C34 Aromatics	27.5	5.00	"	26.7		103	70-130	2.95	25	
Surrogate: o-Terphenyl	*12.8*		*"*	*13.3*		*96.2*	*60-140*			
Surrogate: 1-Chlorooctadecane	*11.7*		*"*	*13.3*		*88.0*	*60-140*			

North Creek Analytical - Bothell

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Brad Meadows For John Clawson, Project Manager

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K06061: Prepared 11/06/03 Using EPA 3550B										
Matrix Spike (3K06061-MS2)					**Source: B3K0154-13**					
C10-C12 Aliphatics	30.0	5.00	mg/kg dry	4.11	6.45	573	70-130			Q-03
C12-C16 Aliphatics	178	5.00	"	8.21	52.5	1530	70-130			Q-03
C16-C21 Aliphatics	156	5.00	"	8.21	68.2	1070	70-130			Q-03
C21-C34 Aliphatics	68.8	5.00	"	28.7	23.2	159	70-130			Q-03
C10-C12 Aromatics	2.66	5.00	"	4.11	1.00	40.4	70-130			Q-03, J
C12-C16 Aromatics	18.5	5.00	"	12.3	2.03	134	70-130			Q-03
C16-C21 Aromatics	69.6	5.00	"	20.5	17.7	253	70-130			Q-03
C21-C34 Aromatics	52.9	5.00	"	32.8	12.9	122	70-130			
Surrogate: o-Terphenyl	*15.2*		*"*	*16.4*		*92.7*	*60-140*			
Surrogate: 1-Chlorooctadecane	*15.0*		*"*	*16.4*		*91.5*	*60-140*			
Matrix Spike Dup (3K06061-MSD2)					**Source: B3K0154-13**					
C10-C12 Aliphatics	34.9	5.00	mg/kg dry	4.11	6.45	692	70-130	15.1	25	Q-03
C12-C16 Aliphatics	243	5.00	"	8.21	52.5	2320	70-130	30.9	25	Q-03
C16-C21 Aliphatics	197	5.00	"	8.21	68.2	1570	70-130	23.2	25	Q-03
C21-C34 Aliphatics	82.3	5.00	"	28.7	23.2	206	70-130	17.9	25	Q-03
C10-C12 Aromatics	2.77	5.00	"	4.11	1.00	43.1	70-130	4.05	25	Q-03, J
C12-C16 Aromatics	17.8	5.00	"	12.3	2.03	128	70-130	3.86	25	
C16-C21 Aromatics	82.8	5.00	"	20.5	17.7	318	70-130	17.3	25	Q-03
C21-C34 Aromatics	58.7	5.00	"	32.8	12.9	140	70-130	10.4	25	Q-03
Surrogate: o-Terphenyl	*15.2*		*"*	*16.4*		*92.7*	*60-140*			
Surrogate: 1-Chlorooctadecane	*14.8*		*"*	*16.4*		*90.2*	*60-140*			
Batch 3K06062: Prepared 11/06/03 Using EPA 3510C										
Blank (3K06062-BLK1)										
C10-C12 Aliphatics	21.3	50.0	ug/l							D, J
C12-C16 Aliphatics	38.7	50.0	"							D, J
C16-C21 Aliphatics	17.6	50.0	"							D, J
C21-C34 Aliphatics	16.9	50.0	"							D, J
C10-C12 Aromatics	16.2	50.0	"							D, J
C12-C16 Aromatics	ND	50.0	"							D, U
C16-C21 Aromatics	19.0	50.0	"							D, J
C21-C34 Aromatics	ND	50.0	"							D, U
Surrogate: o-Terphenyl	*338*		*"*	*400*		*84.5*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*386*		*"*	*400*		*96.5*	*60-140*			*D*

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K06062: Prepared 11/06/03 Using EPA 3510C										
LCS (3K06062-BS2)										
C10-C12 Aliphatics	113	50.0	ug/l	100		113	70-130			D
C12-C16 Aliphatics	210	50.0	"	200		105	70-130			D
C16-C21 Aliphatics	201	50.0	"	200		100	70-130			D
C21-C34 Aliphatics	681	50.0	"	700		97.3	70-130			D
C10-C12 Aromatics	74.9	50.0	"	100		74.9	70-130			D
C12-C16 Aromatics	254	50.0	"	300		84.7	70-130			D
C16-C21 Aromatics	468	50.0	"	500		93.6	70-130			D
C21-C34 Aromatics	675	50.0	"	800		84.4	70-130			D
Surrogate: o-Terphenyl	*378*		*"*	*400*		*94.5*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*426*		*"*	*400*		*106*	*60-140*			*D*
LCS Dup (3K06062-BSD2)										
C10-C12 Aliphatics	114	50.0	ug/l	100		114	70-130	0.881	25	D
C12-C16 Aliphatics	210	50.0	"	200		105	70-130	0.00	25	D
C16-C21 Aliphatics	201	50.0	"	200		100	70-130	0.00	25	D
C21-C34 Aliphatics	689	50.0	"	700		98.4	70-130	1.17	25	D
C10-C12 Aromatics	77.6	50.0	"	100		77.6	70-130	3.54	25	D
C12-C16 Aromatics	233	50.0	"	300		77.7	70-130	8.62	25	D
C16-C21 Aromatics	449	50.0	"	500		89.8	70-130	4.14	25	D
C21-C34 Aromatics	646	50.0	"	800		80.8	70-130	4.39	25	D
Surrogate: o-Terphenyl	*367*		*"*	*400*		*91.8*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*443*		*"*	*400*		*111*	*60-140*			*D*
Matrix Spike (3K06062-MS2)					**Source: B3K0154-25**					
C10-C12 Aliphatics	118	53.2	ug/l	106	24.2	88.5	70-130			D
C12-C16 Aliphatics	211	53.2	"	213	43.7	78.5	70-130			D
C16-C21 Aliphatics	211	53.2	"	213	24.0	87.8	70-130			D
C21-C34 Aliphatics	752	53.2	"	745	35.7	96.1	70-130			D
C10-C12 Aromatics	70.6	53.2	"	106	5.58	61.3	70-130			Q-01, D
C12-C16 Aromatics	236	53.2	"	319	ND	74.0	70-130			D
C16-C21 Aromatics	462	53.2	"	532	12.4	84.5	70-130			D
C21-C34 Aromatics	648	53.2	"	851	ND	76.1	70-130			D
Surrogate: o-Terphenyl	*379*		*"*	*426*		*89.0*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*446*		*"*	*426*		*105*	*60-140*			*D*

North Creek Analytical - Bothell

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Brad Meadows For John Clawson, Project Manager

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K06062: Prepared 11/06/03 Using EPA 3510C										
Matrix Spike Dup (3K06062-MSD2)					**Source: B3K0154-25**					
C10-C12 Aliphatics	101	53.8	ug/l	108	24.2	71.1	70-130	15.5	25	D
C12-C16 Aliphatics	200	53.8	"	215	43.7	72.7	70-130	5.35	25	D
C16-C21 Aliphatics	202	53.8	"	215	24.0	82.8	70-130	4.36	25	D
C21-C34 Aliphatics	723	53.8	"	753	35.7	91.3	70-130	3.93	25	D
C10-C12 Aromatics	74.5	53.8	"	108	5.58	63.8	70-130	5.38	25	Q-01, D
C12-C16 Aromatics	218	53.8	"	323	ND	67.5	70-130	7.93	25	Q-01, D
C16-C21 Aromatics	459	53.8	"	538	12.4	83.0	70-130	0.651	25	D
C21-C34 Aromatics	629	53.8	"	860	ND	73.1	70-130	2.98	25	D
Surrogate: o-Terphenyl	*366*		*"*	*430*		*85.1*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*429*		*"*	*430*		*99.8*	*60-140*			*D*
Batch 3K14024: Prepared 11/14/03 Using EPA 3520C										
Blank (3K14024-BLK1)										
C10-C12 Aliphatics	ND	50.0	ug/l							D, U
C12-C16 Aliphatics	ND	50.0	"							D, U
C16-C21 Aliphatics	ND	50.0	"							D, U
C21-C34 Aliphatics	ND	50.0	"							D, U
C10-C12 Aromatics	5.24	50.0	"							D, J
C12-C16 Aromatics	ND	50.0	"							D, U
C16-C21 Aromatics	ND	50.0	"							D, U
C21-C34 Aromatics	ND	50.0	"							D, U
Surrogate: o-Terphenyl	*374*		*"*	*400*		*93.5*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*374*		*"*	*400*		*93.5*	*60-140*			*D*
Blank (3K14024-BLK2)										
C10-C12 Aliphatics	ND	50.0	ug/l							D, U
C12-C16 Aliphatics	ND	50.0	"							D, U
C16-C21 Aliphatics	ND	50.0	"							D, U
C21-C34 Aliphatics	ND	50.0	"							D, U
C10-C12 Aromatics	5.24	50.0	"							D, J
C12-C16 Aromatics	ND	50.0	"							D, U
C16-C21 Aromatics	ND	50.0	"							D, U
C21-C34 Aromatics	ND	50.0	"							D, U
Surrogate: o-Terphenyl	*330*		*"*	*400*		*82.5*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*367*		*"*	*400*		*91.8*	*60-140*			*D*

North Creek Analytical - Bothell

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CH2M Hill - Honolulu	Project: Johnson Atoll TPH Investigation	
1585 Kapiolani Blvd. Suite 1420	Project Number: 179600.05.01.01	**Reported:**
Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Extractable Petroleum Hydrocarbons by WDOE TPH Policy Method - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K14024: Prepared 11/14/03 Using EPA 3520C										
LCS (3K14024-BS2)										
C10-C12 Aliphatics	76.6	50.0	ug/l	100		76.6	70-130			D
C12-C16 Aliphatics	177	50.0	"	200		88.5	70-130			D
C16-C21 Aliphatics	185	50.0	"	200		92.5	70-130			D
C21-C34 Aliphatics	604	50.0	"	700		86.3	70-130			D
C10-C12 Aromatics	82.8	50.0	"	100		82.8	70-130			D
C12-C16 Aromatics	224	50.0	"	300		74.7	70-130			D
C16-C21 Aromatics	427	50.0	"	500		85.4	70-130			D
C21-C34 Aromatics	583	50.0	"	800		72.9	70-130			D
Surrogate: o-Terphenyl	*381*		*"*	*400*		*95.2*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*380*		*"*	*400*		*95.0*	*60-140*			*D*
LCS Dup (3K14024-BSD2)										
C10-C12 Aliphatics	73.3	50.0	ug/l	100		73.3	70-130	4.40	25	D
C12-C16 Aliphatics	176	50.0	"	200		88.0	70-130	0.567	25	D
C16-C21 Aliphatics	186	50.0	"	200		93.0	70-130	0.539	25	D
C21-C34 Aliphatics	615	50.0	"	700		87.9	70-130	1.80	25	D
C10-C12 Aromatics	82.5	50.0	"	100		82.5	70-130	0.363	25	D
C12-C16 Aromatics	221	50.0	"	300		73.7	70-130	1.35	25	D
C16-C21 Aromatics	424	50.0	"	500		84.8	70-130	0.705	25	D
C21-C34 Aromatics	579	50.0	"	800		72.4	70-130	0.688	25	D
Surrogate: o-Terphenyl	*379*		*"*	*400*		*94.8*	*60-140*			*D*
Surrogate: 1-Chlorooctadecane	*375*		*"*	*400*		*93.8*	*60-140*			*D*

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Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3K11008: Prepared 11/11/03 Using Dry Weight										
Blank (3K11008-BLK1)										
Dry Weight	100	1.00	%							
Batch 3K17042: Prepared 11/13/03 Using TOC Preparation										
Blank (3K17042-BLK1)										
Fractional Organic Carbon - Low	ND	0.00100	g/g							U
Fractional Organic Carbon - High	ND	0.00100	"							U
Fractional Organic Carbon - Average	ND	0.00100	"							U
LCS (3K17042-BS1)										
Fractional Organic Carbon - Low	0.0308	0.00100	g/g	0.0300		103	80-120			
Fractional Organic Carbon - High	0.0351	0.00100	"	0.0300		117	80-120			
Fractional Organic Carbon - Average	0.0326	0.00100	"	0.0300		109	90-110			
Duplicate (3K17042-DUP1)					**Source: B3K0154-05**					
Fractional Organic Carbon - Low	0.00374	0.00100	g/g		0.00171			74.5	25	
Fractional Organic Carbon - High	0.00626	0.00100	"		0.00852			30.6	25	
Fractional Organic Carbon - Average	0.00507	0.00100	"		0.00462			9.29	25	
Matrix Spike (3K17042-MS1)					**Source: B3K0154-05**					
Fractional Organic Carbon - Low	0.00936	0.00100	g/g	0.00708	0.00171	108	70-130			
Fractional Organic Carbon - High	0.0123	0.00100	"	0.00708	0.00852	53.4	70-130			
Fractional Organic Carbon - Average	0.0108	0.00100	"	0.00708	0.00462	87.3	70-125			

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Honolulu, HI 96814	Project Manager: Jeff Cotter	11/24/03 07:41

Notes and Definitions

A-01	Sample analyzed at a dilution due to coelution with internal standard.
D	Data reported from a preparation or analytical dilution.
D-06	The sample chromatographic pattern does not resemble the fuel standard used for quantitation.
G-01	Results reported for the gas range are primarily due to overlap from diesel range hydrocarbons.
J	Estimated value.
Q-01	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
Q-02	The spike recovery for this QC sample is outside of NCA established control limits due to sample matrix interference.
Q-03	The percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte already present in the sample.
Q-16	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to interference from coeluting organic compounds present in the sample.
S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
U	Analyte included in the analysis but not detected.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Chromatograms

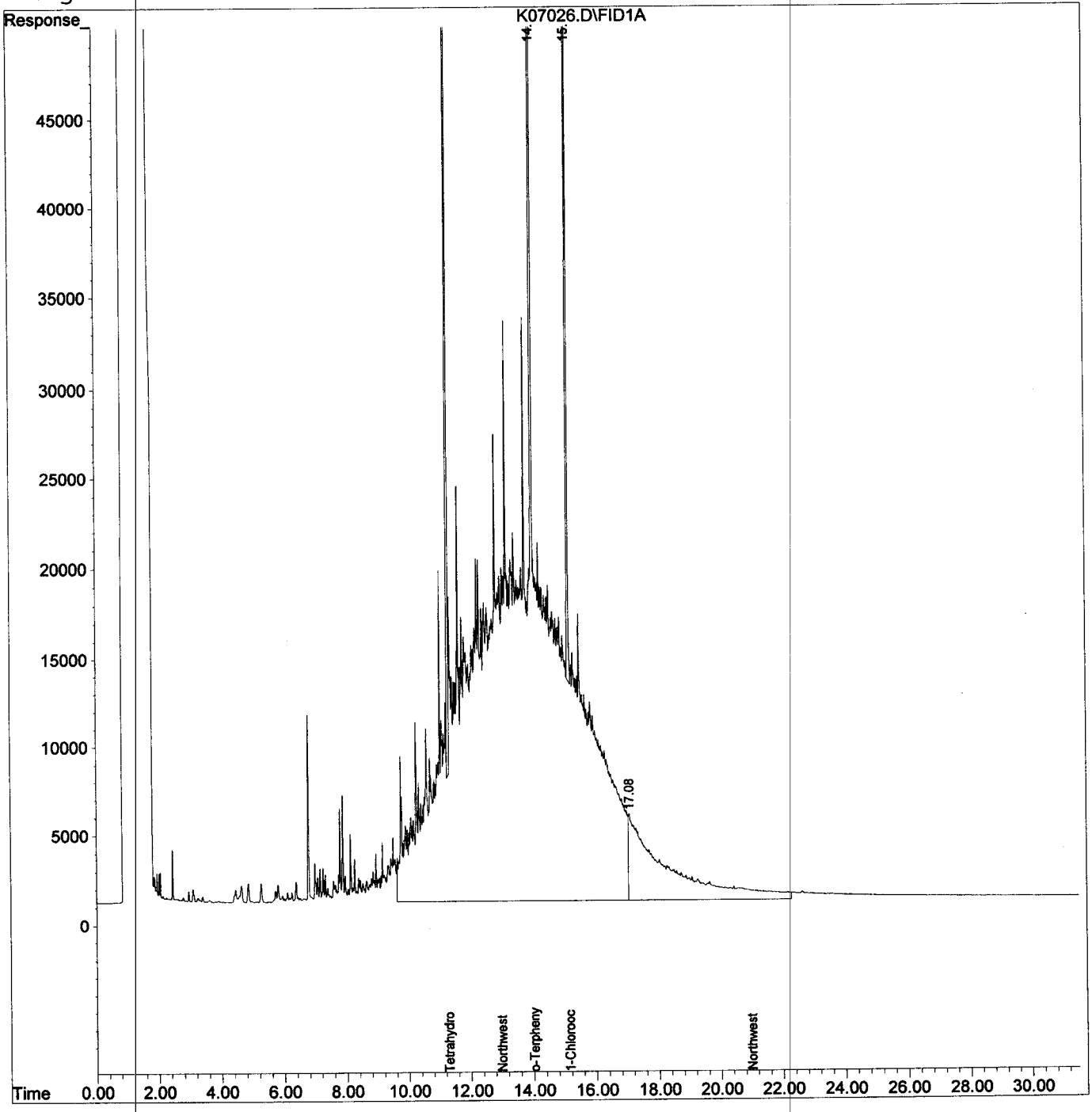
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K07026.D
Acq On : 7 Nov 2003 5:50 pm
Sample : B3K0154-13
Misc : 1x s nw
IntFile : SURR.E
Quant Time: Nov 7 18:46 2003 Quant Results File: K0703A5F.RES

Vial: 14
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

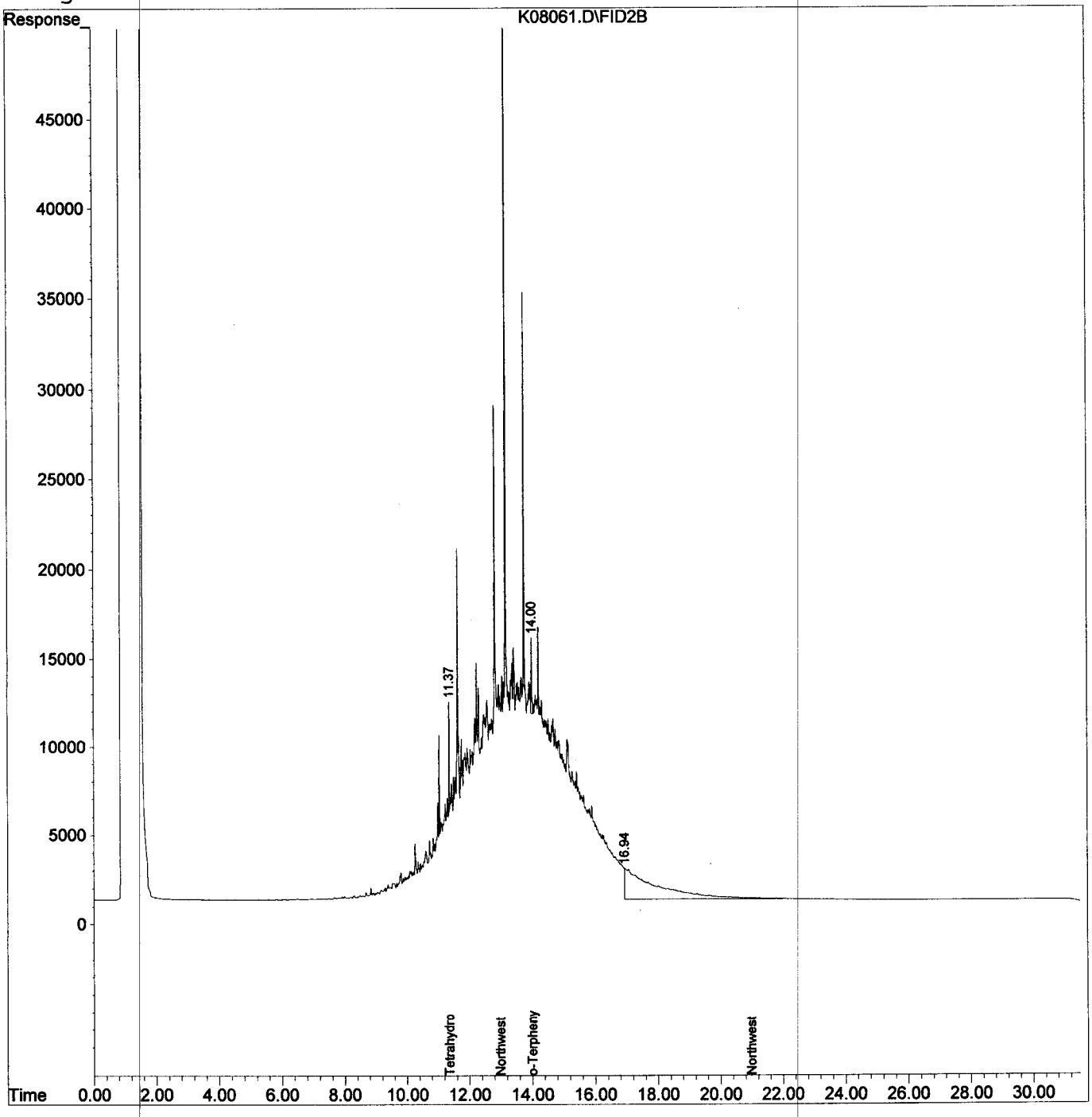


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08061.D Vial: 4
Acq On : 9 Nov 2003 5:13 am Operator: EJE
Sample : b3k0154-06 Inst : GC #5
Misc : 100X s R1 NWdx Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 9 8:54 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



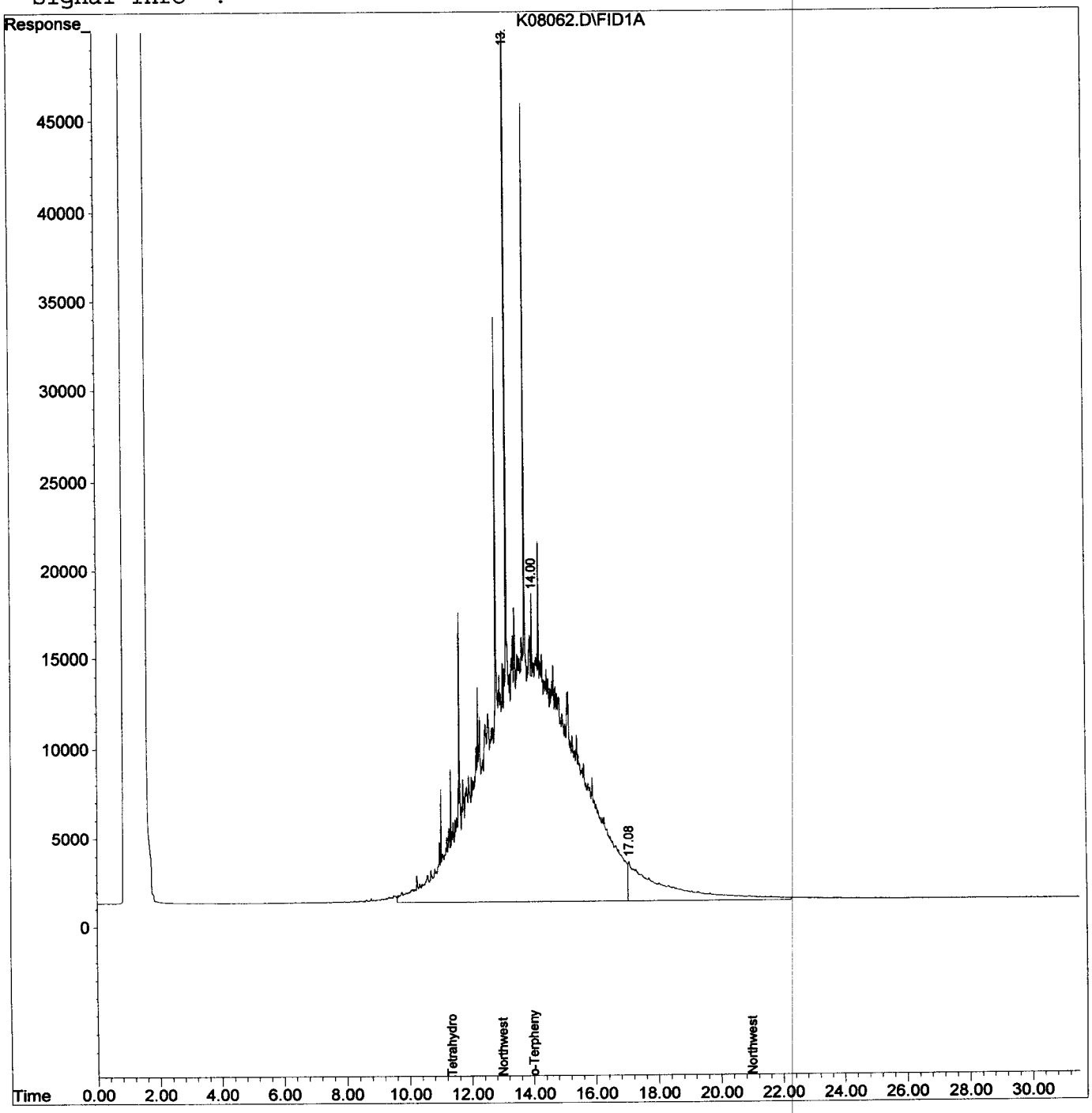
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08062.D
Acq On : 9 Nov 2003 5:13 am
Sample : b3k0154-07
Misc : 100X s R1 NWdx
IntFile : SURR.E
Quant Time: Nov 9 8:41 2003 Quant Results File: K0703A5F.RES

Vial: 5
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



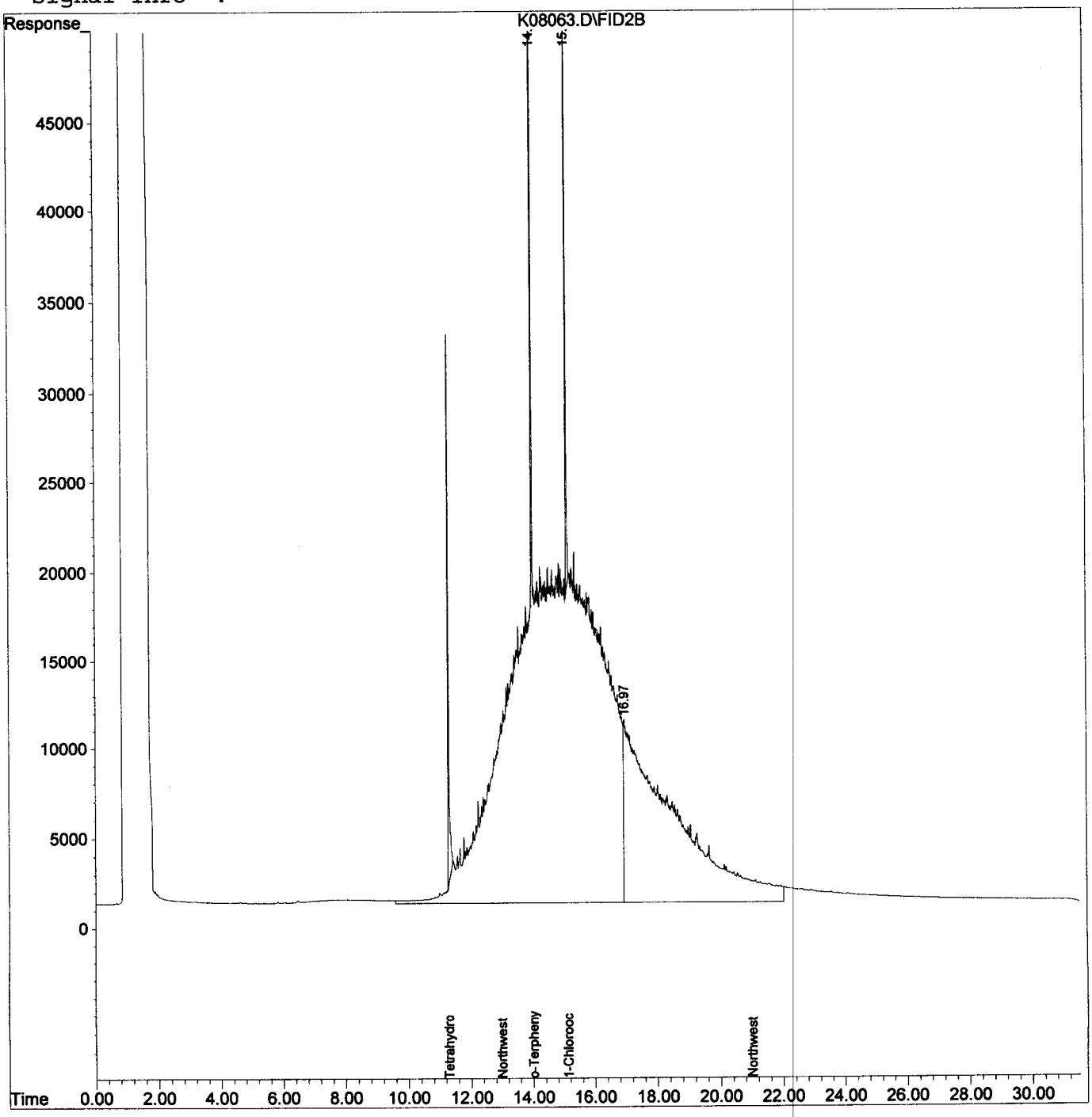
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08063.D
Acq On : 9 Nov 2003 5:54 am
Sample : b3k0154-08
Misc : 5X s R1 NWdx
IntFile : SURR.E
Quant Time: Nov 9 8:54 2003 Quant Results File: K0703A5R.RES

Vial: 6
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



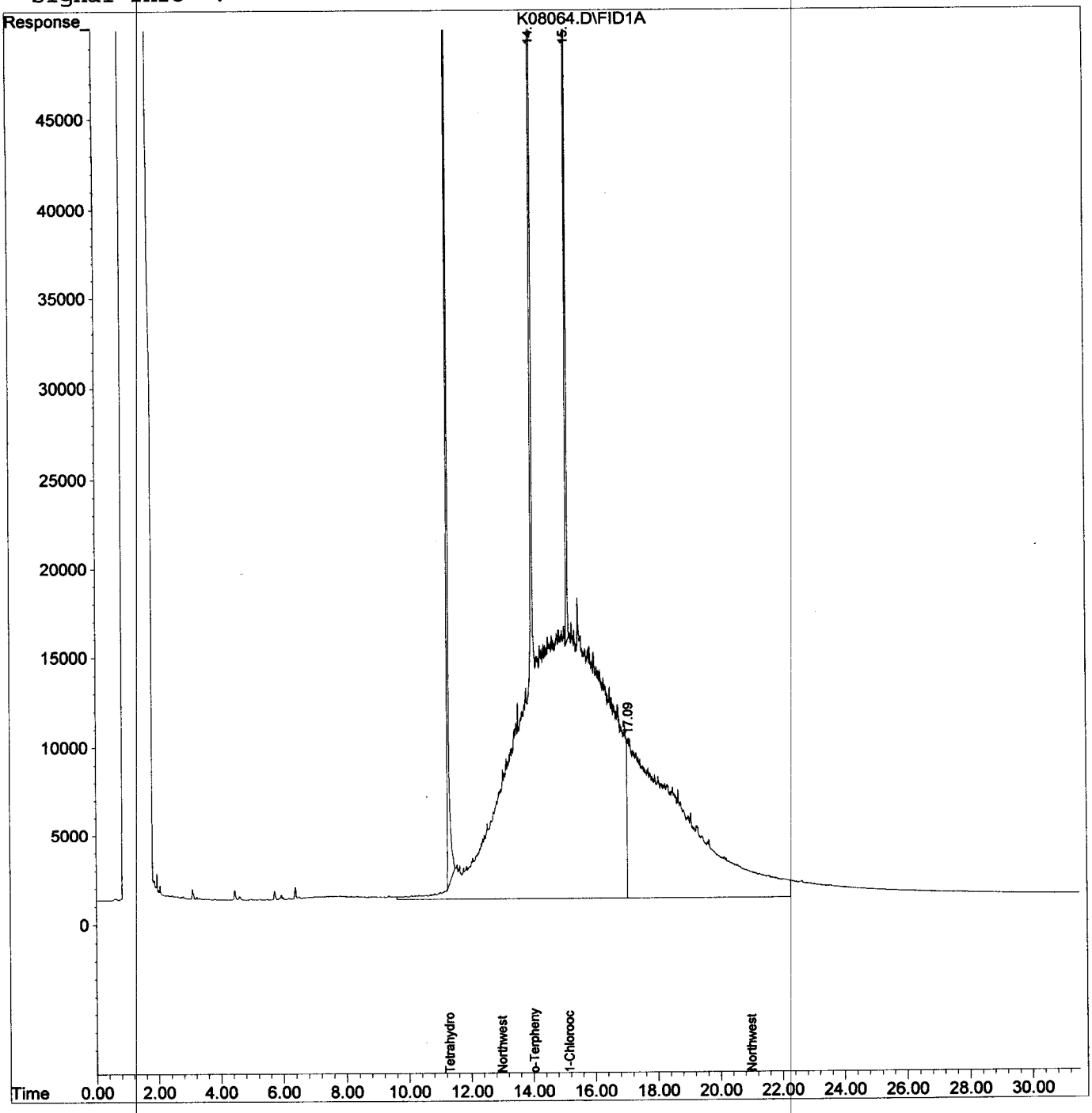
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08064.D
Acq On : 9 Nov 2003 5:54 am
Sample : b3k0154-10
Misc : s R1 NWdx
IntFile : SURR.E
Quant Time: Nov 9 8:41 2003 Quant Results File: K0703A5F.RES

Vial: 7
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

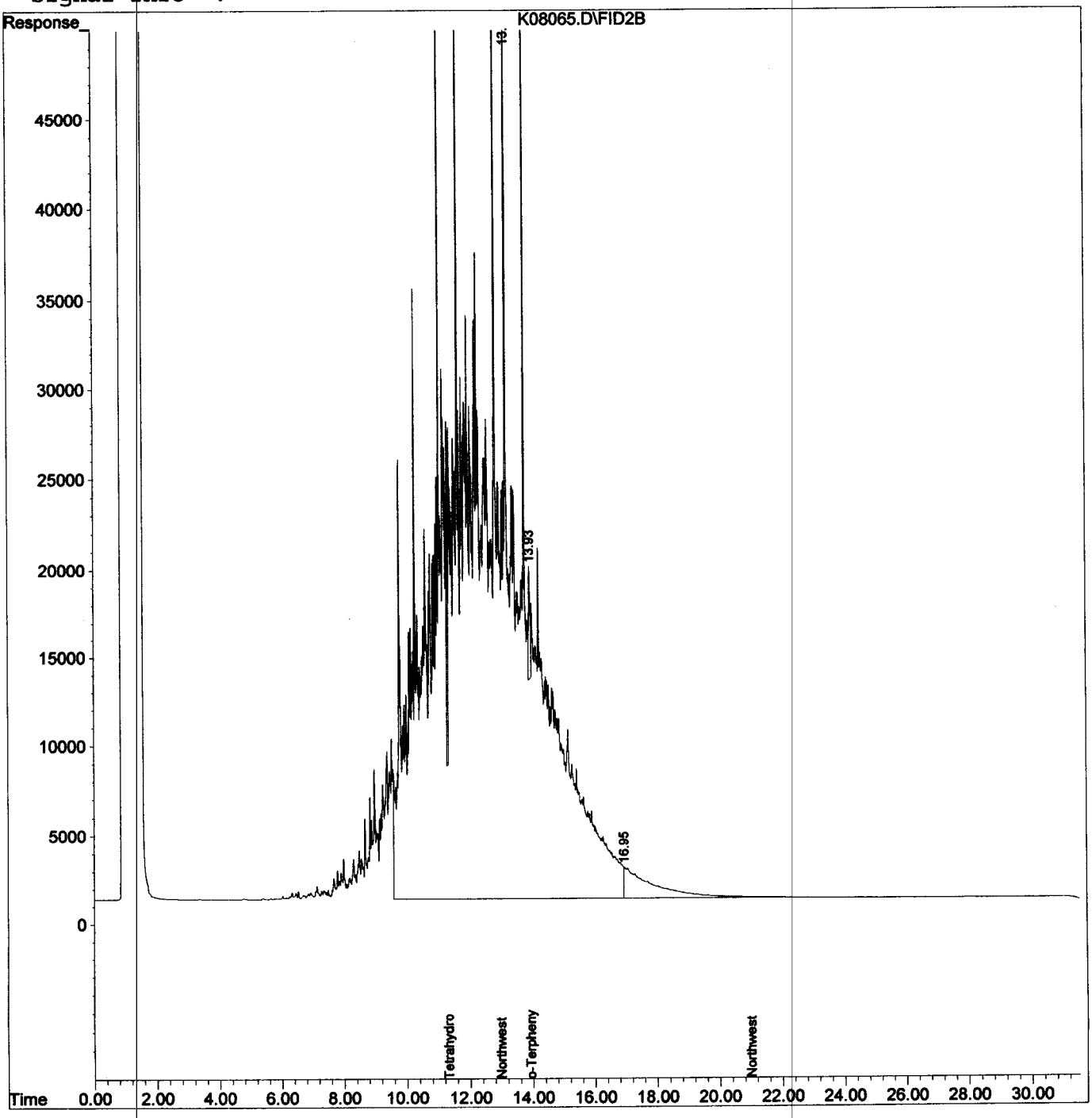


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08065.D Vial: 8
Acq On : 9 Nov 2003 6:35 am Operator: EJE
Sample : b3k0154-11 Inst : GC #5
Misc : 200X s R1 NWdx Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 9 8:54 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



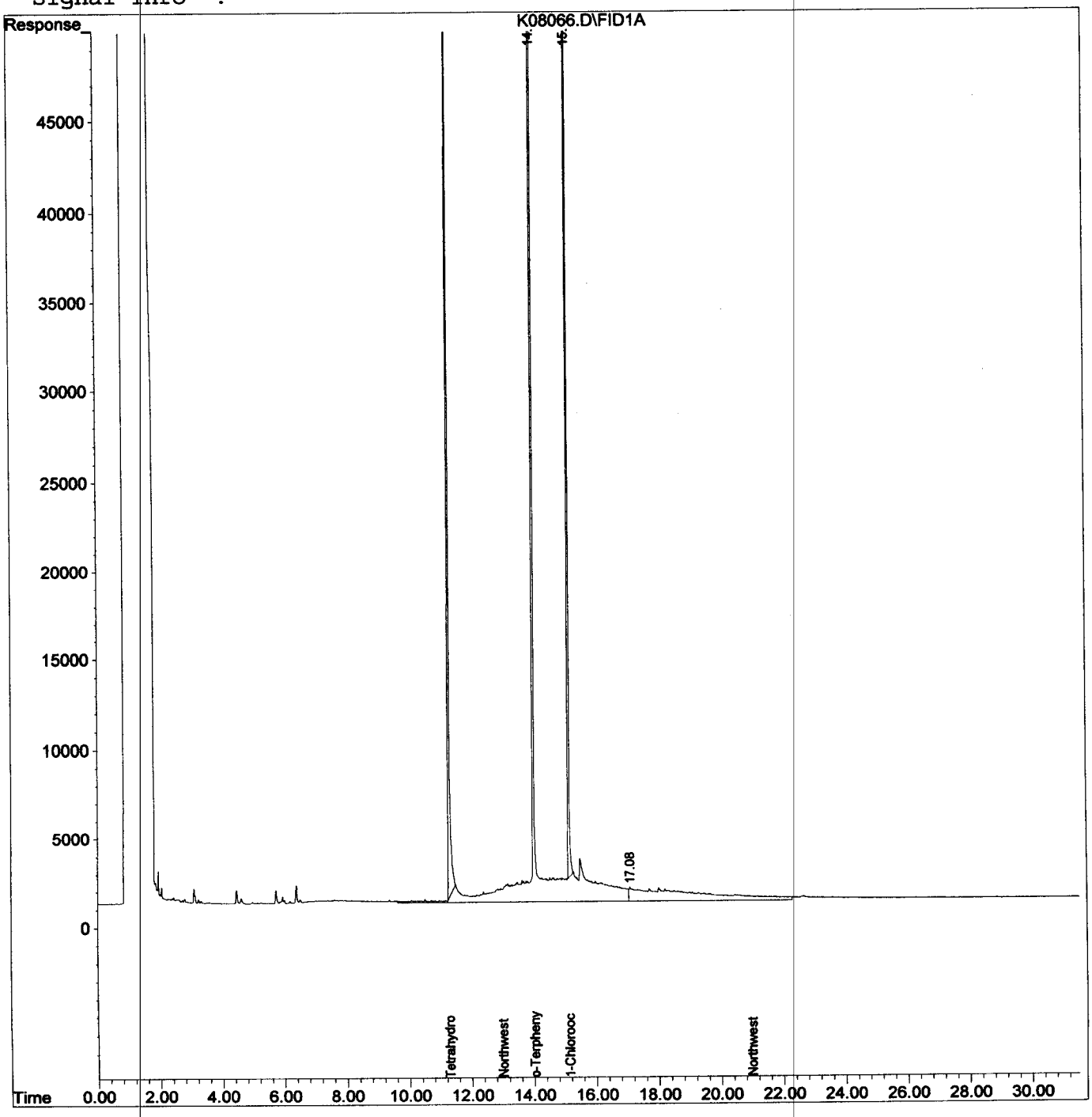
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08066.D
Acq On : 9 Nov 2003 6:35 am
Sample : b3k0154-14
Misc : s R1 NWdx
IntFile : SURR.E
Quant Time: Nov 9 8:41 2003 Quant Results File: K0703A5F.RES

Vial: 9
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



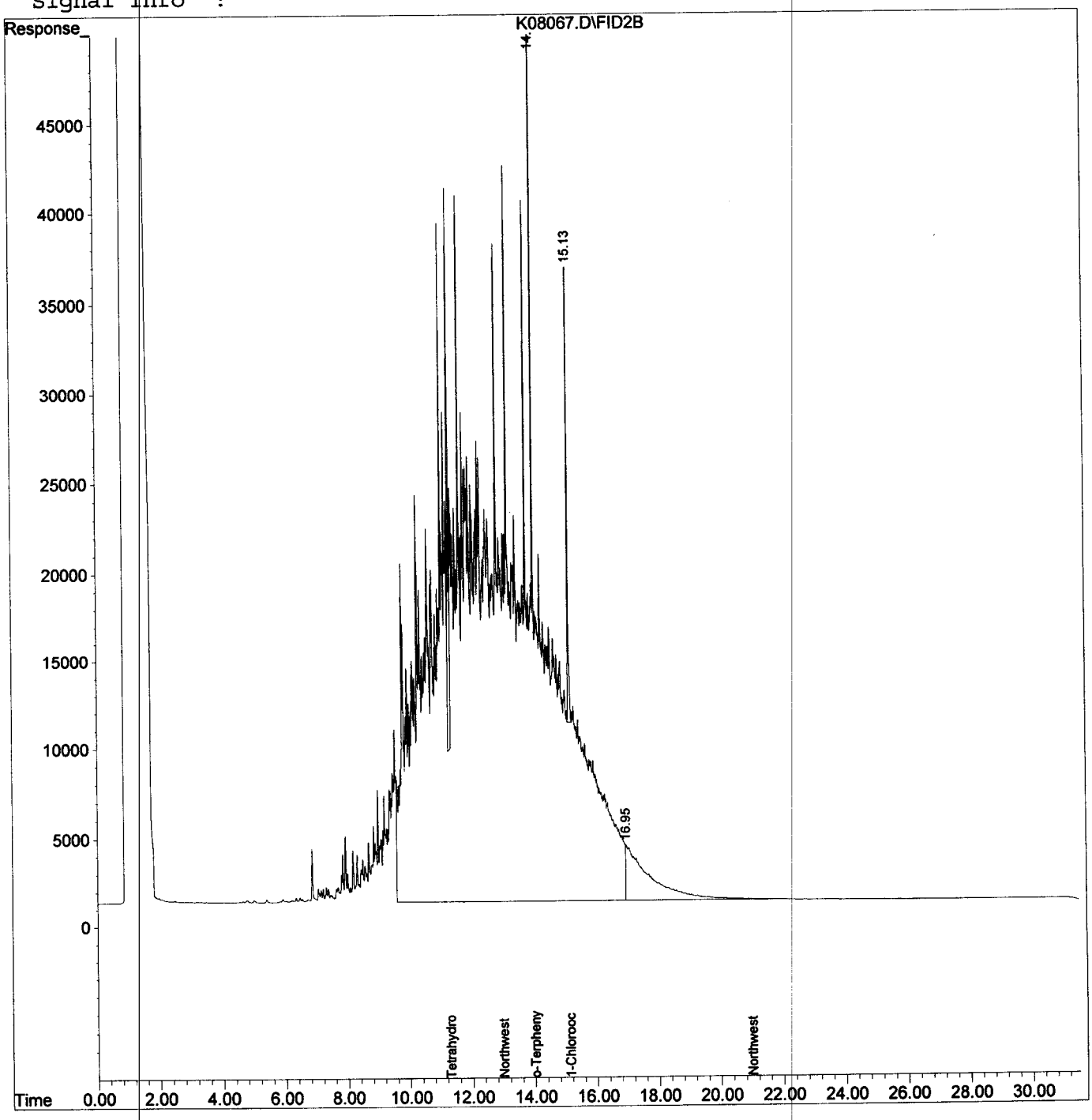
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08067.D
Acq On : 9 Nov 2003 7:16 am
Sample : b3k0154-15
Misc : 10X s R1 NWdx
IntFile : SURR.E
Quant Time: Nov 9 8:54 2003 Quant Results File: K0703A5R.RES

Vial: 10
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



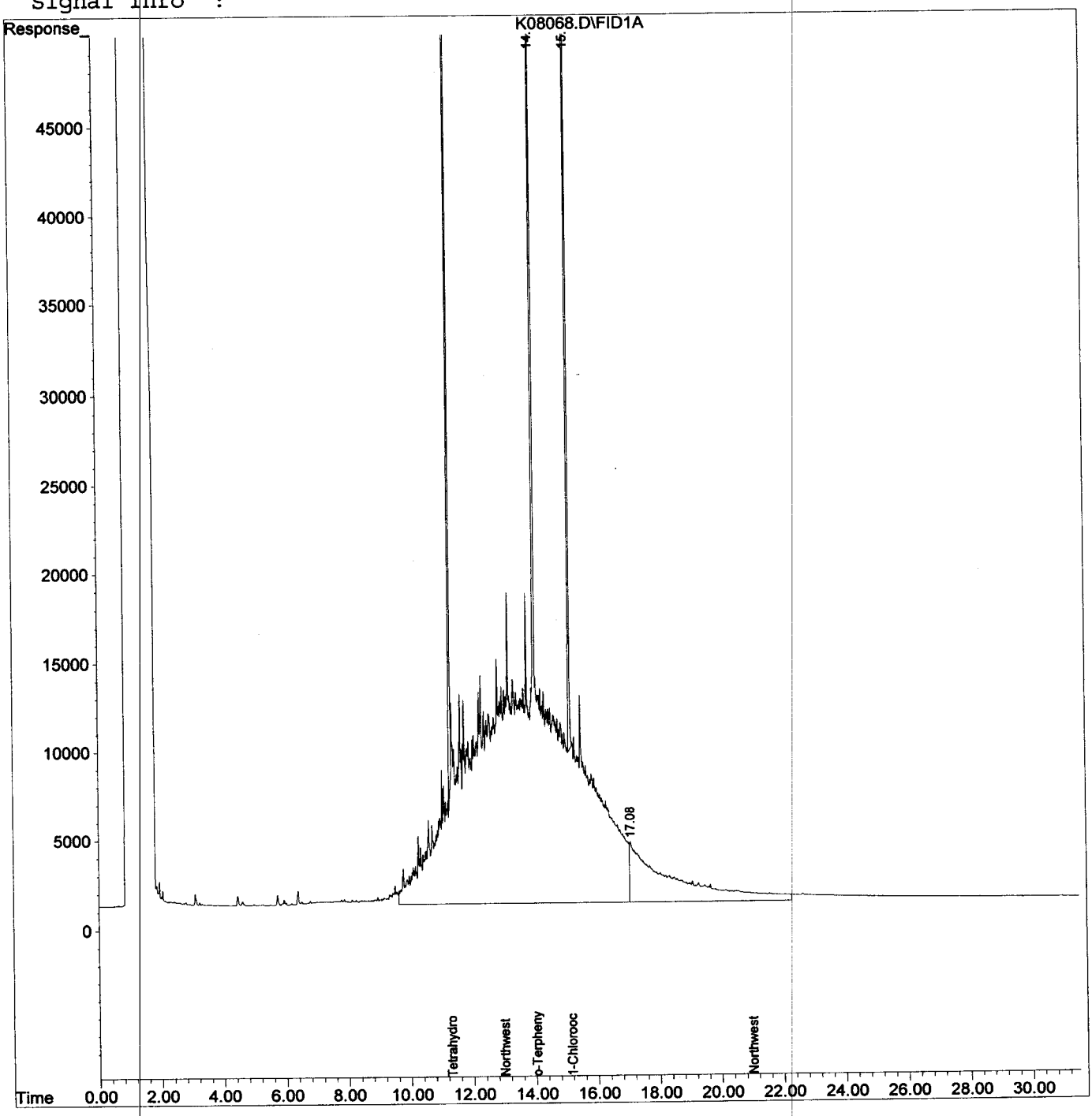
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08068.D
Acq On : 9 Nov 2003 7:16 am
Sample : b3k0154-16
Misc : s R1 NWdx
IntFile : SURR.E
Quant Time: Nov 9 8:41 2003 Quant Results File: K0703A5F.RES

Vial: 11
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



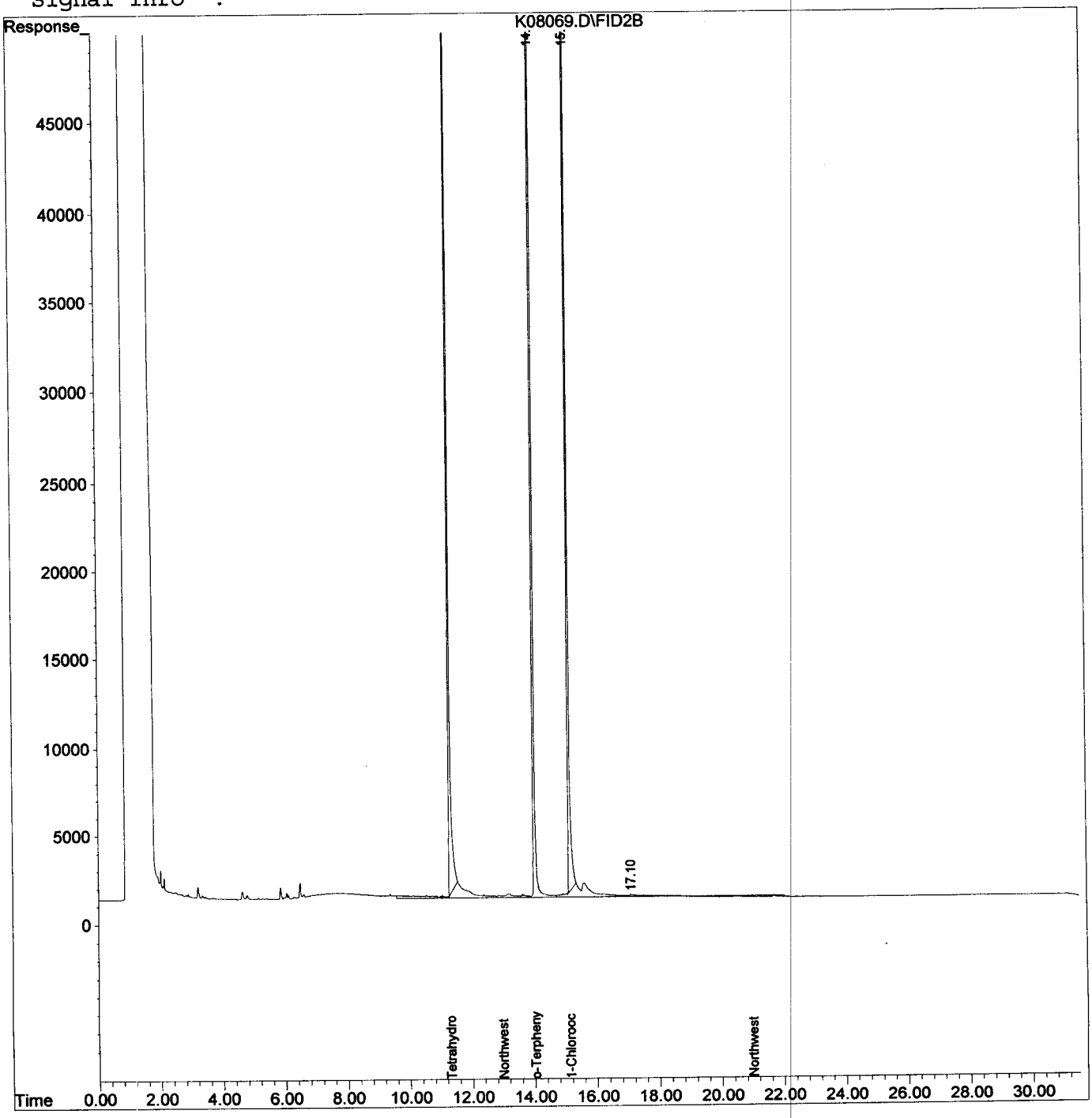
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08069.D
Acq On : 9 Nov 2003 7:57 am
Sample : b3k0154-17
Misc : s R1 NWdx
IntFile : SURR.E
Quant Time: Nov 9 8:54 2003 Quant Results File: K0703A5R.RES

Vial: 12
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



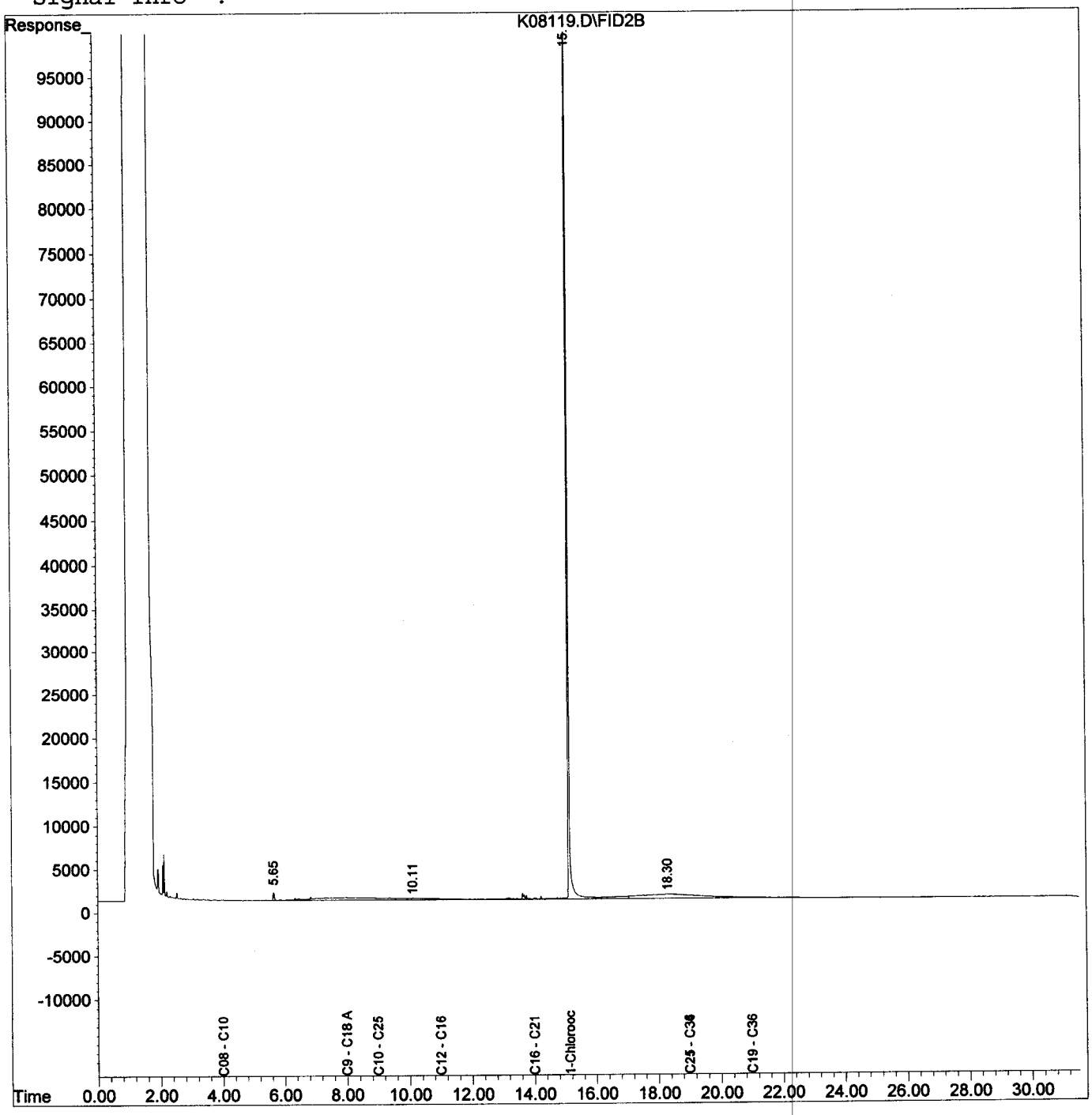
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08119.D
Acq On : 10 Nov 2003 6:25 am
Sample : b3k0154-01
Misc : 1x AL
IntFile : SURR.E
Quant Time: Nov 10 9:07 2003 Quant Results File: K0603L5R.RES

Vial: 16
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



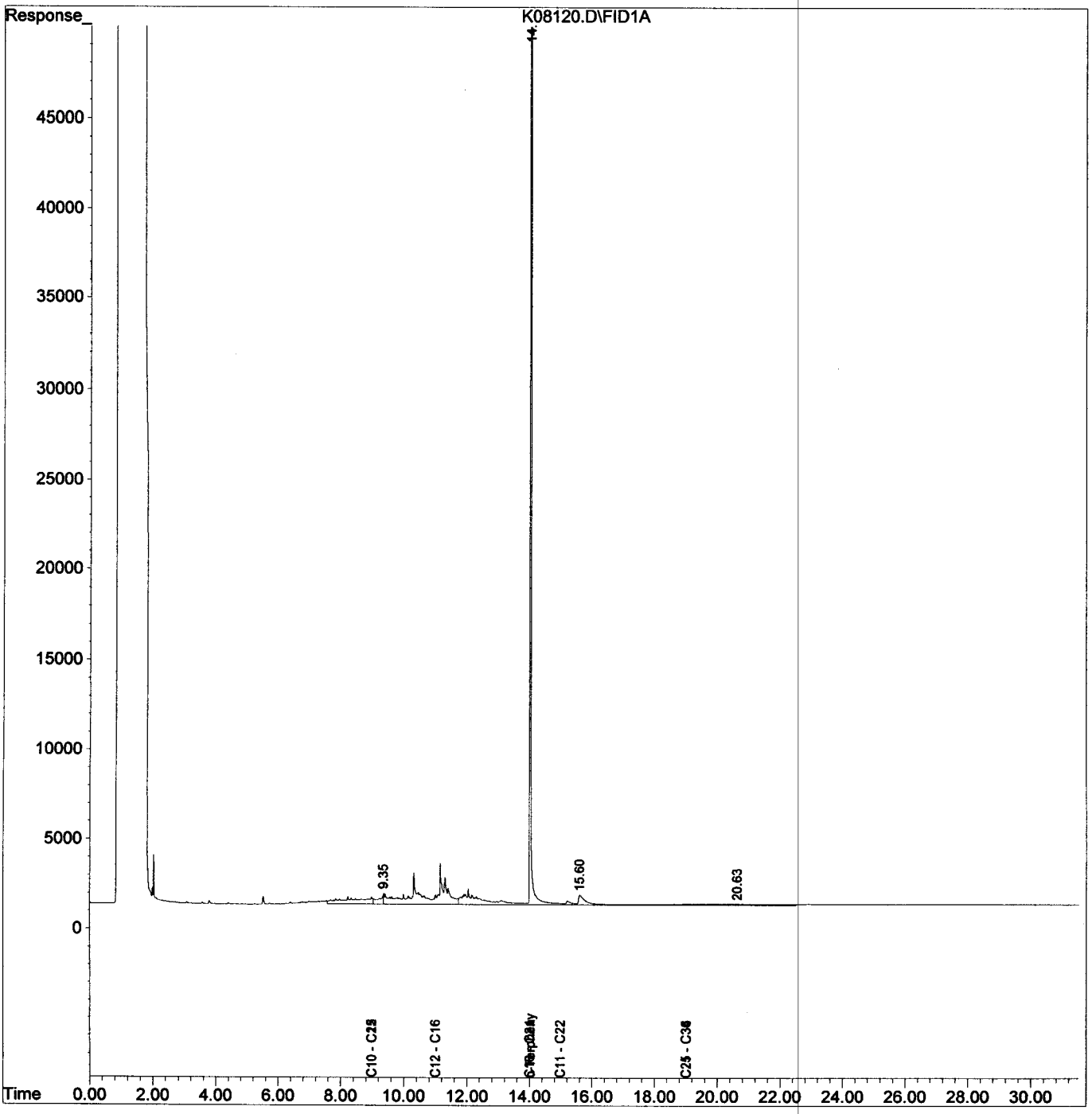
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08120.D
Acq On : 10 Nov 2003 6:25 am
Sample : b3k0154-01
Misc : 2x AR w
IntFile : SURR.E
Quant Time: Nov 10 9:15 2003 Quant Results File: K0603R5F.RES

Vial: 17
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

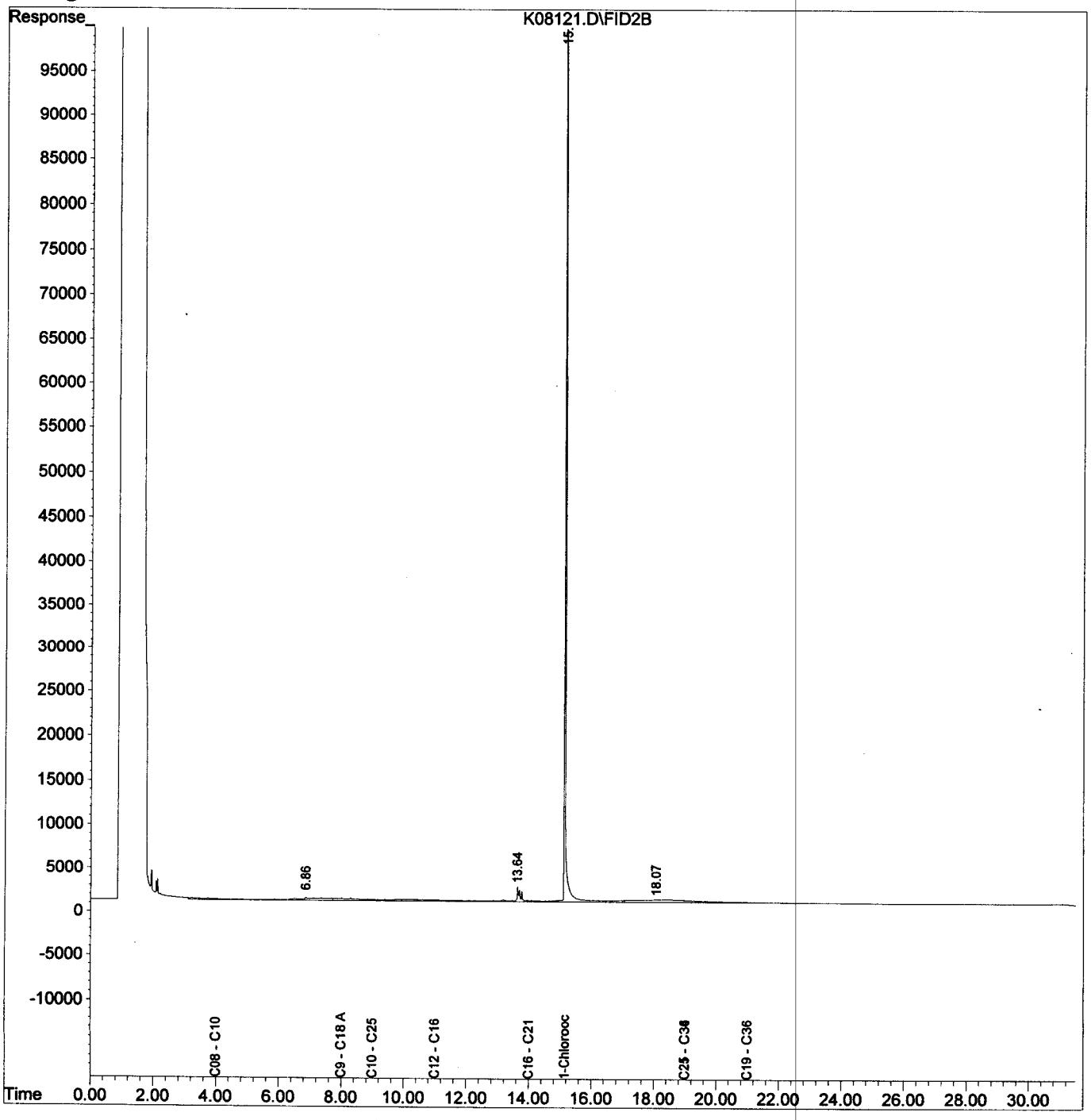


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08121.D Vial: 18
Acq On : 10 Nov 2003 7:06 am Operator: EJE
Sample : b3k0154-02 Inst : GC #5
Misc : 1x AL w Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 9:07 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



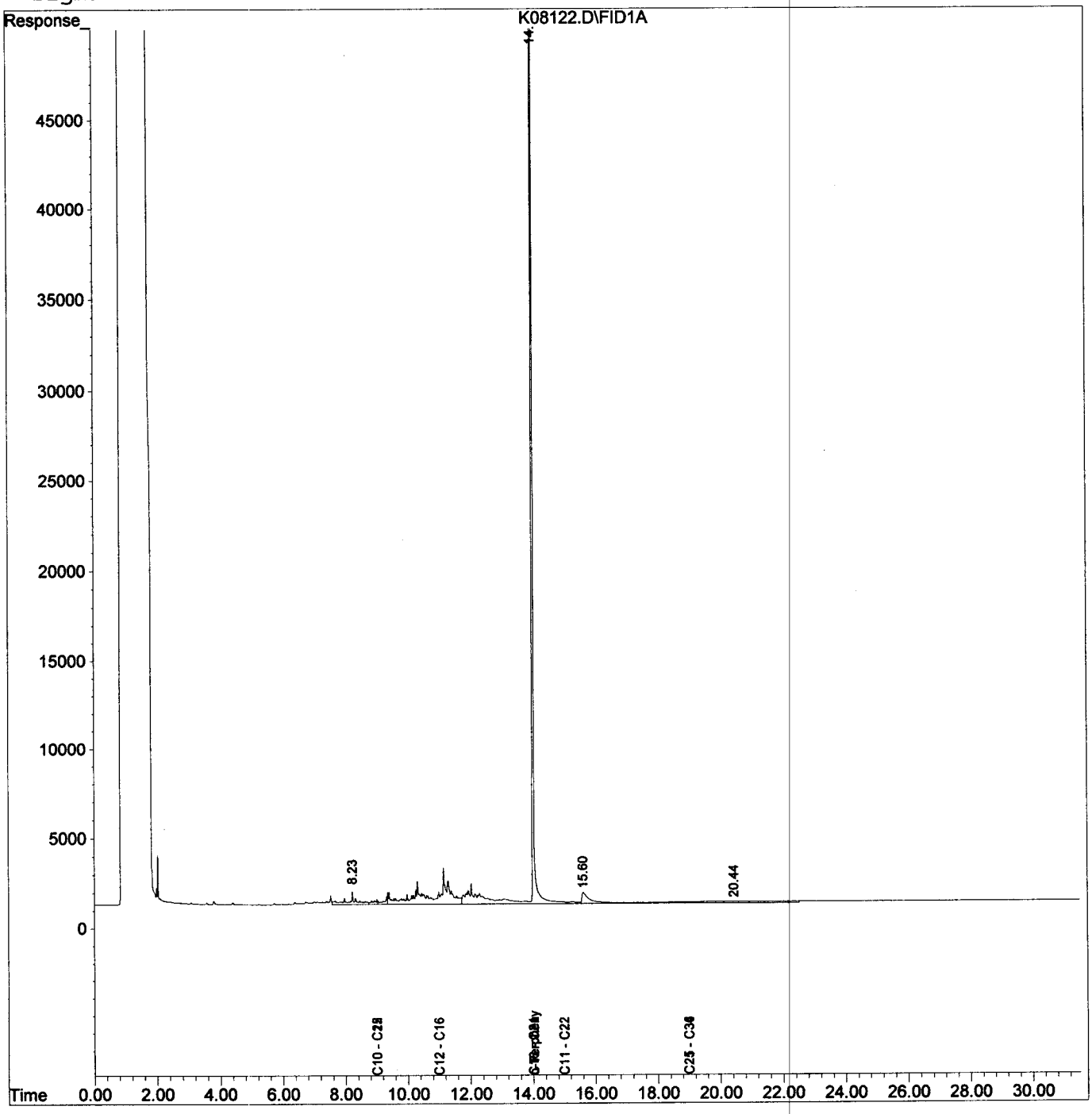
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08122.D
Acq On : 10 Nov 2003 7:06 am
Sample : b3k0154-02
Misc : 2x AR w
IntFile : SURR.E
Quant Time: Nov 10 9:15 2003 Quant Results File: K0603R5F.RES

Vial: 19
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

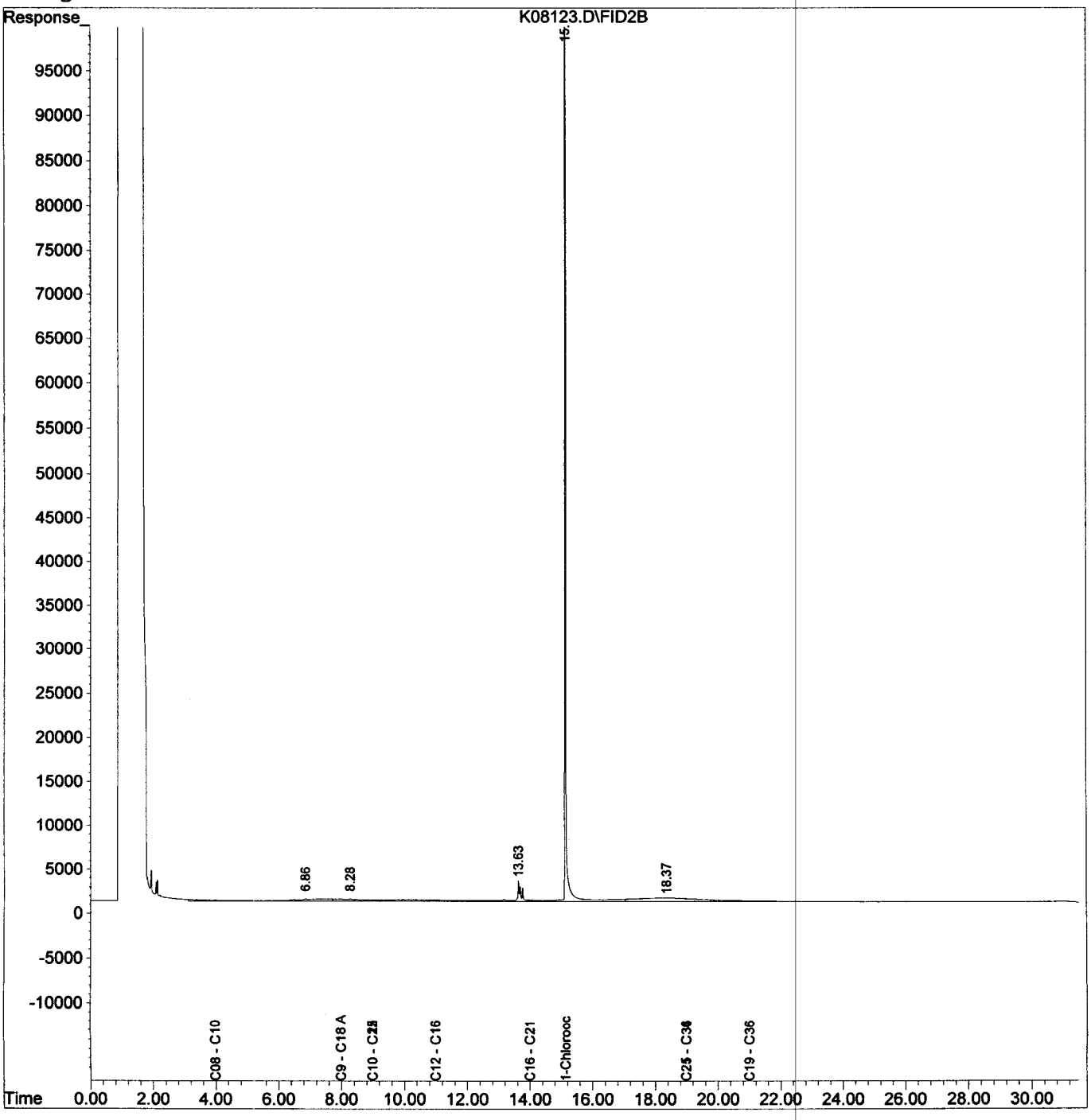


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08123.D Vial: 20
Acq On : 10 Nov 2003 7:47 am Operator: EJE
Sample : b3k0154-03 Inst : GC #5
Misc : 1x AL w Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 9:07 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

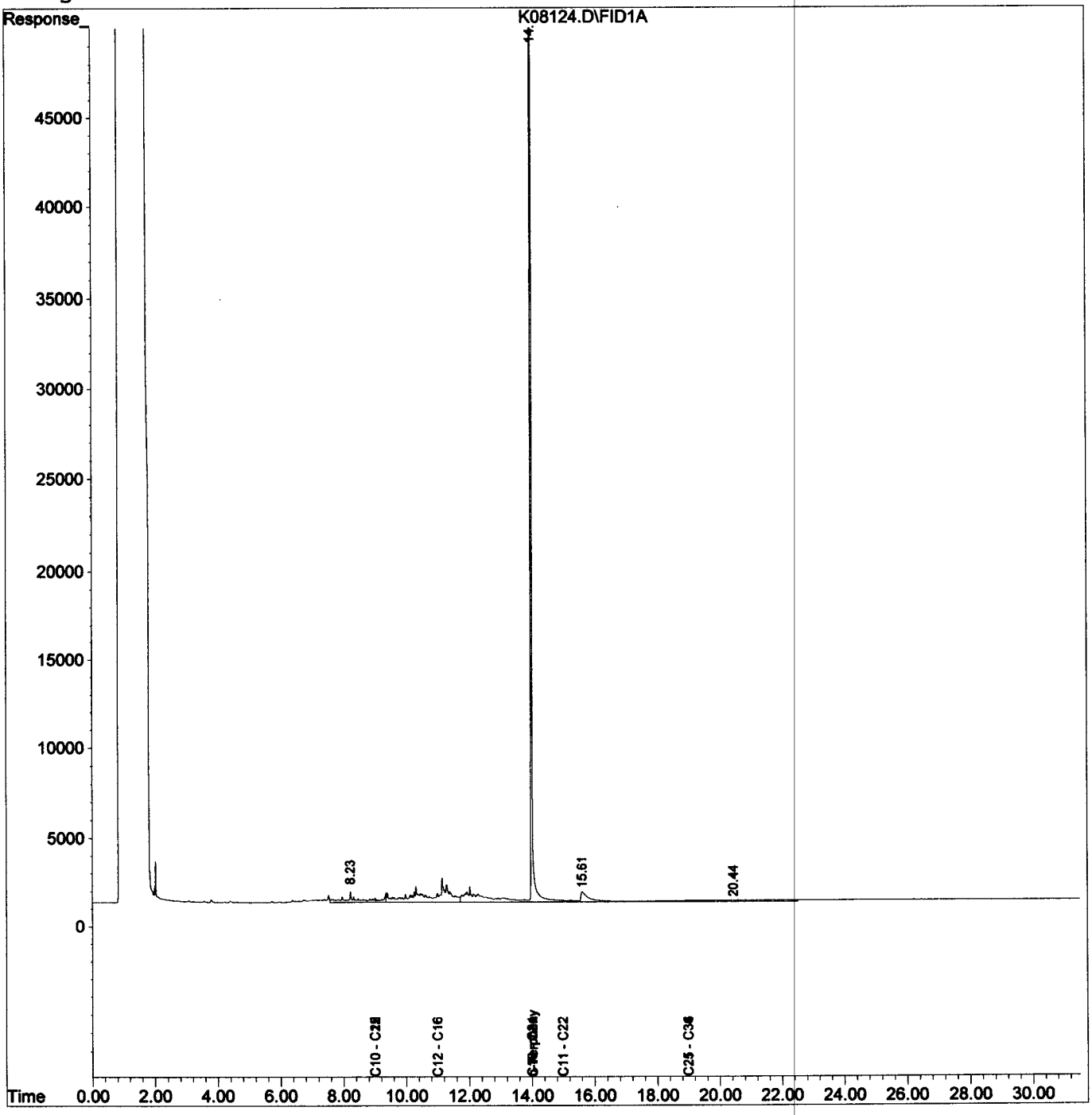


Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08124.D Vial: 21
Acq On : 10 Nov 2003 7:47 am Operator: EJE
Sample : b3k0154-03 Inst : GC #5
Misc : 2x AR w Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 9:15 2003 Quant Results File: K0603R5F.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

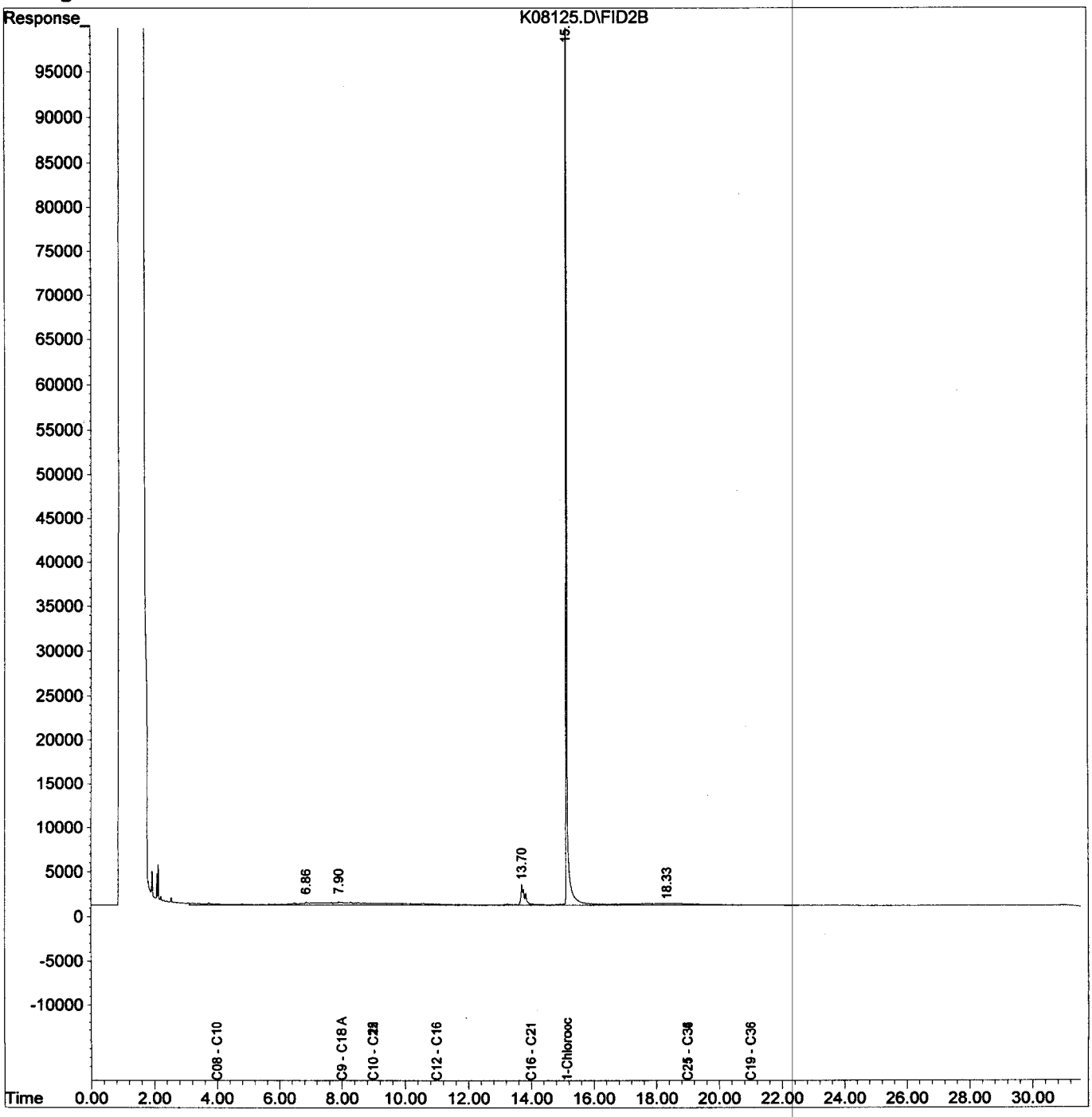


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08125.D Vial: 22
Acq On : 10 Nov 2003 8:28 am Operator: EJE
Sample : b3k0154-18 Inst : GC #5
Misc : 1x AL w Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 9:07 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



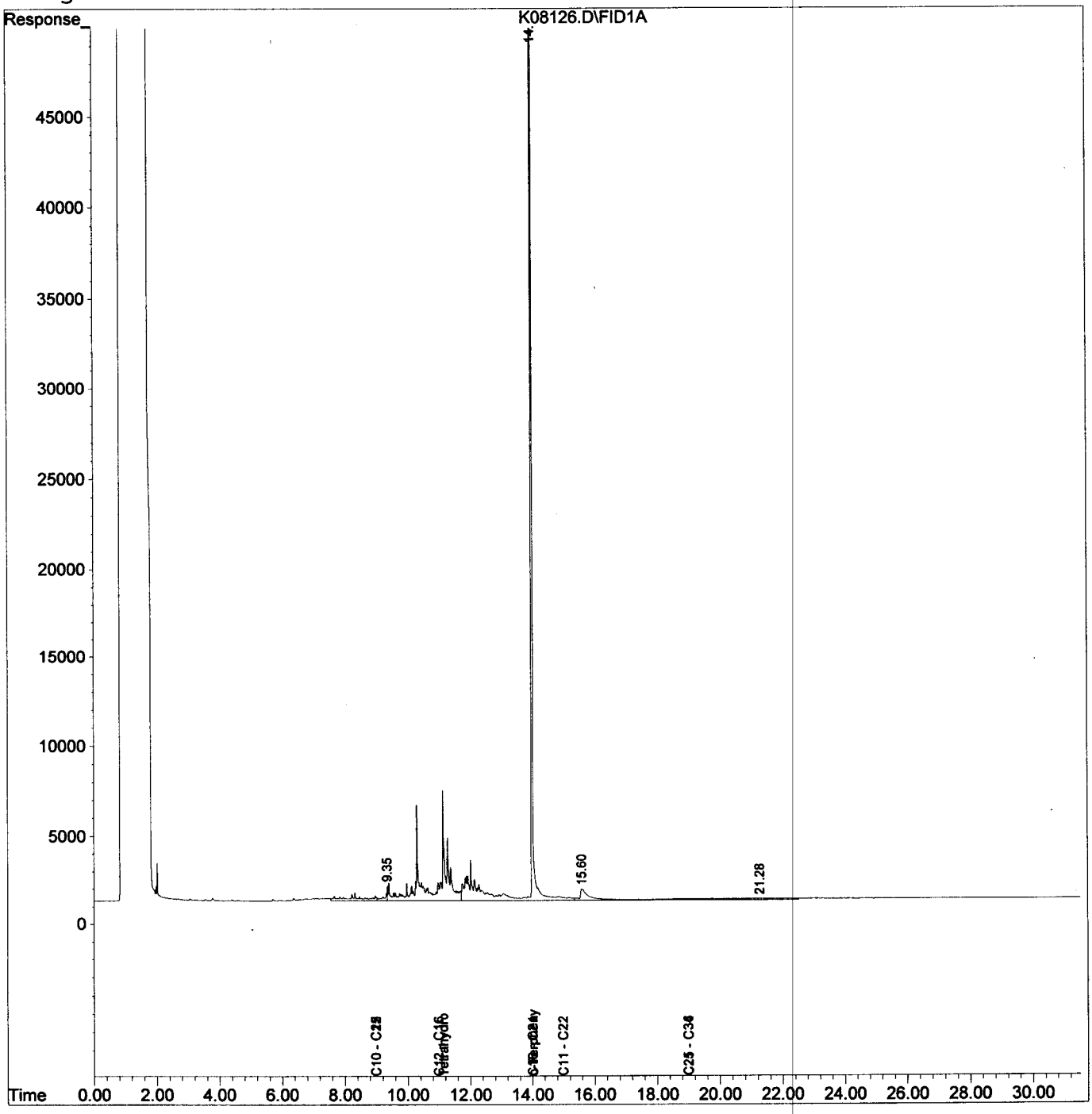
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08126.D
Acq On : 10 Nov 2003 8:28 am
Sample : b3k0154-18
Misc : 2x AR w
IntFile : SURR.E
Quant Time: Nov 10 9:15 2003 Quant Results File: K0603R5F.RES

Vial: 23
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

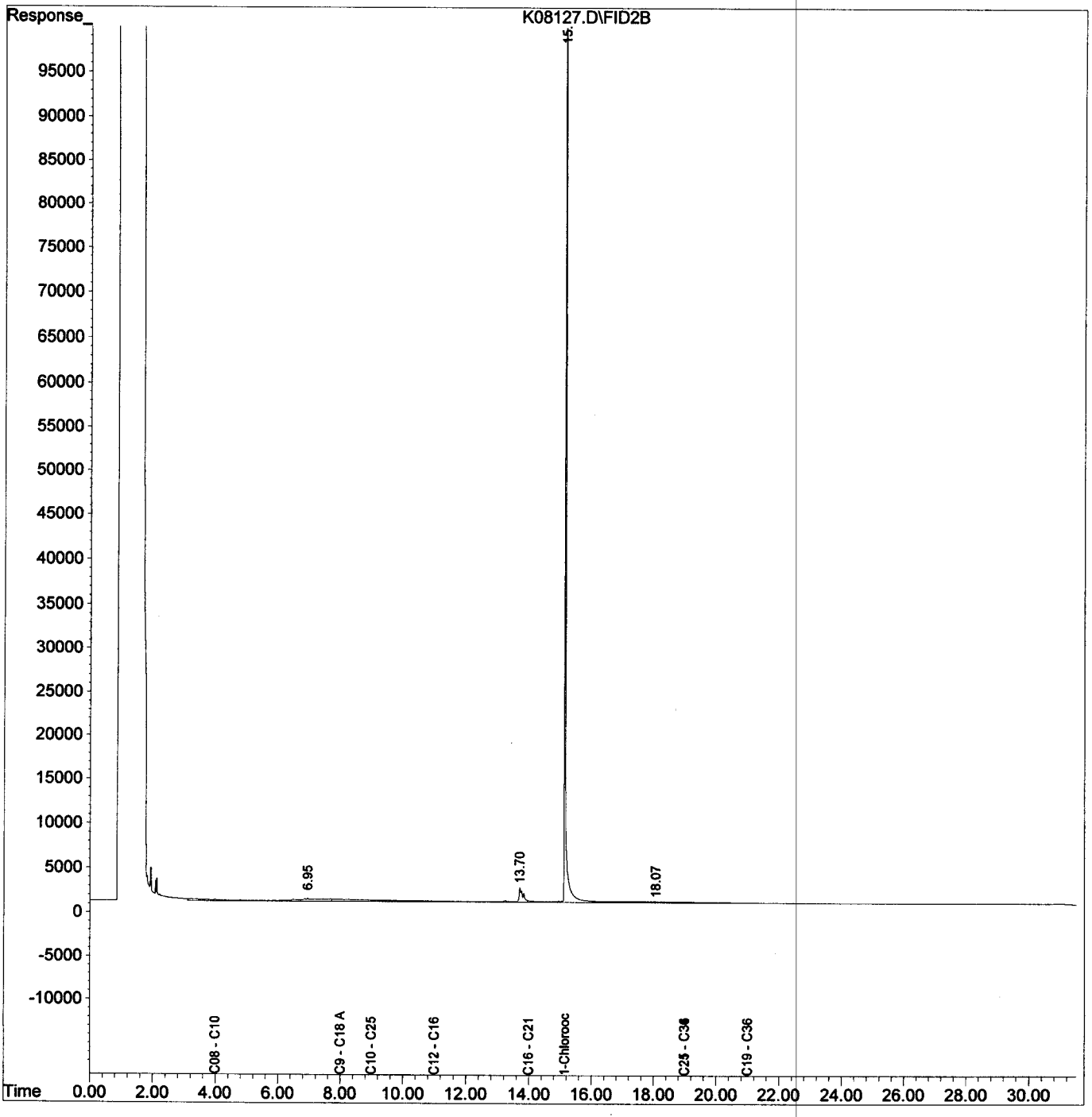


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08127.D Vial: 24
Acq On : 10 Nov 2003 9:09 am Operator: GAP
Sample : b3k0154-19 Inst : GC #5
Misc : 2x AL w Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 12:13 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



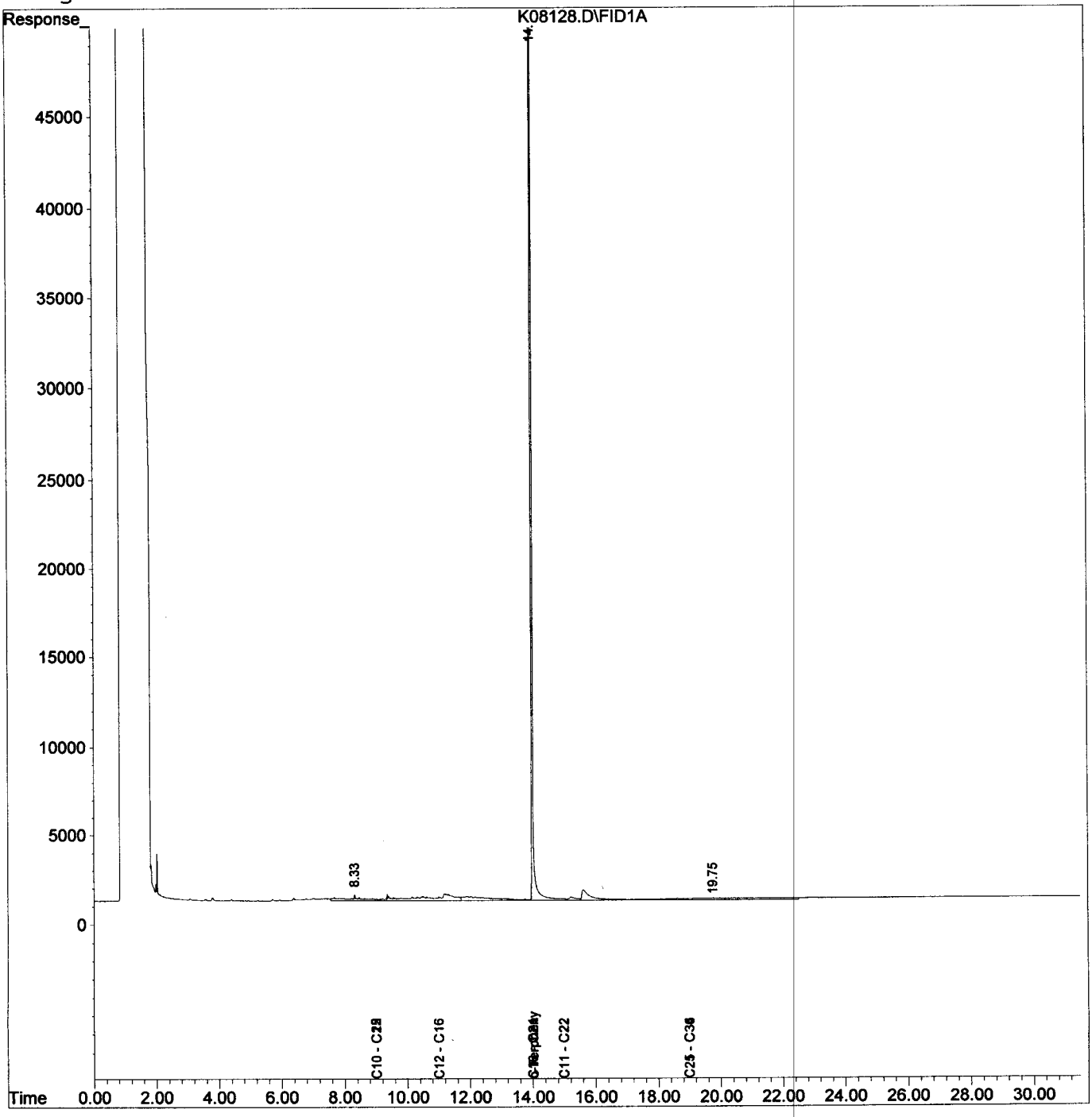
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08128.D
Acq On : 10 Nov 2003 9:09 am
Sample : b3k0154-19
Misc : 2x AR w
IntFile : SURR.E
Quant Time: Nov 10 12:20 2003 Quant Results File: K0603R5F.RES

Vial: 25
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

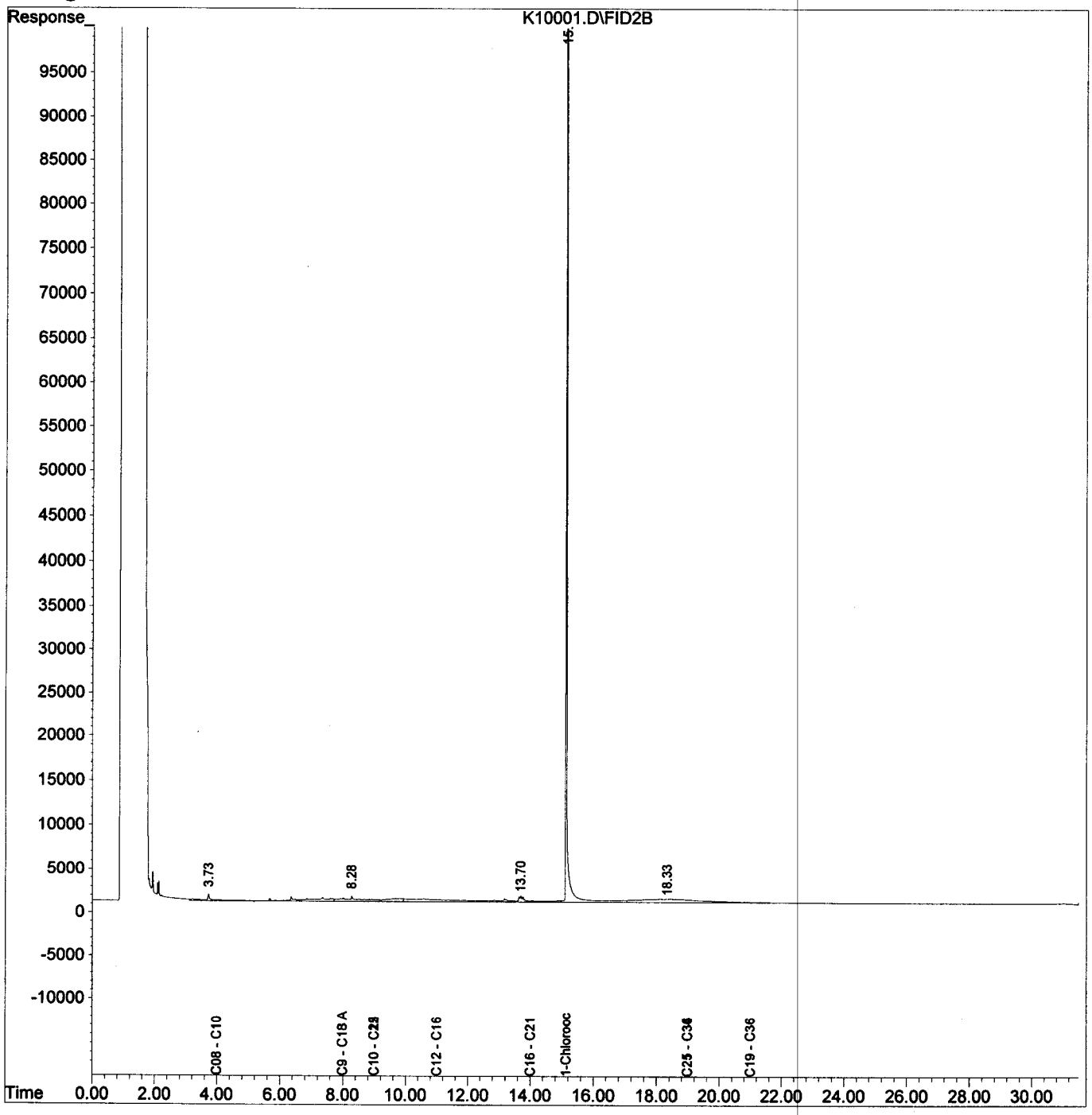


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10001.D Vial: 26
Acq On : 10 Nov 2003 11:54 am Operator: GAP
Sample : b3k0154-21 Inst : GC #5
Misc : 2x AL w Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 12:37 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



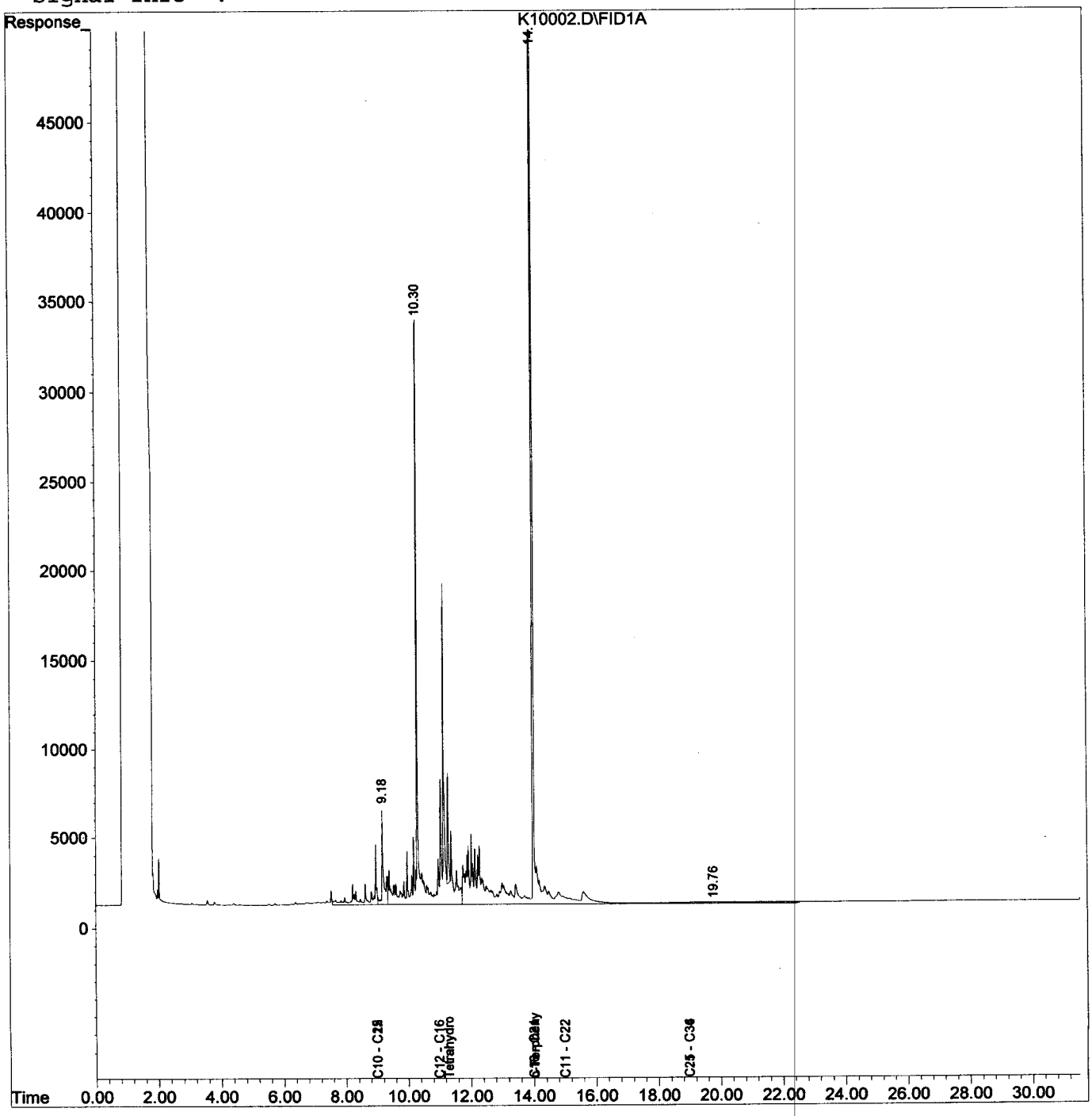
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10002.D
Acq On : 10 Nov 2003 11:54 am
Sample : b3k0154-21
Misc : 2x AR w
IntFile : SURR.E
Quant Time: Nov 10 12:36 2003 Quant Results File: K0603R5F.RES

Vial: 27
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

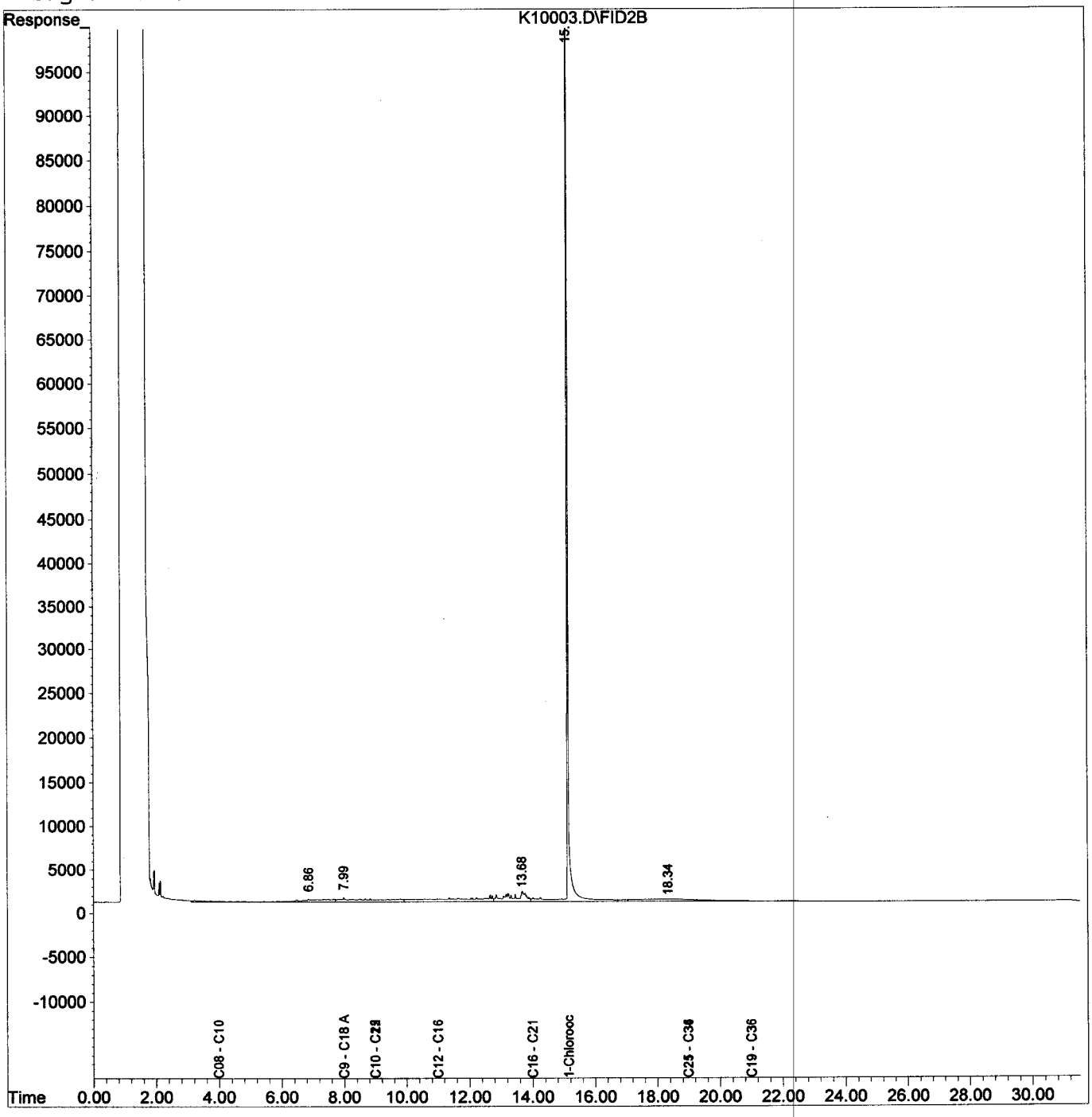


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10003.D Vial: 28
Acq On : 10 Nov 2003 12:35 pm Operator: GAP
Sample : b3k0154-22 Inst : GC #5
Misc : 2x AL w Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 15:10 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



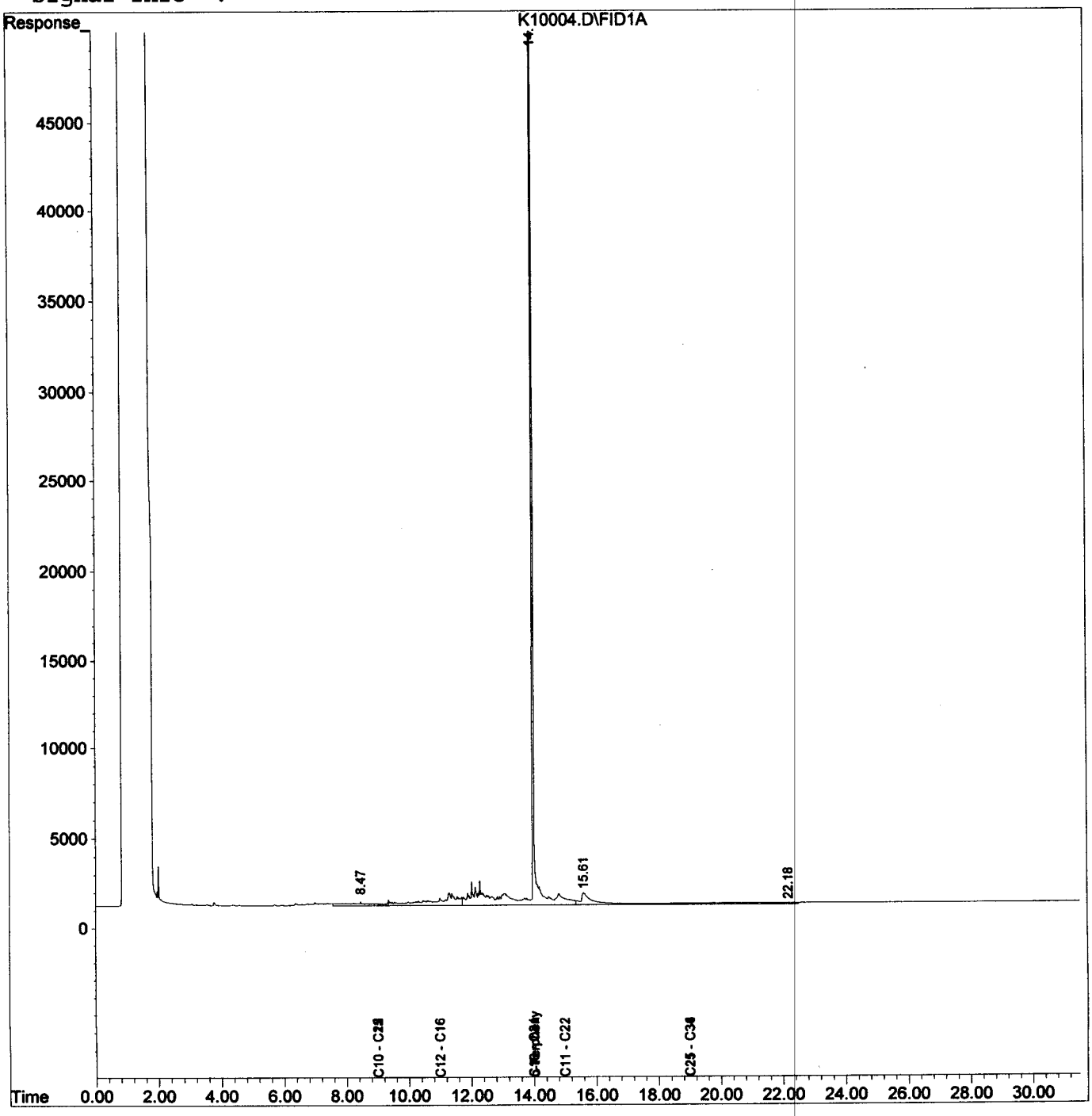
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10004.D
Acq On : 10 Nov 2003 12:35 pm
Sample : b3k0154-22
Misc : 2x AR w
IntFile : SURR.E
Quant Time: Nov 10 15:13 2003 Quant Results File: K0603R5F.RES

Vial: 29
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

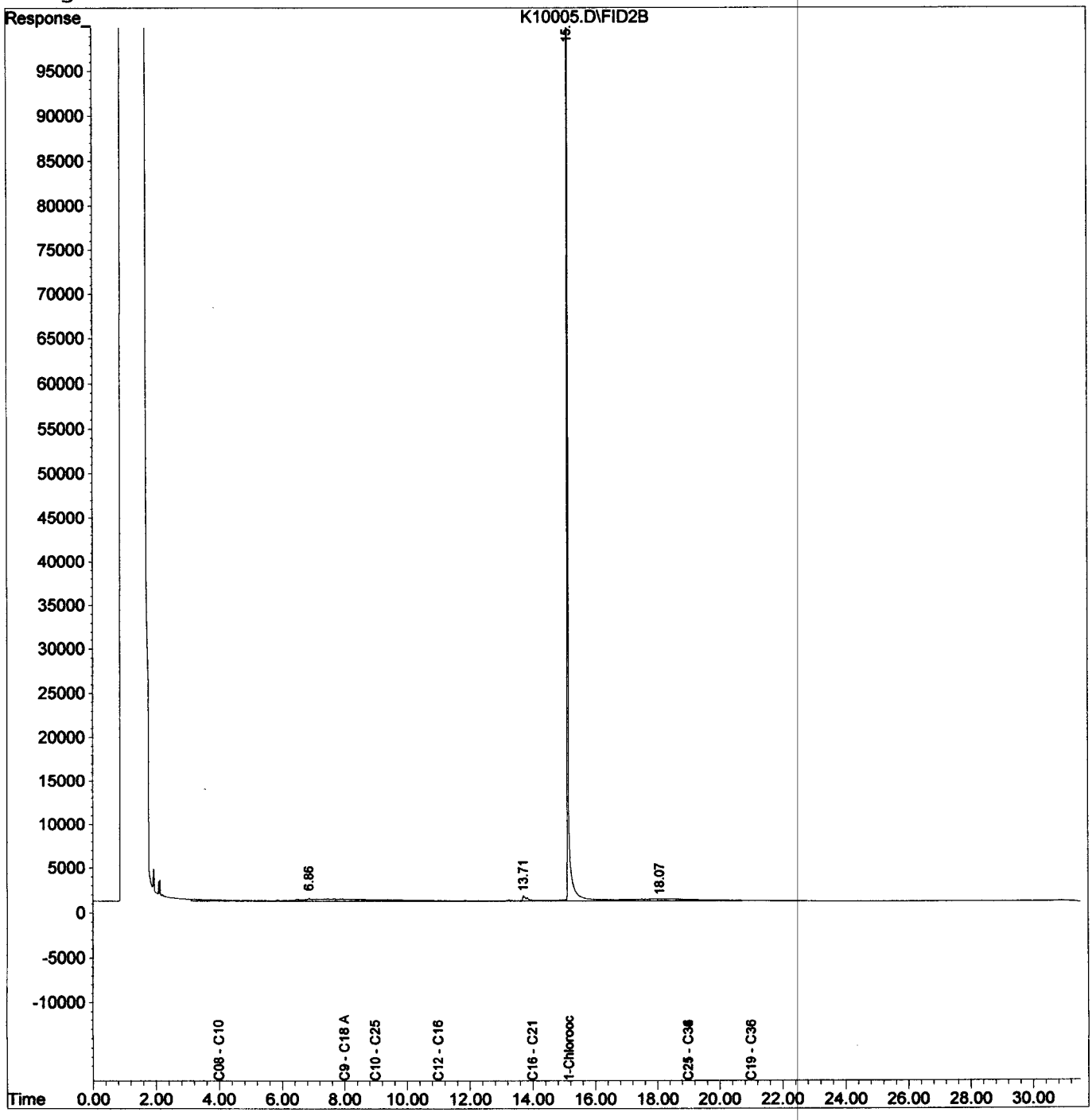


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10005.D Vial: 30
Acq On : 10 Nov 2003 1:17 pm Operator: GAP
Sample : b3k0154-23 Inst : GC #5
Misc : 2x AL w Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 15:10 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



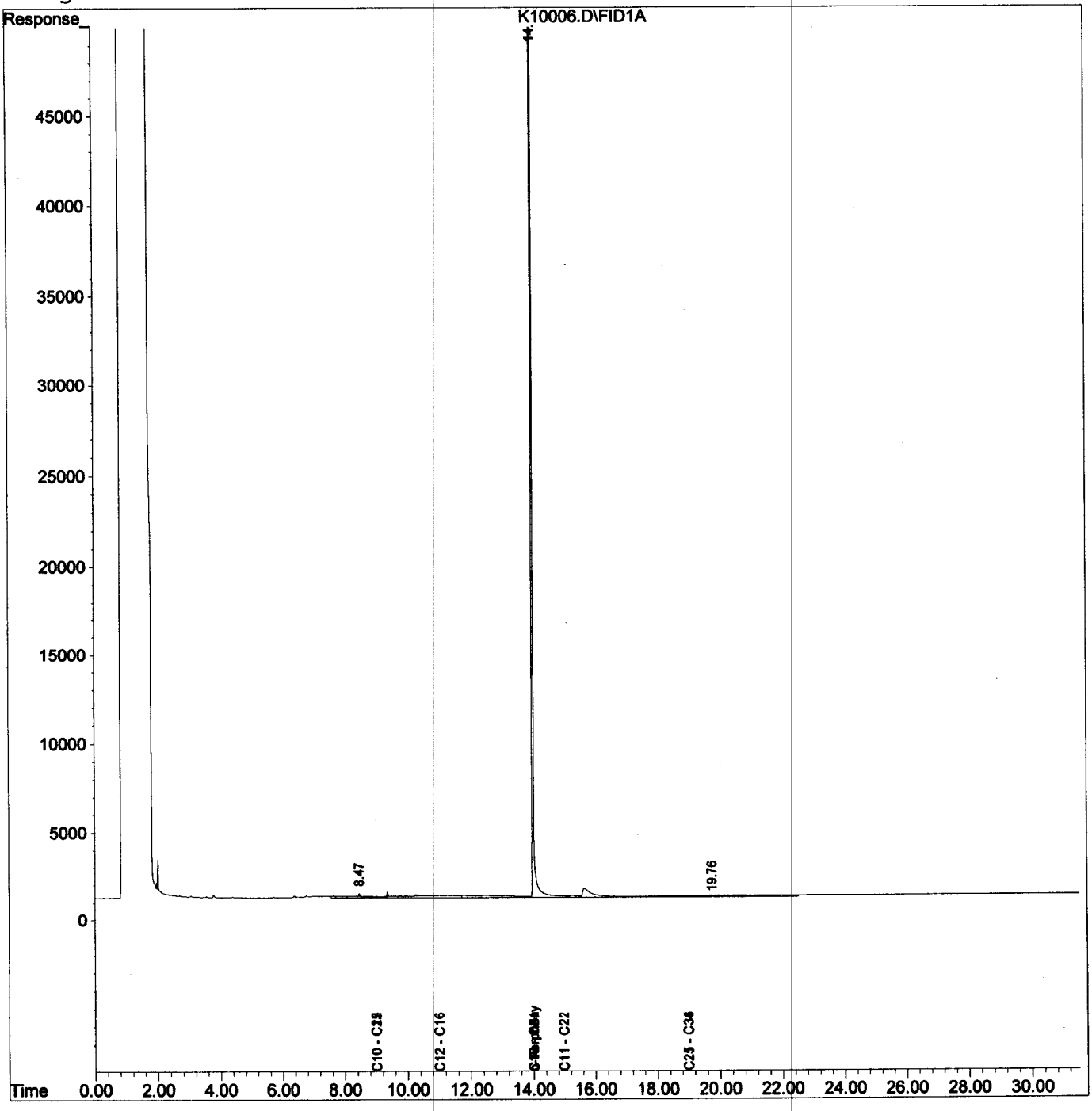
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10006.D
Acq On : 10 Nov 2003 1:17 pm
Sample : b3k0154-23
Misc : 2x AR w
IntFile : SURR.E
Quant Time: Nov 10 15:13 2003 Quant Results File: K0603R5F.RES

Vial: 31
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



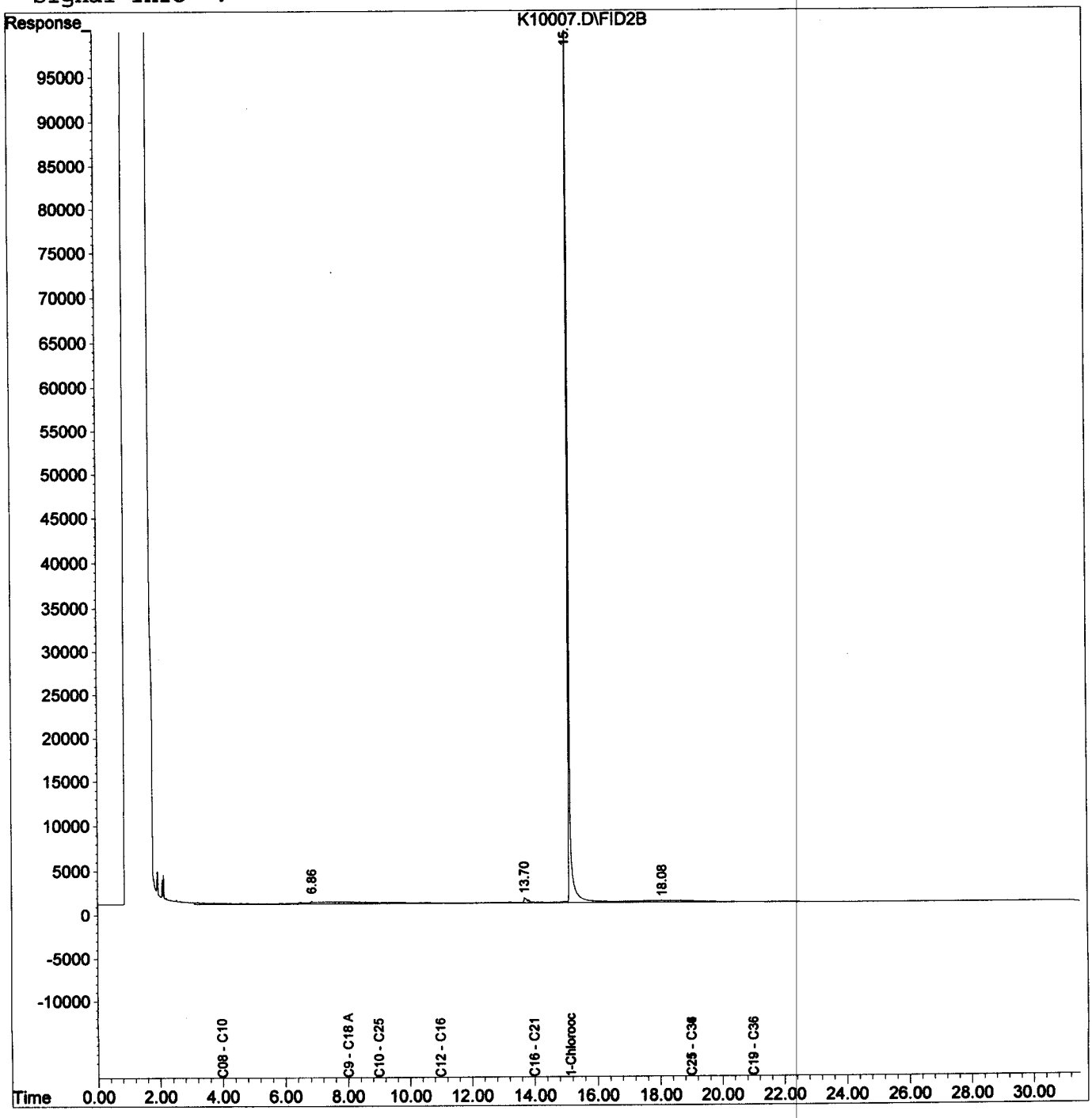
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10007.D
Acq On : 10 Nov 2003 1:59 pm
Sample : b3k0154-25
Misc : 2x AL w
IntFile : SURR.E
Quant Time: Nov 10 15:10 2003 Quant Results File: K0603L5R.RES

Vial: 32
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



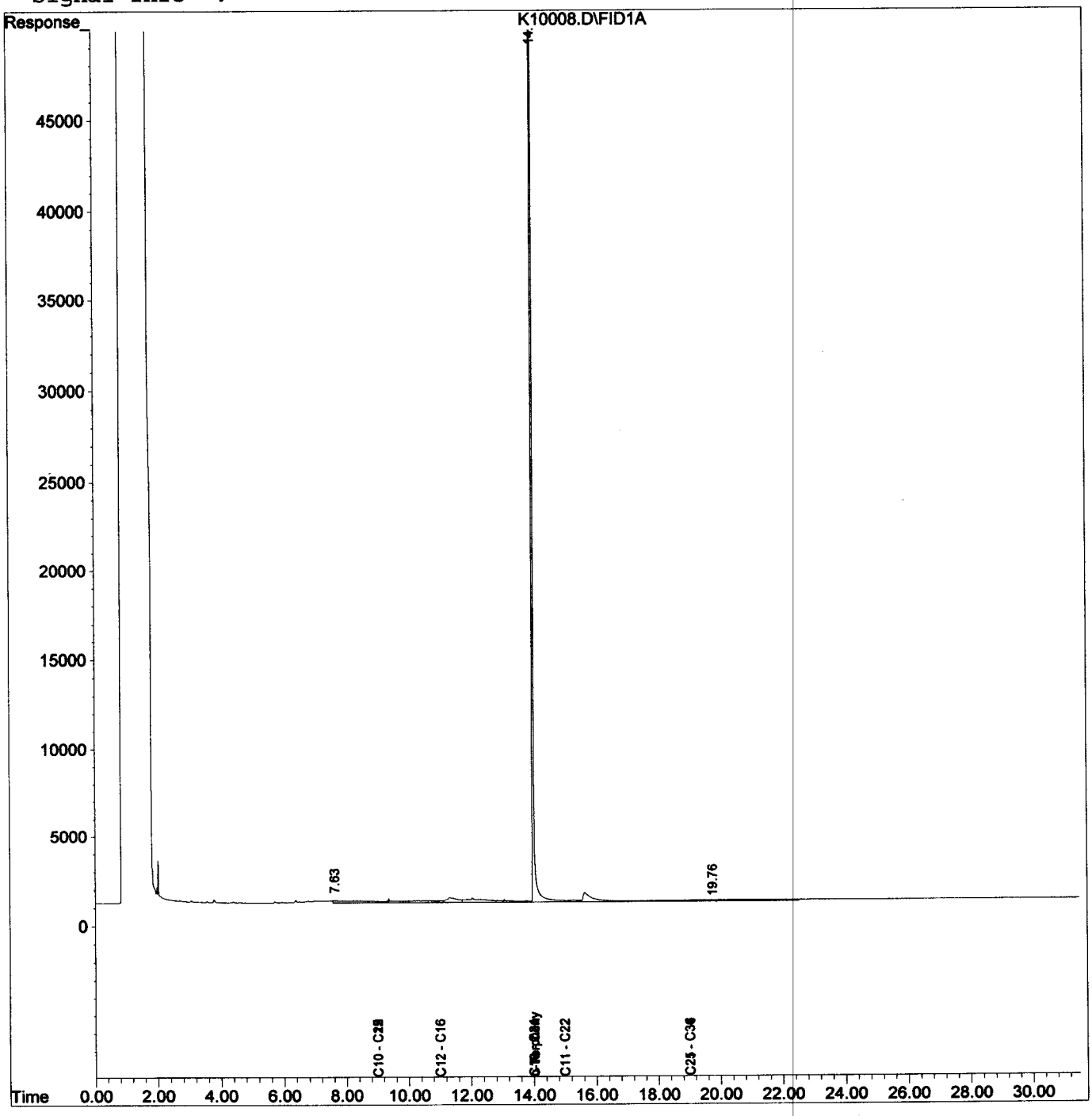
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10008.D
Acq On : 10 Nov 2003 1:59 pm
Sample : b3k0154-25
Misc : 2x AR w
IntFile : SURR.E
Quant Time: Nov 10 15:13 2003 Quant Results File: K0603R5F.RES

Vial: 33
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



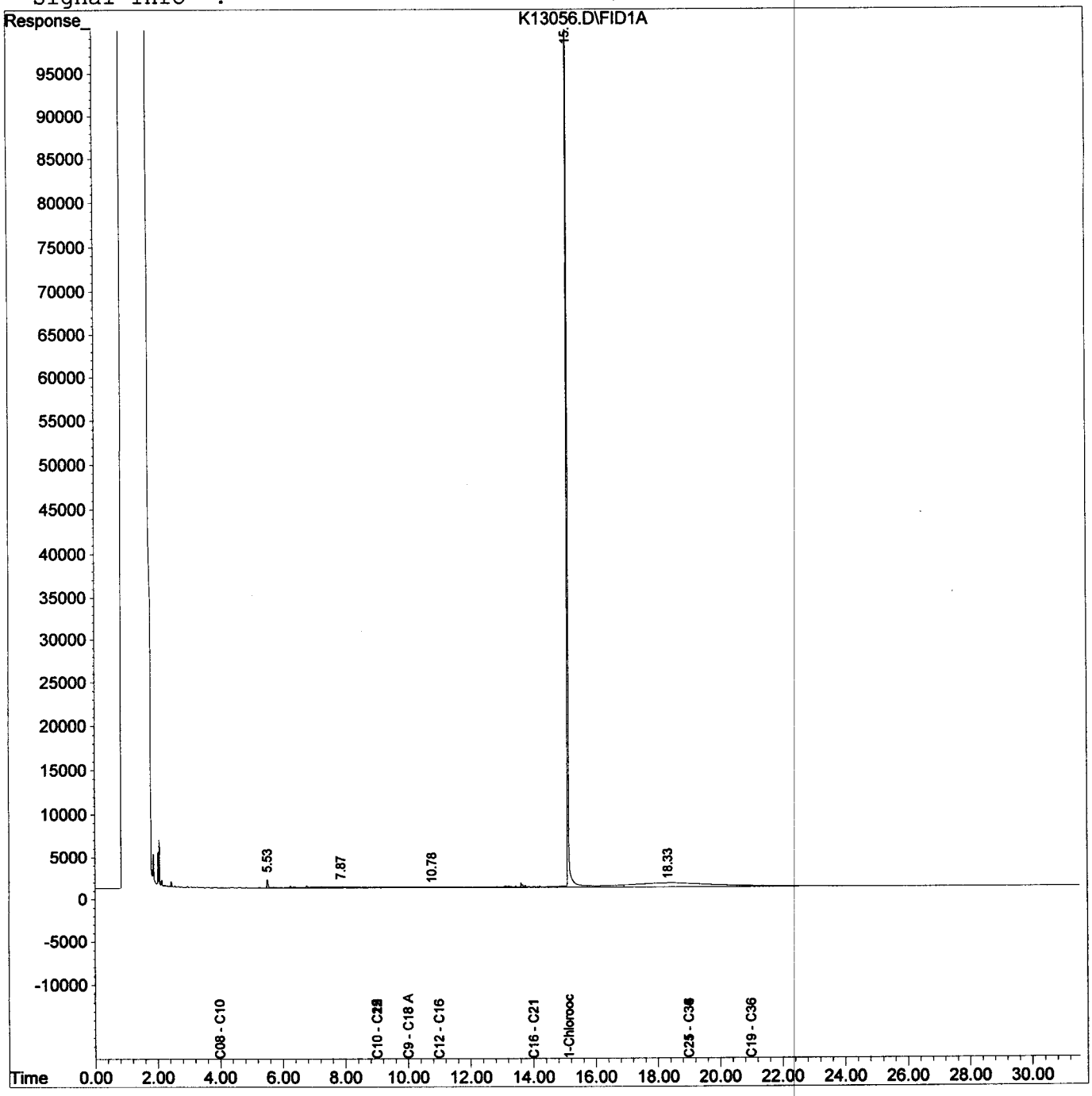
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13056.D
Acq On : 14 Nov 2003 4:49 am
Sample : B3K0154-01
Misc : 1x AL
IntFile : SURR.E
Quant Time: Nov 14 7:25 2003 Quant Results File: K0603L5F.RES

Vial: 26
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

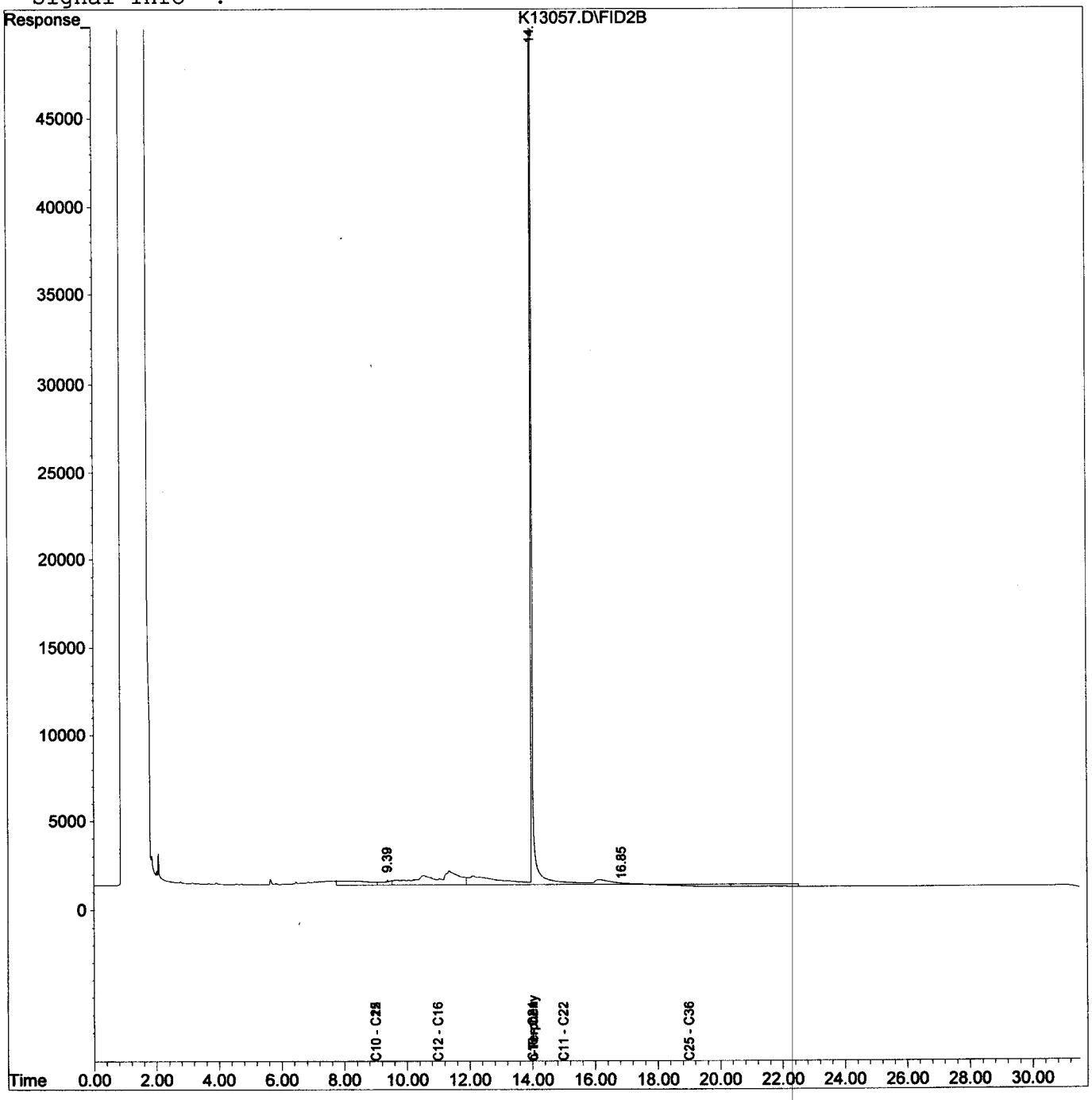


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13057.D Vial: 27
Acq On : 14 Nov 2003 5:30 am Operator: GAP
Sample : B3K0154-01 Inst : GC #5
Misc : 1x AR Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 14 7:04 2003 Quant Results File: K0603R5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

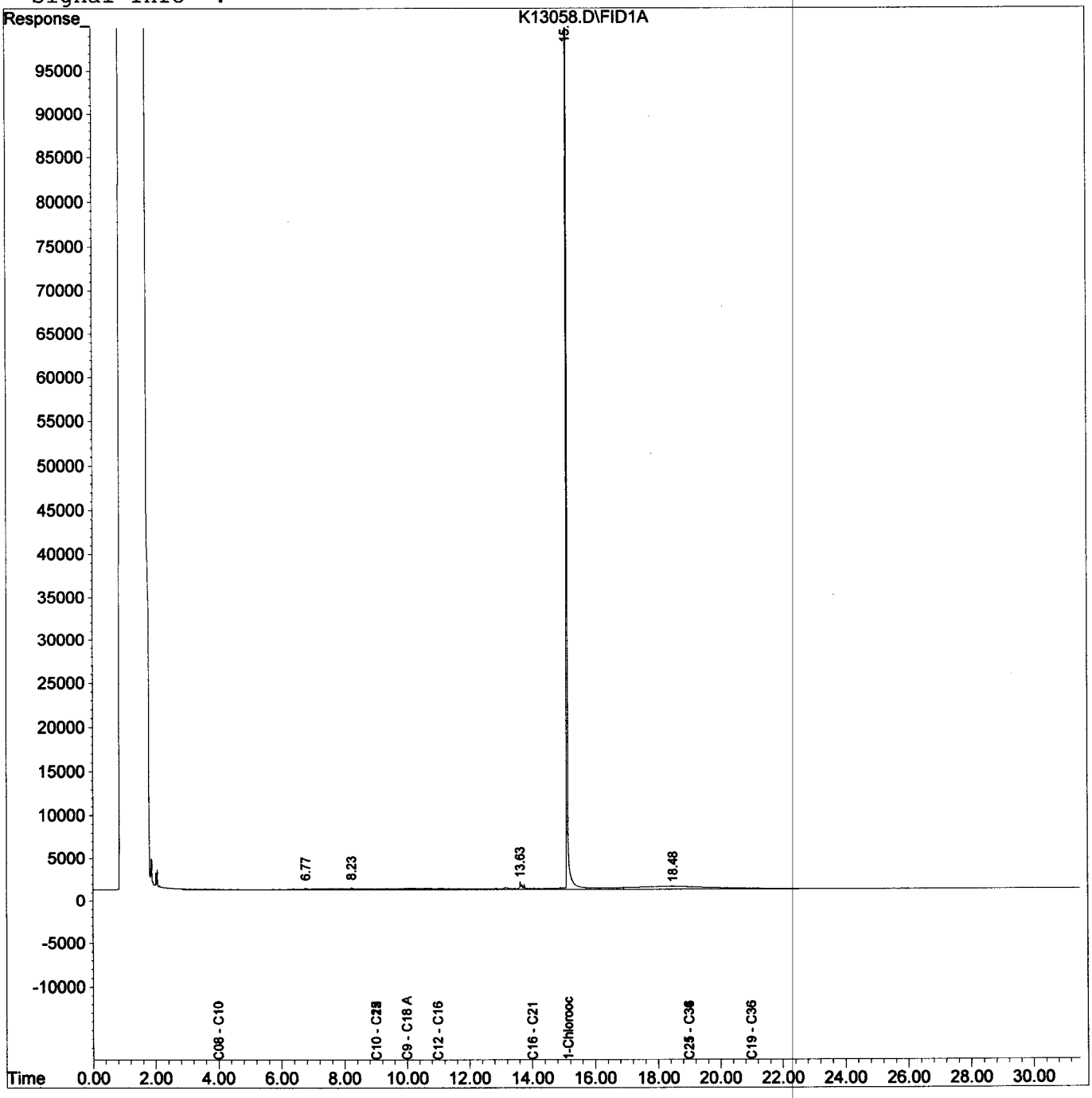


Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13058.D Vial: 28
Acq On : 14 Nov 2003 5:30 am Operator: GAP
Sample : B3K0154-02 Inst : GC #5
Misc : 1x AL Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 14 7:25 2003 Quant Results File: K0603L5F.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

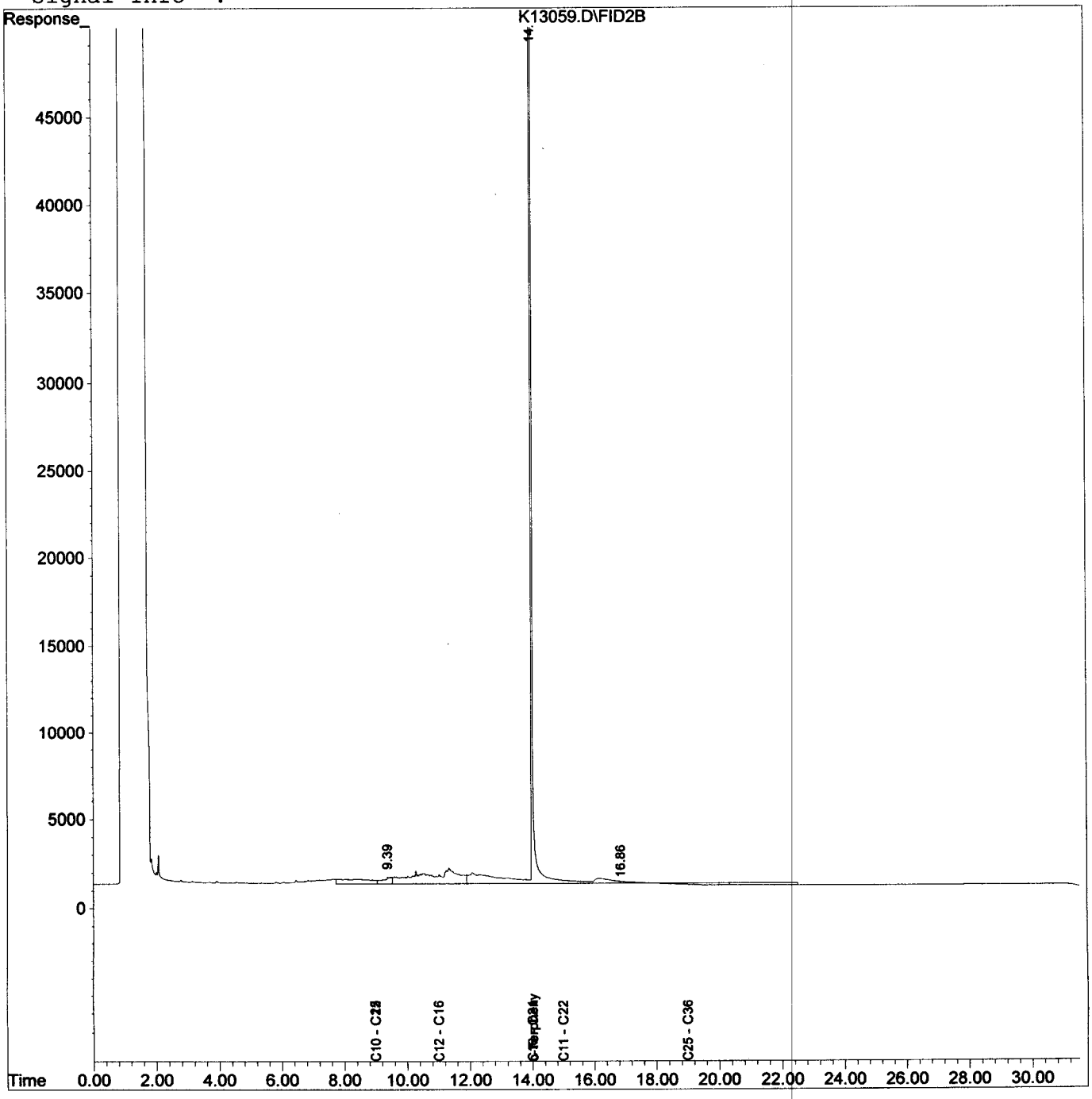


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13059.D Vial: 29
Acq On : 14 Nov 2003 6:11 am Operator: GAP
Sample : B3K0154-02 Inst : GC #5
Misc : 1x AR Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 14 7:04 2003 Quant Results File: K0603R5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

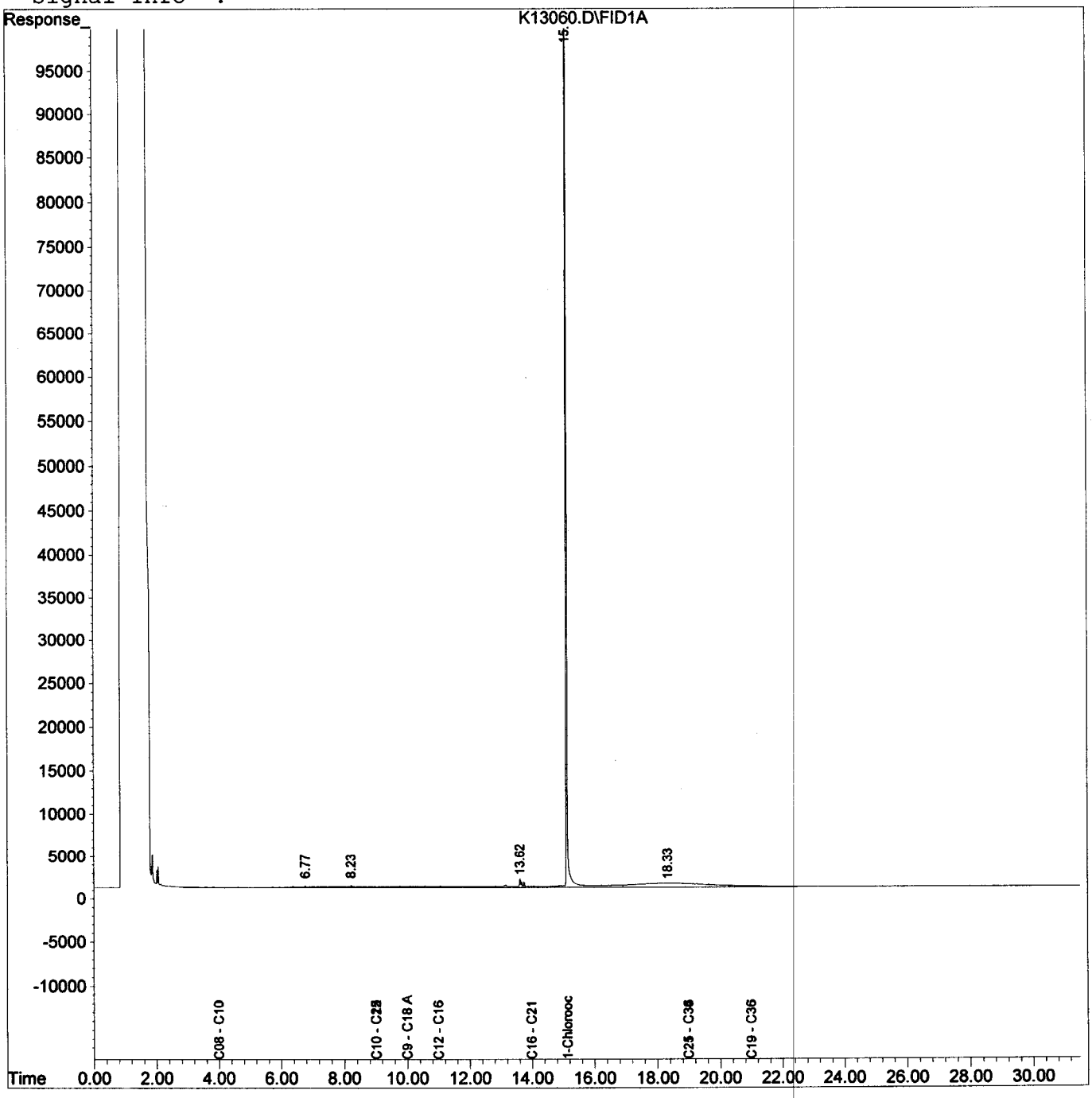


Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13060.D Vial: 30
Acq On : 14 Nov 2003 6:11 am Operator: GAP
Sample : B3K0154-03 Inst : GC #5
Misc : 1x AL Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 14 7:25 2003 Quant Results File: K0603L5F.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

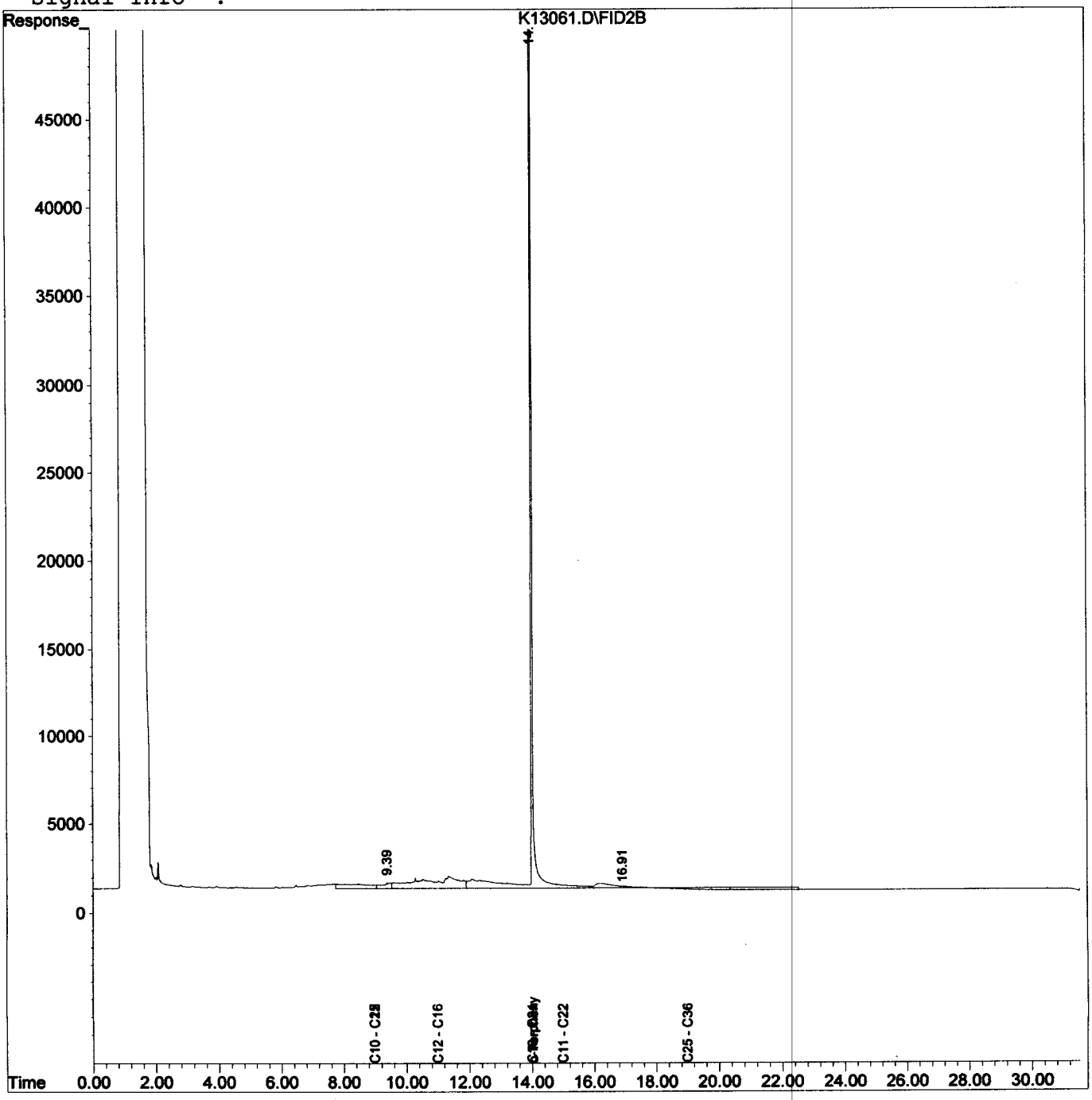


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13061.D Vial: 31
Acq On : 14 Nov 2003 6:52 am Operator: GAP
Sample : B3K0154-03 Inst : GC #5
Misc : 1x AR Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 14 12:25 2003 Quant Results File: K0603R5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

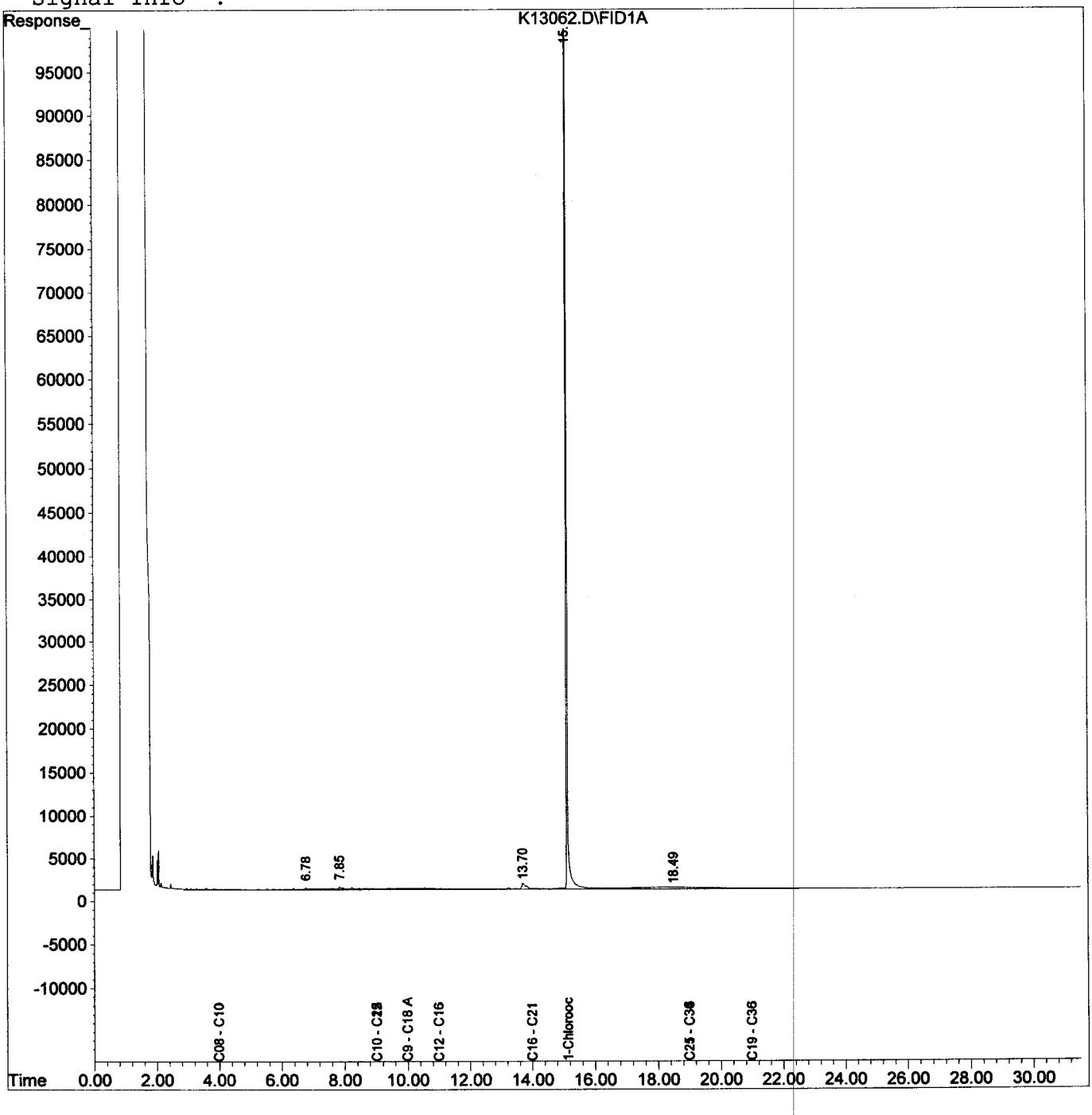


Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13062.D Vial: 32
Acq On : 14 Nov 2003 6:52 am Operator: GAP
Sample : B3K0154-18 Inst : GC #5
Misc : 1x AL Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 14 7:28 2003 Quant Results File: K0603L5F.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

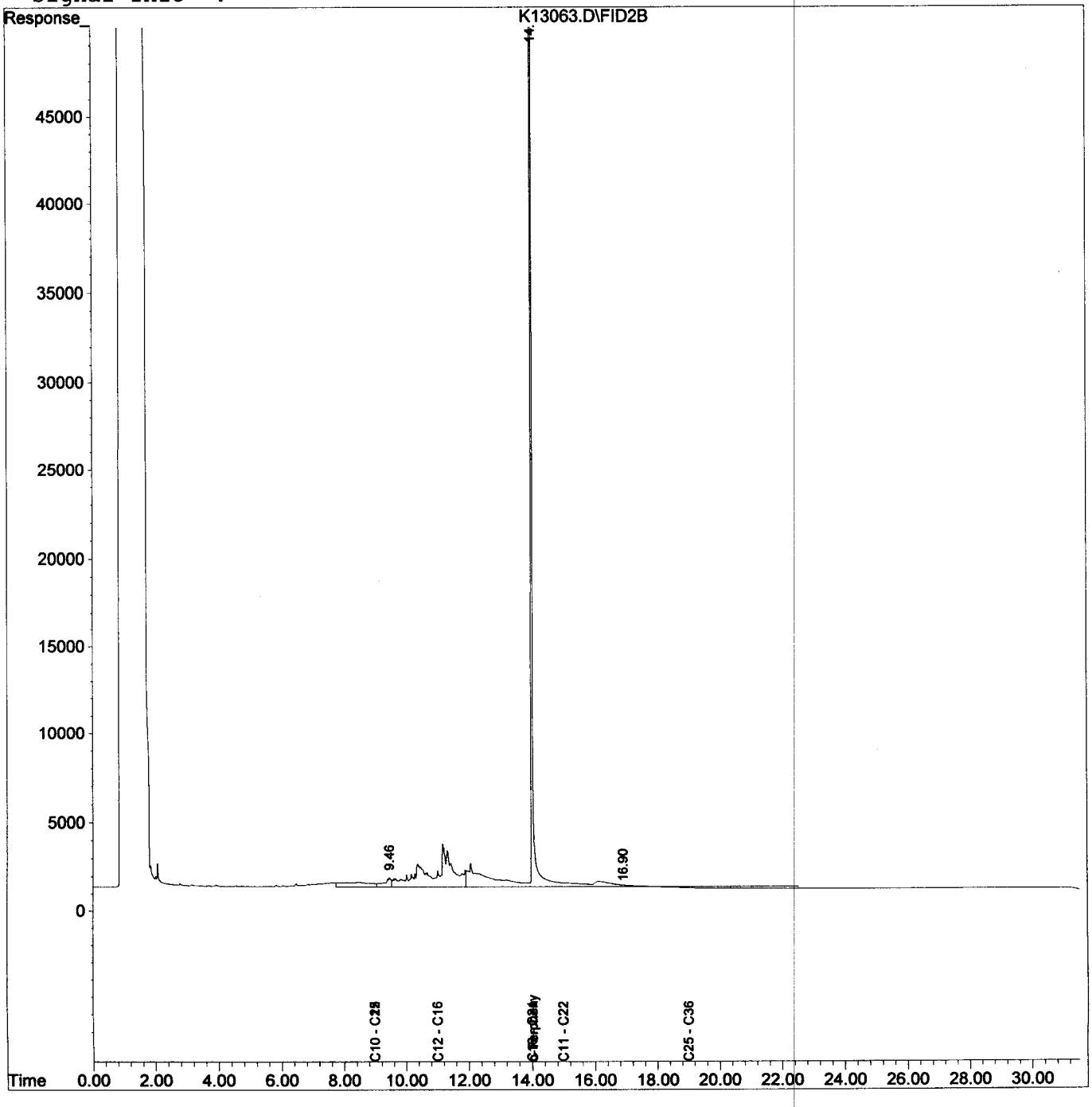


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13063.D Vial: 33
Acq On : 14 Nov 2003 7:34 am Operator: GAP
Sample : B3K0154-18 Inst : GC #5
Misc : 1x AR Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 14 12:26 2003 Quant Results File: K0603R5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



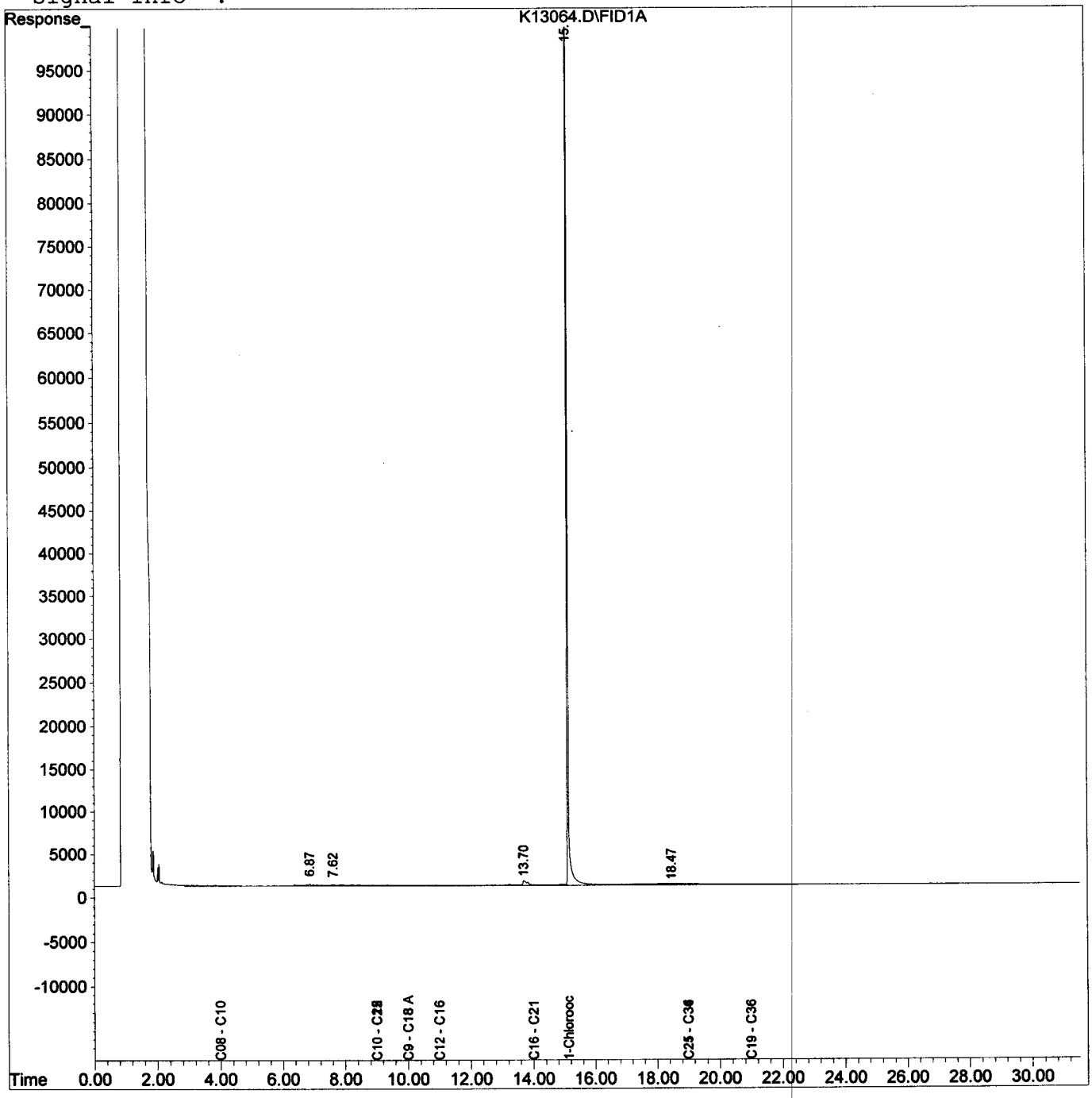
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13064.D
Acq On : 14 Nov 2003 7:34 am
Sample : B3K0154-19
Misc : 1x AL
IntFile : SURR.E
Quant Time: Nov 14 12:20 2003 Quant Results File: K0603L5F.RES

Vial: 34
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

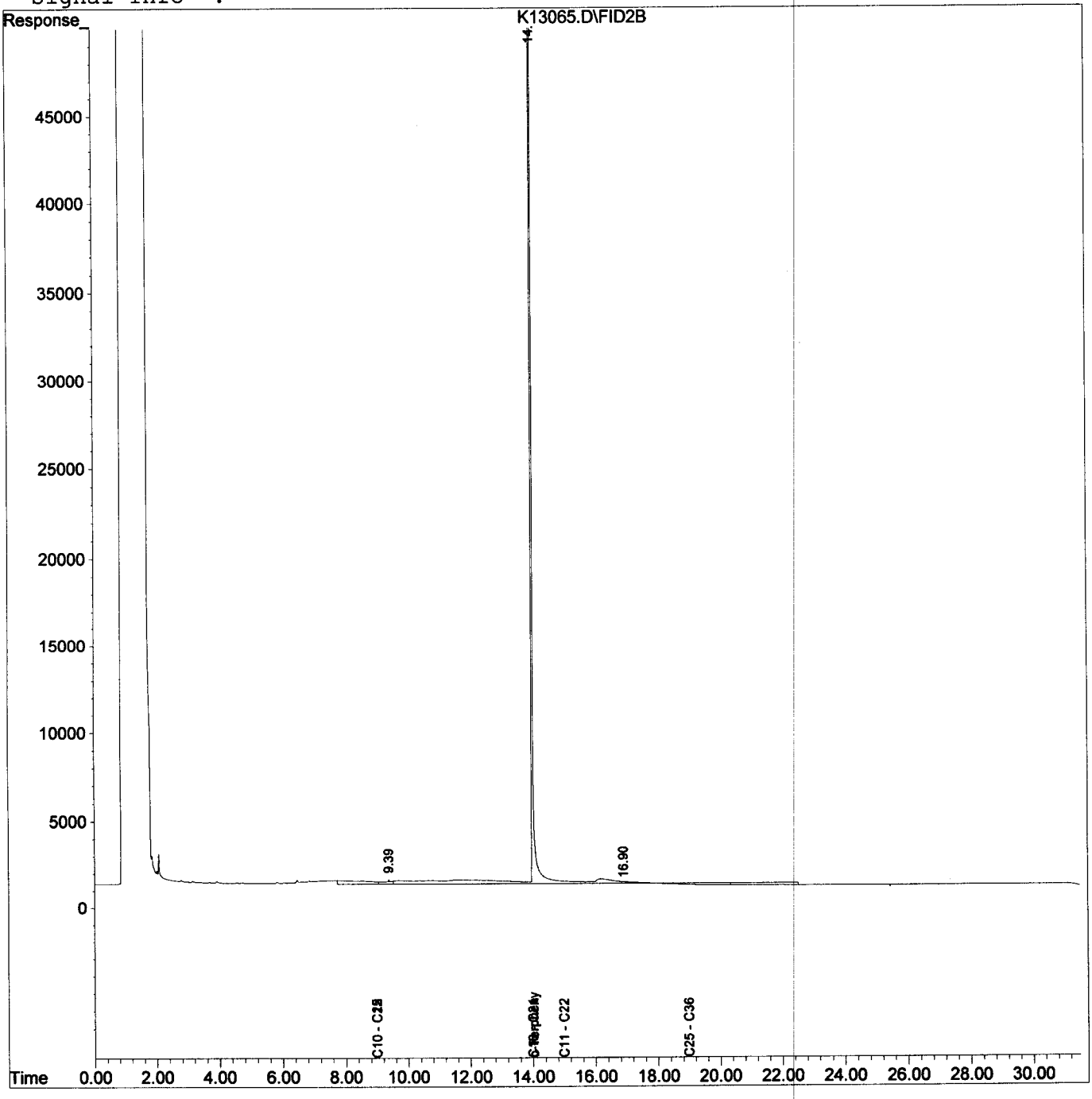


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13065.D
Acq On : 14 Nov 2003 8:15 am
Sample : B3K0154-19
Misc : 1x AR
IntFile : SURR.E
Vial: 35
Operator: GAP
Inst : GC #5
Multiplr: 1.00
Quant Time: Nov 14 12:26 2003 Quant Results File: K0603R5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



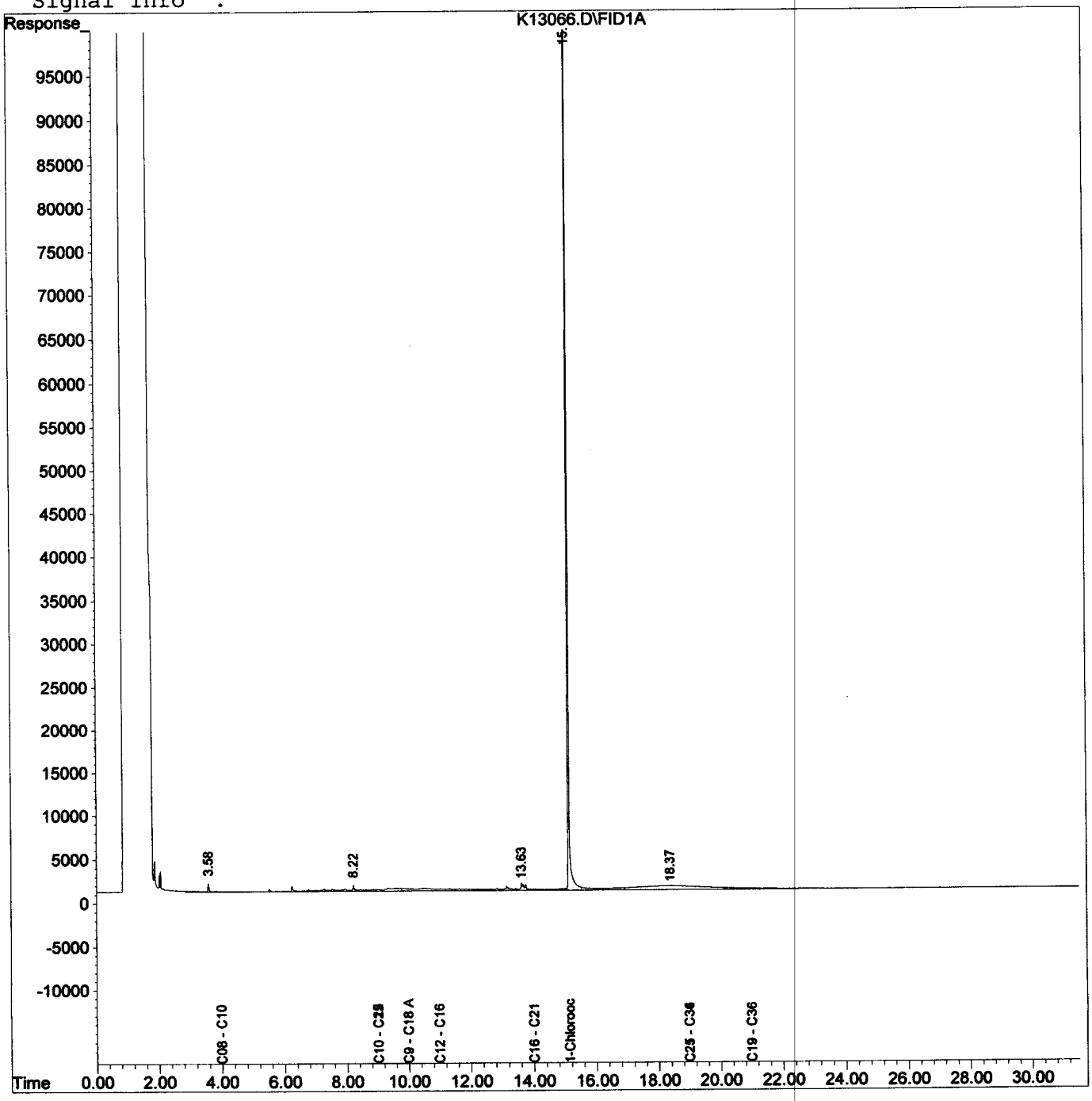
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13066.D
Acq On : 14 Nov 2003 8:15 am
Sample : B3K0154-21
Misc : 1x AL
IntFile : SURR.E
Quant Time: Nov 14 12:20 2003 Quant Results File: K0603L5F.RES

Vial: 36
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



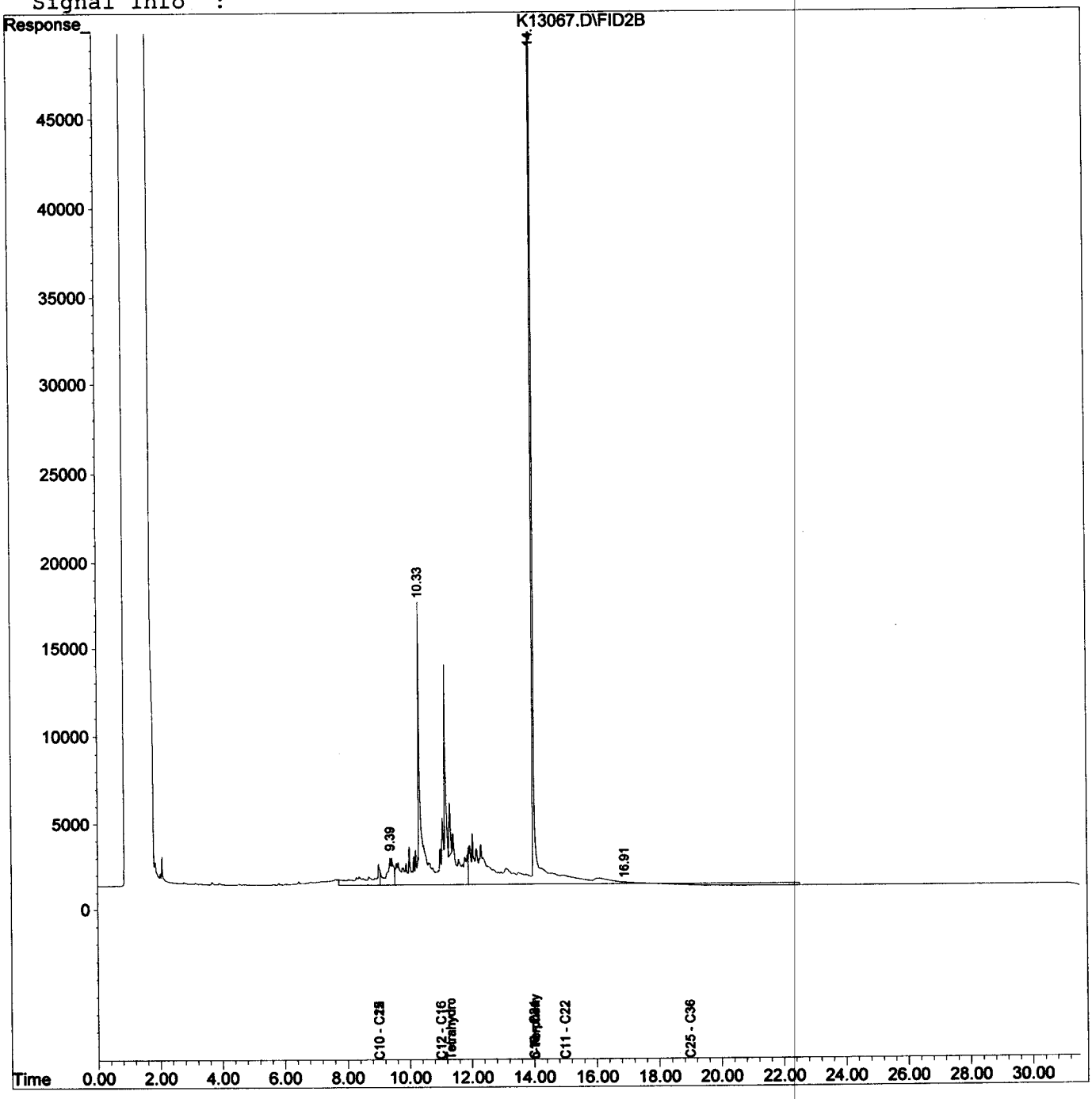
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13067.D
Acq On : 14 Nov 2003 8:56 am
Sample : B3K0154-21
Misc : 1x AR
IntFile : SURR.E
Quant Time: Nov 14 12:26 2003 Quant Results File: K0603R5R.RES

Vial: 37
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



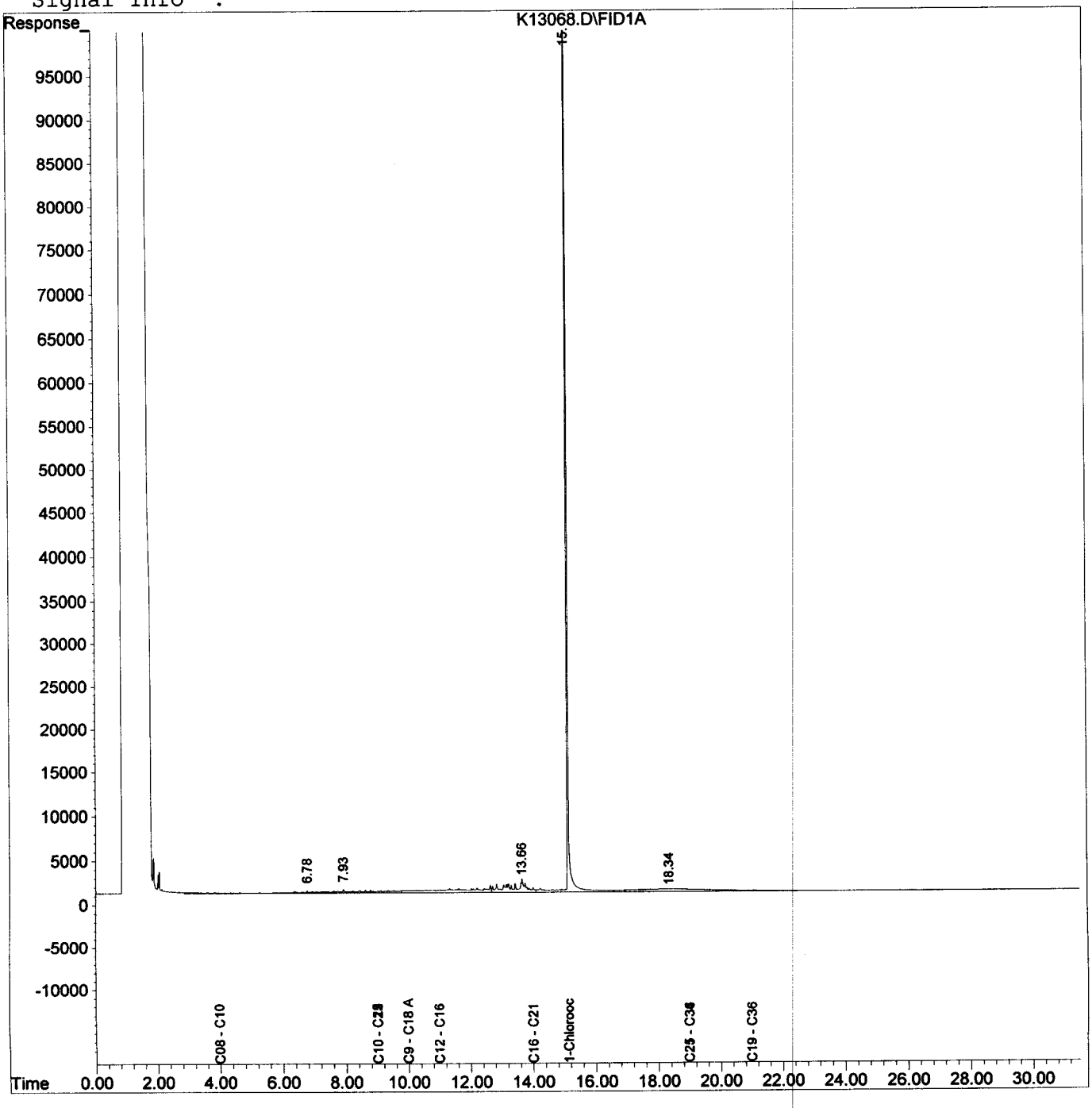
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13068.D
Acq On : 14 Nov 2003 8:56 am
Sample : B3K0154-22
Misc : 1x AL
IntFile : SURR.E
Quant Time: Nov 14 12:20 2003 Quant Results File: K0603L5F.RES

Vial: 38
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



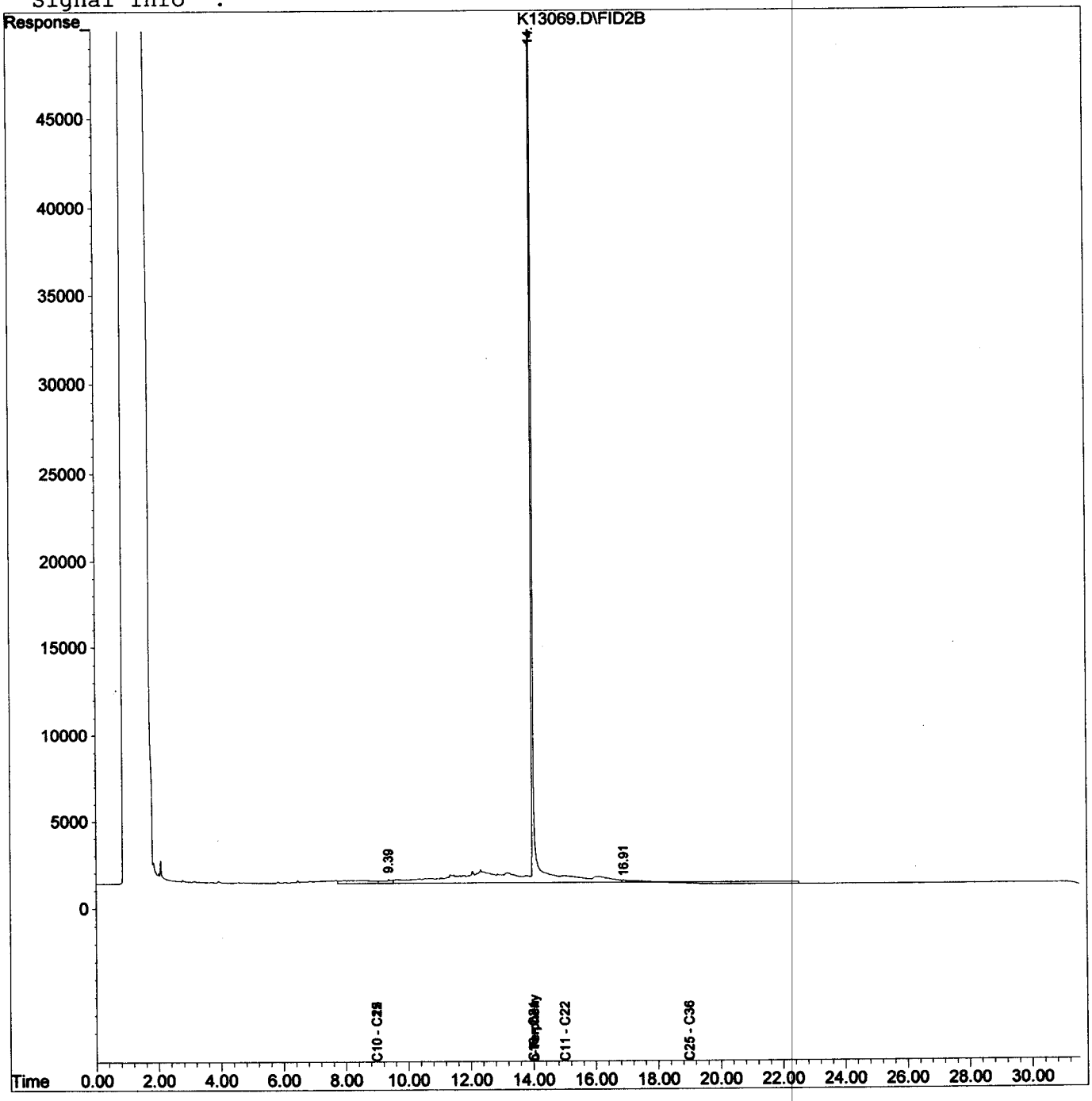
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13069.D
Acq On : 14 Nov 2003 9:37 am
Sample : B3K0154-22
Misc : 1x AR
IntFile : SURR.E
Quant Time: Nov 14 12:26 2003 Quant Results File: K0603R5R.RES

Vial: 39
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



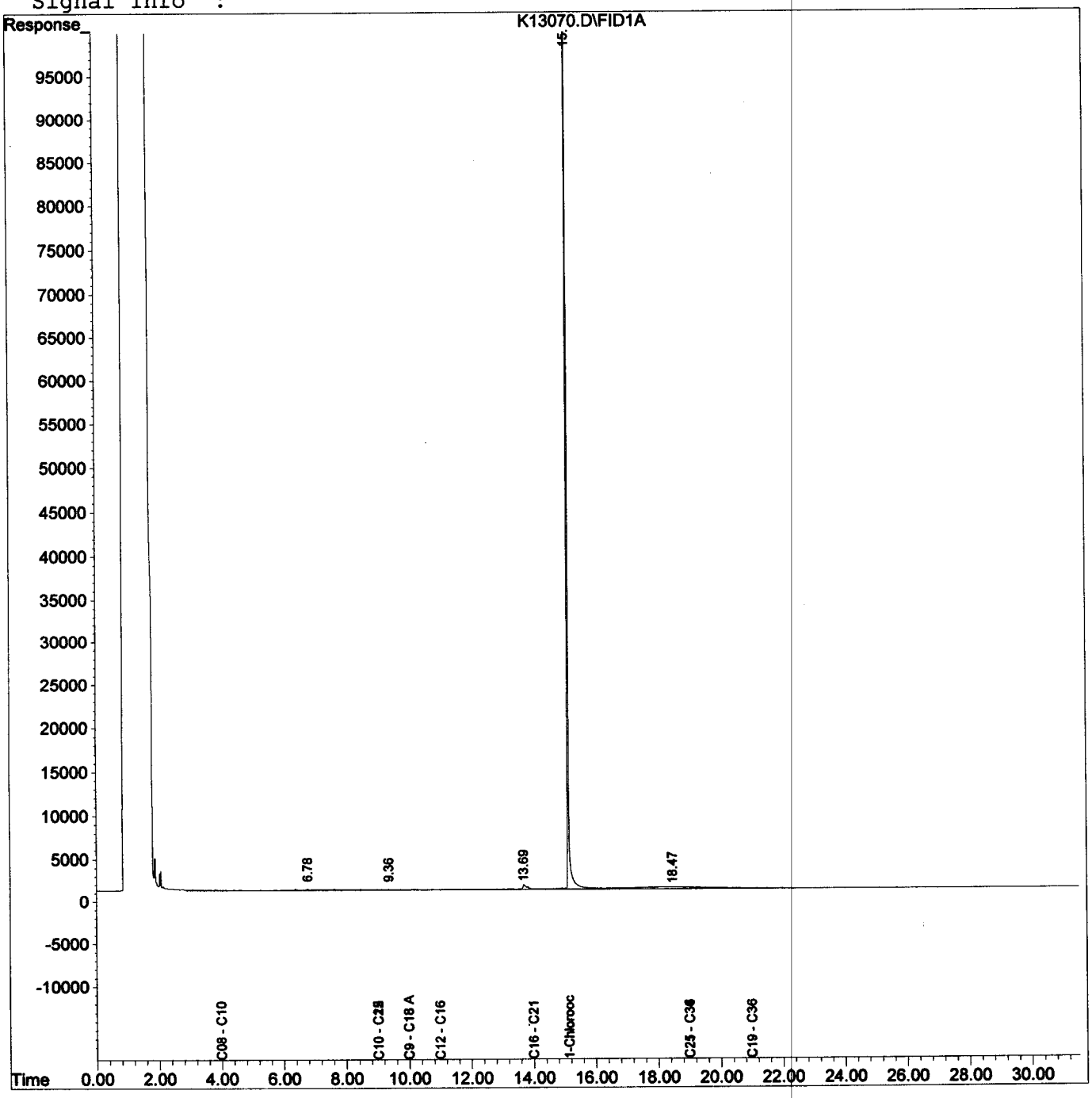
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13070.D
Acq On : 14 Nov 2003 9:37 am
Sample : B3K0154-23
Misc : 1x AL
IntFile : SURR.E
Quant Time: Nov 14 12:20 2003 Quant Results File: K0603L5F.RES

Vial: 40
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



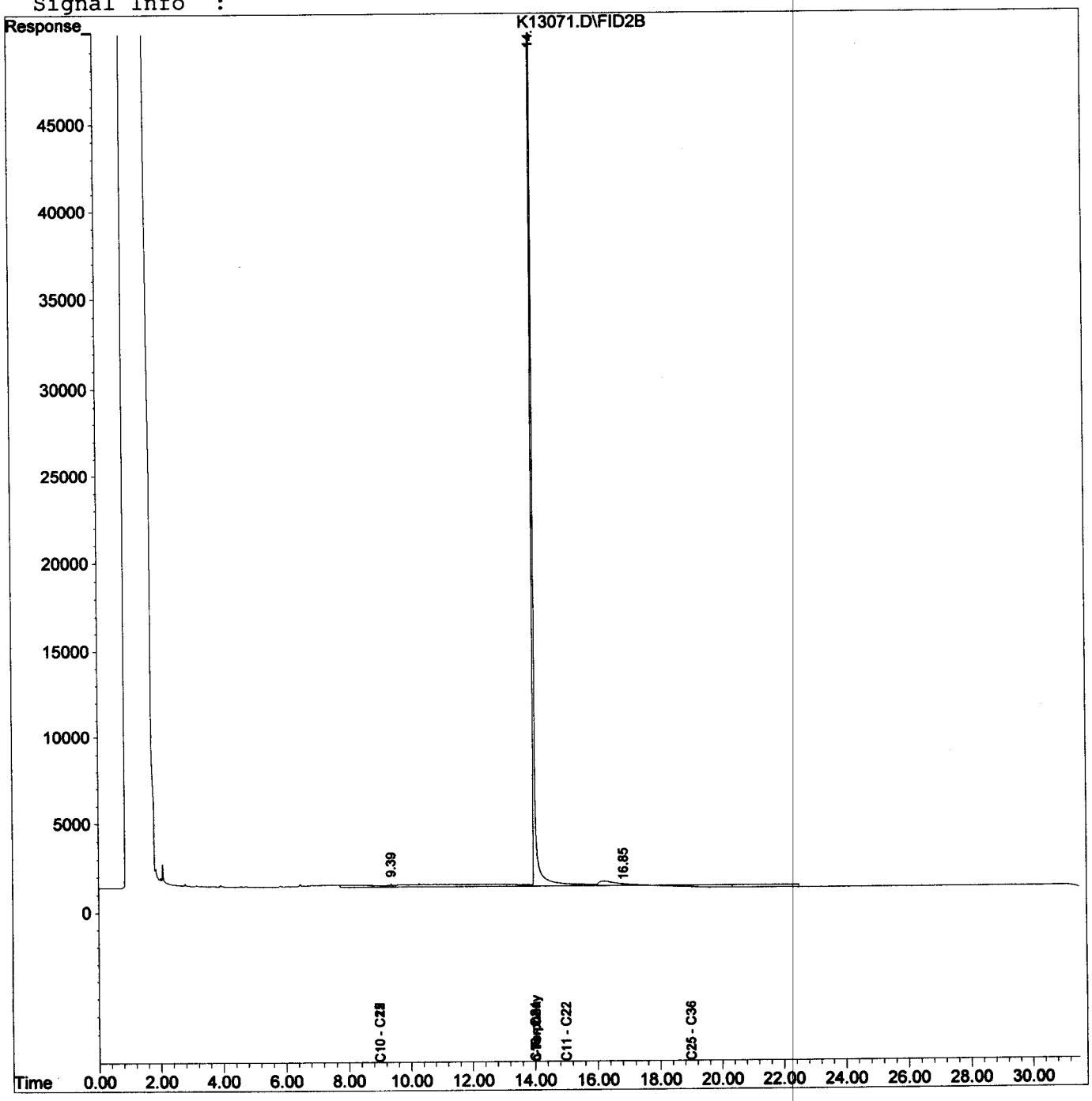
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13071.D
Acq On : 14 Nov 2003 10:18 am
Sample : B3K0154-23
Misc : 1x AR
IntFile : SURR.E
Quant Time: Nov 14 12:26 2003 Quant Results File: K0603R5R.RES

Vial: 41
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



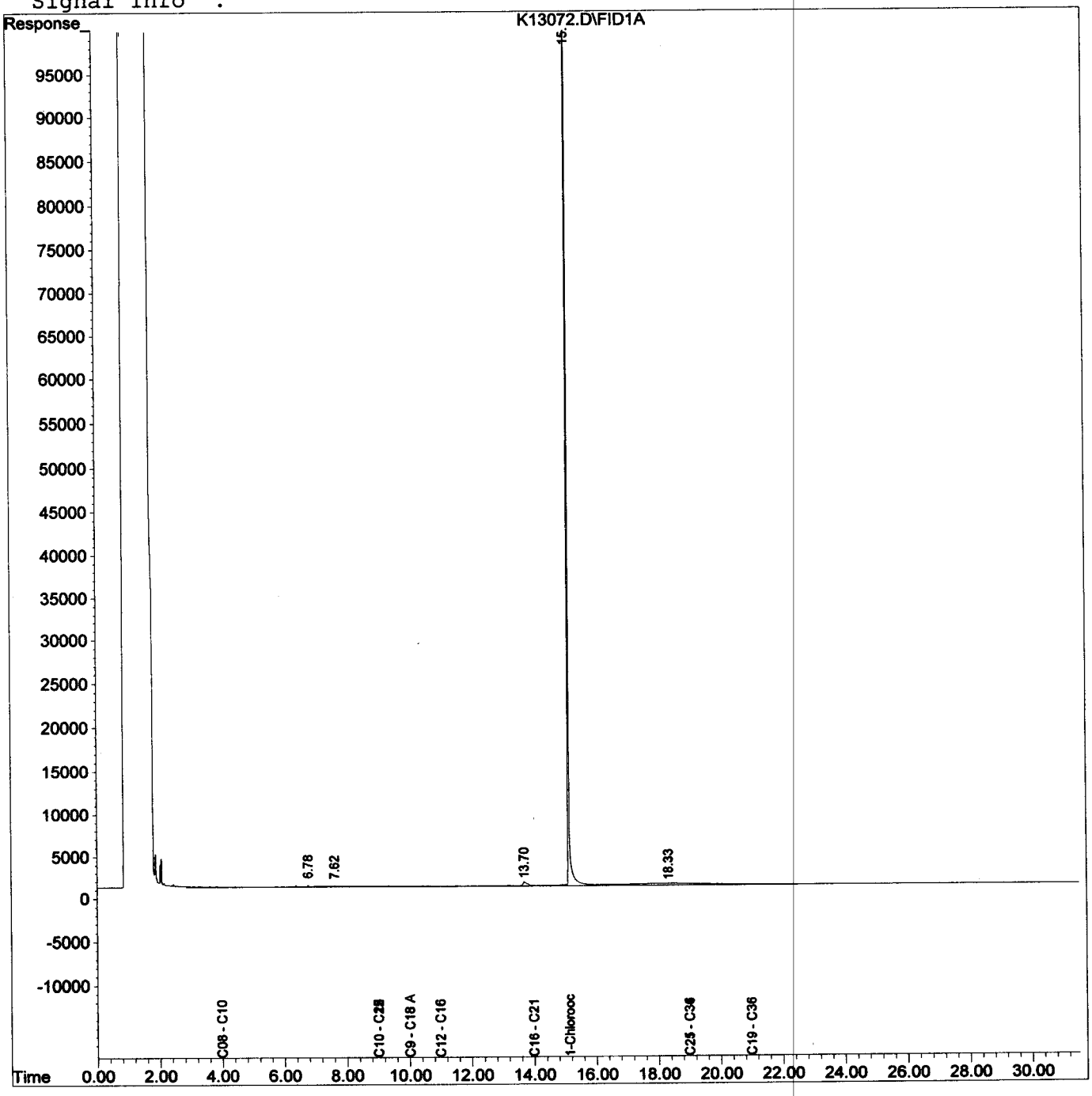
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K13072.D
Acq On : 14 Nov 2003 10:18 am
Sample : B3K0154-25
Misc : 1x AL
IntFile : SURR.E
Quant Time: Nov 14 12:21 2003 Quant Results File: K0603L5F.RES

Vial: 42
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603L5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Wed Nov 12 10:19:19 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



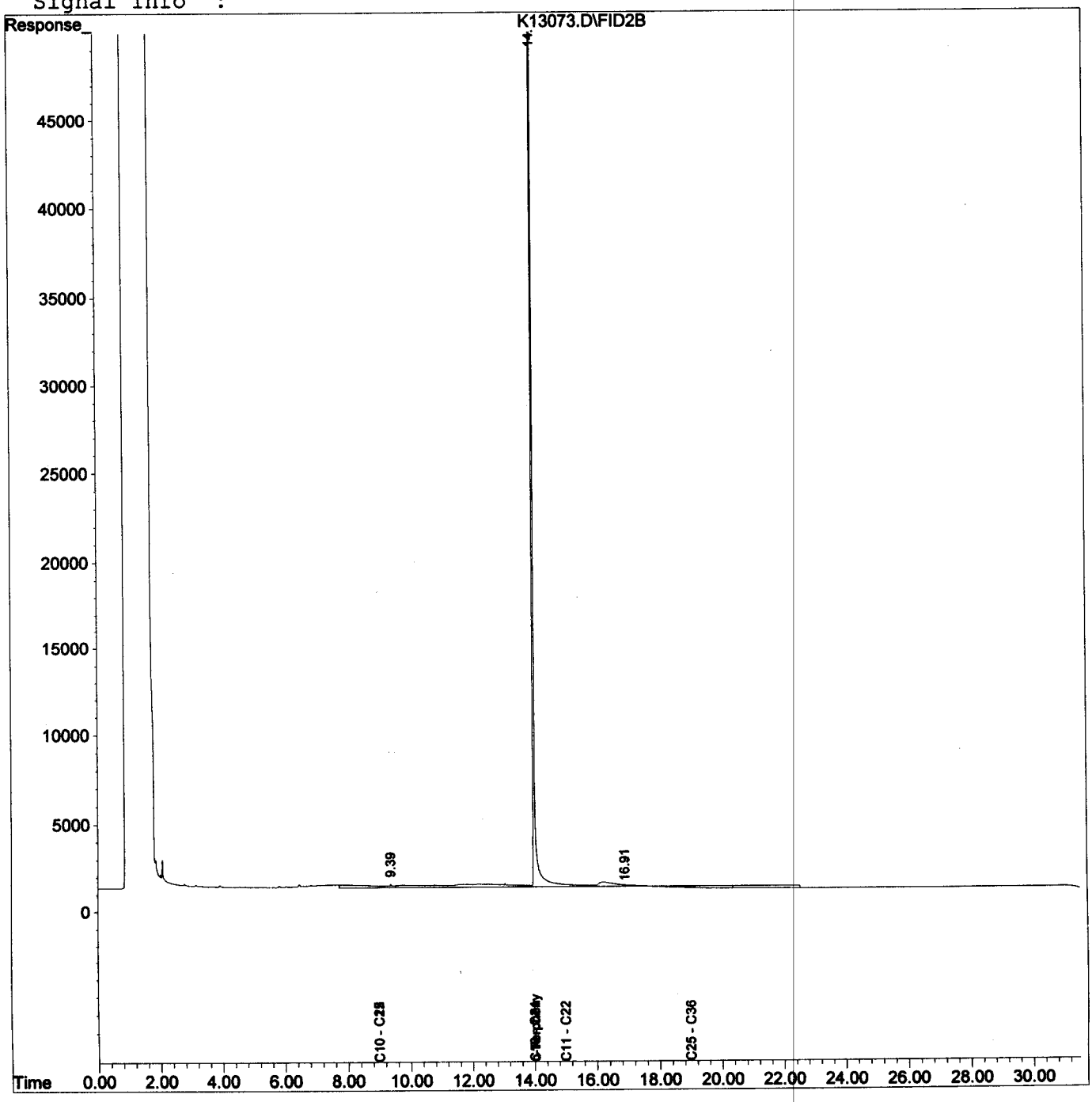
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K13073.D
Acq On : 14 Nov 2003 10:59 am
Sample : B3K0154-25
Misc : 1x AR
IntFile : SURR.E
Quant Time: Nov 14 12:26 2003 Quant Results File: K0603R5R.RES

Vial: 43
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

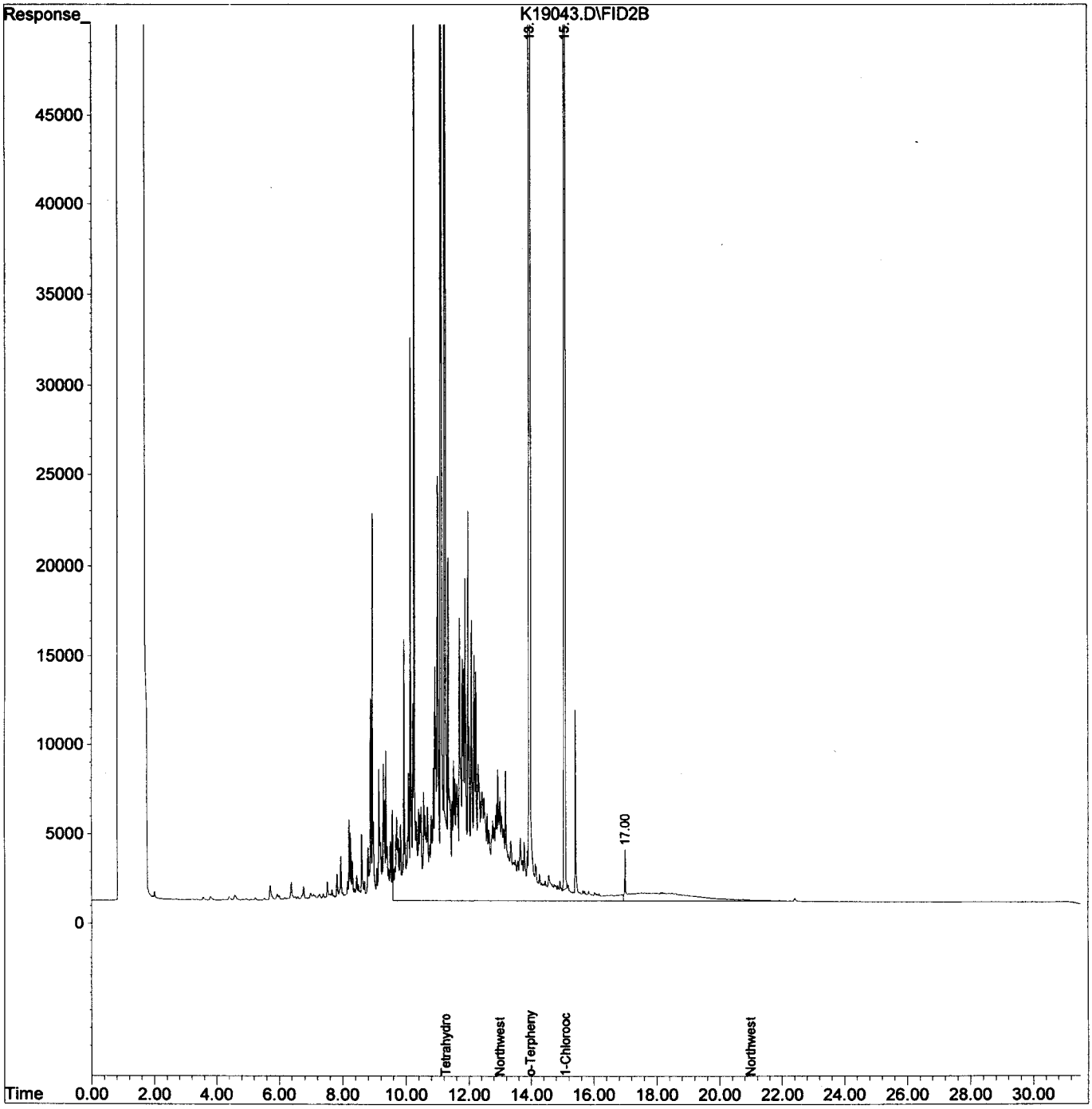


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K19043.D Vial: 35
Acq On : 19 Nov 2003 11:57 pm Operator: GAP
Sample : B3K0154-12 Inst : GC #5
Misc : 1x w nw sg addon Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 20 8:50 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : K0703A5F.M

Volume Inj. :
Signal Phase :
Signal Info :



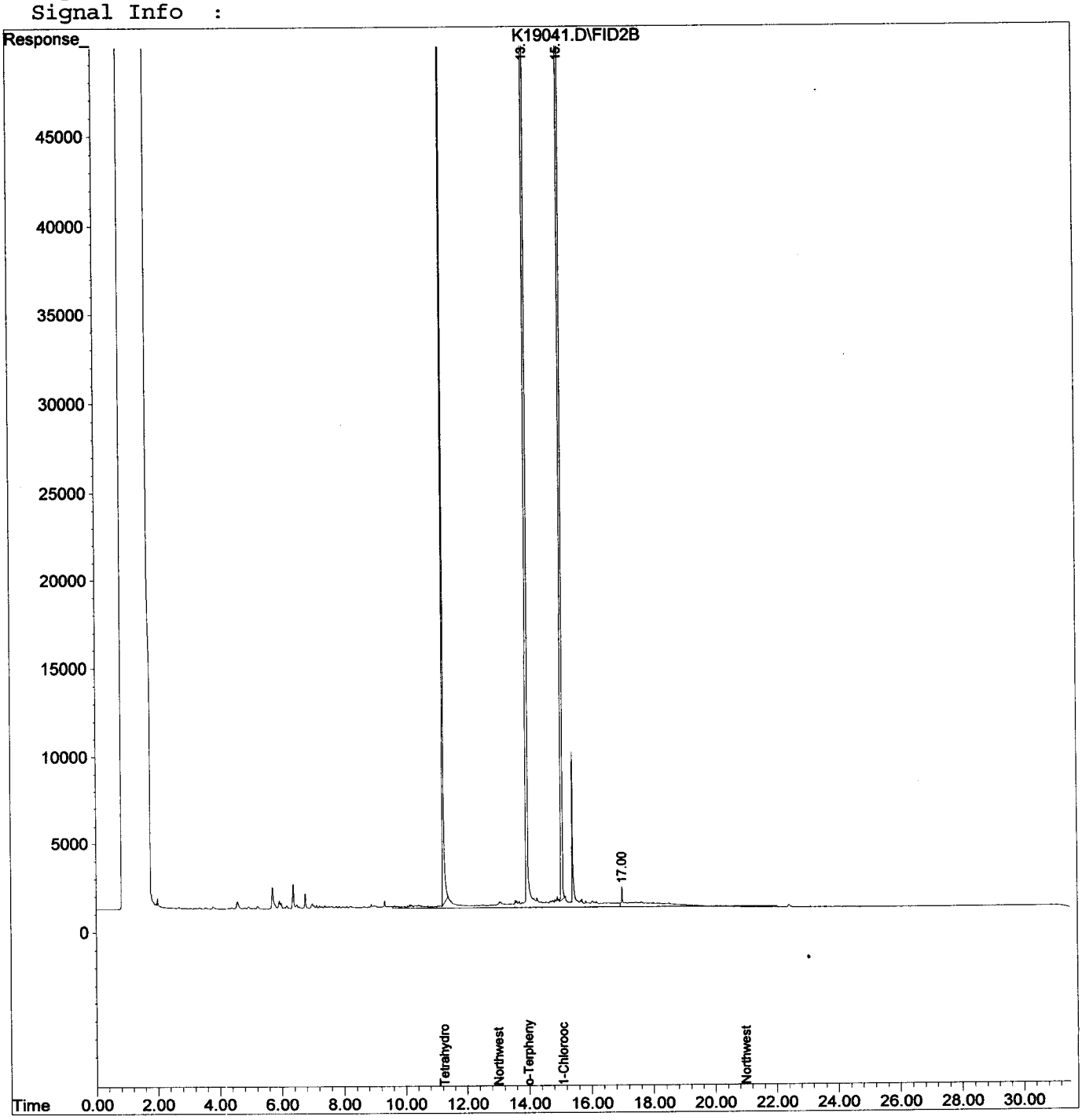
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K19041.D
Acq On : 19 Nov 2003 11:16 pm
Sample : B3K0154-09
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 19 23:48 2003 Quant Results File: K0703A5R.RES

Vial: 34
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : K0703A5F.M

Volume Inj. :
Signal Phase :
Signal Info :



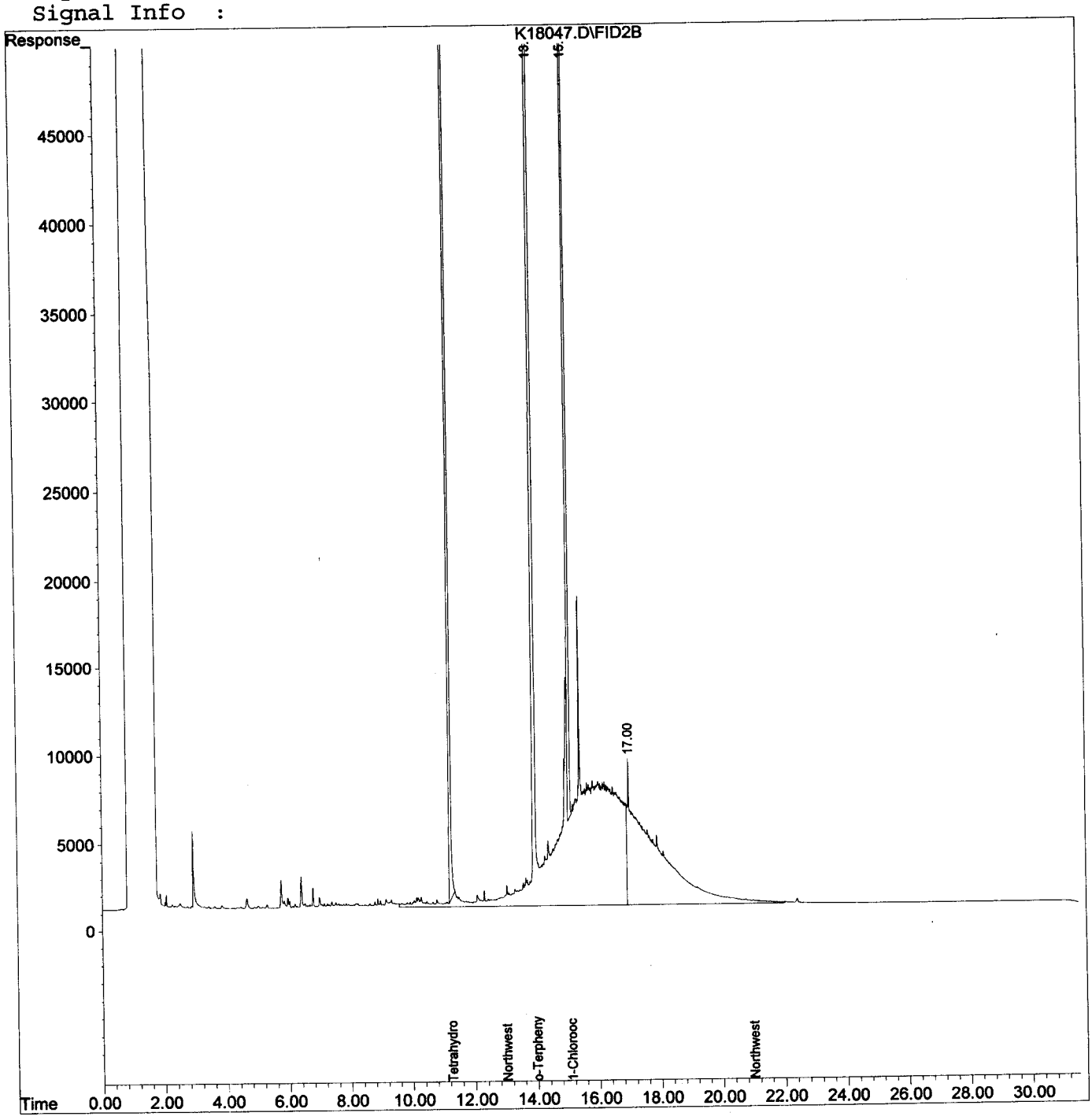
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\111803R\K18047.D
Acq On : 19 Nov 2003 4:57 am
Sample : B3K0154-09
Misc : 1x w nw
IntFile : SURR.E
Quant Time: Nov 19 5:29 2003 Quant Results File: K0703A5R.RES

Vial: 20
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : K0703A5F.M

Volume Inj. :
Signal Phase :
Signal Info :

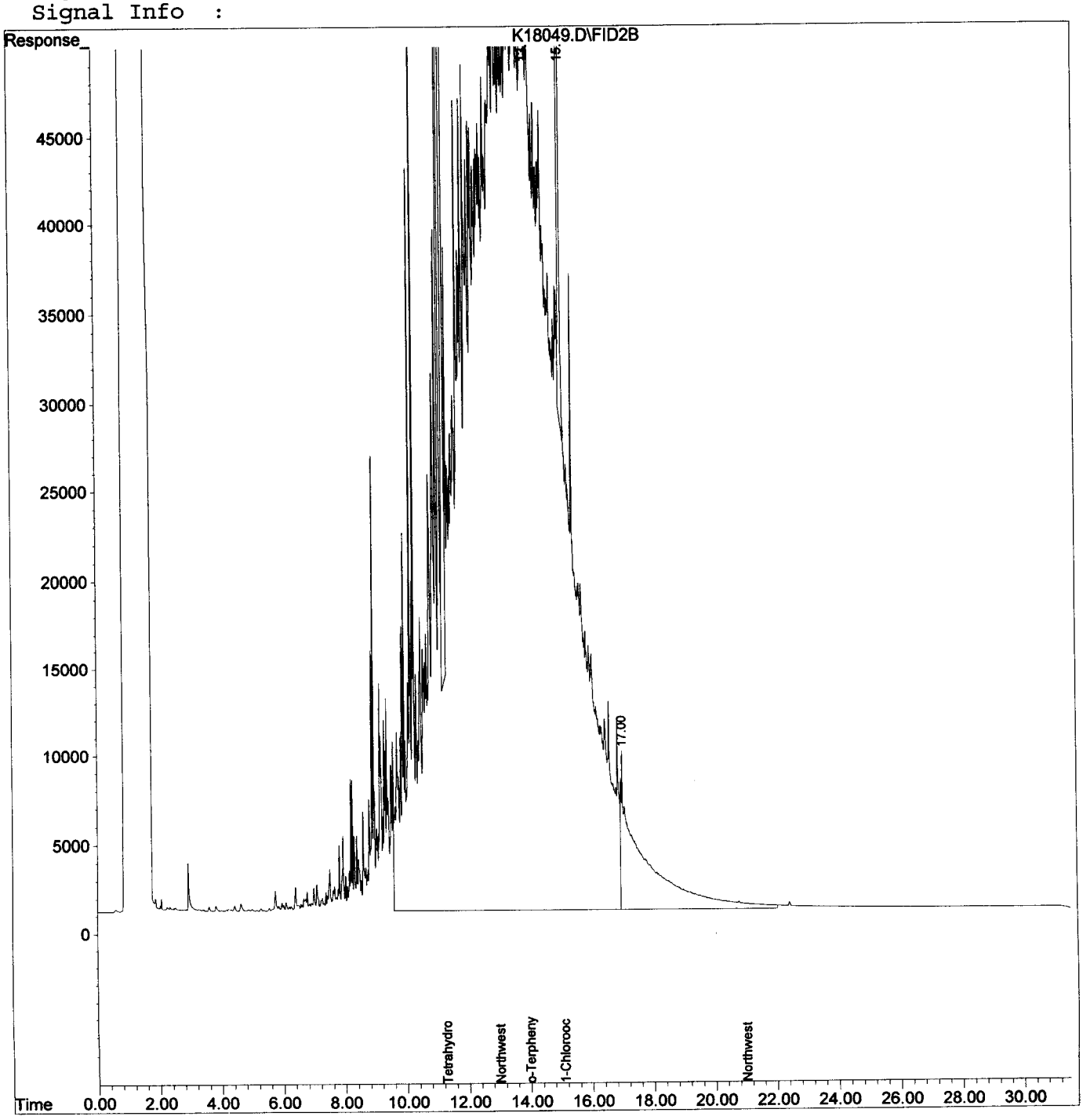


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\111803R\K18049.D Vial: 21
Acq On : 19 Nov 2003 5:39 am Operator: GAP
Sample : B3K0154-12 Inst : GC #5
Misc : 1x w nw Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 19 6:10 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : K0703A5F.M

Volume Inj. :
Signal Phase :
Signal Info :

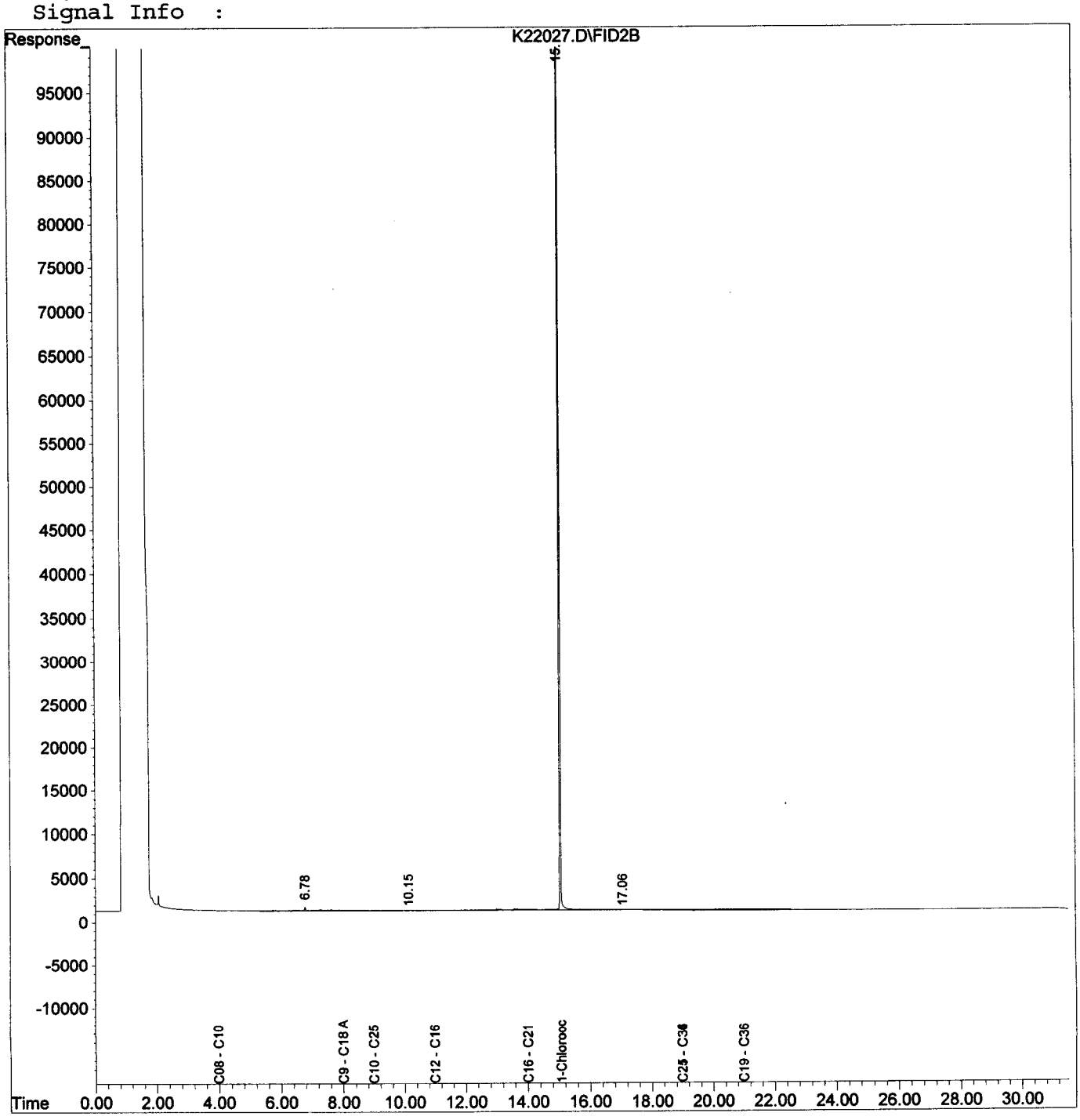


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K22027.D Vial: 67
Acq On : 23 Nov 2003 3:52 am Operator: EJE
Sample : b3k0154-~~09RE1~~ -09 Inst : GC #5
Misc : w Al Multiplr: 1.00
IntFile : SURR.E anl 11-23-03
Quant Time: Nov 23 7:33 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

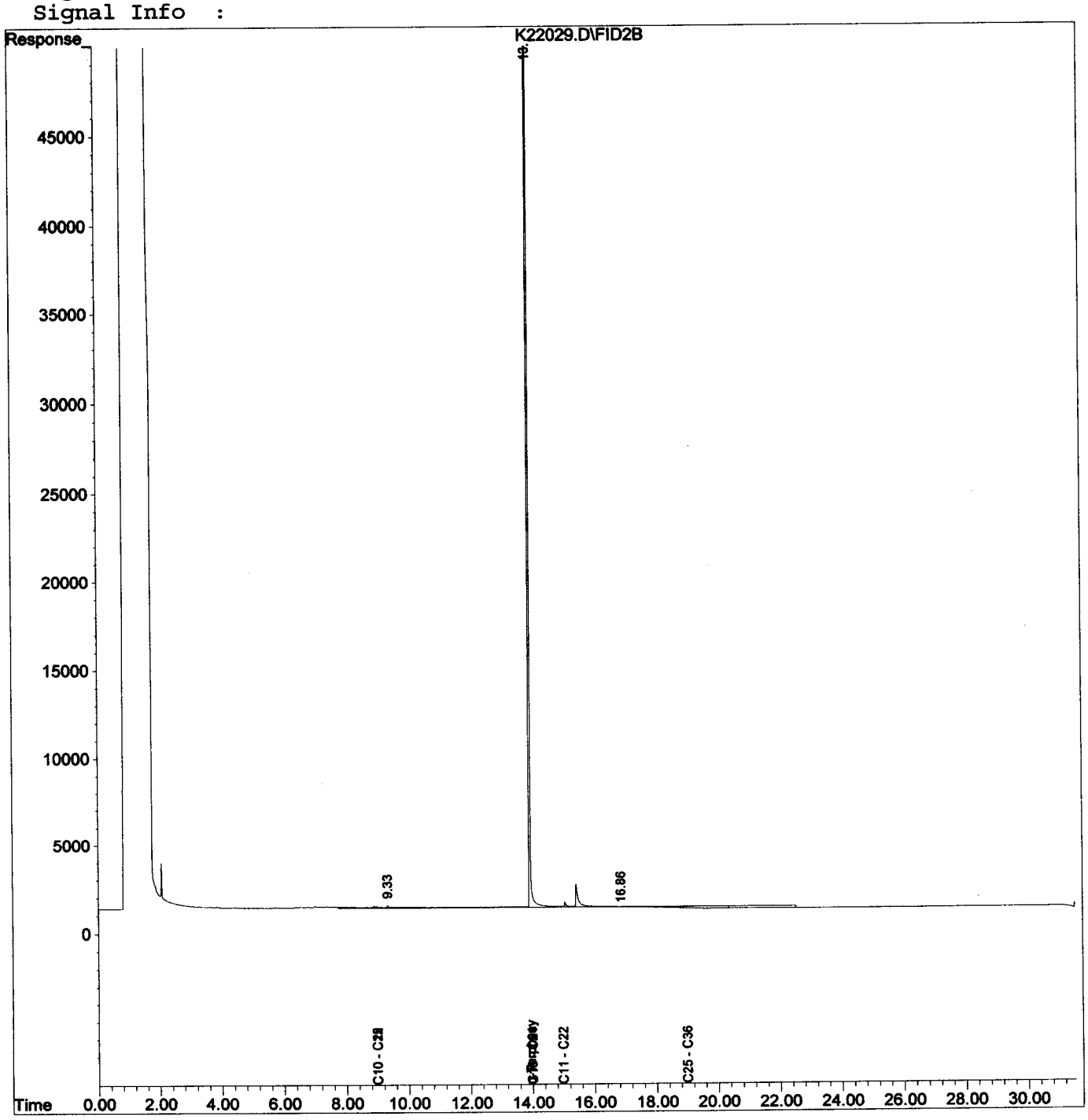
Data File : C:\HPCHEM\3\DATA.SEC\K22029.D
Acq On : 23 Nov 2003 4:34 am
Sample : b3k0154-~~09RE1~~ -09 RE1
Misc : w Ar
IntFile : SURR.E
Quant Time: Nov 23 7:36 2003 Quant Results File: K0603R5R.RES

Vial: 68
Operator: EJE
Inst : GC #5
Multiplr: 1.00

mdf 11-23-03

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report

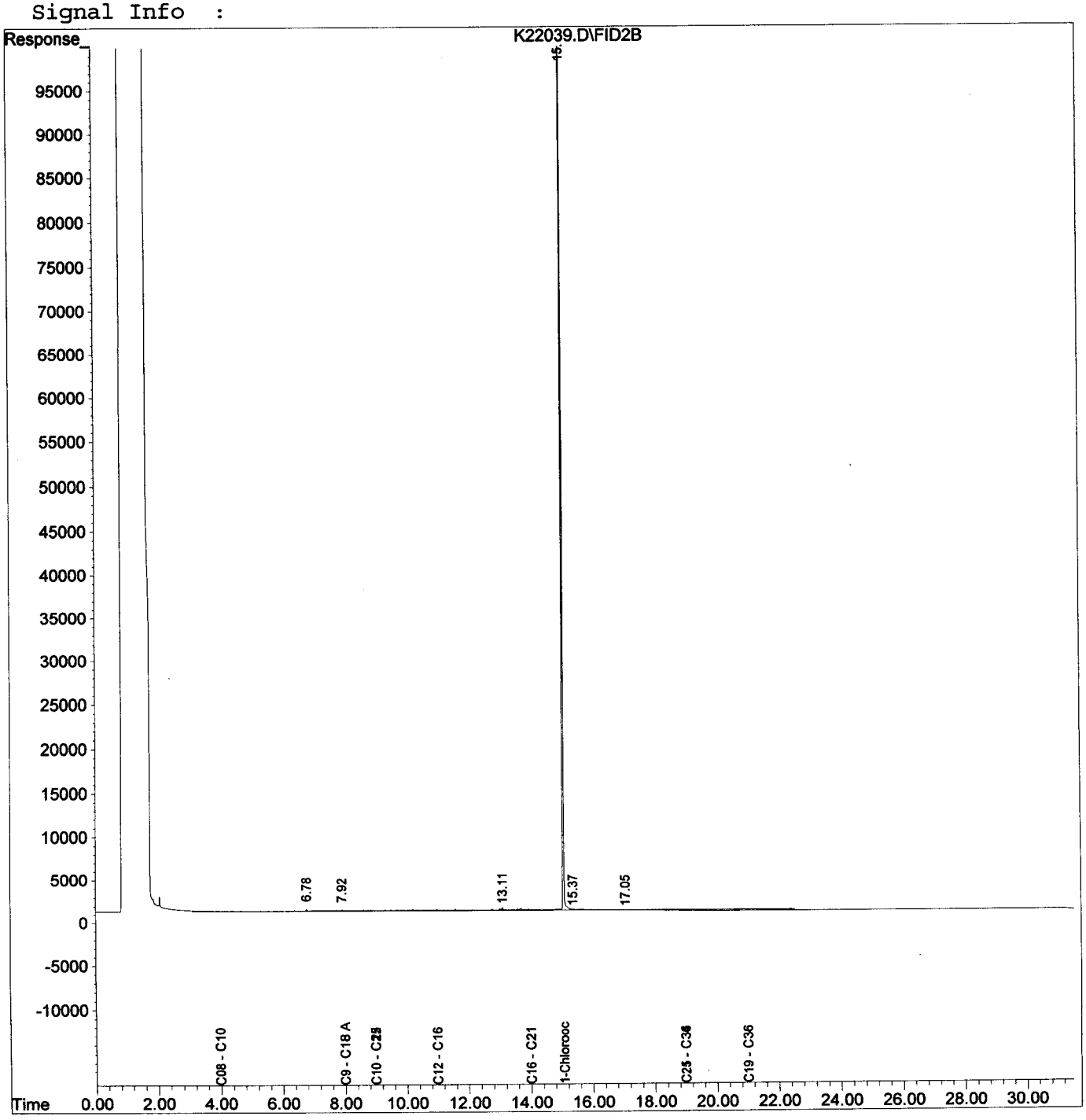
Data File : C:\HPCHEM\3\DATA.SEC\K22039.D
Acq On : 23 Nov 2003 7:58 am
Sample : b3k0154-~~12~~RE1
Misc : w Al -12
IntFile : SURR.E
Quant Time: Nov 23 11:13 2003 Quant Results File: K0603L5R.RES

Vial: 69
Operator: EJE
Inst : GC #5
Multiplr: 1.00

cmb 11-23-03

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



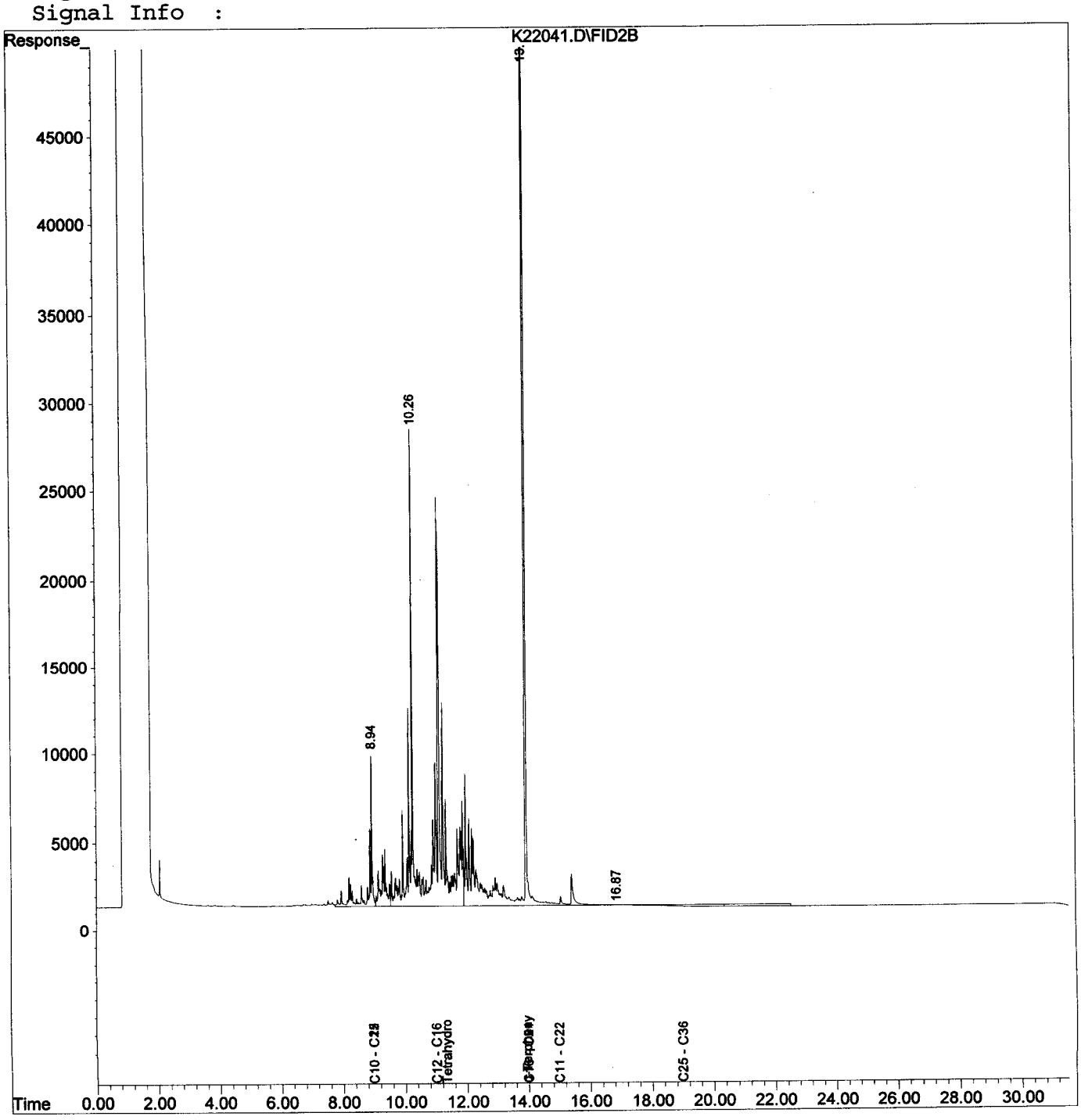
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K22041.D
Acq On : 23 Nov 2003 8:39 am
Sample : b3k0154-12~~RE1~~ 11/23/03 AM
Misc : w Ar
IntFile : SURR.E
Quant Time: Nov 23 14:48 2003 Quant Results File: K0603R5R.RES

Vial: 70
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 18:34:11 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

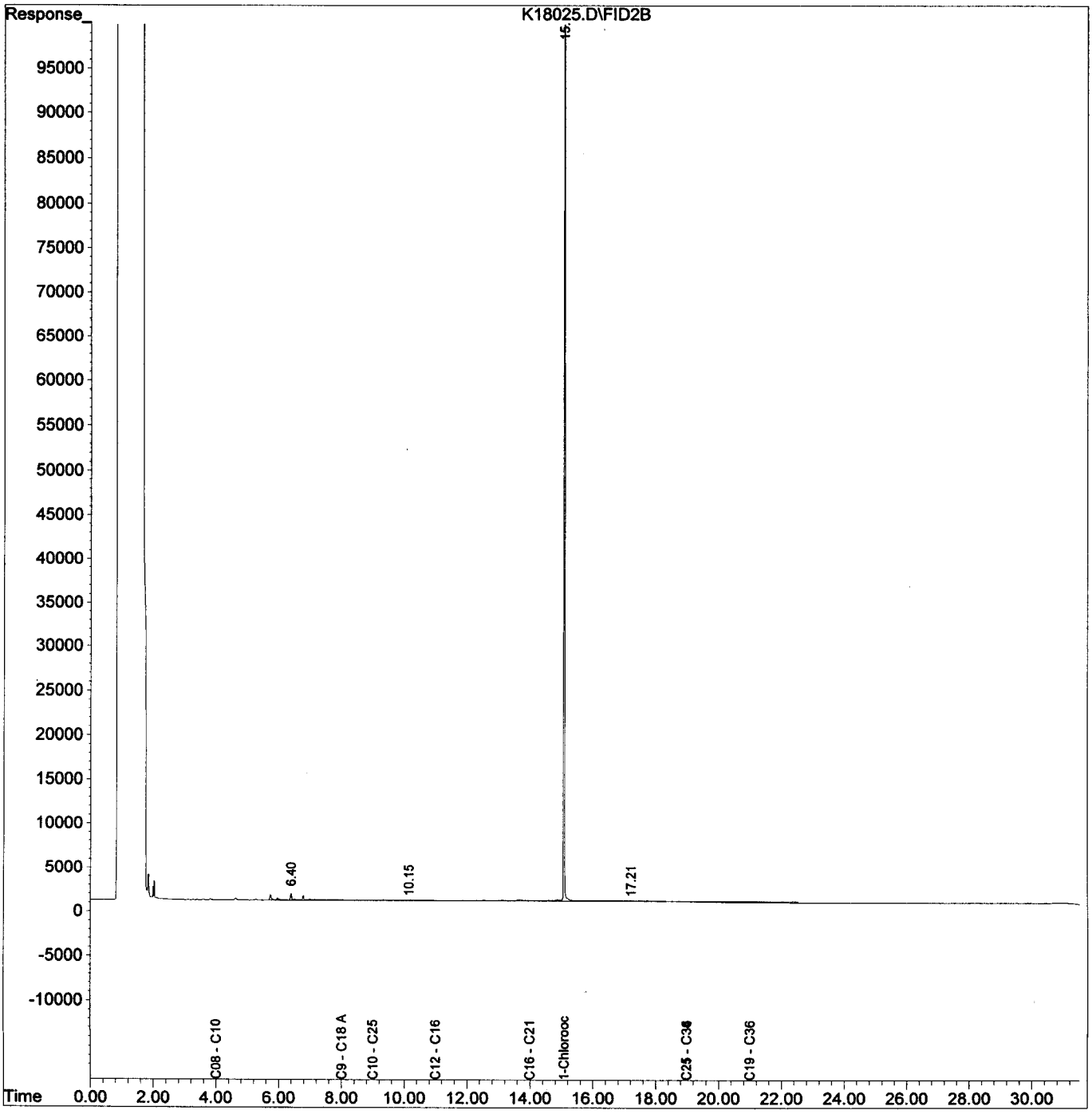


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\111803R\K18025.D Vial: 13
Acq On : 18 Nov 2003 9:24 pm Operator: GAP
Sample : B3K0154-09 Inst : GC #5
Misc : 1x AL Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 19 8:26 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



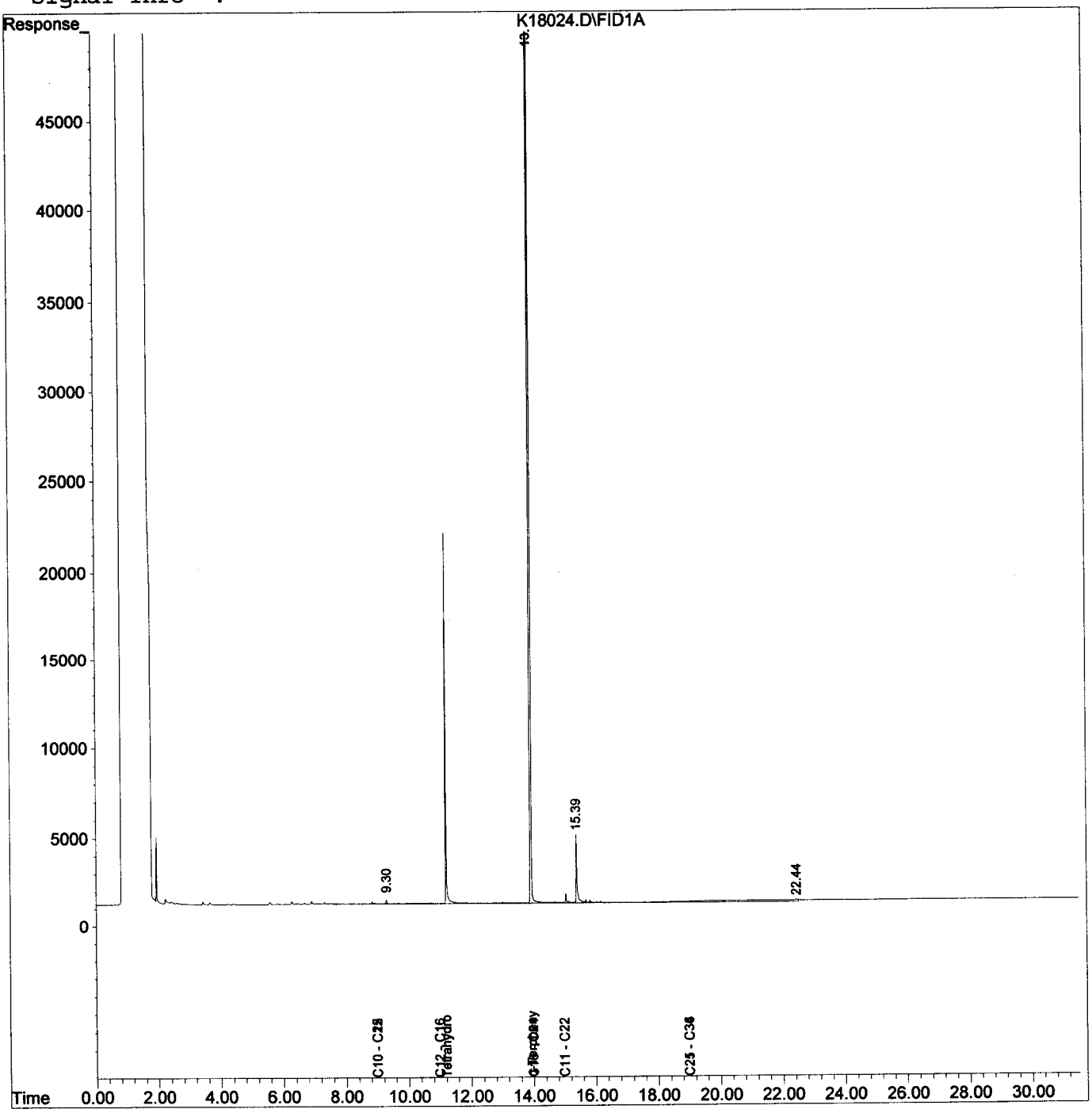
Quantitation Report

Data File : C:\HPCHEM\3\DATA\111803F\K18024.D
Acq On : 18 Nov 2003 8:43 pm
Sample : B3K0154-09
Misc : 1x AR
IntFile : SURR.E
Quant Time: Nov 19 8:16 2003 Quant Results File: K0603R5F.RES

Vial: 12
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

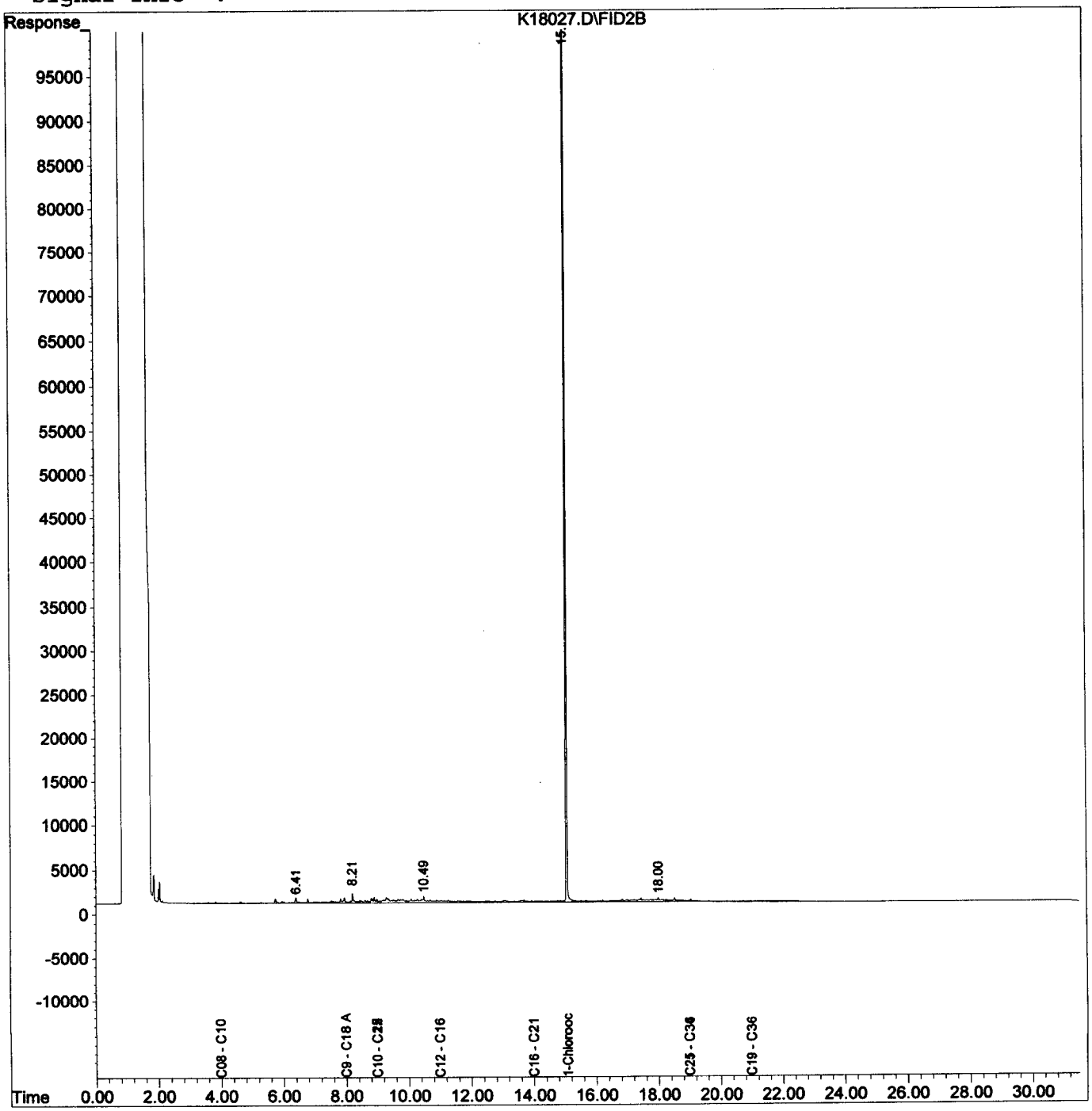


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\111803R\K18027.D Vial: 15
Acq On : 18 Nov 2003 10:06 pm Operator: GAP
Sample : B3K0154-12 Inst : GC #5
Misc : 1x AL Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 19 8:26 2003 Quant Results File: K0603L5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0603L5R.M (Chemstation Integrator)
Title : EPH Rear Method
Last Update : Fri Nov 07 14:17:41 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



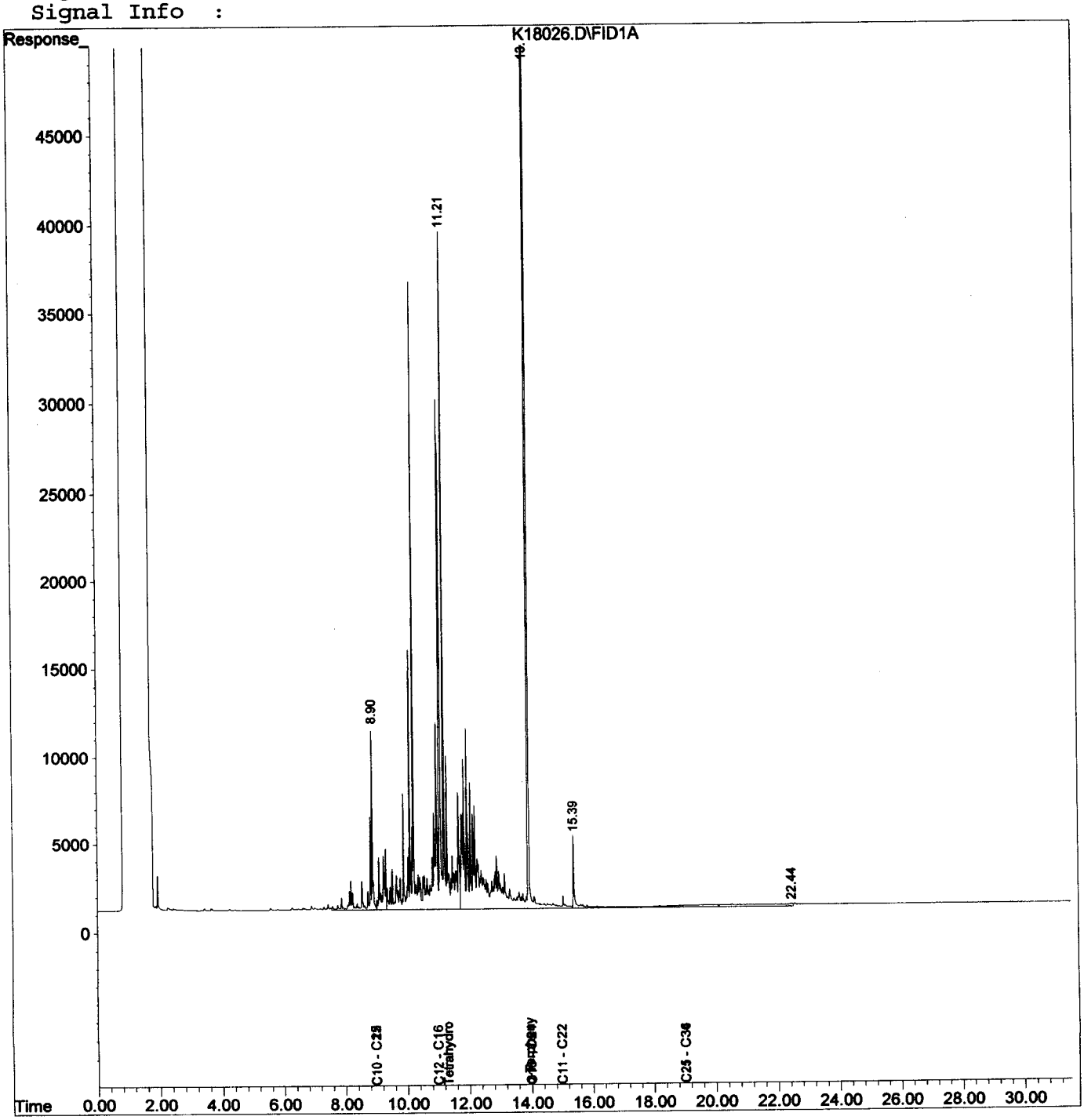
Quantitation Report

Data File : C:\HPCHEM\3\DATA\111803F\K18026.D
Acq On : 18 Nov 2003 9:24 pm
Sample : B3K0154-12
Misc : 1x AR
IntFile : SURR.E
Quant Time: Nov 19 8:17 2003 Quant Results File: K0603R5F.RES

Vial: 14
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0603R5F.M (Chemstation Integrator)
Title : EPH Front Method
Last Update : Fri Nov 07 18:45:32 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



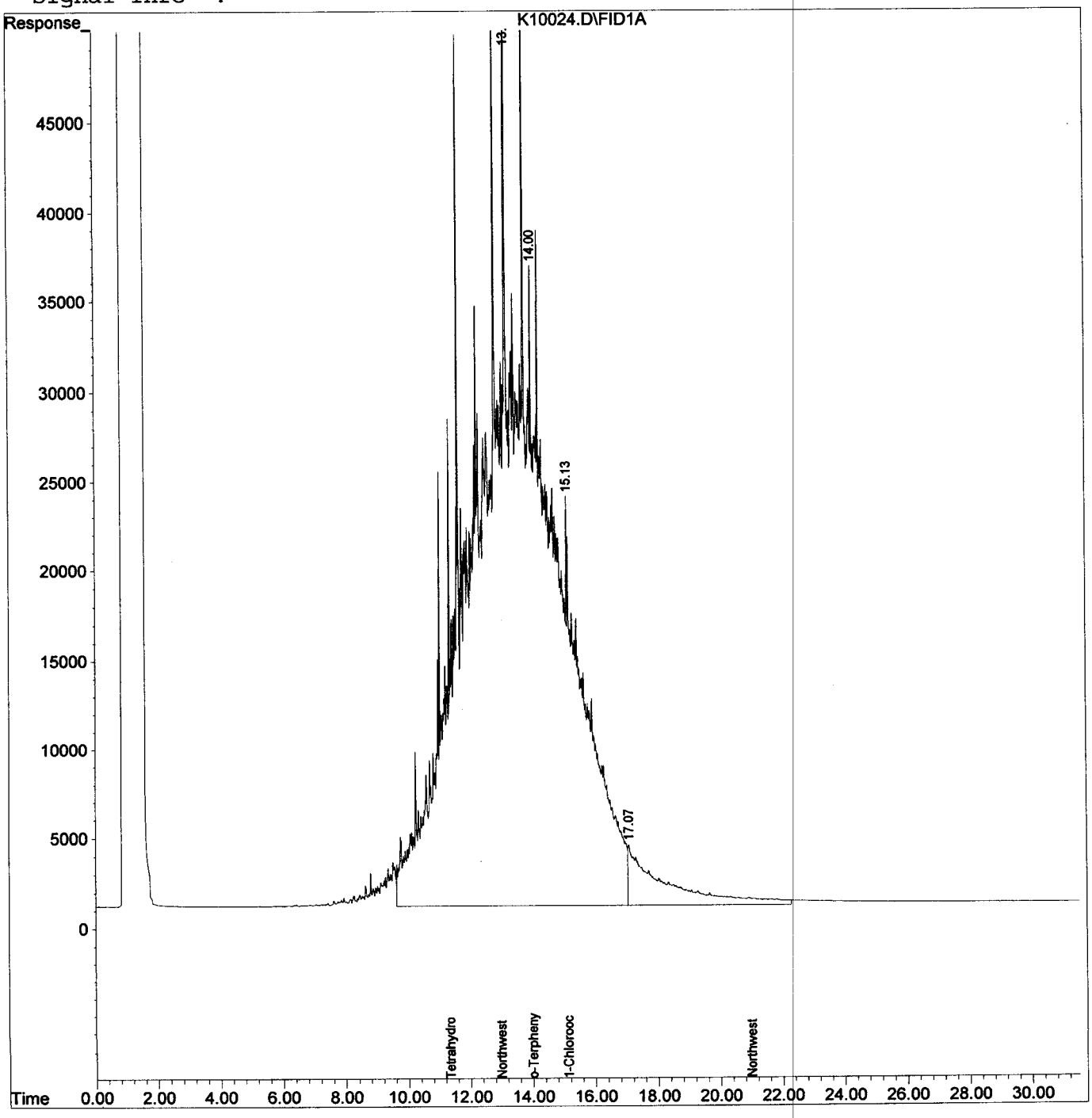
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10024.D
Acq On : 10 Nov 2003 8:02 pm
Sample : B3K0154-06
Misc : 40x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 7:28 2003 Quant Results File: K0703A5F.RES

Vial: 5
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



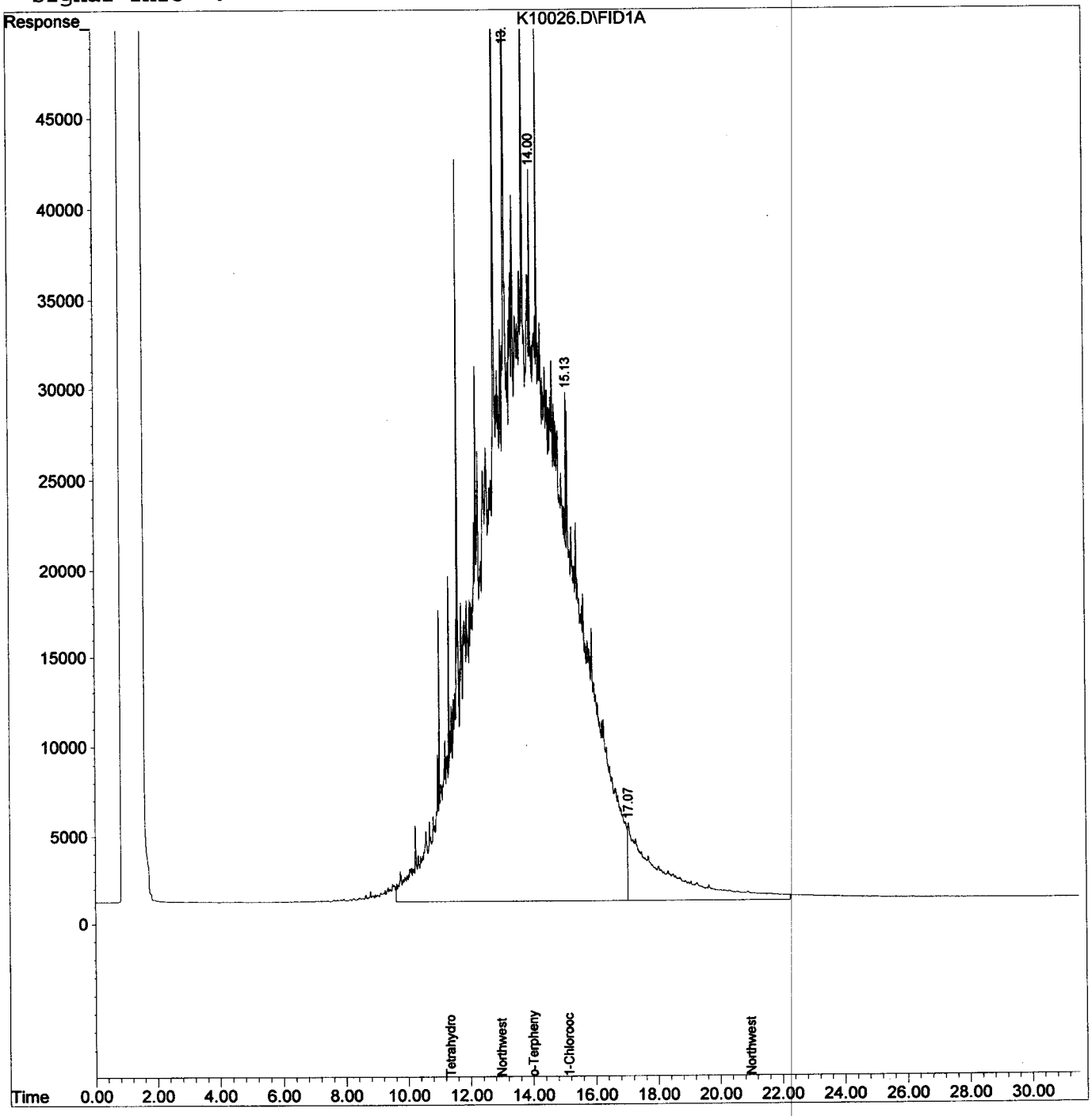
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10026.D
Acq On : 10 Nov 2003 8:44 pm
Sample : B3K0154-07
Misc : 40x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 7:29 2003 Quant Results File: K0703A5F.RES

Vial: 7
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



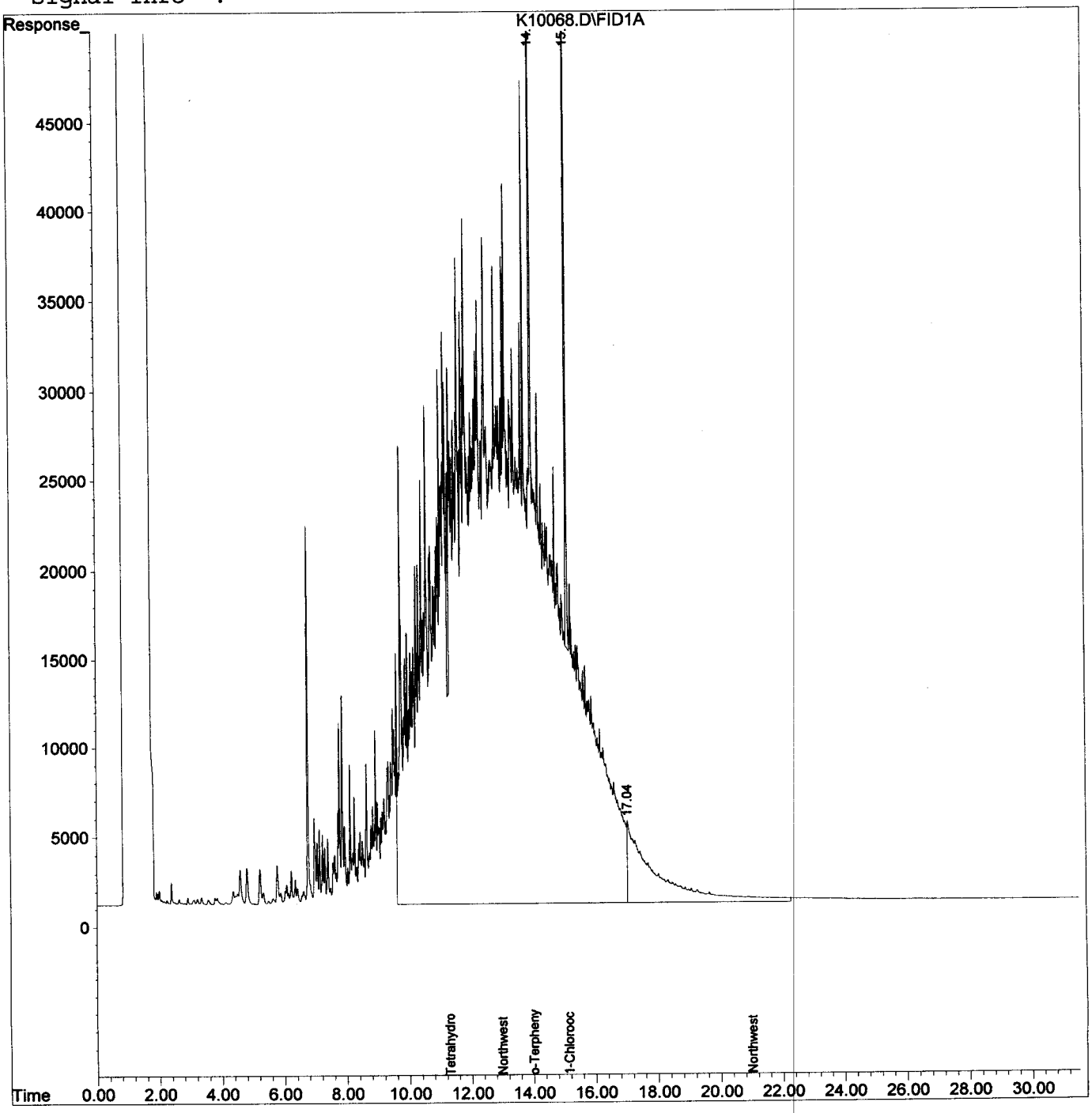
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10068.D
Acq On : 11 Nov 2003 11:23 am
Sample : B3K0154-08
Misc : 2x s nw sg addon r1 Diesel Only
IntFile : SURR.E
Quant Time: Nov 11 12:25 2003 Quant Results File: K0703A5F.RES

Vial: 39
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



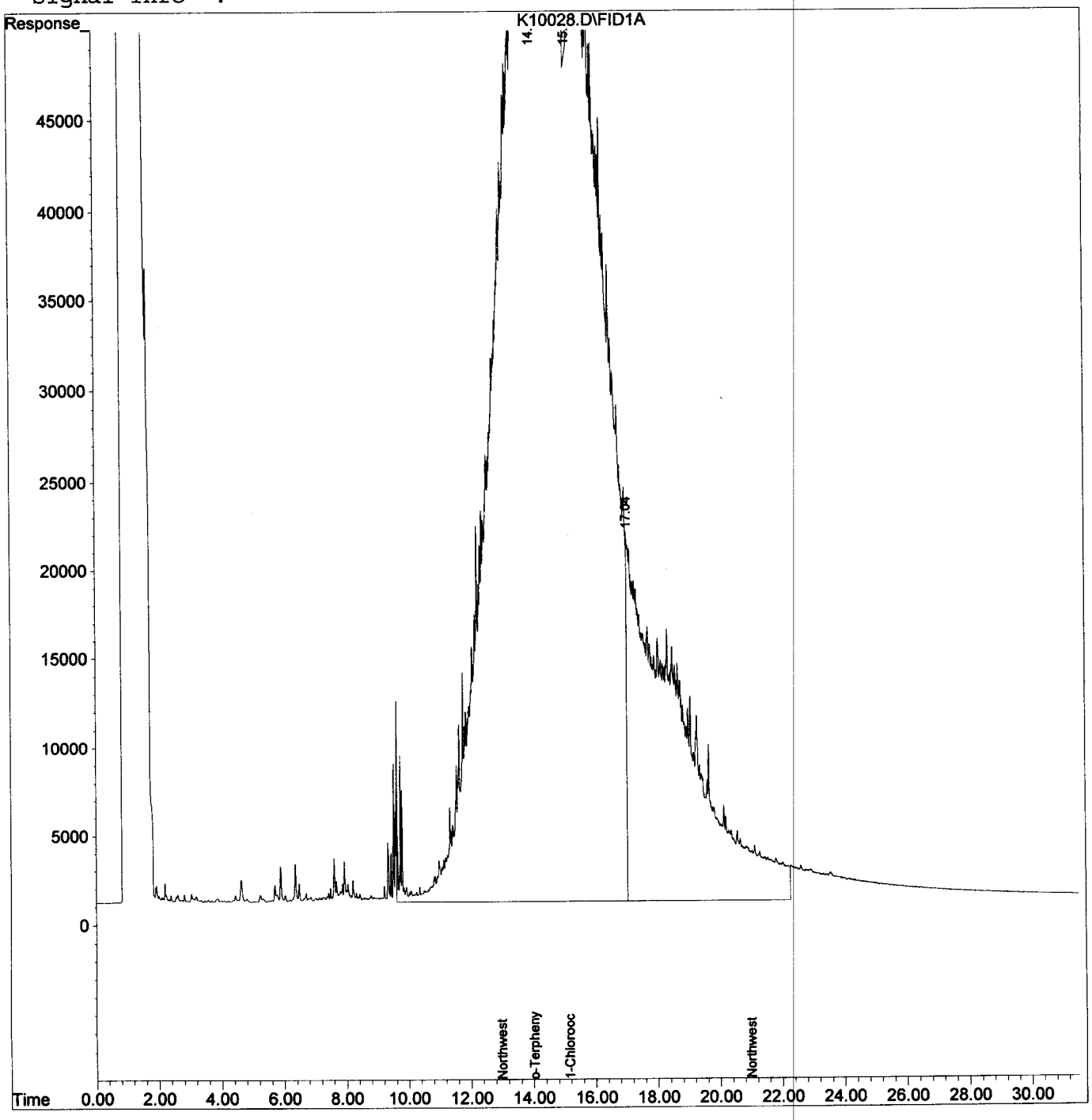
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10028.D
Acq On : 10 Nov 2003 9:26 pm
Sample : B3K0154-08
Misc : 1x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 7:25 2003 Quant Results File: K0703A5F.RES

Vial: 9
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



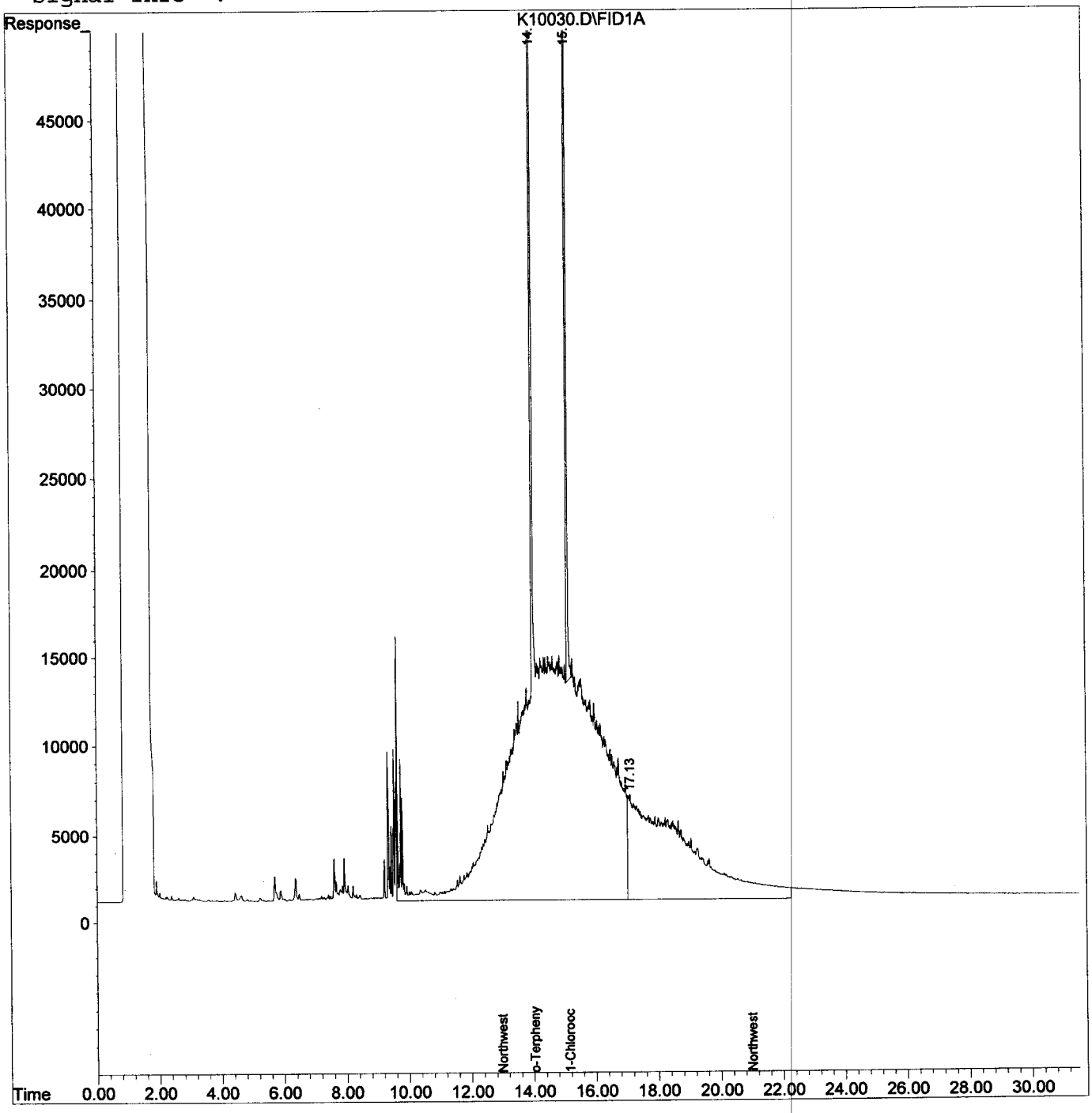
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10030.D
Acq On : 10 Nov 2003 10:08 pm
Sample : B3K0154-10
Misc : 1x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 7:26 2003 Quant Results File: K0703A5F.RES

Vial: 11
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



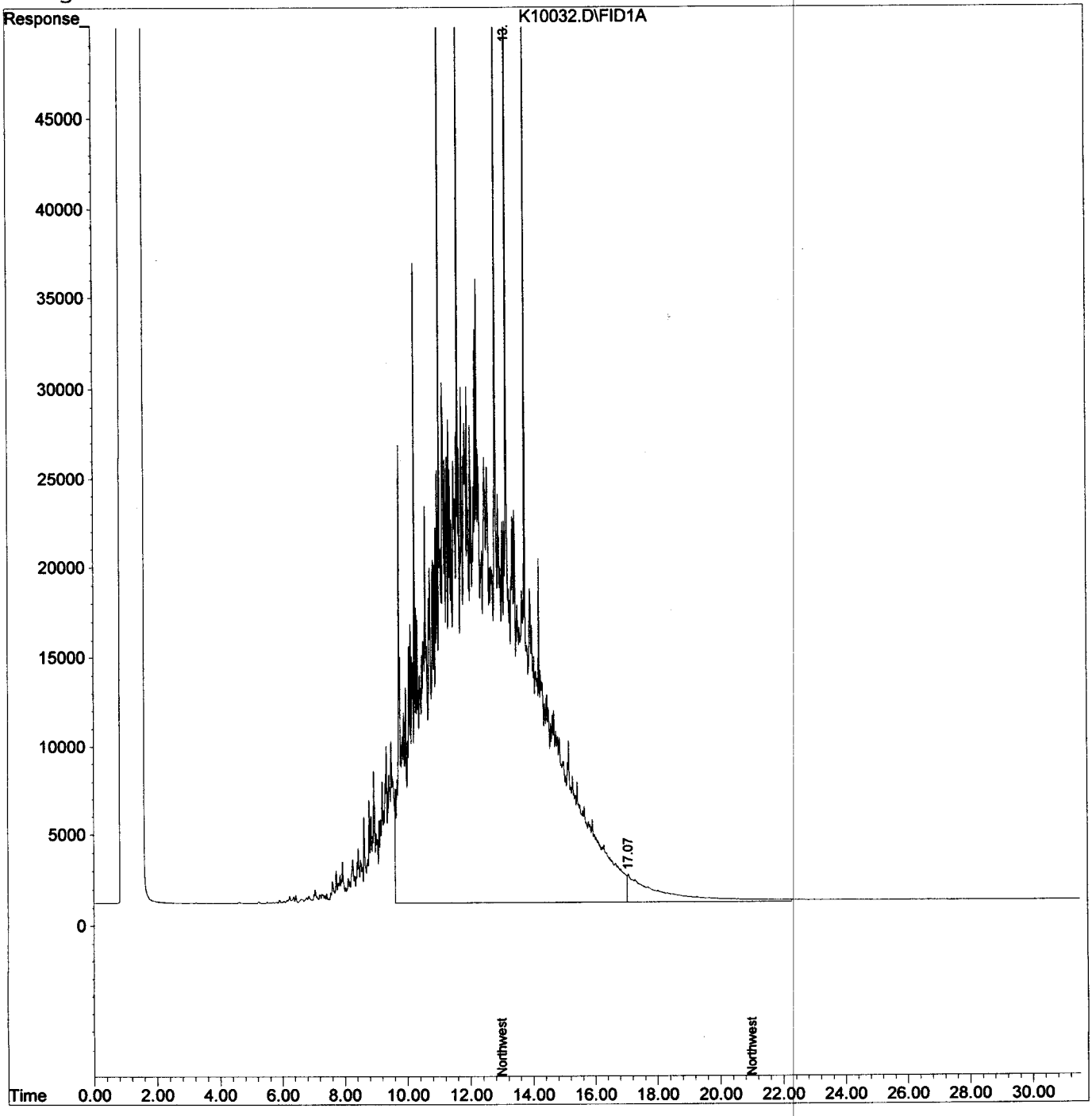
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10032.D
Acq On : 10 Nov 2003 10:49 pm
Sample : B3K0154-11
Misc : 200x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 7:31 2003 Quant Results File: K0703A5F.RES

Vial: 13
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

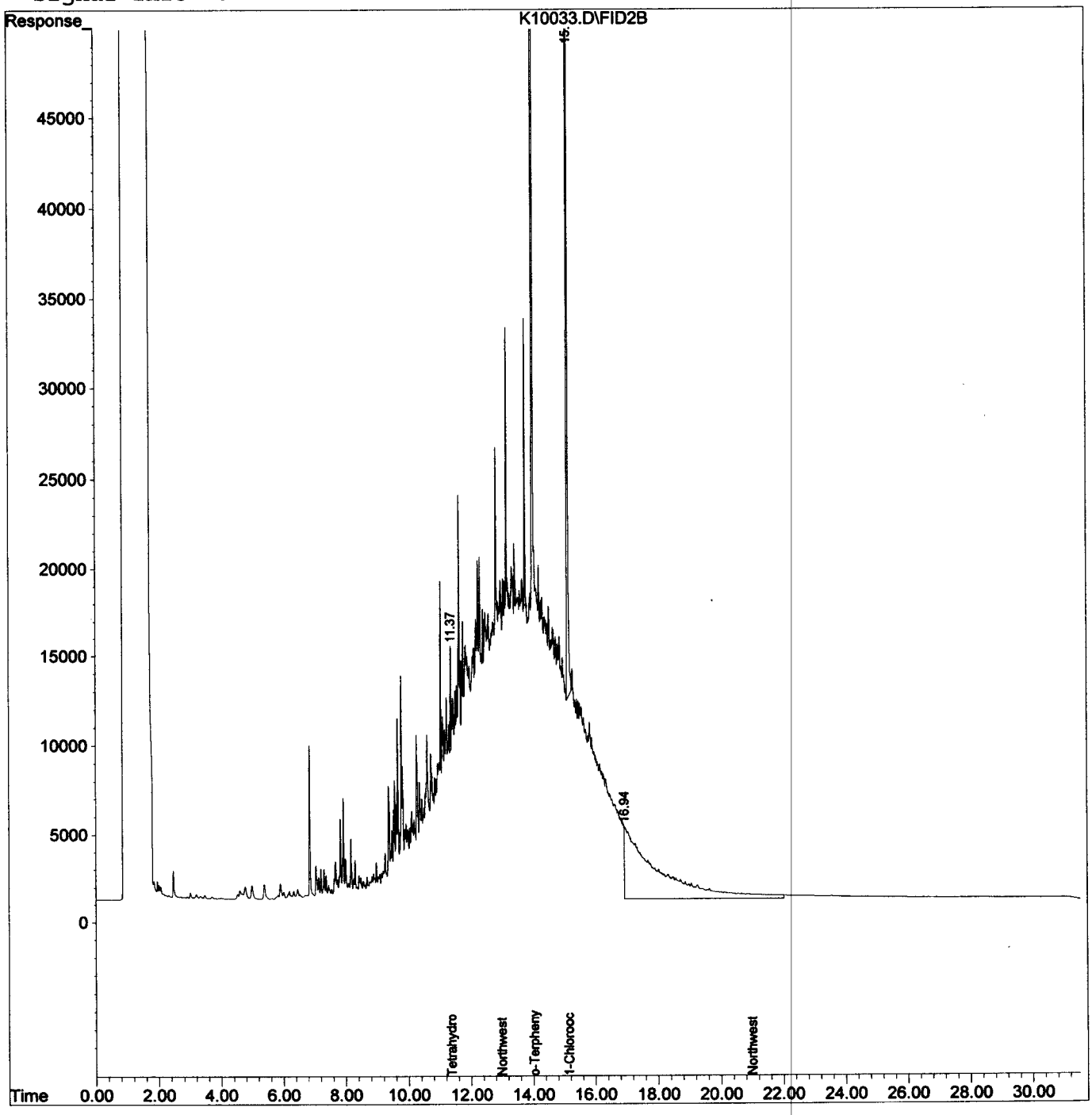


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10033.D Vial: 14
Acq On : 10 Nov 2003 11:31 pm Operator: GAP
Sample : B3K0154-13 Inst : GC #5
Misc : 1x s nw sg addon Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 11 6:44 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



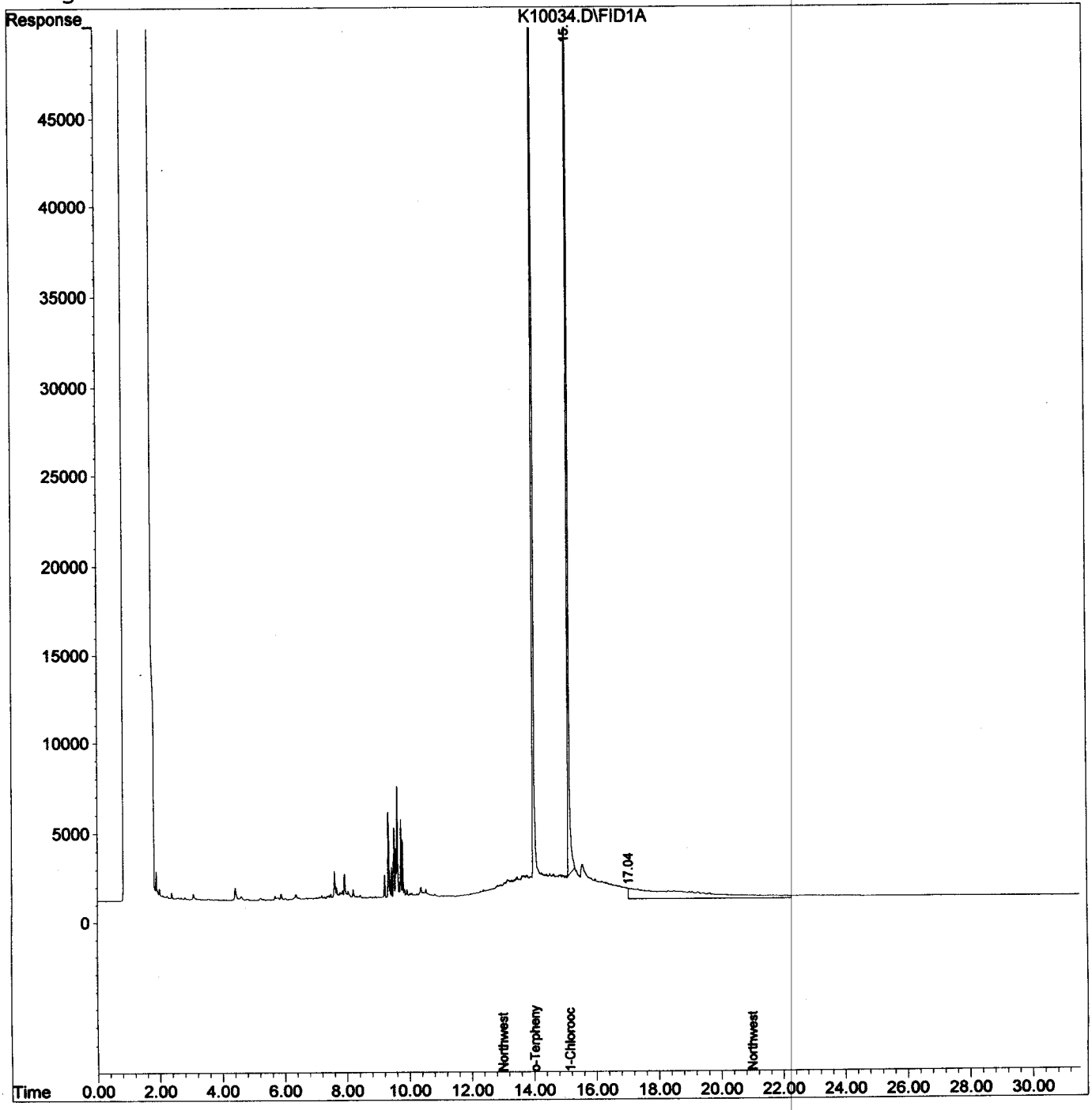
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10034.D
Acq On : 10 Nov 2003 11:31 pm
Sample : B3K0154-14
Misc : 1x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 7:26 2003 Quant Results File: K0703A5F.RES

Vial: 15
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



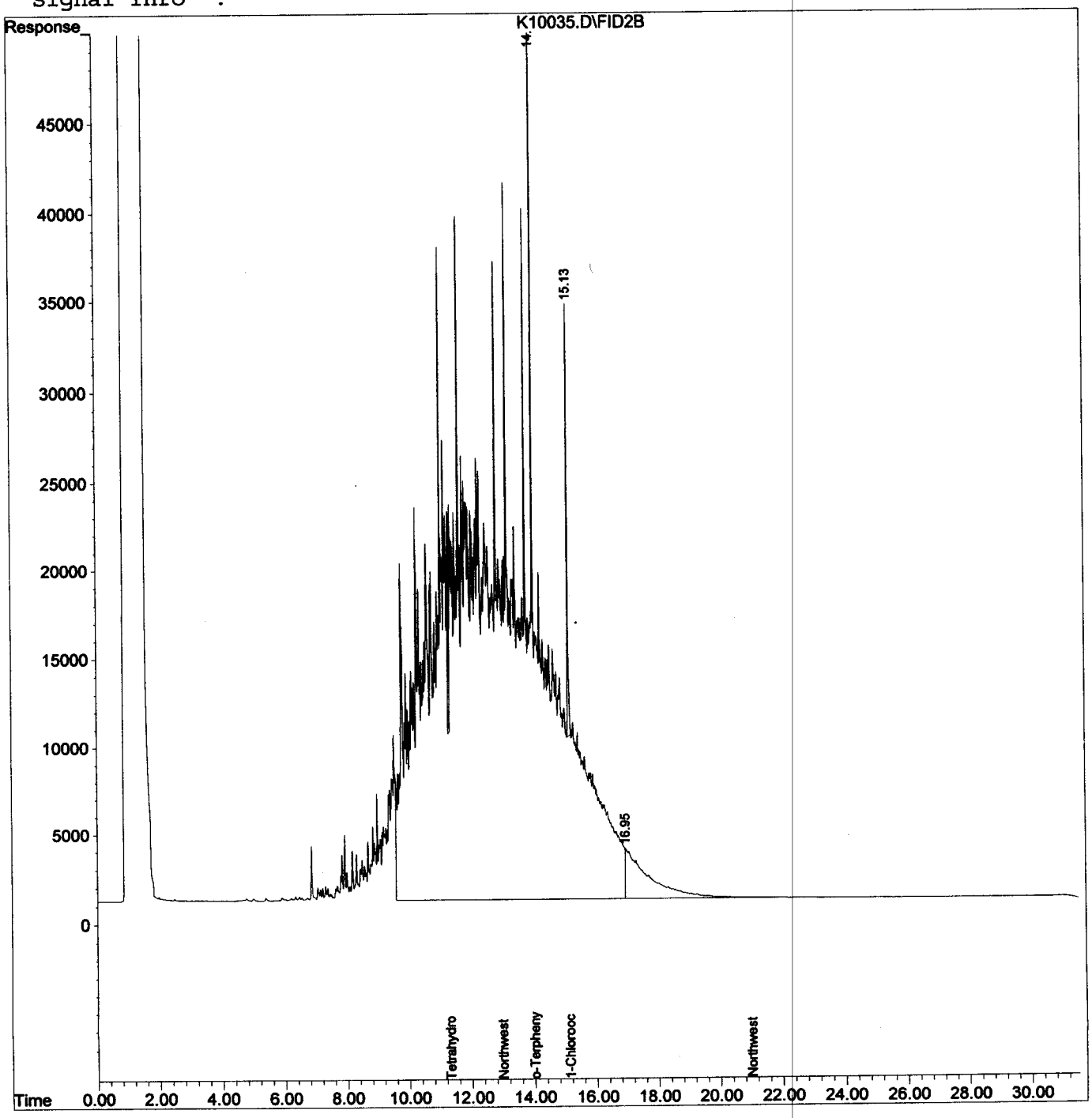
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10035.D
Acq On : 11 Nov 2003 12:13 am
Sample : B3K0154-15
Misc : 10x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 6:44 2003 Quant Results File: K0703A5R.RES

Vial: 16
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



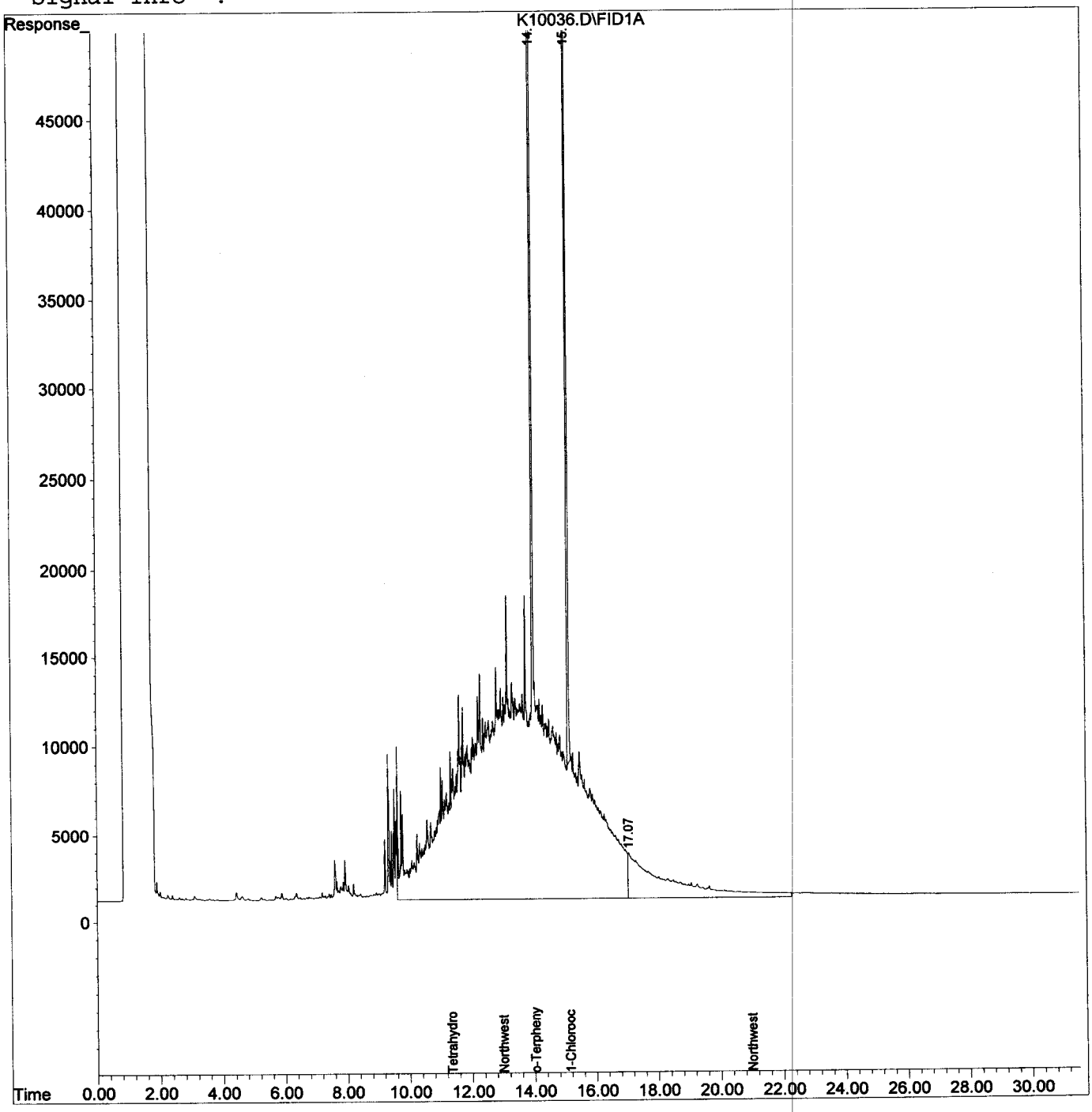
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10036.D
Acq On : 11 Nov 2003 12:13 am
Sample : B3K0154-16
Misc : 1x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 7:26 2003 Quant Results File: K0703A5F.RES

Vial: 17
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



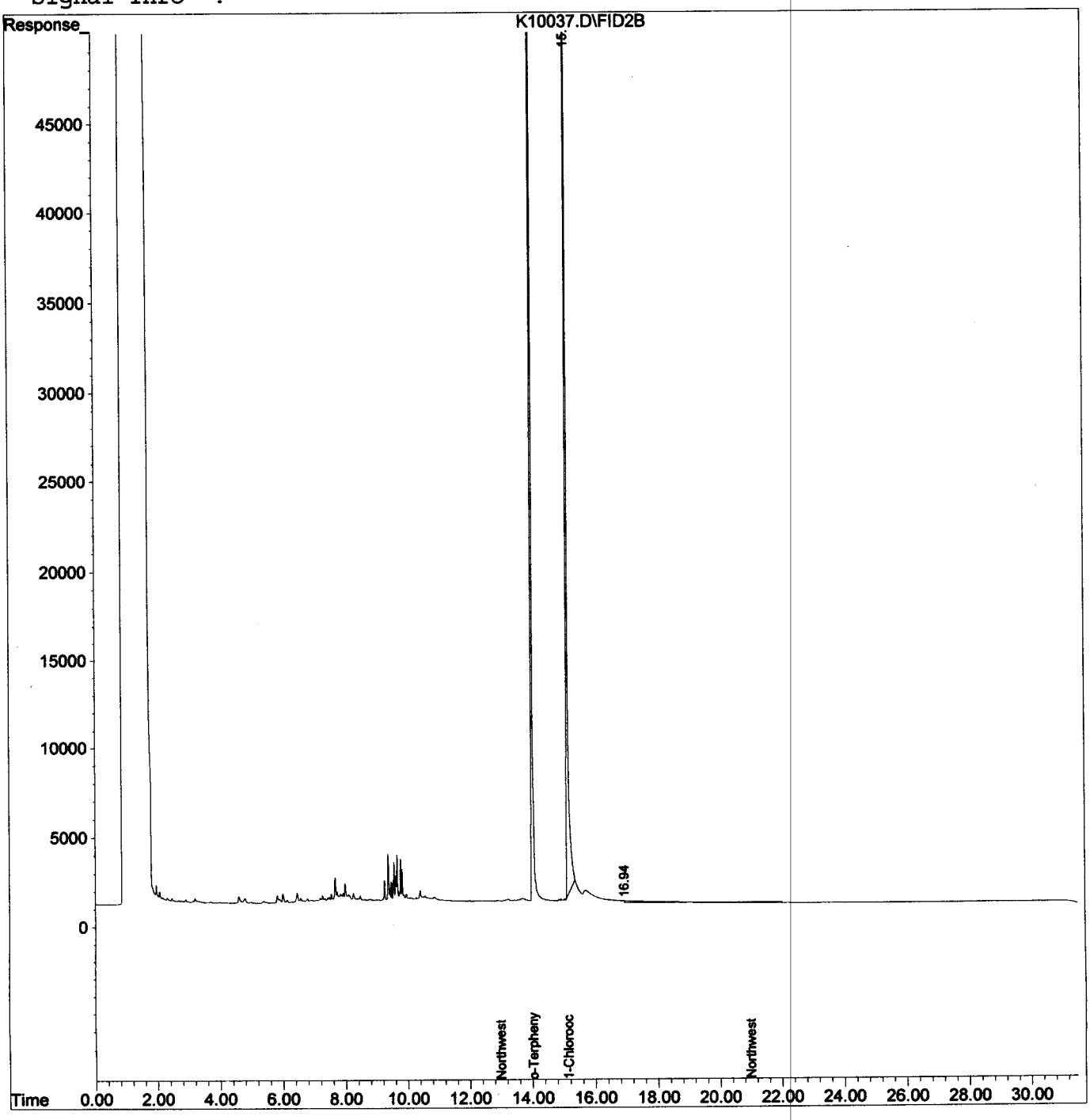
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10037.D
Acq On : 11 Nov 2003 12:55 am
Sample : B3K0154-17
Misc : 1x s nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 6:44 2003 Quant Results File: K0703A5R.RES

Vial: 18
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

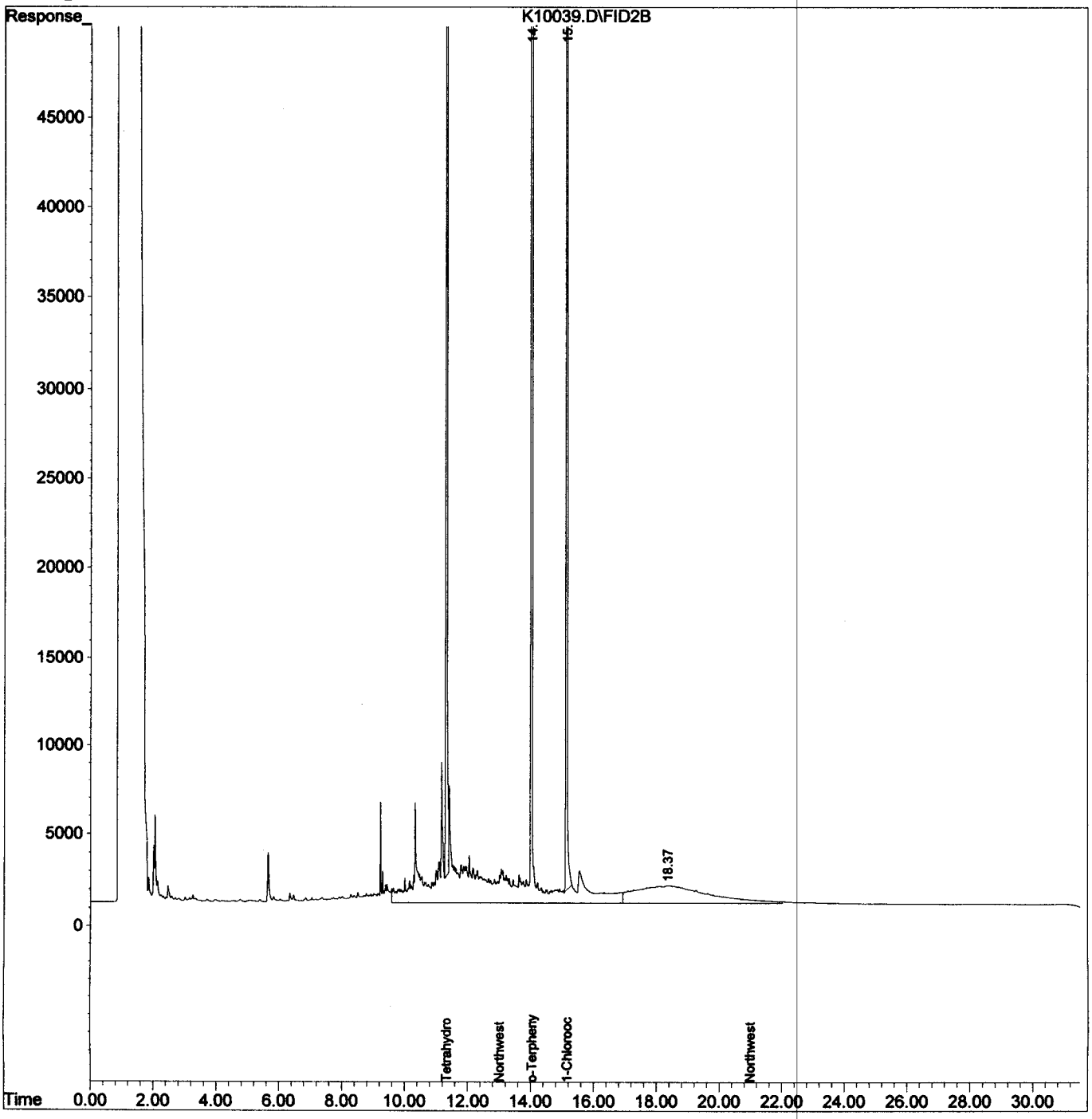


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10039.D Vial: 20
Acq On : 11 Nov 2003 1:36 am Operator: GAP
Sample : B3K0154-01 Inst : GC #5
Misc : 1x w nw sg addon Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 11 6:44 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

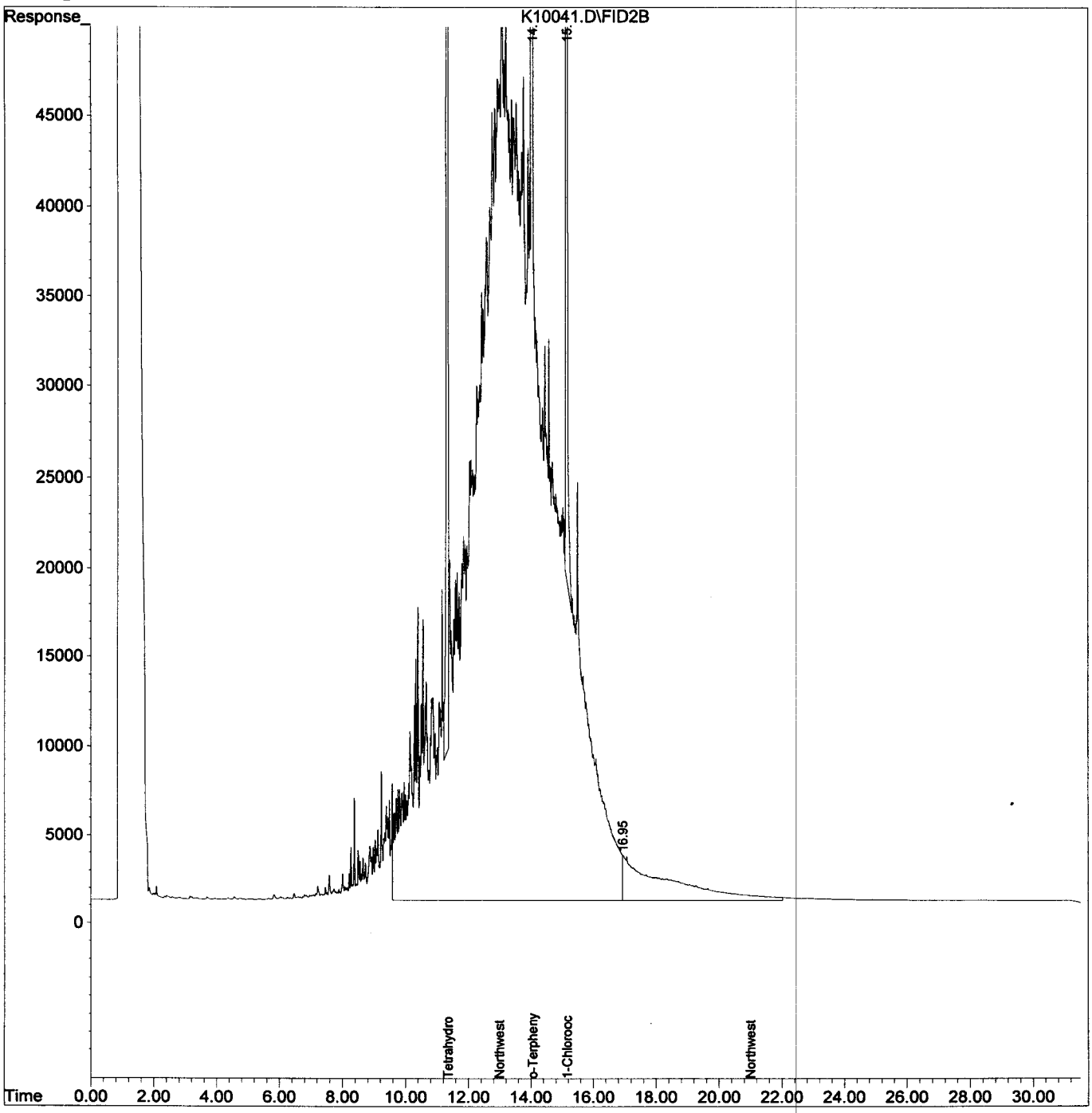


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10041.D Vial: 22
Acq On : 11 Nov 2003 2:18 am Operator: GAP
Sample : B3K0154-02 Inst : GC #5
Misc : 1x w nw sg addon Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 11 6:44 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

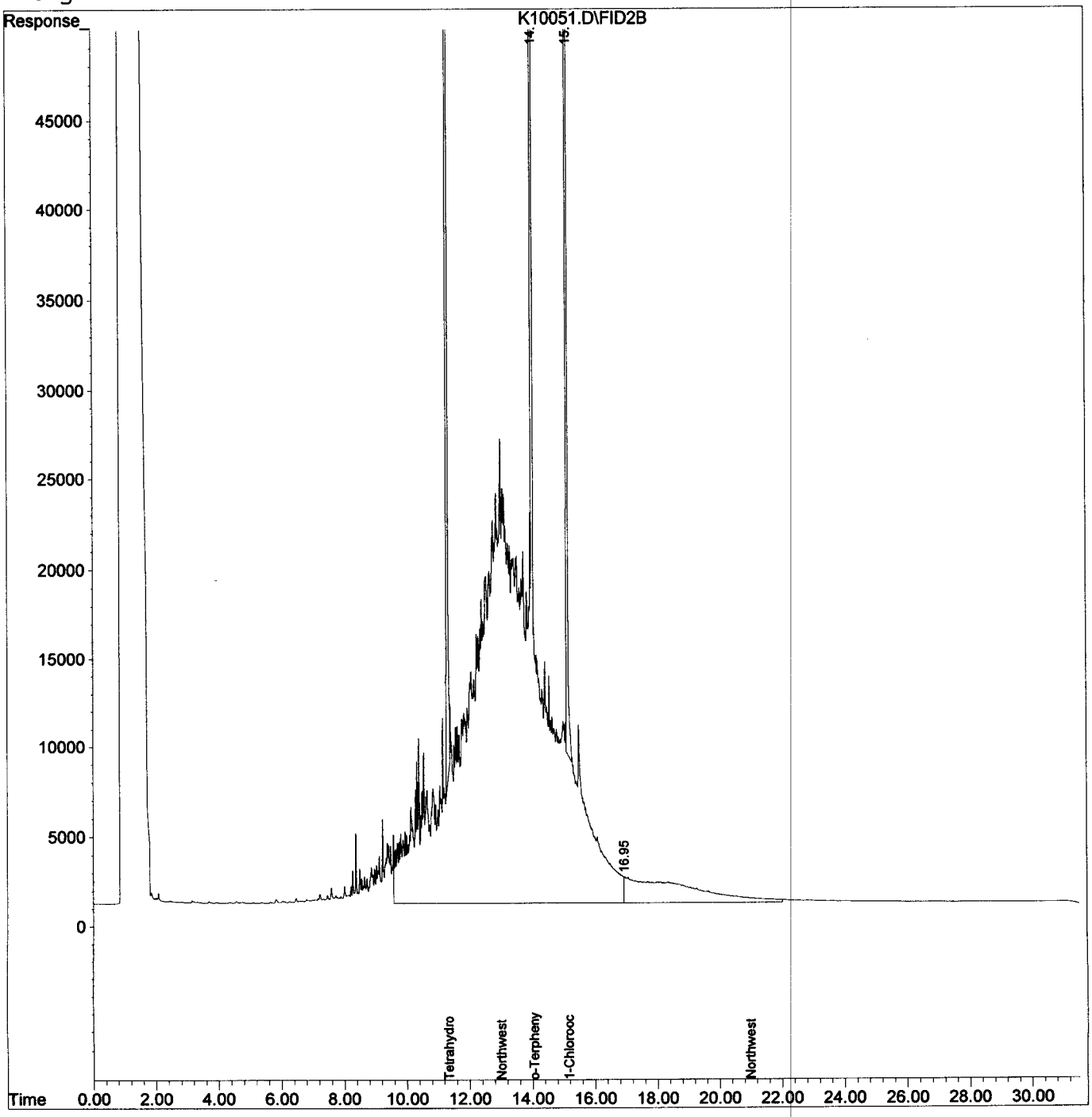


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10051.D Vial: 24
Acq On : 11 Nov 2003 5:46 am Operator: GAP
Sample : B3K0154-03 Inst : GC #5
Misc : 1x w nw sg addon Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 11 6:44 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

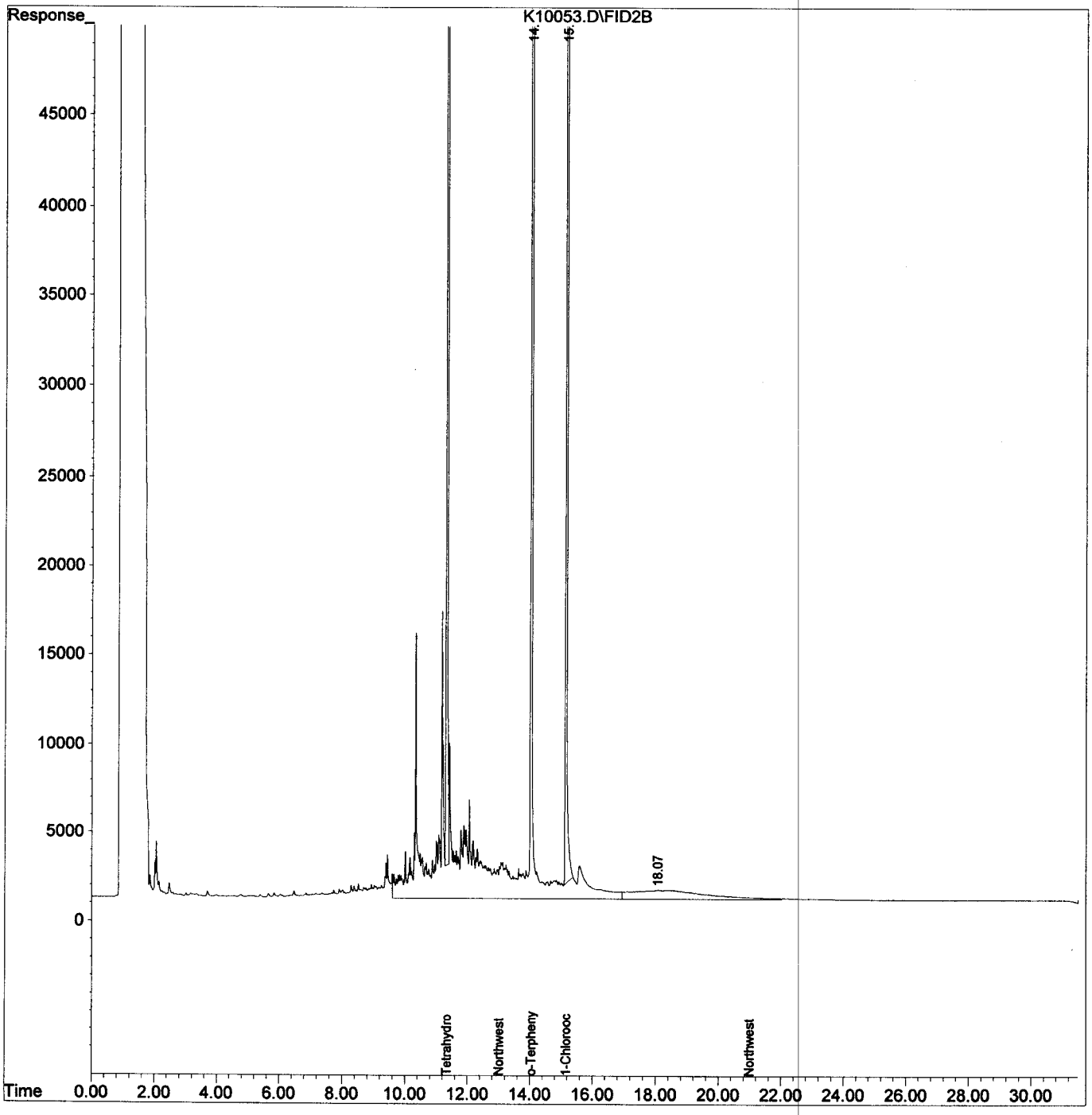


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10053.D Vial: 26
Acq On : 11 Nov 2003 6:27 am Operator: GAP
Sample : B3K0154-18 Inst : GC #5
Misc : 1x w nw sg addon Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 11 7:23 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

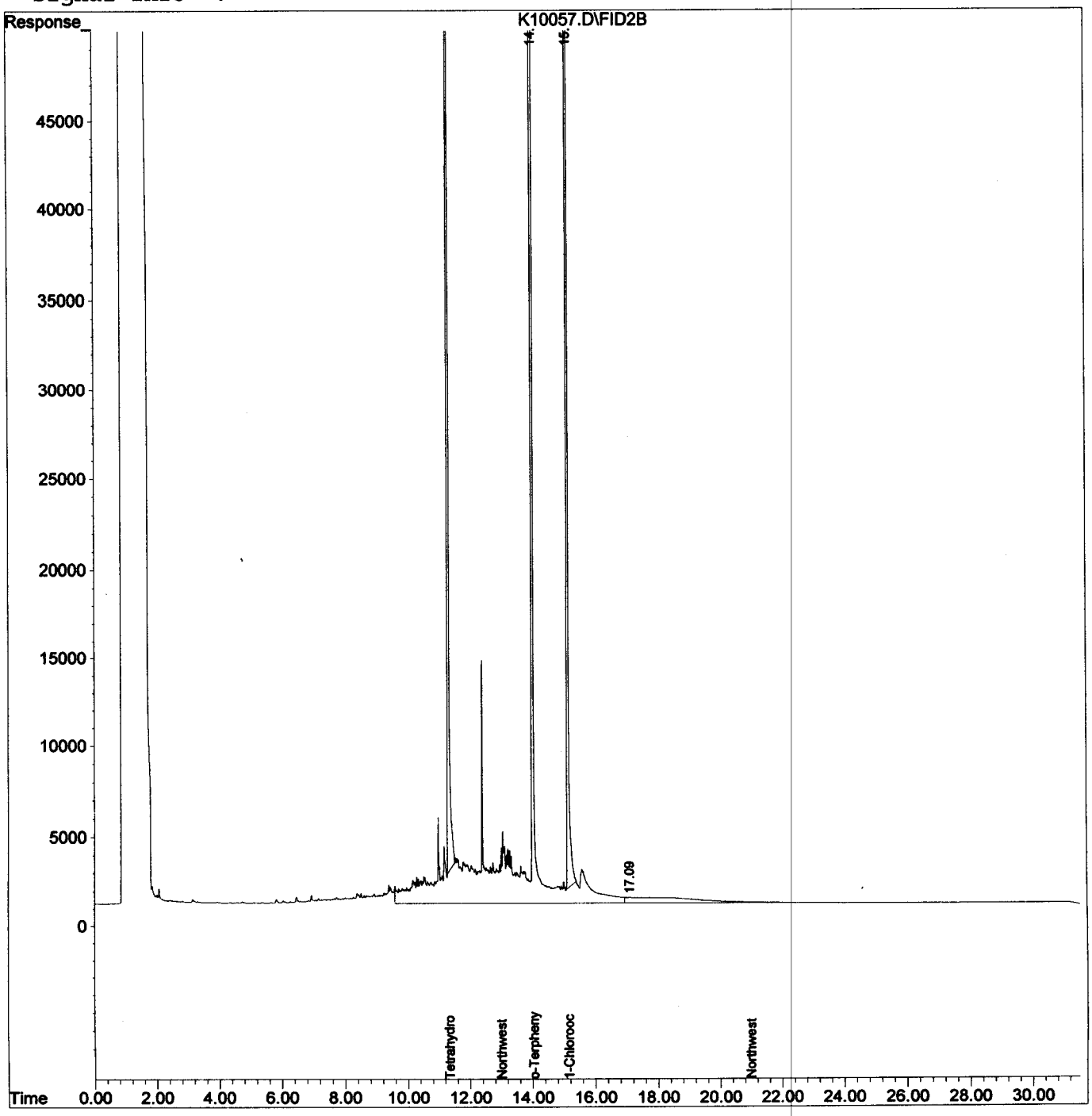


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10057.D Vial: 28
Acq On : 11 Nov 2003 7:50 am Operator: GAP
Sample : B3K0154-19 Inst : GC #5
Misc : 1x w nw sg addon Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 11 8:23 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



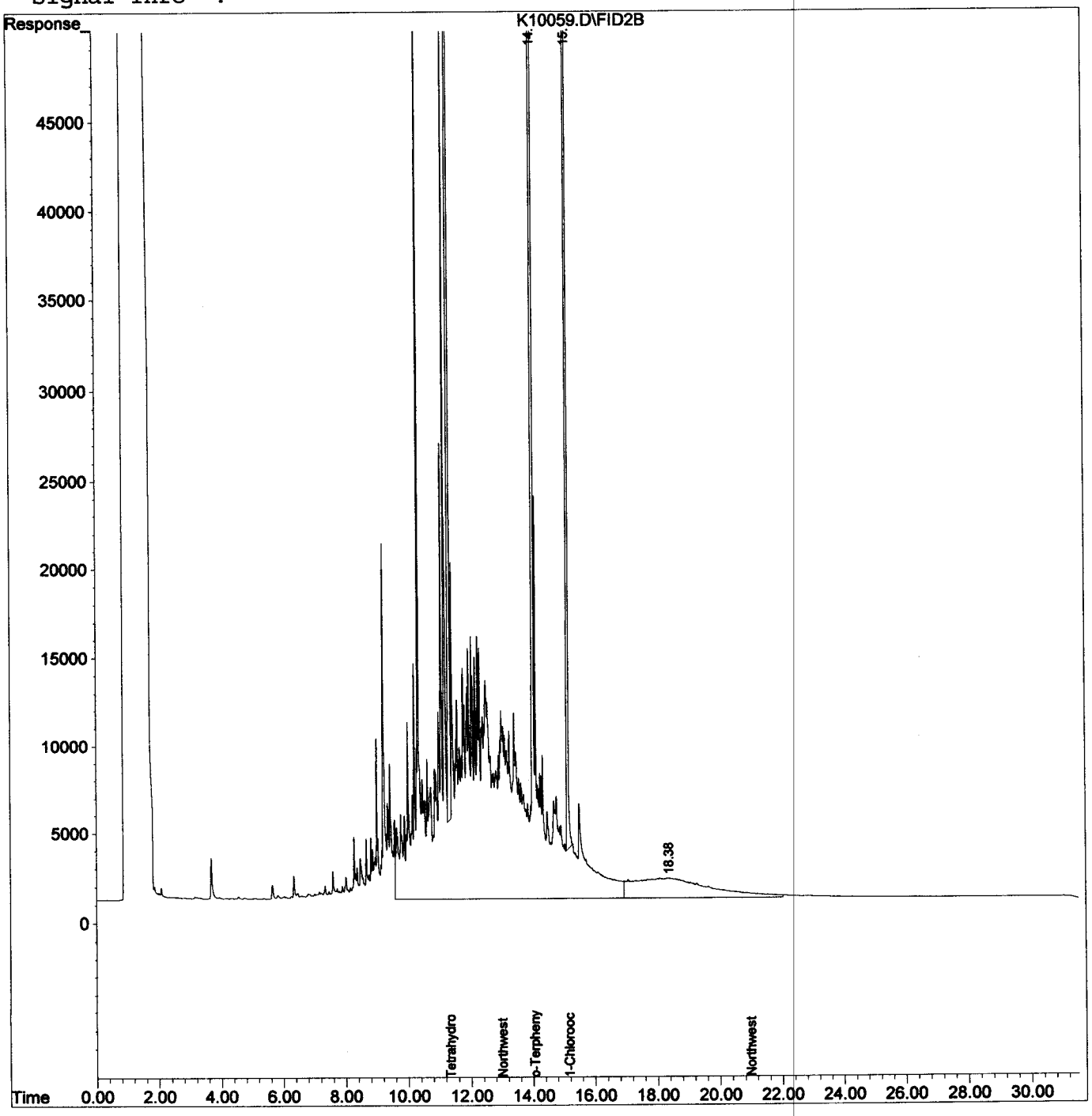
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10059.D
Acq On : 11 Nov 2003 8:32 am
Sample : B3K0154-21
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 10:53 2003 Quant Results File: K0703A5R.RES

Vial: 30
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



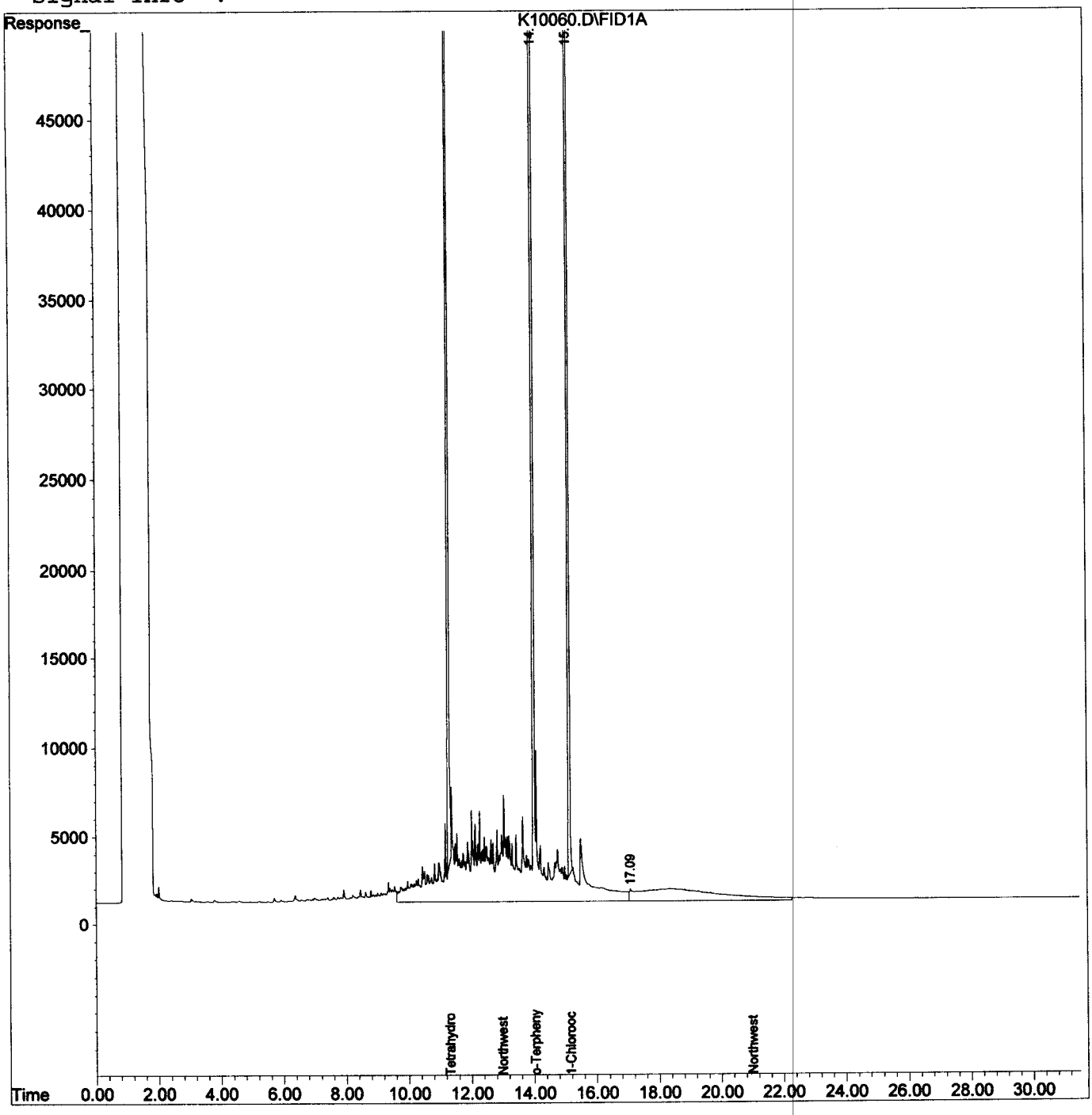
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10060.D
Acq On : 11 Nov 2003 8:32 am
Sample : B3K0154-22
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 10:54 2003 Quant Results File: K0703A5F.RES

Vial: 31
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



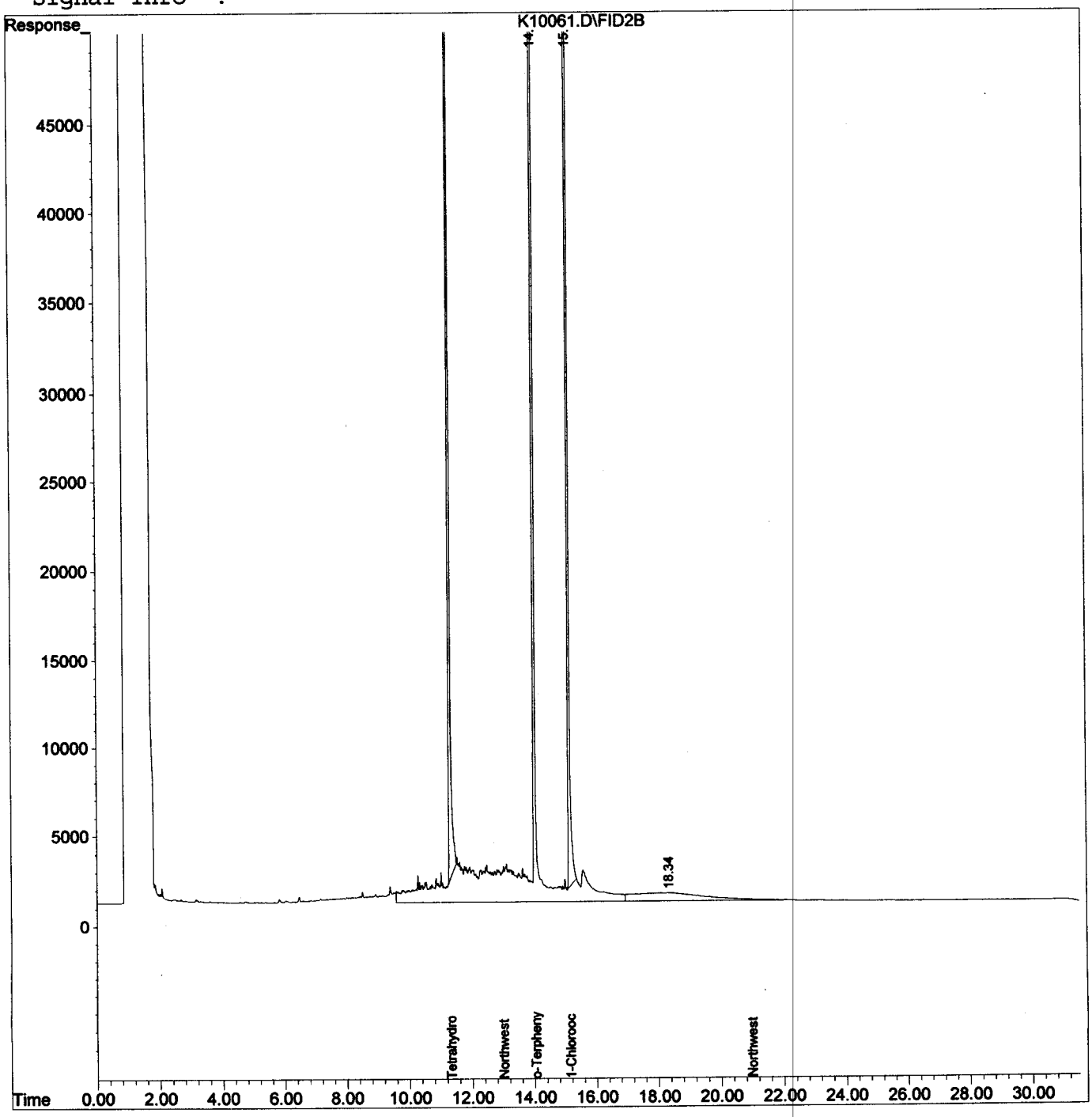
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10061.D
Acq On : 11 Nov 2003 9:18 am
Sample : B3K0154-23
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 10:53 2003 Quant Results File: K0703A5R.RES

Vial: 32
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



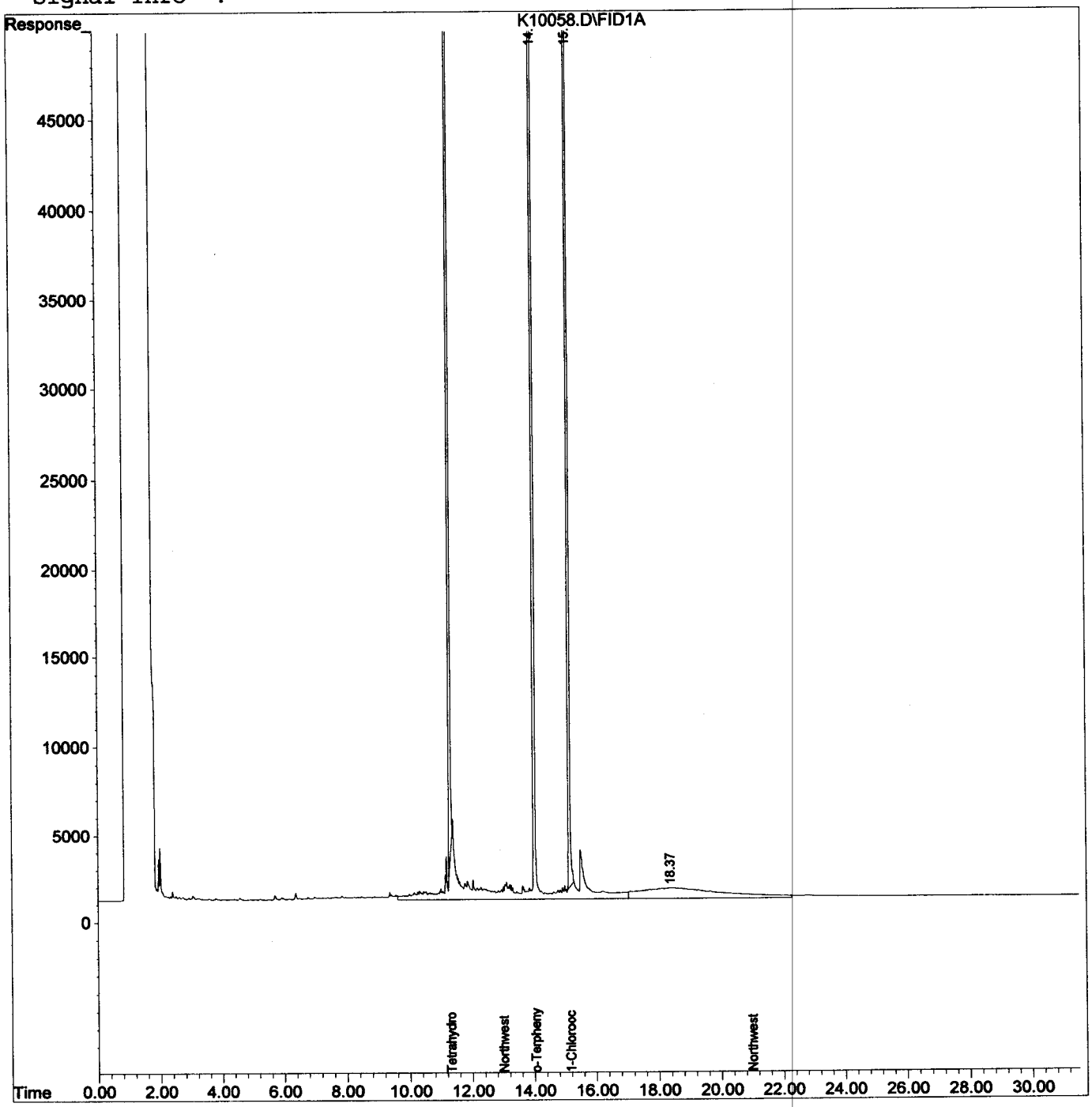
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10058.D
Acq On : 11 Nov 2003 7:50 am
Sample : B3K0154-25
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 8:23 2003 Quant Results File: K0703A5F.RES

Vial: 29
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



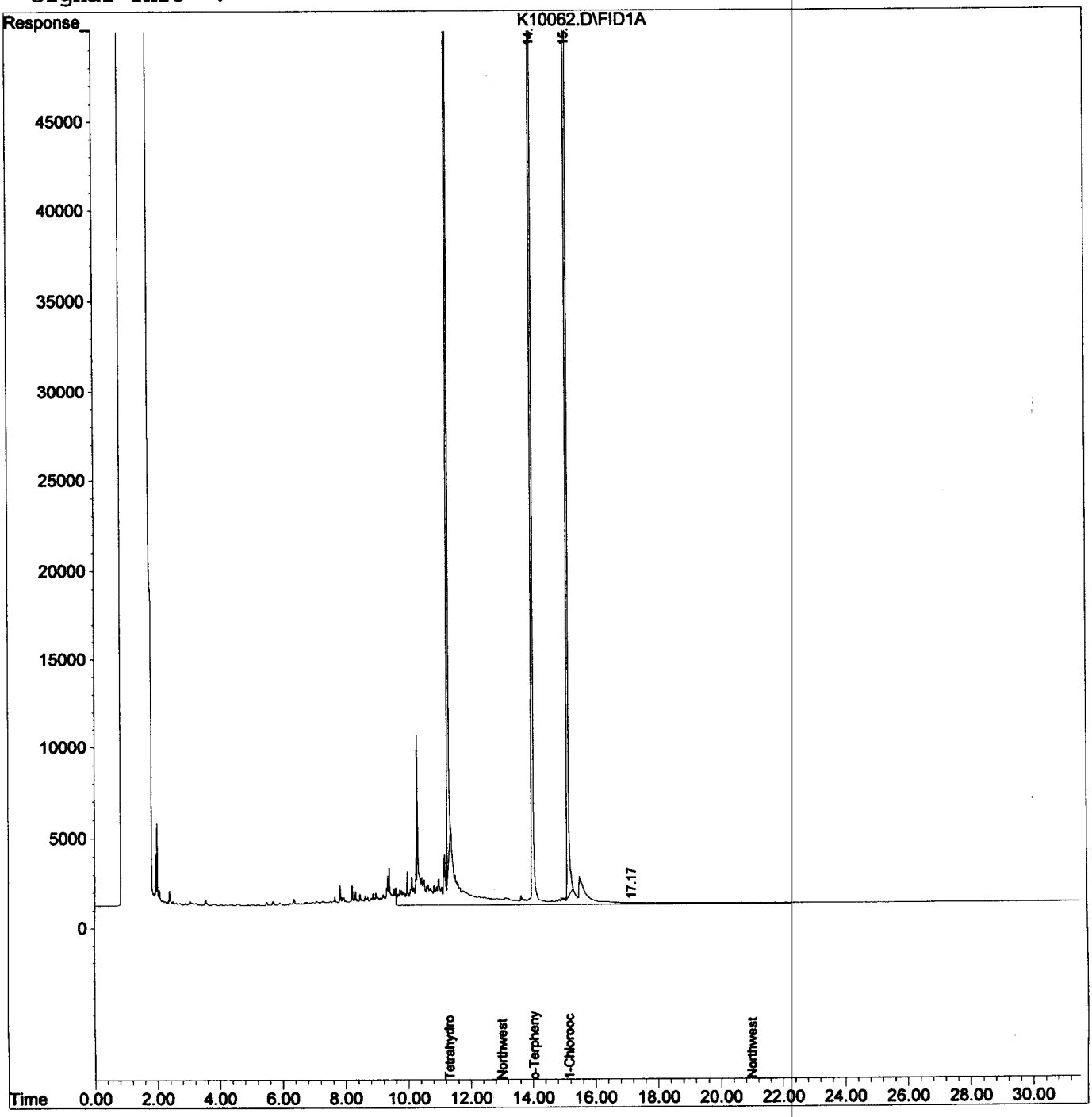
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10062.D
Acq On : 11 Nov 2003 9:18 am
Sample : B3K0154-27
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 10:54 2003 Quant Results File: K0703A5F.RES

Vial: 33
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



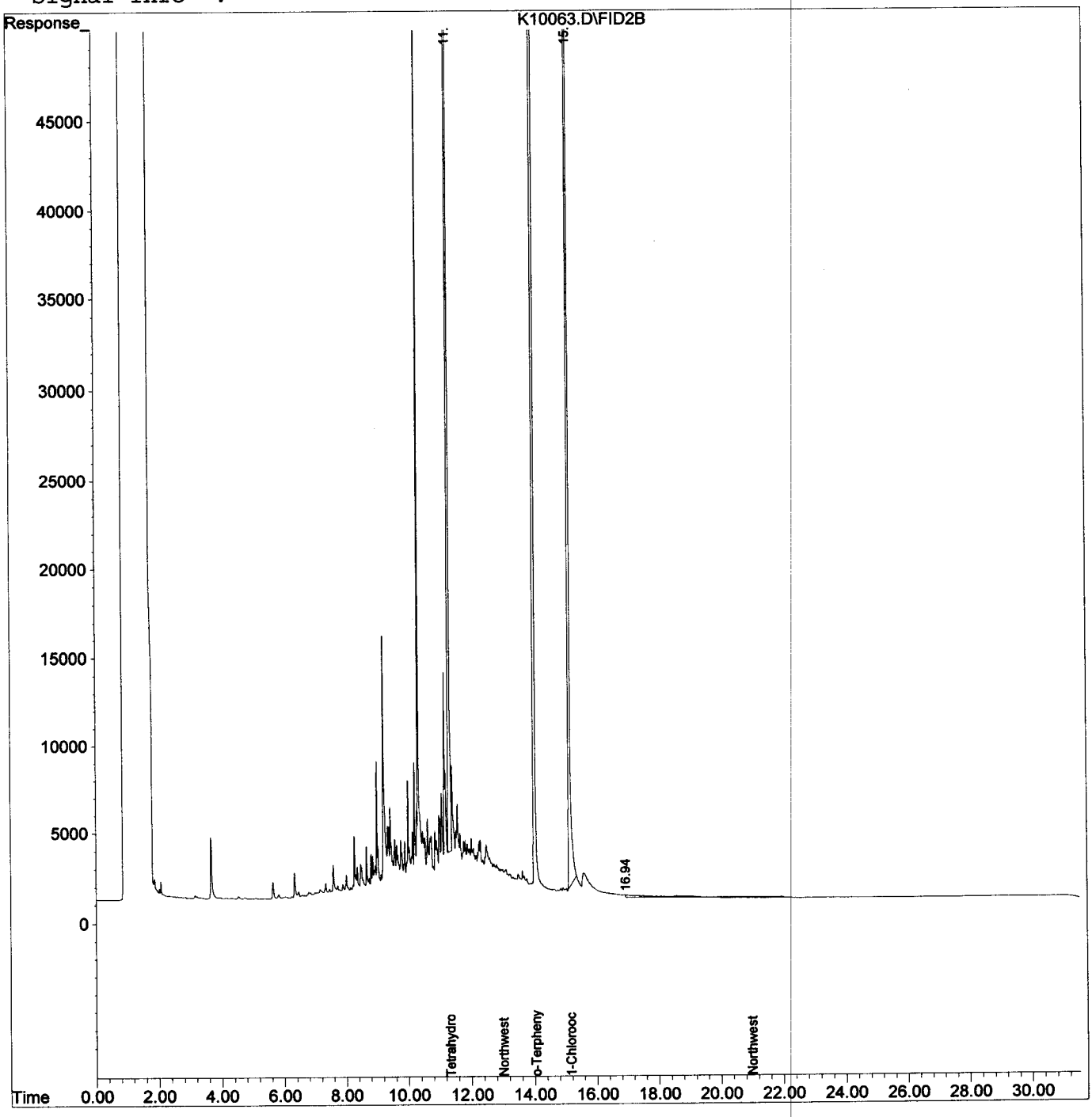
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10063.D
Acq On : 11 Nov 2003 10:00 am
Sample : B3K0154-28
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 10:53 2003 Quant Results File: K0703A5R.RES

Vial: 34
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



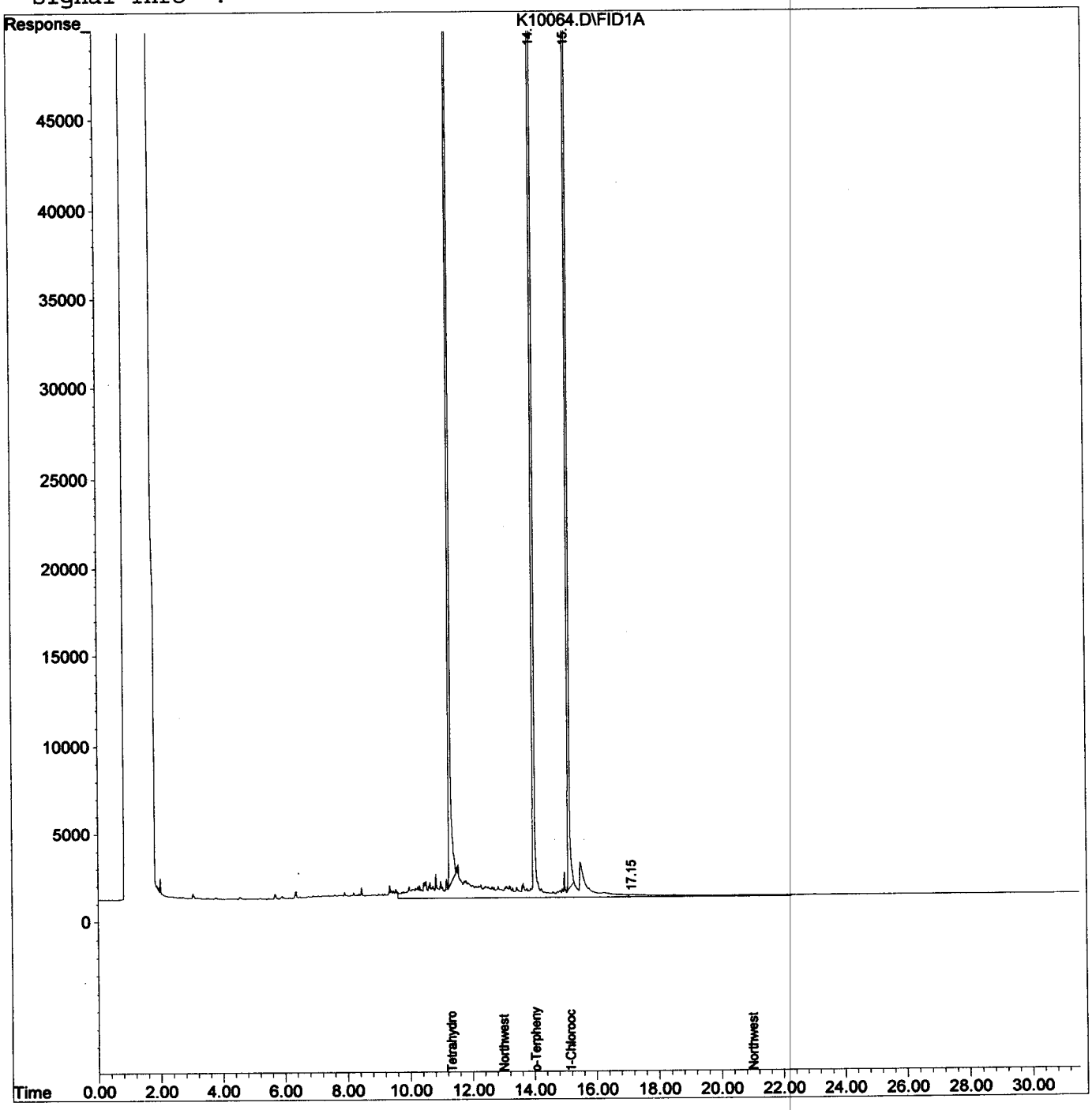
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K10064.D
Acq On : 11 Nov 2003 10:00 am
Sample : B3K0154-29
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 10:54 2003 Quant Results File: K0703A5F.RES

Vial: 35
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



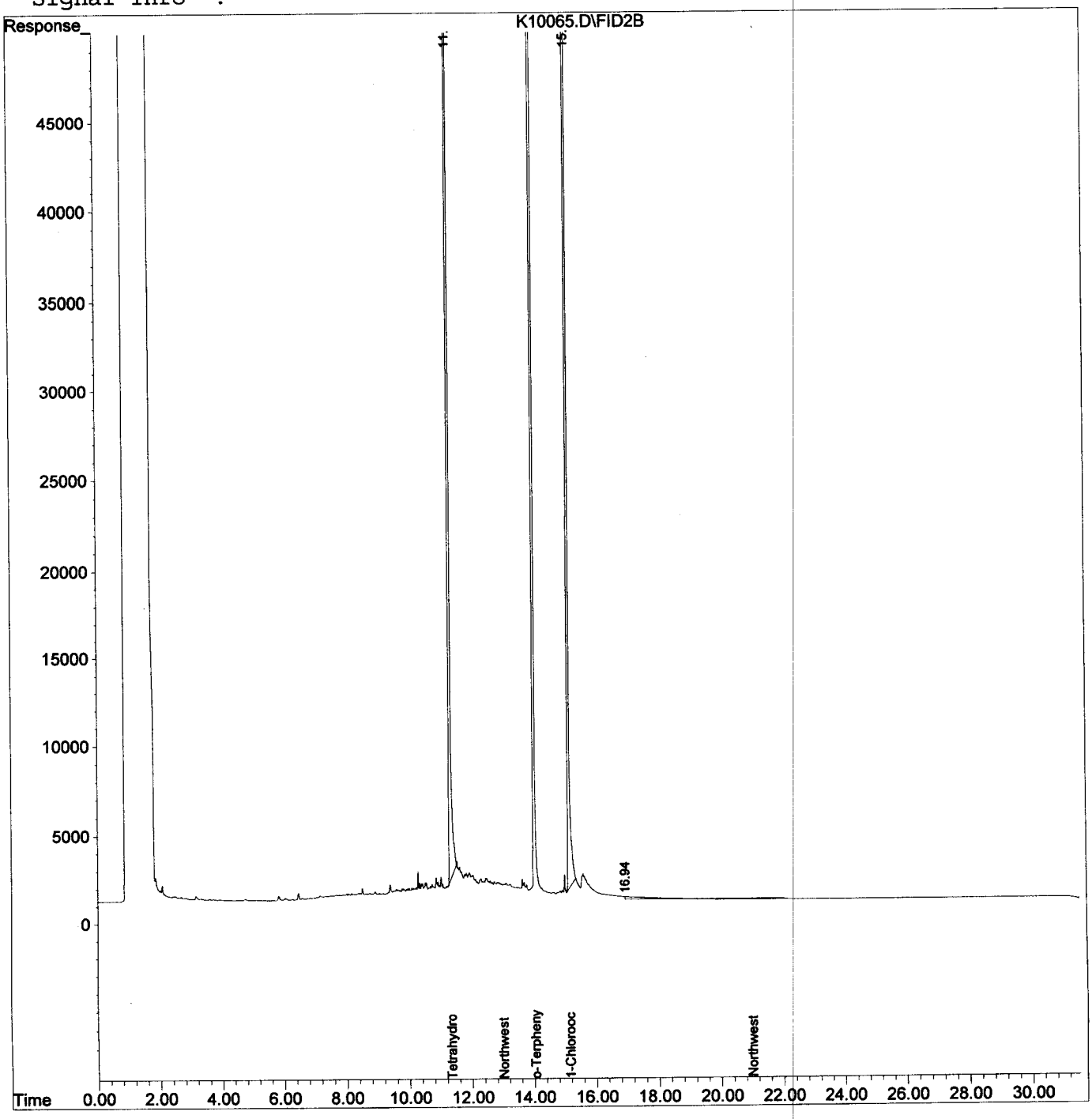
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K10065.D
Acq On : 11 Nov 2003 10:41 am
Sample : B3K0154-30
Misc : 1x w nw sg addon
IntFile : SURR.E
Quant Time: Nov 11 12:25 2003 Quant Results File: K0703A5R.RES

Vial: 36
Operator: GAP
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

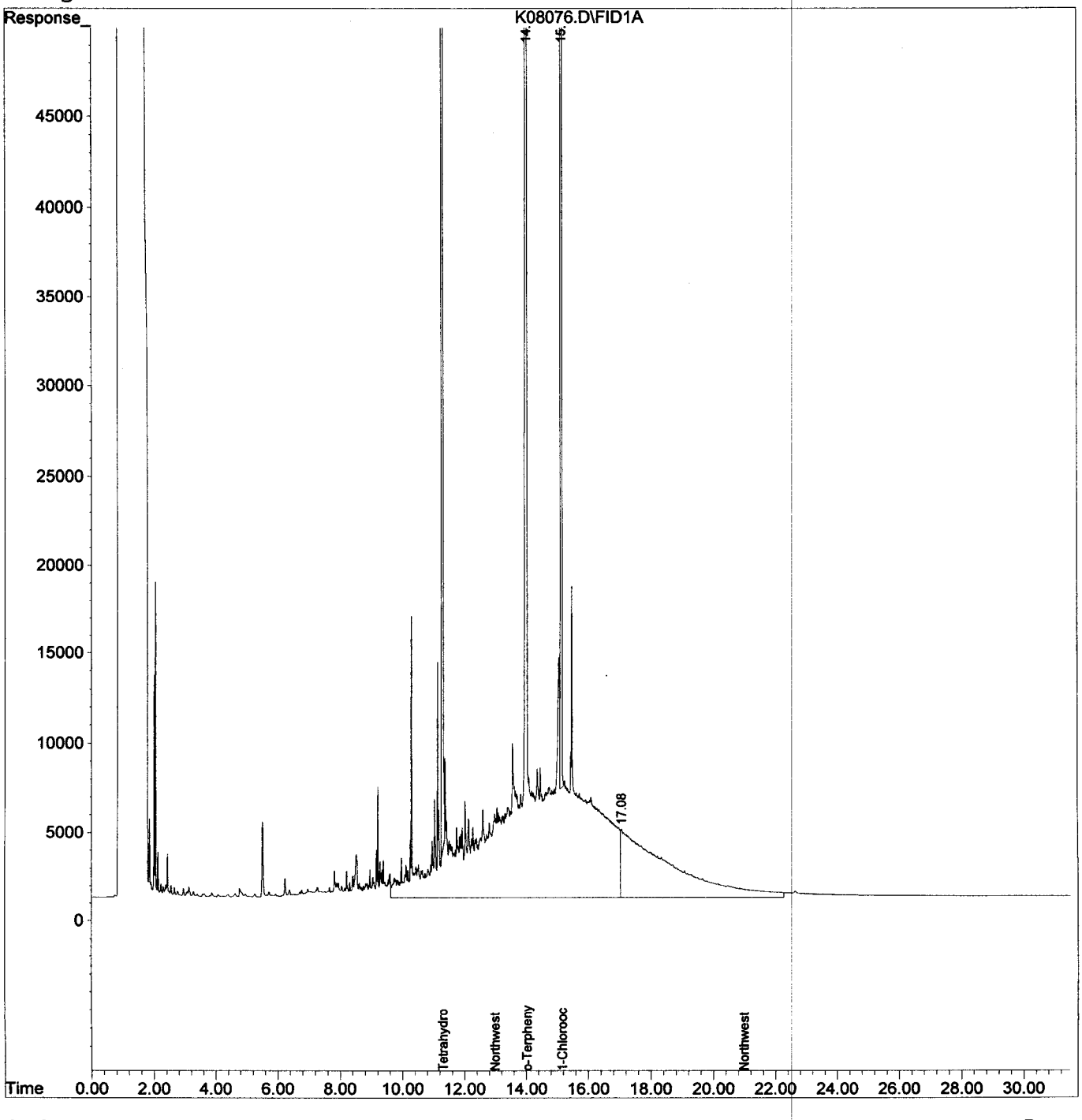


Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08076.D Vial: 49
Acq On : 9 Nov 2003 9:59 am Operator: EJE
Sample : b3k0154-01 Inst : GC #5
Misc : w NWdx Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 9 13:33 2003 Quant Results File: K0703A5F.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

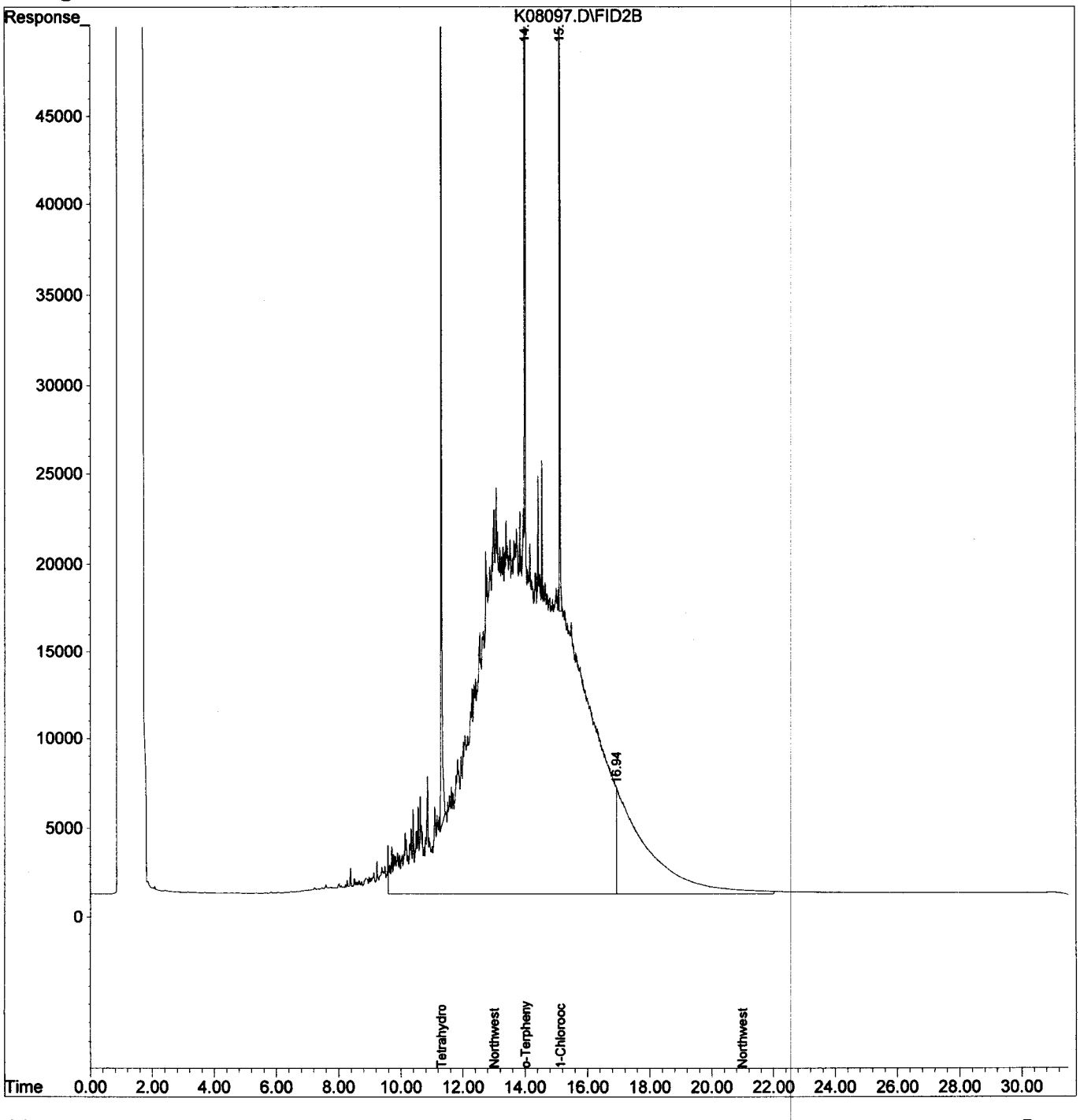


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08097.D Vial: 4
Acq On : 9 Nov 2003 6:00 pm Operator: EJE
Sample : b3k0154-02 Inst : GC #5
Misc : 5x w NWdx r1 Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 10 6:32 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

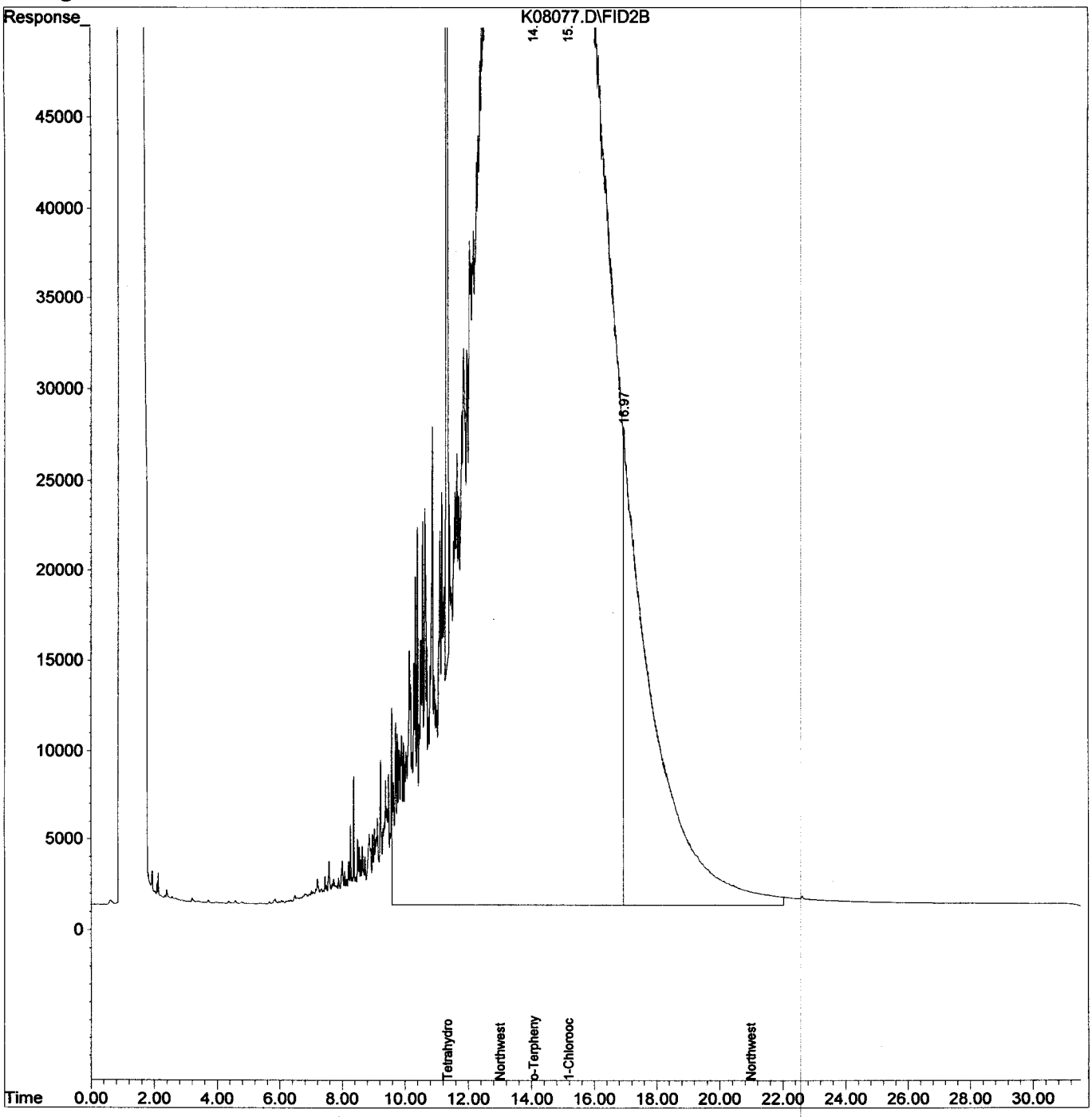


Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08077.D Vial: 50
Acq On : 9 Nov 2003 10:40 am Operator: EJE
Sample : b3k0154-02 Inst : GC #5
Misc : w NWdx Multiplr: 1.00
IntFile : SURR.E
Quant Time: Nov 9 13:31 2003 Quant Results File: K0703A5R.RES

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



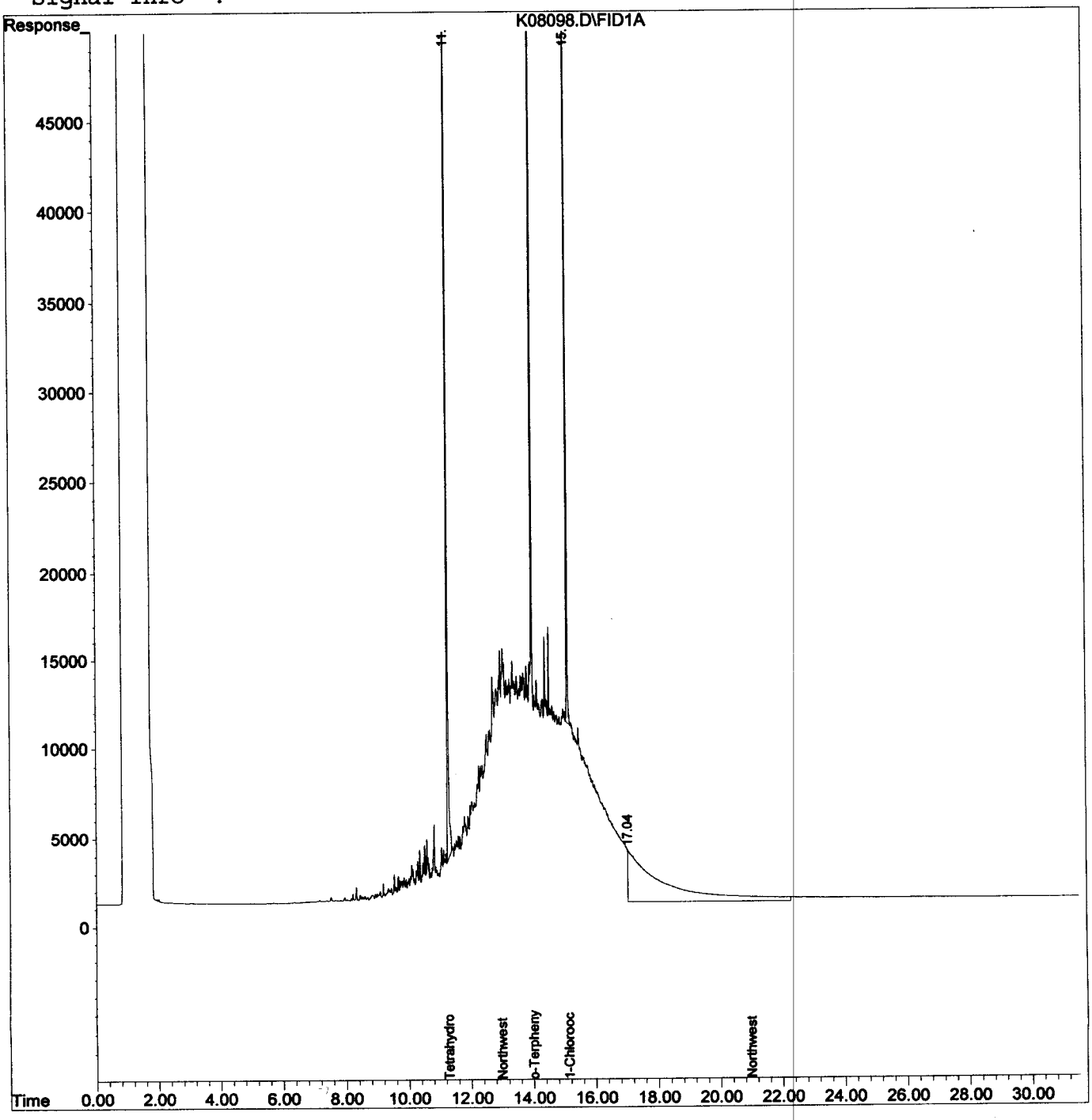
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08098.D
Acq On : 9 Nov 2003 6:00 pm
Sample : b3k0154-03
Misc : 5x w NWdx r1
IntFile : SURR.E
Quant Time: Nov 10 6:25 2003 Quant Results File: K0703A5F.RES

Vial: 5
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



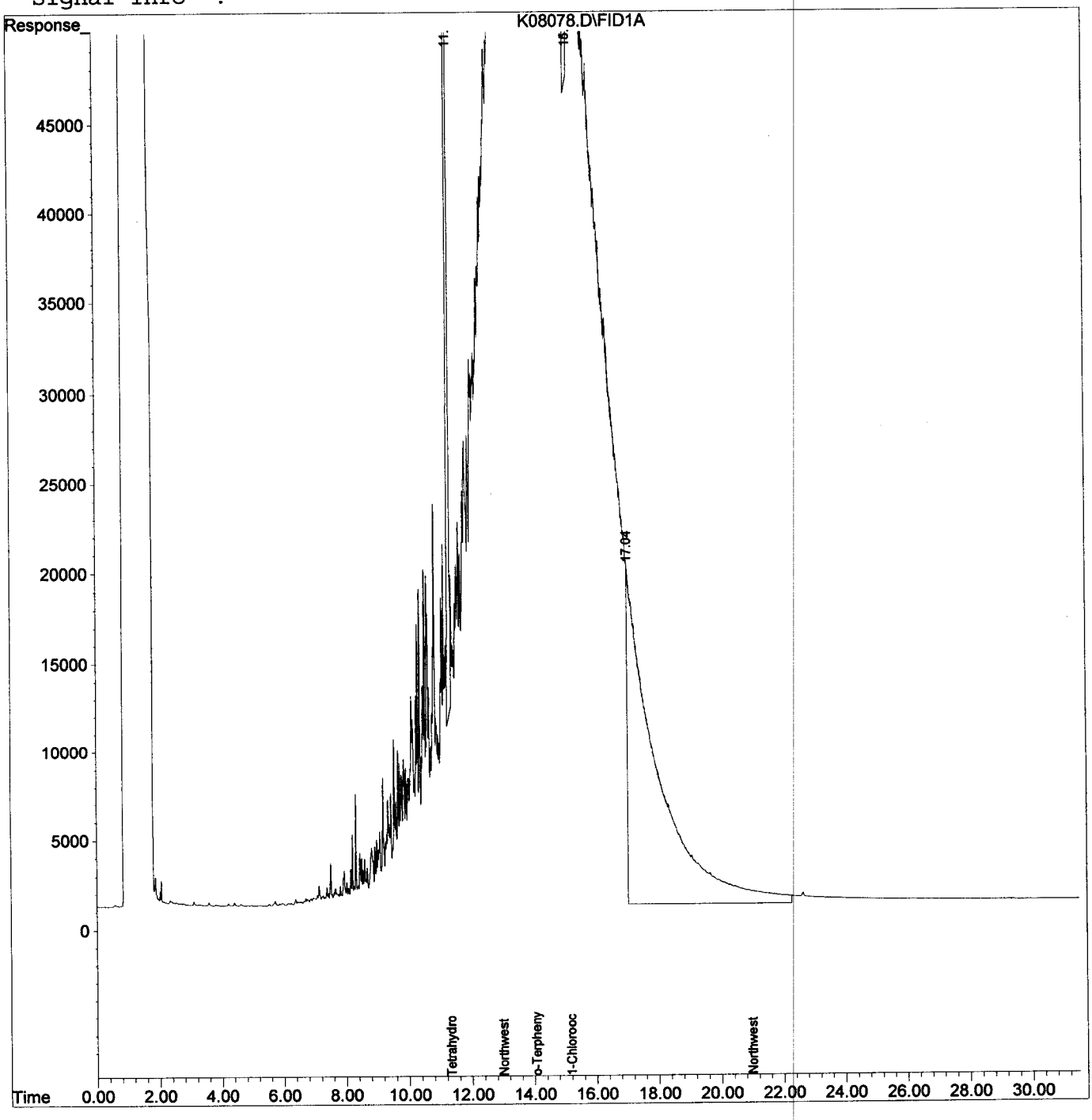
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08078.D
Acq On : 9 Nov 2003 10:40 am
Sample : b3k0154-03
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 9 13:33 2003 Quant Results File: K0703A5F.RES

Vial: 51
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



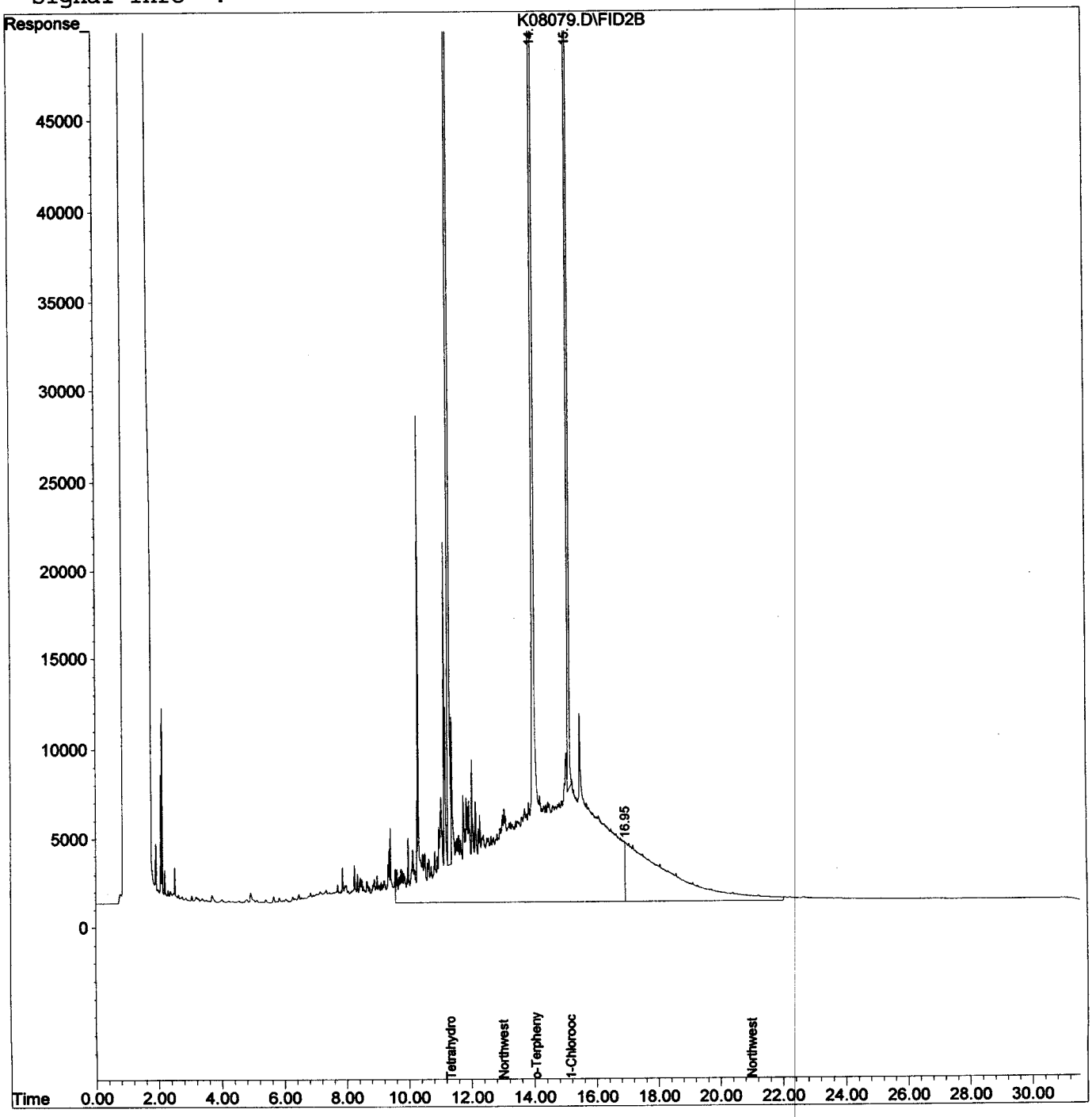
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08079.D
Acq On : 9 Nov 2003 11:21 am
Sample : b3k0154-18
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 9 13:31 2003 Quant Results File: K0703A5R.RES

Vial: 52
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



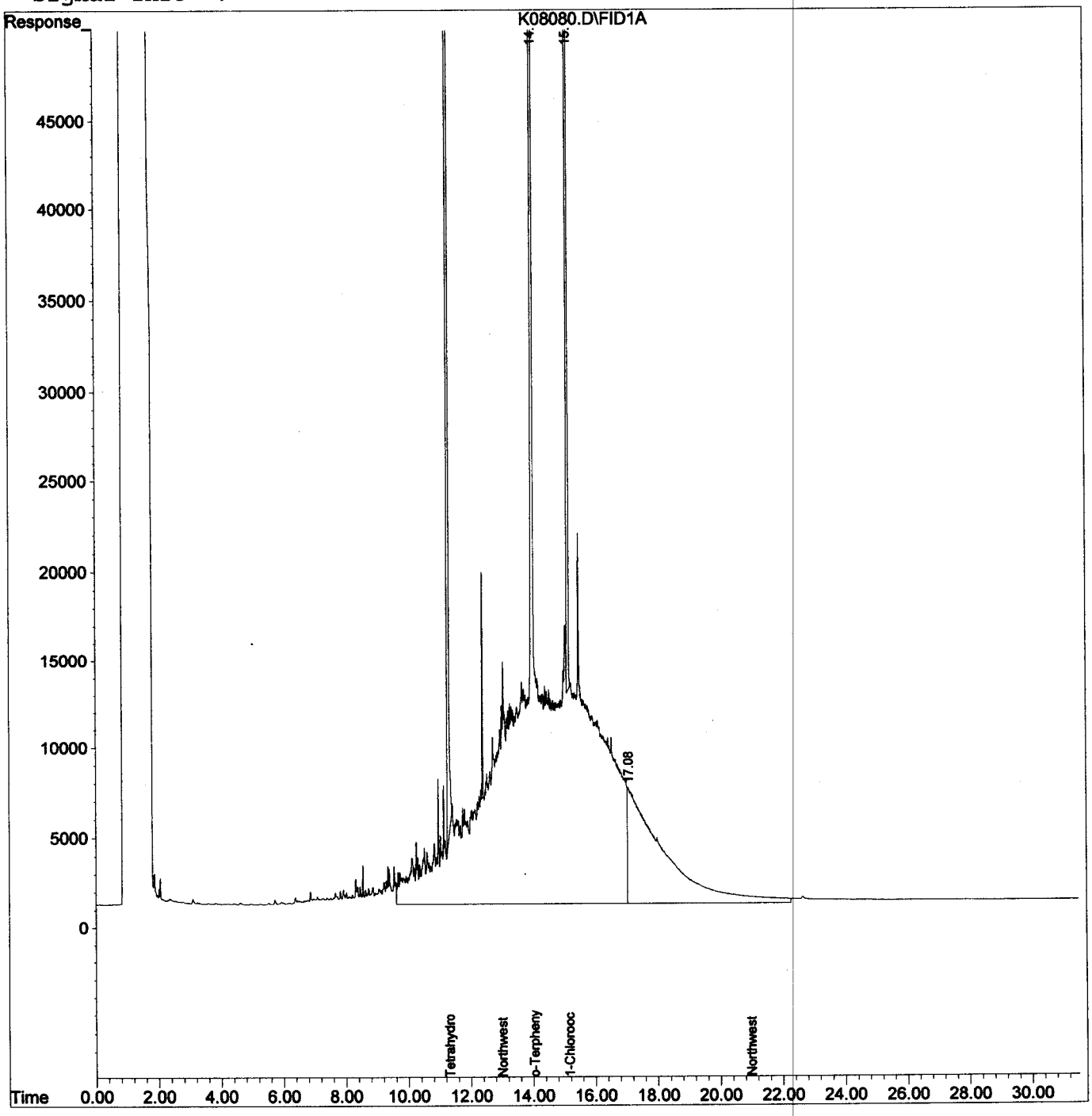
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08080.D
Acq On : 9 Nov 2003 11:21 am
Sample : b3k0154-19
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 9 13:34 2003 Quant Results File: K0703A5F.RES

Vial: 53
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



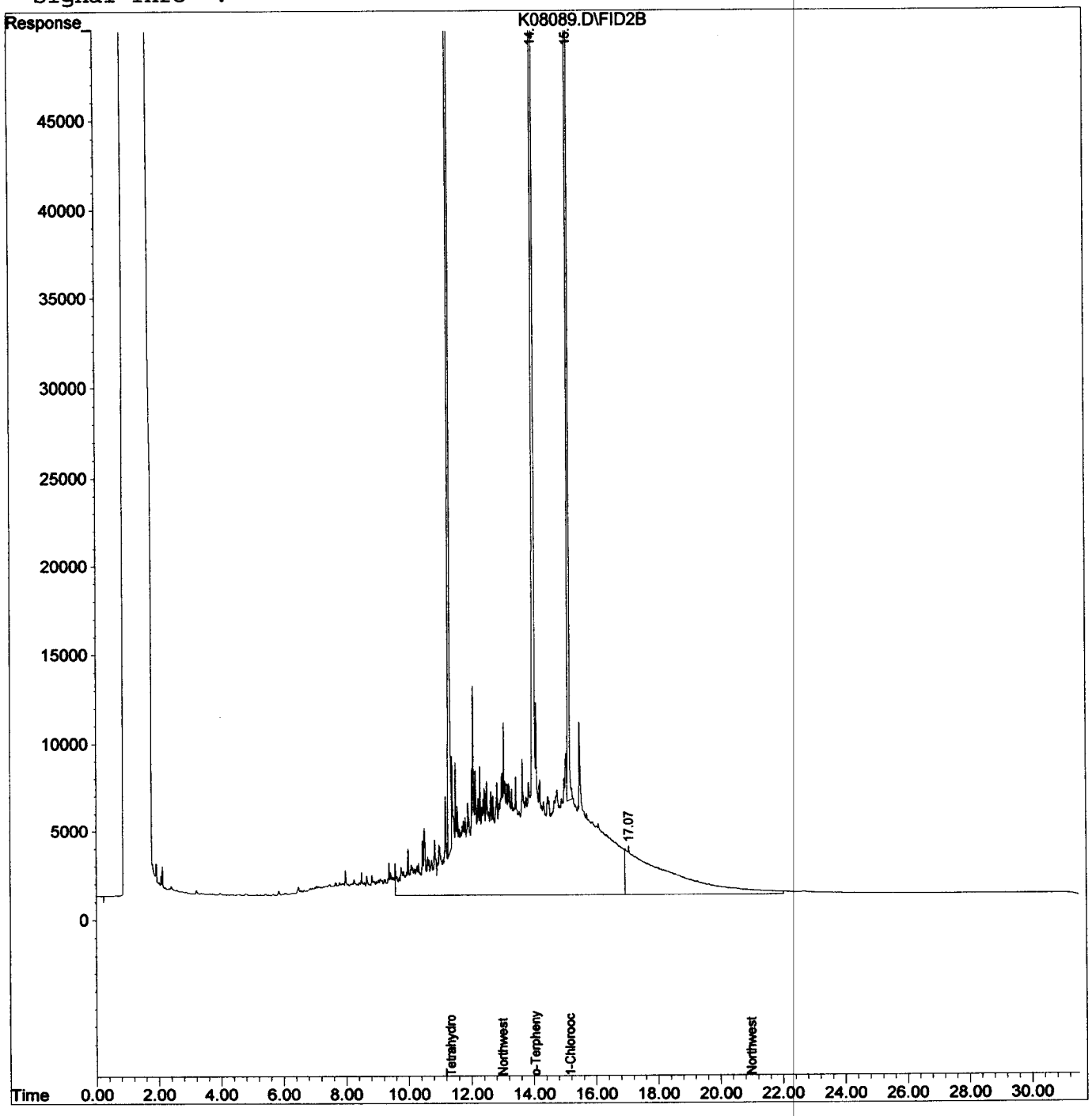
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08089.D
Acq On : 9 Nov 2003 2:47 pm
Sample : b3k0154-21
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 10 6:31 2003 Quant Results File: K0703A5R.RES

Vial: 54
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



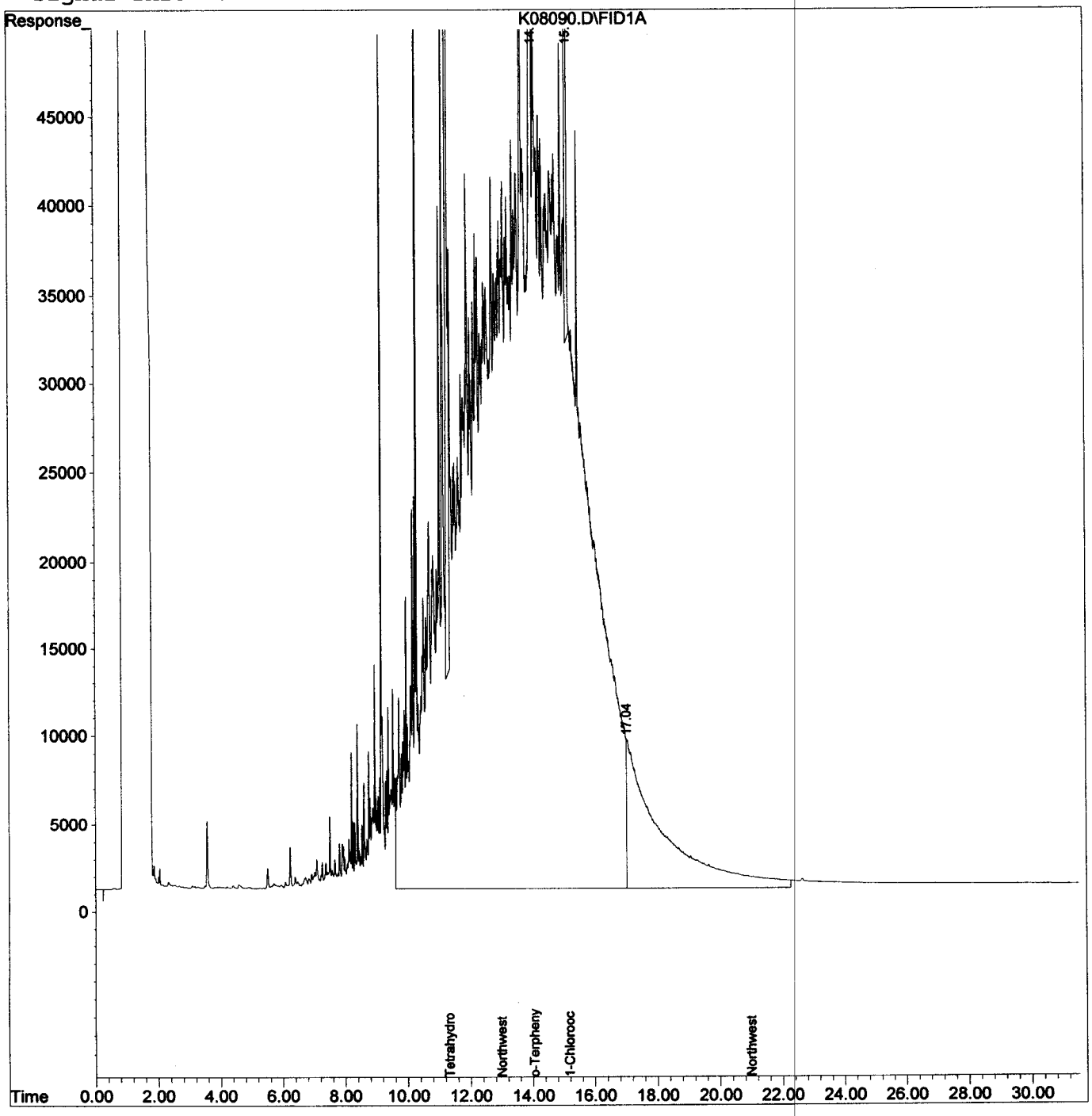
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08090.D
Acq On : 9 Nov 2003 2:47 pm
Sample : b3k0154-22
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 10 6:24 2003 Quant Results File: K0703A5F.RES

Vial: 55
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



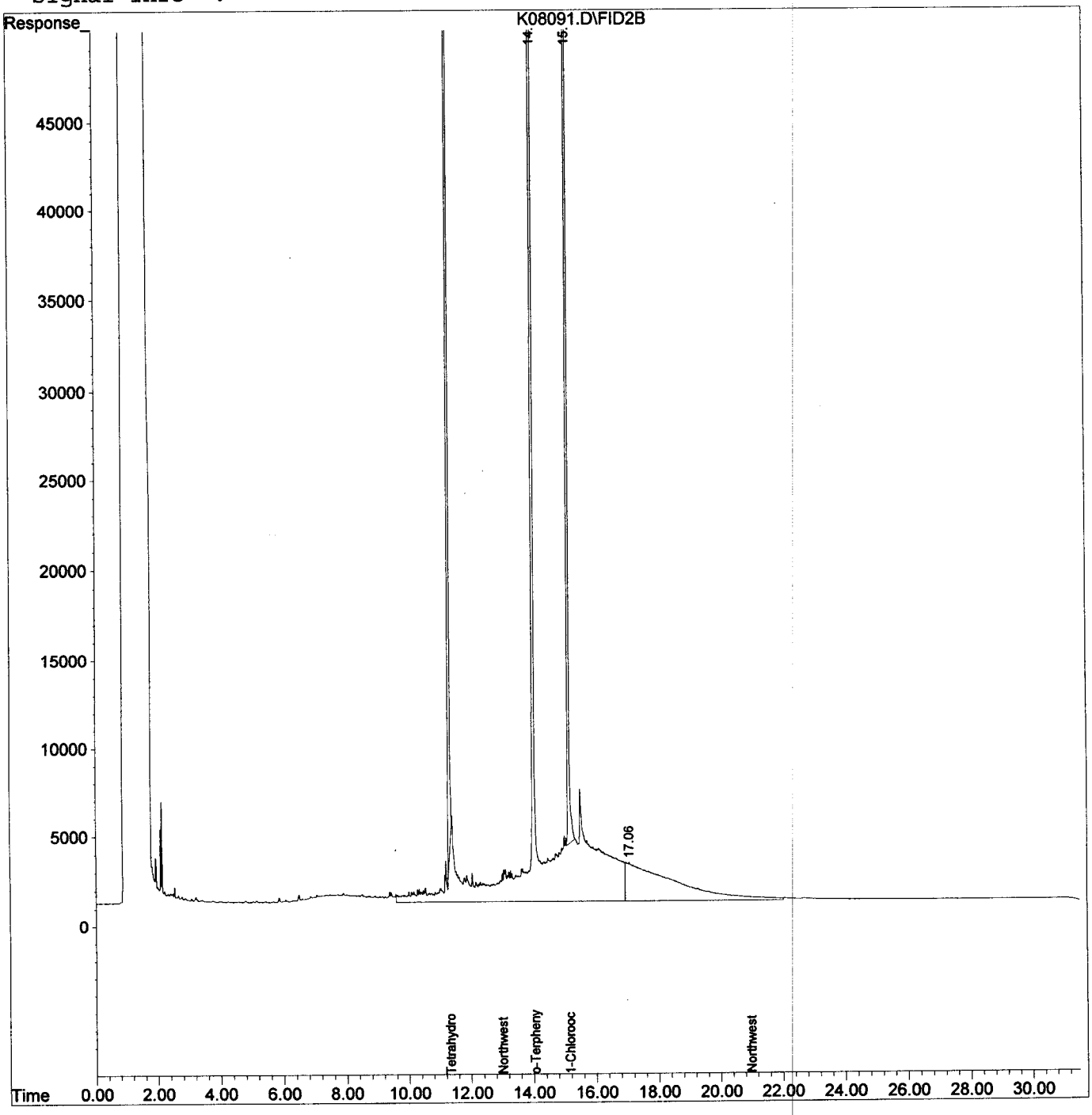
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08091.D
Acq On : 9 Nov 2003 3:28 pm
Sample : b3k0154-23
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 10 6:31 2003 Quant Results File: K0703A5R.RES

Vial: 56
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



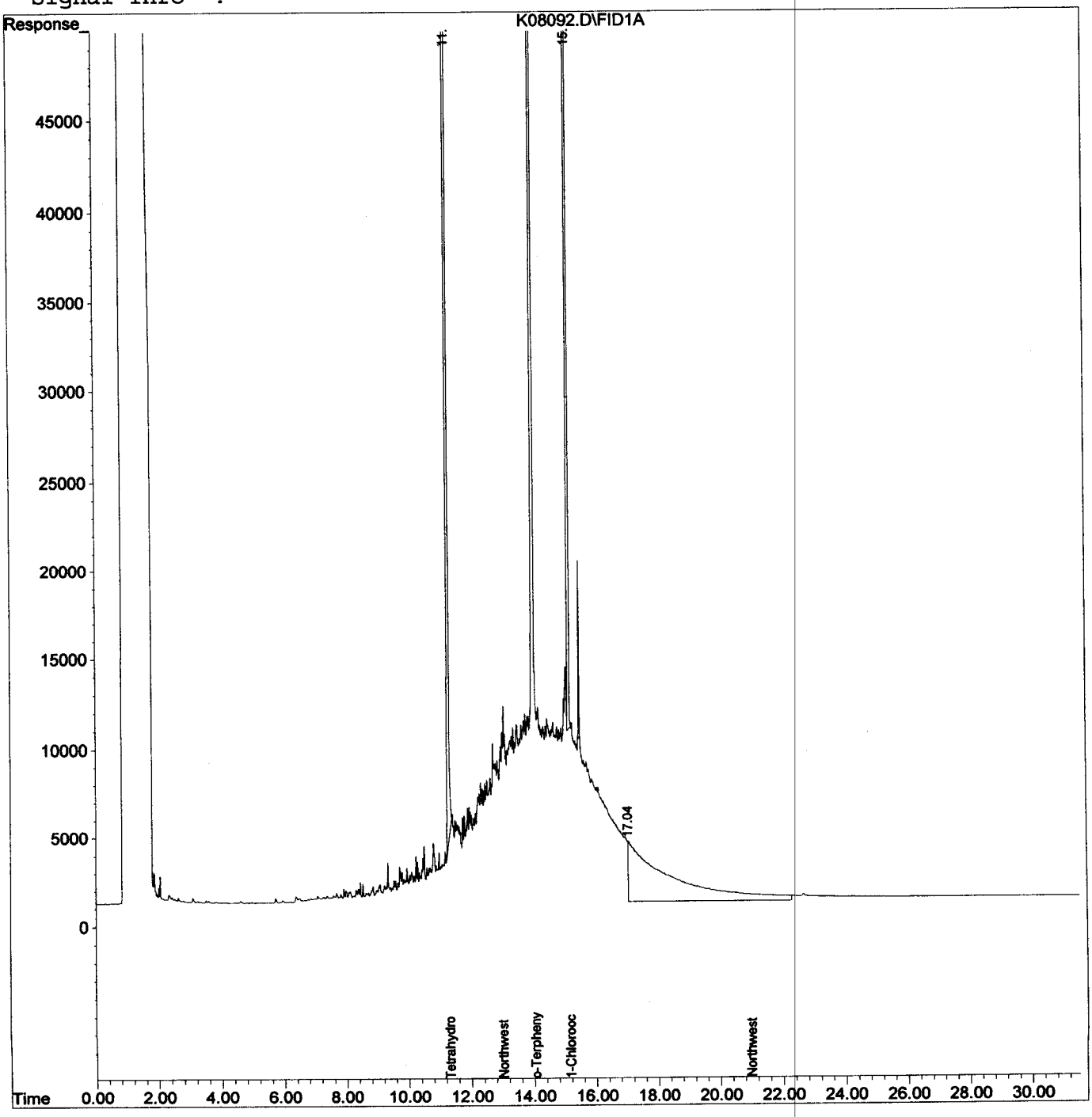
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08092.D
Acq On : 9 Nov 2003 3:28 pm
Sample : b3k0154-25
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 10 6:24 2003 Quant Results File: K0703A5F.RES

Vial: 57
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



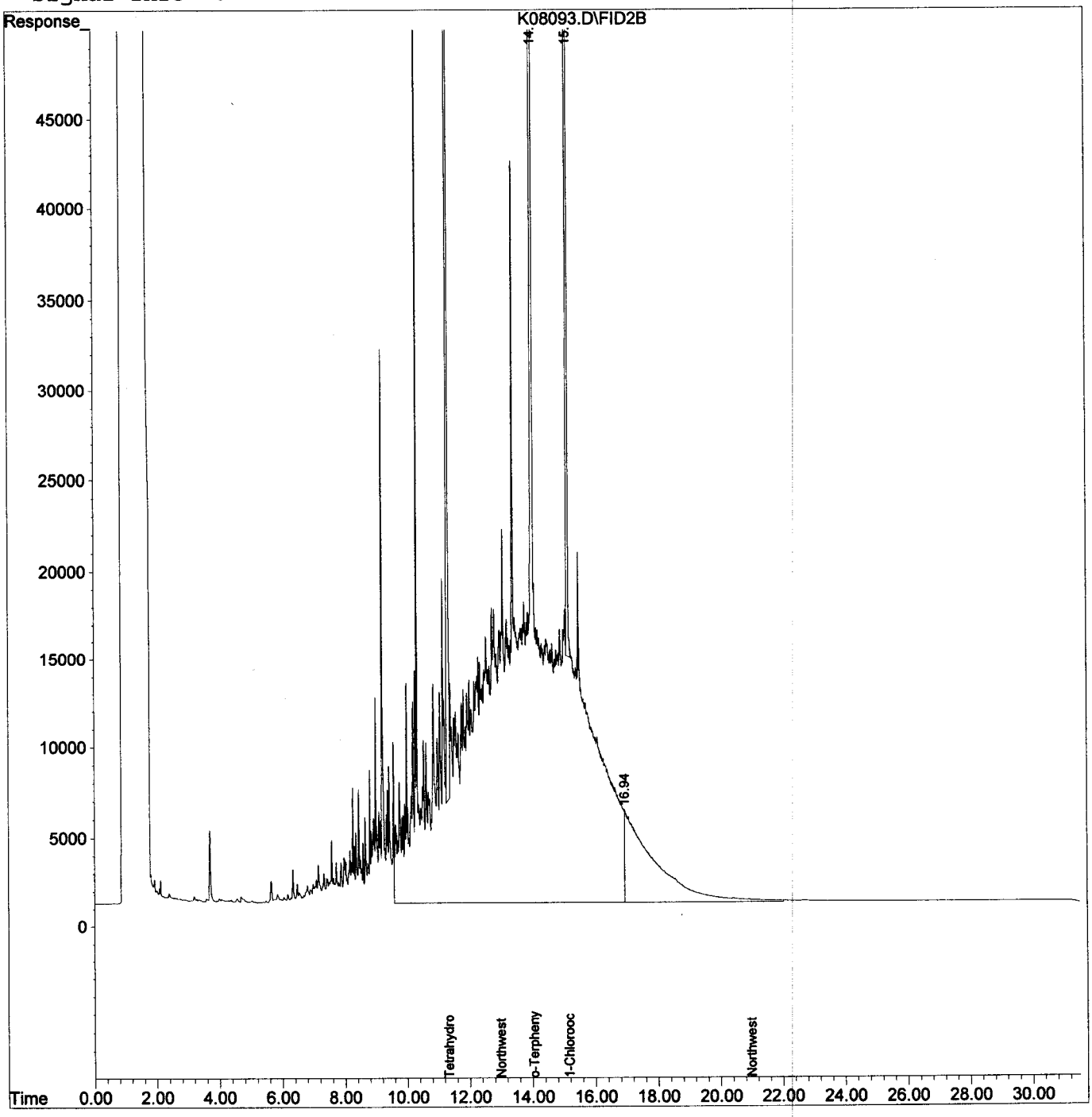
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08093.D
Acq On : 9 Nov 2003 4:38 pm
Sample : b3k0154-27
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 10 6:31 2003 Quant Results File: K0703A5R.RES

Vial: 58
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



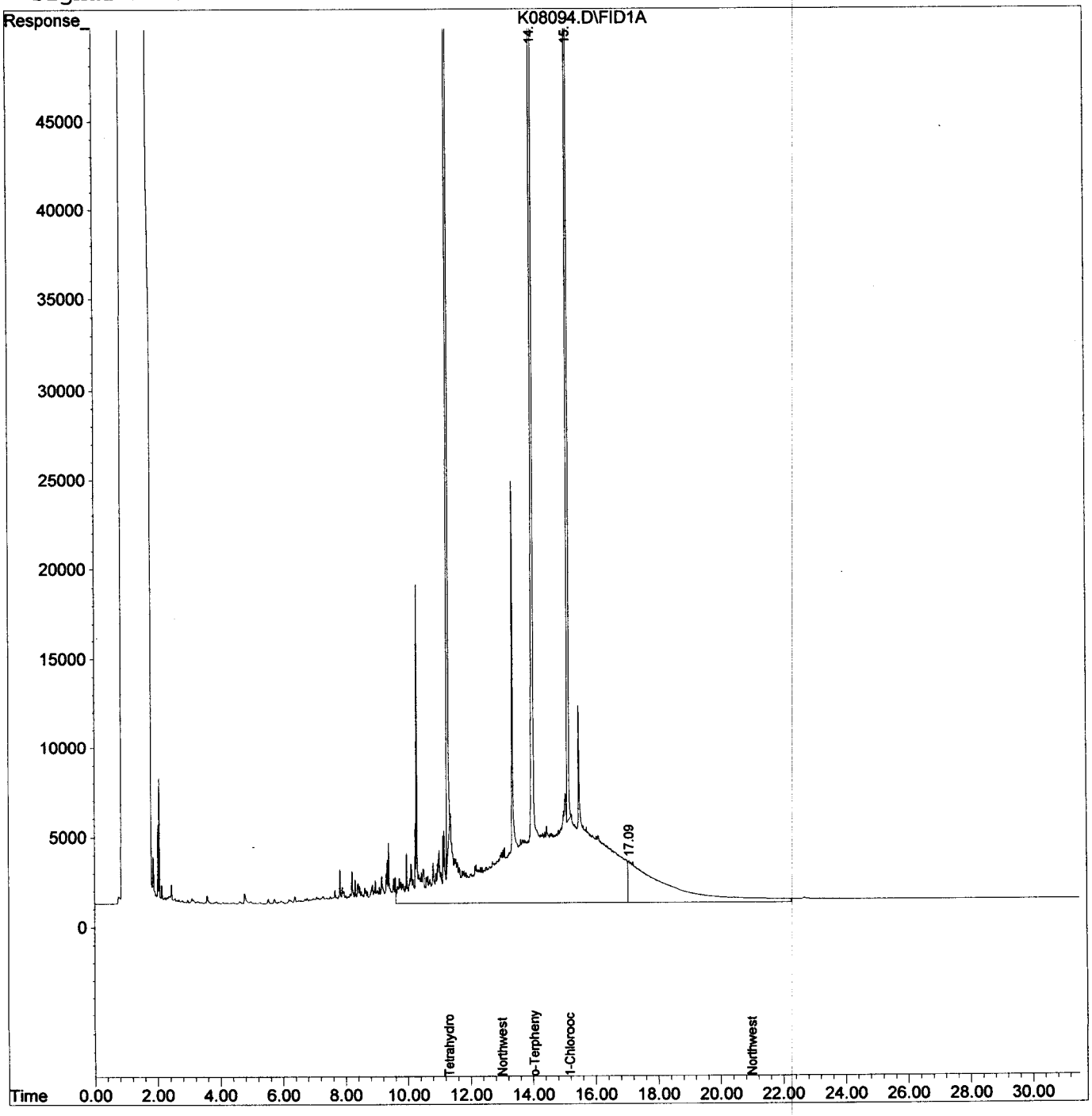
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08094.D
Acq On : 9 Nov 2003 4:38 pm
Sample : b3k0154-28
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 10 6:25 2003 Quant Results File: K0703A5F.RES

Vial: 59
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



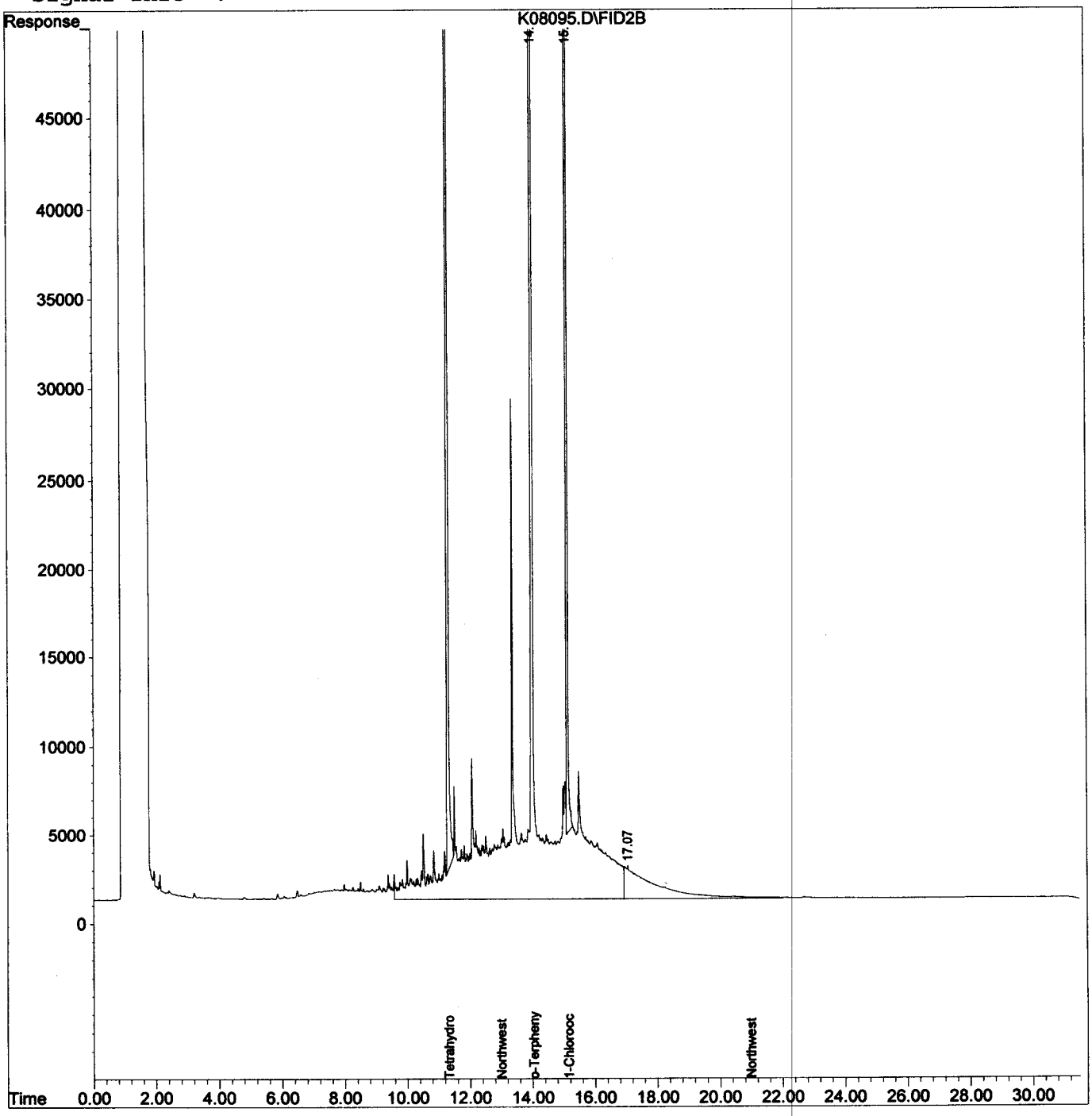
Quantitation Report

Data File : C:\HPCHEM\3\DATA.SEC\K08095.D
Acq On : 9 Nov 2003 5:19 pm
Sample : b3k0154-29
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 10 6:32 2003 Quant Results File: K0703A5R.RES

Vial: 60
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5R.M (Chemstation Integrator)
Title : TPH-D Rear Method
Last Update : Fri Nov 07 17:01:07 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :



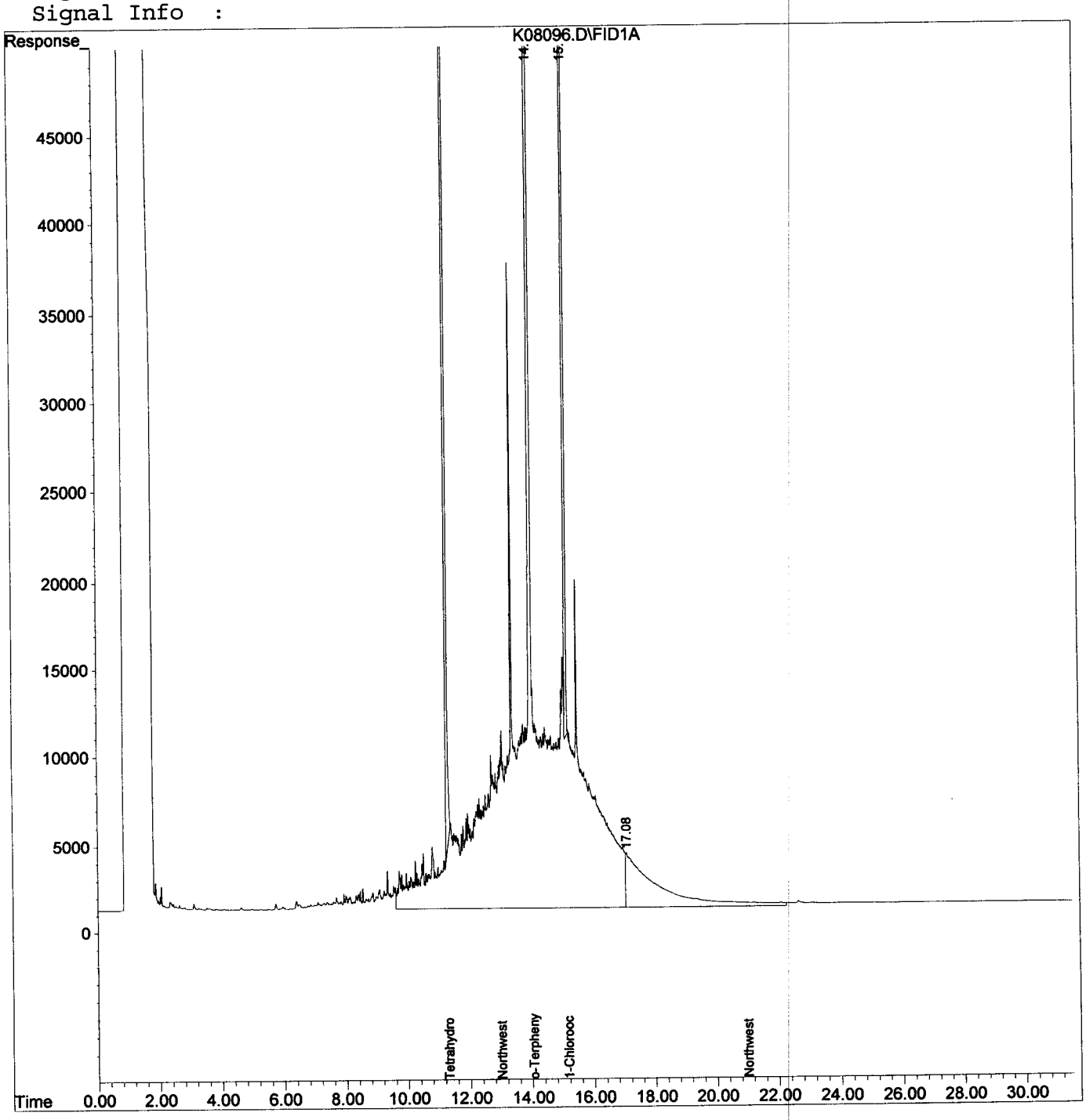
Quantitation Report

Data File : C:\HPCHEM\3\DATA\K08096.D
Acq On : 9 Nov 2003 5:19 pm
Sample : b3k0154-30
Misc : w NWdx
IntFile : SURR.E
Quant Time: Nov 10 6:25 2003 Quant Results File: K0703A5F.RES

Vial: 61
Operator: EJE
Inst : GC #5
Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\K0703A5F.M (Chemstation Integrator)
Title : TPH-D Front Method
Last Update : Fri Nov 07 16:36:27 2003
Response via : Multiple Level Calibration
DataAcq Meth : J2303T5F.M

Volume Inj. :
Signal Phase :
Signal Info :

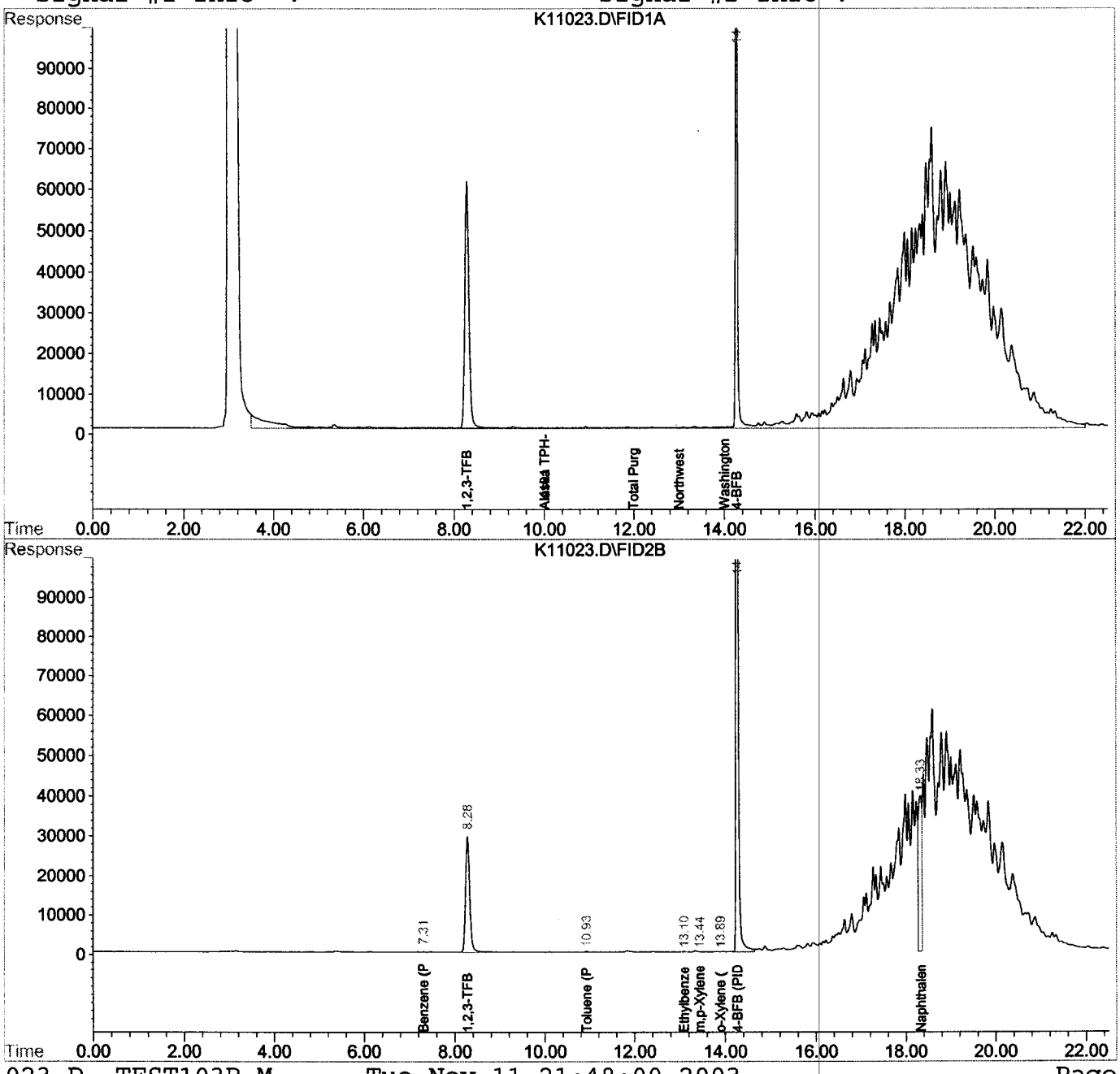


Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11023.D\FID1A.CH Vial: 23
Signal #2 : D:\HPCHEM\1\DATA\111103\K11023.D\FID2B.CH
Acq On : 11 Nov 2003 21:24 Operator: sk
Sample : b3k0154-06 r1 Inst : GC #10
Misc : 1x 100 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 21:47 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

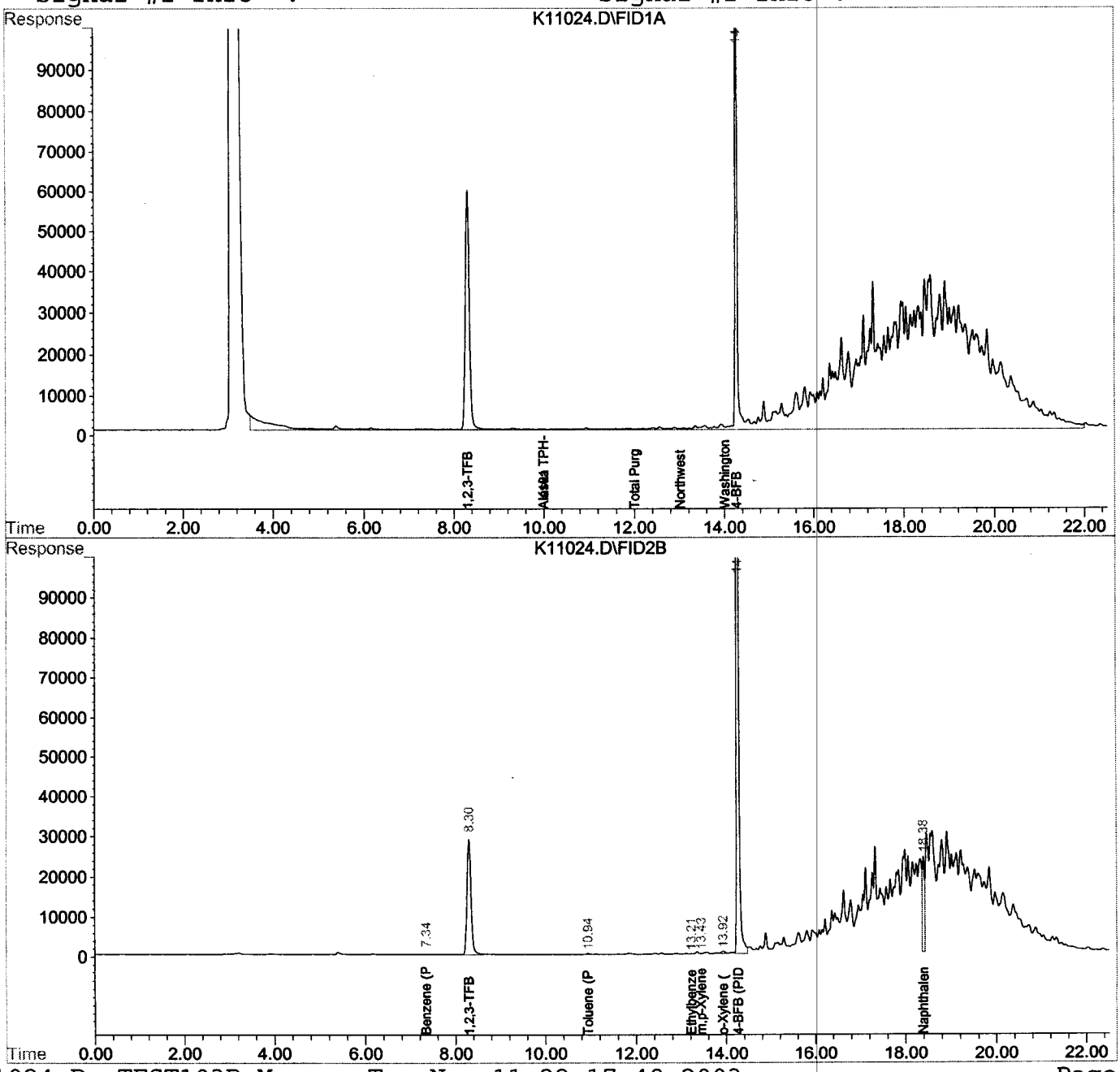


Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11024.D\FID1A.CH Vial: 24
Signal #2 : D:\HPCHEM\1\DATA\111103\K11024.D\FID2B.CH
Acq On : 11 Nov 2003 21:54 Operator: sk
Sample : b3k0154-07 r1 Inst : GC #10
Misc : 1x 100 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 22:17 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

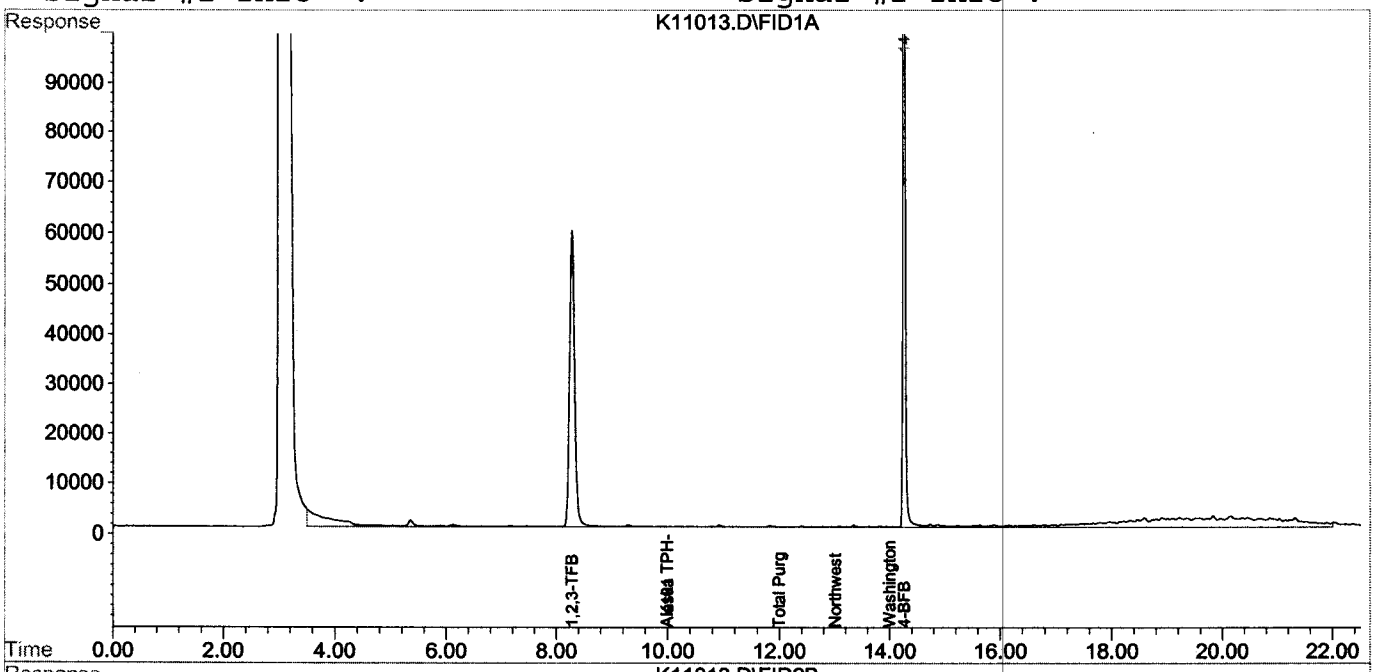


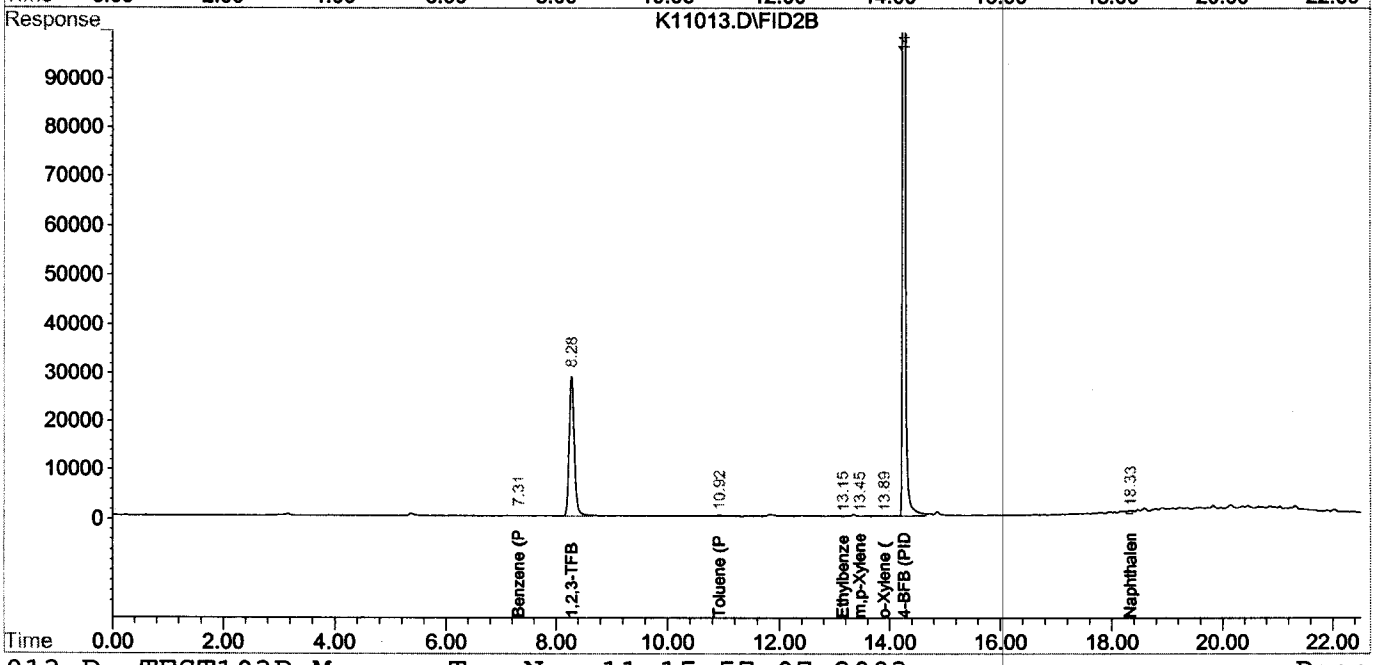
Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11013.D\FID1A.CH Vial: 13
Signal #2 : D:\HPCHEM\1\DATA\111103\K11013.D\FID2B.CH
Acq On : 11 Nov 2003 15:34 Operator: sk
Sample : b3k0154-08 Inst : GC #10
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 15:57 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



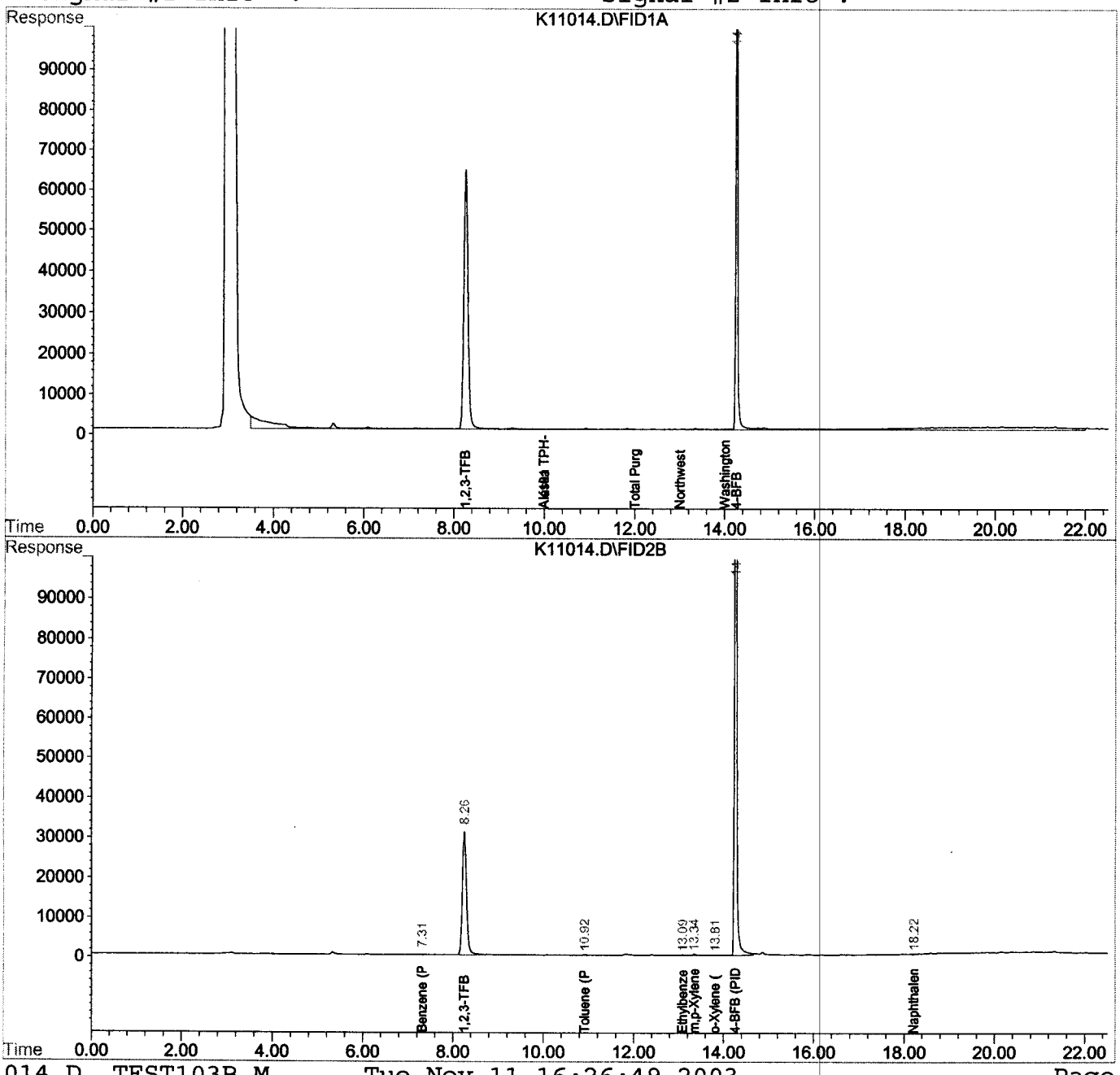


Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11014.D\FID1A.CH Vial: 14
Signal #2 : D:\HPCHEM\1\DATA\111103\K11014.D\FID2B.CH
Acq On : 11 Nov 2003 16:03 Operator: sk
Sample : b3k0154-10 Inst : GC #10
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 16:26 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

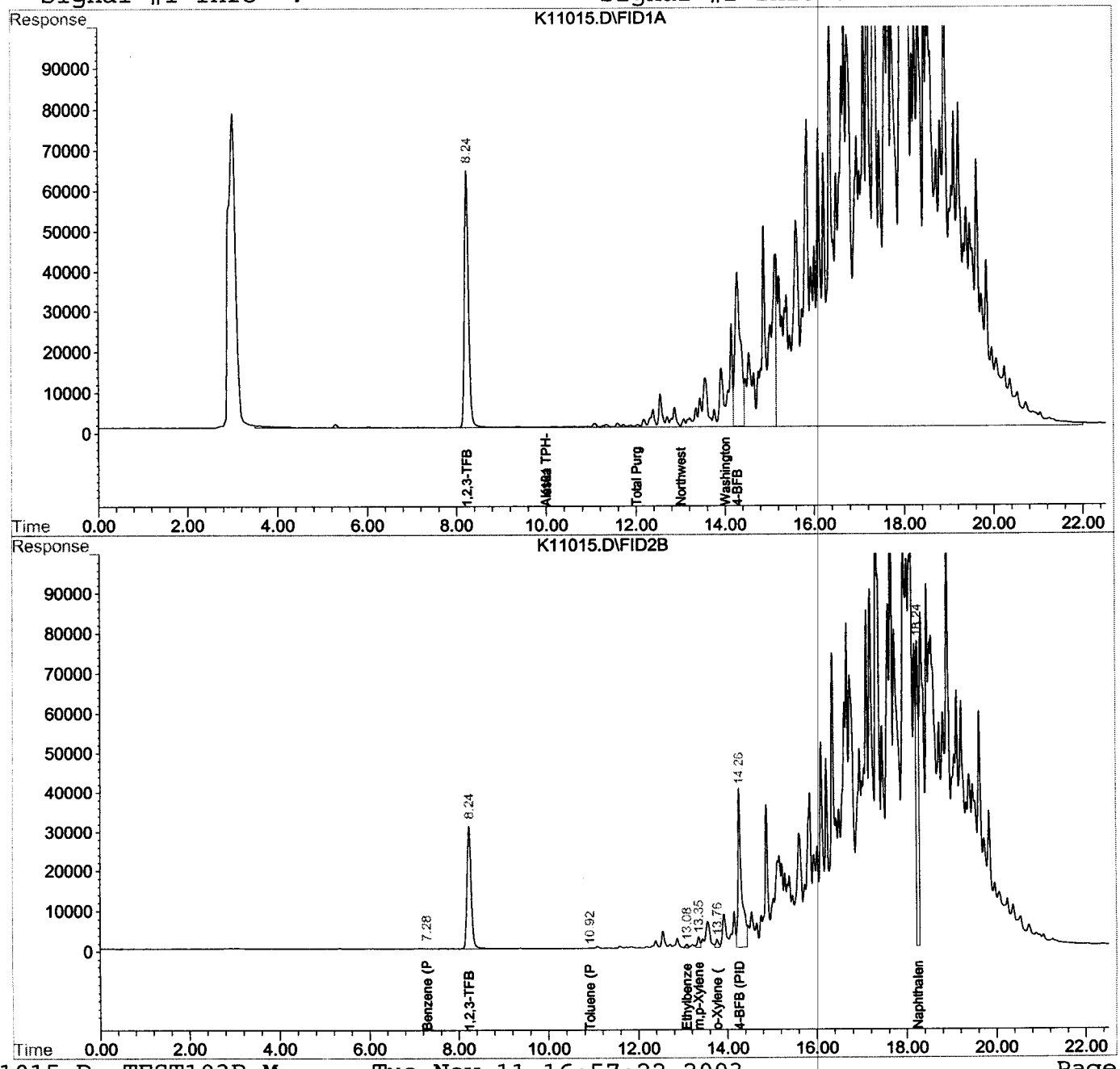


Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11015.D\FID1A.CH Vial: 15
Signal #2 : D:\HPCHEM\1\DATA\111103\K11015.D\FID2B.CH
Acq On : 11 Nov 2003 16:34 Operator: sk
Sample : b3k0154-11 Inst : GC #10
Misc : 10x 10 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 16:57 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

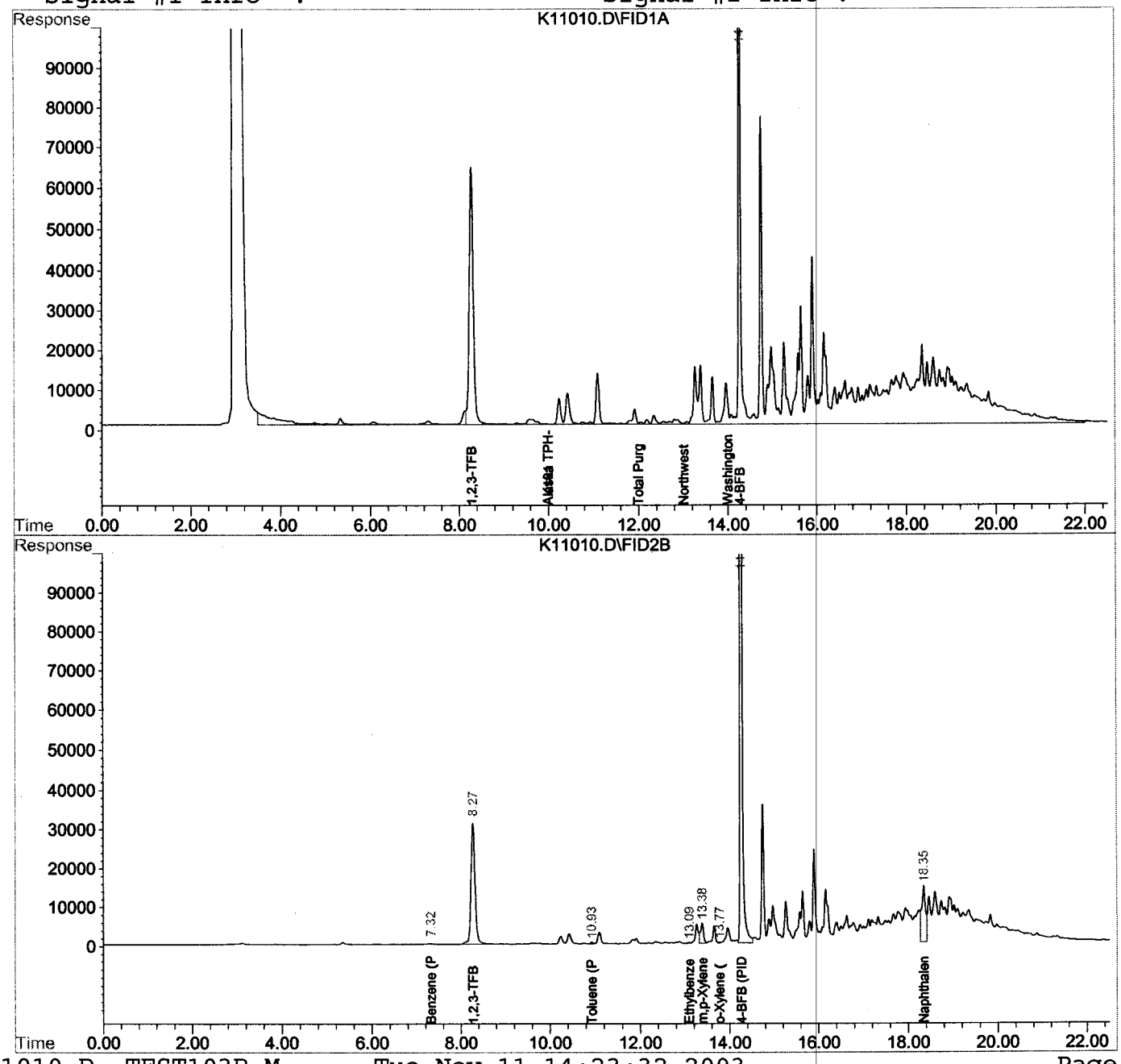


Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11010.D\FID1A.CH Vial: 10
Signal #2 : D:\HPCHEM\1\DATA\111103\K11010.D\FID2B.CH
Acq On : 11 Nov 2003 14:00 Operator: sk
Sample : b3k0154-13 Inst : GC #10
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 14:23 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

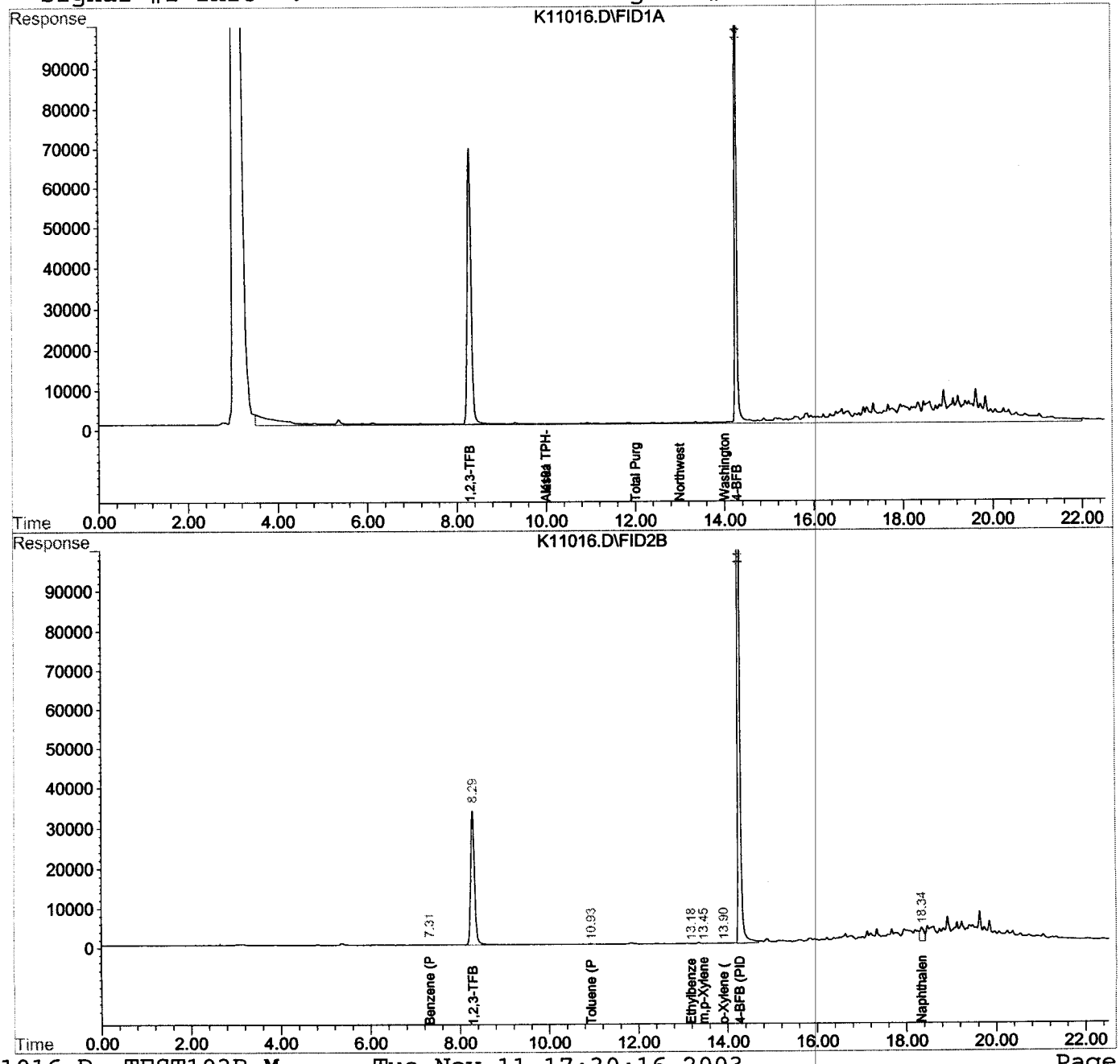


Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11016.D\FID1A.CH Vial: 16
Signal #2 : D:\HPCHEM\1\DATA\111103\K11016.D\FID2B.CH
Acq On : 11 Nov 2003 17:07 Operator: sk
Sample : b3k0154-14 Inst : GC #10
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 17:30 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

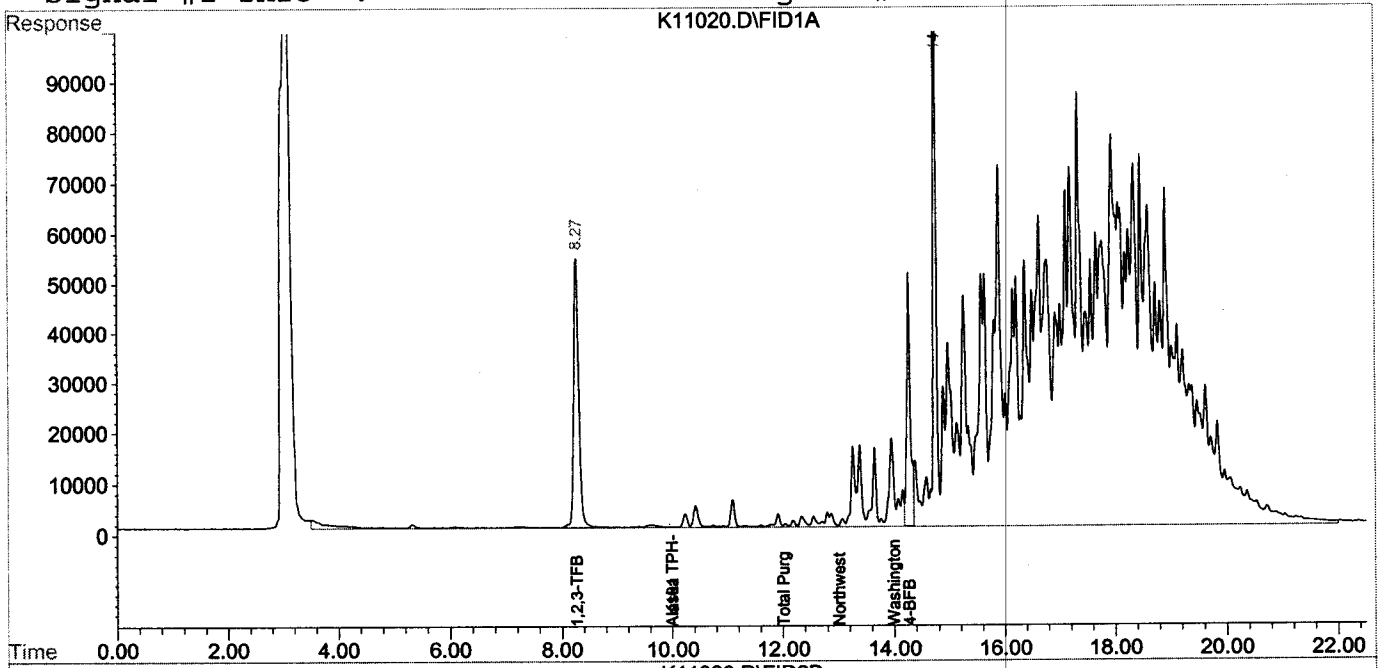


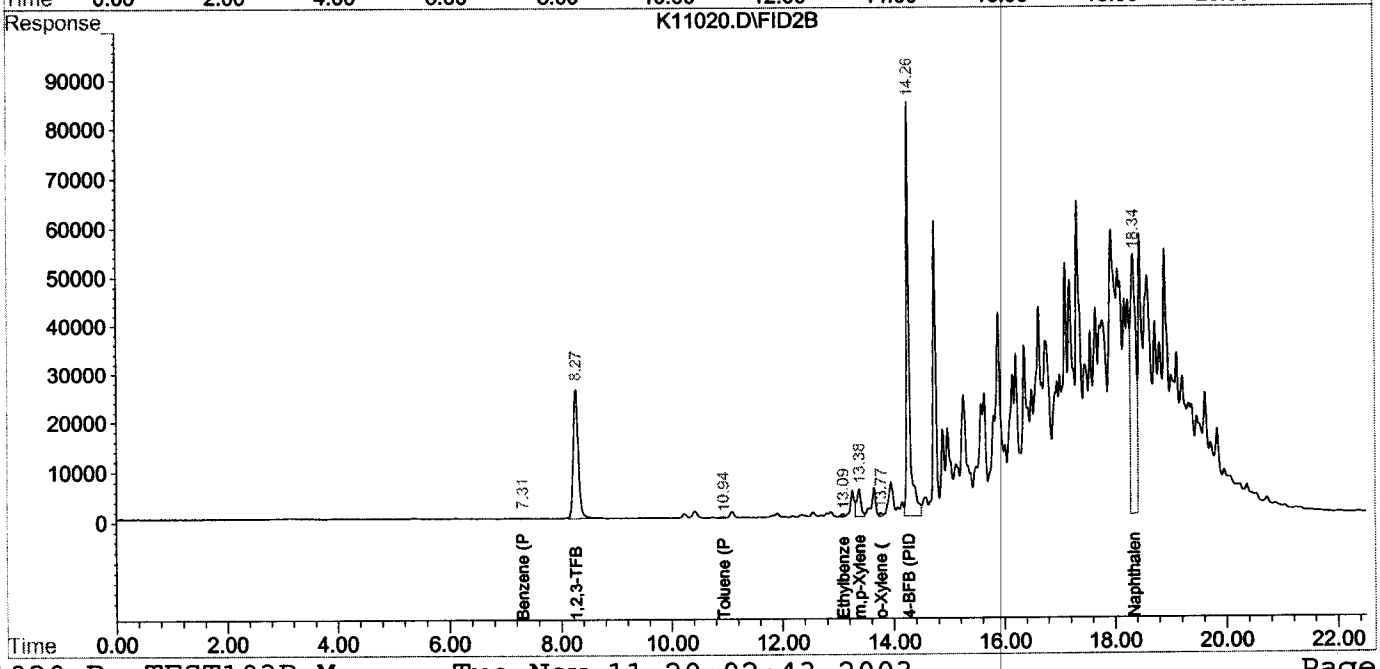
Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11020.D\FID1A.CH Vial: 20
Signal #2 : D:\HPCHEM\1\DATA\111103\K11020.D\FID2B.CH
Acq On : 11 Nov 2003 19:39 Operator: sk
Sample : b3k0154-15 Inst : GC #10
Misc : 4x 25 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 20:02 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



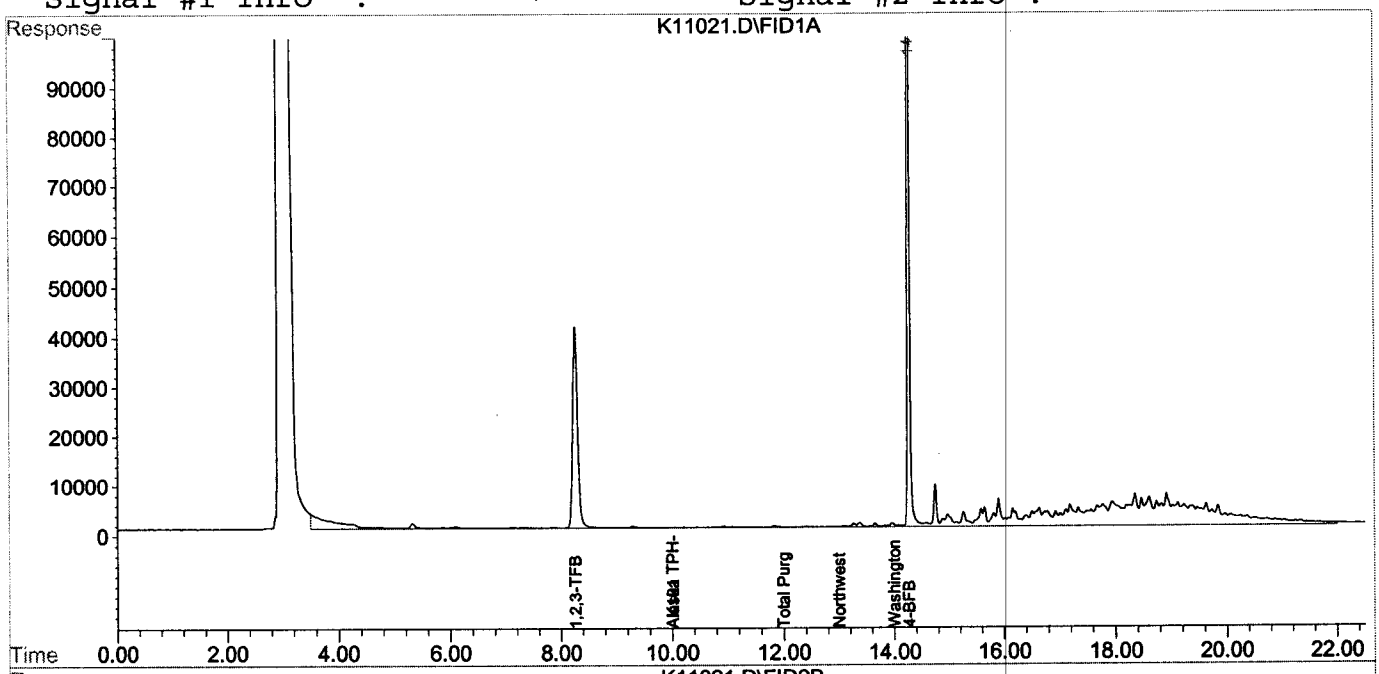


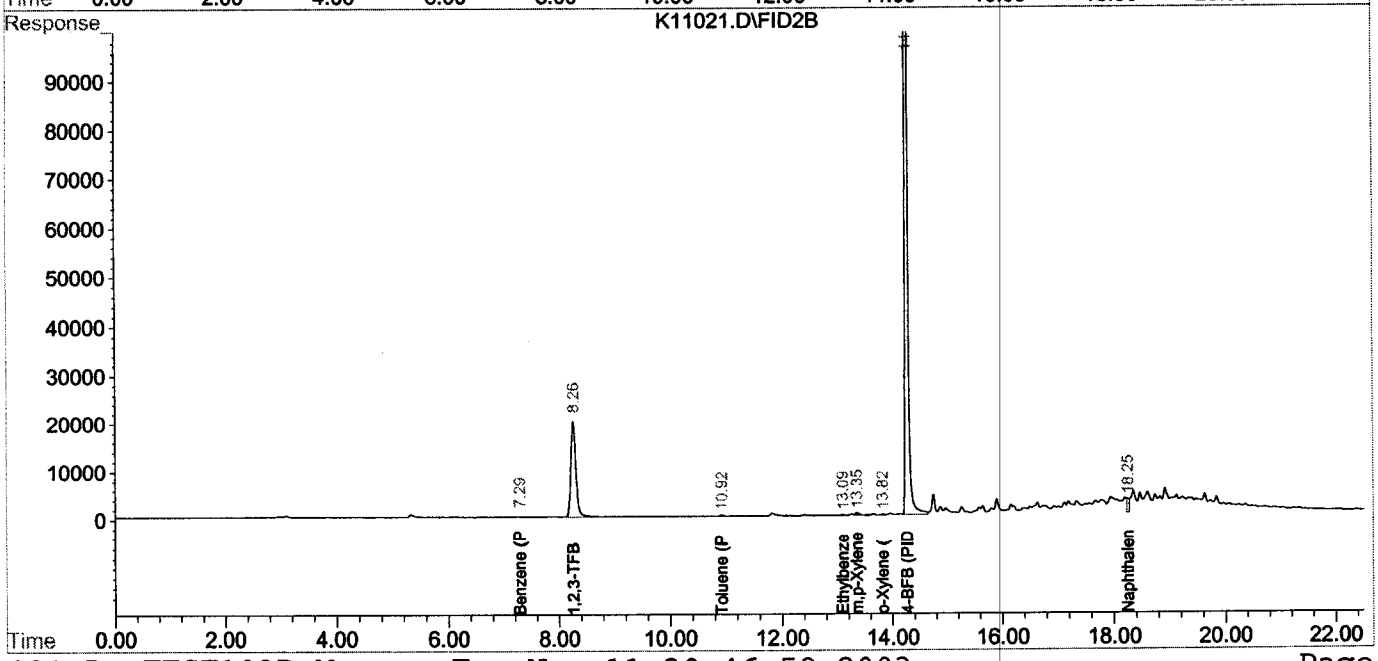
Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11021.D\FID1A.CH Vial: 21
Signal #2 : D:\HPCHEM\1\DATA\111103\K11021.D\FID2B.CH
Acq On : 11 Nov 2003 20:24 Operator: sk
Sample : b3k0154-16 Inst : GC #10
Misc : 1x 100 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 20:46 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



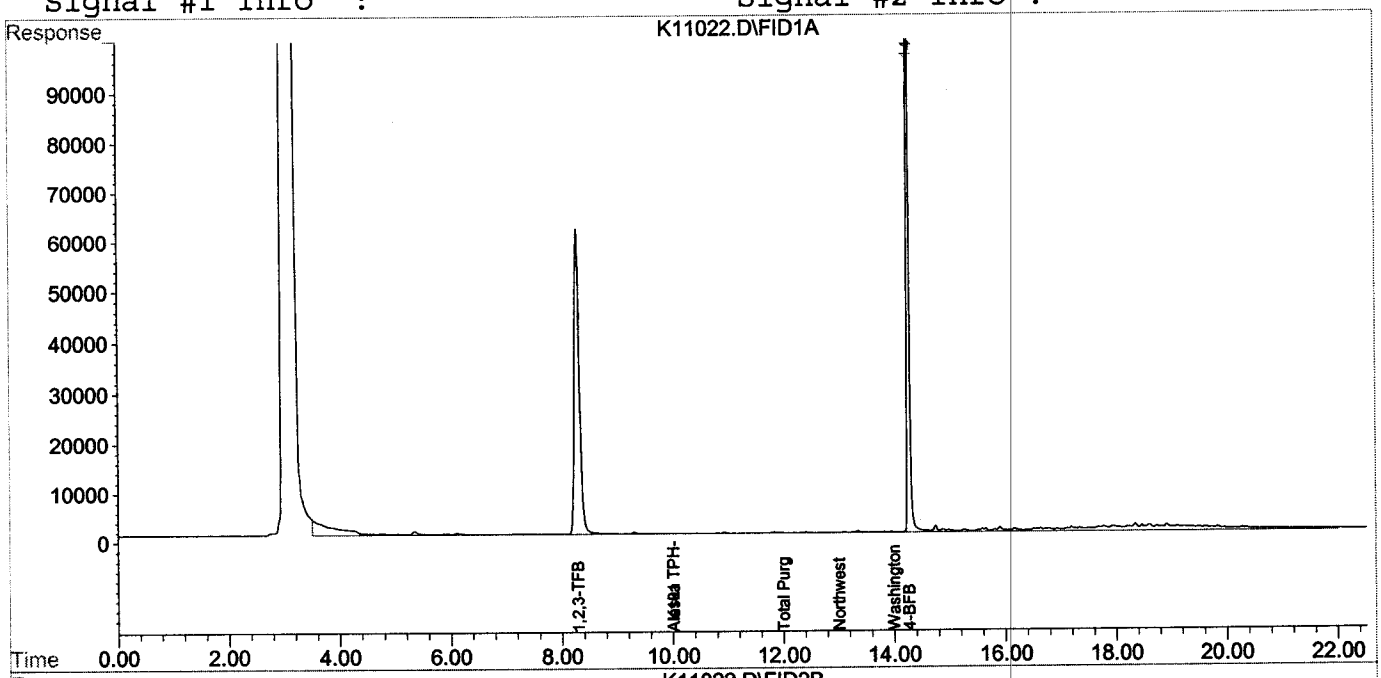


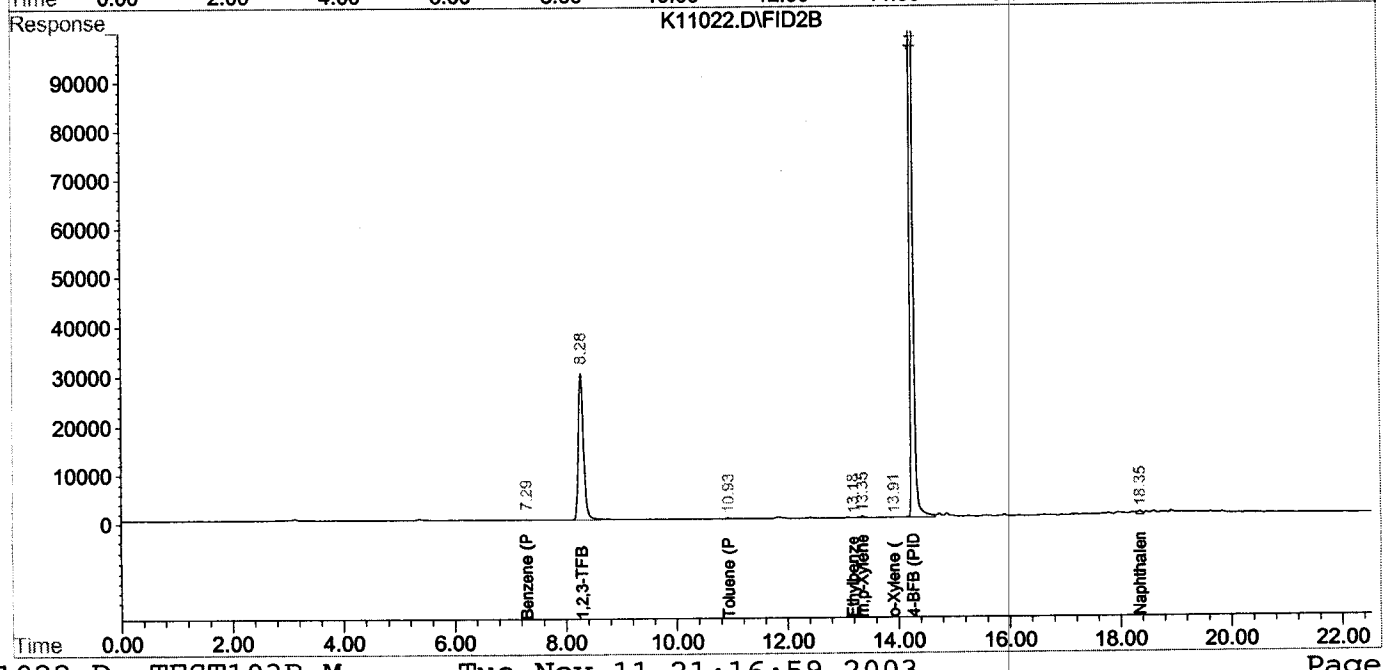
Quantitation Report

Signal #1 : D:\HPCHEM\1\DATA\111103\K11022.D\FID1A.CH Vial: 22
Signal #2 : D:\HPCHEM\1\DATA\111103\K11022.D\FID2B.CH
Acq On : 11 Nov 2003 20:54 Operator: sk
Sample : b3k0154-17 Inst : GC #10
Misc : 1x 100 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 21:16 2003 Quant Results File: TEST103B.RES

Quant Method : D:\HPCHEM\1\METHODS\TEST103B.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 08:31:14 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



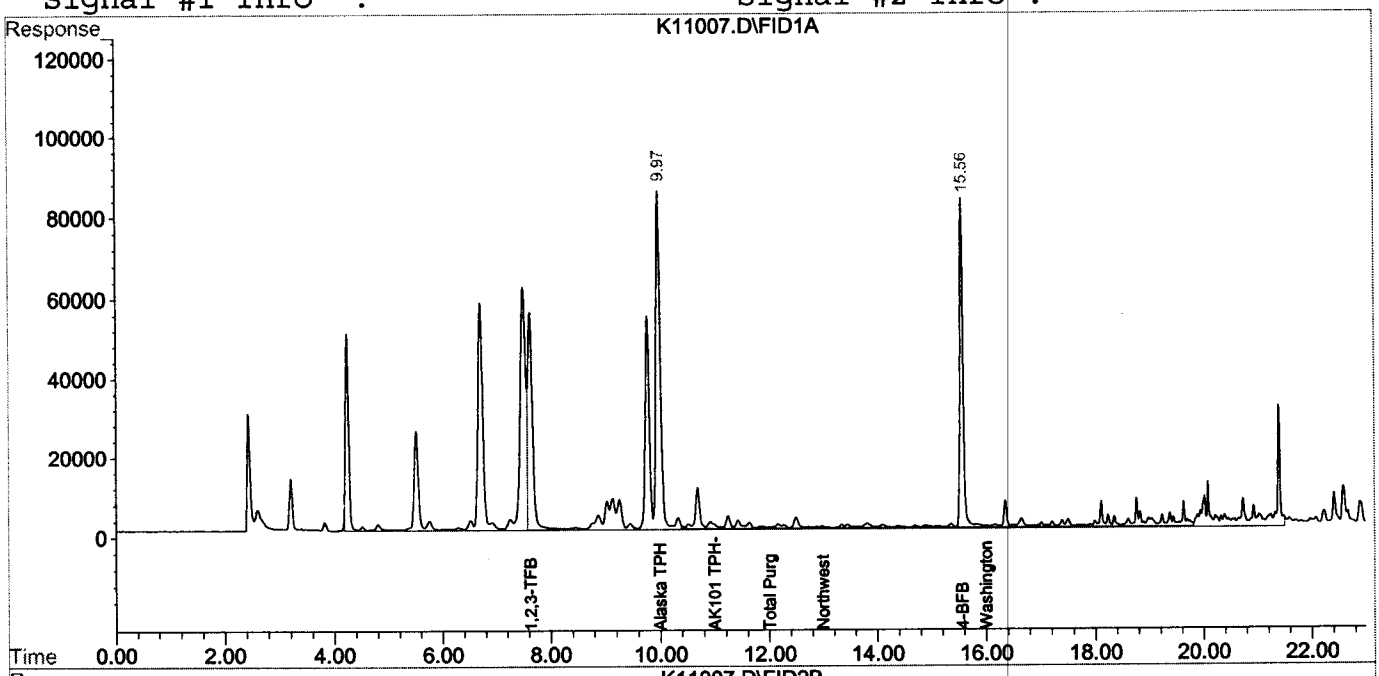


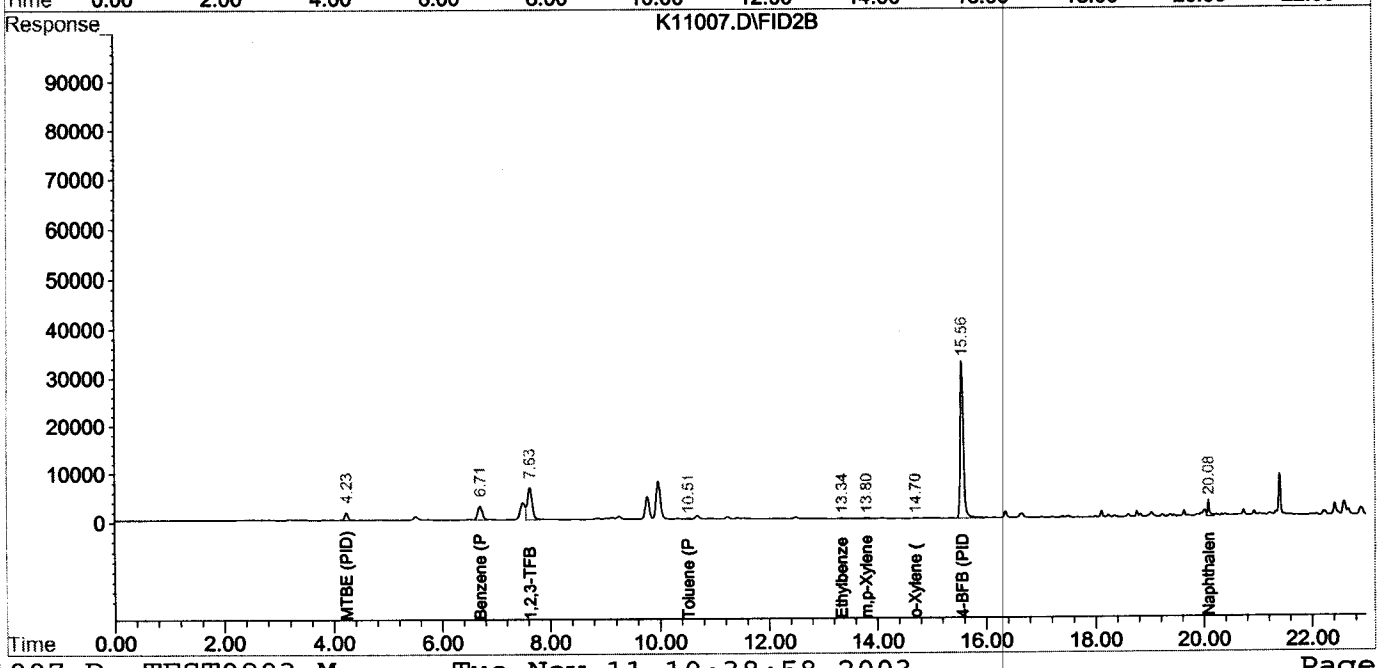
Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\111103\K11007.D\FID1A.CH Vial: 7
Signal #2 : C:\HPCHEM\1\DATA\111103\K11007.D\FID2B.CH
Acq On : 11 Nov 2003 10:14 Operator: sk
Sample : b3k0154-01 Inst : GC #2
Misc : 2x 2.5 mL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 10:38 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Mon Nov 10 17:42:09 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



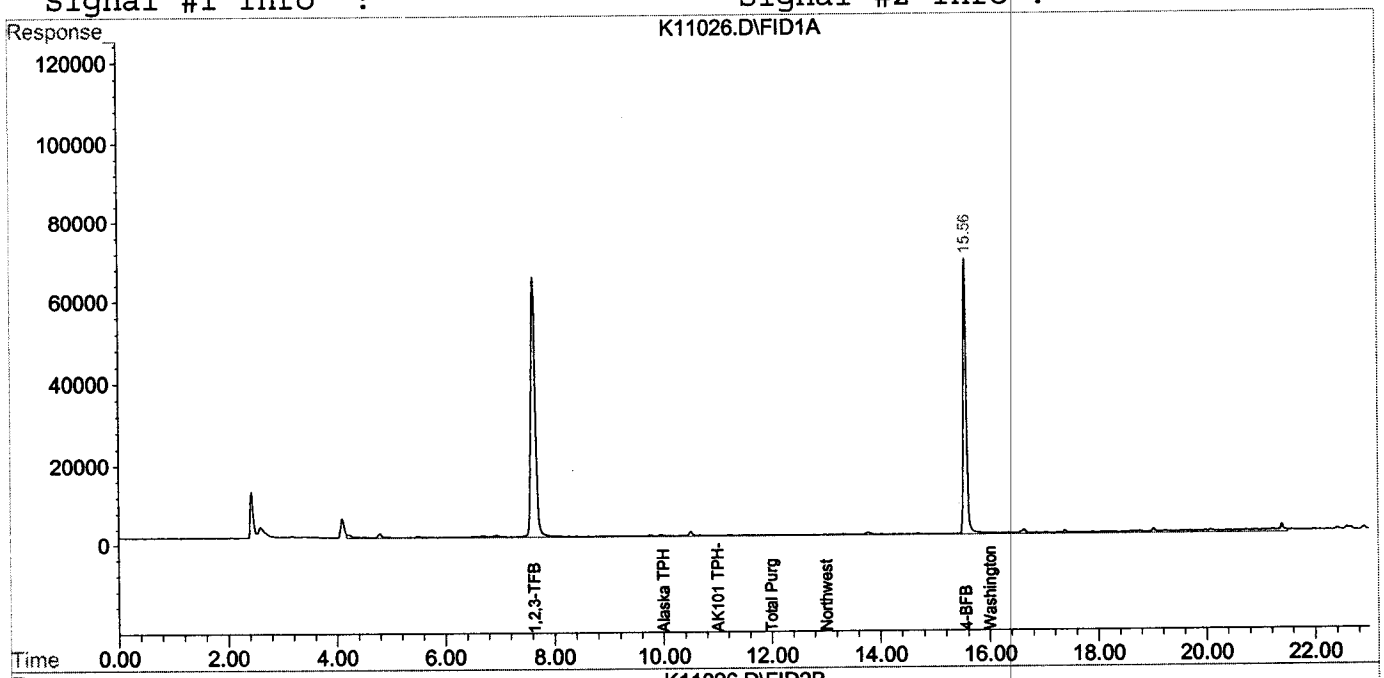


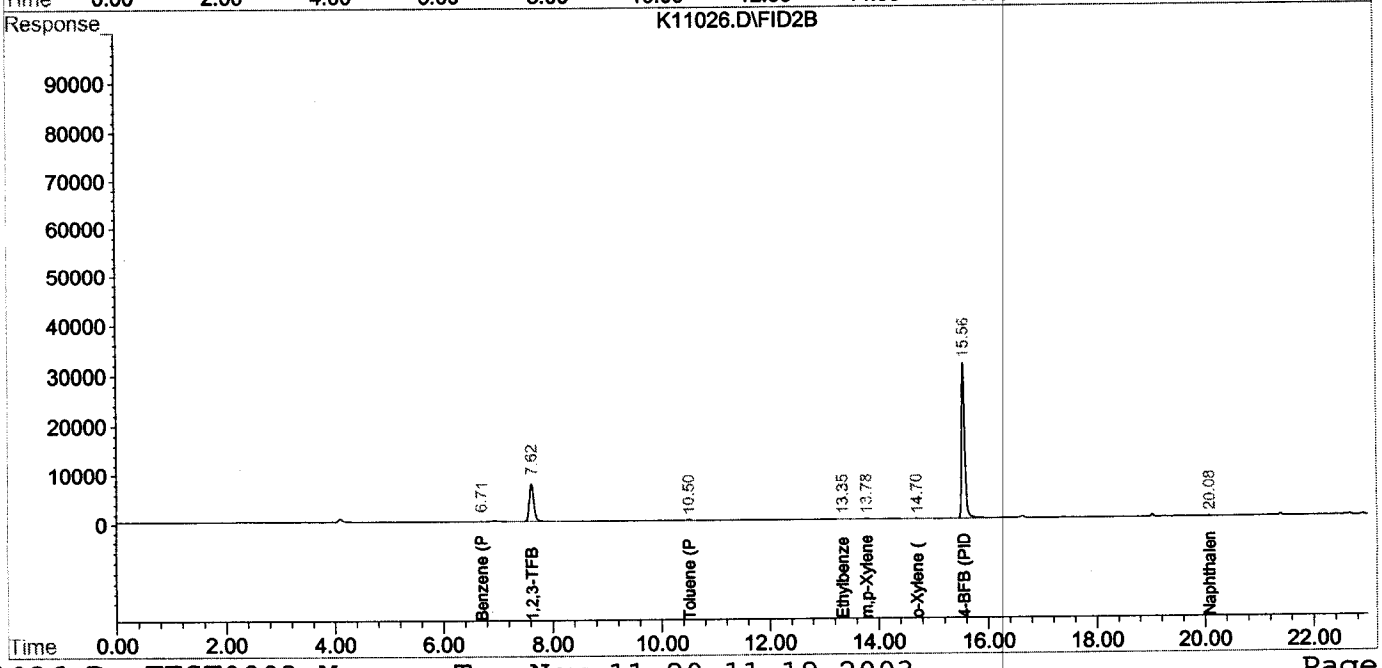
Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\111103\K11026.D\FID1A.CH Vial: 26
Signal #2 : C:\HPCHEM\1\DATA\111103\K11026.D\FID2B.CH
Acq On : 11 Nov 2003 19:47 Operator: sk
Sample : b3k0154-04 Inst : GC #2
Misc : 1x 5 ml TB Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 20:11 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Mon Nov 10 17:42:09 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



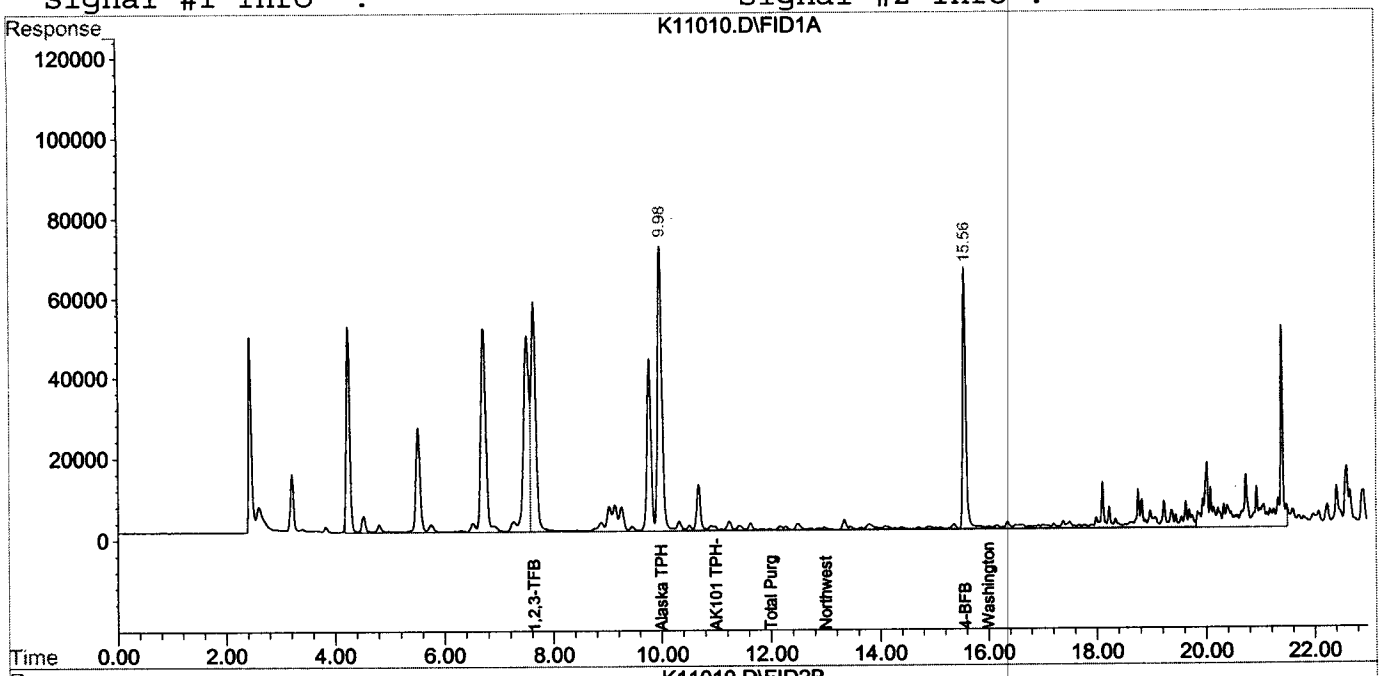


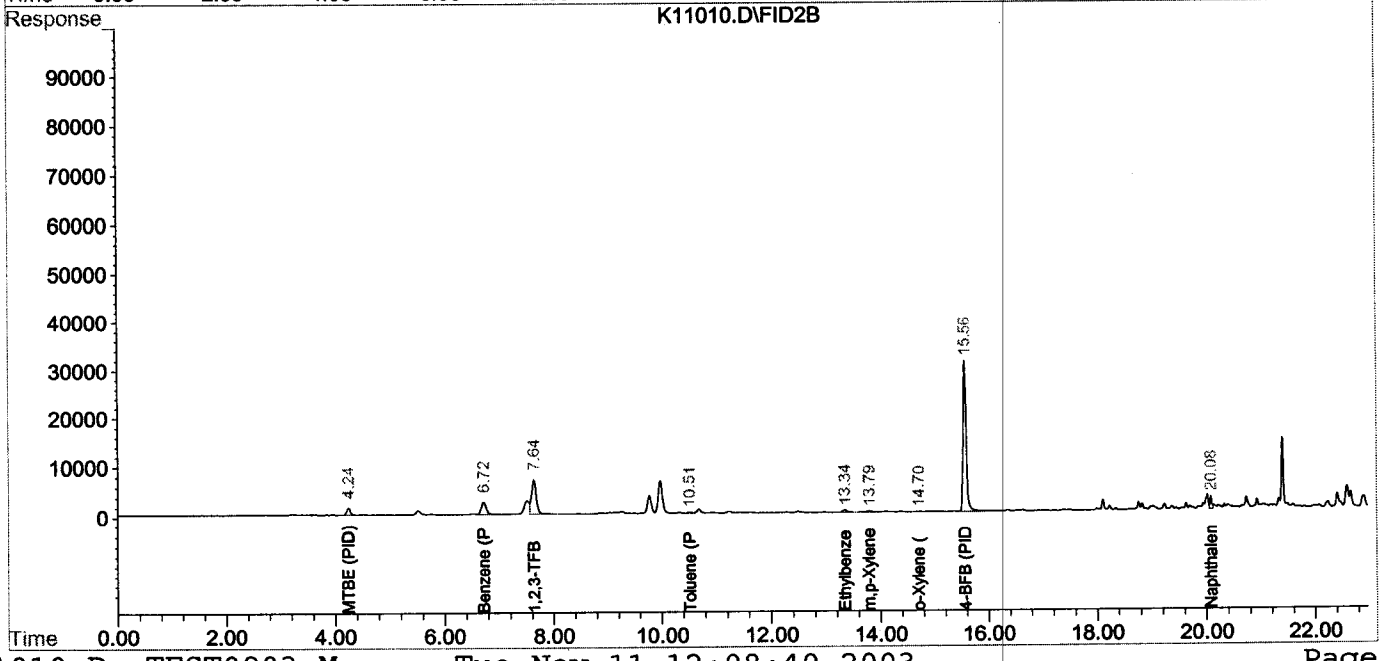
Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\111103\K11010.D\FID1A.CH Vial: 10
Signal #2 : C:\HPCHEM\1\DATA\111103\K11010.D\FID2B.CH
Acq On : 11 Nov 2003 11:45 Operator: sk
Sample : b3k0154-18 Inst : GC #2
Misc : 2x 2.5 mL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 12:08 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Mon Nov 10 17:42:09 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



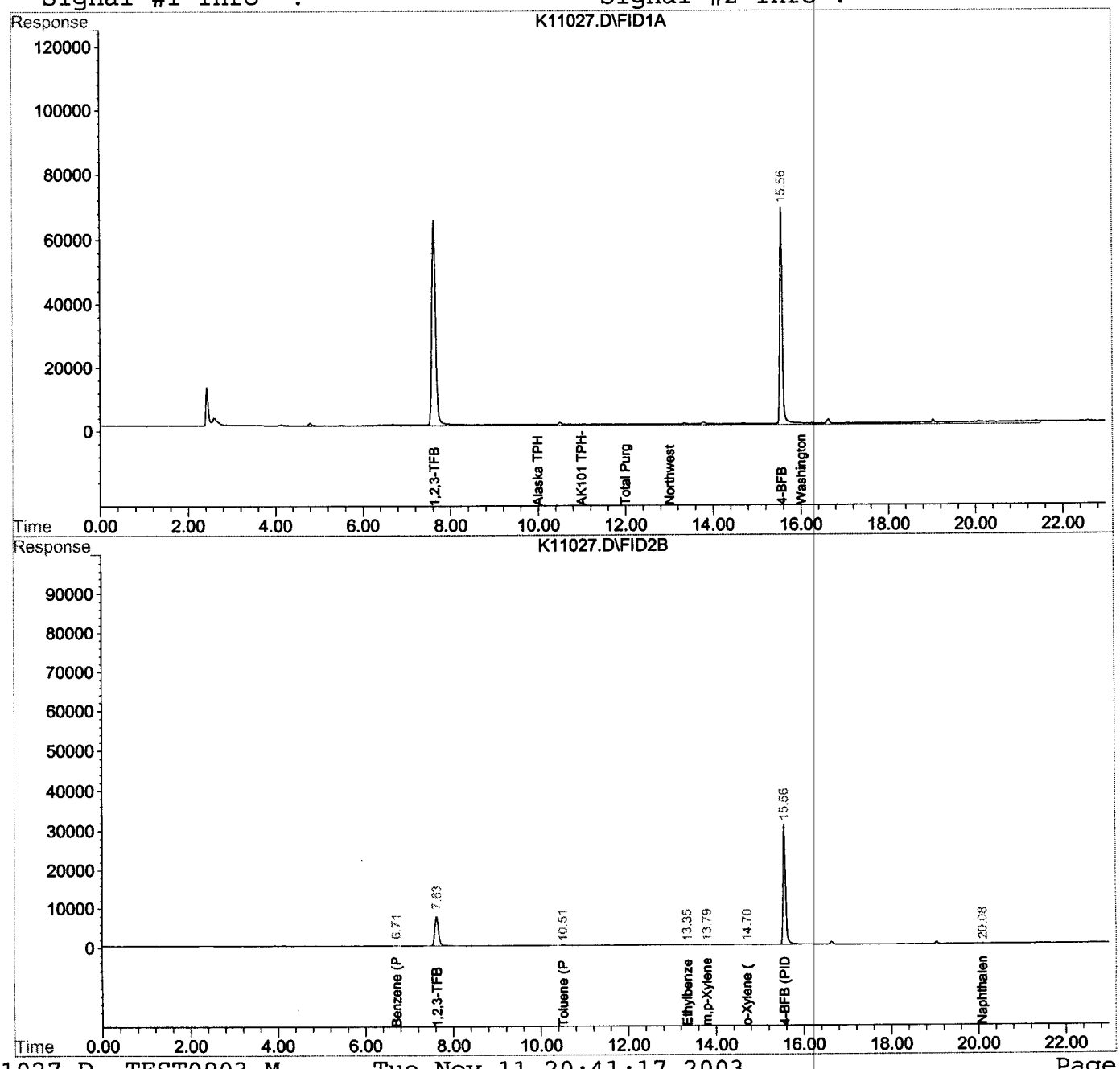


Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\111103\K11027.D\FID1A.CH Vial: 27
Signal #2 : C:\HPCHEM\1\DATA\111103\K11027.D\FID2B.CH
Acq On : 11 Nov 2003 20:17 Operator: sk
Sample : b3k0154-20 Inst : GC #2
Misc : 1x 5 ml TB Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 20:41 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Mon Nov 10 17:42:09 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

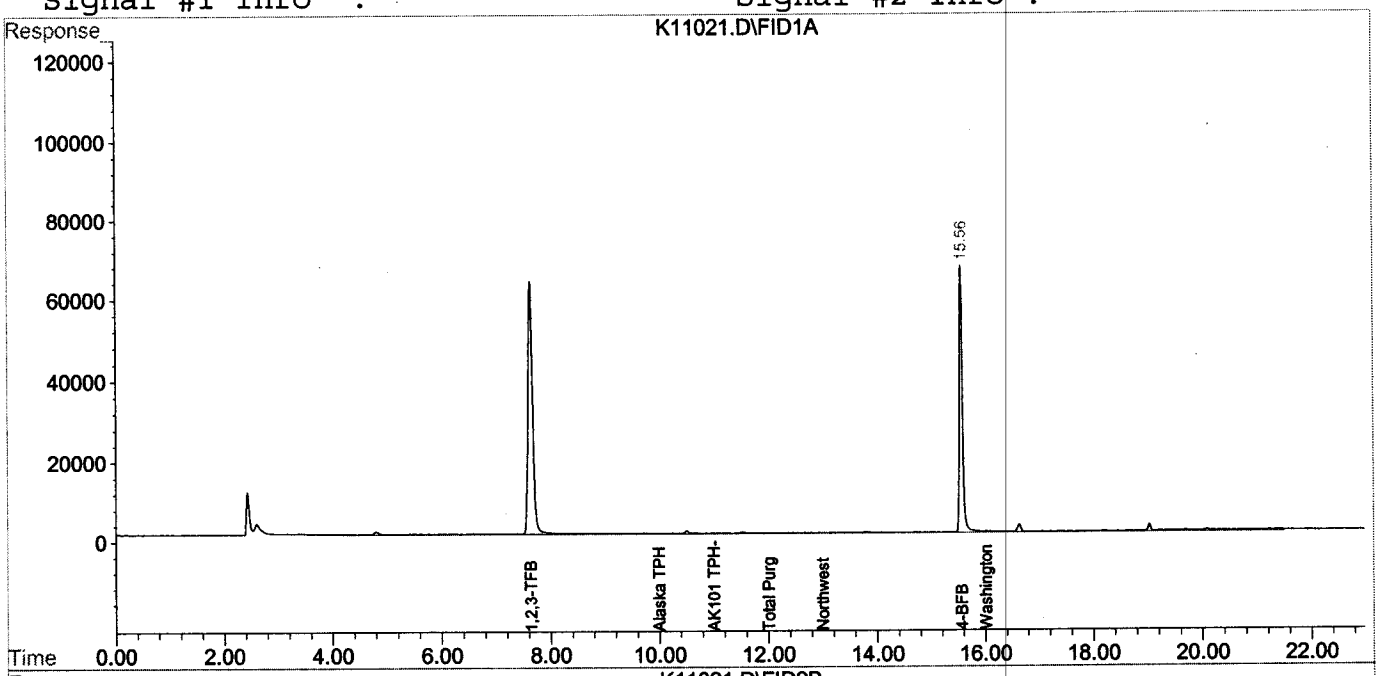


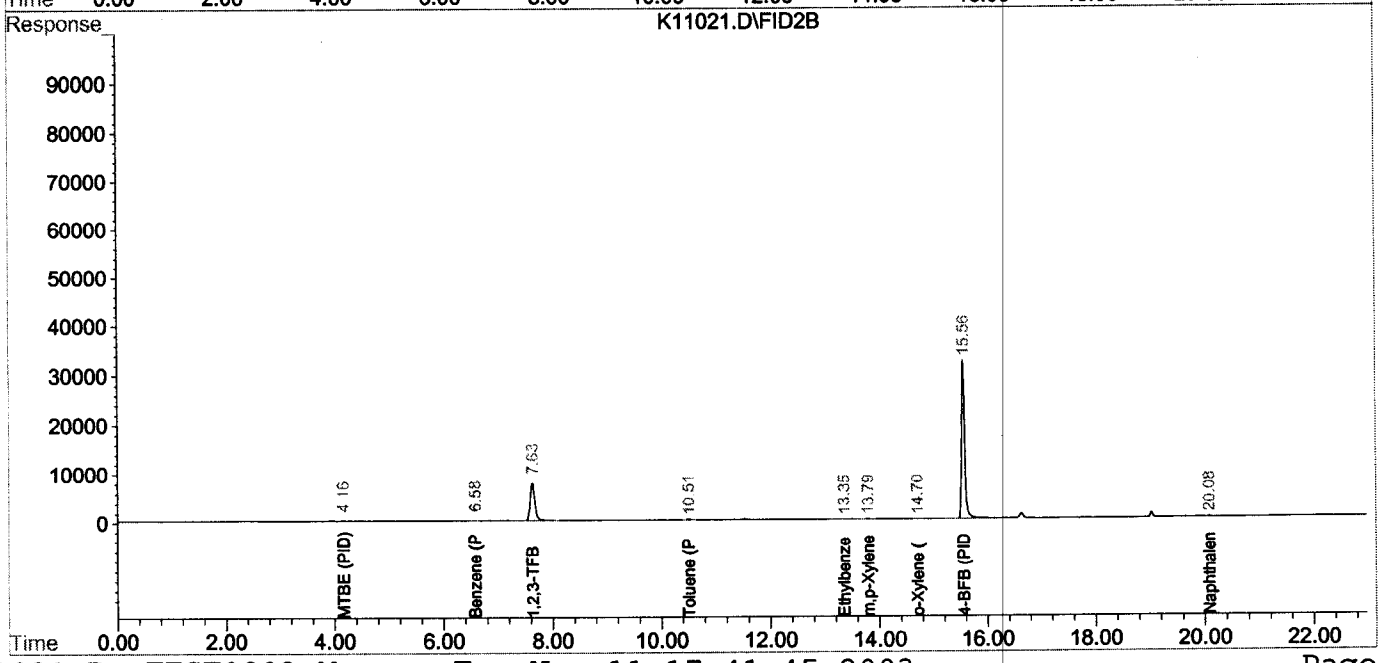
Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\111103\K11021.D\FID1A.CH Vial: 21
Signal #2 : C:\HPCHEM\1\DATA\111103\K11021.D\FID2B.CH
Acq On : 11 Nov 2003 17:18 Operator: sk
Sample : b3k0154-24 Inst : GC #2
Misc : 1x 5 mL TB Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 17:41 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Mon Nov 10 17:42:09 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



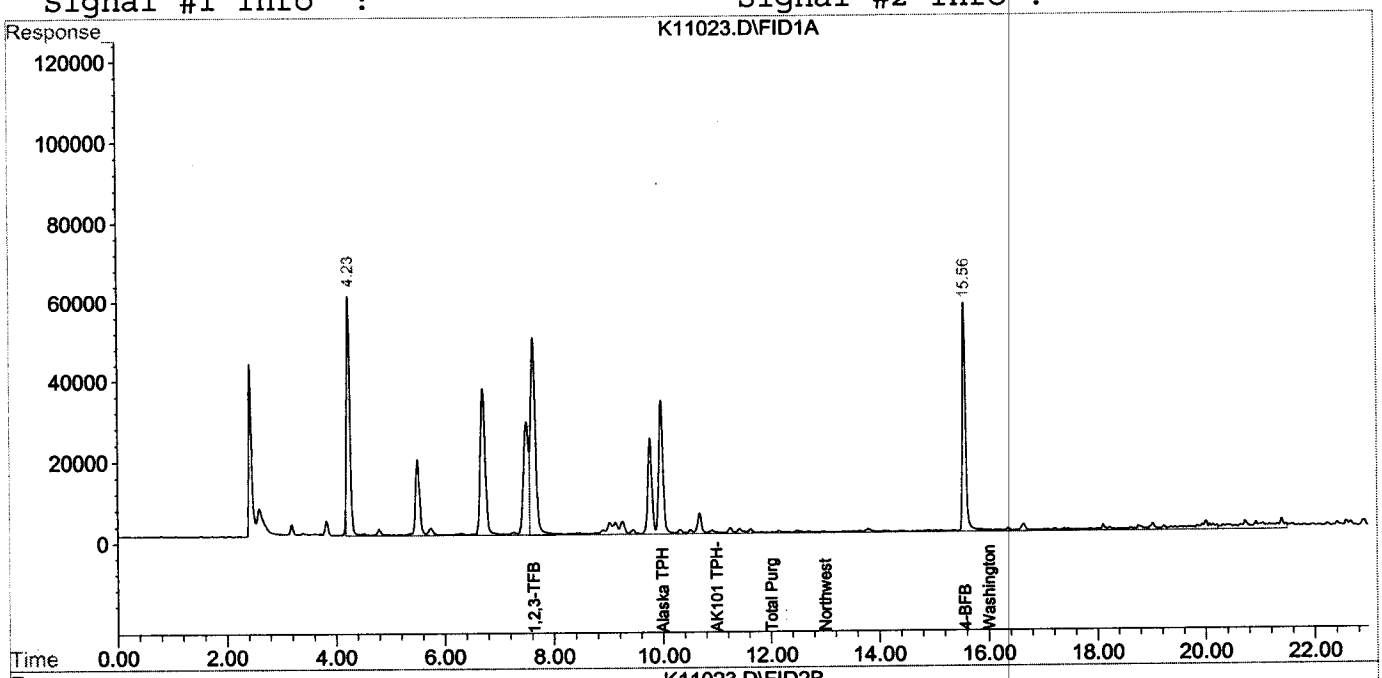


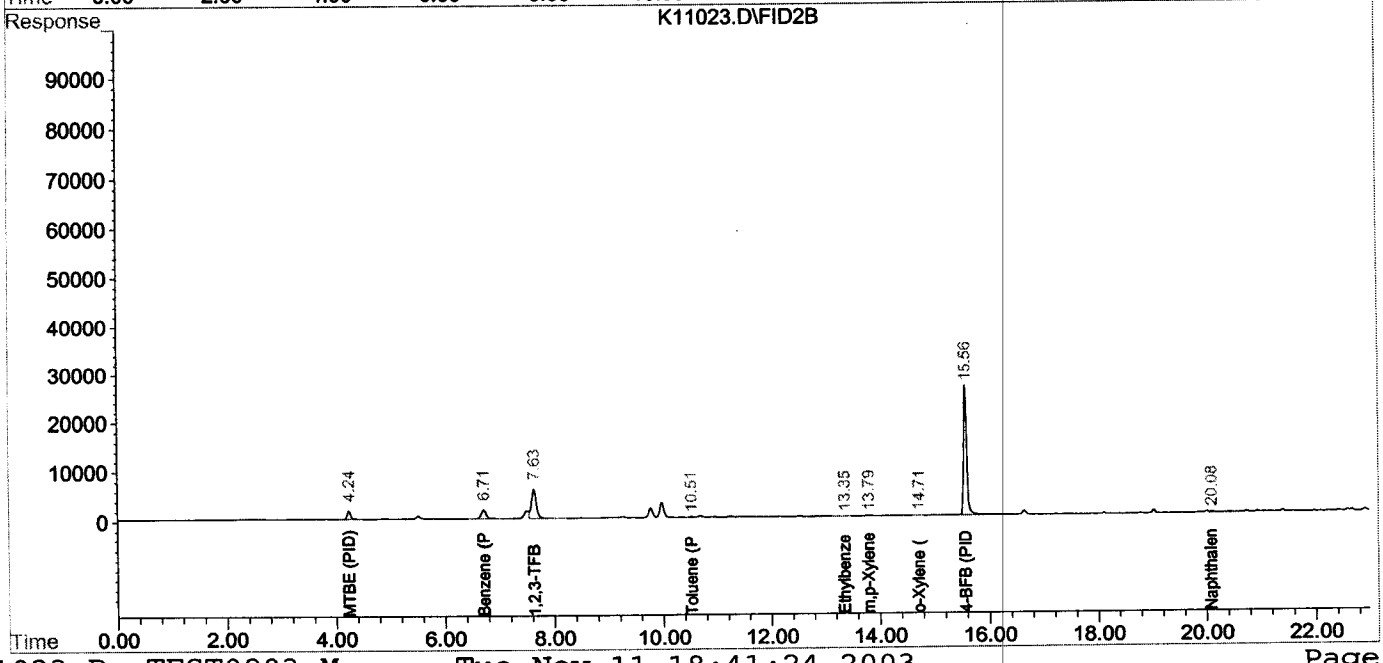
Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\111103\K11023.D\FID1A.CH Vial: 23
Signal #2 : C:\HPCHEM\1\DATA\111103\K11023.D\FID2B.CH
Acq On : 11 Nov 2003 18:18 Operator: sk
Sample : b3k0154-25 Inst : GC #2
Misc : 2x 2.5 mL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 18:41 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Mon Nov 10 17:42:09 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



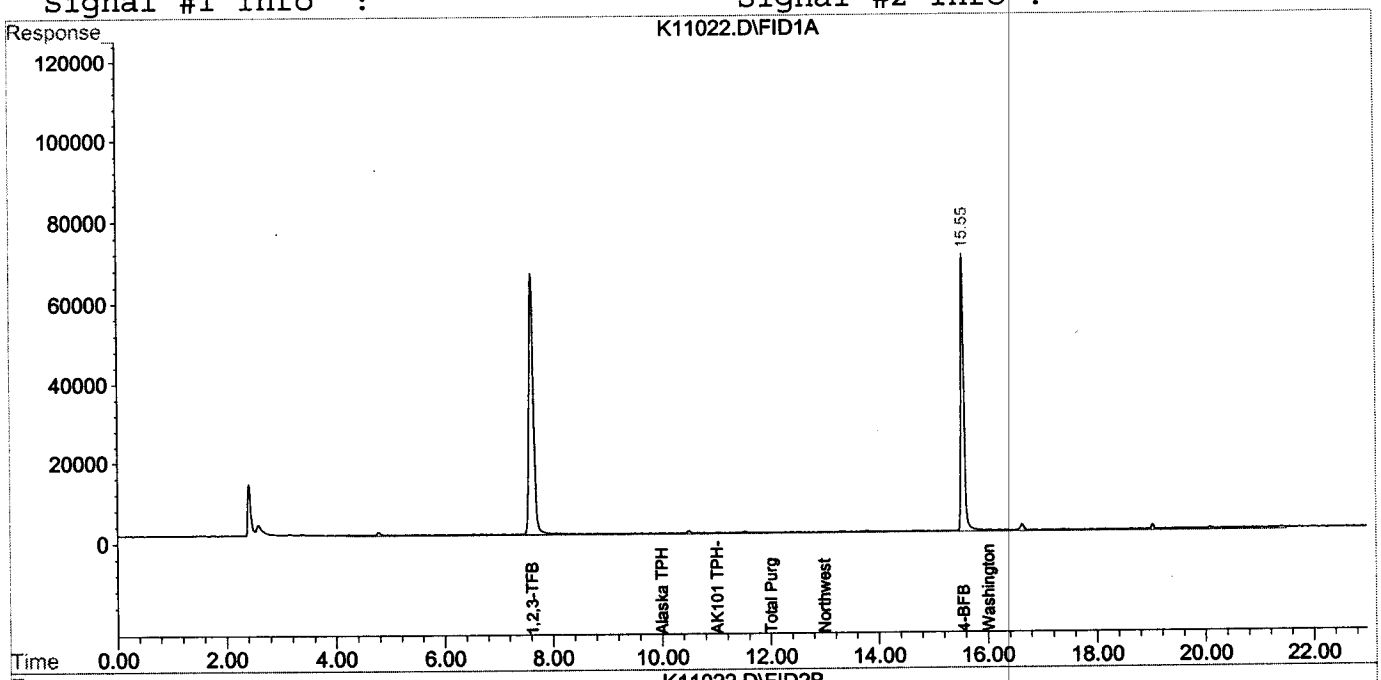


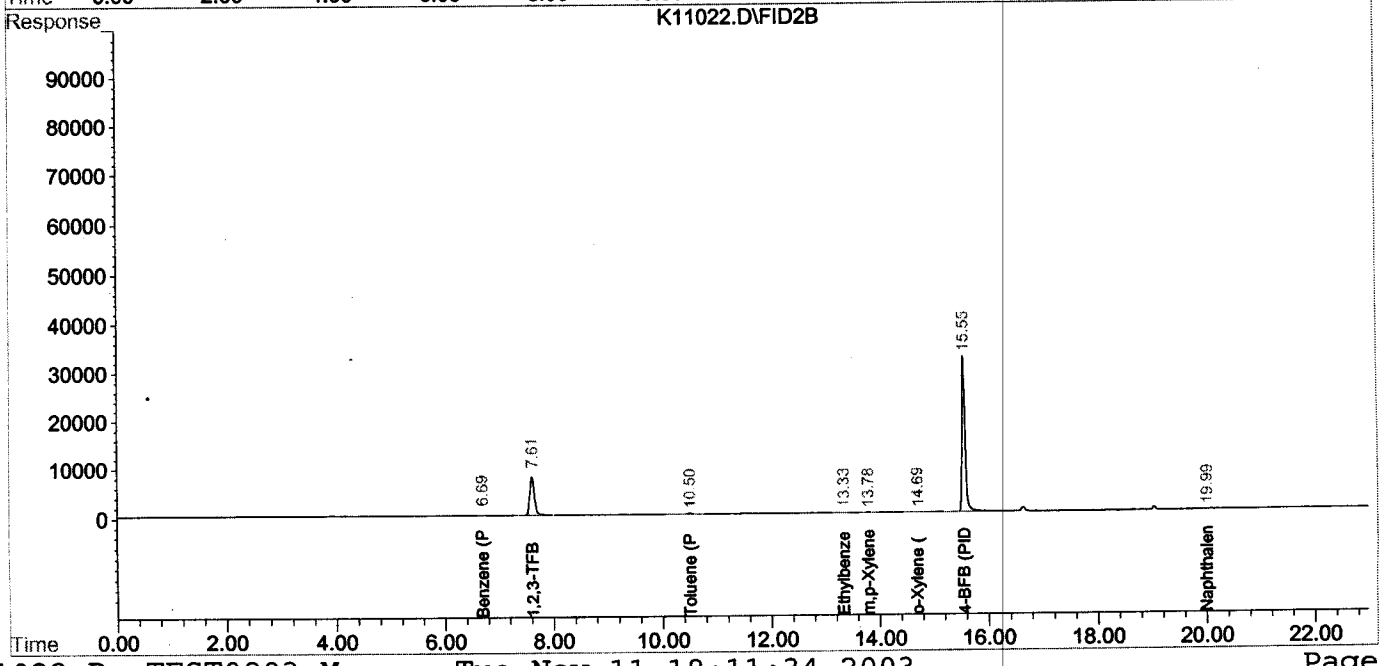
Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\111103\K11022.D\FID1A.CH Vial: 22
Signal #2 : C:\HPCHEM\1\DATA\111103\K11022.D\FID2B.CH
Acq On : 11 Nov 2003 17:48 Operator: sk
Sample : b3k0154-26 Inst : GC #2
Misc : 1x 5 mL TB Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 11 18:11 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Mon Nov 10 17:42:09 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



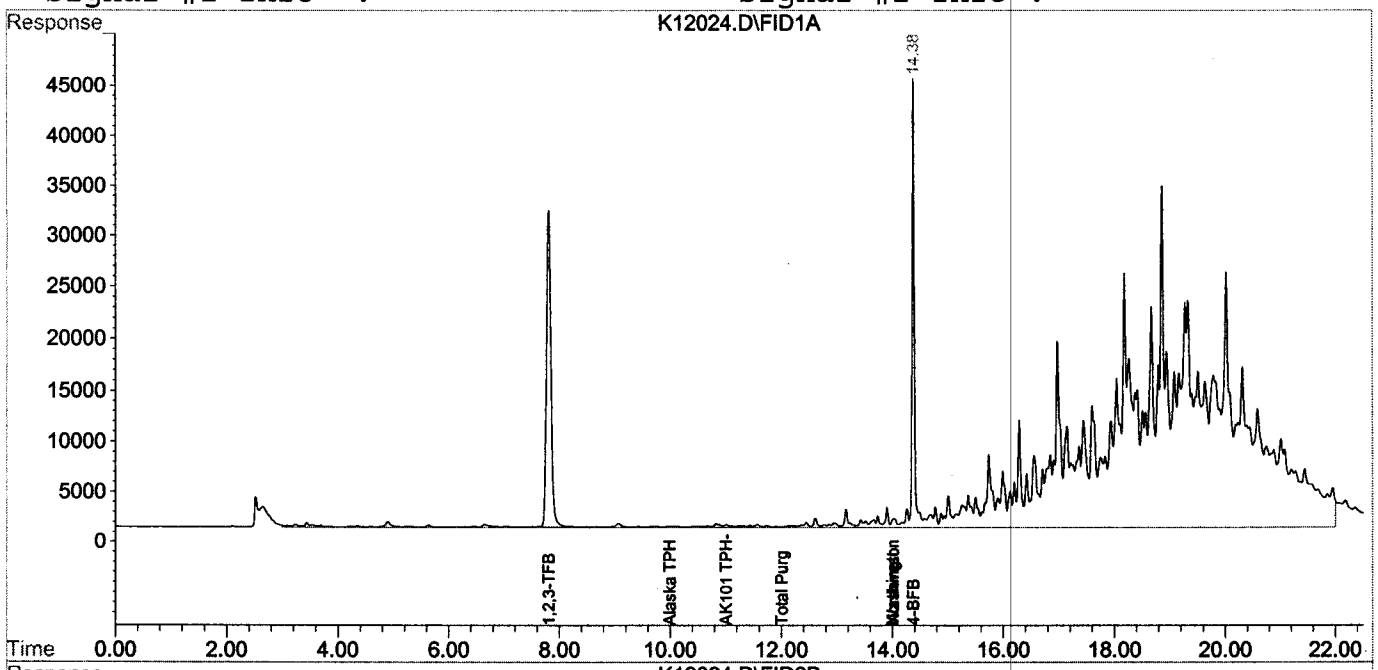


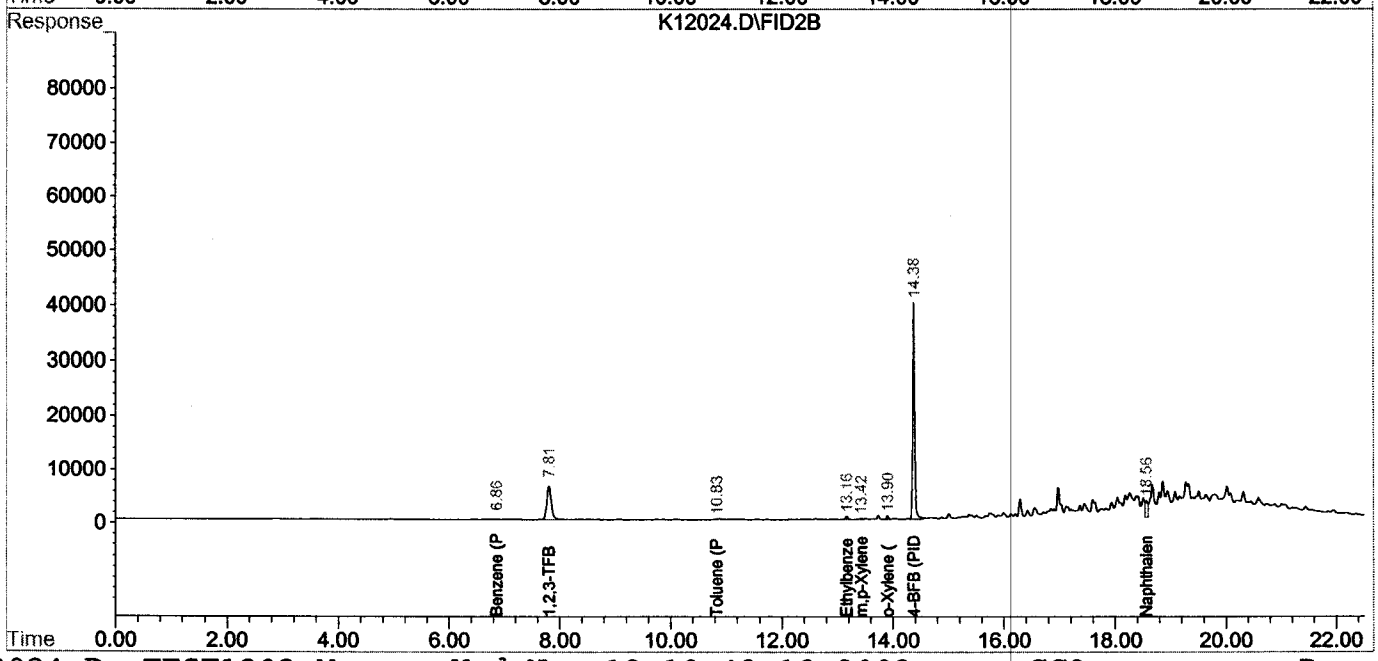
Quantitation Report

Signal #1 : D:\HPCHEM\4\DATA\111203\K12024.D\FID1A.CH Vial: 24
Signal #2 : D:\HPCHEM\4\DATA\111203\K12024.D\FID2B.CH
Acq On : 12 Nov 2003 18:19 Operator: sk
Sample : b3k0154-02 Inst : GC #8
Misc : 1x 5 ml Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 12 18:42 2003 Quant Results File: TEST1202.RES

Quant Method : D:\HPCHEM\4\METHODS\TEST1202.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 21:58:54 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST1202.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



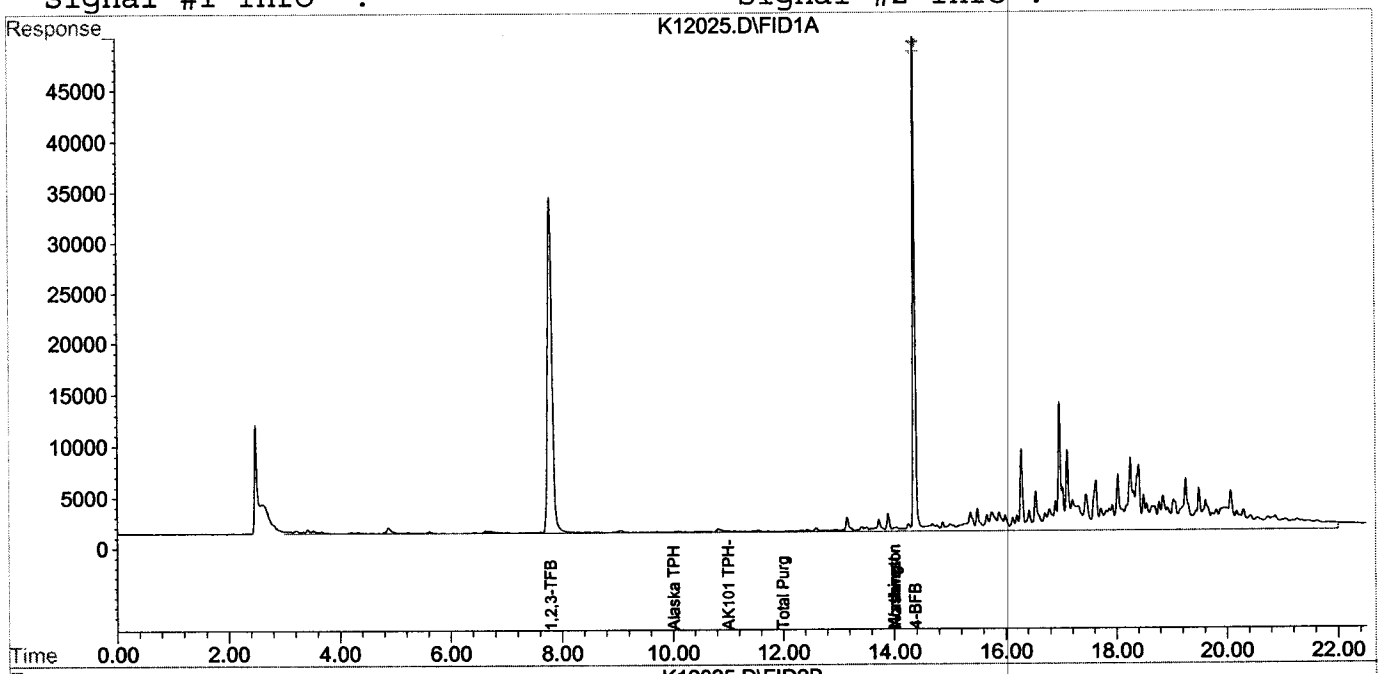


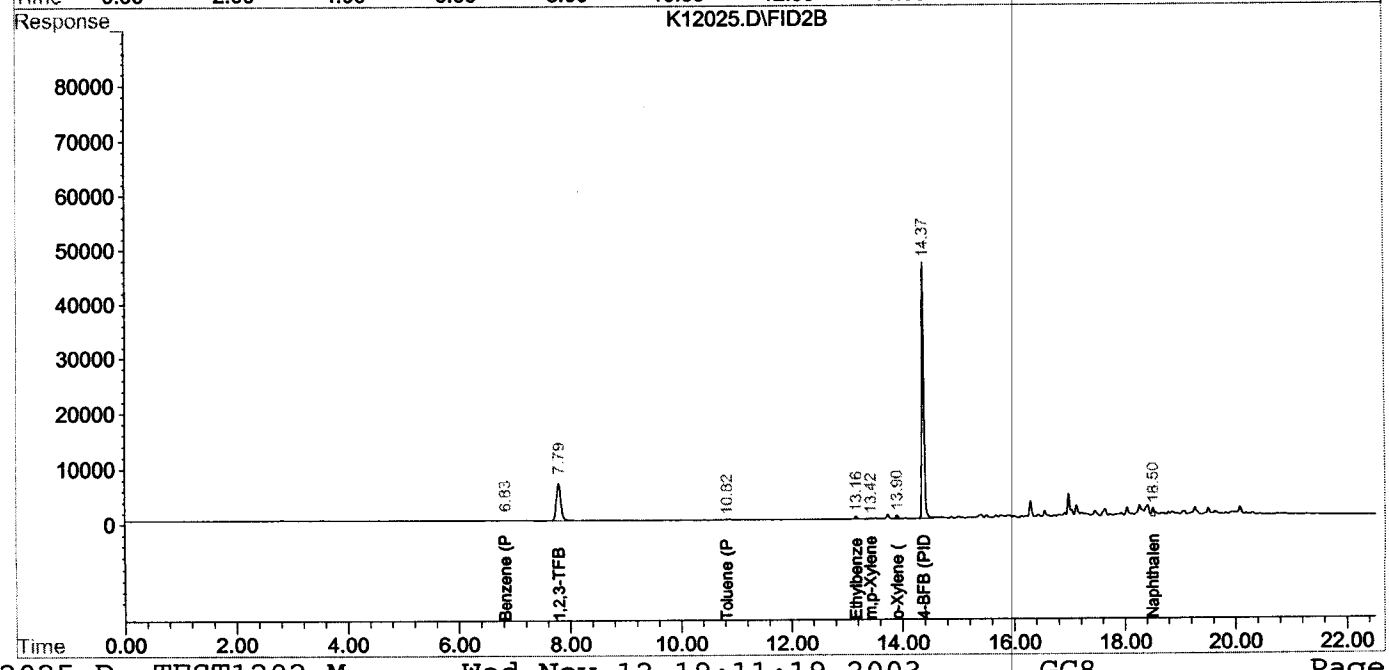
Quantitation Report

Signal #1 : D:\HPCHEM\4\DATA\111203\K12025.D\FID1A.CH Vial: 25
Signal #2 : D:\HPCHEM\4\DATA\111203\K12025.D\FID2B.CH
Acq On : 12 Nov 2003 18:48 Operator: sk
Sample : b3k0154-03 Inst : GC #8
Misc : 1x 5 ml Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 12 19:11 2003 Quant Results File: TEST1202.RES

Quant Method : D:\HPCHEM\4\METHODS\TEST1202.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 21:58:54 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST1202.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



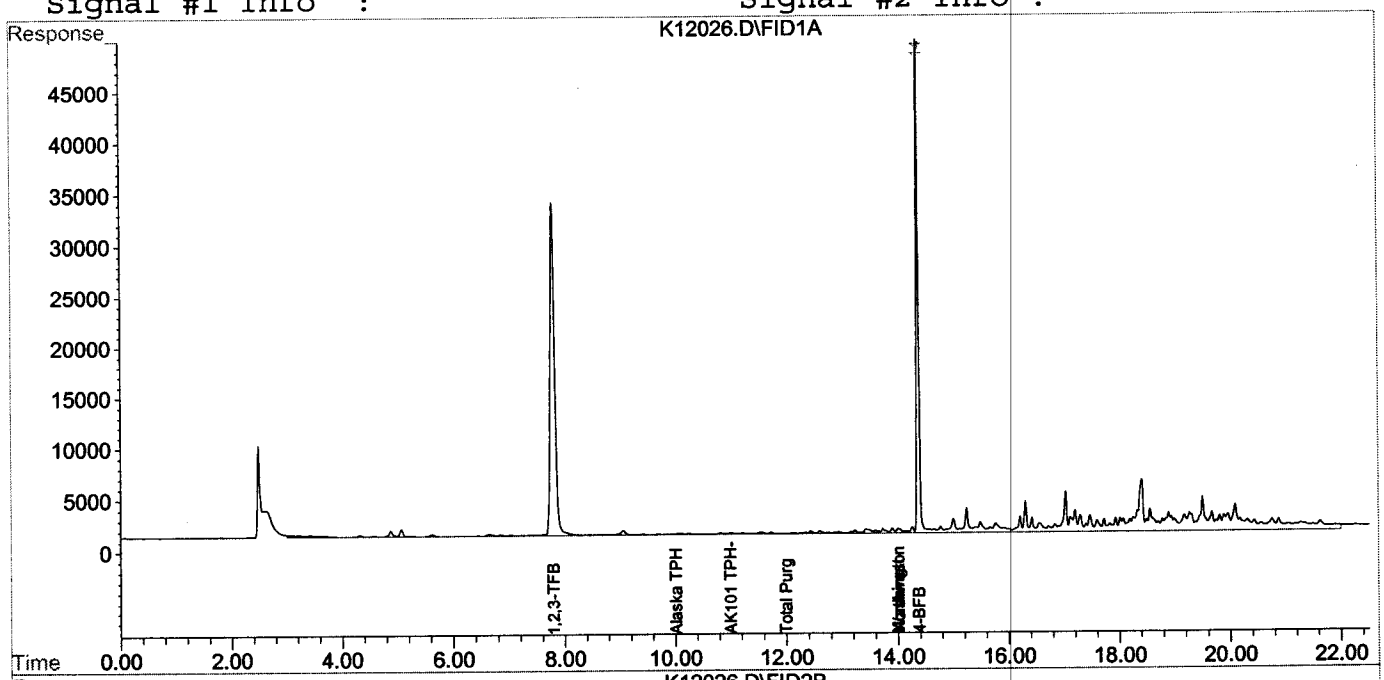


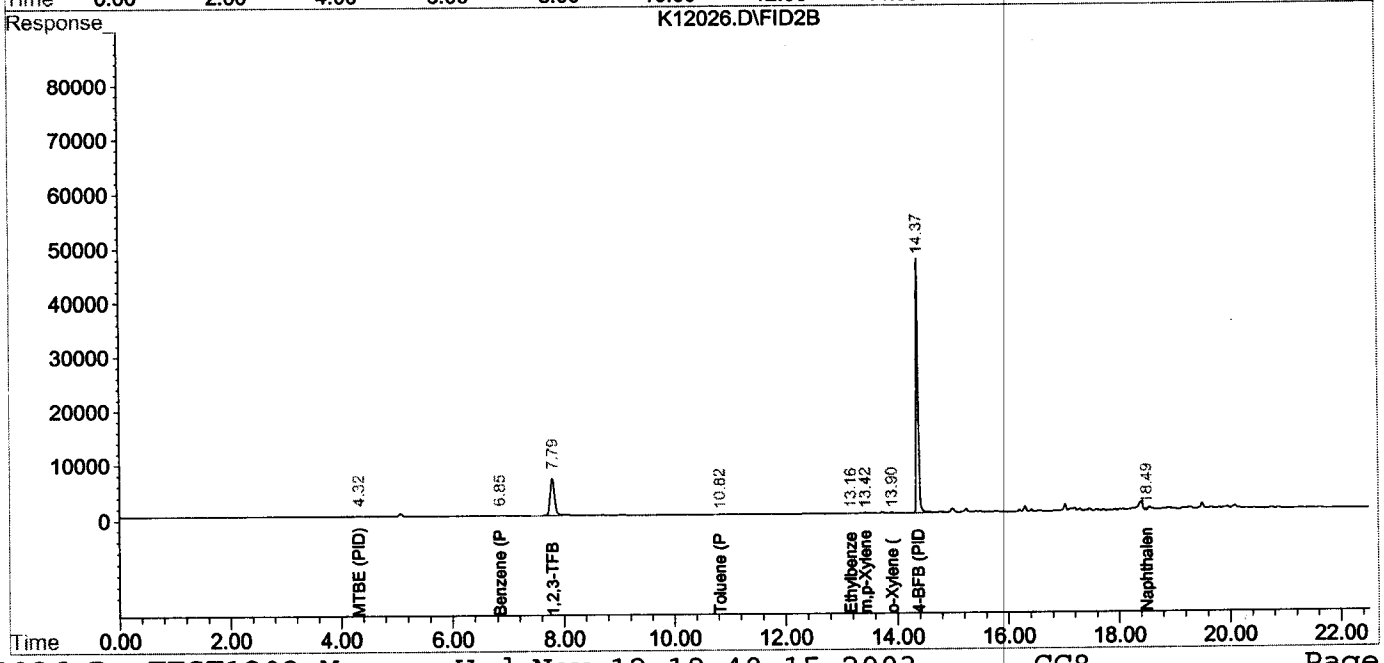
Quantitation Report

Signal #1 : D:\HPCHEM\4\DATA\111203\K12026.D\FID1A.CH Vial: 26
Signal #2 : D:\HPCHEM\4\DATA\111203\K12026.D\FID2B.CH
Acq On : 12 Nov 2003 19:17 Operator: sk
Sample : b3k0154-19 Inst : GC #8
Misc : 1x 5 ml Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 12 19:40 2003 Quant Results File: TEST1202.RES

Quant Method : D:\HPCHEM\4\METHODS\TEST1202.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 21:58:54 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST1202.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



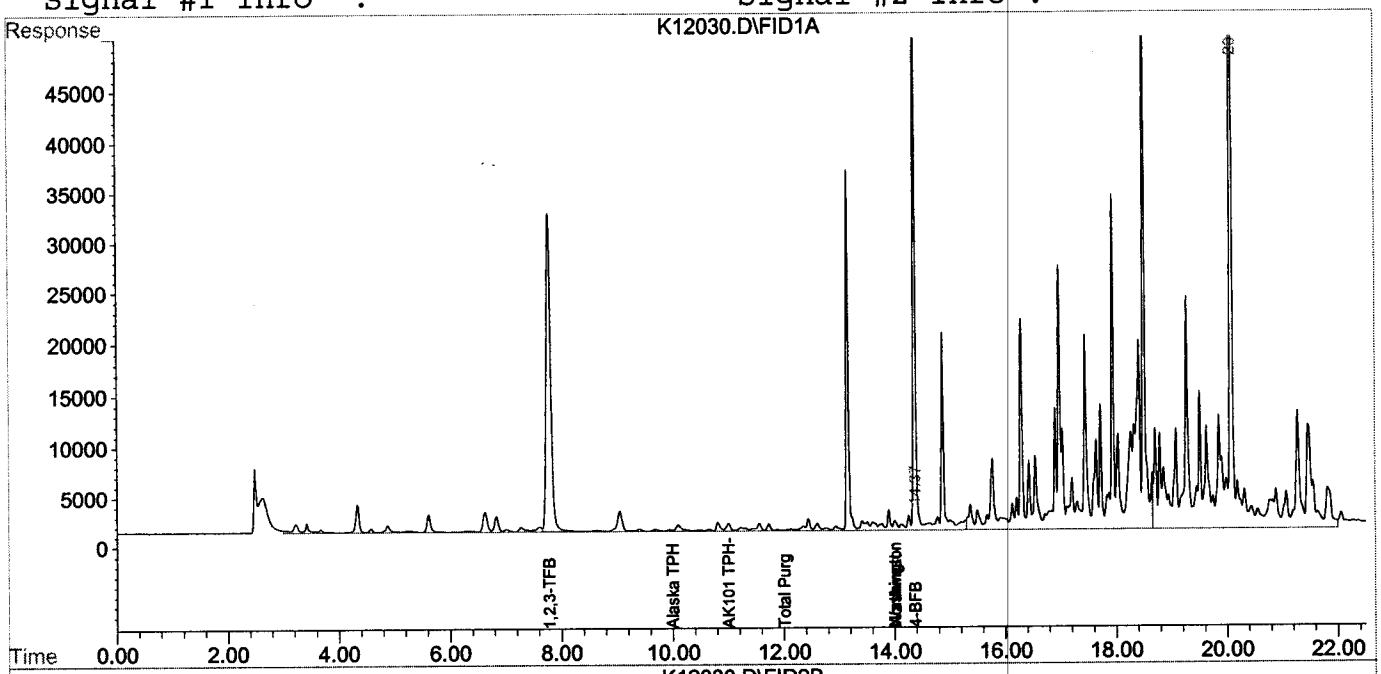


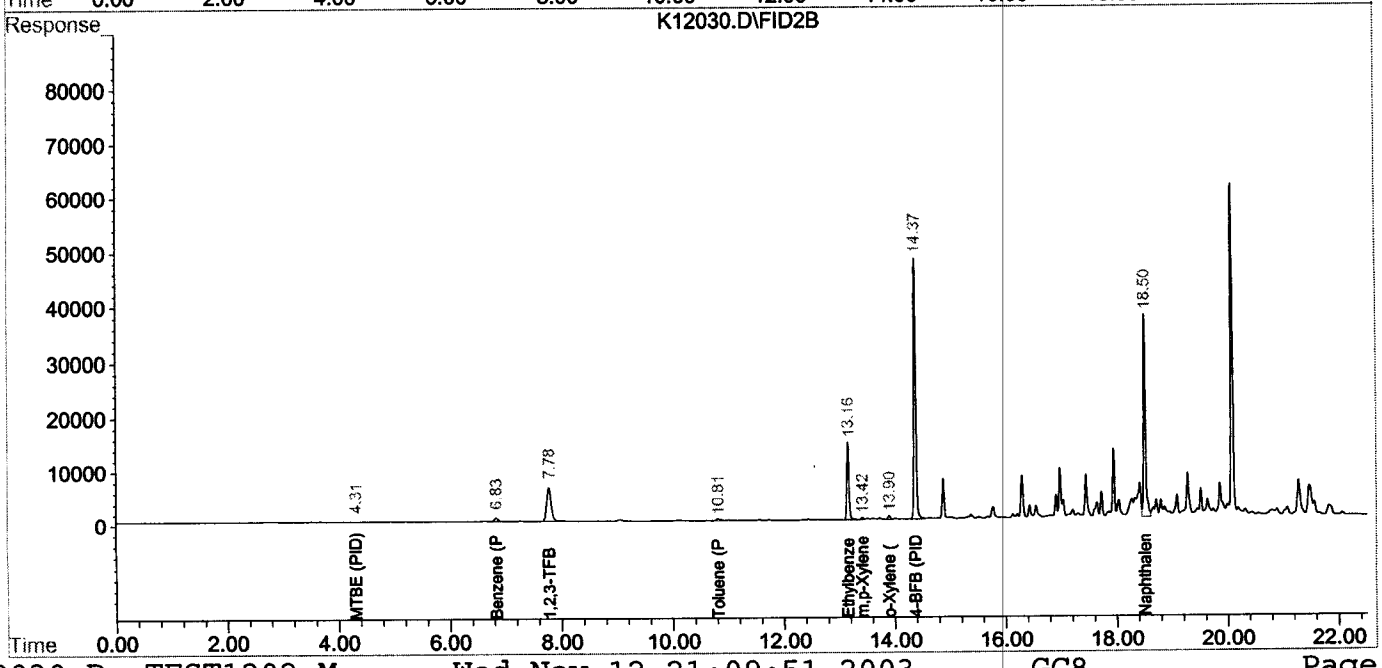
Quantitation Report

Signal #1 : D:\HPCHEM\4\DATA\111203\K12030.D\FID1A.CH Vial: 30
Signal #2 : D:\HPCHEM\4\DATA\111203\K12030.D\FID2B.CH
Acq On : 12 Nov 2003 20:47 Operator: sk
Sample : b3k0154-21 Inst : GC #8
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 12 21:09 2003 Quant Results File: TEST1202.RES

Quant Method : D:\HPCHEM\4\METHODS\TEST1202.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 21:58:54 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST1202.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



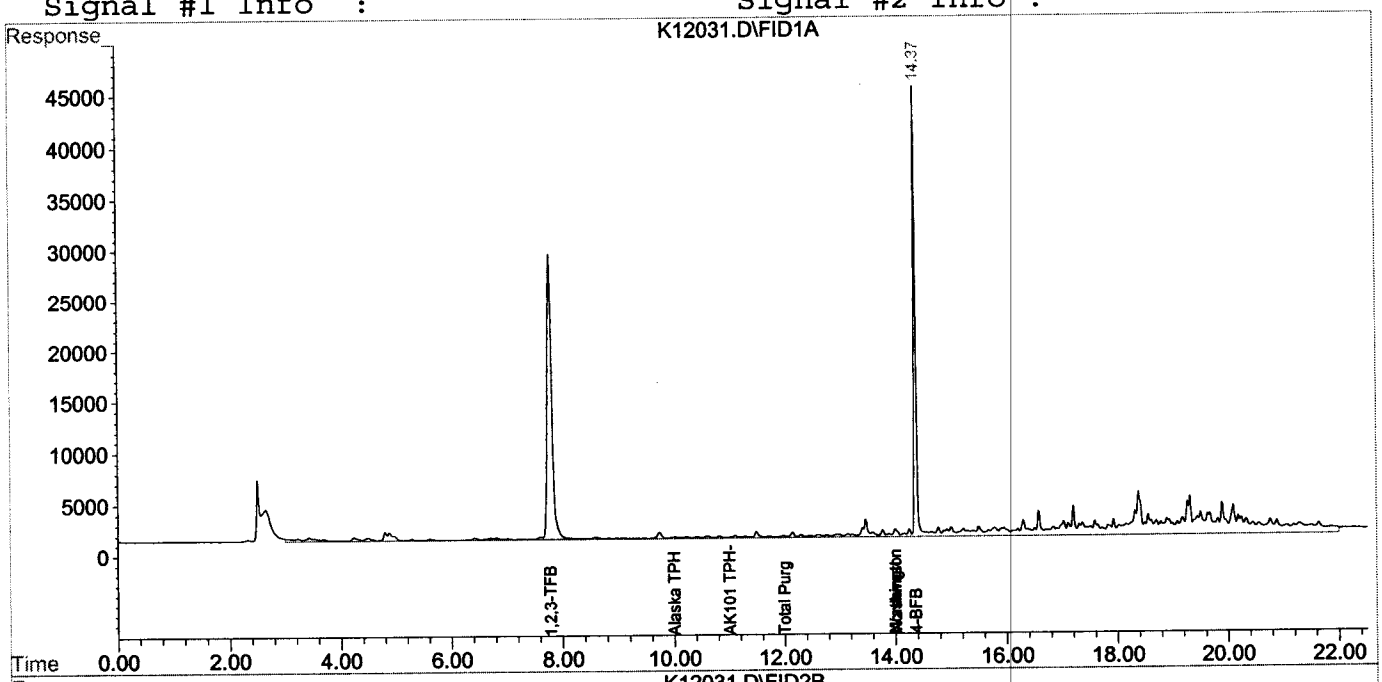


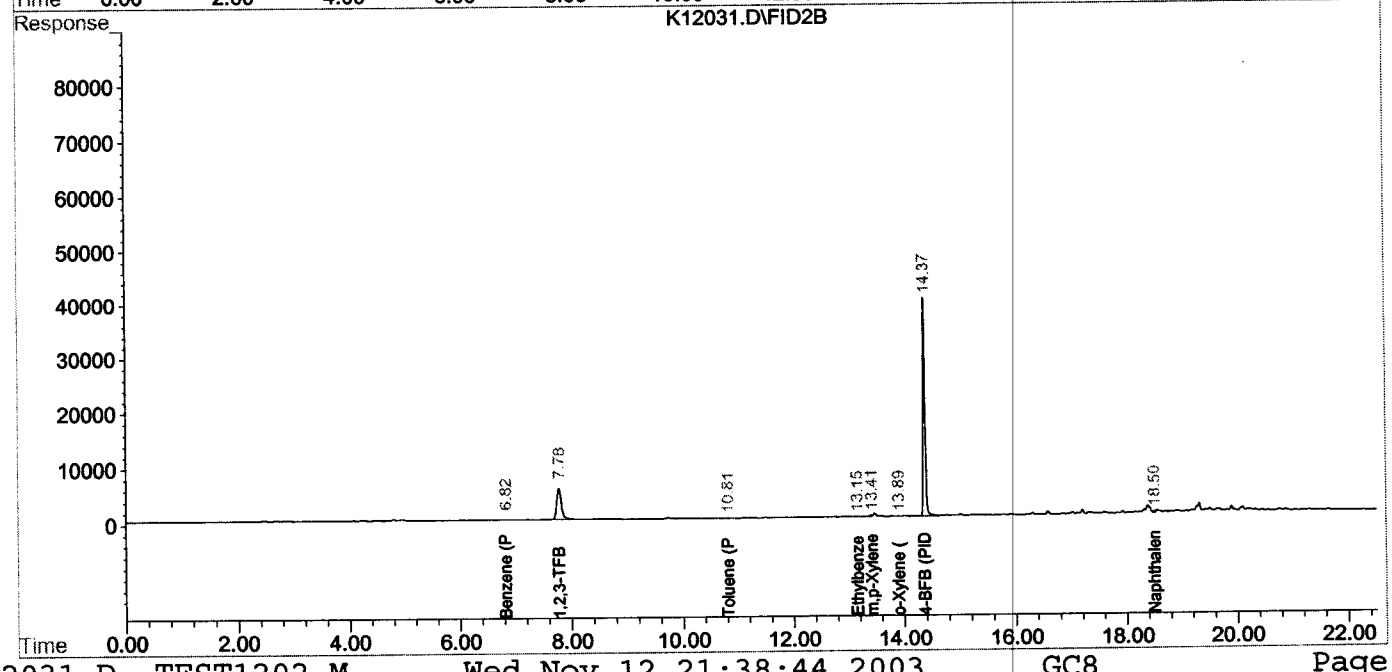
Quantitation Report

Signal #1 : D:\HPCHEM\4\DATA\111203\K12031.D\FID1A.CH Vial: 31
Signal #2 : D:\HPCHEM\4\DATA\111203\K12031.D\FID2B.CH
Acq On : 12 Nov 2003 21:15 Operator: sk
Sample : b3k0154-22 Inst : GC #8
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 12 21:38 2003 Quant Results File: TEST1202.RES

Quant Method : D:\HPCHEM\4\METHODS\TEST1202.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 21:58:54 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST1202.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



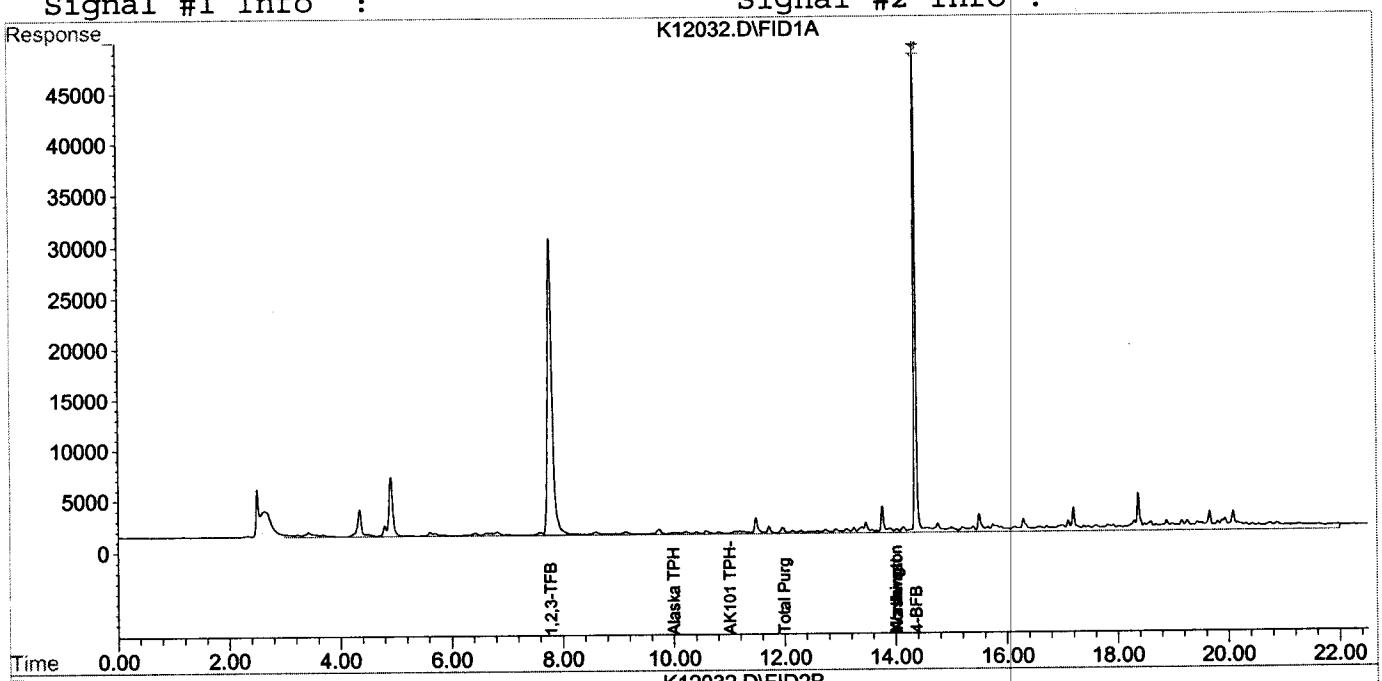


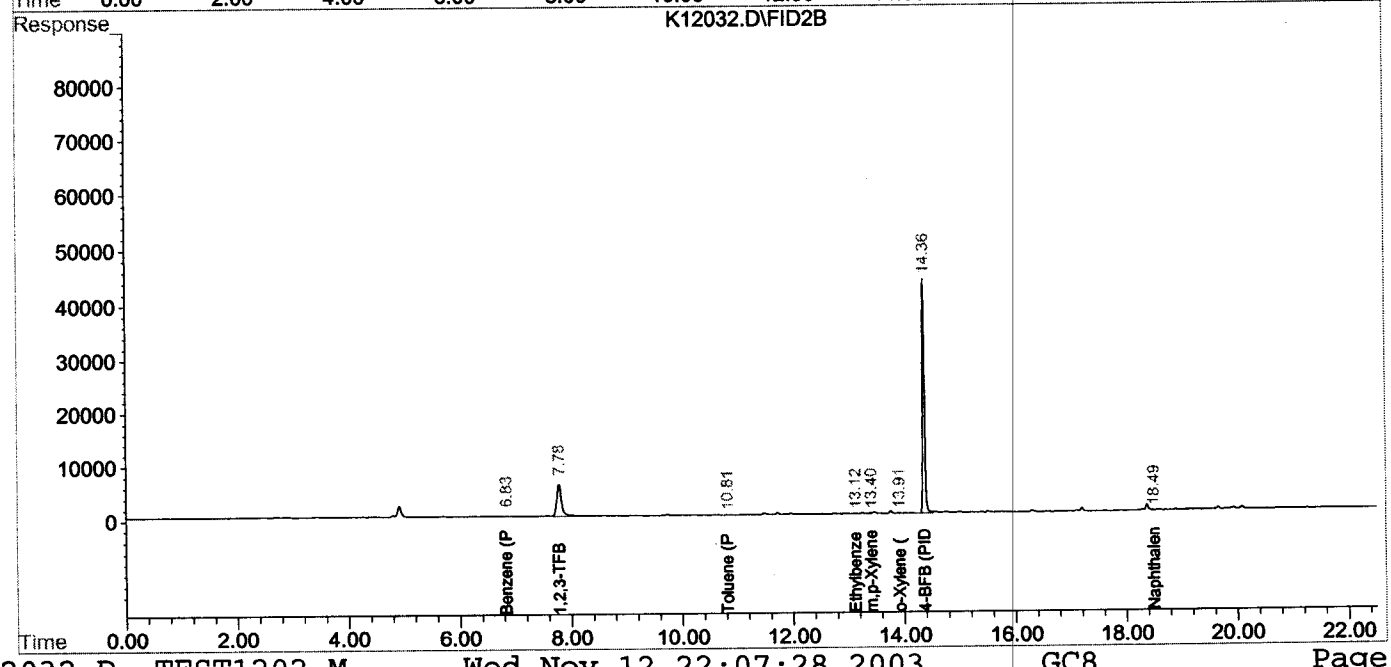
Quantitation Report

Signal #1 : D:\HPCHEM\4\DATA\111203\K12032.D\FID1A.CH Vial: 32
Signal #2 : D:\HPCHEM\4\DATA\111203\K12032.D\FID2B.CH
Acq On : 12 Nov 2003 21:44 Operator: sk
Sample : b3k0154-23 Inst : GC #8
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 12 22:07 2003 Quant Results File: TEST1202.RES

Quant Method : D:\HPCHEM\4\METHODS\TEST1202.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Tue Nov 11 21:58:54 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST1202.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



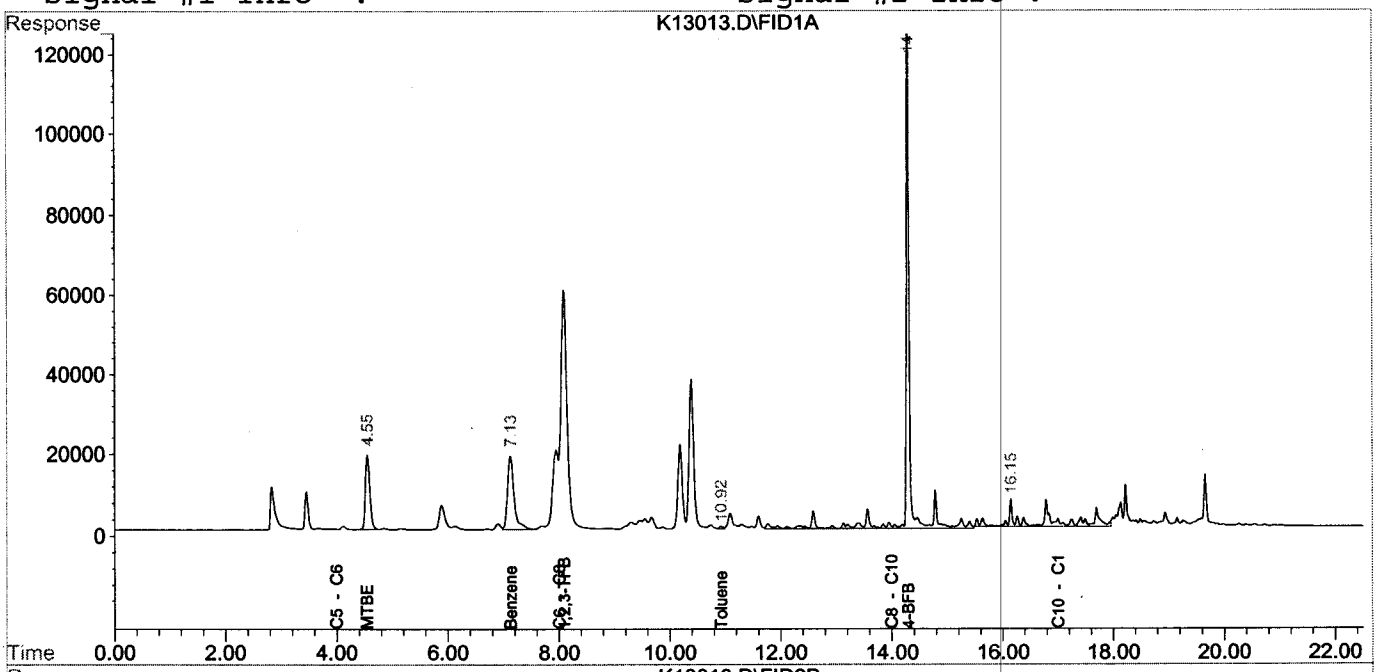


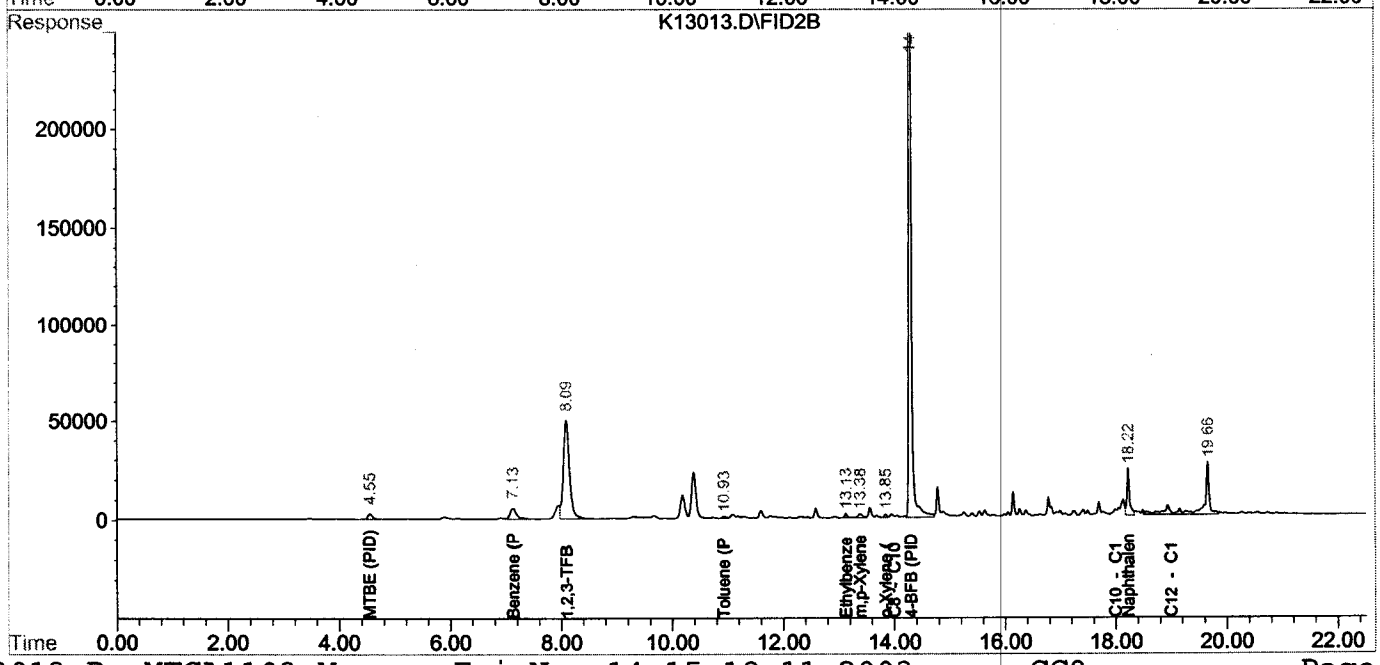
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13013.D\FID1A.CH Vial: 13
Signal #2 : D:\HPCHEM\3\DATA\111303\K13013.D\FID2B.CH
Acq On : 13 Nov 2003 13:36 Operator: sk
Sample : b3k0154-01 Inst : GC #6
Misc : 2x 2.5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:15 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



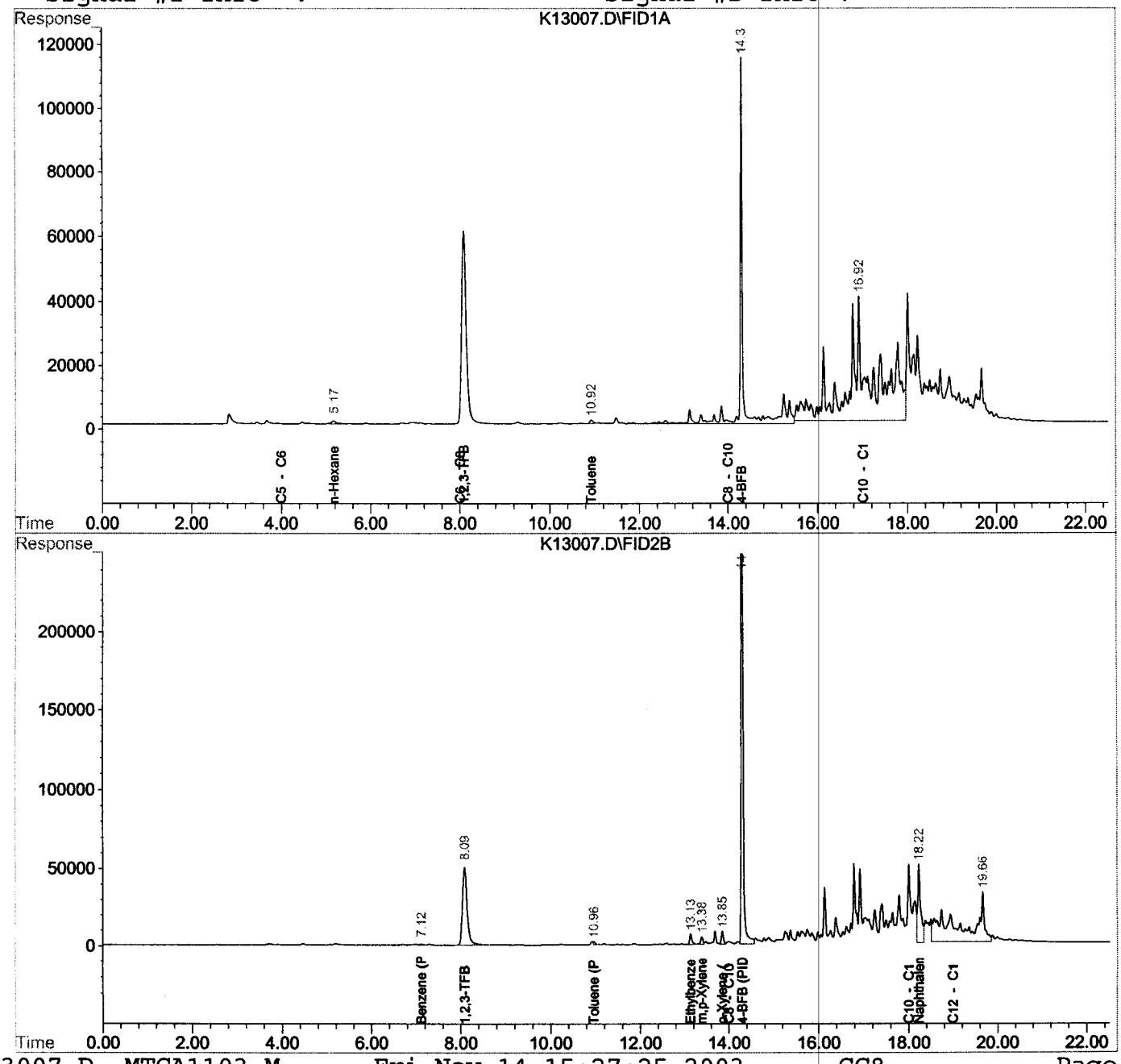


Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13007.D\FID1A.CH Vial: 7
Signal #2 : D:\HPCHEM\3\DATA\111303\K13007.D\FID2B.CH
Acq On : 13 Nov 2003 10:32 Operator: sk
Sample : b3k0154-02 Inst : GC #6
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:26 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

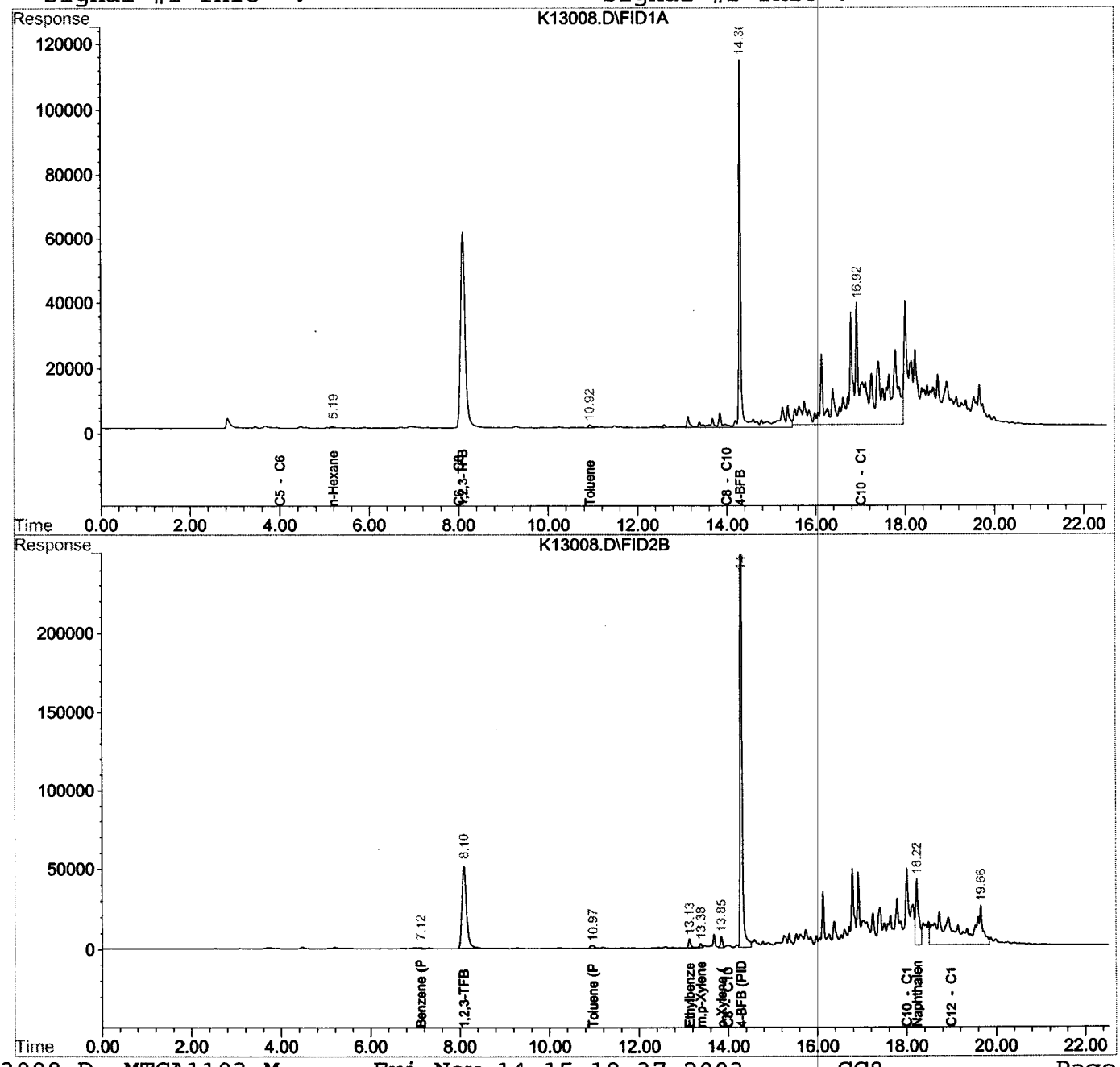


Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13008.D\FID1A.CH Vial: 8
Signal #2 : D:\HPCHEM\3\DATA\111303\K13008.D\FID2B.CH
Acq On : 13 Nov 2003 11:01 Operator: sk
Sample : b3k0154-03 Inst : GC #6
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:12 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

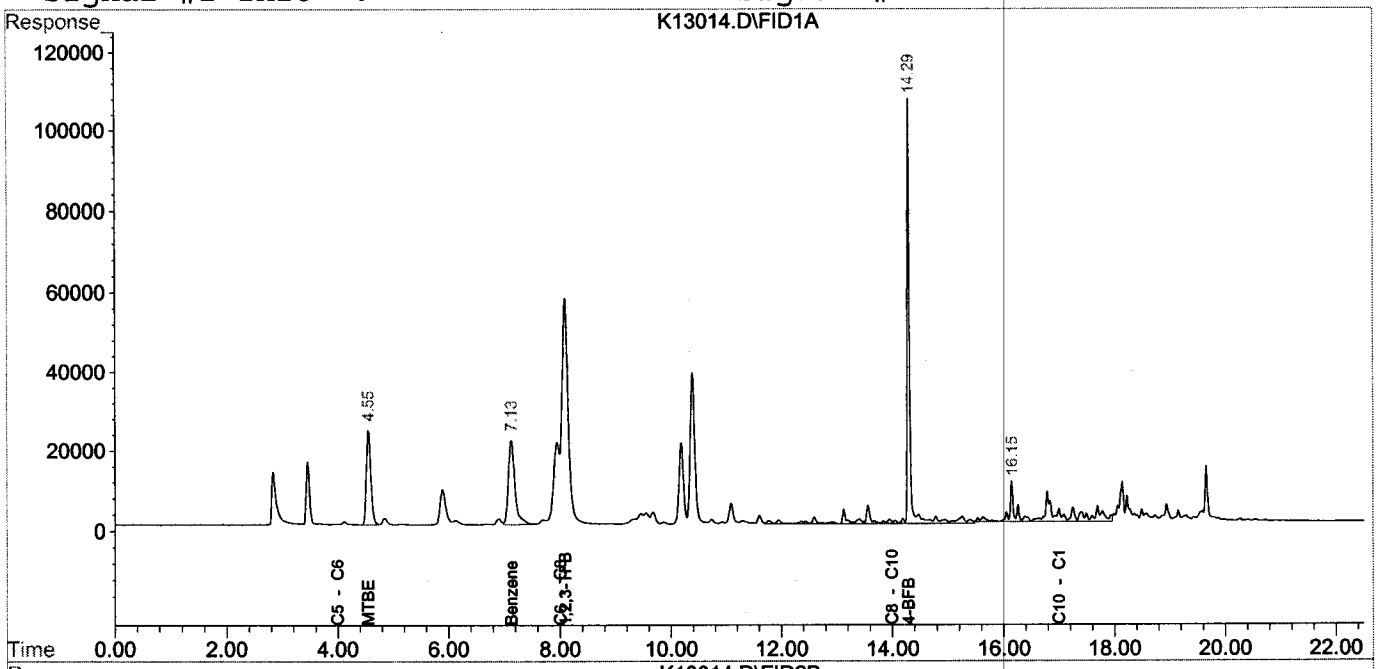


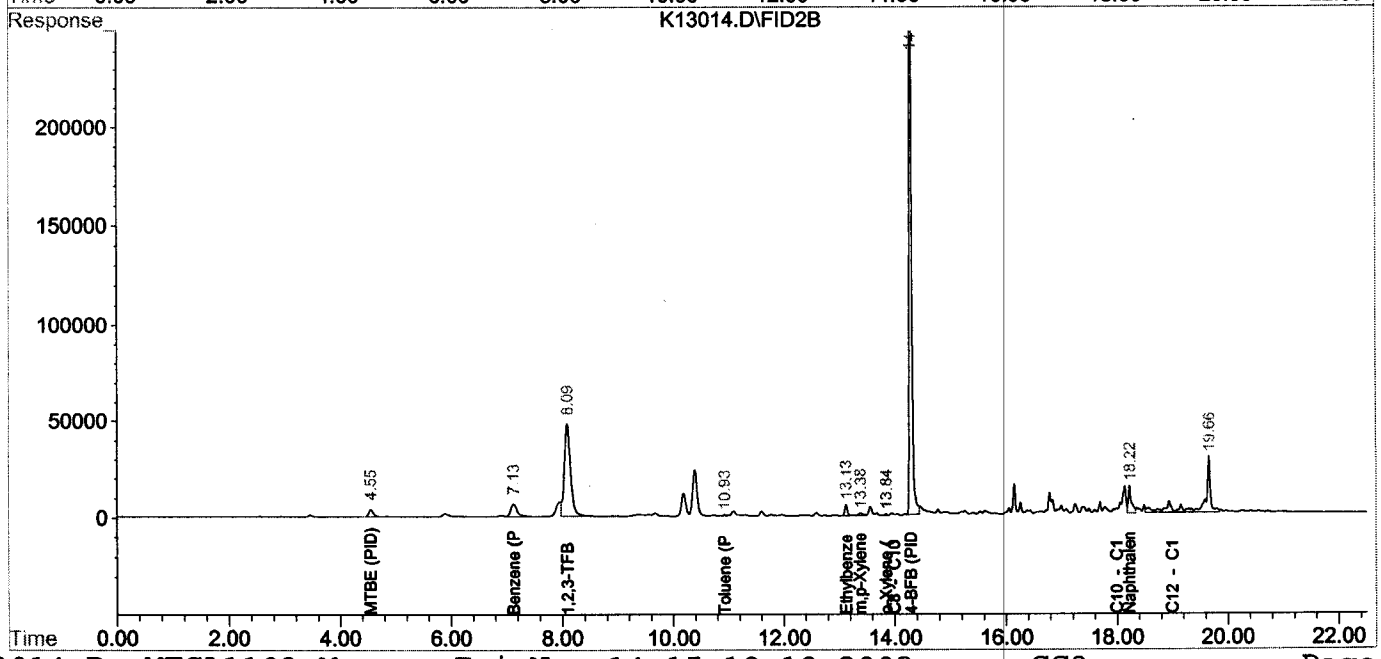
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13014.D\FID1A.CH Vial: 14
Signal #2 : D:\HPCHEM\3\DATA\111303\K13014.D\FID2B.CH
Acq On : 13 Nov 2003 14:05 Operator: sk
Sample : b3k0154-18 Inst : GC #6
Misc : 2x 2.5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:15 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



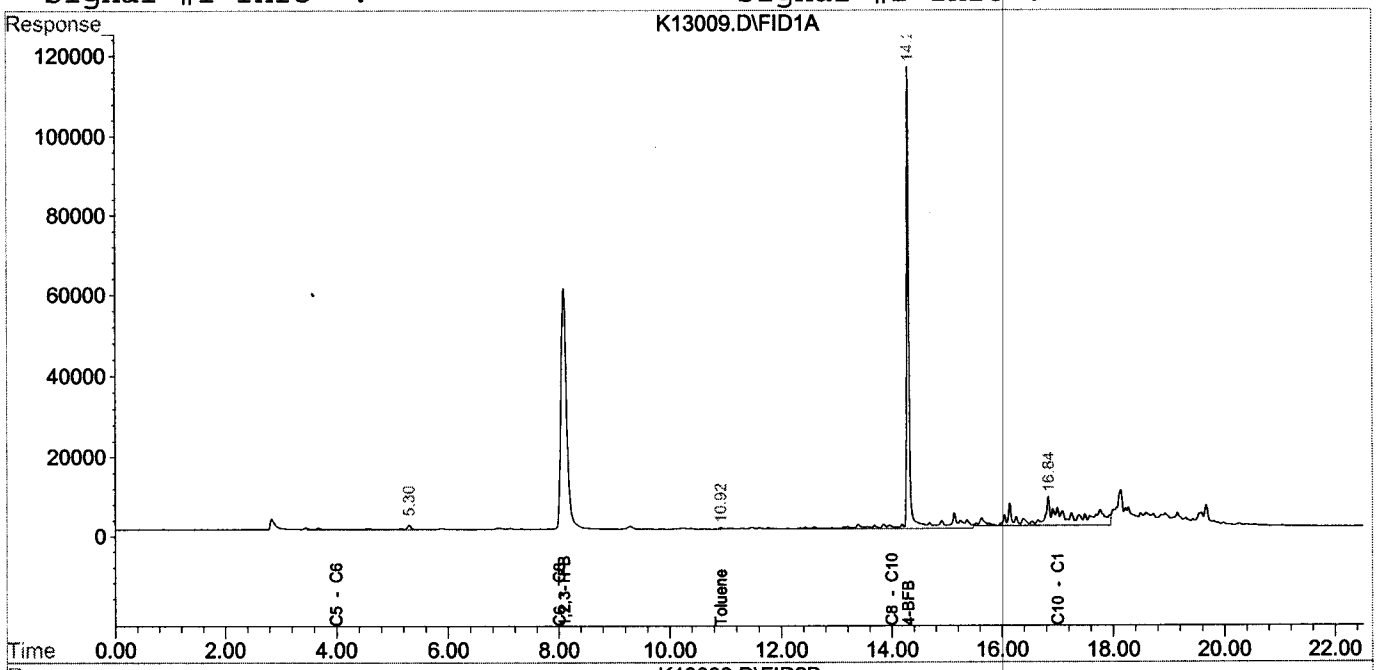


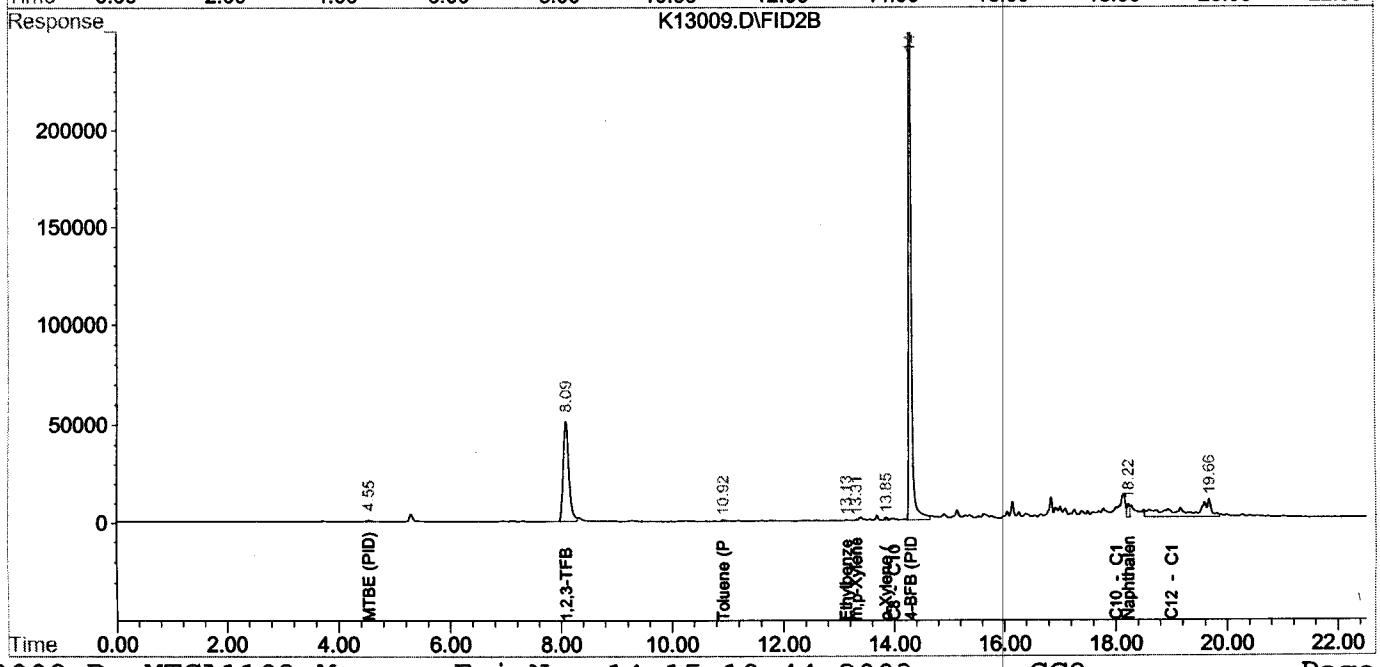
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13009.D\FID1A.CH Vial: 9
Signal #2 : D:\HPCHEM\3\DATA\111303\K13009.D\FID2B.CH
Acq On : 13 Nov 2003 11:29 Operator: sk
Sample : b3k0154-19 Inst : GC #6
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:13 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



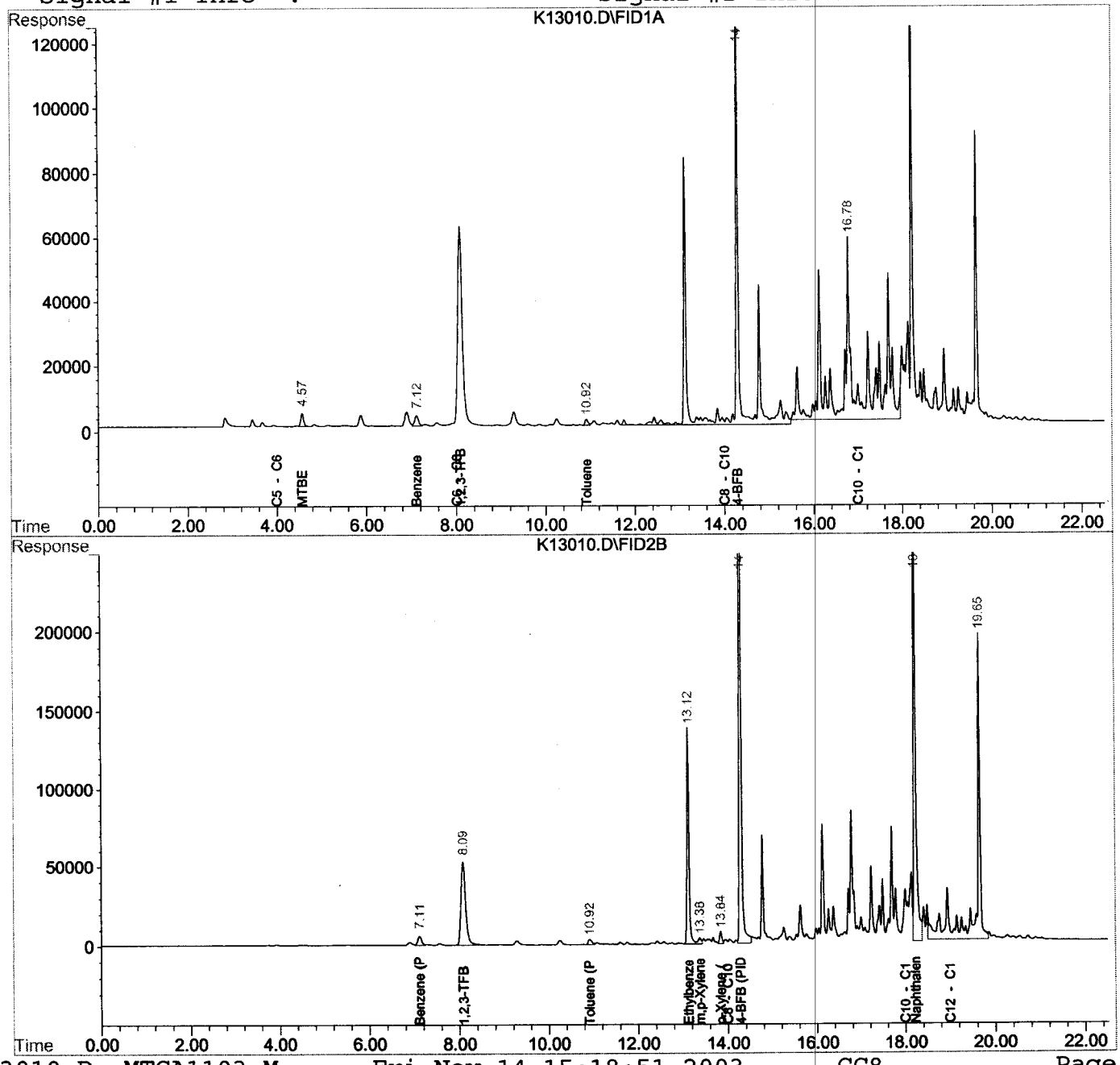


Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13010.D\FID1A.CH Vial: 10
Signal #2 : D:\HPCHEM\3\DATA\111303\K13010.D\FID2B.CH
Acq On : 13 Nov 2003 11:58 Operator: sk
Sample : b3k0154-21 Inst : GC #6
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:13 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

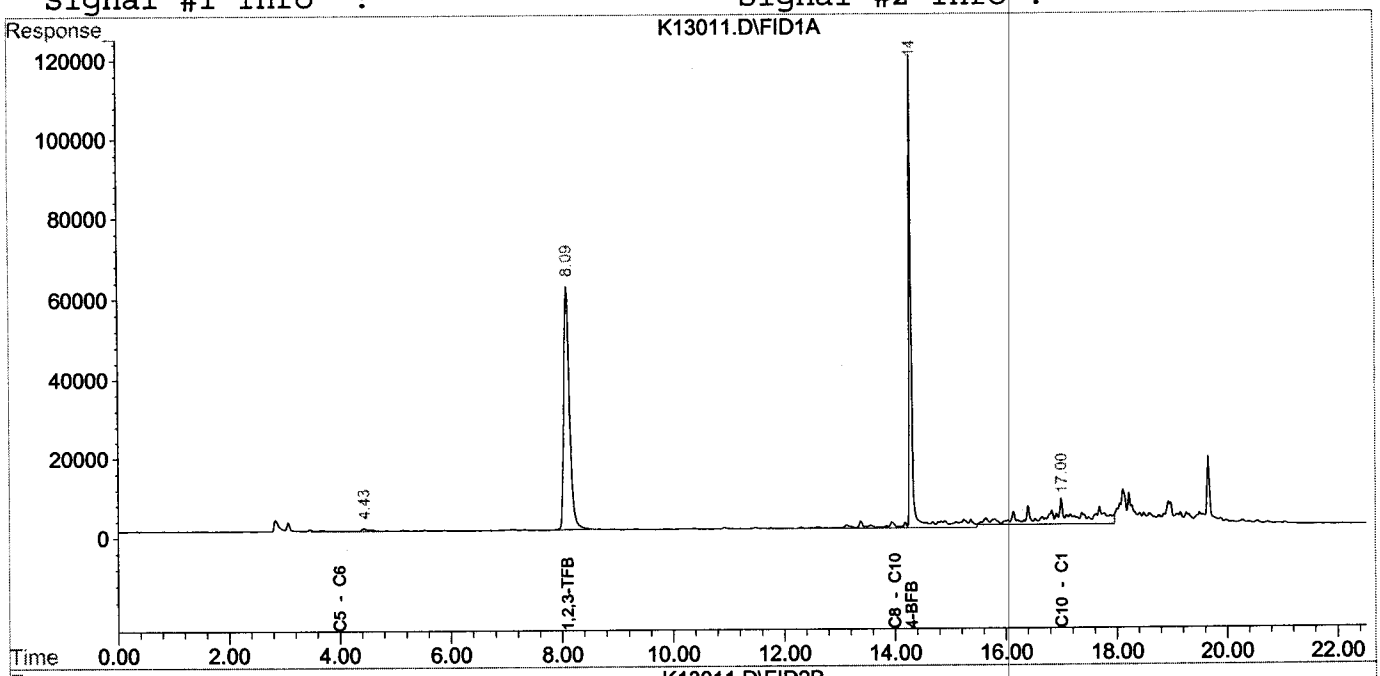


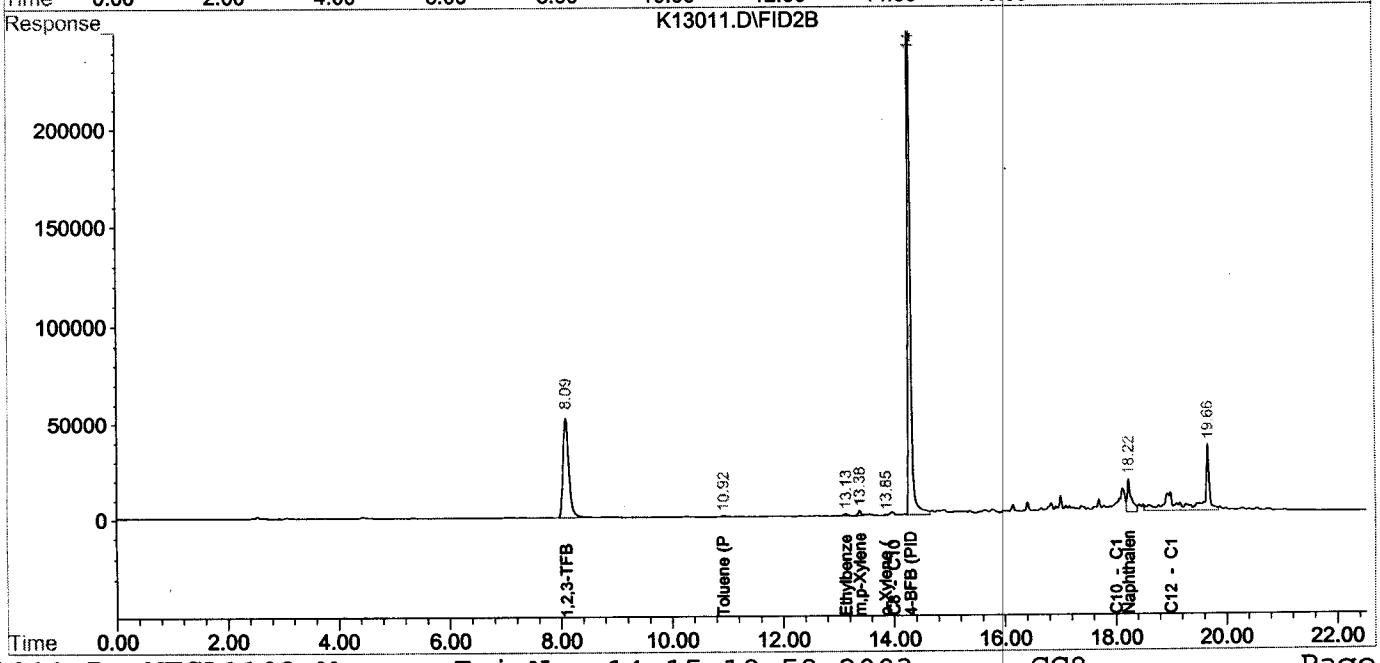
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13011.D\FID1A.CH Vial: 11
Signal #2 : D:\HPCHEM\3\DATA\111303\K13011.D\FID2B.CH
Acq On : 13 Nov 2003 12:27 Operator: sk
Sample : b3k0154-22 Inst : GC #6
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:13 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



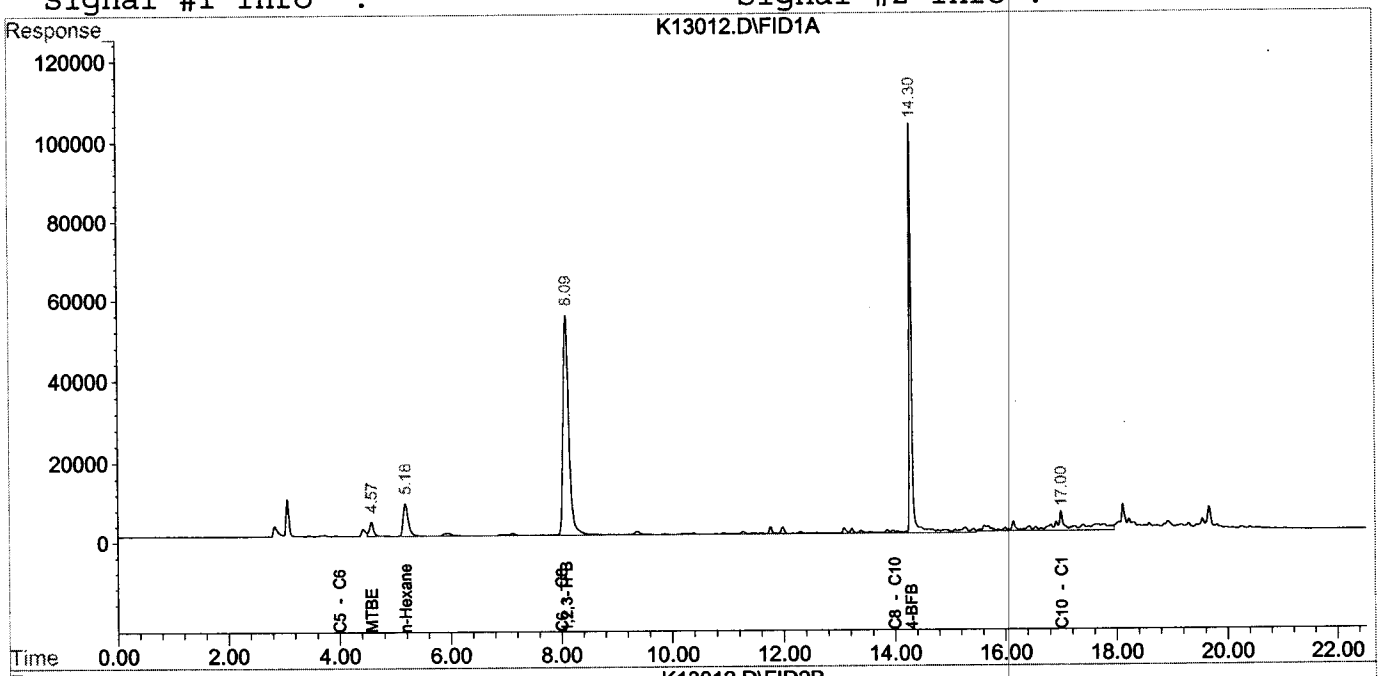


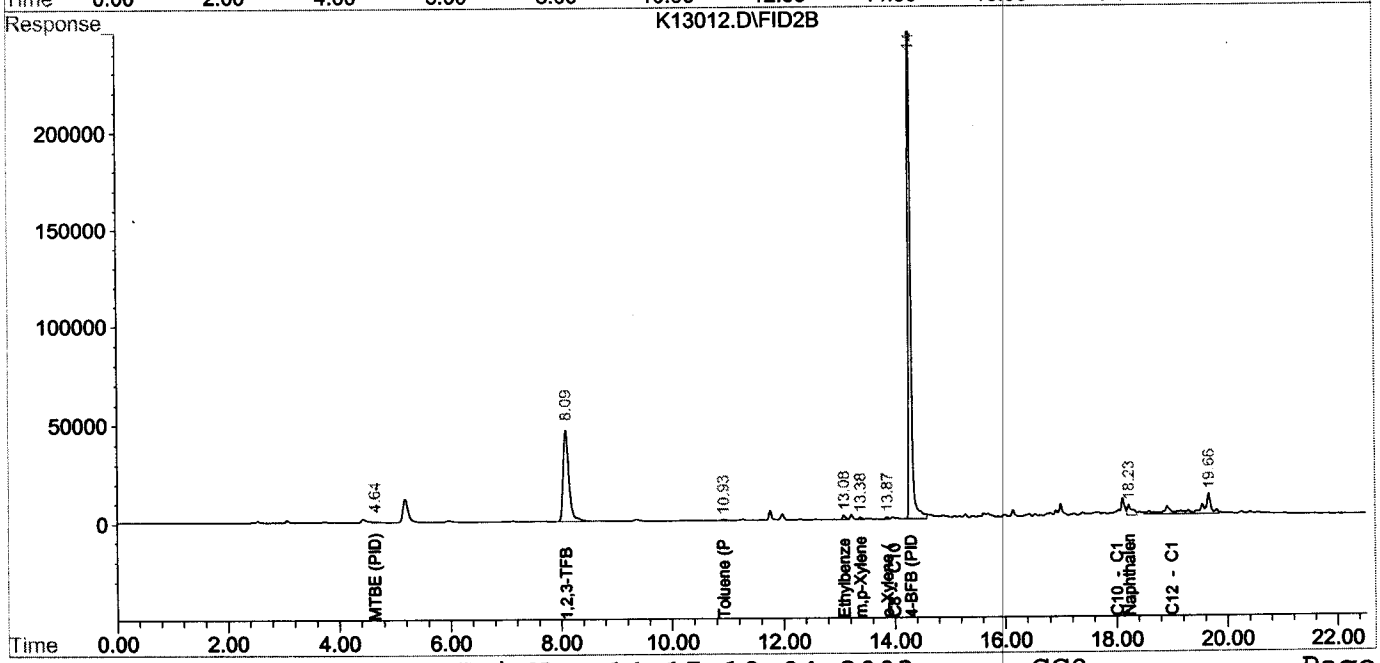
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13012.D\FID1A.CH Vial: 12
Signal #2 : D:\HPCHEM\3\DATA\111303\K13012.D\FID2B.CH
Acq On : 13 Nov 2003 12:56 Operator: sk
Sample : b3k0154-23 Inst : GC #6
Misc : 1x 5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:14 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



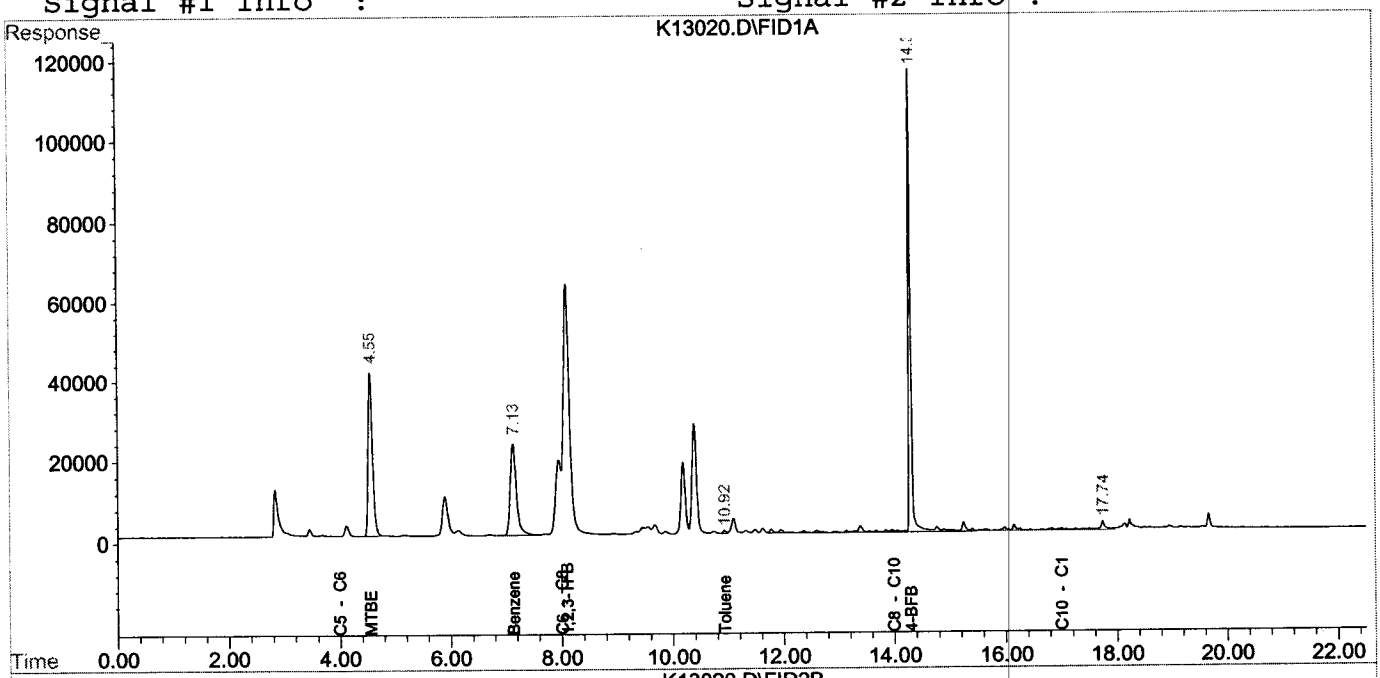


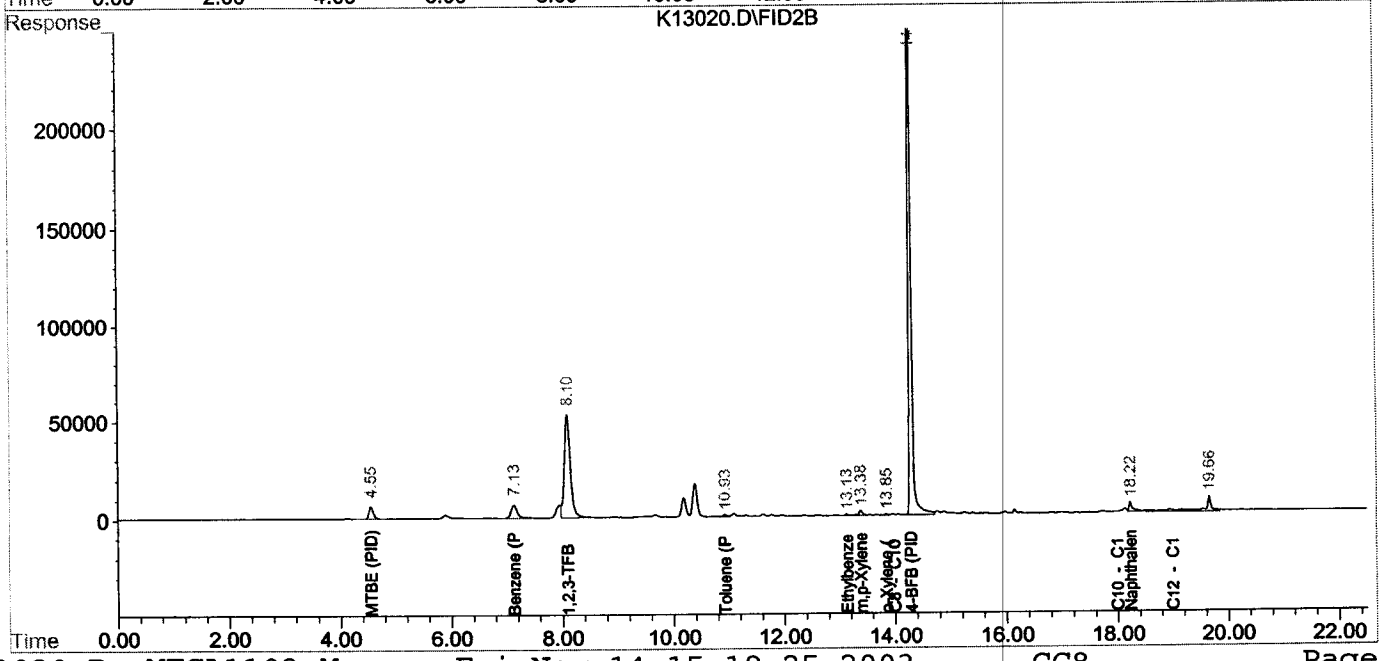
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111303\K13020.D\FID1A.CH Vial: 20
Signal #2 : D:\HPCHEM\3\DATA\111303\K13020.D\FID2B.CH
Acq On : 13 Nov 2003 17:53 Operator: sk
Sample : b3k0154-25 Inst : GC #6
Misc : 2x 2.5 mL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 14 15:16 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



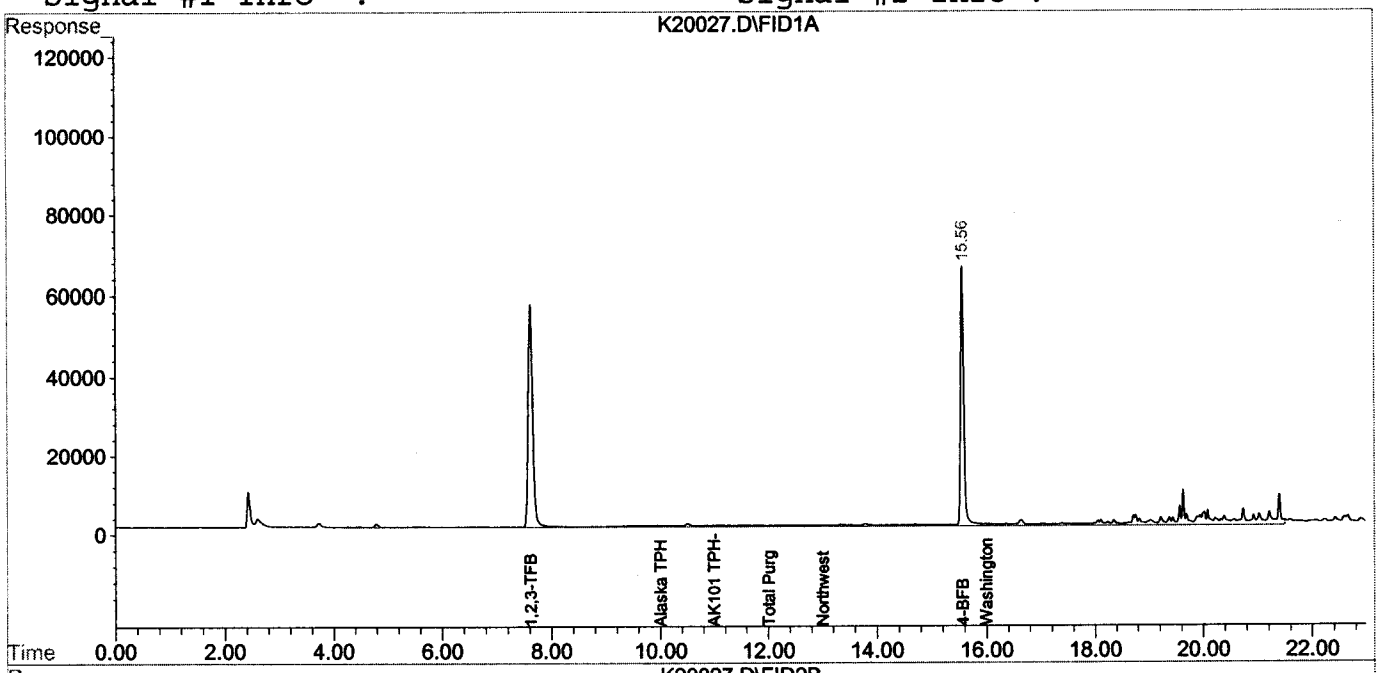


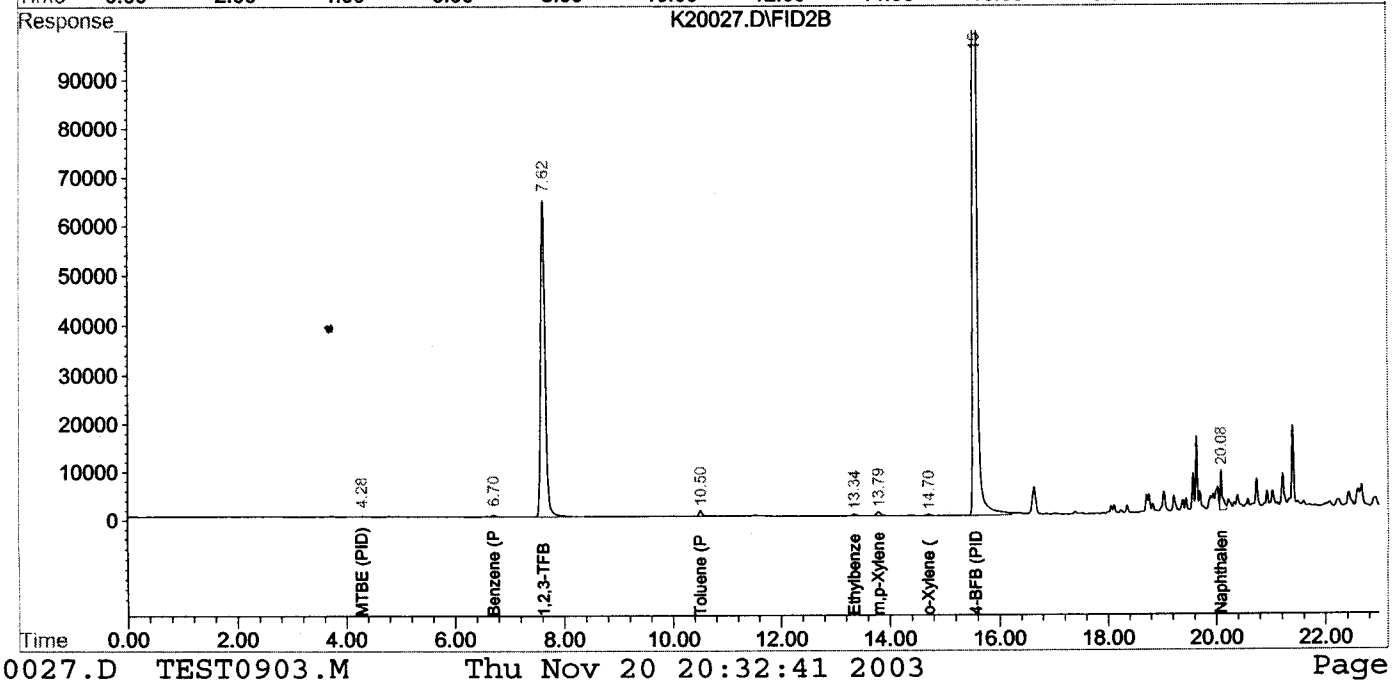
Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\112003\K20027.D\FID1A.CH Vial: 27
Signal #2 : C:\HPCHEM\1\DATA\112003\K20027.D\FID2B.CH
Acq On : 20 Nov 2003 20:09 Operator: sk
Sample : b3k0154-12 Inst : GC #2
Misc : 1x 250 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 20 20:32 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Thu Nov 20 13:38:35 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



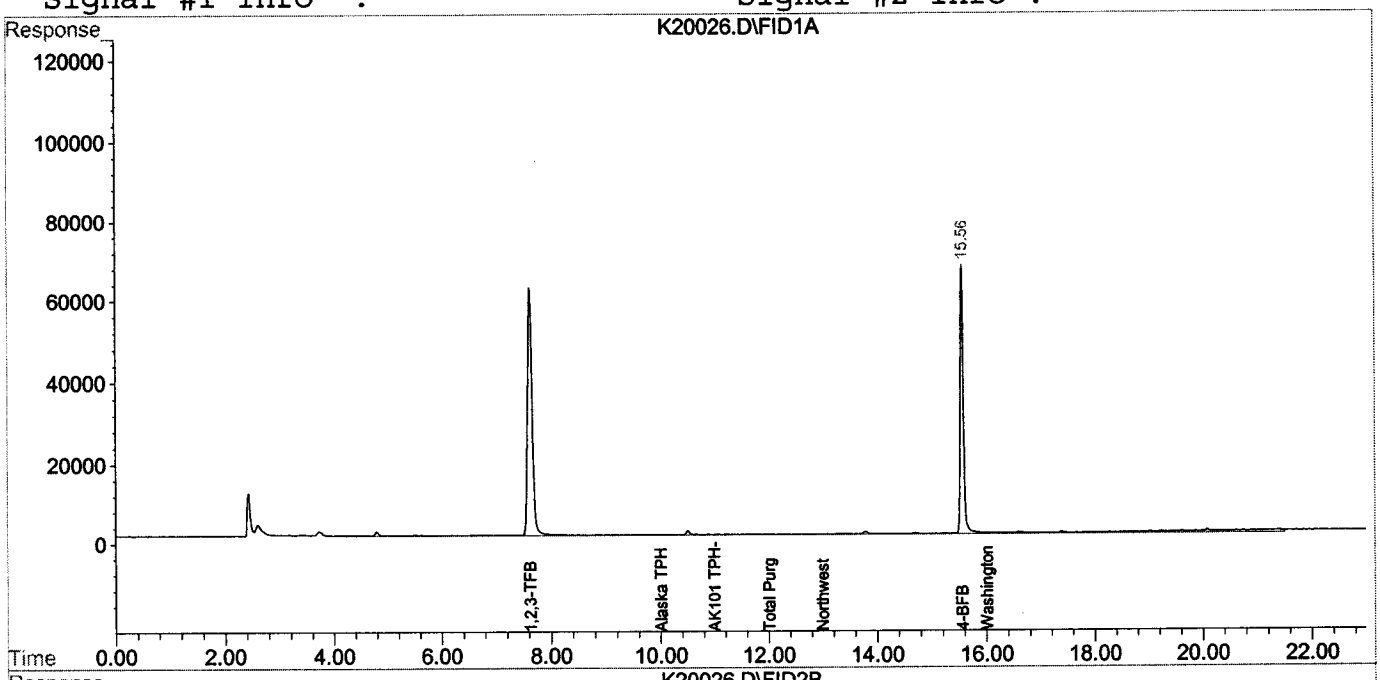


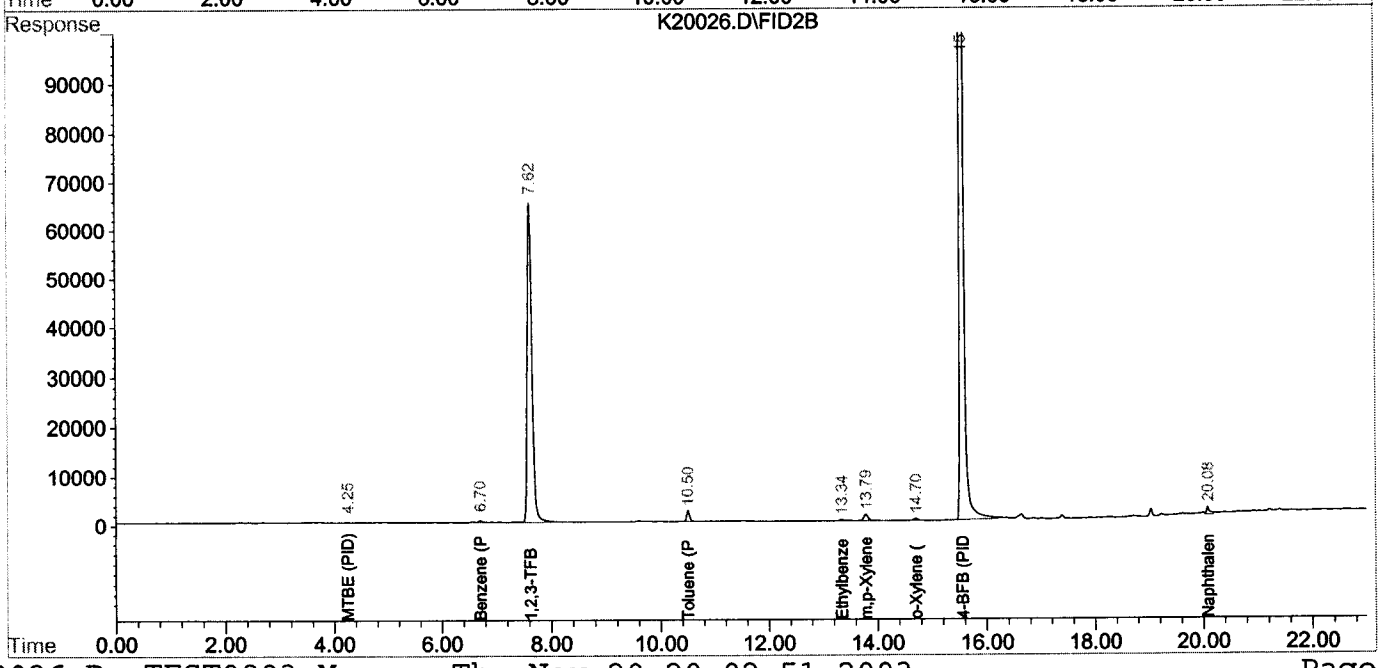
Quantitation Report

Signal #1 : C:\HPCHEM\1\DATA\112003\K20026.D\FID1A.CH Vial: 26
Signal #2 : C:\HPCHEM\1\DATA\112003\K20026.D\FID2B.CH
Acq On : 20 Nov 2003 19:39 Operator: sk
Sample : b3k0154-09 Inst : GC #2
Misc : 1x 250 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 20 20:02 2003 Quant Results File: TEST0903.RES

Quant Method : C:\HPCHEM\1\METHODS\TEST0903.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Thu Nov 20 13:38:35 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST0903.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



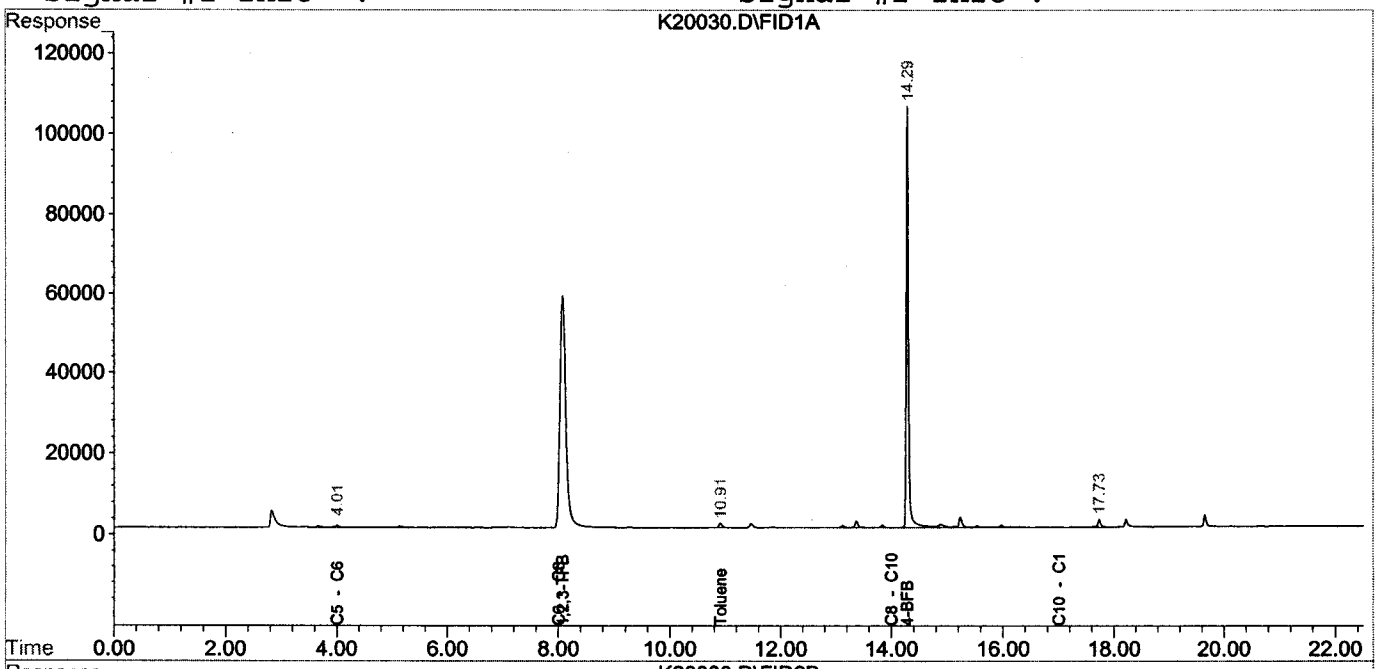


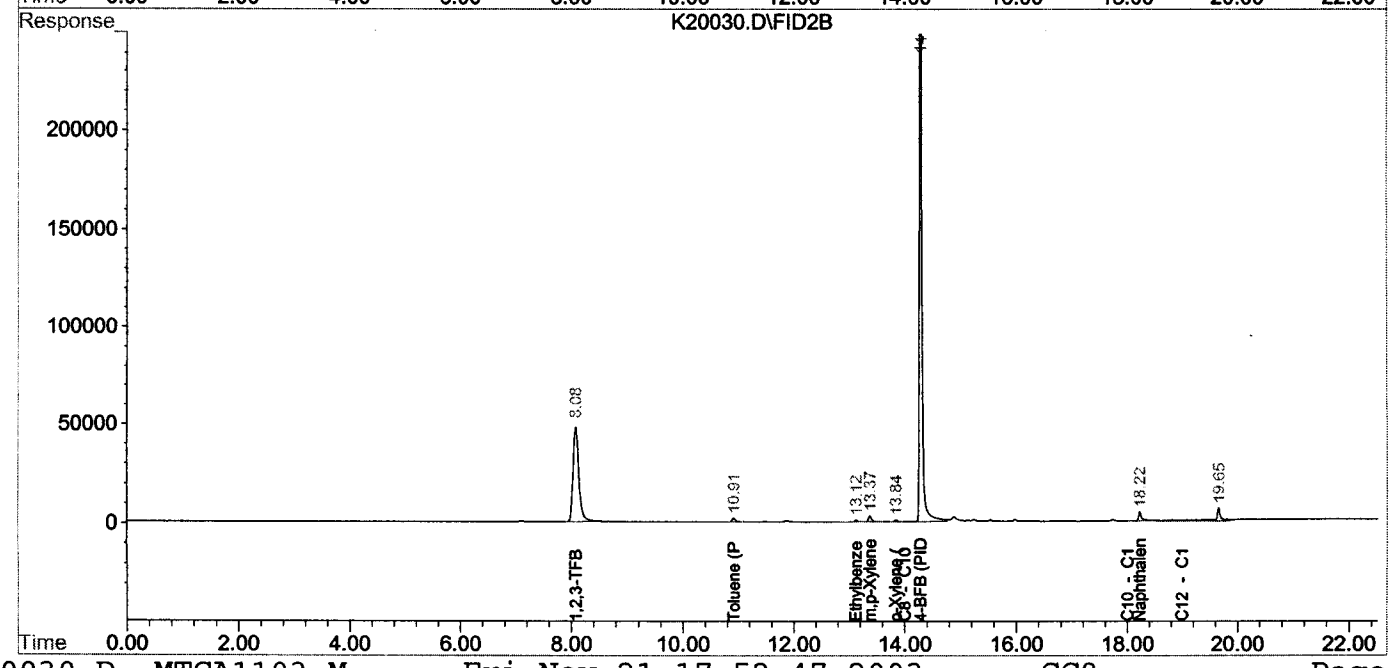
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\112003\K20030.D\FID1A.CH Vial: 30
Signal #2 : D:\HPCHEM\3\DATA\112003\K20030.D\FID2B.CH
Acq On : 20 Nov 2003 23:50 Operator: sk
Sample : b3k0154-09 Inst : GC #6
Misc : 1x 250 uL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 21 17:52 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



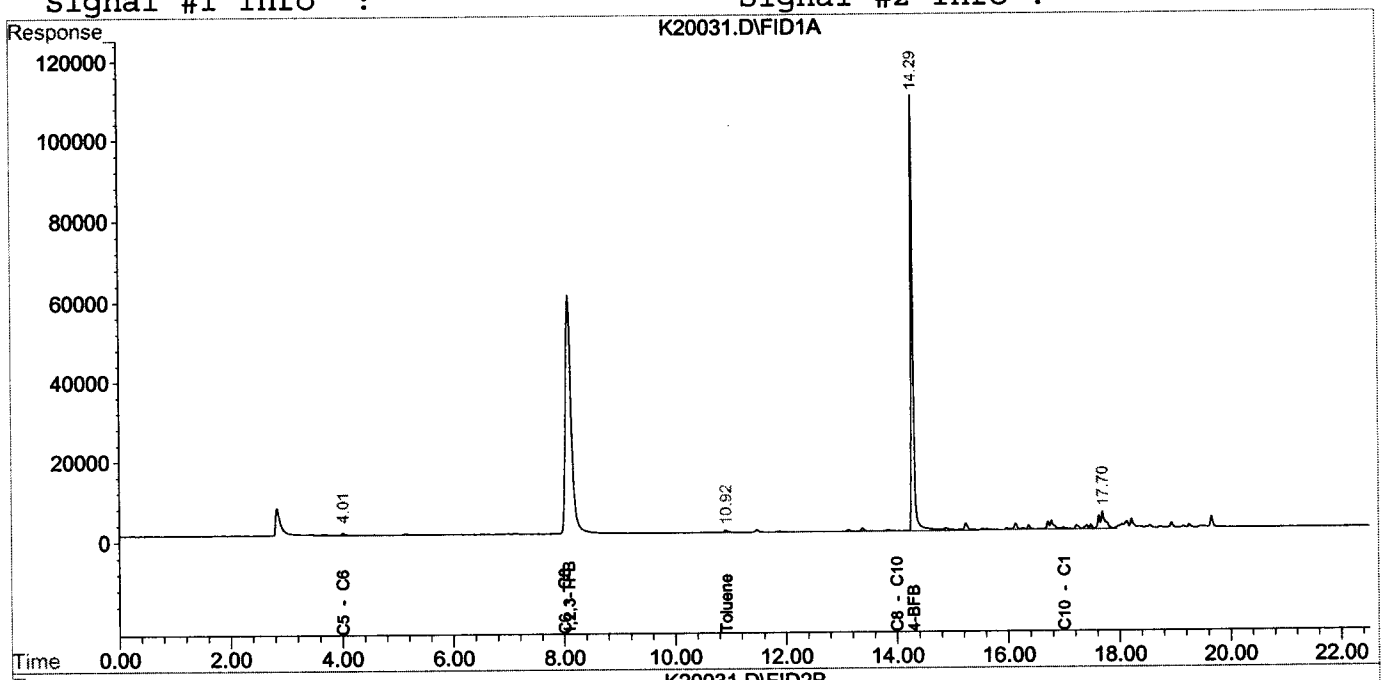


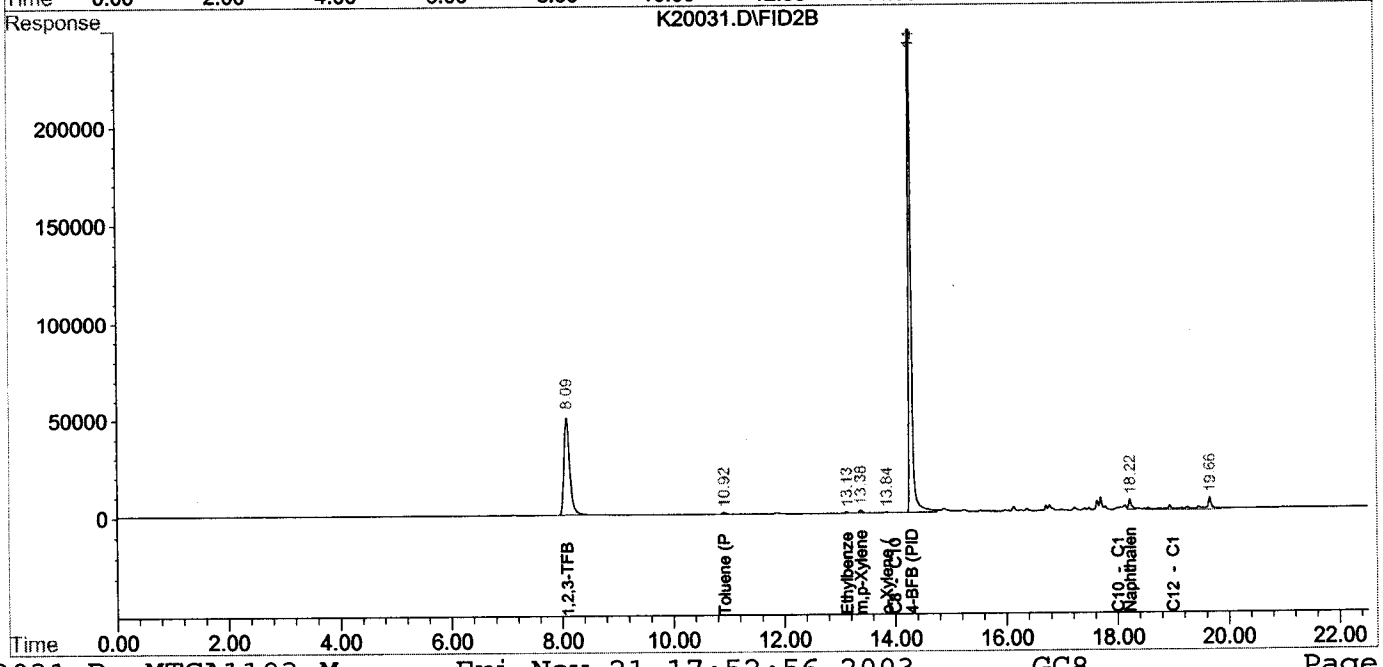
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\112003\K20031.D\FID1A.CH Vial: 31
Signal #2 : D:\HPCHEM\3\DATA\112003\K20031.D\FID2B.CH
Acq On : 21 Nov 2003 00:19 Operator: sk
Sample : b3k0154-12 Inst : GC #6
Misc : 1x 250 uL Multiplr: 1.00
IntFile Signal #1: autoint1.e IntFile Signal #2: autoint2.e
Quant Time: Nov 21 17:52 2003 Quant Results File: MTCA1103.RES

Quant Method : D:\HPCHEM\3\METHODS\MTCA1103.M (Chemstation Integrator)
Title : VPH Water Method
Last Update : Fri Nov 14 15:11:57 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



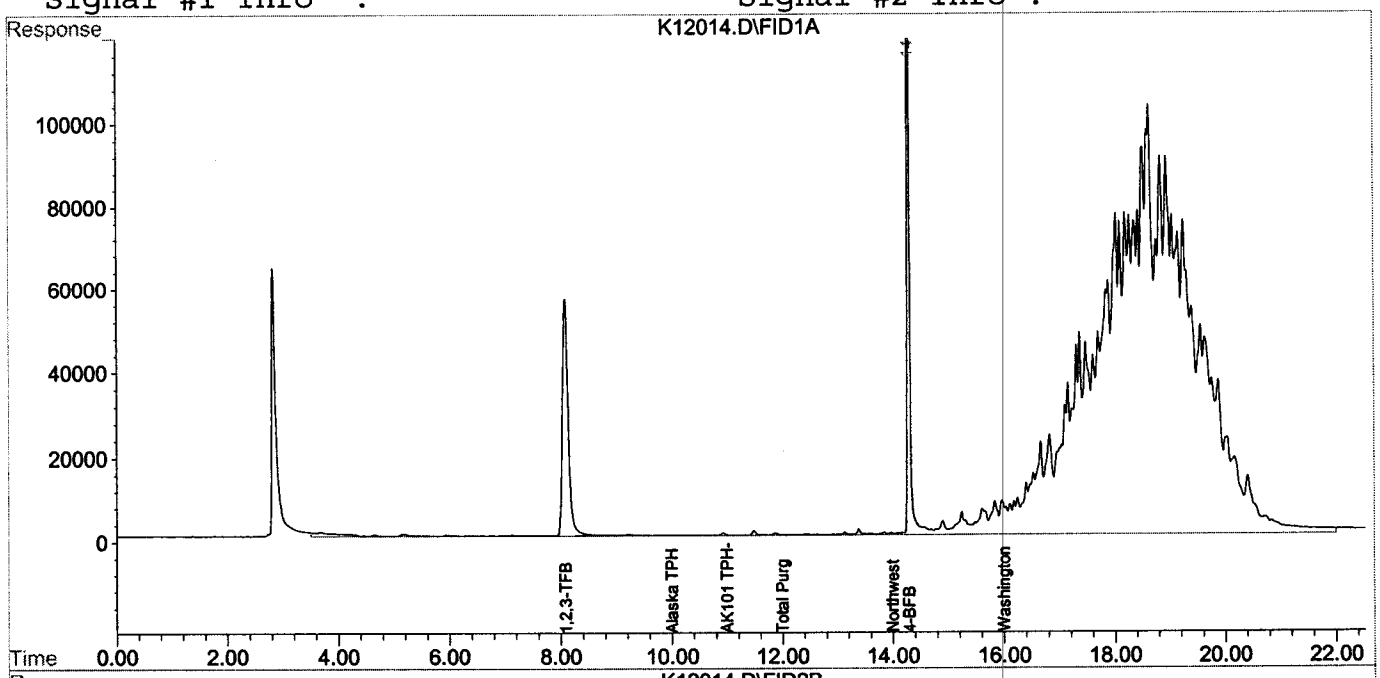


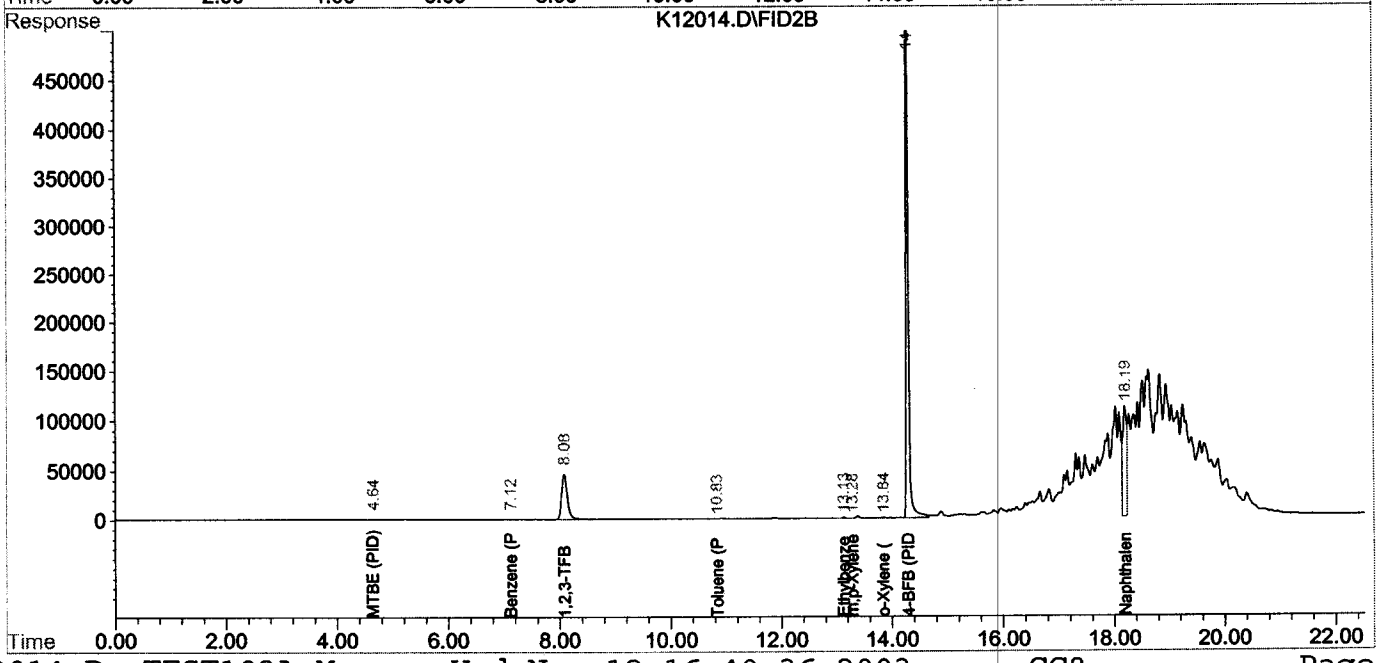
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12014.D\FID1A.CH Vial: 14
Signal #2 : D:\HPCHEM\3\DATA\111203\K12014.D\FID2B.CH
Acq On : 12 Nov 2003 16:17 Operator: sk
Sample : b3k0154-06 Inst : GC #6
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 16:40 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



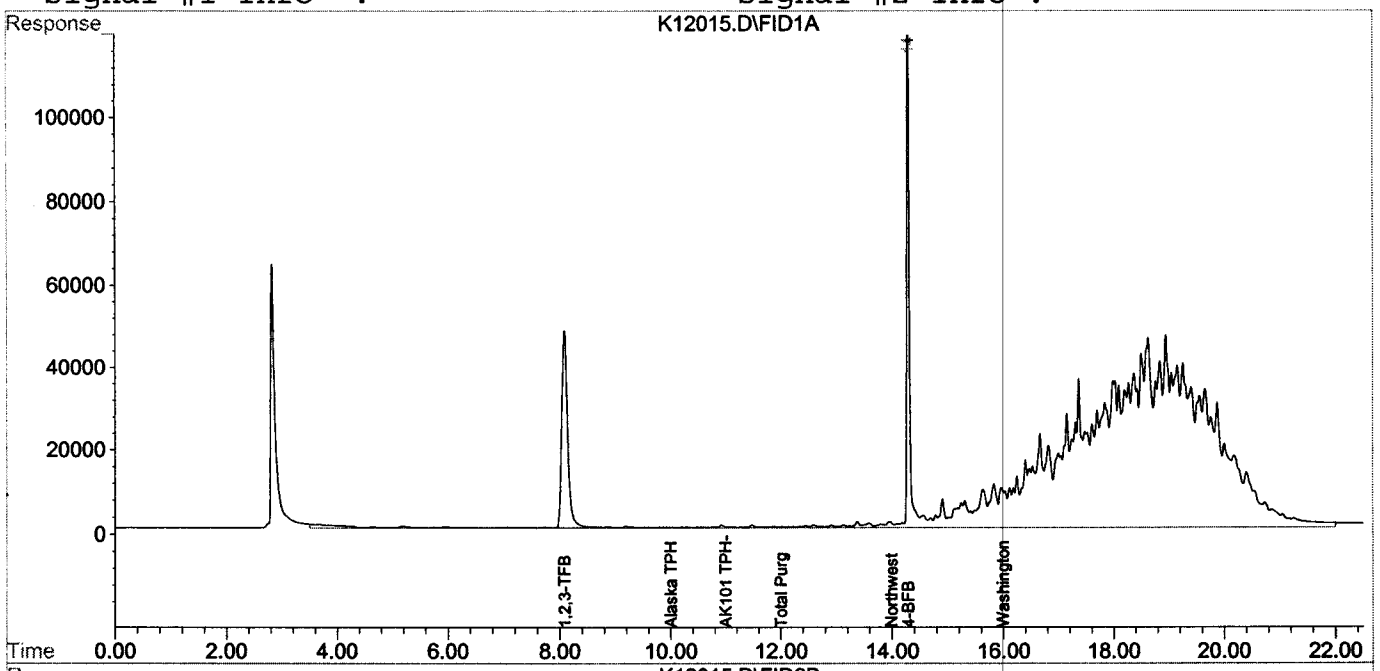


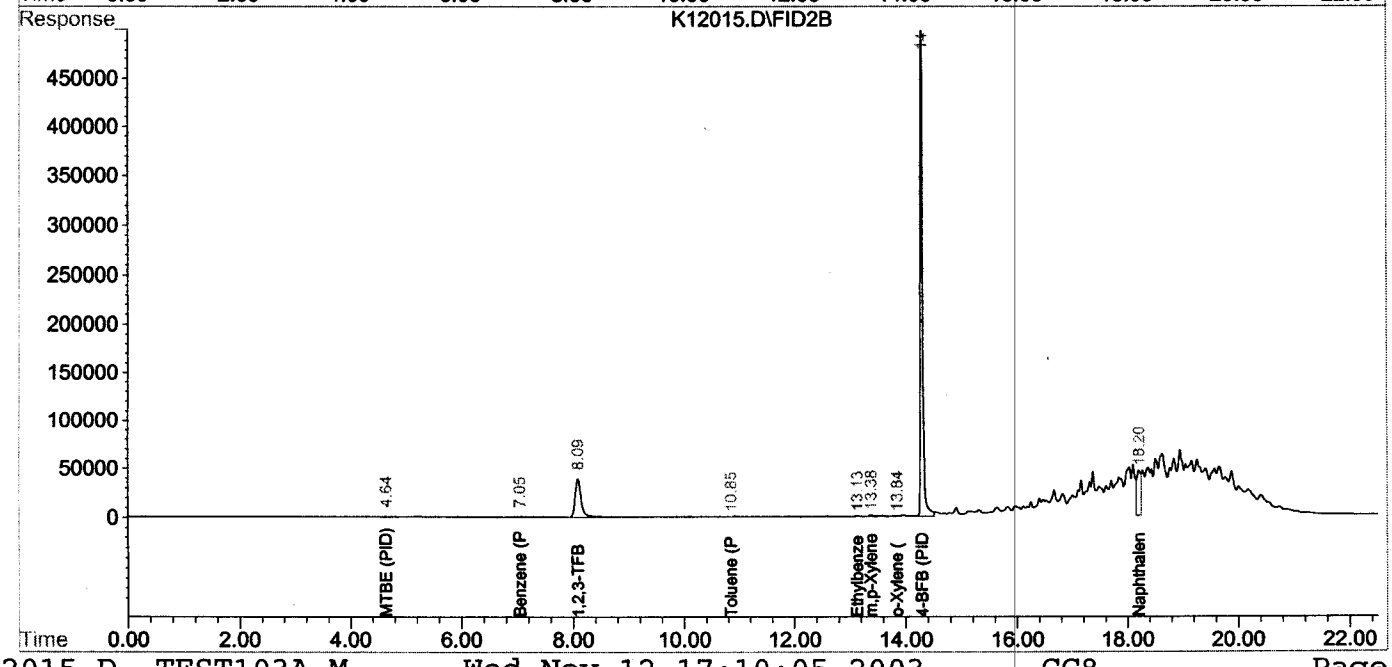
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12015.D\FID1A.CH Vial: 15
Signal #2 : D:\HPCHEM\3\DATA\111203\K12015.D\FID2B.CH
Acq On : 12 Nov 2003 16:47 Operator: sk
Sample : b3k0154-07 Inst : GC #6
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 17:10 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



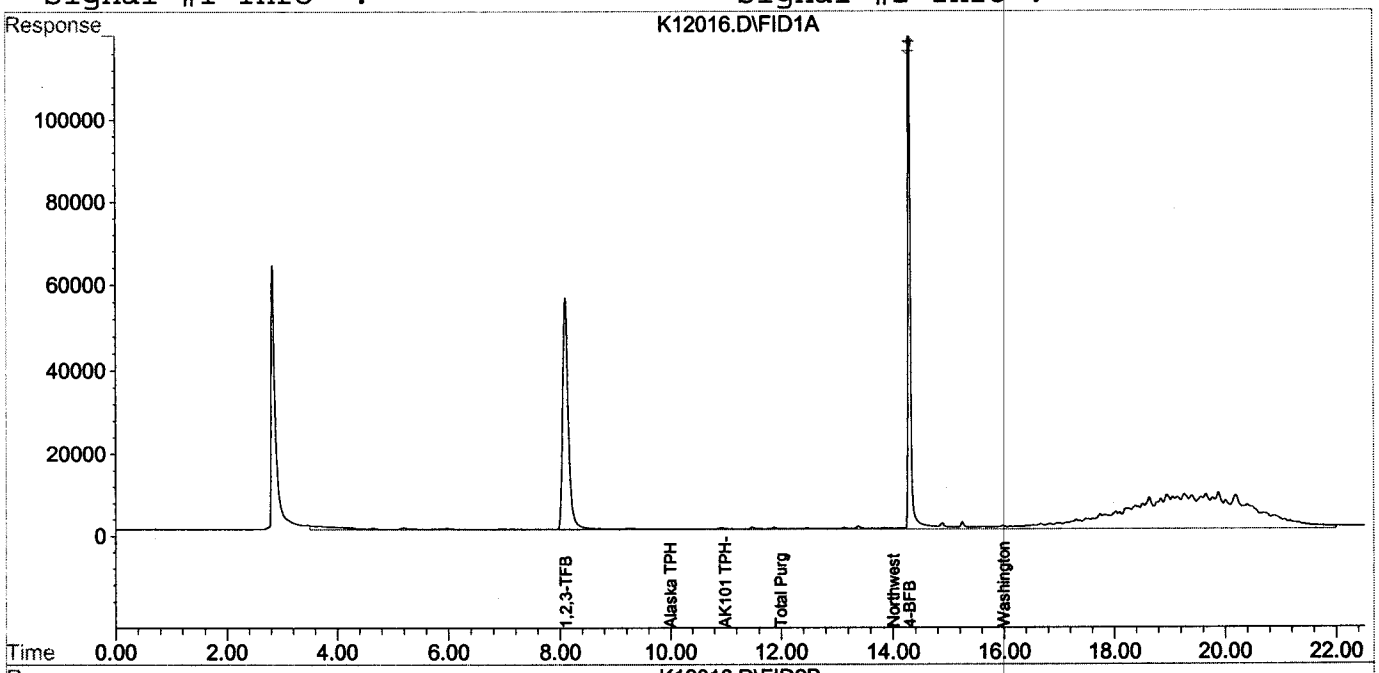


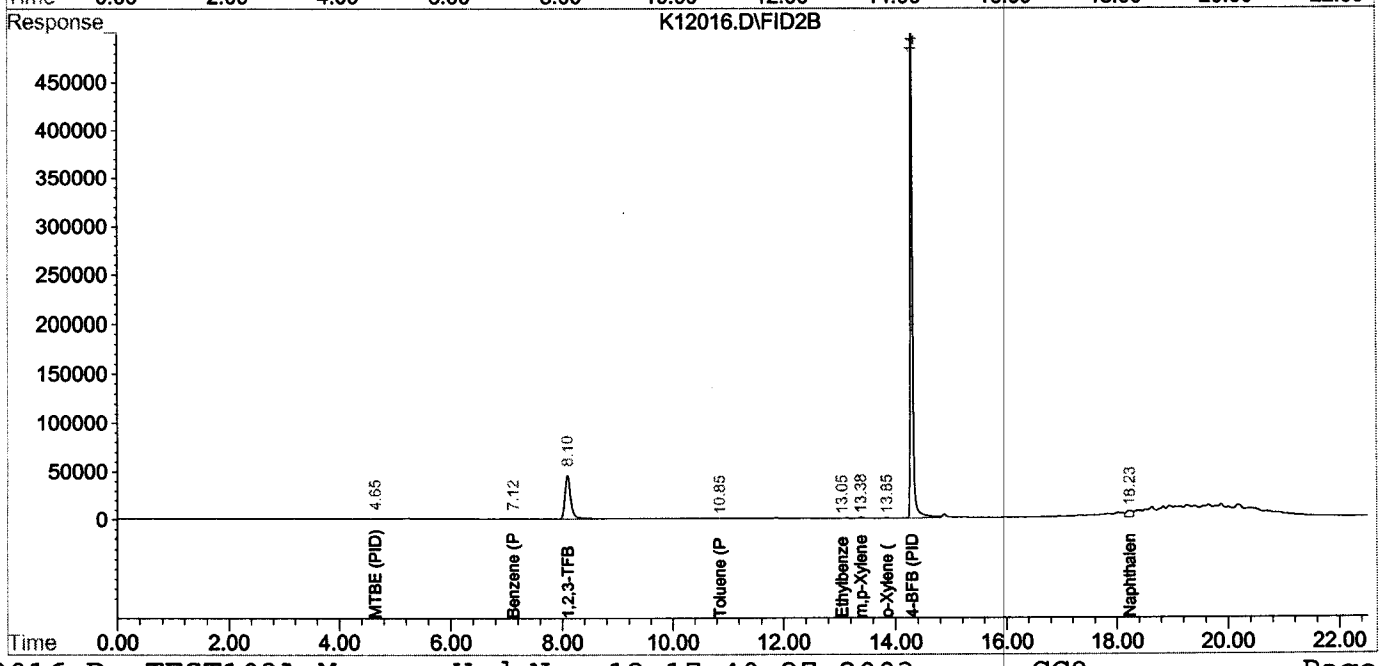
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12016.D\FID1A.CH Vial: 16
Signal #2 : D:\HPCHEM\3\DATA\111203\K12016.D\FID2B.CH
Acq On : 12 Nov 2003 17:16 Operator: sk
Sample : b3k0154-08 Inst : GC #6
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 17:40 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



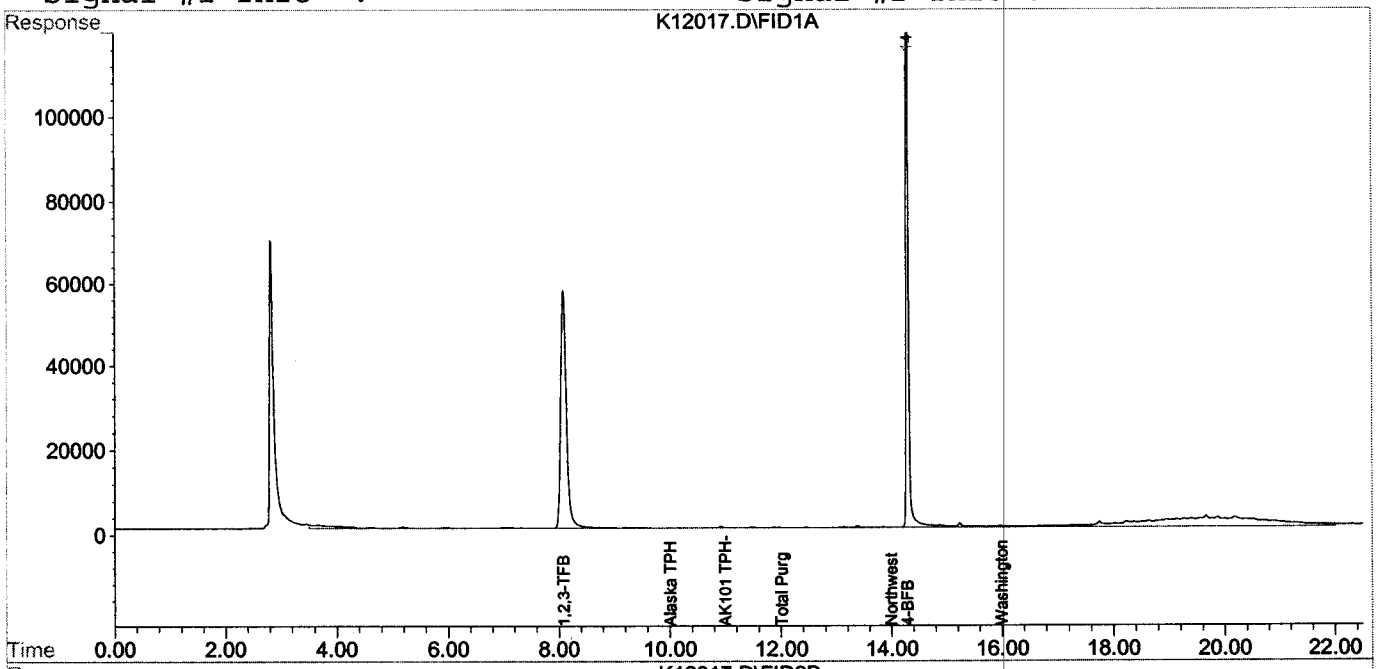


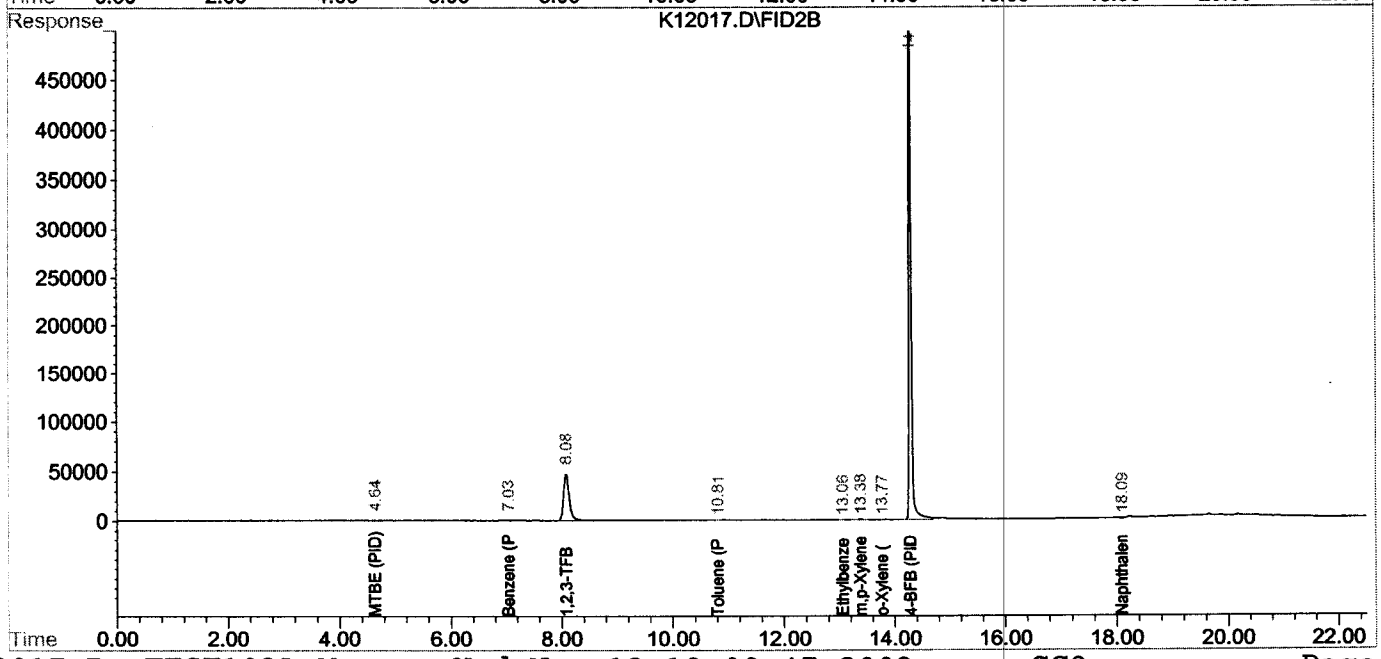
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12017.D\FID1A.CH Vial: 17
Signal #2 : D:\HPCHEM\3\DATA\111203\K12017.D\FID2B.CH
Acq On : 12 Nov 2003 17:46 Operator: sk
Sample : b3k0154-10 Inst : GC #6
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 18:09 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



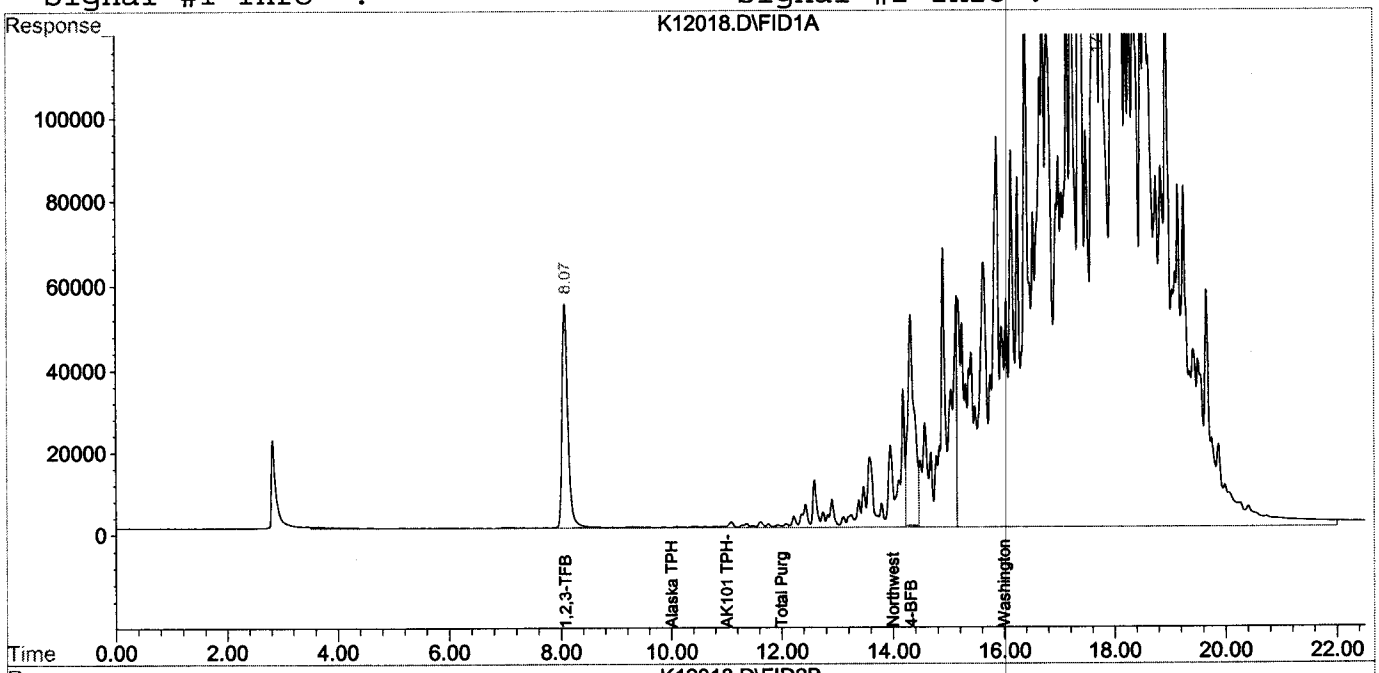


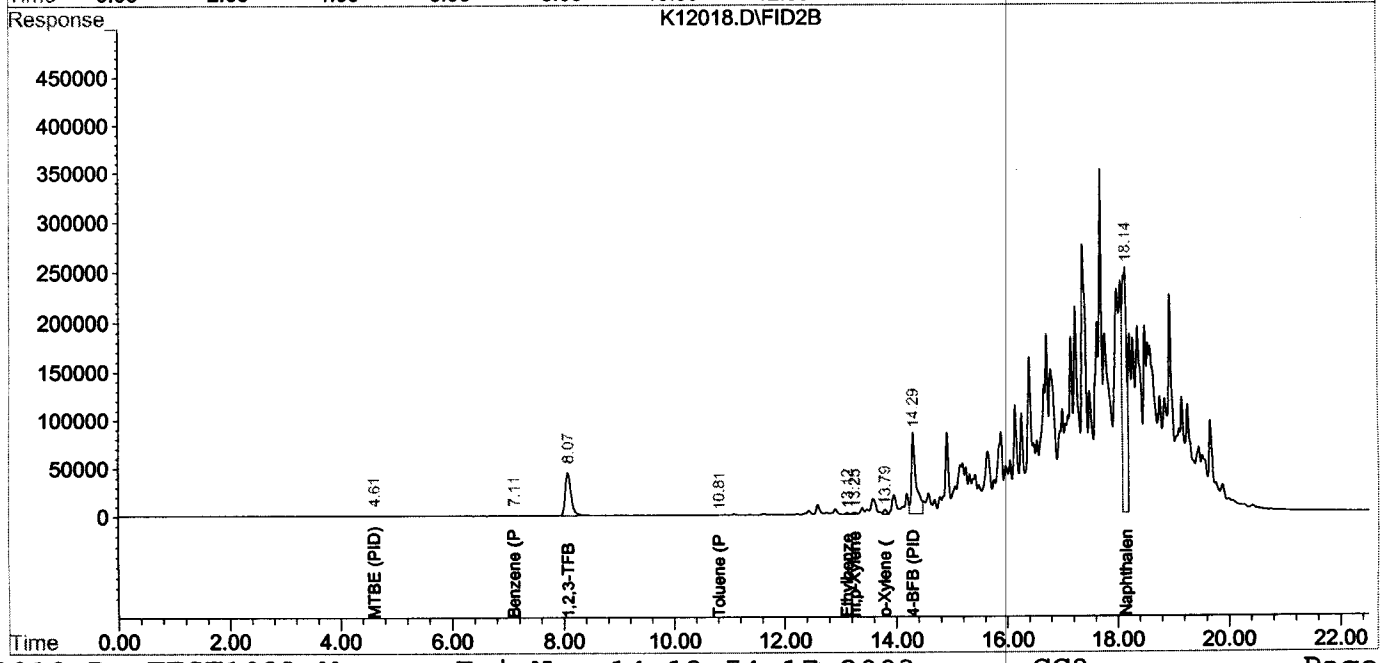
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12018.D\FID1A.CH Vial: 18
Signal #2 : D:\HPCHEM\3\DATA\111203\K12018.D\FID2B.CH
Acq On : 12 Nov 2003 18:16 Operator: sk
Sample : b3k0154-11 Inst : GC #6
Misc : 10x 10 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 18:39 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



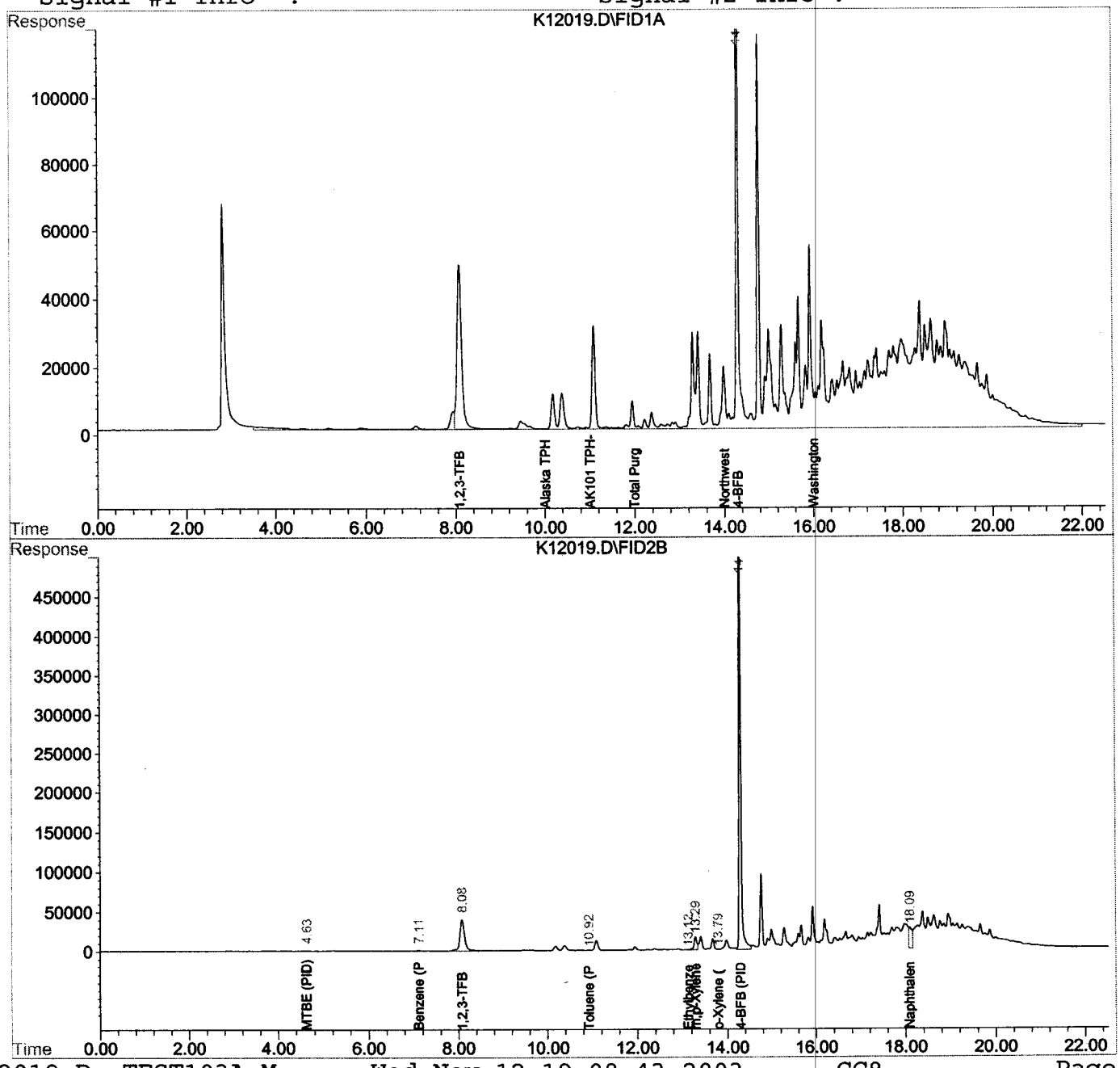


Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12019.D\FID1A.CH Vial: 19
Signal #2 : D:\HPCHEM\3\DATA\111203\K12019.D\FID2B.CH
Acq On : 12 Nov 2003 18:45 Operator: sk
Sample : b3k0154-13 Inst : GC #6
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 19:08 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

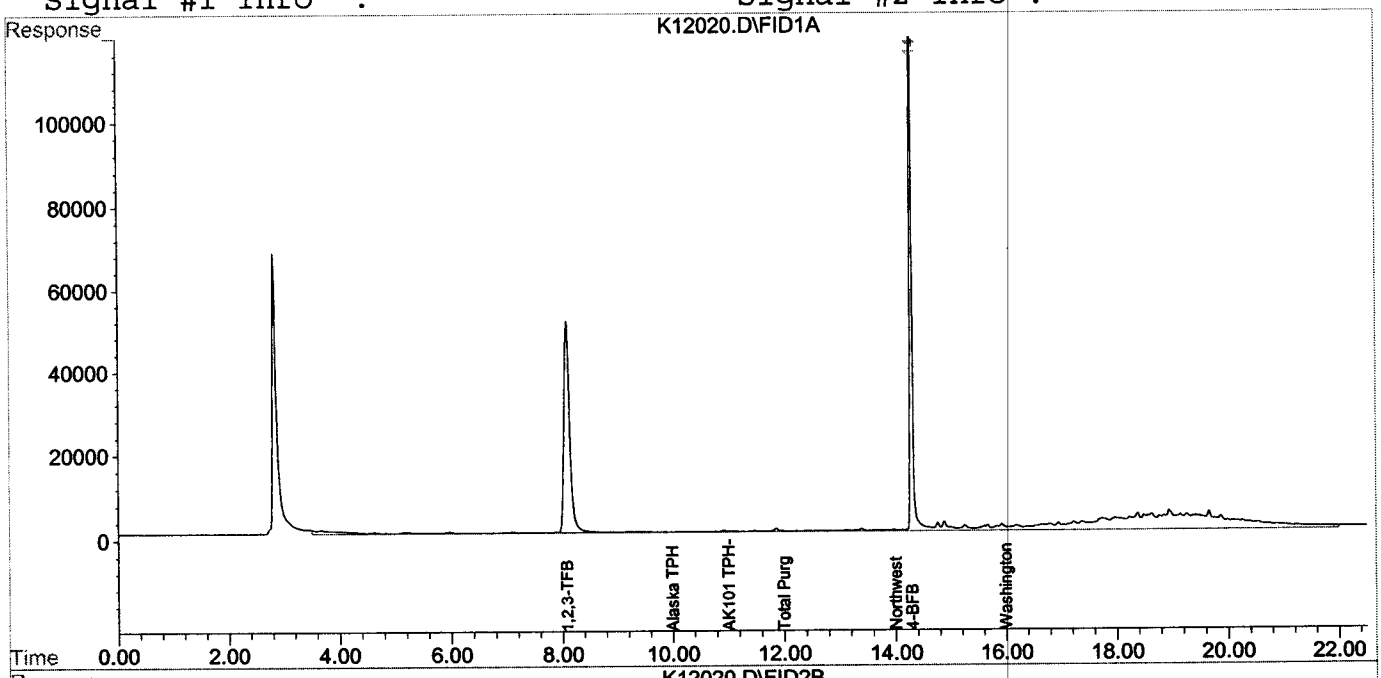


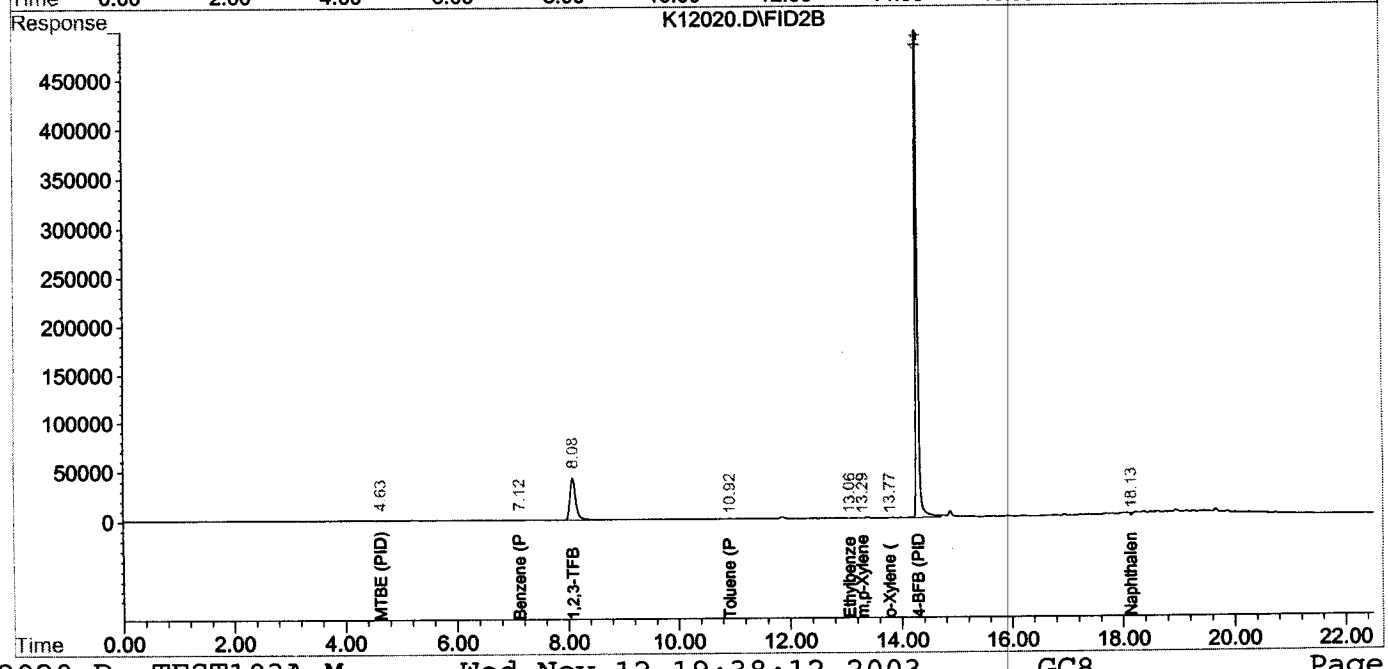
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12020.D\FID1A.CH Vial: 20
Signal #2 : D:\HPCHEM\3\DATA\111203\K12020.D\FID2B.CH
Acq On : 12 Nov 2003 19:15 Operator: sk
Sample : b3k0154-14 Inst : GC #6
Misc : 1x 100 ul Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 19:38 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



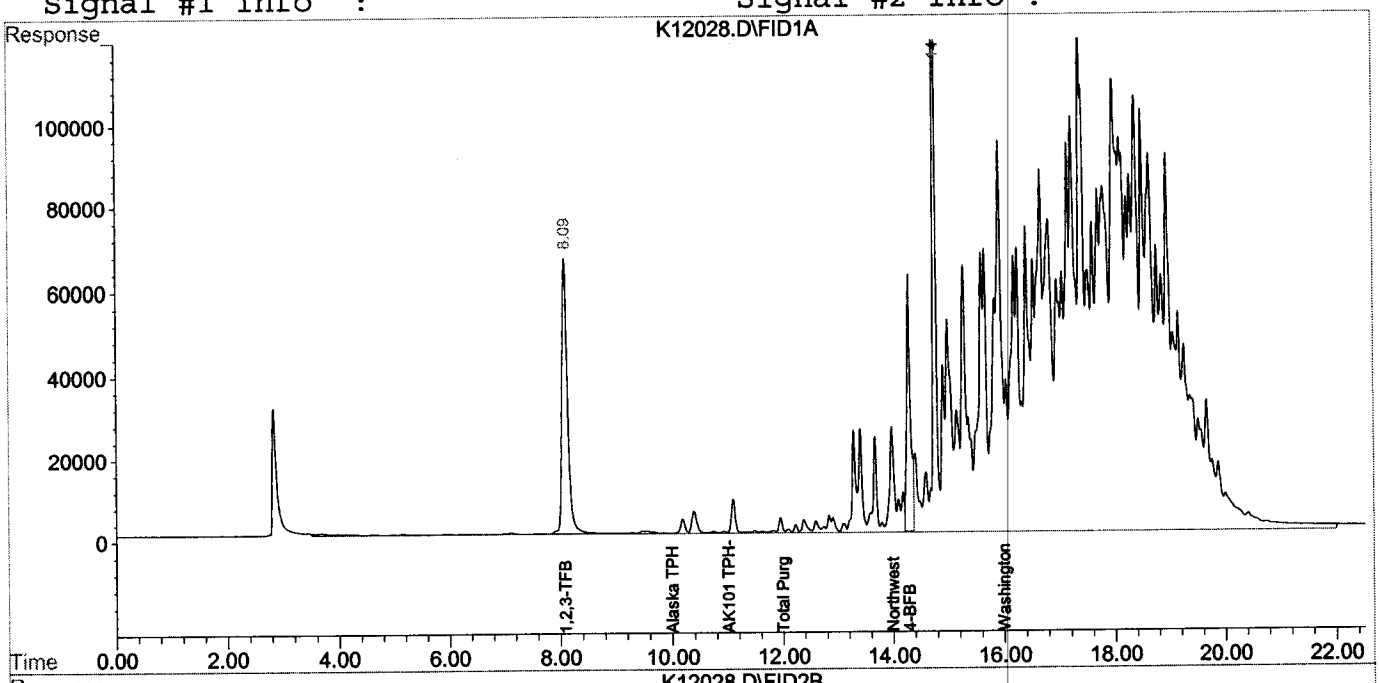


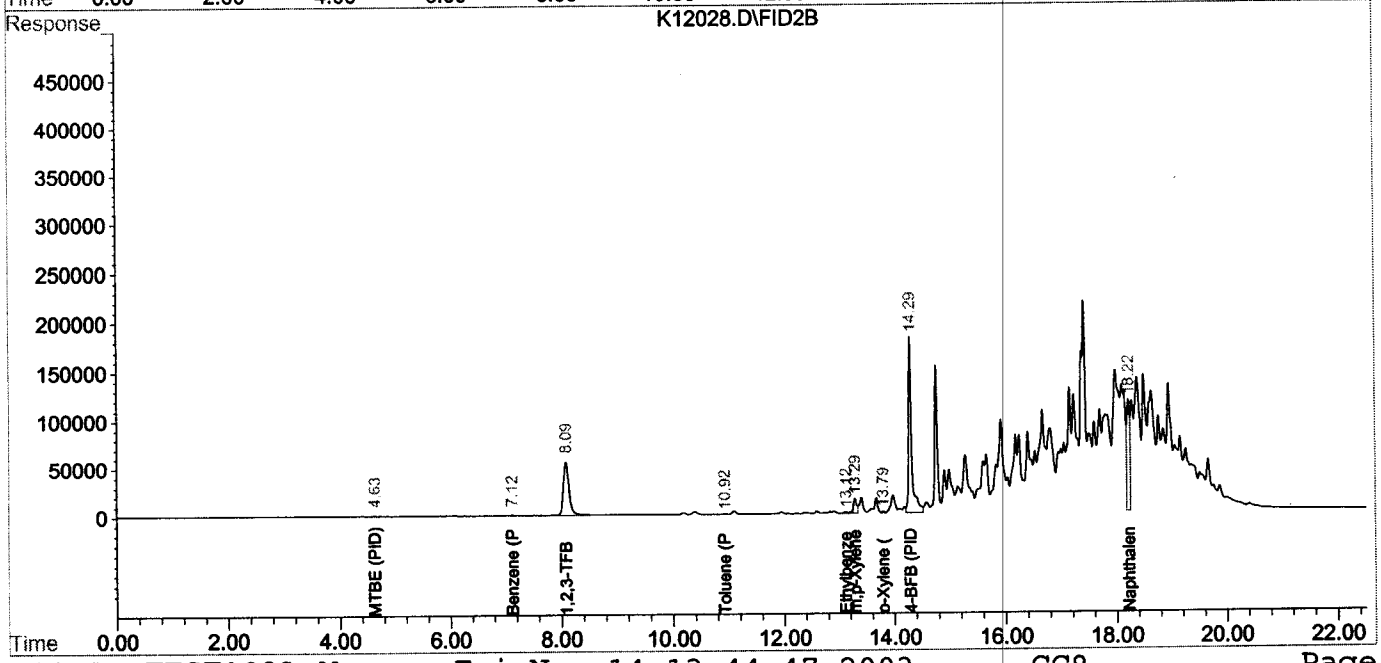
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12028.D\FID1A.CH Vial: 28
Signal #2 : D:\HPCHEM\3\DATA\111203\K12028.D\FID2B.CH
Acq On : 12 Nov 2003 23:40 Operator: sk
Sample : b3k0154-15 Inst : GC #6
Misc : 4x 25 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 13 0:03 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



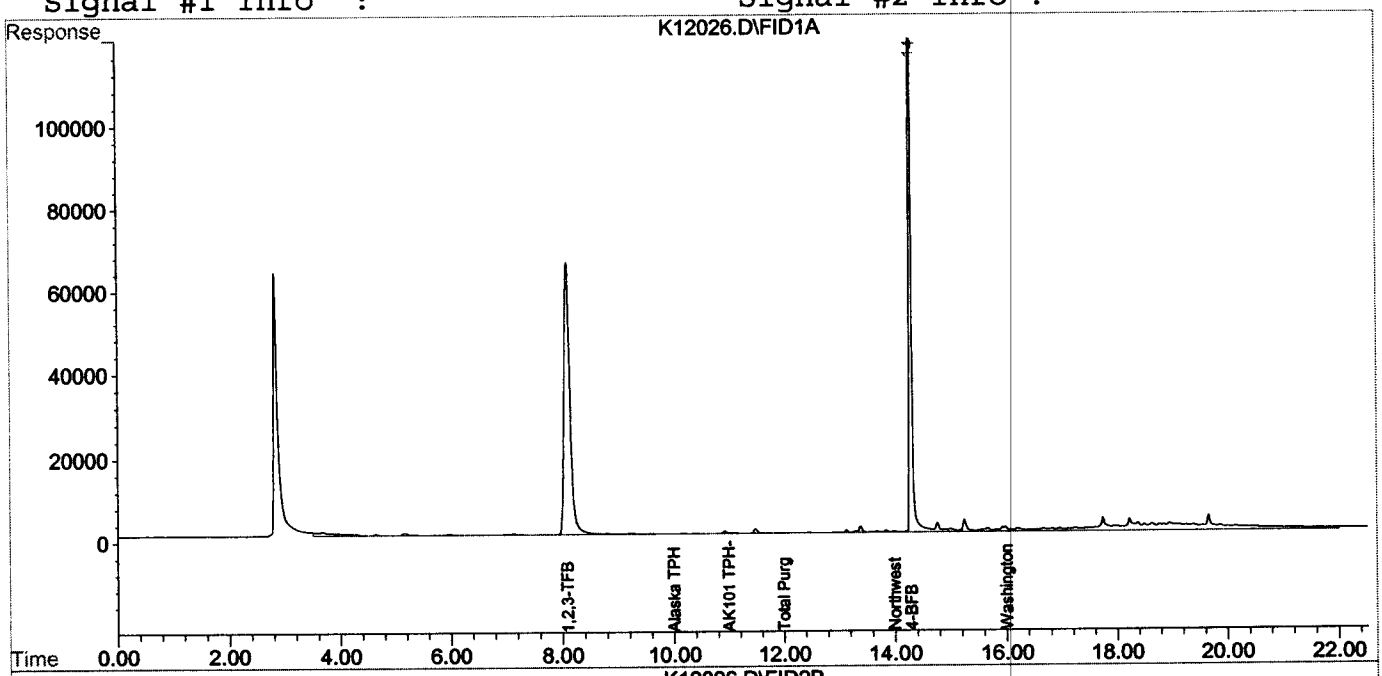


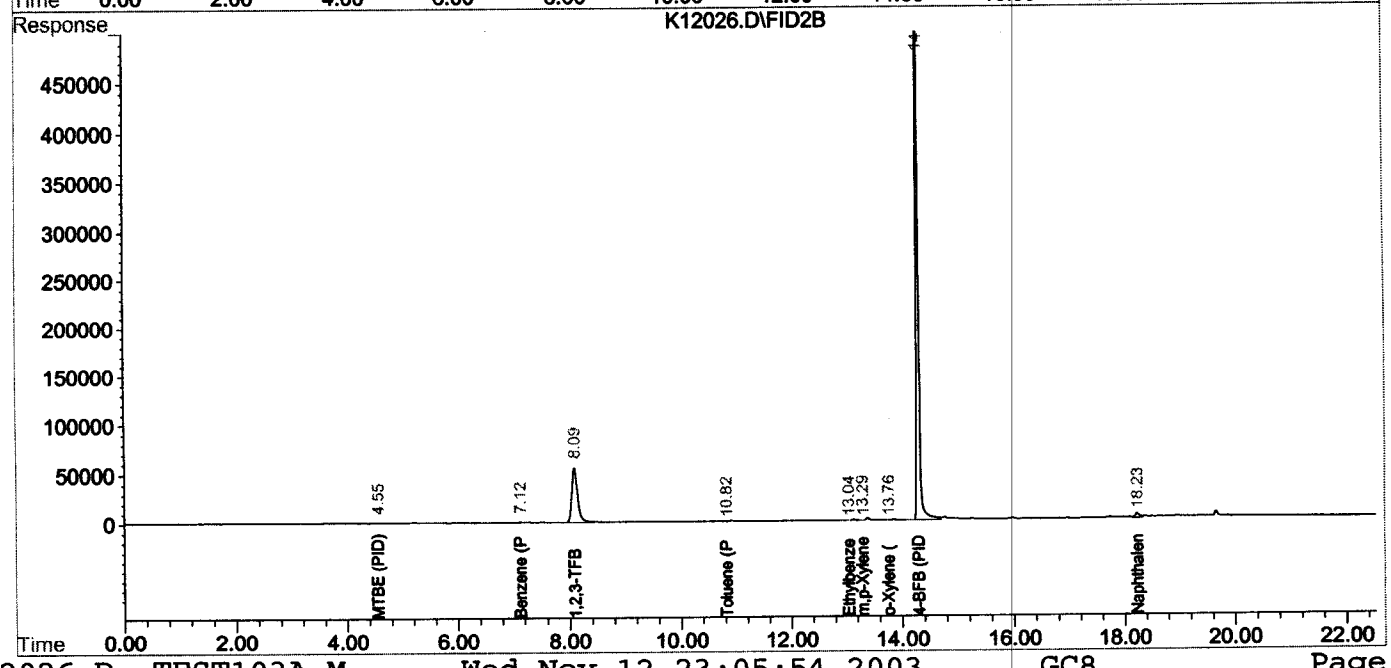
Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12026.D\FID1A.CH Vial: 26
Signal #2 : D:\HPCHEM\3\DATA\111203\K12026.D\FID2B.CH
Acq On : 12 Nov 2003 22:42 Operator: sk
Sample : b3k0154-16 Inst : GC #6
Misc : 1x 100 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 23:05 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





Quantitation Report

Signal #1 : D:\HPCHEM\3\DATA\111203\K12027.D\FID1A.CH Vial: 27
Signal #2 : D:\HPCHEM\3\DATA\111203\K12027.D\FID2B.CH
Acq On : 12 Nov 2003 23:11 Operator: sk
Sample : b3k0154-17 Inst : GC #6
Misc : 1x 100 uL Multiplr: 1.00
IntFile Signal #1: TPH.E IntFile Signal #2: SURR2.E
Quant Time: Nov 12 23:34 2003 Quant Results File: TEST103A.RES

Quant Method : D:\HPCHEM\3\METHODS\TEST103A.M (Chemstation Integrator)
Title : TPH-G/BTEX 8015/8021 Method
Last Update : Fri Nov 07 13:11:40 2003
Response via : Multiple Level Calibration
DataAcq Meth : TEST103A.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :