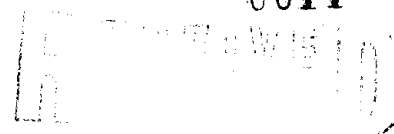


Consulting Engineers  
and Geoscientists

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Dept. of Environmental Protection  
Underground Storage Tank Unit - EAS

**Summary Report for 1999 Field Investigation**

**Texaco Service Station No. 63-057-0010**

**Anchorage, Alaska**

**July 31, 2000**

**For**

**Equiva Services, LLC**

July 31, 2000

**Consulting Engineers  
and Geoscientists**

Offices in Washington,  
Oregon and Alaska

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Attention: Anthony Palagyi

Summary of 1999 Site Closure Activities  
Texaco Service Station No. 63-057-0010  
1501 Northern Lights Boulevard  
Anchorage, Alaska  
ADEC File No. L25.20  
GEI File No. 0401-064-01

## **INTRODUCTION**

This letter presents the results of GeoEngineers' 1999 field investigation at "Big Corners" Texaco (Service Station No. 63-057-0010), located at 1501 W. Northern Lights Boulevard in Anchorage, Alaska. The October 1999 investigation included borehole and monitor well drilling and sampling to further delineate the extent of soil and ground water contamination previously detected at the site. The intent of the work was to provide additional information in support of Alaska Department of Environmental Conservation (ADEC) Method Two site closure.

## **BACKGROUND**

This section presents background information about the site, its hydrogeologic setting and previous site activities and investigations. This background information is intended to provide an understanding of the focus of the October 1999 field investigation and a summary of pertinent site information toward evaluation for ADEC Method Two closure.

## **SITE DESCRIPTION**

Big Corners Texaco occupies the northwest corner of Northern Lights Boulevard and Minnesota Bypass near the Turnagain Bluff area of Anchorage. The general layout of the service station facility and select prior sample locations are shown in Figure 1. Existing site facilities include a service station building with a convenience store and an automotive maintenance facility, two covered dispensing islands located east of the building, one covered dispensing island located south of the building, four product underground storage tanks (USTs), and

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associated buried product lines. The station also operates an automated car wash along the northwest corner of the site. The paved lot is situated on level terrain in a commercial district in Midtown Anchorage.

## **HYDROGEOLOGIC SETTING**

The subject property is located in a heavily-developed commercial district of Anchorage. It is situated close to a watershed divide between the Chester Creek and Fish Creek drainages. The site is approximately 3/5 mile south of Westchester lagoon, where Chester Creek drains into Cook Inlet. It is also approximately 1/2 mile northeast of the smaller Fish Creek channel. Limited observations of shallow ground water elevations at the site indicate a west-southwesterly gradient, suggesting association with the Fish Creek drainage. Deeper ground water flow in the vicinity of the site is likely to be toward the Knik Arm of Cook Inlet, located approximately one mile to the northwest.

Shallow subsurface materials in the vicinity of the site generally consist of glacial outwash and till. The material typically consists of layers of fine-grained material interbedded with poorly-sorted gravel. A thick layer of fine silt with clay, the Bootlegger Cove Formation, typically underlies the glacial outwash in the vicinity of the site.

## **SITE INVESTIGATIONS**

As detailed below, prior subsurface investigations at the site were conducted in three phases, beginning with compliance monitoring during station upgrades in September and October 1996. Subsequent investigations, conducted in August 1997 and December 1997 were implemented to progressively refine our understanding of the nature and extent of the subsurface contamination initially detected during the 1996 station upgrade. Detailed reports of the previous investigations, dated March 13 and October 31, 1997, and January 29, 1998, have been submitted by GeoEngineers.

**1996 Compliance Monitoring.** Station upgrades were conducted in 1996 and included removal of a 550-gallon waste oil UST and replacement of fuel dispensers and associated product piping. Environmental compliance monitoring conducted by GeoEngineers during the 1996 upgrade, identified three areas of petroleum-impacted soil: beneath the former waste oil UST; beneath the south dispensing island; and beneath the outer, east dispensing island. Five soil samples from these locations exceeded former ADEC soil cleanup standards ("Level A") for diesel-range organics (DRO) (samples BC-6, BC-25, BC-33, WO-1 and WO-2). Additionally, Level A standards for gasoline-range organics (GRO) and total benzene, ethylbenzene, toluene and xylenes (BETX) were exceeded in one sample collected from beneath the south dispensing island (BC-6) and in one sample from beneath the outer, east dispensing island (BC-33). The identified impacted soil was collected from depths of 3.5 to 5 feet below ground surface (bgs) at the dispensing islands, and further excavation was not conducted at the time due to proximity to vulnerable structures.

**October 1997 Site Assessment.** To refine our understanding of subsurface impacts detected during the 1996 facility upgrade, GeoEngineers conducted a site assessment (consisting of drilling four borings) in August 1997 to delineate the extent of contamination at the three locations of interest. Laboratory analysis for GRO, BETX and DRO of soil samples from the borings identified Level A cleanup standard exceedances for DRO only, in just one of the borings (B1), which is located at the former waste oil UST. DRO was detected in this sample at a concentration of 523 milligrams per kilogram (mg/kg). This soil sample was also tested for residual-range organics (RRO) and total petroleum hydrocarbons (TPH), which were detected at concentrations of 1,800 mg/kg and 6,220 mg/kg.

Grab samples of ground water were collected from the four boreholes in 1997 at depths of approximately 13 to 15 feet bgs. All four samples were analyzed for GRO, DRO and BETX. The sample from borehole B1, adjacent to the former waste oil UST, was also analyzed for TPH, Total Metals, halogenated volatile organic compounds (HVOCs), RRO and polychlorinated biphenyls (PCBs). The four water samples all contained BETX compounds, but at concentrations less than the former ADEC ground water standard (Maximum Contaminant Levels or "MCLs"). One borehole water sample (B-3) contained GRO at a concentration of 63.9 milligrams per liter (mg/l) and all four contained DRO with a maximum concentration (sample B-3) of 0.979 mg/l. MCLs for GRO and DRO in water were not established at the time of the investigation. Additional analyses conducted on sample B-1 included TPH and total (unfiltered) metals (barium, chromium, mercury and silver). TPH detected in the B-1 sample exceeded the former ADEC MCL. Concentrations of the four metals detected in the unfiltered sample from B-1 could not be compared to the MCLs; however, laboratory analysis for metals was conducted for total concentration, not dissolved, and thus particulate concentrations may have been detected.

**December 1997 Monitoring Well Installation.** A monitoring well was installed in December 1997 in the vicinity of the former waste oil UST (and boring B-1) to further assess and monitor impacts to ground water. GRO and BETX were not detected in the water sample from MW-1; however, DRO was detected at a concentration of 5.77 mg/l. Two dissolved metals, barium and silver, were also detected in the sample, but at concentrations less than past MCLs.

## **REGULATORY EVALUATION**

ADEC has developed a set of regulations for assessment and cleanup of USTs. These regulations (18AAC78) were most recently updated on April 16, 2000, however they were in place prior to development of a work scope for the present field investigation. The UST regulations adopt risk-based cleanup methods contained in the Contaminated Sites Regulations (18AAC75.341). There are four options available to conduct a risk-based assessment and it is our judgment that Method Two may be applicable for this site. Under Method Two, soil and ground water standards are provided in look-up tables that may be demonstrated to apply based on site-specific information supporting a Conceptual Site Model (CSM).

Following is a summary of the status of subsurface contamination at the three areas of interest based on the Method Two look-up tables. Soil contamination is evaluated relative to 18AAC75.341 Table B1 for a migration to ground water pathway in a low precipitation zone. Ground water contamination is evaluated relative to 18AAC75.345 Table C standards.

## **DISPENSING ISLANDS**

Soil contamination beneath the south and east dispensing islands is impractical to remove due to the proximity to canopy supports. Two 1996 soil samples (BC-6 located beneath the south dispensing island, and BC-33 located beneath the northeast dispensing island) exceeded current ADEC Method Two cleanup standards. The exceedances in sample BC-6 are for GRO (889 mg/kg); and in sample BC-33 are for GRO (5,000 mg/kg), DRO (272 mg/kg), and for ethylbenzene, toluene and xylenes (11.0 mg/kg, 8.6 mg/kg and 1,320 mg/kg, respectively). Ground water samples previously collected from the vicinity of the dispensing islands detected only low levels of hydrocarbons (less than current ADEC "Table C" ground water standards).

## **FORMER WASTE OIL UST**

Subsurface soil contamination also remains in the vicinity of the former waste oil UST; however, removal is impractical due to proximity to the station building and an Anchorage Water and Wastewater Utility (AWWU) sewer line. DRO concentrations previously detected in ground water at this location exceed current ADEC Table C ground water standards.

## **PURPOSE AND OBJECTIVES**

The purpose of the present investigation was to obtain soil and ground water samples in the three areas of interest at the site. The objective of the investigation was to procure supplemental data toward site evaluation relative to current, ADEC Method Two site closure standards.

## **DISPENSING ISLANDS**

During this investigation, GeoEngineers aimed to collect samples in the immediate vicinity of former soil sample locations BC-6 and BC-33, if possible, using hollow stem auger drilling equipment. The objective of the soil samples in these locations was to investigate soil conditions relative to new ADEC regulatory standards for aliphatic and aromatic fractions of hydrocarbons.

## **WASTE OIL UST CONTAMINATION**

This investigation was designed to further investigate the extent of ground water impacts in the vicinity of the former waste oil UST to secure Method Two closure for this site. Our scope of work included installing and sampling two monitoring wells north and west of boring B-1 and monitoring existing well MW-1. The purpose of the new wells was to determine ground water conditions along the Texaco property boundaries closest to, and presumably down-gradient of the former waste oil UST area.

## **SCOPE OF WORK**

### **DISPENSING ISLANDS**

1. Conducted a utility locate in the vicinity of proposed borings near 1996 soil samples BC-6 and BC-33, beneath the south and east dispensing islands, respectively.
2. Consulted with a drilling subcontractor to determine the feasibility of obtaining soil samples from these proposed sample locations.
3. Drilled and sampled boring 99B-5 and 99B-6 in the vicinity of BC-6 and boring 99B-3 in the vicinity of BC-33.
4. Obtained five to seven soil samples from each of the borings at approximate 2.5-foot intervals. Field screened the samples for evidence of petroleum contamination using visual and headspace vapor screening methods.
5. Based on field screening results, submitted two soil samples from each boring to NCA for chemical analysis of GRO/BETX by Alaska Method AK101, aliphatic/aromatic fractionation of GRO by AK101AA, DRO by AK102 and aliphatic/aromatic fractionation of DRO by AK102AA. The samples were also analyzed for Total Organic Carbon (TOC) by EPA Method 9060M.
6. Monitored the installation of a 2-inch-diameter polyvinyl chloride (PVC) monitoring well in two of the borings to depths of 19 feet bgs (99B-3/MW-C) and 18 feet bgs (99B-6/MW-D). Constructed each well with 10 feet of 0.020-inch slot width screen at the bottom and blank Schedule 40 PVC pipe from the surface to the top of screen, and a locking watertight well cap. Completed the wells with a medium sand pack, bentonite well seal, concrete collar and a steel monument installed flush with grade.
7. Contained all soil cuttings generated during drilling operations in a 55-gallon drum and temporarily stored them on the Texaco service station site. The soil cuttings were later characterized for transport and treatment by Anchorage Soil Recycling.
8. Developed the new monitoring wells and temporarily contained the purge water in a 55-gallon drum on site. Purge water was later transported to Alaska Pollution Control for recycling at their Palmer, Alaska facility.

### **FORMER WASTE OIL UST AREA**

1. Conducted property map research and a utility locate in the vicinity the former waste oil UST to establish final locations of two wells, MW-A and MW-B.
2. Monitored the drilling of two soil borings (99B-1/MW-A and 99B-2/MW-B) to depths of 20 feet and 17 feet bgs, respectively, using hollow-stem auger drilling techniques.
3. Obtained two soil samples from each of the borings at depths ranging from 13.5 to 19.0 feet bgs. Field screened the samples for evidence of petroleum contamination using visual and headspace vapor screening methods.
4. Based on field screening results, submitted one soil sample from each boring to NCA for chemical analysis of DRO and RRO with aliphatic/aromatic fractionation by Alaska Methods AK102/103 and for TOC.

5. Monitored the installation of a 2-inch-diameter polyvinyl chloride (PVC) monitoring well in each boring to depths of 19 feet bgs (MW-A) and 17 feet bgs (MW-B). Constructed each well with 10 feet of 0.020-inch slot width screen at the bottom and blank Schedule 40 PVC pipe from the surface to the top of screen, and a locking watertight well cap. Completed the wells with a medium sand pack, bentonite well seal, concrete collar and a steel monument installed flush with grade.
6. Contained all soil cuttings generated during drilling operations in a 55-gallon drum and temporarily stored them on the Texaco service station site. The soil cuttings were later characterized for transport and treatment by Anchorage Soil Recycling.
7. Developed the new monitoring wells and temporarily contained the purge water in a 55-gallon drum on site. Purge water was later transported to Alaska Pollution Control for recycling at their Palmer, Alaska facility.

### **GROUND WATER SAMPLING**

1. Measured the depth to ground water in monitoring well MW-1 and the four new wells on two occasions (10/28/99 and 12/07/99) to an accuracy of 0.01 feet using an electronic water level indicator.
2. Collected ground water samples during one sampling event (12/99) from each of the five wells using a new, disposable, 1-inch-diameter bailer and cord to minimize the possibility of cross-contamination.
3. Submitted ground water samples from MW-1, MW-C and MW-D to NCA for chemical analysis of GRO/BETX by Method AK101 and for DRO and RRO by Methods AK102 and AK103. Submitted ground water samples from MW-A and MW-B for chemical analysis of DRO/RRO by Method AK102 and also analyzed samples MW-A, MW-B and MW-1 for dissolved metals by U.S. Environmental Protection Agency (EPA) Methods 6010A/7000.

### **REPORTING**

1. Evaluated the laboratory data generated during the subsurface explorations with respect to existing Method Two regulatory standards.
2. Prepared a written report discussing the results of the subsurface explorations and laboratory testing, and presenting our conclusions.

## **FIELD ACTIVITIES**

### **METHODOLOGY**

Five soil borings were drilled and four monitoring wells were installed at the site between October 26 and 28, 1999. Ground water samples were collected from wells at the site on December 7, 1999. A geologist from our staff monitored the well installations, determined the soil sampling locations, examined and classified the soils encountered, and collected soil and ground water samples for chemical analysis. Locations of soil borings, monitoring wells and



select former soil sample locations are shown on Figure 1. GeoEngineers' field procedures are described in Attachment A.

### **WASTE OIL UST**

GeoEngineers monitored the drilling and installation of soil borings 99B-1 and 99B-2 (monitoring wells MW-A and MW-B, respectively) on October 26, 1999. The two borings were drilled to between 17 to 20 feet bgs and were located in the northwest quarter of the site (north and west of the former waste oil UST). Specifically, the boring 99B-1 was located along the south wall of the north section of the car wash building, and boring 99B-2 was located near the center of the east wall of the south section of the car wash building (see Figure 1). Soil encountered during drilling of these two borings consisted of medium dense, brown to gray, medium-coarse, gravelly sand overlying stiff to medium-stiff, gray, fine, sandy silt at a depth of approximately 17 feet bgs. Ground water was encountered in each of these two borings at approximately 13 feet bgs.

### **NORTHEAST DISPENSING ISLAND**

Boring 99B-3 (MW-C) was drilled and sampled on October 28, 1999. The boring was situated immediately west of the station's northeast fuel dispenser. Soil encountered during drilling of boring 99B-3 consisted of brown fine-medium sand with silt grading with depth to medium-coarse sand at approximately 13 feet bgs. A light gray silt with very fine sand was encountered at approximately 17 feet bgs. Ground water was encountered in the boring at approximately 13.5 feet bgs.

Boring 99B-4 (not shown on the Site Plan) was attempted several feet south of 99B-3 on the west side of the northeast fuel dispenser; however, an electrical conduit was encountered at 2 feet bgs. The conduit was undamaged and the boring was abandoned using bentonite chips and a concrete patch.

### **SOUTH DISPENSING ISLAND**

Borings 99B-5 and 99B-6 (MW-D) were drilled immediately on the north side and near the center of the station's south fuel dispensing island on October 27, 1999. Soil encountered during drilling of borings 99B-5 and 99B-6 generally consisted of dark brown fine-medium sand grading with depth to medium-coarse sand with gravel at approximately 12 feet bgs. A light gray silt with very fine sand was encountered at approximately 17.5 feet bgs in boring 99B-6. Ground water was encountered in boring 99B-6 at approximately 14.5 feet bgs. Boring 99B-5 was abandoned prior to encountering ground water (approximately 14.0 feet bgs).

### **GROUND WATER SAMPLING**

Top-of-casing elevations were surveyed relative to an arbitrary datum, and ground water levels were measured in monitoring wells MW-1, MW-A, MW-B, MW-C and MW-D on October 28, 1999. The newly-installed monitoring wells were developed on November 2, 1999.

Ground water levels were measured again, and ground water samples were collected from each well at the site on December 7, 1999.

## **RESULTS**

Field screening and analytical data for soil samples collected during this investigation are summarized in Table 2. Based on ground water elevations measured at the site, the shallow ground water beneath the site appears to flow south-southwest at a relatively flat gradient. Depth to water measurements and ground water elevations are summarized in Table 1. Analytical data for ground water samples collected in December 1999 are summarized in Table 3. Laboratory analytical data reports for soil and ground water samples are presented in Attachment B.

### **FORMER WASTE OIL UST AREA**

#### **Soil Results**

Soil borings 99B-1 (MW-A) and 99B-2 (MW-B) were drilled north and west, respectively, of the former waste oil UST. Soil samples were collected from each boring at or beneath the shallow ground water table to identify soil contamination resulting from waste oil contaminated ground water. Two soil samples were collected from each boring for field screening. One sample from each boring was analyzed for DRO and RRO, aliphatic/aromatic fractions of DRO and RRO and for TOC.

Neither DRO nor RRO were detected in the soil sample from boring 99B-3 (MW-B). RRO was not detected in the sample analyzed from boring 99B-1 (MW-A). DRO was detected in the sample collected from 16 feet bgs in boring 99B-1 (MW-A) at a concentration of 8.66 mg/kg. The sample was also analyzed for aliphatic and aromatic fractions of DRO. Aliphatic DRO was detected at a concentration of 5.74 mg/kg and aromatic DRO was not detected above a laboratory detection limit of 5.0 mg/kg.

#### **Ground Water Results**

Ground water from wells MW-A, MW-B and MW-1 (situated at the former waste oil UST location) was sampled on December 7, 1999. The ground water samples were analyzed for DRO, RRO and dissolved metals (Resource Conservation and Recovery Act [RCRA] eight: arsenic, barium, cadmium, chromium, lead, selenium, mercury and silver). RRO was not detected in the ground water samples collected from wells MW-A and MW-B. RRO was detected in sample MW-1 at a concentration of 3.57 mg/l. DRO was detected in samples MW-1 and MW-B at concentrations of 1.34 mg/l and 0.112 mg/l, respectively. Dissolved barium was detected in each of the three ground water samples at concentrations ranging from 0.0251 mg/l to 0.0335 mg/l. Dissolved chromium was also detected in the MW-1 sample at a concentration of 0.00207 mg/l.

## **NORTHEAST DISPENSING ISLAND**

### **Soil Results**

Soil boring 99B-3 (MW-C) was drilled immediately west of the station's northeast fuel dispenser. The purpose of this boring was to evaluate gasoline-related contamination detected in shallow soil beneath this dispenser (sample B-33) in 1996. Field screening indicated little to no contamination in soil shallower than 9 feet bgs. Moderate to heavy sheen and elevated vapor headspace measurements indicated significant contamination at depths of 11 feet and 13.5 feet bgs. These indicators diminished at depths greater than 13.5 feet bgs. Based on these field results, samples from 13.5 feet and 18 feet bgs were selected for chemical analysis. The samples were analyzed for BETX, GRO, DRO, aliphatic/aromatic fractions of GRO and DRO, and for TOC.

GRO and BETX were detected in the sample collected from 13.5 feet bgs at concentrations of 1,200 mg/kg GRO and 421 mg/kg total BETX. Aliphatic and aromatic fractions of GRO were quantified at 401 mg/kg and 431 mg/kg, respectively. DRO was detected in the 13.5-foot-bgs sample at a concentration of 7.11 mg/kg. The aliphatic/aromatic fractionation analysis did not detect DRO above the laboratory detection limits of 5.00 mg/kg.

GRO was not detected in the sample collected from 18 feet bgs. Xylenes were detected in the sample at a concentration of 0.189 mg/kg. DRO was detected in the 18-foot-bgs sample at a concentration of 5.77 mg/kg with aliphatic and aromatic fractions of 9.35 mg/kg and 8.71 mg/kg, respectively.

### **Ground Water Results**

A ground water sample was collected from well MW-C located on the west side of the northeast dispensing island. The sample was analyzed for BETX, GRO, DRO and RRO. RRO was not detected in the MW-C sample. Benzene was detected in the sample at a concentration of 27.9 micrograms per liter ( $\mu\text{g/l}$ ). Other BETX compounds were also detected in the sample at concentrations ranging from 120  $\mu\text{g/l}$  to 9,470  $\mu\text{g/l}$ . GRO and DRO were detected in the MW-C sample at concentrations of 30,600  $\mu\text{g/l}$  and 2.05 mg/l, respectively.

## **SOUTH DISPENSING ISLAND**

### **Soil Results**

Soil borings 99B-5 and 99B-6 (MW-D) were drilled immediately north of the station's southern dispensing island. Field screening (moderate sheen and fuel odor diminishing with depth to slight sheen and no odor) indicated significant contamination in shallow soil in boring 99B-5. Field screening (moderate to heavy sheens, strong fuel odors and elevated vapor headspace measurements) indicated significant contamination in shallow soil extending to ground water in boring 99B-6 (MW-D). Based on these results, samples from 6.5 feet bgs and 13.5 feet bgs from boring 99B-5, and samples from 6.5 feet bgs and 16 feet bgs from boring 99B-6 (MW-D) were selected for chemical analysis. The samples were analyzed for BETX, GRO, DRO, aliphatic/aromatic fractions of GRO and DRO, and for TOC.

GRO and BETX were detected in the 6.5-foot-bgs sample from boring 99B-5 at concentrations of 14.6 mg/kg GRO and 0.513 mg/kg total BETX. Aromatic GRO was detected at a concentration of 14.2 mg/kg and aliphatic GRO was not detected. DRO was detected in the 6.5-foot-bgs sample from 99B-5 at a concentration of 28.8 mg/kg. Aliphatic DRO was detected at a concentration of 7.88 mg/kg and aromatic DRO was not detected. Neither GRO nor DRO were detected in the 13.5-foot-bgs sample from 99B-5. Only ethylbenzene and xylenes were detected in the 13.5-foot-bgs sample at a combined concentration of 0.263 mg/kg (total BETX). TOC was detected in the 13.5-foot-bgs sample from boring 99B-5 at an average concentration of 571 mg/kg.

BETX and GRO were detected in the 6.5-foot-bgs sample from boring 99B-6 (MW-D) at concentrations of 1.0 mg/kg total BETX and 6.25 mg/kg GRO. Aliphatic and aromatic fractions of GRO were measured at 4.21 mg/kg aliphatic and 4.43 mg/kg aromatic. DRO was detected in the 6.5-foot-bgs sample at a concentration of 19.4 mg/kg. Aliphatic and aromatic fractions of DRO were not detected above the laboratory reporting limit of 5.0 mg/kg. TOC was detected in the 6.5-foot-bgs sample from boring 99B-6 (MW-D) at an average concentration of 506 mg/kg. GRO and DRO were detected in the sample collected from 16 feet bgs in boring 99B-6 at concentrations of 428 mg/kg GRO and 420 mg/kg DRO. Aliphatic and aromatic fractions of GRO and DRO were not measured for this sample due to inadequate sample volume. BETX was not detected in the 16-foot-bgs sample but the laboratory detection limits for BETX compounds were significantly elevated (benzene less than 2.67 mg/kg) due to the high concentrations of analyte in the sample. TOC was detected in the 16-foot-bgs sample from 99B-6 (MW-D) at an average concentration of 751 mg/kg.

### **Ground Water Results**

A ground water sample was collected from well MW-D located on the north side of the southern fuel dispensing island. The sample was analyzed for BETX, GRO, DRO and RRO. RRO was not detected in the MW-D sample. Xylenes and GRO were detected in the sample at respective concentrations of 84.4 µg/l and 2,730 µg/l. Benzene was not detected in the MW-D sample but the laboratory detection limit for benzene was raised to 28.6 µg/l due to the high concentrations of hydrocarbons in the sample. Similarly, ethylbenzene and toluene were not detected in the MW-D sample above the elevated detection limits of 3.40 µg/l and 14.6 µg/l, respectively. DRO was detected in the sample at a concentration of 0.829 mg/l.

## **CONCLUSIONS**

### **FORMER WASTE OIL UST AREA**

Borings 99B-1 (MW-A) and 99B-2 (MW-B) and the previously-installed monitoring well MW-1 were completed to evaluate contamination associated with the former waste oil UST. Minor diesel-range soil contamination (8.66 mg/kg) was identified in soil beneath the ground water table in boring 99B-1.

Neither DRO nor RRO were detected in the 99B-2 boring, located downgradient from the former waste oil UST. Minor diesel-range contamination (0.112 mg/l) was detected in the ground water sample collected from MW-B. This detected concentration is well below the current ADEC ground water cleanup level of 1.5 mg/l for DRO.

The ground water sample collected from well MW-1, located at the former waste oil UST, contained DRO at a concentration less than the current ADEC ground water cleanup levels. However, RRO was detected in the sample at 3.57 mg/l, which exceeds the ADEC ground water cleanup level of 1.1 mg/l for RRO. Dissolved metals concentrations detected in MW-1 samples since 1997 and in the MW-A and MW-B ground water samples during this investigation do not exceed ADEC ground water cleanup levels. It may be appropriate to resample well MW-1 for aliphatic and aromatic fractions of RRO and DRO to determine whether these analytes (specifically the RRO) remain above regulatory guidelines. However, based on the concentration of total RRO in the MW-1 sample, it is not certain whether the aromatic fraction of RRO would be less than the ADEC guideline of 1.1 mg/l aromatic RRO.

We understand that ground water cleanup levels of up to 10 times the ADEC regulations for ground water may be applied to sites where the affected aquifer is not nor will be considered a drinking water source, and provided that the original ADEC cleanup levels are met at the property boundary. Data collected from monitoring wells MW-B (downgradient of the former waste oil UST) and MW-A (located upgradient of the former UST) indicate that DRO and RRO concentrations at the property boundary meet the current ADEC ground water cleanup levels. GeoEngineers recommends that Equiva complete a conceptual site model in order to document ground water use at and around the site property. We understand that this will allow for use of 10 times the current regulatory cleanup guidelines for RRO and DRO at the site (should they remain at elevated concentrations). With these accepted guidelines in place, Equiva may request an ADEC Method II closure for contamination associated with the former waste oil UST.

## **NORTHEAST DISPENSING ISLAND**

In 1996, soil sample BC-33 exceeded current regulatory cleanup guidelines for GRO, DRO, ethylbenzene, toluene and xylenes. In each of these cases, the detected concentration of the analyte exceeded the most stringent guidelines (for the migration to ground water pathway) but not for the inhalation pathway, with one exception. Xylenes detected in 1996 exceeded both the migration to ground water and the inhalation pathway cleanup standards.

Boring 99B-3 (MW-C) was drilled with the intention of further evaluating this sample location. The most contaminated sample from boring 99B-3 contained ethylbenzene, toluene, xylenes and GRO (both aliphatic and aromatic fractions) that exceeded the ADEC migration to ground water cleanup standards. With the exception of xylenes (396 mg/kg), each of these analyte concentrations met the less stringent inhalation pathway cleanup standard for soil. Benzene was not detected in the sample collected from 99B-3. However, due to matrix interferences, the

detection limits in this sample are between ADEC's migration to ground water clean up standards and inhalation cleanup standards.

The ground water from well MW-C contained high GRO and BETX concentrations. Specifically, concentrations of GRO, benzene, ethylbenzene and DRO exceeded ADEC ground water cleanup standards. The DRO results were noted by the laboratory as being primarily due to overlap from a gasoline range product and may likely be discounted. The BETX and GRO exceedances are significant, however. The detected concentrations of benzene and ethylbenzene were within 10 times the regulatory cleanup standard, but the detected concentration of GRO (30.8 mg/l) exceeds even 20 times the regulatory cleanup standard of 1.3 mg/l for GRO. Because of the soil and ground water exceedances for GRO and BETX, a conceptual site model will be required to document site and surrounding property usage and to evaluate the possibility of ADEC Method II or risk-based closure. A simple Method II closure option may not be available in this case; however, due to the high concentration of xylenes in soil and GRO in ground water in this location.

## **SOUTH DISPENSING ISLAND**

In 1996, soil sample BC-6 exceeded current regulatory cleanup guidelines for GRO (889 mg/kg). The detected GRO concentration exceeded the most stringent soil cleanup guideline (for the migration to ground water pathway) but not the somewhat less stringent inhalation pathway cleanup standards.

Borings 99B-5 and 99B-6 (MW-D) were drilled with the intention of further evaluating this sample location. Detected concentrations of GRO, BETX and DRO in soil samples from boring 99B-5 did not exceed ADEC migration to ground water cleanup levels, with the following exception. Benzene was not detected in samples collected from this boring; but in each case, the detection limit for benzene exceeded the migration to ground water cleanup level of 0.02 mg/kg.

Soil samples collected from boring 99B-6 (MW-D) contained GRO and DRO at concentrations exceeding the migration to ground water pathway cleanup standards. In addition, like the samples from boring 99B-5, although benzene was not detected in samples from boring 99B-6, the benzene detection limit exceeded these cleanup levels. While the laboratory detection limits for benzene in most of these samples are only slightly above the ADEC cleanup level, the detection limit for one sample in particular (99B-6, 16 feet bgs) was elevated to 2.67 mg/kg (over 100 times the most stringent regulatory limit). Results of all of the soil samples collected from boring 99B-6 (MW-D) meet the inhalation pathway cleanup standards for soil.

The most contaminated soil sample from boring 99B-6 (MW-D) was collected from 16 feet bgs. The ground water sample collected from well MW-D contained GRO, BETX and DRO. The detected concentration of GRO (2.73 mg/l) in the MW-D sample exceeds ADEC regulatory standard, but is within 10 times this standard. Benzene was not detected in the ground water sample collected from MW-D but the laboratory detection limit for benzene was elevated to 28.6 µg/l, which exceeds the ADEC regulatory standard of 5 µg/l for benzene. Like the GRO

exceedance, this potential benzene concentration of up to 28.6 µg/l does not exceed 10 times the regulatory standard.

### **RECOMMENDATIONS**

We understand that ground water cleanup levels of up to 10 times the ADEC regulations for ground water may be applied to sites where the affected aquifer is not nor will be considered a drinking water source, and provided that the original ADEC cleanup levels are met at the property boundary. In addition, we understand that the less conservative inhalation or ingestion pathway cleanup standards may be applied to sites based on exposure risks.

Because of soil and ground water exceedances for GRO and DRO at the south dispensing island; GRO and BETX at the northeast dispensing island; and RRO at MW-1 (at the former waste oil UST), a simple Method II site closure is not possible for this site unless a conceptual site model is completed.

Data collected from monitoring wells MW-B (downgradient of the former waste oil UST) and MW-A (located upgradient of the former UST) indicate that DRO and RRO concentrations at the property boundaries nearest the former waste oil UST meet the current ADEC ground water cleanup levels. Ground water samples collected from borings in 1997 also confirm that ground water contaminant concentrations 10 feet away from the northeast dispensing island and 12 feet from the south dispensing island also meet current ADEC ground water cleanup levels.

GeoEngineers recommends that Equiva complete a conceptual site model in order to document site and surrounding property usage and to evaluate the possibility of risk-based closure. It should be noted, however, that due to the high concentration of xylenes in soil and GRO in ground water at the northeast fuel dispenser (1996 BC-33 and 1999 boring 99B-3 MW-C), a more extensive evaluation of exposure risk may be required to secure site closure



We appreciate the opportunity to be of service to Equiva. Please contact us if you have questions regarding this project.

Yours very truly,

GeoEngineers, Inc.

Elizabeth J. Shen  
Project Hydrogeologist

Scott E. Widness, P.E.  
Principal

EJS:SEW:skl  
Document ID: 040106401drpt.doc

#### Attachments

Three copies submitted

cc: Robert Weimer  
ADEC - Anchorage Office



TABLE 1  
SUMMARY OF GROUND WATER ELEVATION DATA  
1999 FIELD INVESTIGATION  
TEXACO SERVICE STATION 63-057-0010  
1501 WEST NORTHERN LIGHTS BOULEVARD  
ANCHORAGE, ALASKA  
GEI JOB #0401-064-01

Monitoring Well	Top of Casing Elevation <sup>1</sup> (feet)	Date	Depth to Water From Top of Casing (feet)	Ground Water Elevation (feet)
MW-1	98.99	10/28/99	13.67	85.32
		12/07/99	13.82	85.17
MW-A	98.35	10/28/99	12.89	85.46
		12/07/99	13.04	85.31
MW-B	98.37	10/28/99	13.12	85.01
		12/07/99	13.28	85.09
MW-C	98.69	10/28/99	13.36	85.33
		12/07/99	13.39	85.30
MW-D	99.27	10/28/99	14.17	85.10
		12/07/99	14.21	85.06

## Notes:

<sup>1</sup>Elevations are relative to an assumed site datum (southeast building corner)

TABLE 2 (Page 1 of 3)  
SUMMARY OF SOIL FIELD SCREENING AND ANALYTICAL DATA<sup>1</sup>  
1999 FIELD INVESTIGATION  
TEXACO SERVICE STATION 63-057-0010  
1501 WEST NORTHERN LIGHTS BOULEVARD, ANCHORAGE, ALASKA  
GEI JOB #0401-064-01

Sample ID	Field Screening <sup>2</sup>		BETX <sup>3</sup> EPA Method 8021B (mg/kg)							GRO <sup>4</sup> (mg/kg)	DRO <sup>5</sup> (mg/kg)	RRO <sup>6</sup> (mg/kg)	TOC <sup>7</sup> (mg/kg)
	Sheen	PID Headspace (ppm)	B	E	T	X	Total BETX						
Boring 99B-1 (MW-A) - 10/28/99													
99B1-16.0	NS	--	--	--	--	--	--	--	--	8.66 aliphatic=5.74 aromatic=<5.0	<25.0	539	
99B1-19.0	NS	--	--	--	--	--	--	--	--	--	--	--	
Boring 99B-2 (MW-B) - 10/26/99													
99B2-13.5	SS	--	--	--	--	--	--	--	--	<4.0	<25.0	<300	
99B2-16.5	NS	--	--	--	--	--	--	--	--	--	--	--	
Boring 99B-3 (MW-C) - 10/28/99													
99B3-3.5	NS	0	--	--	--	--	--	--	--	--	--	--	
99B3-6.5	SS	0	--	--	--	--	--	--	--	--	--	--	
99B3-9.0	NS	0	--	--	--	--	--	--	--	--	--	--	
99B3-11.0	MS	97.5	--	--	--	--	--	--	--	--	--	--	
99B3-13.5	HS	531	<0.964	15.3	8.76	396	420	1,200 aliphatic-431 aromatic-401	7.11 aliphatic=<5.0 <sup>a</sup> aromatic=<5.0	--	--	761	
99B3-16.0	NS	12.7	--	--	--	--	--	--	--	--	--	--	
99B3-18.0	SS	3.9	<0.0376	<0.0376	<0.0376	0.189	0.189	<3.76	5.77 aliphatic=8.71 aromatic=9.35	--	--	4,810	

Notes appear on page 3 of 3.

TABLE 2 (Page 2 of 3)

Sample ID	Field Screening <sup>2</sup>		BETX <sup>3</sup> EPA Method 8021B (mg/kg)					GRO <sup>4</sup> (mg/kg)	DRO <sup>5</sup> (mg/kg)	RRO <sup>6</sup> (mg/kg)	TOC <sup>7</sup> (mg/kg)
	Sheen	PID Headspace (ppm)	(mg/kg)								
			B	E	T	X	Total BETX				
Boring 99B-5 - 10/27/99											
99B5-3.5	MS	7.9 <sup>9</sup>	--	--	--	--	--	--	--	--	--
99B5-6.5	MS	6.6 <sup>9</sup>	<0.0318	0.0804	0.0688	0.364	0.513	14.6 <sup>10</sup> aliphatic=14.2 aromatic=<3.45	28.8 aliphatic=7.88 aromatic=<5.0	--	545
99B5-9.0	MS	1.5 <sup>9</sup>	--	--	--	--	--	--	--	--	--
99B5-11.0	SS-NS	10.6 <sup>9</sup>	--	--	--	--	--	--	--	--	--
99B5-13.5	SS	1.3 <sup>9</sup>	<0.0287	<0.0287	0.100	0.163	0.263	<2.87	<4.0	--	571
Boring 99B-6 (MW-D) - 10/27/99											
99B6-3.5	MS	186	--	--	--	--	--	--	--	--	--
99B6-6.5	MS	53.5	<0.0309	<0.0309	0.0454	0.956	1.00	6.25 <sup>10</sup> aliphatic=4.21 aromatic=4.43	19.4 aliphatic=<5.0 aromatic=<5.0	--	506
99B6-9.0	SS	19.0	--	--	--	--	--	--	--	--	--
99B6-11.0	SS	109	--	--	--	--	--	--	--	--	--
99B6-13.5	MS	6.5	--	--	--	--	--	--	--	--	--
99B6-16.0	HS	330	<2.67 <sup>11</sup>	<1.15 <sup>11</sup>	<0.644 <sup>11</sup>	<1.70 <sup>11</sup>	--	428	420	--	751
ADEC Method Two Soil Cleanup Standards											
Migration to Ground Water Pathways			0.02	5.5	5.4	78	--	300 aliphatic = 270 aromatic = 150	250 aliphatic = 7,200 aromatic = 500	11,000 aliphatic = 20,000 aromatic = 3,300	--
Inhalation Pathways							--	1,400 aliphatic = 1,000 aromatic = 1,000	12,500 aliphatic = 10,000 aromatic = 5,000	22,000 aliphatic = 20,000 aromatic = 10,000	--
Ingestion Pathways							--	1,400 aliphatic = 1,000 aromatic = 1,000	10,250 aliphatic = 10,000 aromatic = 4,100	10,000 aliphatic = 20,000 aromatic = 3,000	--

Notes appear on page 3 of 3.

6-6-01  
14.2

TABLE 2 (Page 3 of 3)

Notes:

<sup>1</sup>Samples collected by GeoEngineers from October 26-28, 1999.

<sup>2</sup>Field screening methods are described in Attachment A.

NS = no sheen, SS = slight sheen, MS = moderate sheen, HS = heavy sheen

<sup>3</sup>B = benzene, E = ethylbenzene, T = toluene, X = xylenes

<sup>4</sup>GRO = Gasoline-Range Organics by ADEC Method AK101. Duplicates of select samples also analyzed for aromatic and aliphatic fractions of volatile petroleum hydrocarbons by ADEC Method AK101AA.

<sup>5</sup>DRO = Diesel-Range Organics by ADEC Method AK102. Duplicates of select samples also analyzed for aromatic and aliphatic fractions of extractable petroleum hydrocarbons by ADEC Method AK102/103AA.

<sup>6</sup>RRO = Residual-Range Organics by ADEC Method AK103. Duplicates of select samples also analyzed for aromatic and aliphatic fractions of extractable petroleum hydrocarbons by ADEC Method AK102/103AA.

<sup>7</sup>TOC = Total Organic Carbon by EPA Method 9060 Modified.

<sup>8</sup>Laboratory notes indicate that the aliphatic surrogate recovery is outside of established control limits. Results for the aliphatic portion should be considered a low estimated value.

<sup>9</sup>PID measurements for 99B-5 were measured a second time following an instrument malfunction. Results are skewed low.

<sup>10</sup>Laboratory notes indicate that the chromatogram for this sample does not resemble a typical gasoline pattern.

<sup>11</sup>The laboratory reporting limit for this analyte has been raised to account for interference from coeluting organic compounds present in this sample.

PID = photoionization detector

ppm = parts per million

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams per kilogram

"-" = not analyzed or not applicable

ADEC = Alaska Department of Environmental Conservation

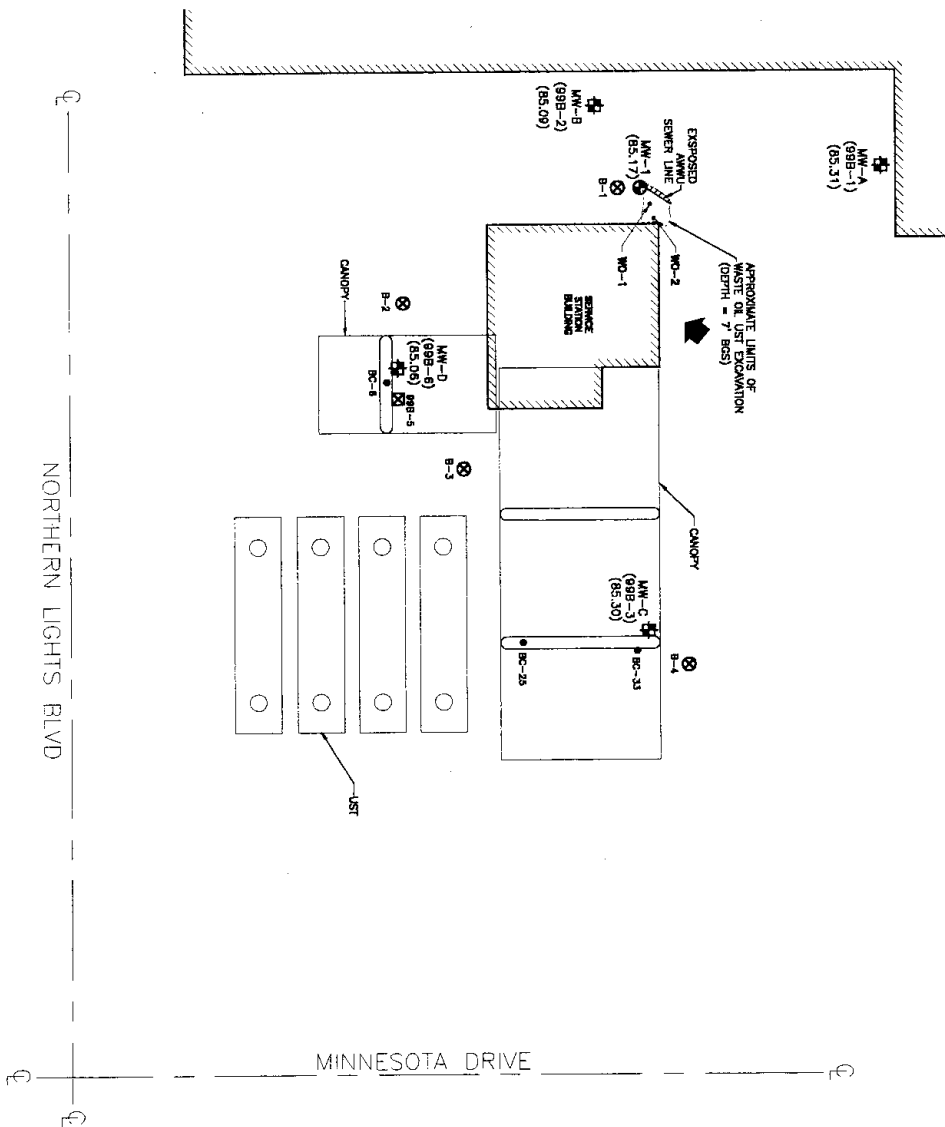
TABLE 3 (Page 1 of 2)  
GROUND WATER ANALYTICAL RESULTS FOR  
1999 FIELD INVESTIGATION  
TEXACO SERVICE STATION 63-057-0010  
1501 WEST NORTHERN LIGHTS BOULEVARD, ANCHORAGE, ALASKA  
GEI JOB #0401-064-01

Well ID	Date Sampled	BETX <sup>1</sup> EPA Method 8021B (µg/l)				GRO <sup>2</sup> (µg/l)	DRO <sup>3</sup> (mg/l)	RRO <sup>4</sup> (mg/l)	Dissolved Metals <sup>5</sup> (mg/l)
		B	E	T	X				
MW-1	12/03/97	<0.05	<0.05	<0.05	<1.0	<50.0	5.77	--	Barium = 0.0286 Silver = 0.0270
	12/07/99	--	--	--	--	--	1.34 <sup>6</sup>	3.57	Barium = 0.0237
MW-A	12/07/99	--	--	--	--	--	<0.100	<0.750	Chromium = 0.00207
MW-B	12/07/99	--	--	--	--	--	0.112	<0.750	Barium = 0.0335
MW-C	12/07/99	<50.0	789	72.3	9,560	30,800	1.89 <sup>7</sup>	<0.750	Barium = 0.0251
	12/07/99*	27.9	801	120	9,470	30,600	2.05 <sup>7</sup>	<0.750	--
MW-D	12/07/99	<28.6 <sup>8</sup>	<3.40 <sup>8</sup>	<14.6 <sup>8</sup>	84.4	2,730	0.829	<0.750	--
		5	700	1,000	10,000	1,300	1.5	0.1	Barium = 2.0 Silver = 0.18 Chromium = 0.1
ADEC Ground Water Cleanup Standards									

Notes appear on page 2 of 2.

TABLE 3 (Page 2 of 2)

Notes:	
<sup>1</sup> B = benzene, E = ethylbenzene, T = toluene, X = xylenes	
<sup>2</sup> GRO = Gasoline-Range Organics by ADEC Method AK101	
<sup>3</sup> DRO = Diesel-Range Organics by ADEC Method AK102	
<sup>4</sup> RRO = Residual-Range Organics by ADEC Method AK103	
<sup>5</sup> Dissolved Metals by EPA Method Series 6000/7000. Includes arsenic, barium, cadmium, chromium, lead, selenium, mercury and silver. These metals were not detected in the sample unless noted otherwise.	
<sup>6</sup> Laboratory notes indicate that results in the diesel range are primarily due to overlap from a heavy-oil-range product.	
<sup>7</sup> Laboratory notes indicate that results in the diesel range are primarily from a gasoline-range product.	
<sup>8</sup> Laboratory reporting limit for this sample was raised to account for interference from coeluting organic compounds present in the sample.	
EPA = U.S. Environmental Protection Agency	
µg/l = micrograms per liter	
mg/l = milligrams per liter	
"_" = not analyzed	
"dup" = duplicate sample	
ADEC = Alaska Department of Environmental Conservation	
Shading indicates concentrations greater than ADEC ground water cleanup standards.	



**Note:** The locations of all features shown are approximate.

Geo  
  
Engineers

**SITE PLAN**  
**FIGURE 1**

TEXACO FACILITY No. 63-057-0010  
1501 NORTHERN LIGHTS BLVD  
ANCHORAGE, AK

## EXPLANATION

BC-6 ●  
SOIL SAMPLE BY GEDEENGINEERS  
DN 09/24/96 AND 10/04/96

8-2  SOIL BORING BY GEDENG ENGINEERS  
DN 08/06/97

MONITORING WELL BY GEOTECHNICAL ENGINEERS  
ON 12/02/97, WITH GROUND WATER  
ELEVATION, IN FEET

998-5 ☒ BORING BY GEOTECHNICALS ON 10/27/99

MN-C  
 (998-3)  
 (85-30)

BORING AND MONITORING WELL BY  
 GEENGINEERS ON 10/26/99 - 10/28/99,  
 WITH GROUND WATER ELEVATION, IN FEET

INFERRED GROUND WATER FLOW DIRECTION

0 30 60  
SCALE IN FEET

0032

**ATTACHMENT A**



## **ATTACHMENT A**

### **FIELD EXPLORATIONS**

Subsurface soil and ground water conditions were explored at Texaco Service Station 63-057-0010 (1501 West Northern Light Boulevard, Anchorage, Alaska) by drilling and sampling five soil borings and installation of four monitoring wells from October 26-28, 1999. Soil samples were collected for laboratory analysis at the time of drilling, while analytical samples of ground water were collected on December 7, 1999. Two of the borings (MW-A and MW-B) were drilled and the monitoring wells installed using a truck-mounted CME-45 rotary drill rig, owned and operated by Discovery Drilling of Anchorage, Alaska. The remaining three borings (MW-C, 99B-5 and MW-D) were drilled and two completed as monitoring wells using the same drill rig mounted on skids and modified for low clearance. The boring logs and well details are provided in this attachment.

### **FIELD PERSONNEL**

Field explorations in October 1999 were monitored by GeoEngineers' Anchorage, Alaska, field representatives. The wells were developed by Discovery Drilling personnel in November 1999. GeoEngineers field personnel collected ground water samples from each well at the site in December 1999.

### **SOIL BORING AND SAMPLING**

Five soil borings were drilled and sampled to depths ranging from 14.5 feet and 10 feet below ground surface (bgs) during the October 1999 investigation. The borings were drilled using 8-inch-diameter hollow-stem auger drilling equipment. The approximate locations of the soil borings are shown in Figure 1 of this report. The boring logs are presented in Figures A-3 through A-7.

Discovery Drilling steam-cleaned their equipment (i.e., hollow stem auger, drill bits and center rod) prior to mobilizing for the site. The split-spoon samplers were cleaned prior to each sampling attempt with an Alconox wash, a tap water rinse and a distilled water rinse. The GeoEngineers representative wore clean, disposable, nitrile gloves while handling the sample equipment during sample collection.

Soil cuttings generated during the drilling of the exploratory borings were transferred into 55-gallon steel drums. Approximately five drums containing the cuttings were temporarily stored on site. The drums were transferred to Anchorage Soil Recycling treatment facility on December 9, 1999, and were successfully treated on May 1, 2000.

Soil samples were obtained from the borings using a split-spoon sampler (2.5-inch inside diameter). The sampler was driven 24 inches or until refusal by a 340-pound weight falling a vertical distance of 24 inches. The number of blows needed to advance the sampler the second and third 6-inch intervals is termed the standard penetration resistance. This value is indicated to the left of the corresponding sample notations on the boring log.

Borings 99B-3, 99B-5 and 99B-6 required cutting through an 8-inch slab of concrete and hand digging through pea-gravel to confirm that no station utilities were present prior to drilling. Since the boring location was directly beneath the station canopy, modification of the drill rig was required, precluding accurate blow-count data for samples collected.

The soil samples were transferred to 2-ounce glass jars with septum caps and 8-ounce laboratory jars with Teflon-lined caps using individually-wrapped, sterile wooden scoops. The samples in the 2-ounce jars were preserved in the field with premeasured aliquots of methanol. The samples were then kept cool during temporary storage and transport. Soil samples were transported to North Creek Analytical (NCA) in Bothell, Washington. Chain-of-custody procedures were followed during sample transport to the NCA laboratory.

## **SOIL CLASSIFICATION AND FIELD SCREENING**

Soil encountered was classified visually in general accordance with American Society for Testing and Materials (ASTM) D2488-84, the Standard Practice for Description and Identification of Soils, and the United Soil Classification System (USCS).

Each soil sample was screened in the field for residual hydrocarbons using visual and water sheen testing methods. Grab samples of soil corresponding to the laboratory samples were also collected in zip-lock plastic bags for subsequent headspace vapor testing using a Photovac MicroTIP photoionization detector (PID) to further guide identification of samples for laboratory analysis. Soil samples were submitted for analytical testing based upon review of all field screening results. Field screening results are site- and borehole-specific. The results vary with temperature, moisture content, soil type and type of contamination.

Visual screening consists of inspecting the soil for stains indicative of fuel-related contamination. Visual screening is generally more effective when contamination is related to heavy petroleum hydrocarbons such as motor oil or when hydrocarbon concentrations are high.

Water sheen screening involves placing soil in water and observing the water surface for signs of sheen. Sheen classifications are as follows:

No Sheen (NS)	No visible sheen on water surface.
Slight Sheen (SS)	Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly.
Moderate Sheen (MS)	Light to heavy sheen; may have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on water surface.
Heavy Sheen (HS)	Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

Headspace vapor screening involves placing a soil sample in a plastic sample bag. Air is captured in the bag and the bag is shaken to expose the soil to the air trapped in the bag. The probe of the PID is inserted into the bag and the PID measures the concentration of combustible vapor concentrations in parts per million (ppm). The PID is calibrated to isobutylene and is

designed to quantify organic vapors in the range between 0.0 ppm and 10,000 ppm. For this application, the lower limit of instrument accuracy was selected to correspond with the concentration of the calibration gas (100 ppm).

## **MONITORING WELL CONSTRUCTION**

Monitoring wells MW-A, MW-B, MW-C and MW-D were completed in boreholes 99B-1, 99B-2, 99B-3 and 99B-6, respectively, immediately following drilling. Two-inch-diameter, Schedule 40 polyvinyl chloride (PVC) well casing was installed in each boring. A 10-foot-long section of PVC well screen with 0.020-inch-wide slots was placed at the bottom of the well. Medium sand was placed approximately two to three feet above each well screen interval followed by approximately two to three feet of bentonite chips. Additional medium sand was placed above the bentonite chips prior to installation of a flush-mount well monument set in concrete. The bottom of each well screen was completed with an end cap and the top of each well casing was completed with a locking watertight cap. Construction details for the monitoring wells are included in Figures A-3 through A-7.

Discovery Drilling developed the newly-installed monitoring wells using a surge block and new disposable bailers to surge and remove water and sediment through the screened interval of each well. Approximately 10 gallons of water (approximately five well volumes) were removed from each well during development. Purge water from well development was contained in a 55-gallon drum, and was removed for treatment and disposal by Alaska Pollution Control on May 3, 2000.

## **GROUND WATER MONITORING AND SAMPLING**

GeoEngineers monitored ground water levels (wells MW-1 and MW-A through MW-D) and collected ground water samples from each well at the site on December 7, 1999. A Slope Instruments electronic water level indicator was used to measure the depth to ground water in both wells. All measurements were made relative to the top of each well casing.

Ground water elevations were determined by subtracting the depth to ground water from the top-of-well casing elevation. Ground water levels observed in the wells on December 7, 1999, and the corresponding elevations are shown on Figure 1 of this report.

A disposable bailer was used to collect the ground water sample. A new bailer and cord were used to sample the well to minimize the possibility of cross-contamination between samples. The GeoEngineers representative also wore clean, disposable, vinyl gloves to minimize the risk of sample contamination.

The ground water sample was transferred from the bailer to sample containers provided by the analytical laboratory and were kept cool during transport to NCA in Bothell, Washington. Chain-of-custody procedures were followed during sample transport to the laboratory. The laboratory report for this sample is provided in Attachment B.

**SITE SURVEY**

GeoEngineers surveyed the elevations of each well casing at the site relative to an assumed site datum on October 28, 1990. The vertical survey included top-of-casing elevations for monitoring wells MW-1, MW-A, MW-B, MW-C and MW-D. The well elevations for wells MW-A through MW-D are presented with the boring logs in Figures A-3 through A-7 of this attachment. The well elevations for all wells at the site are also presented in Table 1 of this report.

# SOIL CLASSIFICATION SYSTEM

0038

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME	
COARSE GRAINED SOILS  More Than 50% Retained on No. 200 Sieve	GRAVEL  More Than 50% of Coarse Fraction Retained on No. 4 Sieve	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL	
			GP	POORLY-GRADED GRAVEL	
		GRAVEL WITH FINES	GM	SILTY GRAVEL	
			GC	CLAYEY GRAVEL	
	SAND  More Than 50% of Coarse Fraction Passes No. 4 Sieve	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND	
			SP	POORLY-GRADED SAND	
		SAND WITH FINES	SM	SILTY SAND	
			SC	CLAYEY SAND	
FINE GRAINED SOILS  More Than 50% Passes No. 200 Sieve	SILT AND CLAY  Liquid Limit Less Than 50	INORGANIC	ML	SILT	
			CL	CLAY	
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY	
		SILT AND CLAY  Liquid Limit 50 or More	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
	CH			CLAY OF HIGH PLASTICITY, FAT CLAY	
	ORGANIC		OH	ORGANIC CLAY, ORGANIC SILT	
	HIGHLY ORGANIC SOILS			PT	PEAT

## NOTES:

- Field classification is based on visual examination of soil in general accordance with ASTM D2488-90.
- Soil classification using laboratory tests is based on ASTM D2487-90.
- Descriptions of soil density or consistency are based on interpretation of blow count data, visual appearance of soils, and/or test data.

## SOIL MOISTURE MODIFIERS:

- Dry - Absence of moisture, dusty, dry to the touch
- Moist - Damp, but no visible water
- Wet - Visible free water or saturated, usually soil is obtained from below water table

**LABORATORY TESTS:**

CA Chemical Analysis

**FIELD SCREENING TESTS:**Headspace vapor concentration data  
given in parts per million

Sheen classification system:

NS No Visible Sheen

SS Slight Sheen

MS Moderate Sheen

HS Heavy Sheen

NT Not Tested

**SOIL GRAPH:**SM Soil Group Symbol  
(See Note 2)Distinct Contact Between  
Soil StrataGradual or Approximate  
Location of Change  
Between Soil Strata

▽ Water Level

Bottom of Boring

0039

**BLOW-COUNT/SAMPLE DATA:**Blows required to drive a 2.4-inch I.D.  
split-barrel sampler 12 inches or  
other indicated distances using a  
300-pound hammer falling 30 inches.

22 ■

Location of relatively  
undisturbed sample

12 ☒

Location of disturbed sample

17 □

Location of sampling attempt  
with no recoveryBlows required to drive a 1.5-inch I.D.  
(SPT) split-barrel sampler 12 inches  
or other indicated distances using  
140-pound hammer falling 30 inches.

10 ▨

Location of sample obtained  
in general accordance with  
Standard Penetration Test  
(ASTM D 1586) procedures

26 ▩

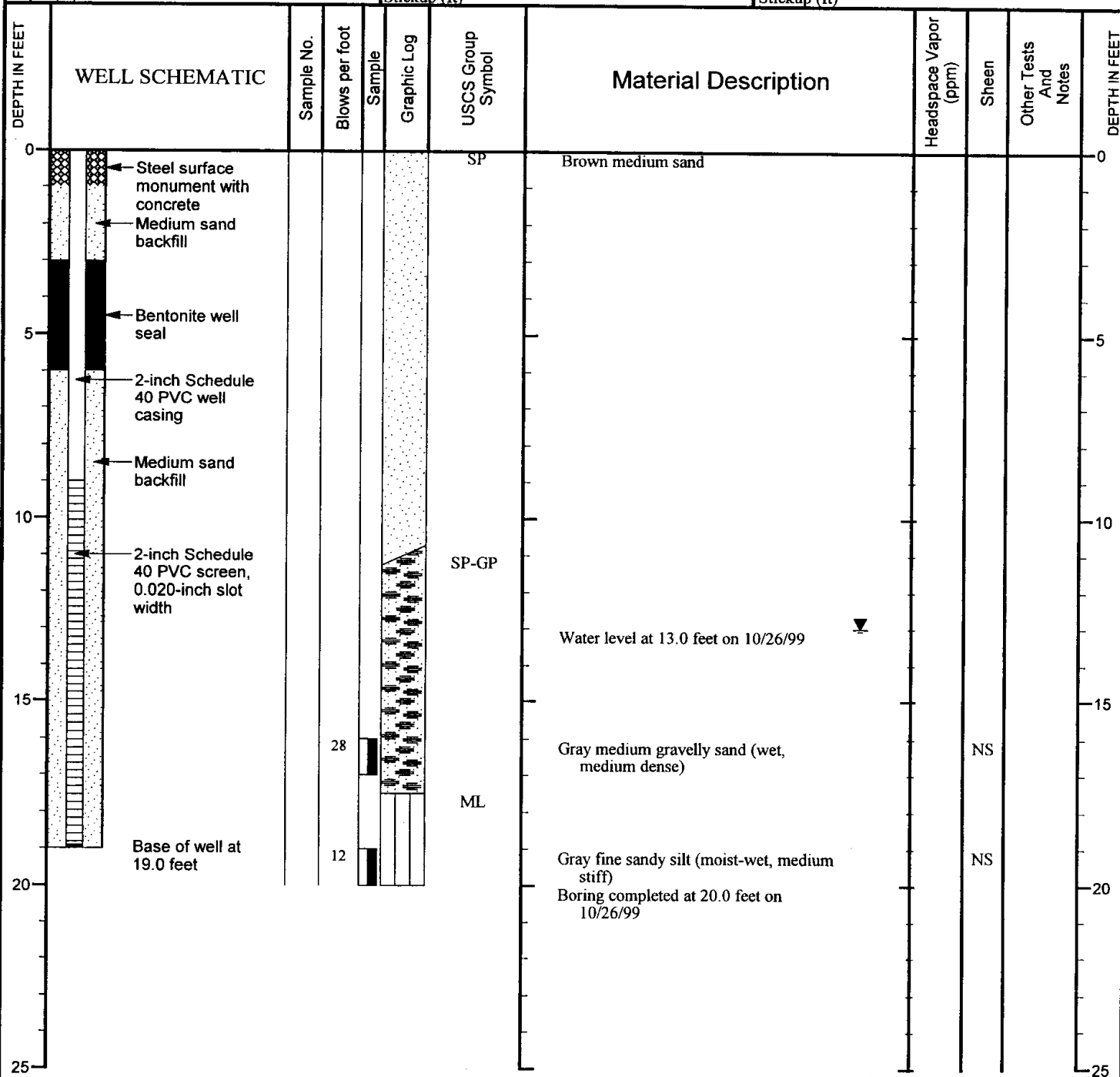
Location of SPT sampling  
attempt with no recovery

Location of grab sample

"P" indicates sampler pushed with  
weight of hammer or against weight  
of drill rig.**NOTES:**

1. The reader must refer to the discussion in the report text, the Key to Boring Log Symbols and the exploration logs for a proper understanding of subsurface conditions.
2. Soil classification system is summarized in Figure A-1.

Project Texaco SS #63-057-0010 (Big Corner)		Job Number 0401-064-01		Location 0040 Anchorage, Alaska	
Date Drilled 10/26/99		Logged By LJD		Contractor Discovery Drilling	
Drill Method HSA CME 45 Rotary Drill Rig		Equipment 8-inch hollow stem auger		Drill Bit 8-inch diameter	
Sample Method Split-Spoon Sampler		Hammer Data 340 lb, 24-inch drop		X-coordinate: Not Determined	
				Y-coordinate: Not Determined	
Total Depth (ft) 20		Elevation (ft) Not Measured		Datum: Not Determined	
Total Well Depth (ft) 19		Monument Elevation Stickup (ft)		Casing Elevation Stickup (ft) 104.91	



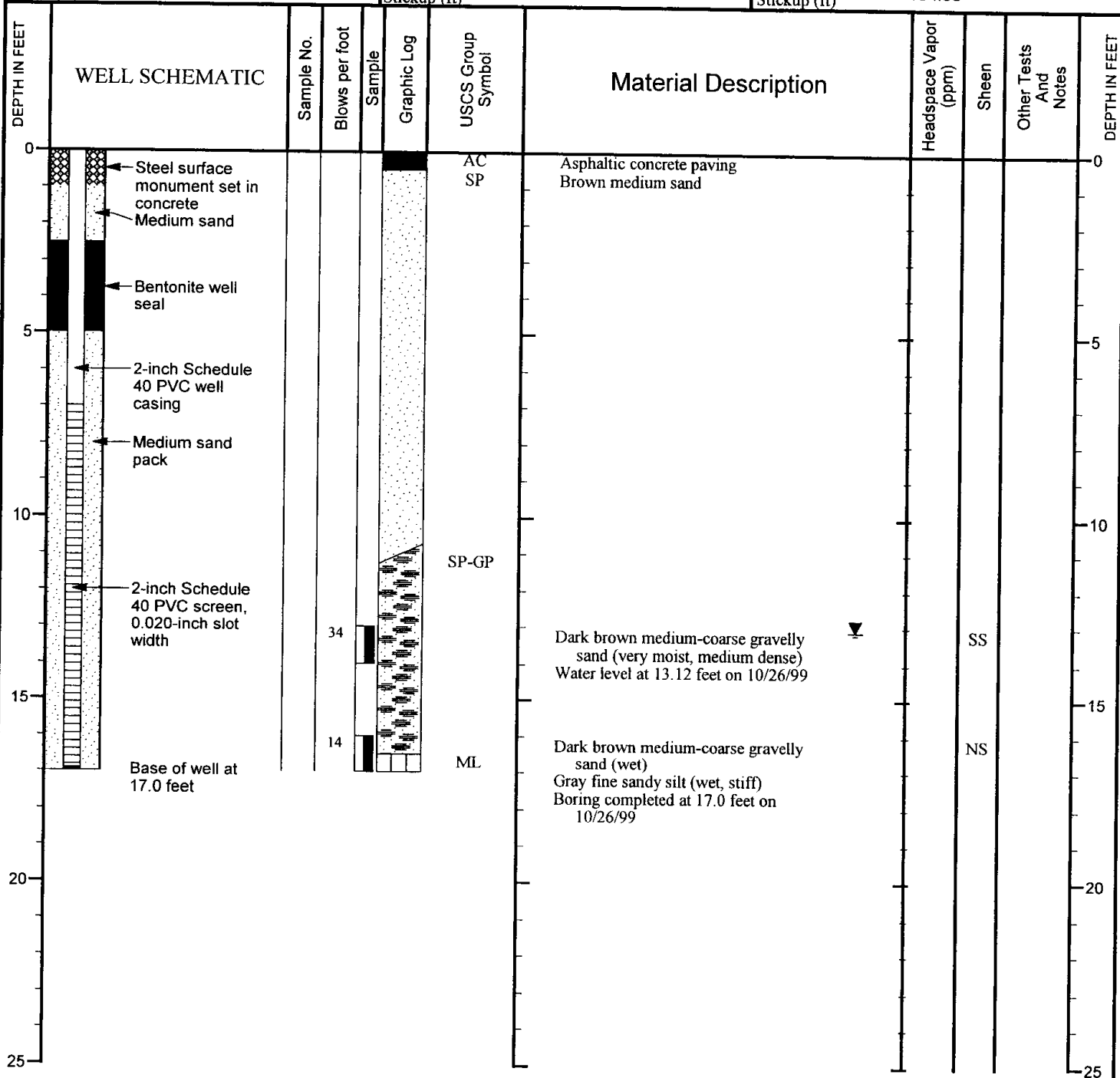
GEI WELL LOG 0401P.GPJ GEI CORP GDT 06/05/00 0401-064-01



LOG OF MONITORING WELL MW-A

FIGURE A-3

Project Texaco SS #63-057-0010 (Big Corner)		Job Number 0401-064-01		Location 0041 Anchorage, Alaska	
Date Drilled 10/26/99		Logged By LJD		Contractor Discovery Drilling	
Drill Method HSA CME 45 Rotary Drill Rig		Equipment 8-inch hollow stem auger		Drill Bit 8-inch diameter	
Sample Method Split Spoon Sampler		Hammer Data 340 lb, 24-inch drop		X-coordinate: Not Determined	
Total Depth (ft) 17		Elevation (ft) Not Measured		Y-coordinate: Not Determined	
Total Well Depth (ft) 17		Monument Elevation Stickup (ft)		Datum: Not Determined	
				System: Not Determined	
				Casing Elevation Stickup (ft) 104.89	





Project Texaco SS #63-057-0010 (Big Corner)		Job Number 0401-064-01	Location 0042 Anchorage, Alaska
Date Drilled 10/28/99	Logged By LJD	Contractor Discovery Drilling	
Drill Method HSA CME 45 Rotary Drill Rig	Equipment 8-inch hollow stem auger	Drill Bit 8-inch diameter	
Sample Method Split-Spoon Sampler	Hammer Data 340 lb, 24-inch drop	X-coordinate: Y-coordinate:	Not Determined Not Determined
Total Depth (ft) 19	Elevation (ft) Not Measured	Datum: System:	Not Determined Not Determined
Total Well Depth (ft) 17	Monument Elevation Stickup (ft)	Casing Elevation Stickup (ft)	104.51

DEPTH IN FEET	WELL SCHEMATIC	Sample No.	Blows per foot	Sample	Graphic Log	USCS Group Symbol	Material Description	Headspace Vapor (ppm)	Sheen	Other Tests And Notes	DEPTH IN FEET
0						CONCRETE	Concrete				0
						SP					
5						SM	Dark brown fine-medium sand with trace silt (dry-damp)	0	NS		5
						SP	Dark red-brown silty medium sand with organics (damp)	0	SS		
10							Dark brown medium sand with silt (damp)	0	NS		10
							Gray-brown medium sand (dry-damp)	97.5	MS	strong fuel odor at shoe	
15							Water level at 13.36 feet on 10/28/99 Gray-brown medium-coarse sand (wet at shoe)	531	HS	strong fuel odor	15
						ML	Gray coarse sand with trace silt (wet)	12.7	NS	moderate fuel odor	
20							Gray tight silt with very fine sand (wet)	3.9	SS	slight fuel odor	20
25							Boring completed at 19.0 feet on 10/28/99				25

Project Texaco SS #63-057-0010 (Big Corner)		Job Number 0401-064-01		Location nn43 Anchorage, Alaska	
Date Drilled 10/27/99		Logged By LJD		Contractor Discovery Drilling	
Drill Method HSA CME 45 Rotary Drill Rig		Equipment 8-inch hollow stem auger		Drill Bit 8-inch diameter	
Sample Method Split-Spoon Sampler		Hammer Data 340 lb, 24-inch drop		X-coordinate: Y-coordinate: Datum: System:	
Total Depth (ft) 14.5		Elevation (ft) Not Measured		Not Determined Not Determined Not Determined Not Determined	

DEPTH IN FEET	% Recovery	Sample No.	Blow Count	Sample	Graphic Log	USCS Group Symbol	Material Description	Headspace Vapor (ppm)	Sheen	Other Tests And Notes	DEPTH IN FEET
0						CONCRETE	Concrete				0
75						SP					
5							Dark brown fine-medium sand (damp-moist)	7.9	MS	strong fuel odor	5
75							Dark brown medium sand with coarse sand (damp-moist)	6.6	MS	strong fuel odor	
67							Dark brown medium sand with coarse sand and trace organic inclusions (damp-moist)	1.5	MS	strong fuel odor	
10							Brown medium sand with coarse sand (damp-moist)	10.6	SS-NS	slight fuel odor	10
67						SP-GP	Dark brown medium-coarse sand with gravel (moist)	1.3	SS	no odor	
15							Boring completed at 14.5 feet on 10/27/99. No ground water encountered.				15
20											20
25											25

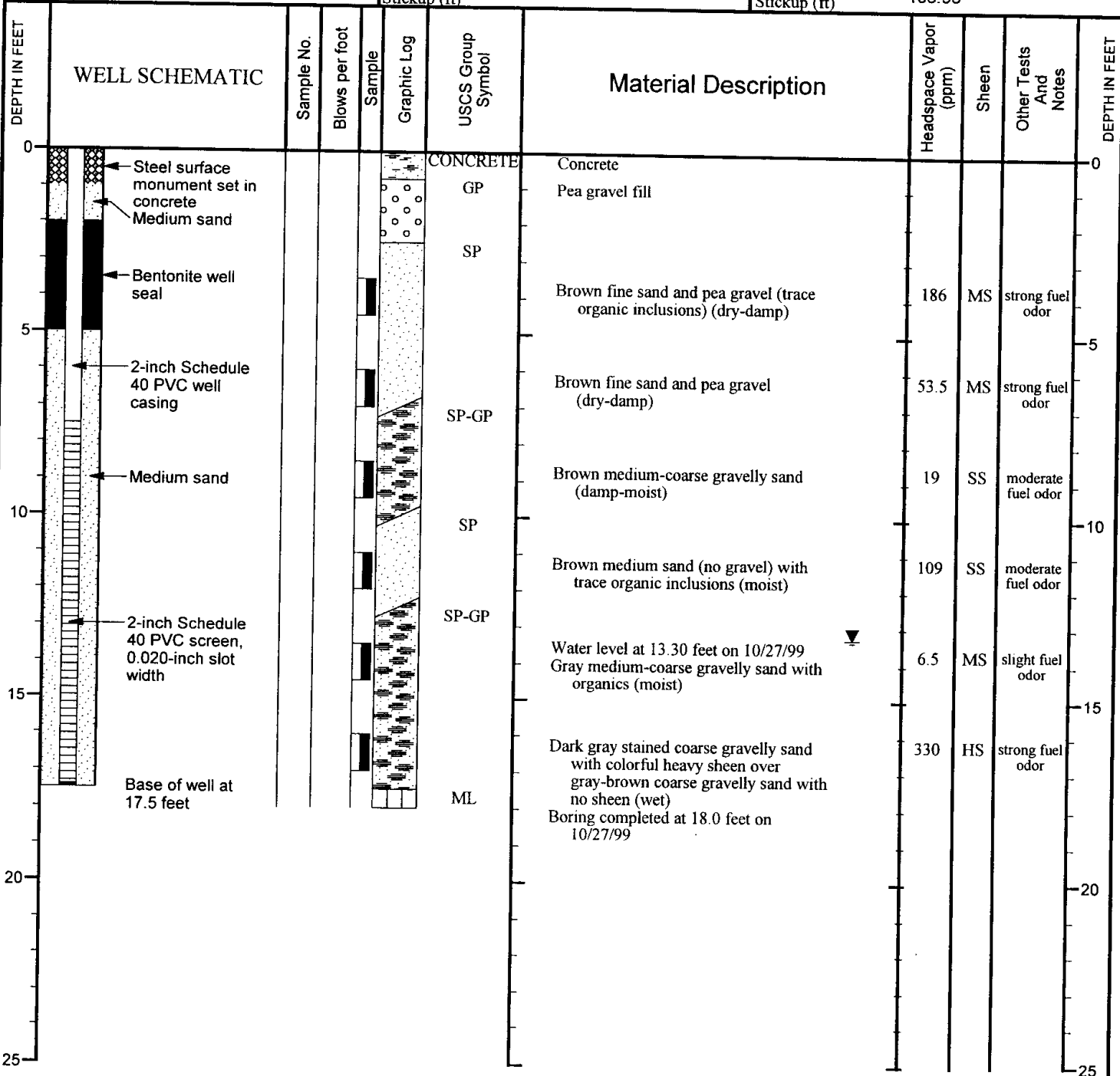
Note: See Figure A-2 for explanation of symbols



LOG OF BORING 99B-5

FIGURE A-6

Project Texaco SS #63-057-0010 (Big Corner)		Job Number 0401-064-01		Location Anchorage, Alaska <b>0044</b>	
Date Drilled 10/27/99		Logged By LJD		Contractor Discovery Drilling	
Drill Method HSA CME 45 Rotary Drill Rig		Equipment 8-inch hollow stem auger		Drill Bit 8-inch diameter	
Sample Method Split-Spoon Sampler		Hammer Data 340 lb, 24-inch drop		X-coordinate: Y-coordinate: Datum: System: Not Determined Not Determined Not Determined Not Determined	
Total Depth (ft) 18		Elevation (ft) Not Measured		Casing Elevation Stickup (ft) 103.93	
Total Well Depth (ft) 17.5		Monument Elevation Stickup (ft)			



**ATTACHMENT B**

## ATTACHMENT B

### CHEMICAL ANALYTICAL PROGRAM ANALYTICAL METHODS

Chain-of-custody procedures were followed during transport of the soil and ground water samples to the analytical laboratory. The samples were held in cold storage pending extraction and/or analysis. GeoEngineers submitted 22 soil samples collected during the October 26 through 28, 1999, field investigation at the Big Corners Texaco site to North Creek Analytical (NCA) laboratory of Bothell, Washington. Select samples were analyzed for gasoline-range organics (GRO)/benzene, ethylbenzene, toluene and xylenes (BETX); diesel-range organics (DRO); residual-range organics (RRO); and total organic carbon (TOC). In addition to the soil samples, GeoEngineers also submitted five ground water samples and one quality control (QC) blank water sample to NCA on December 7, 1999, for one or more of the following analyses: BETX/GRO, DRO, RRO and dissolved metals analyses. NCA is approved by the Alaska Department of Environmental Conservation's (ADEC) underground storage tank registration program for analytical laboratories.

The analytical results, analytical methods reference and laboratory quality assurance/quality control (QA/QC) records are included in this attachment. The analytical results are summarized in Tables 2 and 3 of this report.

### GEOENGINEERS' ANALYTICAL DATA REVIEW

#### Data Quality Goals

NCA maintains an internal quality assurance program as documented in its laboratory quality assurance manual. NCA uses a combination of method blank analysis, surrogate percent recovery, matrix spike recovery, matrix spike duplicate recovery, blank spike recovery, blank spike duplicate recovery and laboratory duplicates to evaluate the validity of analytical results. NCA also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were supplied by the laboratory. Each group of samples was compared with the existing data quality goals for the laboratory and evaluated using data validation guidelines from the following documents: "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," dated October 1999 (EPA-540/R-99-008) and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," dated February 1994 (EPA-540/R-94-013). The data quality review is presented below.

#### Data Quality Review

**Surrogates.** Surrogates were added to all soil and ground water samples prior to extraction and analysis to monitor sample handling procedures, matrix effects and purging efficiency. Surrogate recoveries were all within recommended control limits with the following exceptions: Due to an extraction anomaly and/or matrix interference the aliphatic surrogate was outside of established control limits for the DRO analysis of sample 99B3-16.0; The surrogate recovery for

sample 99B3-13.5 (aliphatic/aromatic GRO analysis and GRO/BETX analysis) was not available due to sample dilution required from high analyte concentration and/or matrix interferences. The surrogate recovery for sample 99B6-16.0 (GRO/BETX analysis) could not be accurately quantified due to interference from coeluting organic compounds present in the sample.

**Matrix Spike/Matrix Spike Duplicates (MS/MSD).** Matrix spikes and matrix spike duplicates were analyzed for soil and water by U.S. Environmental Protection Agency (EPA) Method 8021B. All MS/MSD recoveries and relative percent differences were within recommended control limits, with one exception. Multiple analyses indicate that the matrix spike and the matrix spike duplicate percent recovery for dissolved mercury in ground water samples MW-1, MW-A and MW-B is outside of control limits due to a matrix effect.

**Blank Spike/Blank Spike Duplicates (BS/BSD).** Blank spike and blank spike duplicates were analyzed by each analytical method. The BS/BSD is a laboratory control sample that is spiked with analytes of interest from an independent source. All BS/BSD recoveries and relative percent differences were within recommended control limits.

**Laboratory Duplicates.** Laboratory duplicates were conducted for each analytical method. All soil and water duplicates were within recovery limits.

**Holding Times.** All soil and ground water samples were extracted and analyzed within the recommended holding times.

**Method Blanks.** Method blanks were analyzed for all analyses to evaluate the possible presence of contaminants that may have been introduced during sample analysis. Contaminants were not detected in the blanks.

**Instrument Calibration.** Instrument calibrations were within laboratory standards without exception.

**Calibration Verification.** Independent standards were within 15 percent of true concentration with no exceptions.

**Trip Blanks.** Trip blanks were submitted with the soil samples to document GRO/BETX contamination associated with shipment, handling and analysis. The trip blanks were prepared by NCA and were not opened again prior to analysis. BETX and GRO were not detected in the soil trip blanks submitted. Trip blanks were submitted with the ground water samples to document GRO/BETX contamination associated with shipment, handling and analysis. The trip blanks were prepared by NCA and were not opened again prior to analysis. BETX and GRO were not detected in the ground water trip blank submitted.

**Field Duplicates.** QA/QC soil samples were not collected during this site investigation. A field duplicate water sample was collected from well MW-C for analysis of GRO/BETX, DRO and RRO. Detected concentrations of GRO, BETX, DRO and RRO in the duplicate sample were within acceptable relative percent difference limits when compared to the MW-C sample.

#### **Additional Laboratory Notes**

The following laboratory notes were also noted in our data review:

- The chromatogram for soil samples 99B5-6.5 and 99B6-6.5 (GRO analysis) does not resemble a typical gasoline pattern.
- The reporting limits for BETX compounds (GRO/BETX analysis) for soil sample 99B6-16.0 and water sample MW-D were raised to account for interferences from coeluting organic compounds present in the sample.
- Results in the diesel-organic range for the DRO analysis of sample MW-1 were primarily due to overlap from a heavy-oil-range product.
- Results in the diesel-organic range for the DRO analysis of sample MW-C were primarily due to overlap from a gasoline-range product.

#### **SUMMARY**

All NCA laboratory reports for samples collected by GeoEngineers during the October 26-28, 1999, soil sampling and December 7, 1999, ground water sampling are included in this attachment. With the exception of the above data quality issues noted during our review of the field and laboratory programs, it is our opinion that the analytical data are acceptable for use on this project.

22 November, 1999

Laurie Jean Dworian  
Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage, AK 99503-7432

GeoEngineers  
ANCHORAGE

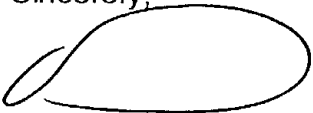
NOV 29 1999

Routing... ☒ ☐ ☐ ☐  
File... 0401-064-01

RE: Equilon SAP #120686

Enclosed are the results of analyses for samples received by the laboratory on 11/02/99 09:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Steve Davis  
Project Manager



Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

**Reported:**  
11/22/99 08:44

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
99B1-16.0	B9K0037-01	Soil	10/26/99 09:45	11/02/99 09:00
99B2-13.5	B9K0037-03	Soil	10/26/99 11:15	11/02/99 09:00
99B3-13.5	B9K0037-09	Soil	10/28/99 09:40	11/02/99 09:00
99B3-18.0	B9K0037-11	Soil	10/28/99 11:20	11/02/99 09:00
99B5-6.5	B9K0037-13	Soil	10/27/99 09:30	11/02/99 09:00
99B5-13.5	B9K0037-16	Soil	10/27/99 09:55	11/02/99 09:00
99B6-6.5	B9K0037-18	Soil	10/27/99 11:20	11/02/99 09:00
99B6-16.0	B9K0037-22	Soil	10/27/99 12:40	11/02/99 09:00

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

Page 1 of 21

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK. 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Volatile Petroleum Hydrocarbons by AK 101 AA**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>99B3-13.5 (B9K0037-09) Soil</b> Sampled: 10/28/99 09:40 Received: 11/02/99 09:00									
Gasoline Range Hydrocarbons	832	110	mg/kg dry	50	9K05010	11/05/99	11/06/99	AK 101 AA	
C6-C10 Aliphatics	431	110	"	"	"	"	"	"	
C6-C10 Aromatics	401	110	"	"	"	"	"	"	
Surrogate: Tetrachloroethene (FID)		183 %	50-150		"	"	"	"	S-01
Surrogate: Tetrachloroethene (PID)		133 %	50-150		"	"	"	"	
Surrogate: a,a,a-TFT (FID)		169 %	50-150		"	"	"	"	S-01
Surrogate: a,a,a-TFT (PID)		227 %	50-150		"	"	"	"	S-01
<b>99B3-18.0 (B9K0037-11) Soil</b> Sampled: 10/28/99 11:20 Received: 11/02/99 09:00									
Gasoline Range Hydrocarbons	ND	3.08	mg/kg dry	1	9K05010	11/05/99	11/06/99	AK 101 AA	
C6-C10 Aliphatics	ND	3.08	"	"	"	"	"	"	
C6-C10 Aromatics	ND	3.08	"	"	"	"	"	"	
Surrogate: Tetrachloroethene (FID)		74.8 %	50-150		"	"	"	"	
Surrogate: Tetrachloroethene (PID)		88.7 %	50-150		"	"	"	"	
Surrogate: a,a,a-TFT (FID)		60.0 %	50-150		"	"	"	"	
Surrogate: a,a,a-TFT (PID)		63.2 %	50-150		"	"	"	"	
<b>99B5-6.5 (B9K0037-13) Soil</b> Sampled: 10/27/99 09:30 Received: 11/02/99 09:00									
Gasoline Range Hydrocarbons	17.0	3.45	mg/kg dry	1	9K05010	11/05/99	11/06/99	AK 101 AA	
C6-C10 Aliphatics	14.2	3.45	"	"	"	"	"	"	
C6-C10 Aromatics	ND	3.45	"	"	"	"	"	"	
Surrogate: Tetrachloroethene (FID)		83.1 %	50-150		"	"	"	"	
Surrogate: Tetrachloroethene (PID)		94.4 %	50-150		"	"	"	"	
Surrogate: a,a,a-TFT (FID)		85.9 %	50-150		"	"	"	"	
Surrogate: a,a,a-TFT (PID)		87.6 %	50-150		"	"	"	"	

North Creek Analytical - Bothell

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North Creek Analytical, Inc.  
Environmental Laboratory Network

Page 2 of 21

0052

Stockpile  
Portland  
Bend

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK. 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Volatile Petroleum Hydrocarbons by AK 101 AA**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
99B6-6.5 (B9K0037-18) Soil Sampled: 10/27/99 11:20 Received: 11/02/99 09:00									
Gasoline Range Hydrocarbons	8.64	3.26	mg/kg dry	1	9K05010	11/05/99	11/06/99	AK 101 AA	
C6-C10 Aliphatics	4.21	3.26	"	"	"	"	"	"	
C6-C10 Aromatics	4.43	3.26	"	"	"	"	"	"	
Surrogate: Tetrachloroethene (FID)		81.2 %	50-150		"	"	"	"	
Surrogate: Tetrachloroethene (PID)		91.0 %	50-150		"	"	"	"	
Surrogate: a,a,a-TFT (FID)		84.4 %	50-150		"	"	"	"	
Surrogate: a,a,a-TFT (PID)		86.2 %	50-150		"	"	"	"	

North Creek Analytical - Bothell

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Page 3 of 21

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Semi-Volatile Petroleum Hydrocarbons by AK 102/103 AA**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>99B1-16.0 (B9K0037-01) Soil Sampled: 10/26/99 09:45 Received: 11/02/99 09:00</b>									
<b>Extractable Petroleum Hydrocarbons</b>	<b>5.74</b>	5.00	mg/kg dry	1	9K08033	11/08/99	11/11/99	AK102AA	
C10-C25 Aromatics	ND	5.00	"	"	"	"	"	"	
<b>C10-C25 Aliphatics</b>	<b>5.74</b>	5.00	"	"	"	"	"	"	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol		%	0-10		"	"	"	"	
Surrogate: o-Terphenyl		71.4 %	70-120		"	"	"	"	
Surrogate: Squalane		77.1 %	70-120		"	"	"	"	
C25-C36 Aliphatics	ND	5.00	"	"	"	"	"	AK103AA	
C25-C36 Aromatics	ND	5.00	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons	ND	5.00	"	"	"	"	"	"	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol		%	0-10		"	"	"	"	
Surrogate: o-Terphenyl		71.4 %	70-120		"	"	"	"	
Surrogate: Squalane		77.1 %	70-120		"	"	"	"	
<b>99B2-13.5 (B9K0037-03) Soil Sampled: 10/26/99 11:15 Received: 11/02/99 09:00</b>									
Extractable Petroleum Hydrocarbons	ND	5.00	mg/kg dry	1	9K08033	11/08/99	11/11/99	AK102AA	
C10-C25 Aromatics	ND	5.00	"	"	"	"	"	"	
C10-C25 Aliphatics	ND	5.00	"	"	"	"	11/12/99	"	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol		%	0-10		"	"	11/11/99	"	
Surrogate: o-Terphenyl		71.4 %	70-120		"	"	11/12/99	"	
Surrogate: Squalane		75.1 %	70-120		"	"	11/11/99	"	
C25-C36 Aliphatics	ND	5.00	"	"	"	"	"	AK103AA	
C25-C36 Aromatics	ND	5.00	"	"	"	"	11/12/99	"	
Extractable Petroleum Hydrocarbons	ND	5.00	"	"	"	"	11/11/99	"	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol		%	0-10		"	"	"	"	
Surrogate: o-Terphenyl		71.4 %	70-120		"	"	11/12/99	"	
Surrogate: Squalane		75.1 %	70-120		"	"	11/11/99	"	

North Creek Analytical - Bothell

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Environmental Laboratory Network

Page 4 of 21

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK. 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Semi-Volatile Petroleum Hydrocarbons by AK 102/103 AA**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
<b>99B3-13.5 (B9K0037-09) Soil Sampled: 10/28/99 09:40 Received: 11/02/99 09:00</b>									
Extractable Petroleum Hydrocarbons	ND	5.00	mg/kg dry	1	9K08033	11/08/99	11/11/99	AK102AA	
C10-C25 Aromatics	ND	5.00	"	"	"	"	"	"	
C10-C25 Aliphatics	ND	5.00	"	"	"	"	"	"	
Extractable Petroleum Hydrocarbons (EPH)	ND	5.00	"	"	"	"	"	"	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol		%	0-10		"	"	"	"	
Surrogate: o-Terphenyl		39.2 %	70-120		"	"	"	"	A-01
Surrogate: Squalane		70.9 %	70-120		"	"	"	"	
<b>99B3-18.0 (B9K0037-11) Soil Sampled: 10/28/99 11:20 Received: 11/02/99 09:00</b>									
Extractable Petroleum Hydrocarbons	18.1	5.00	mg/kg dry	1	9K08033	11/08/99	11/11/99	AK102AA	
C10-C25 Aromatics	8.71	5.00	"	"	"	"	"	"	
C10-C25 Aliphatics	9.35	5.00	"	"	"	"	"	"	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol		%	0-10		"	"	"	"	
Surrogate: o-Terphenyl		70.2 %	70-120		"	"	"	"	
Surrogate: Squalane		75.8 %	70-120		"	"	"	"	
<b>99B5-6.5 (B9K0037-13) Soil Sampled: 10/27/99 09:30 Received: 11/02/99 09:00</b>									
Extractable Petroleum Hydrocarbons	7.88	5.00	mg/kg dry	1	9K08033	11/08/99	11/11/99	AK102AA	
C10-C25 Aromatics	ND	5.00	"	"	"	"	"	"	
C10-C25 Aliphatics	7.88	5.00	"	"	"	"	"	"	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol		%	0-10		"	"	"	"	
Surrogate: o-Terphenyl		76.6 %	70-120		"	"	"	"	
Surrogate: Squalane		79.2 %	70-120		"	"	"	"	
<b>99B6-6.5 (B9K0037-18) Soil Sampled: 10/27/99 11:20 Received: 11/02/99 09:00</b>									
Extractable Petroleum Hydrocarbons	ND	5.00	mg/kg dry	1	9K08033	11/08/99	11/11/99	AK102AA	
C10-C25 Aromatics	ND	5.00	"	"	"	"	"	"	
C10-C25 Aliphatics	ND	5.00	"	"	"	"	"	"	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol		%	0-10		"	"	"	"	
Surrogate: o-Terphenyl		80.7 %	70-120		"	"	"	"	
Surrogate: Squalane		75.9 %	70-120		"	"	"	"	

North Creek Analytical - Bothell

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North Creek Analytical, Inc.  
Environmental Laboratory Network

Page 5 of 21

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

**Reported:**  
11/22/99 08:44

**Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>99B3-13.5 (B9K0037-09) Soil Sampled: 10/28/99 09:40 Received: 11/02/99 09:00</b>									
<b>Gasoline Range Hydrocarbons</b>	<b>1200</b>	<b>96.4</b>	mg/kg dry	50	9K05007	11/05/99	11/06/99	AK 101	
Benzene	ND	0.964	"	"	"	"	"	"	
Toluene	8.76	0.964	"	"	"	"	"	"	
Ethylbenzene	15.3	0.964	"	"	"	"	"	"	
Xylenes (total)	396	7.71	"	200	"	"	11/08/99	"	
Surrogate: 4-BFB (FID)		726 %	60-120	"	"	"	11/06/99	"	S-01
Surrogate: a,a,a-TFT (FID)		83.2 %	50-150	"	"	"	"	"	
Surrogate: 4-BFB (PID)		381 %	60-120	"	"	"	"	"	S-01
Surrogate: a,a,a-TFT (PID)		78.1 %	50-150	"	"	"	"	"	
<b>99B3-18.0 (B9K0037-11) Soil Sampled: 10/28/99 11:20 Received: 11/02/99 09:00</b>									
<b>Gasoline Range Hydrocarbons</b>	<b>ND</b>	<b>3.76</b>	mg/kg dry	1	9K05007	11/05/99	11/08/99	AK 101	
Benzene	ND	0.0376	"	"	"	"	"	"	
Toluene	ND	0.0376	"	"	"	"	"	"	
Ethylbenzene	ND	0.0376	"	"	"	"	"	"	
Xylenes (total)	0.189	0.0753	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		99.7 %	60-120	"	"	"	"	"	
Surrogate: a,a,a-TFT (FID)		76.7 %	50-150	"	"	"	"	"	
Surrogate: 4-BFB (PID)		97.4 %	60-120	"	"	"	"	"	
Surrogate: a,a,a-TFT (PID)		72.8 %	50-150	"	"	"	"	"	
<b>99B5-6.5 (B9K0037-13) Soil Sampled: 10/27/99 09:30 Received: 11/02/99 09:00</b>									
<b>Gasoline Range Hydrocarbons</b>	<b>14.6</b>	<b>3.18</b>	mg/kg dry	1	9K05007	11/05/99	11/08/99	AK 101	G-02
Benzene	ND	0.0318	"	"	"	"	"	"	
Toluene	0.0688	0.0318	"	"	"	"	"	"	
Ethylbenzene	0.0804	0.0318	"	"	"	"	"	"	
Xylenes (total)	0.364	0.0637	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		113 %	60-120	"	"	"	"	"	
Surrogate: a,a,a-TFT (FID)		96.8 %	50-150	"	"	"	"	"	
Surrogate: 4-BFB (PID)		104 %	60-120	"	"	"	"	"	
Surrogate: a,a,a-TFT (PID)		90.4 %	50-150	"	"	"	"	"	

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
<b>99B5-13.5 (B9K0037-16) Soil Sampled: 10/27/99 09:55 Received: 11/02/99 09:00</b>									
Gasoline Range Hydrocarbons	ND	2.87	mg/kg dry	1	9K05007	11/05/99	11/08/99	AK 101	
Benzene	ND	0.0287	"	"	"	"	"	"	
Toluene	0.100	0.0287	"	"	"	"	"	"	
Ethylbenzene	ND	0.0287	"	"	"	"	"	"	
Xylenes (total)	0.163	0.0575	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		98.3 %	60-120		"	"	"	"	
Surrogate: a,a,a-TFT (FID)		90.1 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		96.6 %	60-120		"	"	"	"	
Surrogate: a,a,a-TFT (PID)		89.4 %	50-150		"	"	"	"	
<b>99B6-6.5 (B9K0037-18) Soil Sampled: 10/27/99 11:20 Received: 11/02/99 09:00</b>									
Gasoline Range Hydrocarbons	6.25	3.09	mg/kg dry	1	9K05007	11/05/99	11/08/99	AK 101	
Benzene	ND	0.0309	"	"	"	"	"	"	
Toluene	0.0454	0.0309	"	"	"	"	"	"	
Ethylbenzene	ND	0.0309	"	"	"	"	"	"	
Xylenes (total)	0.956	0.0617	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		105 %	60-120		"	"	"	"	
Surrogate: a,a,a-TFT (FID)		90.7 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		102 %	60-120		"	"	"	"	
Surrogate: a,a,a-TFT (PID)		89.4 %	50-150		"	"	"	"	
<b>99B6-16.0 (B9K0037-22) Soil Sampled: 10/27/99 12:40 Received: 11/02/99 09:00</b>									
Gasoline Range Hydrocarbons	428	23.0	mg/kg dry	10	9K05007	11/05/99	11/09/99	AK 101	G-0
Benzene	ND	2.67	"	"	"	"	"	"	R-0
Toluene	ND	0.644	"	"	"	"	"	"	R-03
Ethylbenzene	ND	1.15	"	"	"	"	"	"	R-0
Xylenes (total)	ND	1.70	"	"	"	"	"	"	R-0
Surrogate: 4-BFB (FID)		78.0 %	60-120		"	"	"	"	S-02
Surrogate: a,a,a-TFT (FID)		88.6 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		68.8 %	60-120		"	"	"	"	
Surrogate: a,a,a-TFT (PID)		73.2 %	50-150		"	"	"	"	

North Creek Analytical - Bothell

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North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworin

Reported:  
11/22/99 08:44

**Diesel Hydrocarbons (C10-C25) by AK102**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>99B3-13.5 (B9K0037-09) Soil Sampled: 10/28/99 09:40 Received: 11/02/99 09:00</b>									
Diesel Range Hydrocarbons	7.11	4.00	mg/kg dry	1	9K04025	11/04/99	11/05/99	AK 102	
Surrogate: 2-FBP		80.3 %	50-150		"	"	"	"	
<b>99B3-18.0 (B9K0037-11) Soil Sampled: 10/28/99 11:20 Received: 11/02/99 09:00</b>									
Diesel Range Hydrocarbons	5.77	4.00	mg/kg dry	1	9K04025	11/04/99	11/05/99	AK 102	
Surrogate: 2-FBP		91.5 %	50-150		"	"	"	"	
<b>99B5-6.5 (B9K0037-13) Soil Sampled: 10/27/99 09:30 Received: 11/02/99 09:00</b>									
Diesel Range Hydrocarbons	28.8	4.00	mg/kg dry	1	9K04025	11/04/99	11/05/99	AK 102	
Surrogate: 2-FBP		89.4 %	50-150		"	"	"	"	
<b>99B5-13.5 (B9K0037-16) Soil Sampled: 10/27/99 09:55 Received: 11/02/99 09:00</b>									
Diesel Range Hydrocarbons	ND	4.00	mg/kg dry	1	9K04025	11/04/99	11/05/99	AK 102	
Surrogate: 2-FBP		84.1 %	50-150		"	"	"	"	
<b>99B6-6.5 (B9K0037-18) Soil Sampled: 10/27/99 11:20 Received: 11/02/99 09:00</b>									
Diesel Range Hydrocarbons	19.4	4.00	mg/kg dry	1	9K04025	11/04/99	11/05/99	AK 102	
Surrogate: 2-FBP		82.4 %	50-150		"	"	"	"	
<b>99B6-16.0 (B9K0037-22) Soil Sampled: 10/27/99 12:40 Received: 11/02/99 09:00</b>									
Diesel Range Hydrocarbons	420	4.00	mg/kg dry	1	9K04025	11/04/99	11/05/99	AK 102	
Surrogate: 2-FBP		92.3 %	50-150		"	"	"	"	

North Creek Analytical - Bothell



Steve Davis, Project Manager

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK. 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>99B1-16.0 (B9K0037-01) Soil Sampled: 10/26/99 09:45 Received: 11/02/99 09:00</b>									
Diesel Range Hydrocarbons	8.66	4.00	mg/kg dry	1	9K04025	11/04/99	11/05/99	AK102/103	
Heavy Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP		85.4 %	50-150		"	"	"	"	
Surrogate: Octacosane		103 %	50-150		"	"	"	"	
<b>99B2-13.5 (B9K0037-03) Soil Sampled: 10/26/99 11:15 Received: 11/02/99 09:00</b>									
Diesel Range Hydrocarbons	ND	4.00	mg/kg dry	1	9K04025	11/04/99	11/05/99	AK102/103	
Heavy Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP		96.3 %	50-150		"	"	"	"	
Surrogate: Octacosane		128 %	50-150		"	"	"	"	

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK. 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworian

Reported:  
11/22/99 08:44

**Conventional Chemistry Parameters by APHA/EPA Methods**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>99B1-16.0 (B9K0037-01) Soil Sampled: 10/26/99 09:45 Received: 11/02/99 09:00</b>									
Total Organic Carbon - Average	539	300	mg/kg dry	1	9K19027	11/17/99	11/17/99	EPA 9060 mod.	
Total Organic Carbon - High	901	300	"	"	"	"	"	"	
Total Organic Carbon - Low	346	300	"	"	"	"	"	"	
<b>99B2-13.5 (B9K0037-03) Soil Sampled: 10/26/99 11:15 Received: 11/02/99 09:00</b>									
Total Organic Carbon - Average	ND	300	mg/kg dry	1	9K17032	11/12/99	11/12/99	EPA 9060 mod.	
Total Organic Carbon - High	ND	300	"	"	"	"	"	"	
Total Organic Carbon - Low	ND	300	"	"	"	"	"	"	
<b>99B3-13.5 (B9K0037-09) Soil Sampled: 10/28/99 09:40 Received: 11/02/99 09:00</b>									
Total Organic Carbon - Average	761	300	mg/kg dry	1	9K17032	11/09/99	11/09/99	EPA 9060 mod.	
Total Organic Carbon - High	1220	300	"	"	"	"	"	"	
Total Organic Carbon - Low	353	300	"	"	"	"	"	"	
<b>99B3-18.0 (B9K0037-11) Soil Sampled: 10/28/99 11:20 Received: 11/02/99 09:00</b>									
Total Organic Carbon - Average	4810	300	mg/kg dry	1	9K17032	11/09/99	11/09/99	EPA 9060 mod.	
Total Organic Carbon - High	5160	300	"	"	"	"	"	"	
Total Organic Carbon - Low	4480	300	"	"	"	"	"	"	
<b>99B5-6.5 (B9K0037-13) Soil Sampled: 10/27/99 09:30 Received: 11/02/99 09:00</b>									
Total Organic Carbon - Average	545	300	mg/kg dry	1	9K17032	11/09/99	11/09/99	EPA 9060 mod.	
Total Organic Carbon - High	883	300	"	"	"	"	"	"	
Total Organic Carbon - Low	ND	300	"	"	"	"	"	"	
<b>99B5-13.5 (B9K0037-16) Soil Sampled: 10/27/99 09:55 Received: 11/02/99 09:00</b>									
Total Organic Carbon - Average	ND	300	mg/kg dry	1	9K19027	11/17/99	11/17/99	EPA 9060 mod.	
Total Organic Carbon - High	571	300	"	"	"	"	"	"	
Total Organic Carbon - Low	ND	300	"	"	"	"	"	"	

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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0060

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK. 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

**Reported:**  
11/22/99 08:44

## Conventional Chemistry Parameters by APHA/EPA Methods

### North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>99B6-6.5 (B9K0037-18) Soil</b> Sampled: 10/27/99 11:20 Received: 11/02/99 09:00									
Total Organic Carbon - Average	ND	300	mg/kg dry	1	9K19027	11/18/99	11/18/99	EPA 9060 mod.	
Total Organic Carbon - High	506	300	"	"	"	"	"	"	
Total Organic Carbon - Low	ND	300	"	"	"	"	"	"	
<b>99B6-16.0 (B9K0037-22) Soil</b> Sampled: 10/27/99 12:40 Received: 11/02/99 09:00									
Total Organic Carbon - Average	751	300	mg/kg dry	1	9K19027	11/18/99	11/18/99	EPA 9060 mod.	
Total Organic Carbon - High	1400	300	"	"	"	"	"	"	
Total Organic Carbon - Low	ND	300	"	"	"	"	"	"	

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworian

Reported:  
11/22/99 08:44

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
99B1-16.0 (B9K0037-01) Soil Sampled: 10/26/99 09:45 Received: 11/02/99 09:00									
Dry Weight	89.1	1.00	%	1	9K09010	11/09/99	11/10/99	BSOPSP003R07	
99B2-13.5 (B9K0037-03) Soil Sampled: 10/26/99 11:15 Received: 11/02/99 09:00									
Dry Weight	95.3	1.00	%	1	9K09010	11/09/99	11/10/99	BSOPSP003R07	
99B3-13.5 (B9K0037-09) Soil Sampled: 10/28/99 09:40 Received: 11/02/99 09:00									
Dry Weight	93.9	1.00	%	1	9K09010	11/09/99	11/10/99	BSOPSP003R07	
99B3-18.0 (B9K0037-11) Soil Sampled: 10/28/99 11:20 Received: 11/02/99 09:00									
Dry Weight	77.7	1.00	%	1	9K09010	11/09/99	11/10/99	BSOPSP003R07	
99B5-6.5 (B9K0037-13) Soil Sampled: 10/27/99 09:30 Received: 11/02/99 09:00									
Dry Weight	97.3	1.00	%	1	9K09010	11/09/99	11/10/99	BSOPSP003R07	
99B5-13.5 (B9K0037-16) Soil Sampled: 10/27/99 09:55 Received: 11/02/99 09:00									
Dry Weight	96.9	1.00	%	1	9K09010	11/09/99	11/10/99	BSOPSP003R07	
99B6-6.5 (B9K0037-18) Soil Sampled: 10/27/99 11:20 Received: 11/02/99 09:00									
Dry Weight	98.0	1.00	%	1	9K09010	11/09/99	11/10/99	BSOPSP003R07	
99B6-16.0 (B9K0037-22) Soil Sampled: 10/27/99 12:40 Received: 11/02/99 09:00									
Dry Weight	89.9	1.00	%	1	9K09010	11/09/99	11/10/99	BSOPSP003R07	

North Creek Analytical - Bothell

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North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
 4951 Eagle Street  
 Anchorage AK, 99503-7432

 Project: Equilon SAP #120686  
 Project Number: 0401-064-01  
 Project Manager: Laurie Jean Dworin

 Reported:  
 11/22/99 08:44

## Volatile Petroleum Hydrocarbons by AK 101 AA - Quality Control

### North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9K05010: Prepared 11/05/99 Using EPA 5030B (MeOH)

**Blank (9K05010-BLK1)**

Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
C6-C10 Aliphatics	ND	5.00	"							
C6-C10 Aromatics	ND	5.00	"							
Surrogate: Tetrachloroethene (FID)	1.75		"	2.00		87.5	50-150			
Surrogate: Tetrachloroethene (PID)	1.97		"	2.00		98.5	50-150			
Surrogate: a,a,a-TFT (FID)	2.18		"	2.40		90.8	50-150			
Surrogate: a,a,a-TFT (PID)	2.29		"	2.40		95.4	50-150			

**LCS (9K05010-BS1)**

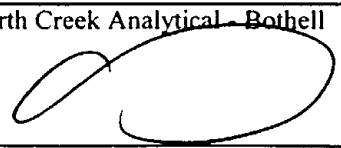
C6-C10 Aromatics	6.81	5.00	mg/kg wet	7.00		97.3	70-130			
Surrogate: Tetrachloroethene (FID)	1.75		"	2.00		87.5	50-150			
Surrogate: Tetrachloroethene (PID)	1.95		"	2.00		97.5	50-150			
Surrogate: a,a,a-TFT (FID)	2.24		"	2.40		93.3	50-150			
Surrogate: a,a,a-TFT (PID)	2.35		"	2.40		97.9	50-150			

**LCS Dup (9K05010-BSD1)**

C6-C10 Aromatics	7.27	5.00	mg/kg wet	7.00		104	70-130	6.53	25	
Surrogate: Tetrachloroethene (FID)	1.76		"	2.00		88.0	50-150			
Surrogate: Tetrachloroethene (PID)	1.92		"	2.00		96.0	50-150			
Surrogate: a,a,a-TFT (FID)	2.30		"	2.40		95.8	50-150			
Surrogate: a,a,a-TFT (PID)	2.31		"	2.40		96.2	50-150			

North Creek Analytical - Bothell

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 Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworin

Reported:  
11/22/99 08:44

**Semi-Volatile Petroleum Hydrocarbons by AK 102/103 AA - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 9K08033: Prepared 11/08/99 Using EPA 3550B**

**Blank (9K08033-BLK1)**

Extractable Petroleum Hydrocarbons	ND	5.00	mg/kg wet							
C10-C25 Aromatics	ND	5.00	"							
C25-C36 Aliphatics	ND	5.00	"							
C10-C25 Aliphatics	ND	5.00	"							
C25-C36 Aromatics	ND	5.00	"							
Extractable Petroleum Hydrocarbons	ND	5.00	"							
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol	0		"	6.68			0-10			
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol	0		"	6.68			0-10			
Surrogate: o-Terphenyl	5.88		"	6.82		86.2	70-120			
Surrogate: o-Terphenyl	5.88		"	6.82		86.2	70-120			
Surrogate: Squalane	5.81		"	6.94		83.7	70-120			
Surrogate: Squalane	5.81		"	6.94		83.7	70-120			

**I.C.S (9K08033-BS1)**

Extractable Petroleum Hydrocarbons	15.8		mg/kg wet	20.2		78.2	70-120			
Extractable Petroleum Hydrocarbons	19.7	5.00	"	20.2		97.5	70-120			
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol	0		"	6.77			0-10			
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol	0		"	6.77			0-10			
Surrogate: o-Terphenyl	5.54		"	6.91		80.2	70-120			
Surrogate: o-Terphenyl	5.54		"	6.91		80.2	70-120			
Surrogate: Squalane	5.96		"	7.04		84.7	70-120			
Surrogate: Squalane	5.96		"	7.04		84.7	70-120			

**Matrix Spike (9K08033-MS1)**

**Source: B9K0037-18**

Extractable Petroleum Hydrocarbons	23.9		mg/kg dry	20.5		117	70-120			
Extractable Petroleum Hydrocarbons	18.8	5.00	"	20.5	ND	91.7	50-150			
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol	0		"	6.86			0-10			
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol	0		"	6.86			0-10			
Surrogate: o-Terphenyl	5.59		"	7.01		79.7	70-120			
Surrogate: o-Terphenyl	5.59		"	7.01		79.7	70-120			
Surrogate: Squalane	5.52		"	7.13		77.4	70-120			
Surrogate: Squalane	5.52		"	7.13		77.4	70-120			

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Semi-Volatile Petroleum Hydrocarbons by AK 102/103 AA - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 9K08033: Prepared 11/08/99 Using EPA 3550B**

**Matrix Spike Dup (9K08033-MSD1)**

**Source: B9K0037-18**

Extractable Petroleum Hydrocarbons	23.1		mg/kg dry	20.5		113	70-120	3.40	20	
Extractable Petroleum Hydrocarbons	19.1	5.00	"	20.5	ND	93.2	50-150	1.58	20	
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol	0		"	6.86			0-10			
Surrogate: 5,6,7,8-Tetrahydro-1-naphthol	0		"	6.86			0-10			
Surrogate: o-Terphenyl	5.44		"	7.01		77.6	70-120			
Surrogate: o-Terphenyl	5.44		"	7.01		77.6	70-120			
Surrogate: Squalane	5.55		"	7.13		77.8	70-120			
Surrogate: Squalane	5.55		"	7.13		77.8	70-120			

North Creek Analytical - Bothell

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North Creek Analytical, Inc.  
Environmental Laboratory Network

Page 15 of 21

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworin

Reported:  
11/22/99 08:44

**Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101 - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 9K05007: Prepared 11/05/99 Using EPA 5030B (MeOH)**

**Blank (9K05007-BLK1)**

Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	3.63		"	4.00		90.8	60-120			
Surrogate: a,a,a-TFT (FID)	2.32		"	2.40		96.7	50-150			
Surrogate: 4-BFB (PID)	3.64		"	4.00		91.0	60-120			
Surrogate: a,a,a-TFT (PID)	2.34		"	2.40		97.5	50-150			

**LCS (9K05007-BS1)**

Benzene	0.518	0.0500	mg/kg wet	0.500		104	60-120			
Toluene	0.532	0.0500	"	0.500		106	60-120			
Ethylbenzene	0.526	0.0500	"	0.500		105	60-120			
Xylenes (total)	1.57	0.100	"	1.50		105	60-120			
Surrogate: 4-BFB (PID)	4.03		"	4.00		101	60-120			
Surrogate: a,a,a-TFT (PID)	2.32		"	2.40		96.7	50-150			

**LCS (9K05007-BS2)**

Gasoline Range Hydrocarbons	23.8	5.00	mg/kg wet	25.0		95.2	60-120			
Surrogate: 4-BFB (FID)	4.30		"	4.00		108	60-120			
Surrogate: a,a,a-TFT (FID)	2.59		"	2.40		108	50-150			

**LCS Dup (9K05007-BSD1)**

Benzene	0.539	0.0500	mg/kg wet	0.500		108	60-120	3.97	20	
Toluene	0.555	0.0500	"	0.500		111	60-120	4.23	20	
Ethylbenzene	0.545	0.0500	"	0.500		109	60-120	3.55	20	
Xylenes (total)	1.62	0.100	"	1.50		108	60-120	3.13	20	
Surrogate: 4-BFB (PID)	3.96		"	4.00		99.0	60-120			
Surrogate: a,a,a-TFT (PID)	2.41		"	2.40		100	50-150			

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK. 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Diesel Hydrocarbons (C10-C25) by AK102 - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 9K04025: Prepared 11/04/99 Using EPA 3550B</b>										
<b>Blank (9K04025-BLK1)</b>										
Diesel Range Hydrocarbons	ND	4.00	mg/kg wet							
Surrogate: 2-FBP	12.3		"	12.8		96.1	50-150			
<b>LCS (9K04025-BS1)</b>										
Diesel Range Hydrocarbons	72.1	4.00	mg/kg wet	80.0		90.1	60-120			
Surrogate: 2-FBP	11.1		"	12.8		86.7	50-150			
<b>LCS Dup (9K04025-BSD1)</b>										
Diesel Range Hydrocarbons	76.2	4.00	mg/kg wet	80.0		95.2	60-120	5.53	20	
Surrogate: 2-FBP	11.5		"	12.8		89.8	50-150			

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103 - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 9K04025: Prepared 11/04/99 Using EPA 3550B**

**Blank (9K04025-BLK1)**

Diesel Range Hydrocarbons	ND	4.00	mg/kg wet							
Heavy Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	12.3		"	12.8		96.1	50-150			
Surrogate: Octacosane	16.4		"	12.8		128	50-150			

**LCS (9K04025-BS1)**

Diesel Range Hydrocarbons	72.1	4.00	mg/kg wet	80.0		90.1	60-120			
Surrogate: 2-FBP	11.1		"	12.8		86.7	50-150			

**LCS (9K04025-BS2)**

Heavy Oil Range Hydrocarbons	63.7	25.0	mg/kg wet	80.0		79.6	60-100			
Surrogate: Octacosane	13.4		"	12.8		105	50-150			

**LCS Dup (9K04025-BSD1)**

Diesel Range Hydrocarbons	76.2	4.00	mg/kg wet	80.0		95.2	60-120	5.53	20	
Surrogate: 2-FBP	11.5		"	12.8		89.8	50-150			

**LCS Dup (9K04025-BSD2)**

Heavy Oil Range Hydrocarbons	62.8	25.0	mg/kg wet	80.0		78.5	60-100	1.42	20	
Surrogate: Octacosane	13.2		"	12.8		103	50-150			

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

**Reported:**  
11/22/99 08:44

**Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 9K17032: Prepared 11/09/99 Using General Preparation</b>										
<b>Blank (9K17032-BLK1)</b>										
Total Organic Carbon - Average	ND	300	mg/kg wet							
<b>Blank (9K17032-BLK2)</b>										
Total Organic Carbon - Average	ND	300	mg/kg wet							
<b>Blank (9K17032-BLK3)</b>										
Total Organic Carbon - Average	ND	300	mg/kg wet							
<b>LCS (9K17032-BS1)</b>										
Total Organic Carbon - Average	3500	300	mg/kg wet	3750		93.3	69.6-130.4			
<b>LCS Dup (9K17032-BSD1)</b>										
Total Organic Carbon - Average	3740	300	mg/kg wet	3750		99.7	69.6-130.4	6.63	30	
<b>Batch 9K19027: Prepared 11/17/99 Using General Preparation</b>										
<b>Blank (9K19027-BLK1)</b>										
Total Organic Carbon - Average	ND	300	mg/kg wet							
<b>Blank (9K19027-BLK2)</b>										
Total Organic Carbon - Average	ND	300	mg/kg wet							
<b>LCS (9K19027-BS1)</b>										
Total Organic Carbon - Average	3630	300	mg/kg wet	3750		96.8	69.6-130.4			
<b>LCS Dup (9K19027-BSD1)</b>										
Total Organic Carbon - Average	3130	300	mg/kg wet	3750		83.5	69.6-130.4	14.8	30	

North Creek Analytical - Bothell

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Steve Davis, Project Manager

**North Creek Analytical, Inc.**  
**Environmental Laboratory Network**

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
11/22/99 08:44

**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
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**Batch 9K09010: Prepared 11/09/99 Using Dry Weight**

**Blank (9K09010-BLK1)**

Dry Weight	100	1.00	%
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**Blank (9K09010-BLK2)**

Dry Weight	100	1.00	%
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**Blank (9K09010-BLK3)**

Dry Weight	100	1.00	%
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**Blank (9K09010-BLK4)**

Dry Weight	100	1.00	%
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North Creek Analytical - Bothell

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Steve Davis, Project Manager

**North Creek Analytical, Inc.**  
**Environmental Laboratory Network**

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007.0

**Reported:**  
11/22/99 08:44

A-01	Due to an extraction anomaly and/or matrix interference the Aliphatic surrogate is outside of established control limits. Results for the Aliphatic portion should be considered a low estimated value.
G-02	The chromatogram for this sample does not resemble a typical gasoline pattern. Please refer to the sample chromatogram.
R-03	The reporting limit for this analyte has been raised to account for 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-02	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
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

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**North Creek Analytical, Inc.**  
**Environmental Laboratory Network**

Data File : C:\HPCHEM\2\DATA\110699\K06016.D\FID1A.CH Vial: 16  
Acq On : 6 Nov 1999 3:13 pm Operator: ys  
Sample : b9K0037-09 r2 Inst : GC #4  
Misc : 2 ul Multiplr: 50.00  
IntFile : SURR.E

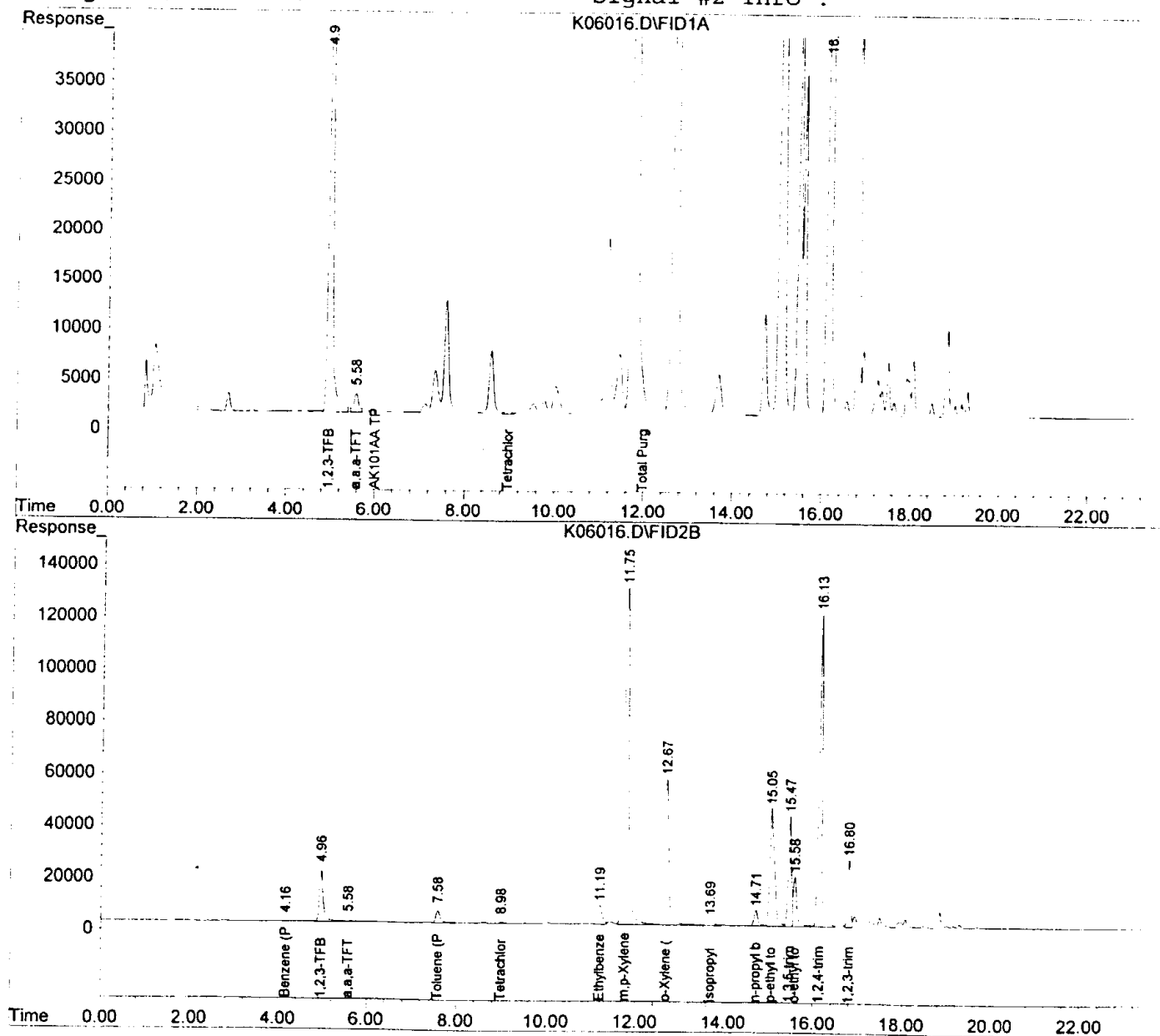
0071

Data File : C:\HPCHEM\2\DATA\110699\K06016.D\FID2B.CH Vial: 16  
Acq On : 6 Nov 99 3:13 pm Operator: ys  
Sample : b9K0037-09 r2 Inst : GC #4  
Misc : 2 ul Multiplr: 50.00  
IntFile : SURR2.E

Quant Time: Nov 8 9:41 1999 Quant Results File: AKAA1199.RES

Quant Method : C:\HPCHEM\2\METHODS\AKAA1199.M (Chemstation Integrator)  
Title : AK101aa Method  
Last Update : Sat Nov 06 09:42:33 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1199.M

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



Data File : C:\HPCHEM\2\DATA\110699\K06010.D\FID1A.CH Vial: 10  
Acq On : 6 Nov 1999 12:13 pm Operator: ys  
Sample : b9K0037-11 r1 Inst : GC #4  
Misc : 100 ul Multiplr: 1.00  
IntFile : SURR.E

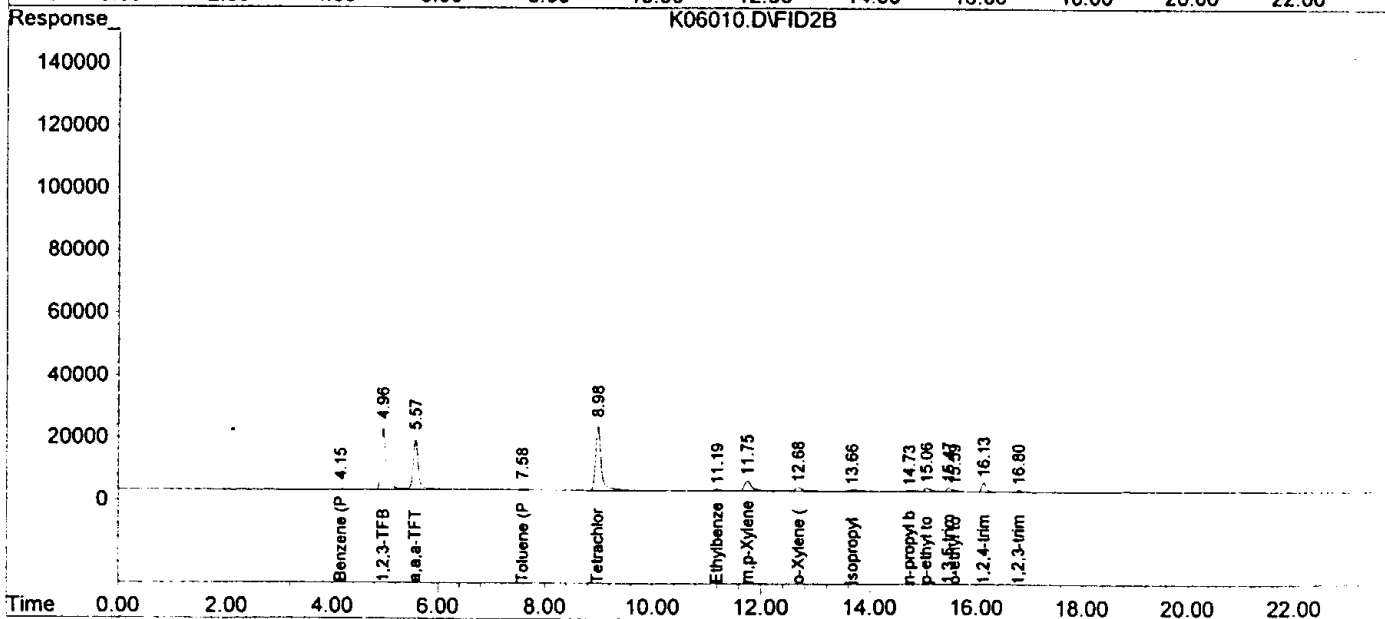
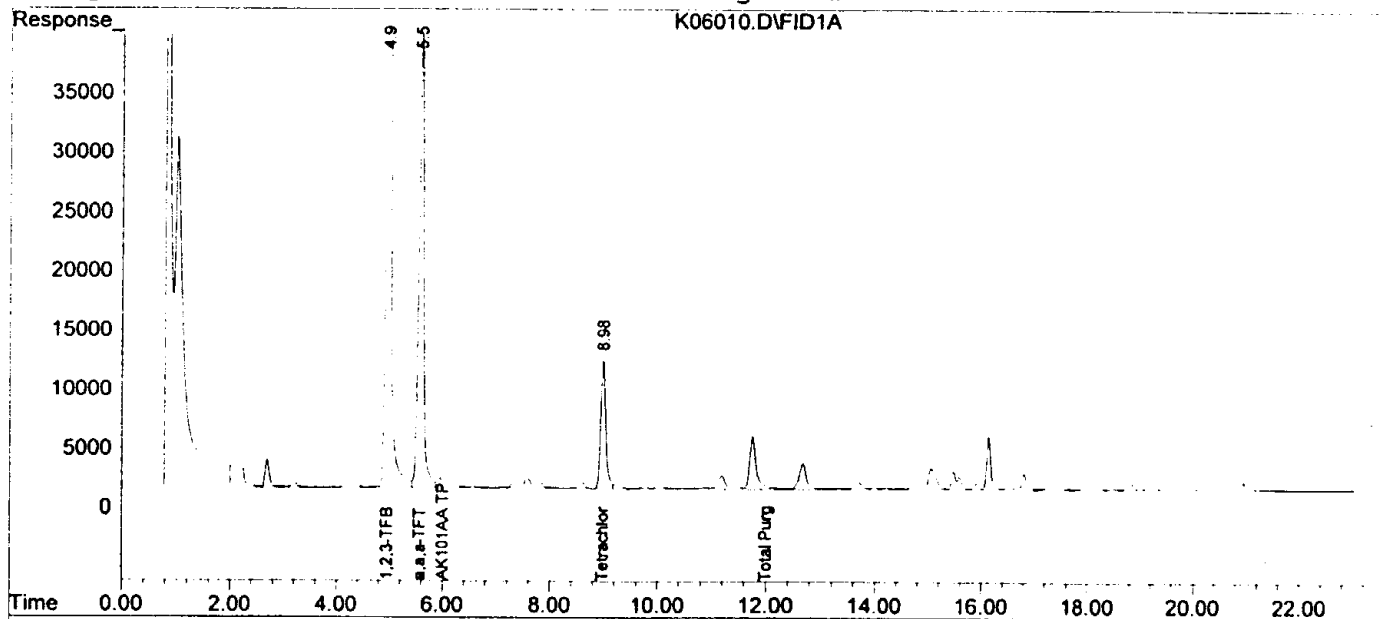
0072

Data File : C:\HPCHEM\2\DATA\110699\K06010.D\FID2B.CH Vial: 10  
Acq On : 6 Nov 99 12:13 pm Operator: ys  
Sample : b9K0037-11 r1 Inst : GC #4  
Misc : 100 ul Multiplr: 1.00  
IntFile : SURR2.E

Quant Time: Nov 8 9:32 1999 Quant Results File: AKAA1199.RES

Quant Method : C:\HPCHEM\2\METHODS\AKAA1199.M (Chemstation Integrator)  
Title : AK101aa Method  
Last Update : Sat Nov 06 09:42:33 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1199.M

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



Data File : C:\HPCHEM\2\DATA\110699\K06011.D\FID1A.CH Vial: 11  
Acq On : 6 Nov 1999 12:43 pm Operator: ys  
Sample : b9K0037-13 r1 Inst : GC #4  
Misc : 100 ul Multiplr: 1.00  
IntFile : SURR.E

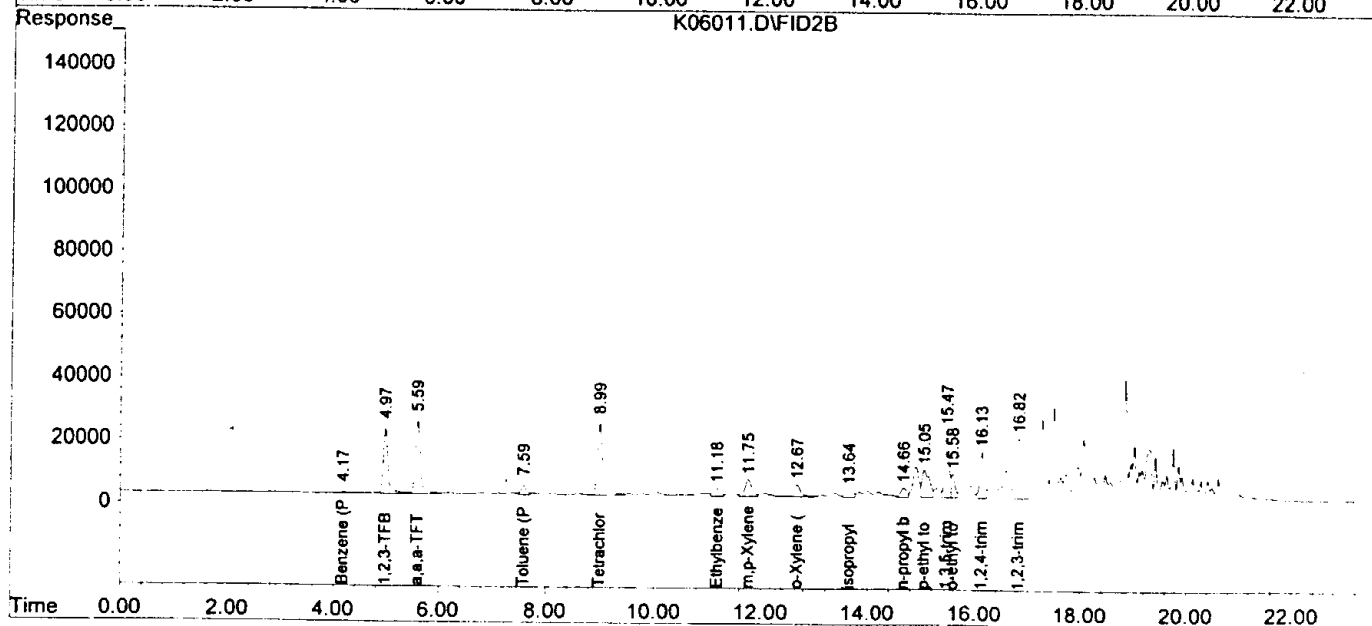
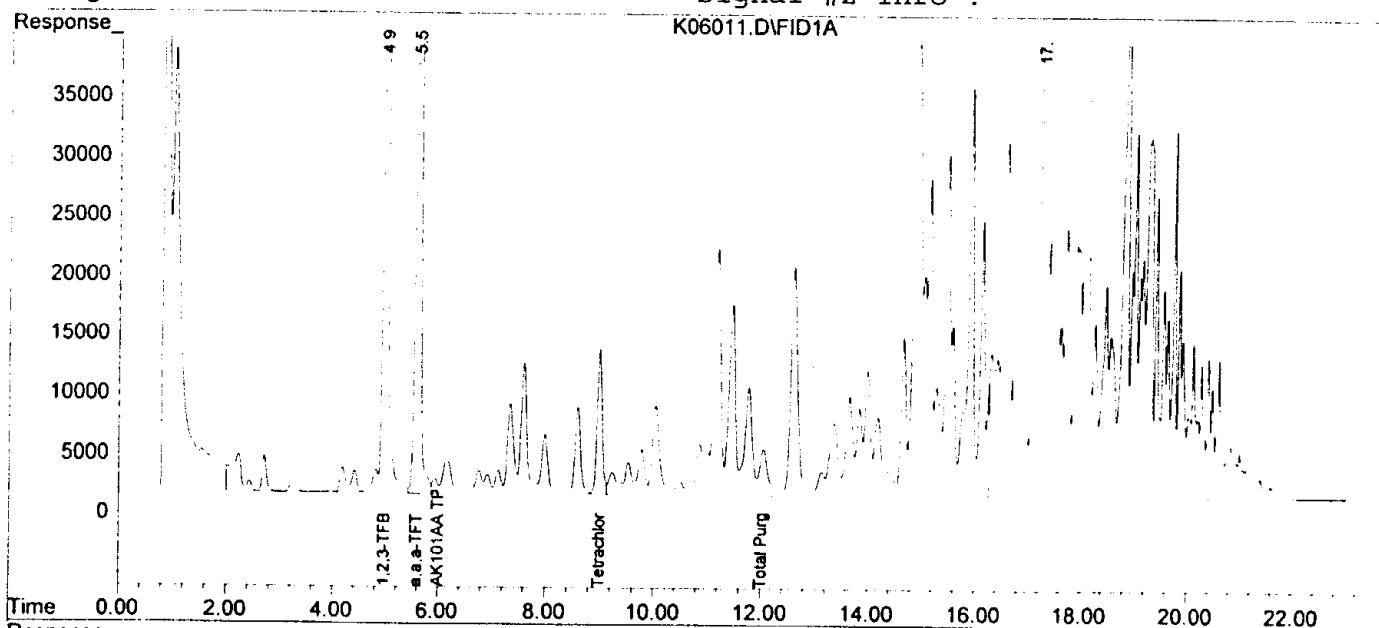
0073

Data File : C:\HPCHEM\2\DATA\110699\K06011.D\FID2B.CH Vial: 11  
Acq On : 6 Nov 99 12:43 pm Operator: ys  
Sample : b9K0037-13 r1 Inst : GC #4  
Misc : 100 ul Multiplr: 1.00  
IntFile : SURR2.E

Quant Time: Nov 8 9:34 1999 Quant Results File: AKAA1199.RES

Quant Method : C:\HPCHEM\2\METHODS\AKAA1199.M (Chemstation Integrator)  
Title : AK101aa Method  
Last Update : Sat Nov 06 09:42:33 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1199.M

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





Data File : C:\HPCHEM\2\DATA\110699\K06012.D\FID1A.CH Vial: 12  
Acq On : 6 Nov 1999 1:13 pm Operator: ys  
Sample : b9K0037-18 r1 Inst : GC #4  
Misc : 100 ul Multiplr: 1.00  
IntFile : SURR.E

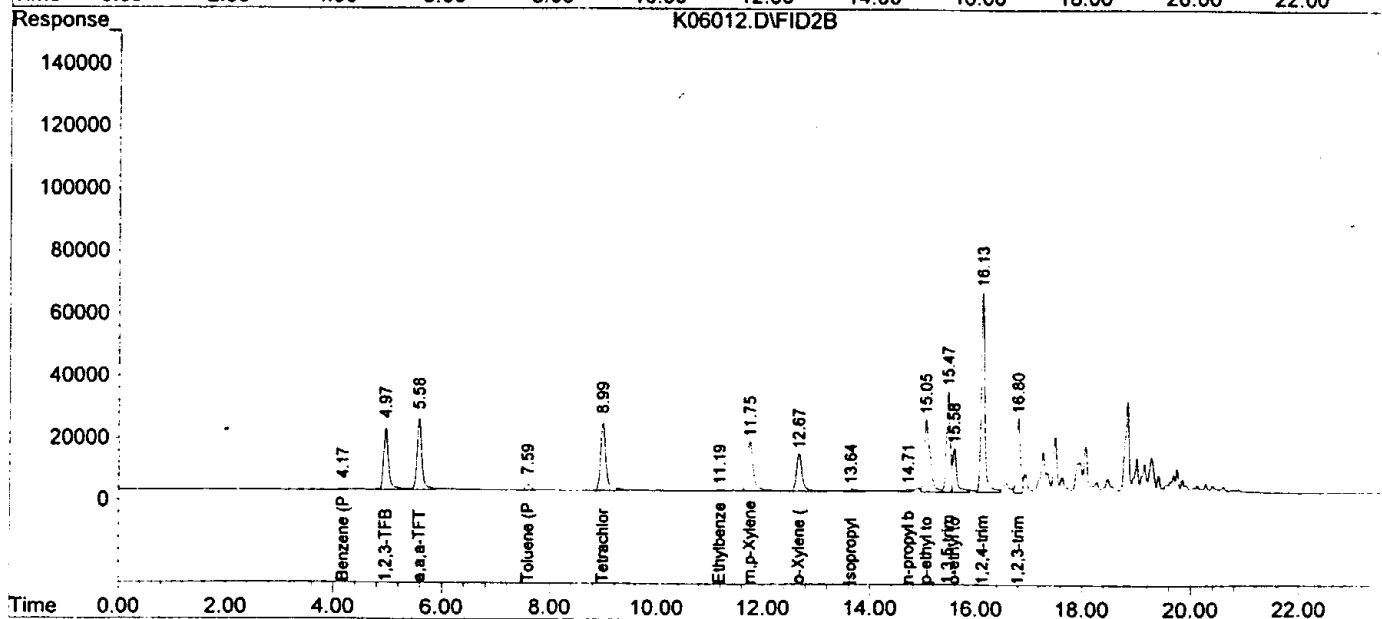
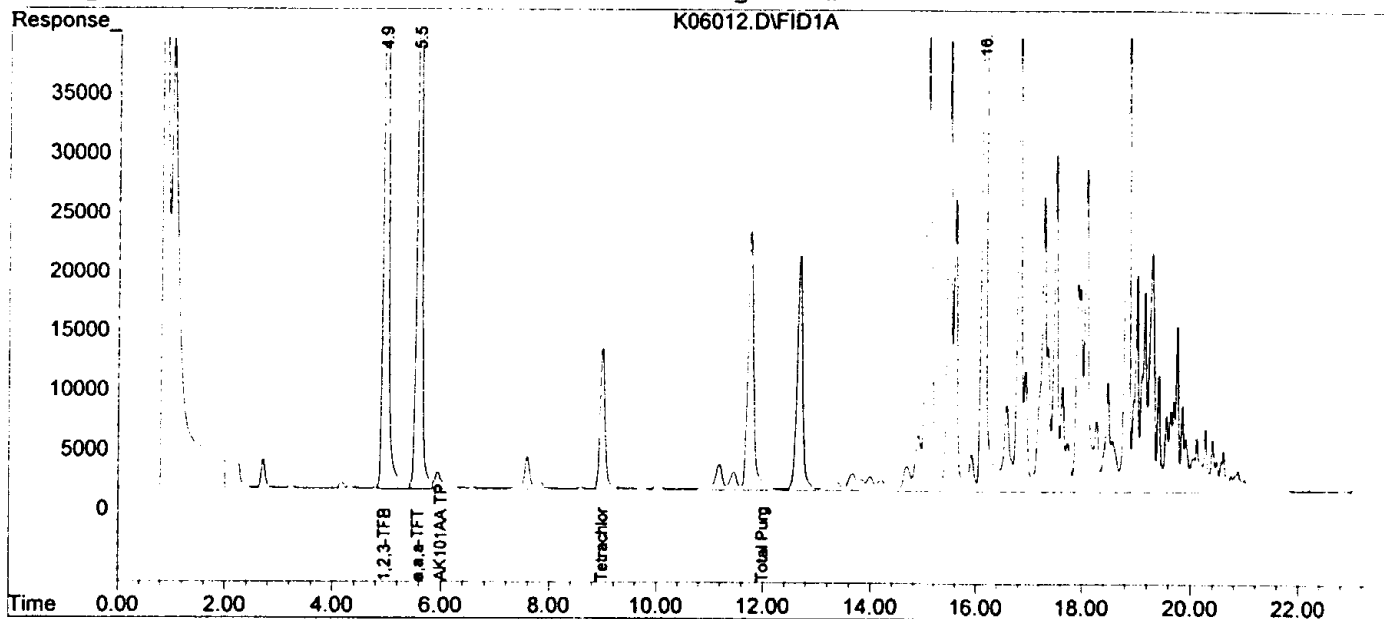
007A

Data File : C:\HPCHEM\2\DATA\110699\K06012.D\FID2B.CH Vial: 12  
Acq On : 6 Nov 99 1:13 pm Operator: ys  
Sample : b9K0037-18 r1 Inst : GC #4  
Misc : 100 ul Multiplr: 1.00  
IntFile : SURR2.E

Quant Time: Nov 8 9:36 1999 Quant Results File: AKAA1199.RES

Quant Method : C:\HPCHEM\2\METHODS\AKAA1199.M (Chemstation Integrator)  
Title : AK101aa Method  
Last Update : Sat Nov 06 09:42:33 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1199.M

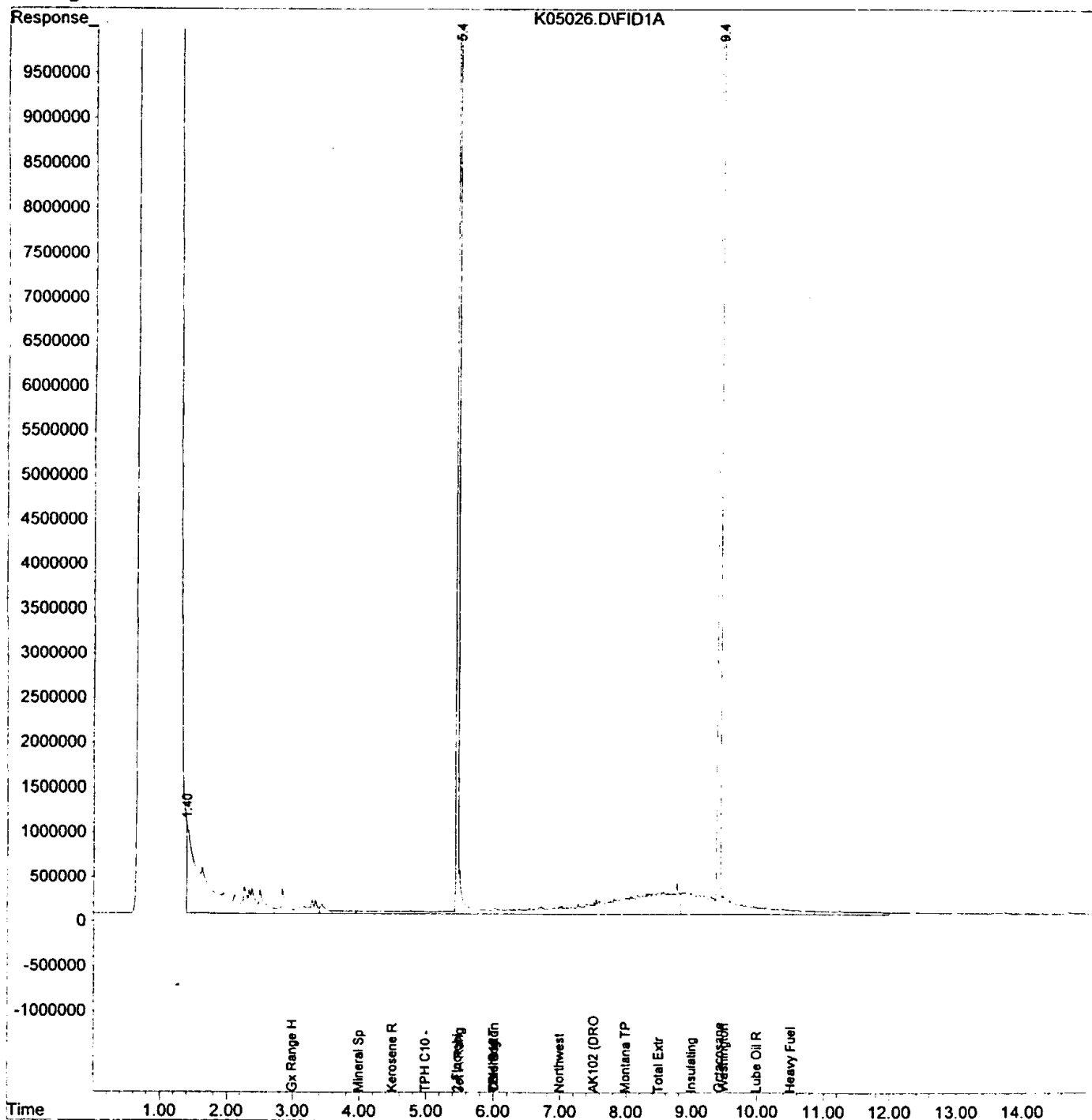
Volume Inj. :  
Signal #1 Phase : Signal #2 Phase:  
Signal #1 Info : Signal #2 Info :



Data File : C:\HPCHEM\4\DATA\K05026.D      Vial: 1/  
Acq On : 11-5-99 4:26:55 PM      Operator: MC  
Sample : b9k0037-01      Inst : GC #7  
Misc : s      0075 Multiplr: 1.00  
IntFile : SURR.E  
Quant Time: Nov 5 18:18 1999      Quant Results File: TPHD.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)  
Title : TPH-D Front Method  
Last Update : Tue Sep 28 13:35:11 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Acq On : 8 Nov 1999 11:34 am  
Sample : B9K0037-18  
Misc : 100 uL  
IntFile : TPH.E

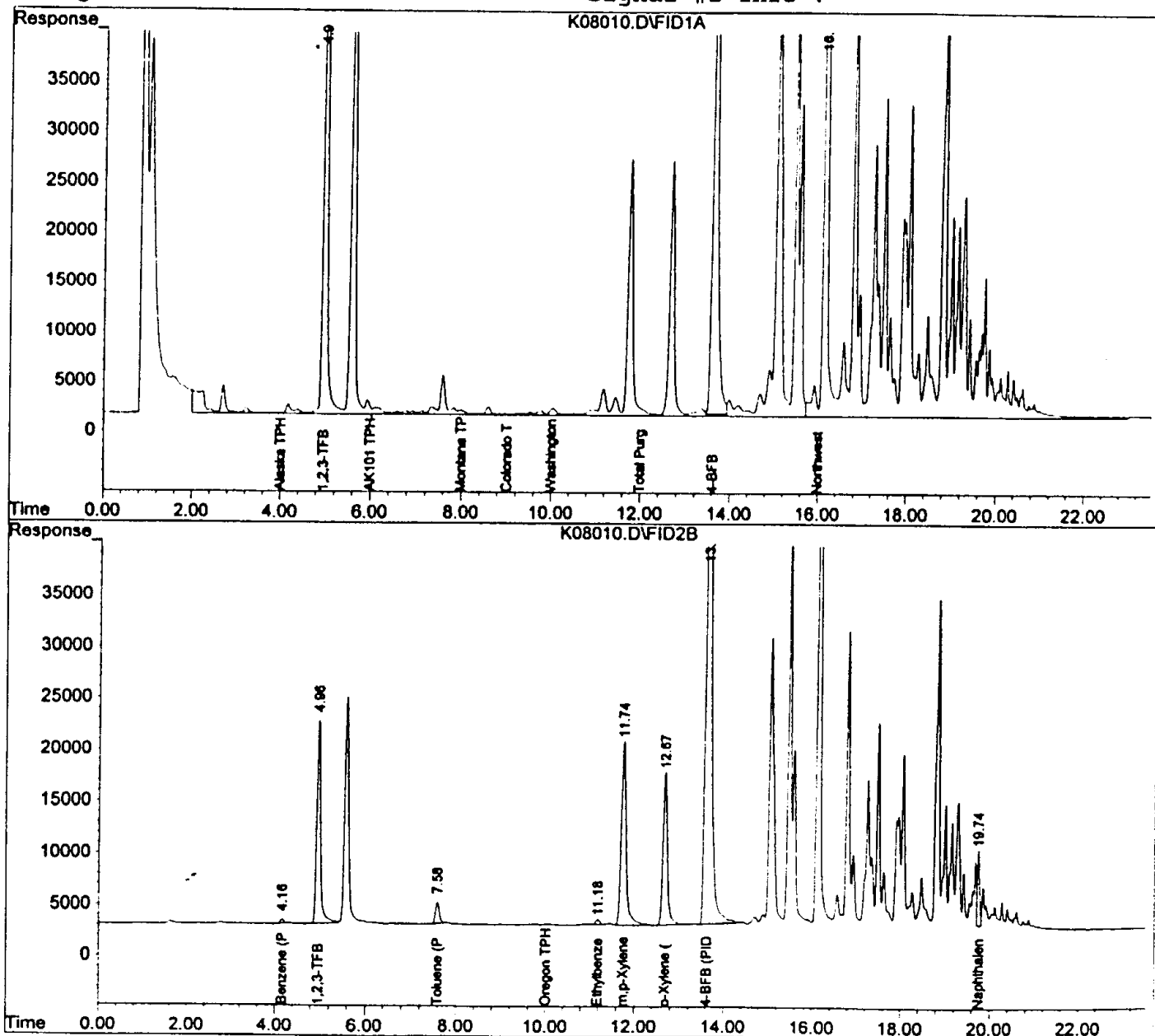
Operator: ys  
Inst : GC #4  
Multiplr: 1.00

0076

Data File : C:\HPCHEM\2\DATA\110899\K08010.D\FID2B.CH Vial: 10  
Acq On : 8 Nov 99 11:34 am Operator: ys  
Sample : B9K0037-18 Inst : GC #4  
Misc : 100 uL Multiplr: 1.00  
IntFile : TPH2.E  
Quant Time: Nov 8 11:58 1999 Quant Results File: TPHG1199.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1199.M (Chemstation Integrator)  
Title : TPH-G Method  
Last Update : Thu Nov 04 12:45:36 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1199.M

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



Acq On : 9 Nov 1999 8:24 am  
Sample : B9K0037-22 r2  
Misc : 10 uL  
IntFile : TPH.E

0077

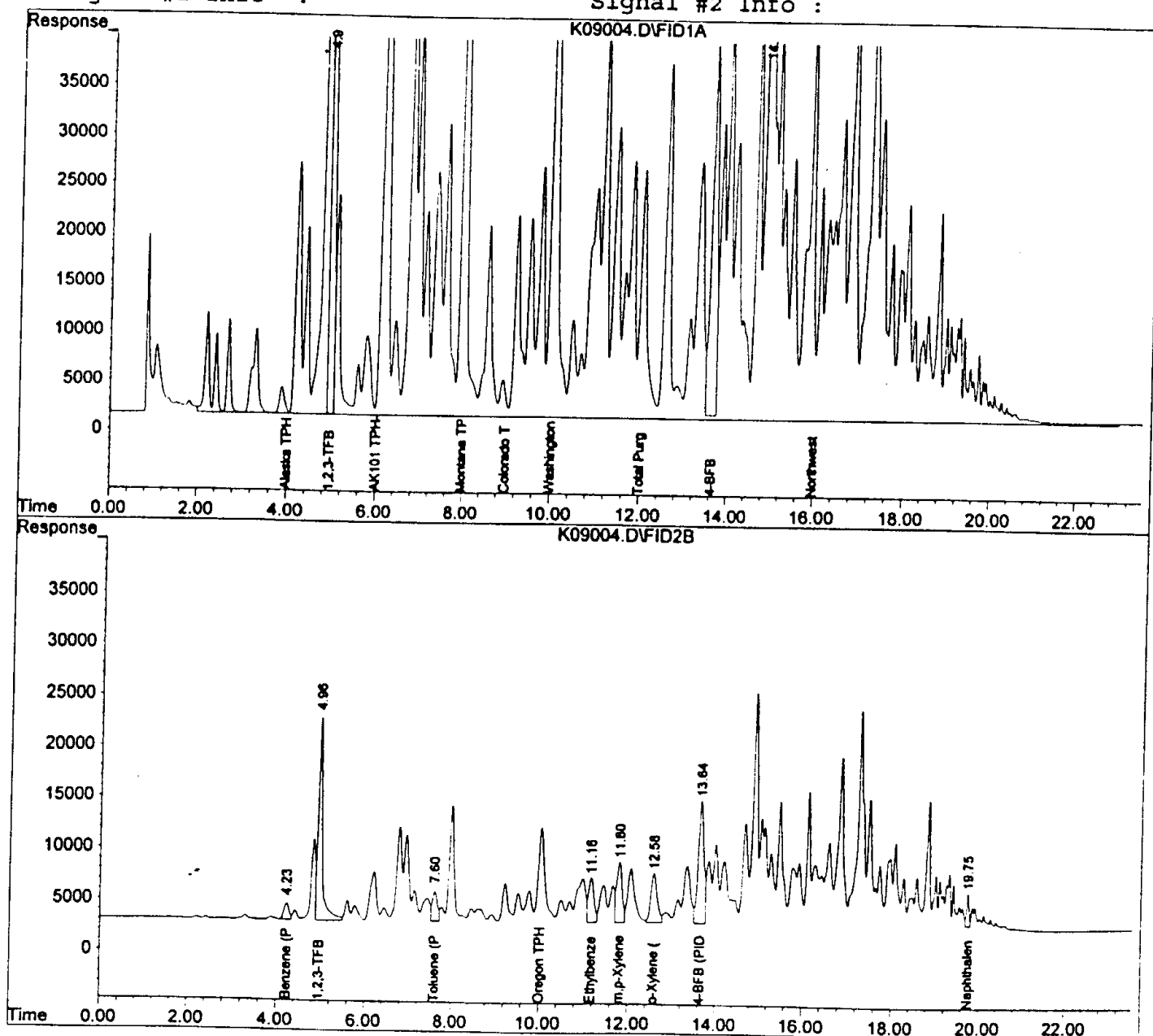
Operator: ys  
Inst : GC #4  
Multiplr: 10.00

Data File : C:\HPCHEM\2\DATA\110999\K09004.D\FID2B.CH Vial: 4  
Acq On : 9 Nov 99 8:24 am Operator: ys  
Sample : B9K0037-22 r2 Inst : GC #4  
Misc : 10 uL Multiplr: 10.00  
IntFile : TPH2.E

Quant Time: Nov 9 8:48 1999 Quant Results File: TPHG1199.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1199.M (Chemstation Integrator)  
Title : TPH-G Method  
Last Update : Mon Nov 08 13:34:21 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1199.M

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



Data File : C:\HPCHEM\3\DATA.SEC\K11013.D

Acq On : 11 Nov 1999 12:47 pm

Sample : b9k0037-01 ar

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 16:15 1999 Quant Results File: EPH2.RES

Vial: 12

Operator: jw

Inst : GC #5

Multiplr: 1.00

0078

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Thu Nov 11 16:12:23 1999

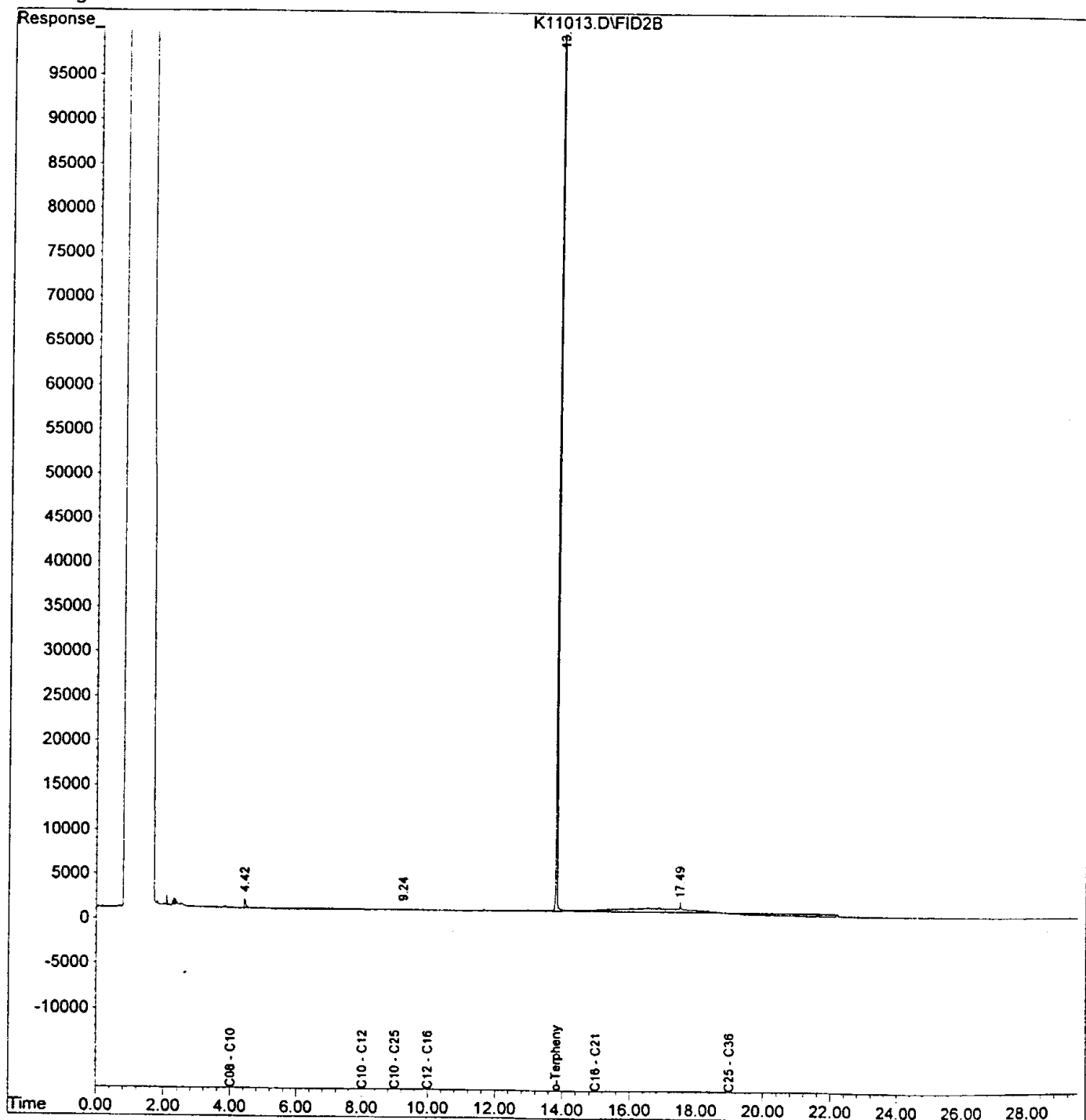
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA\K11014.D

Acq On : 11 Nov 1999 12:47 pm

Sample : b9k0037-01 al

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 16:08 1999 Quant Results File: EPH.RES

Vial: 13

Operator: jw

Inst : GC #5

Multiplr: 1.00

0079

Quant Method : C:\HPCHEM\3\METHODS\EPH.M (Chemstation Integrator)

Title : EPH Front Method

Last Update : Thu Nov 11 16:06:55 1999

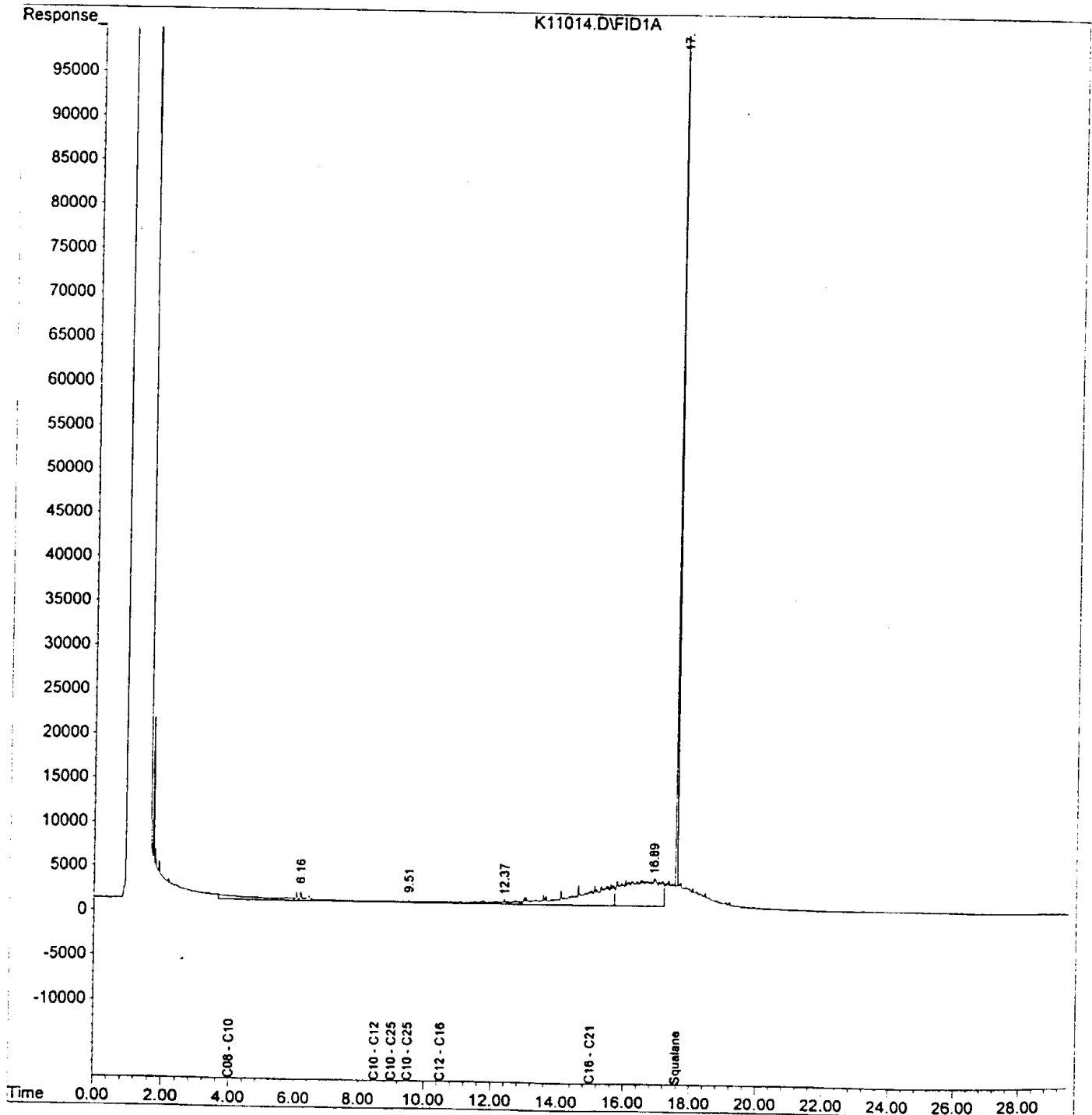
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA\K11018.D

Acq On : 11 Nov 1999 2:24 pm

Sample : b9k0037-03 a1

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 16:09 1999 Quant Results File: EPH.RES

0080

Vial: 15

Operator: MC

Inst : GC #5

Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\EPH.M (Chemstation Integrator)

Title : EPH Front Method

Last Update : Thu Nov 11 16:06:55 1999

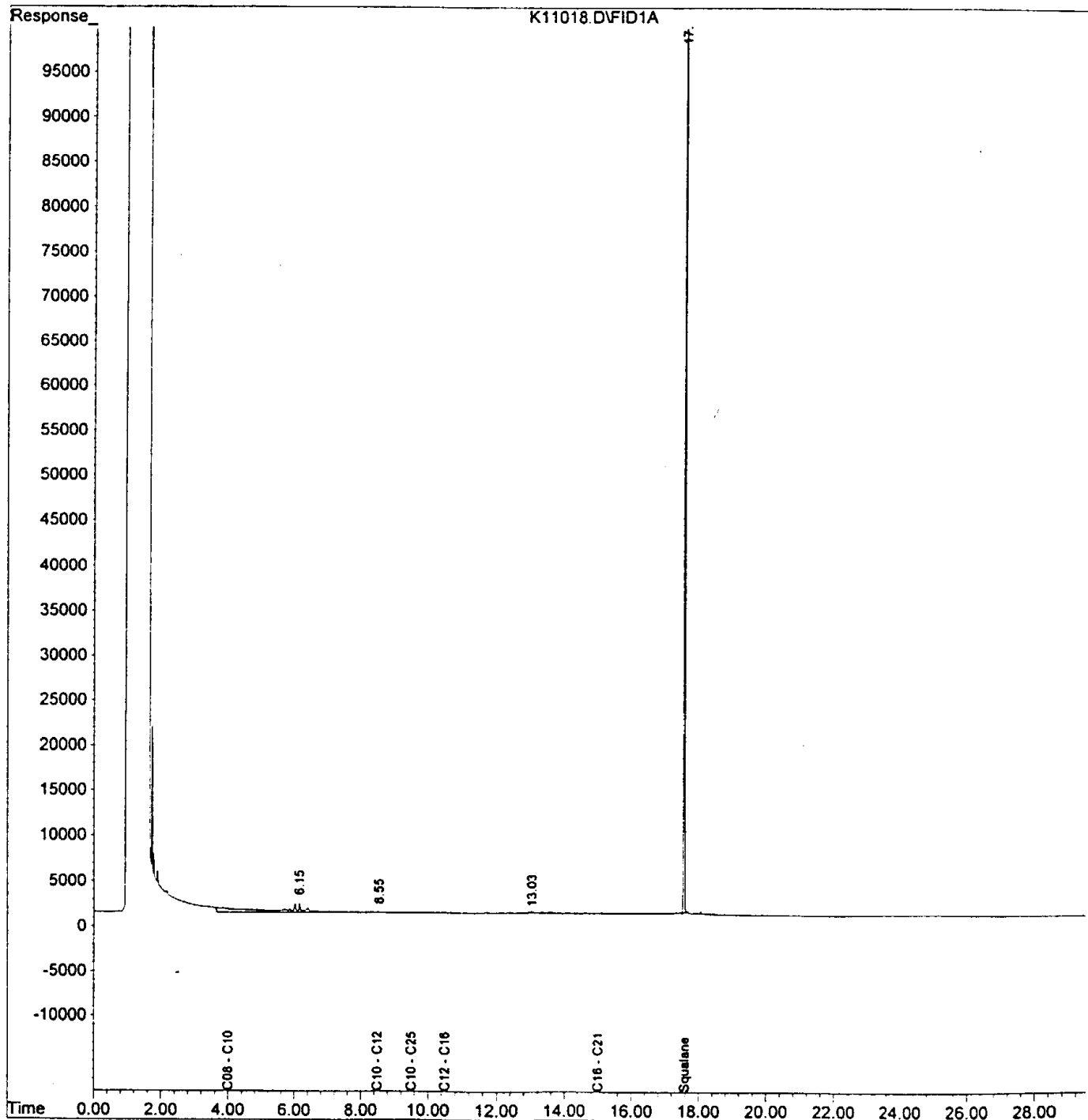
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA.SEC\K11019.D

Acq On : 11 Nov 1999 3:03 pm

Sample : b9k0037-09 ar

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 16:16 1999 Quant Results File: EPH2.RES

Vial: 16

Operator: MC

Inst : GC #5

Multiplr: 1.00

0081

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Thu Nov 11 16:12:23 1999

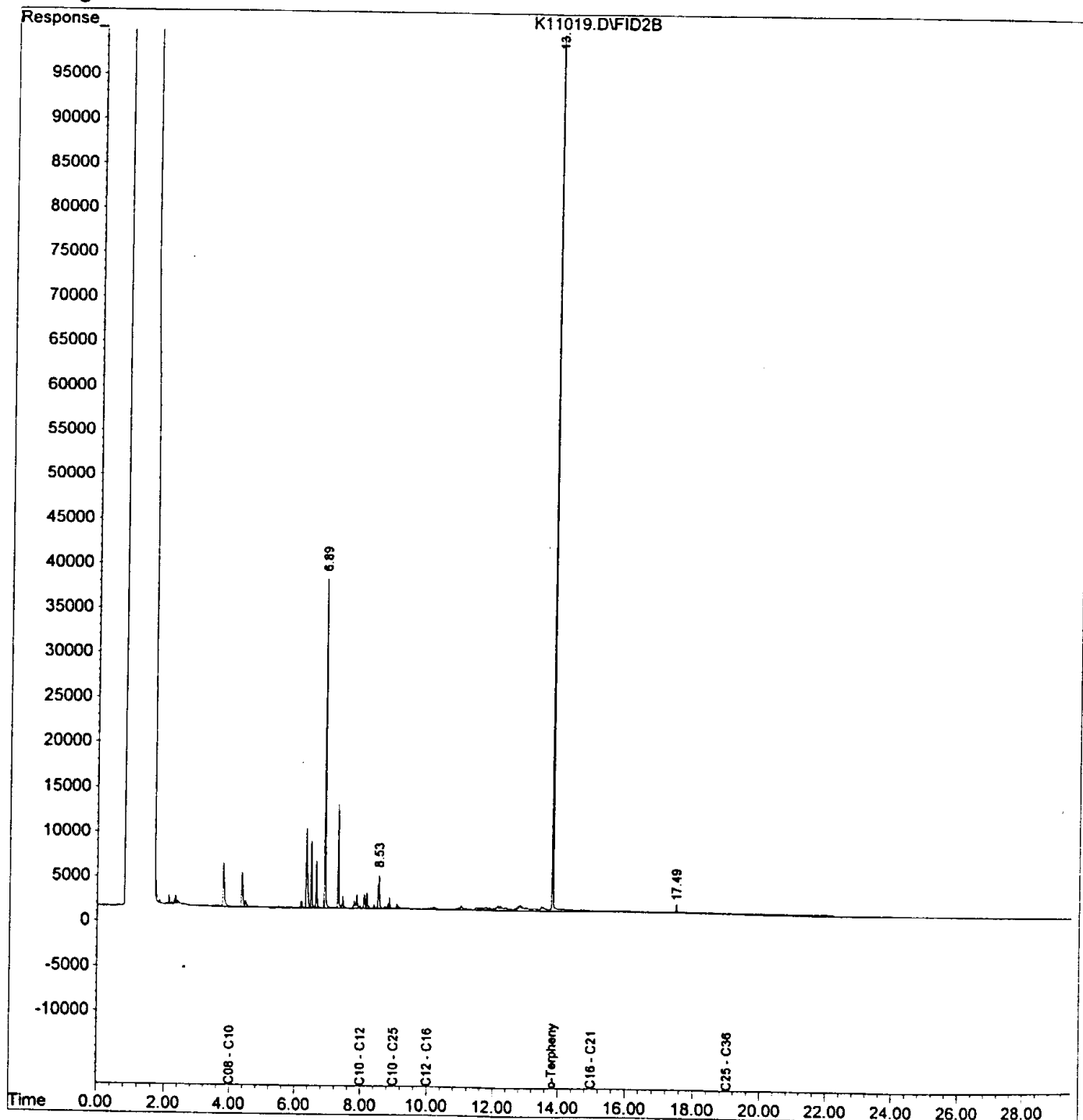
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :





Data File : C:\HPCHEM\3\DATA.SEC\K11053.D

Acq On : 12 Nov 1999 3:13 am

Sample : B9K0037-03 AR

Misc : s r1

IntFile : SURR.E

Quant Time: Nov 12 9:59 1999 Quant Results File: EPH2.RES

Vial: 14

Operator: ME

Inst : GC #5

Multiplr: 1.00

0082

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Fri Nov 12 09:54:55 1999

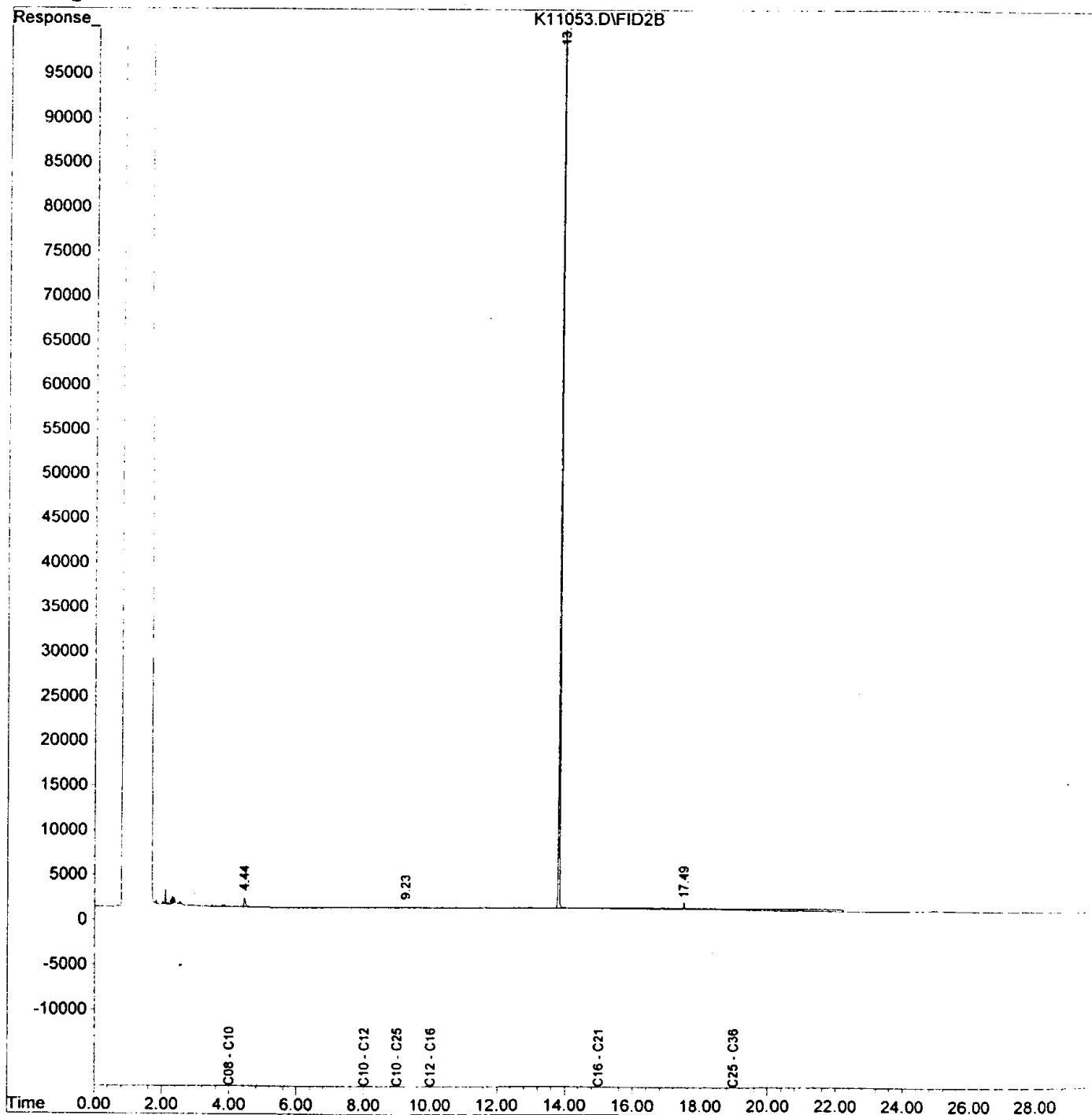
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA.SEC\K11019.D

Acq On : 11 Nov 1999 3:03 pm

Sample : b9k0037-09 ar

Misc : S

IntFile : SURR.E

Quant Time: Nov 11 16:16 1999 Quant Results File: EPH2.RES

Vial: 16

Operator: MC

Inst : GC #5

Multiplr: 1.00

0083

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Thu Nov 11 16:12:23 1999

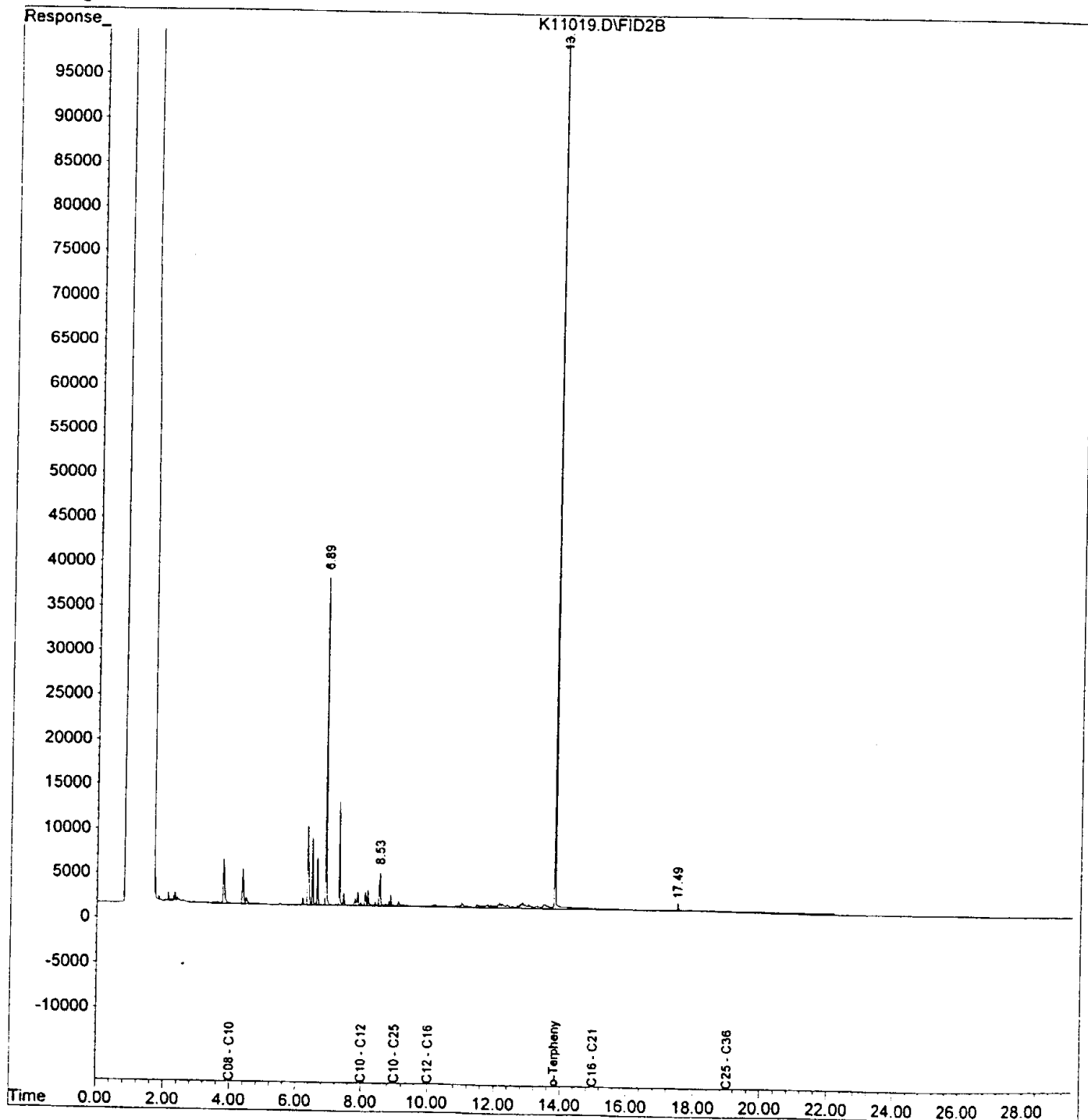
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA\K11020.D

Acq On : 11 Nov 1999 3:03 pm

Sample : b9k0037-09 a1

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 16:09 1999 Quant Results File: EPH.RES

Vial: 17

Operator: MC

Inst : GC #5

Multiplr: 1.00

008A

Quant Method : C:\HPCHEM\3\METHODS\EPH.M (Chemstation Integrator)

Title : EPH Front Method

Last Update : Thu Nov 11 16:06:55 1999

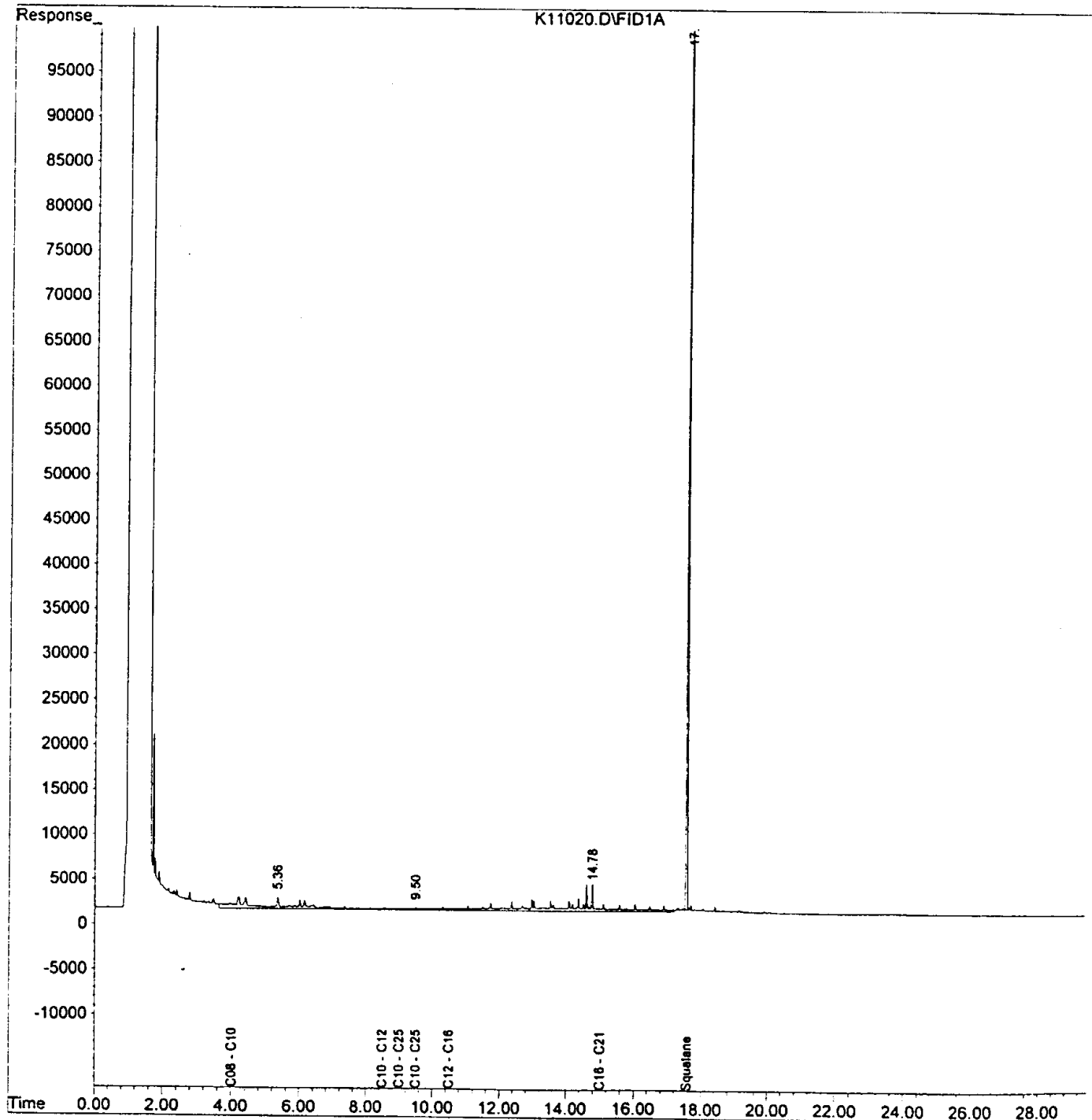
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA.SEC\K11021.D

Acq On : 11 Nov 1999 3:43 pm

Sample : b9k0037-11 ar

Misc : S

IntFile : SURR.E

Quant Time: Nov 11 17:01 1999 Quant Results File: EPH2.RES

Vial: 18

Operator: MC

Inst : GC #5

Multiplr: 1.00

0085

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Thu Nov 11 16:12:23 1999

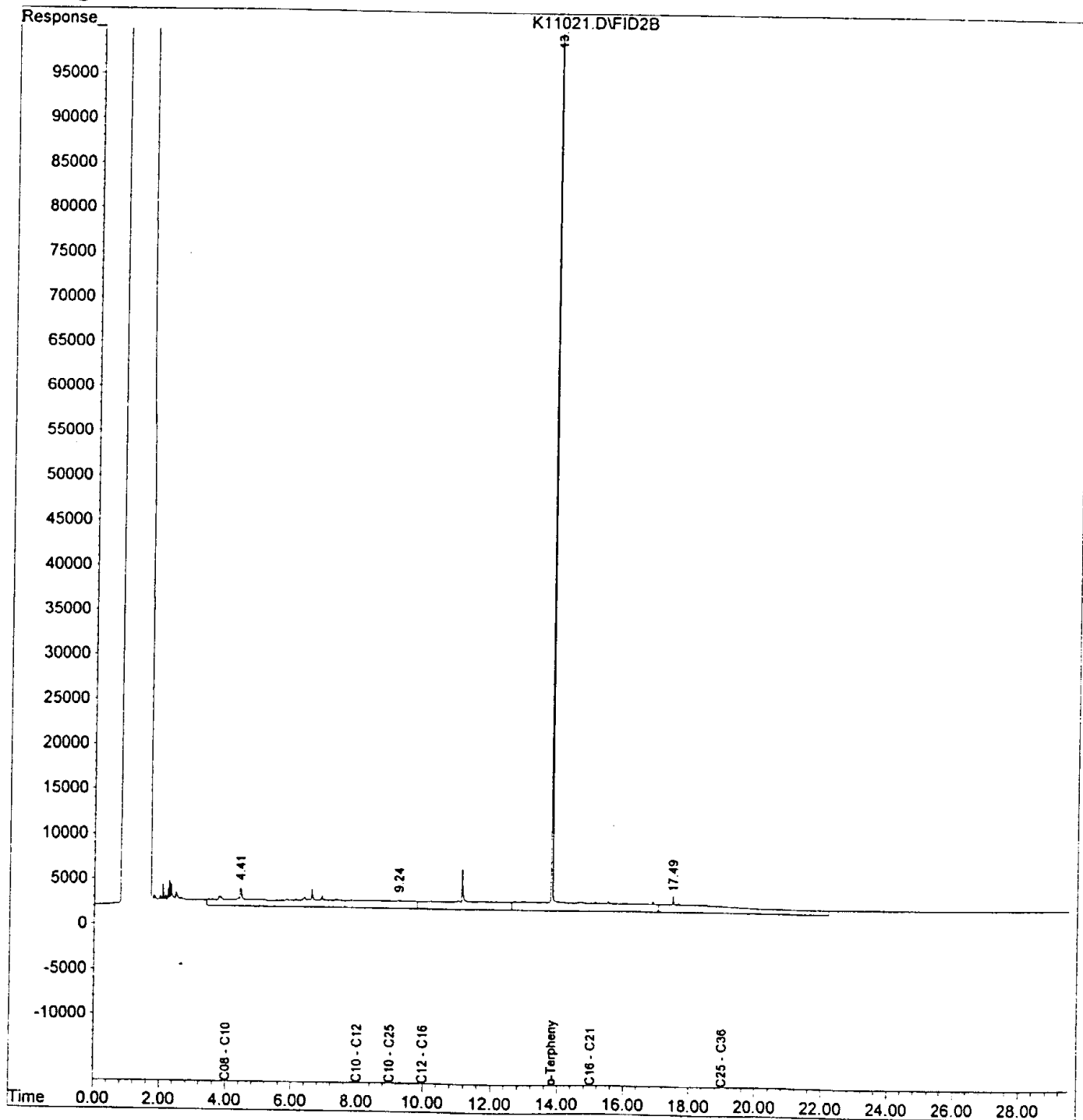
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA\K11022.D

Acq On : 11 Nov 1999 3:43 pm

Sample : b9k0037-11 al

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 17:51 1999 Quant Results File: EPH.RES

Vial: 19

Operator: MC

Inst : GC #5

Multiplr: 1.00

0086

Quant Method : C:\HPCHEM\3\METHODS\EPH.M (Chemstation Integrator)

Title : EPH Front Method

Last Update : Thu Nov 11 08:18:32 1999

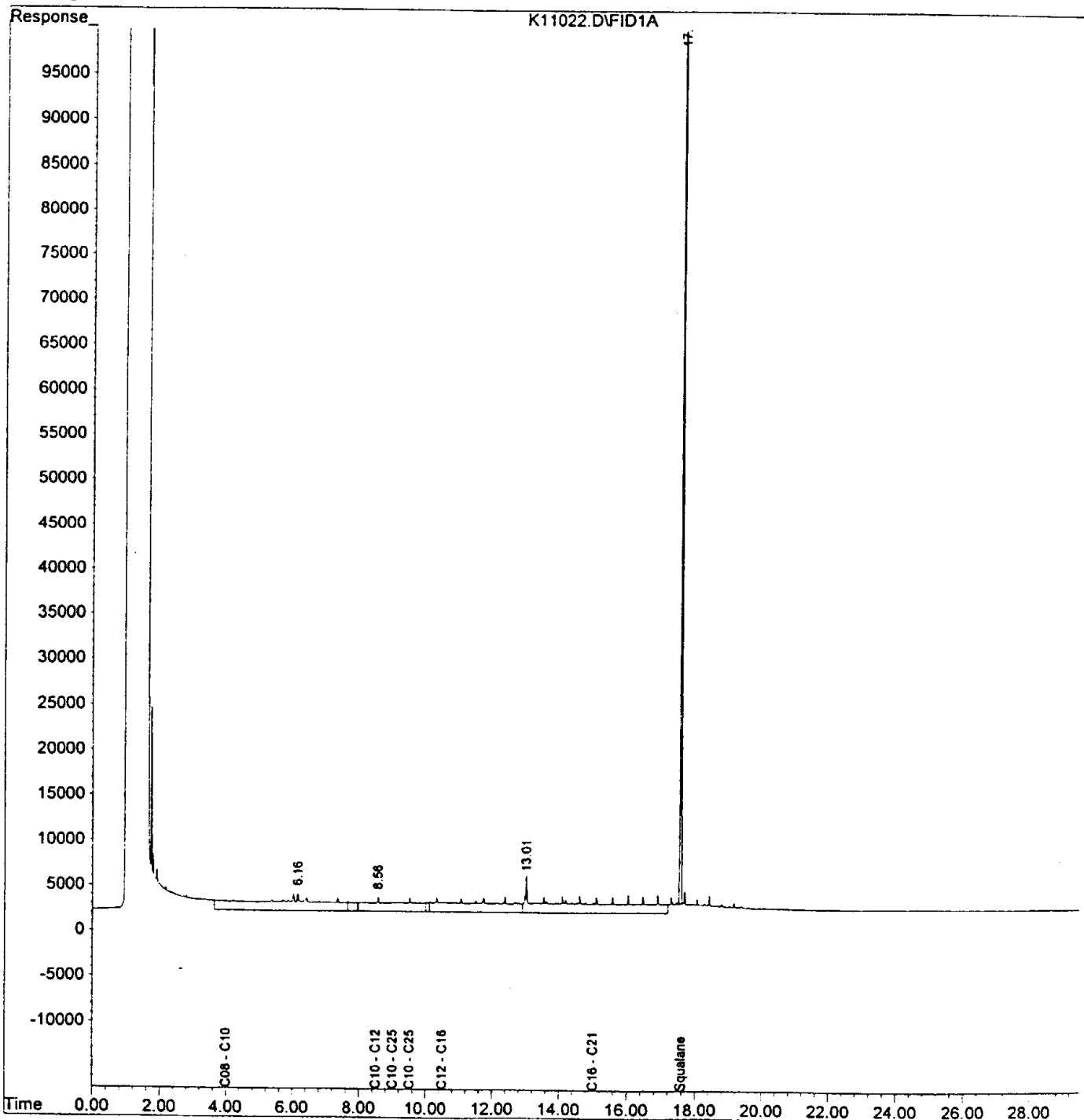
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA.SEC\K11023.D

Acq On : 11 Nov 1999 4:23 pm

Sample : b9k0037-13 ar

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 17:02 1999 Quant Results File: EPH2.RES

Vial: 20

Operator: MC

Inst : GC #5

Multiplr: 1.00

0087

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Thu Nov 11 16:12:23 1999

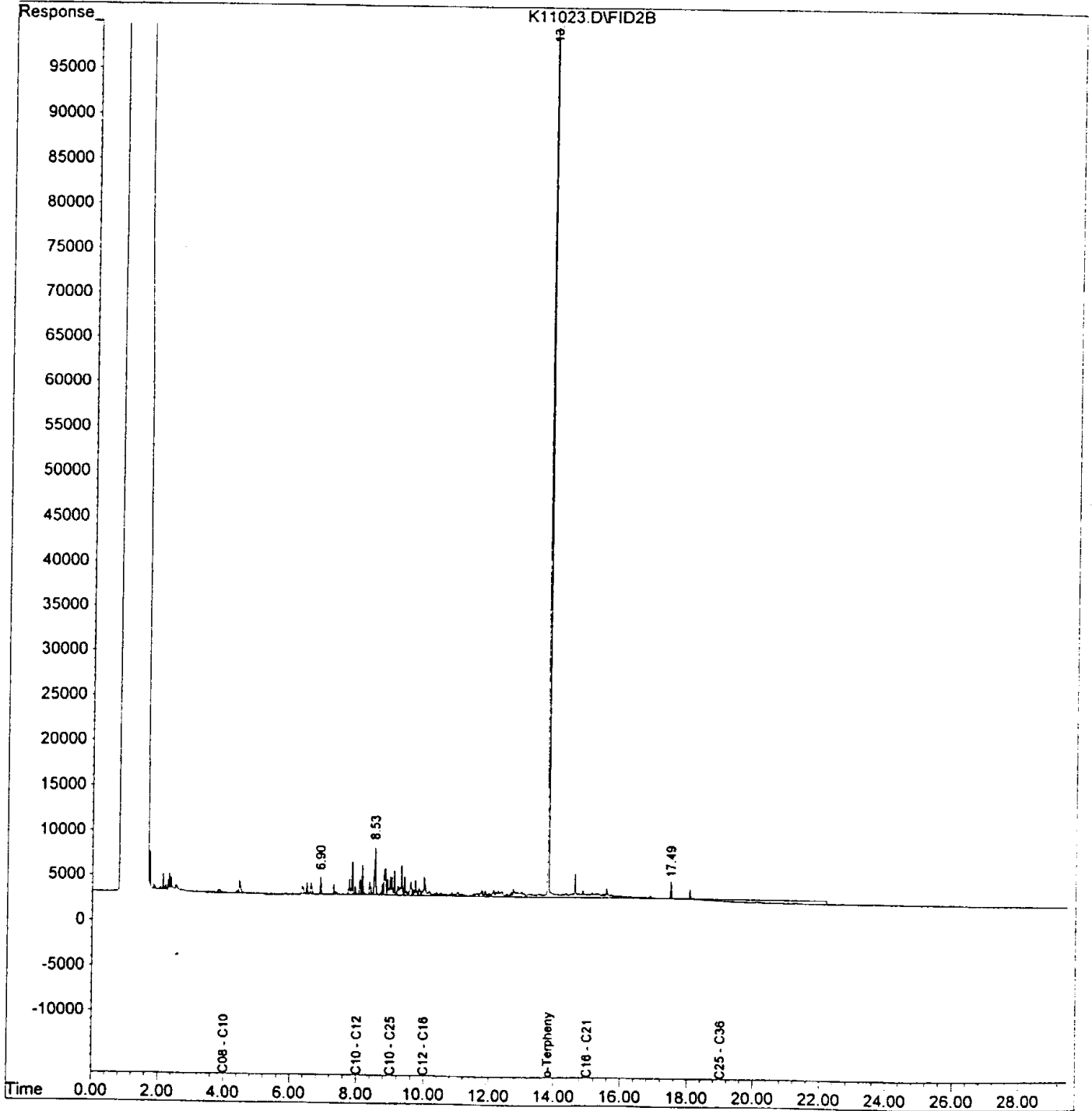
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA\K11024.D

Acq On : 11 Nov 1999 4:23 pm

Sample : b9k0037-13 a1

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 17:51 1999 Quant Results File: EPH.RES

Vial: 21

Operator: MC

Inst : GC #5

Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\EPH.M (Chemstation Integrator)

Title : EPH Front Method

Last Update : Thu Nov 11 17:50:44 1999

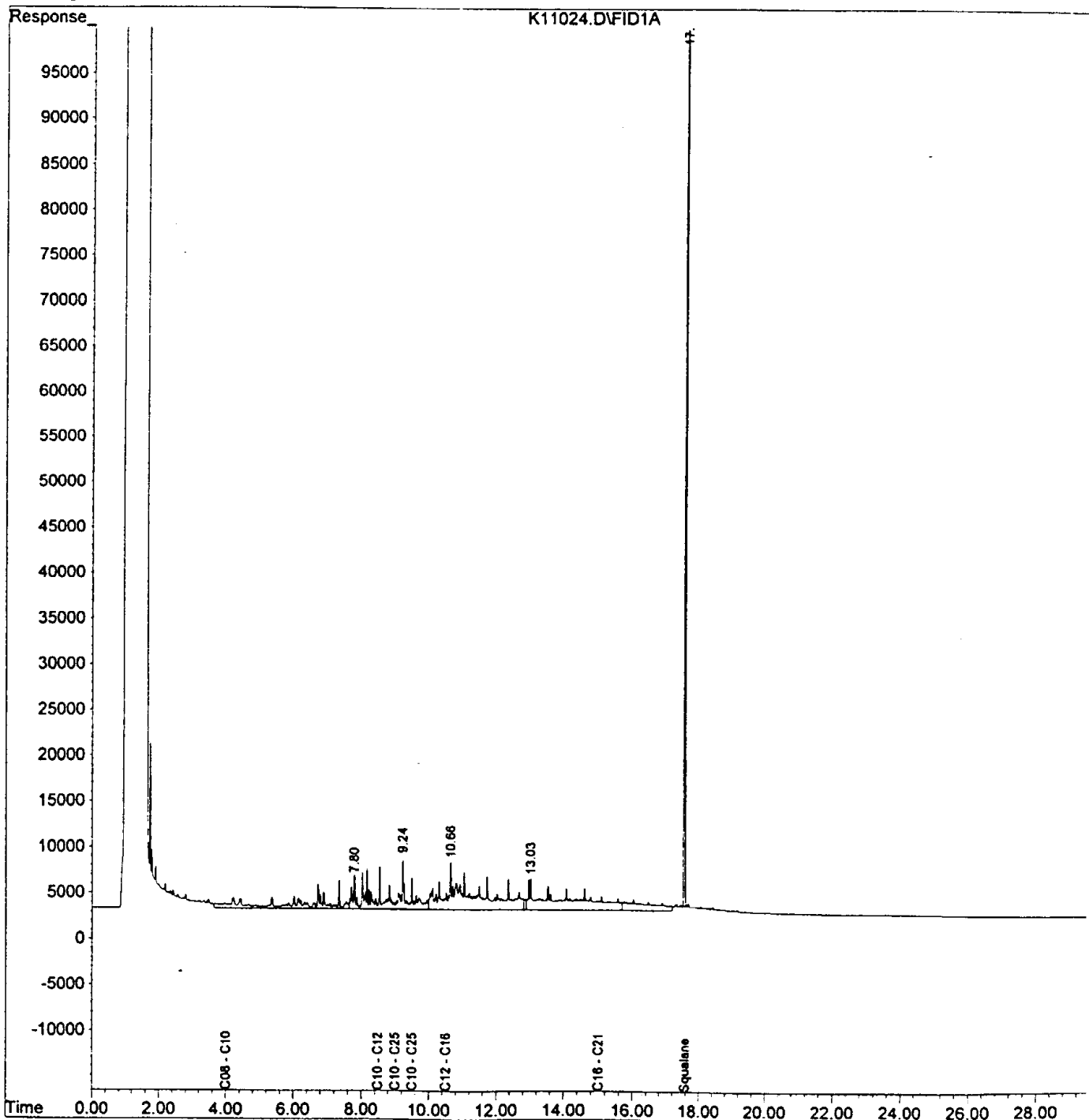
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA.SEC\K11025.D

Acq On : 11 Nov 1999, 5:03 pm

Sample : b9k0037-18 ar

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 17:49 1999 Quant Results File: EPH2.RES

Vial: 22

Operator: MC

Inst : GC #5

Multiplr: 1.00

0089

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Thu Nov 11 16:12:23 1999

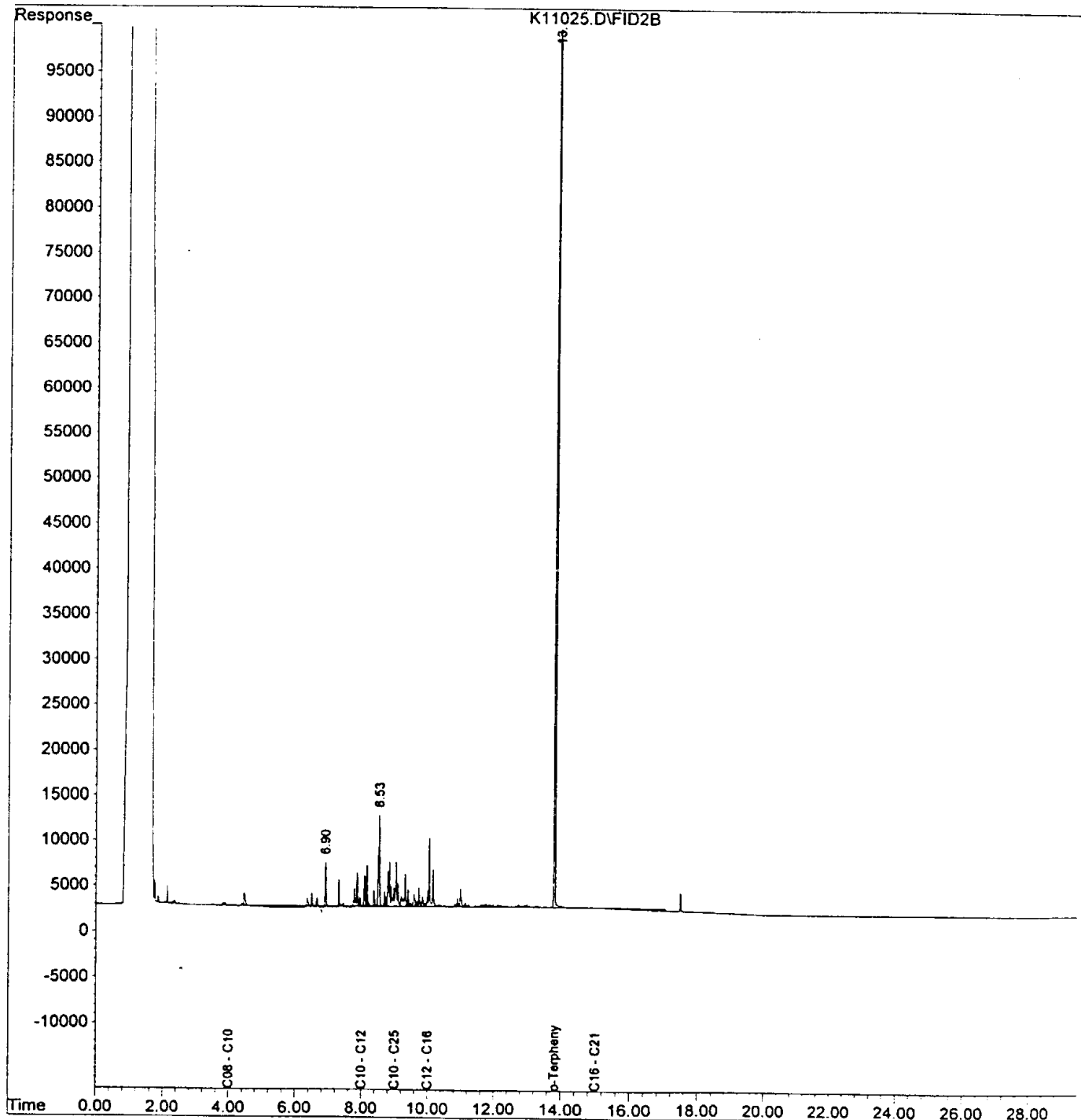
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :





Data File : C:\HPCHEM\3\DATA\K11026.D

Acq On : 11 Nov 1999 5:03 pm

Sample : b9k0037-18 a1

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 17:51 1999 Quant Results File: EPH.RES

Vial: 23

Operator: MC

Inst : GC #5

Multiplr: 1.00

0090

Quant Method : C:\HPCHEM\3\METHODS\EPH.M (Chemstation Integrator)

Title : EPH Front Method

Last Update : Thu Nov 11 17:50:44 1999

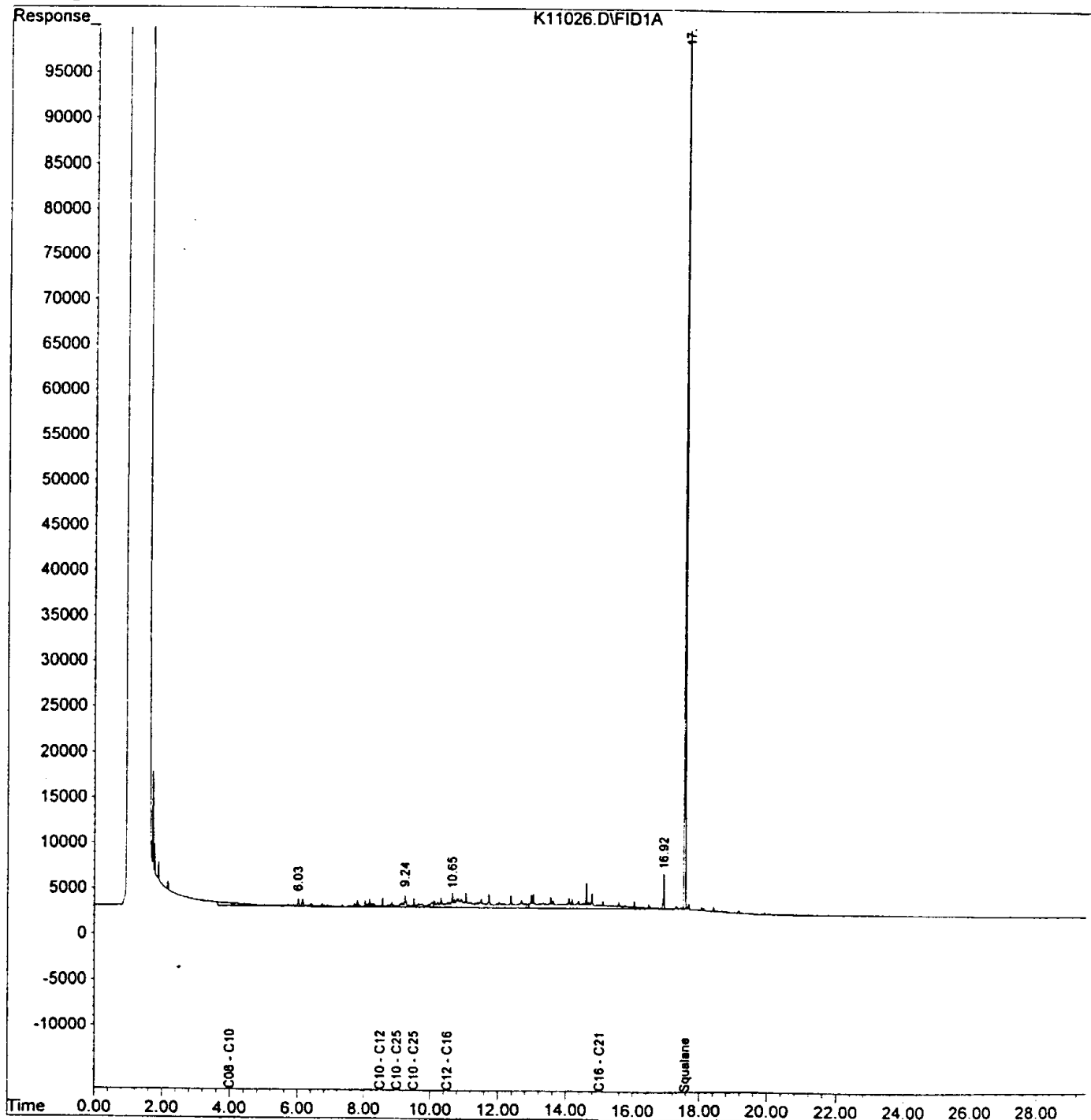
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :





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Environmental Laboratory Services

SAP# 120630

2500 E. 10th Avenue N.E. Suite 101 Redfish WA 98011-9508 (360) 481-9300 FAX 485-5900  
Fax 311-5151 Mailing Suite B Spokane WA 99206-4779 (509) 624-0200 FAX 924-4779  
9405 SW Nimbus Avenue Beaverton OR 97008-7112 (503) 643-0200 FAX 644-2292

# CHAIN OF CUSTODY REPORT

Work Order # 351KCR 37

REPORT TO: <u>Green Engineers</u>		INVOICE TO: <u>Equus Services, LLC</u>	
ATTENTION: <u>Lauree Duvonian</u>		ATTENTION: <u>Tony DeLongis</u>	
ADDRESS: <u>4951 Eagle St</u>		ADDRESS:	
CITY: <u>Richmond Bk 99303</u>		CITY:	
PHONE: <u>907/581-3470</u>		PHONE: <u>907/581-3123</u>	
PROJECT NAME: <u>Bog Corners TRXACO</u>		PROJECT NAME:	
PROJECT NUMBER: <u>2401-064-01</u>		PROJECT NUMBER:	
SAMPLED BY: <u>LJD</u>		SAMPLED BY:	
CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NO. SAMPLES	LABORATORY
<u>99931-16.0'</u>	<u>12/26 9:45</u>	<u>X</u>	<u>X</u>
<u>99931-19.0'</u>	<u>12/26 9:58</u>	<u>X</u>	<u>X</u>
<u>99932-13.5'</u>	<u>12/26 11:15</u>	<u>X</u>	<u>X</u>
<u>99932-16.5'</u>	<u>12/26 11:25</u>	<u>X</u>	<u>X</u>
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5912 W. Avenue N E Suite 101, Bothell, WA 98011-9508	(425) 420-9200	FAX 420-9210
14111 S. M. 42, Cheney, WA 99206-4779	(509) 924-9200	FAX 921-9200
9258 W. Nandus Avenue, Beaverton, OR 97008-7132	(503) 906-9200	FAX 906-9210

# Work Order #

**Work Order #**

[illegible]

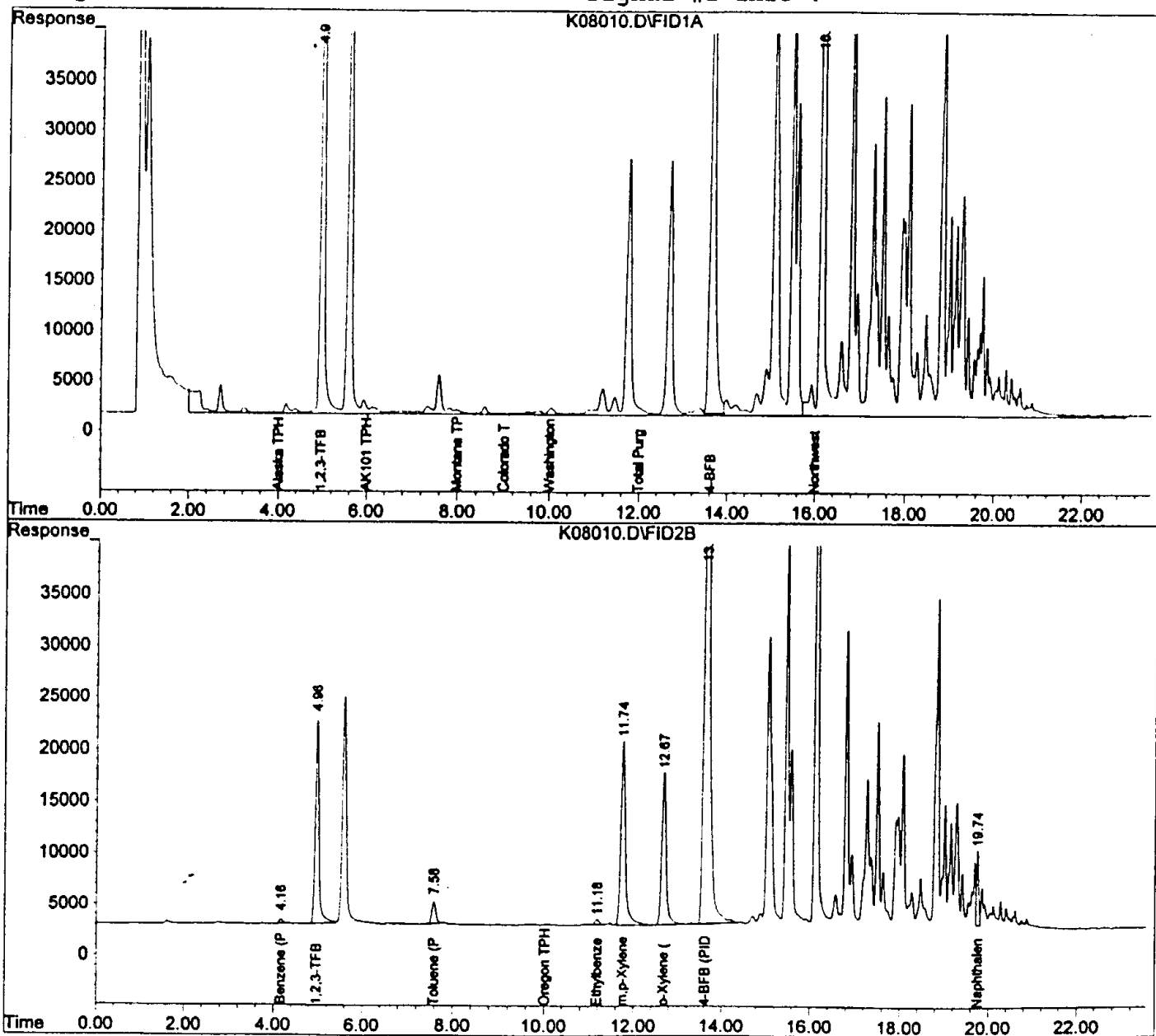
Acq On : 8 Nov 1999 11:34 am Operator: ys  
Sample : B9K0037-18 Inst : GC #4  
Misc : 100 uL Multiplr: 1.00  
IntFile : TPH.E

0094

Data File : C:\HPCHEM\2\DATA\110899\K08010.D\FID2B.CH Vial: 10  
Acq On : 8 Nov 99 11:34 am Operator: ys  
Sample : B9K0037-18 Inst : GC #4  
Misc : 100 uL Multiplr: 1.00  
IntFile : TPH2.E  
Quant Time: Nov 8 11:58 1999 Quant Results File: TPHG1199.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1199.M (Chemstation Integrator)  
Title : TPH-G Method  
Last Update : Thu Nov 04 12:45:36 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1199.M

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



Acq On : 9 Nov 1999 8:24 am  
Sample : B9K0037-22 r2  
Misc : 10 uL  
IntFile : TPH.E

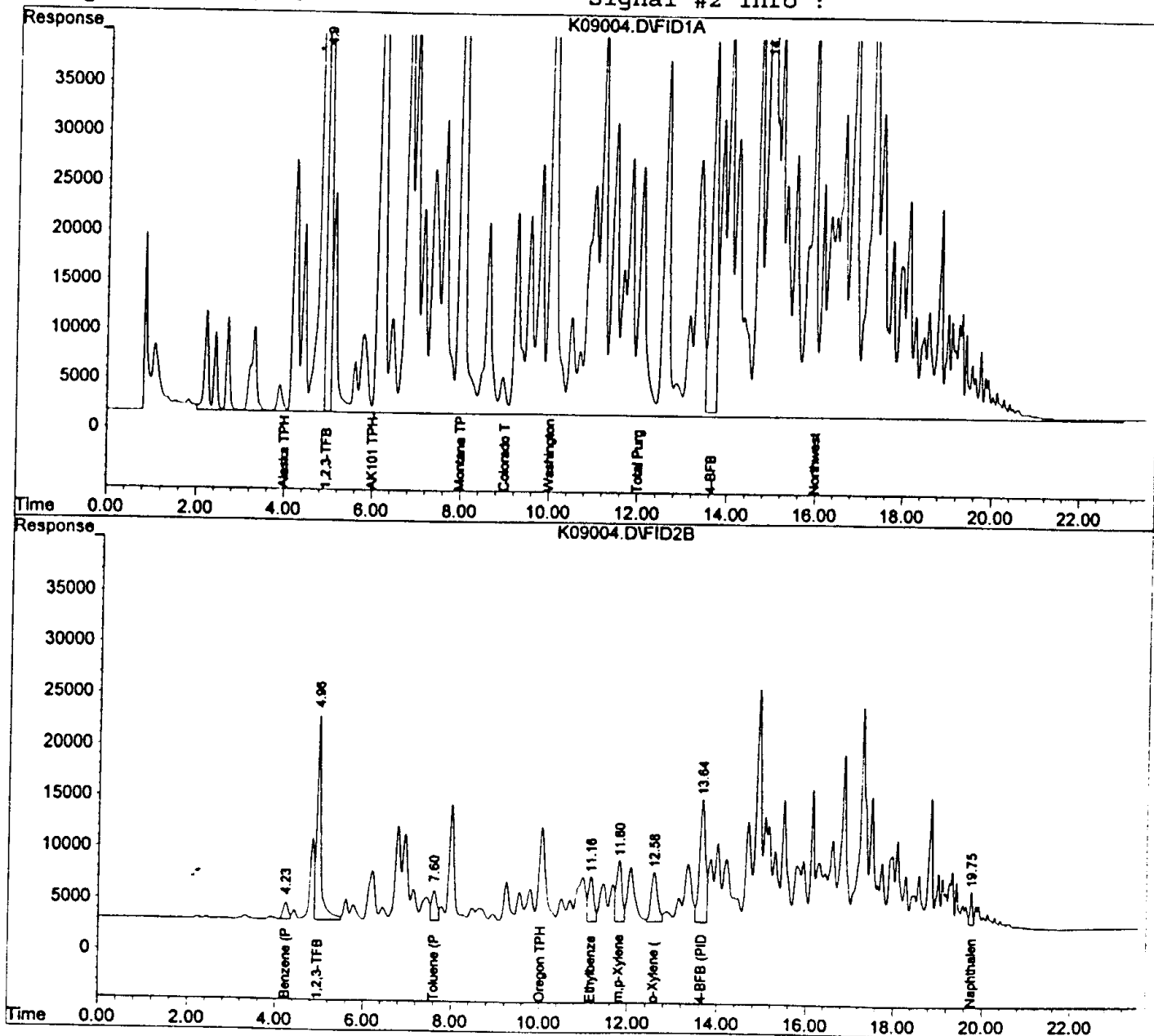
Operator: ys  
Inst : GC #4  
Multiplr: 10.00

0095

Data File : C:\HPCHEM\2\DATA\110999\K09004.D\FID1A.CH Vial: 4  
Acq On : 9 Nov 99 8:24 am Operator: ys  
Sample : B9K0037-22 r2 Inst : GC #4  
Misc : 10 uL Multiplr: 10.00  
IntFile : TPH2.E  
Quant Time: Nov 9 8:48 1999 Quant Results File: TPHG1199.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHG1199.M (Chemstation Integrator)  
Title : TPH-G Method  
Last Update : Mon Nov 08 13:34:21 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1199.M

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



Data File : C:\HPCHEM\3\DATA.SEC\K11013.D

Acq On : 11 Nov 1999 12:47 pm

Sample : b9k0037-01 ar

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 16:15 1999 Quant Results File: EPH2.RES

Vial: 12

Operator: jw

Inst : GC #5

Multiplr: 1.00

0096

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Thu Nov 11 16:12:23 1999

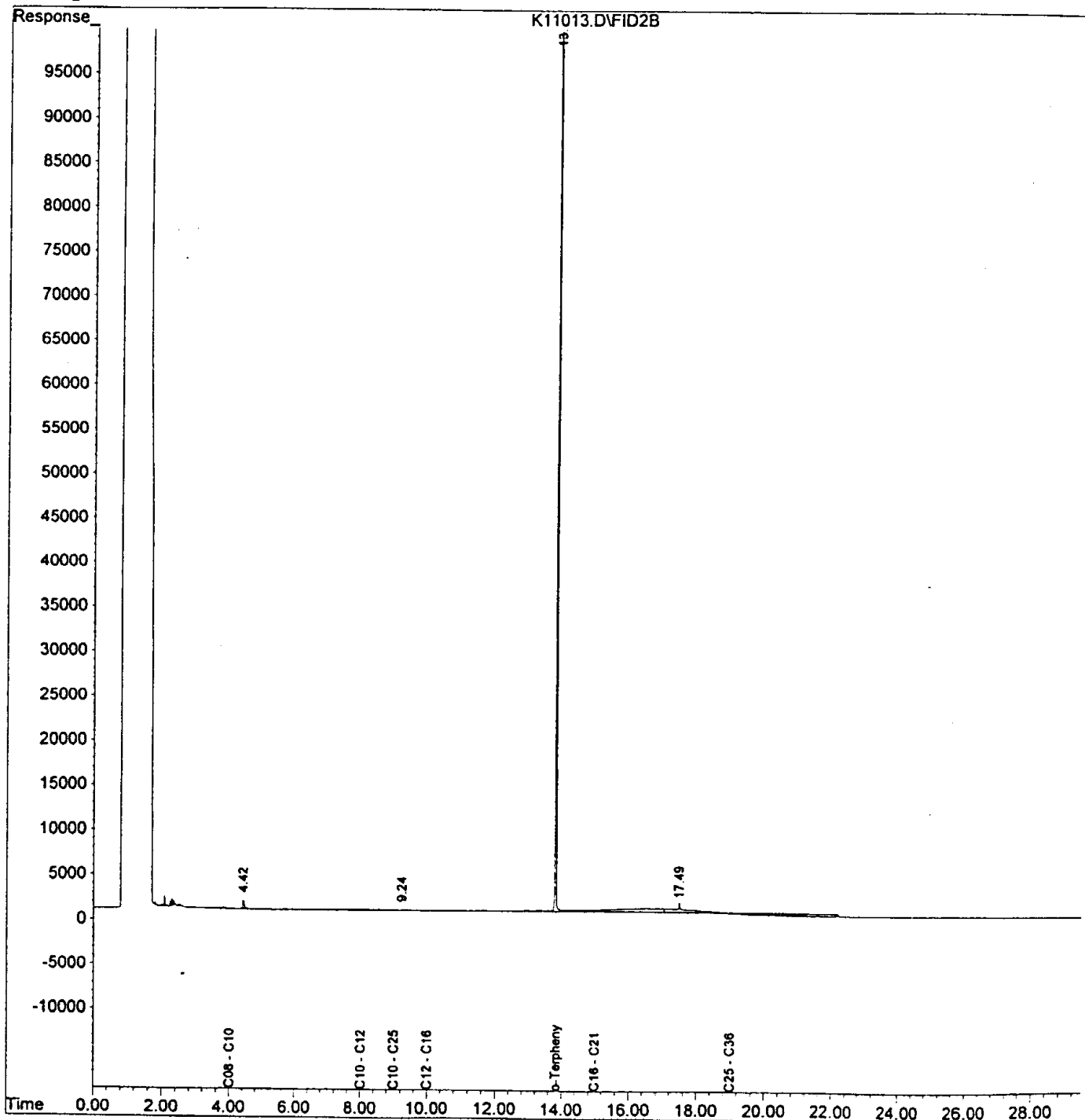
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\3\DATA.SEC\K11023.D

Acq On : 11 Nov 1999 4:23 pm

Sample : b9k0037-13 ar

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 17:02 1999 Quant Results File: EPH2.RES

Vial: 20

Operator: MC

Inst : GC #5

Multiplr: 1.00

0097

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)

Title : EPH Rear Method

Last Update : Thu Nov 11 16:12:23 1999

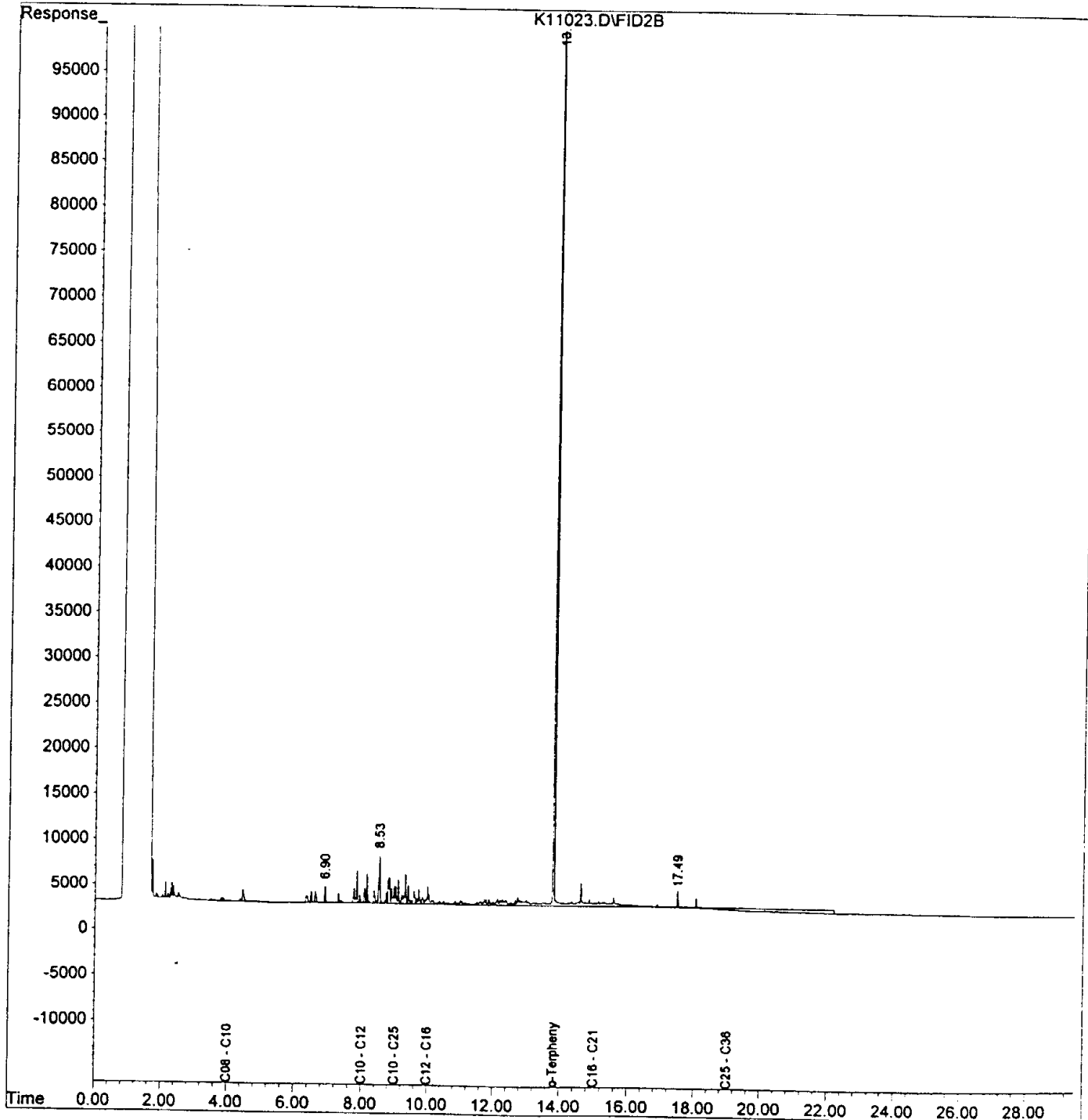
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :





Data File : C:\HPCHEM\3\DATA\K11024.D

Acq On : 11 Nov 1999 4:23 pm

Sample : b9k0037-13 al

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 17:51 1999 Quant Results File: EPH.RES

Vial: 21

Operator: MC

Inst : GC #5

Multiplr: 1.00

0098

Quant Method : C:\HPCHEM\3\METHODS\EPH.M (Chemstation Integrator)

Title : EPH Front Method

Last Update : Thu Nov 11 17:50:44 1999

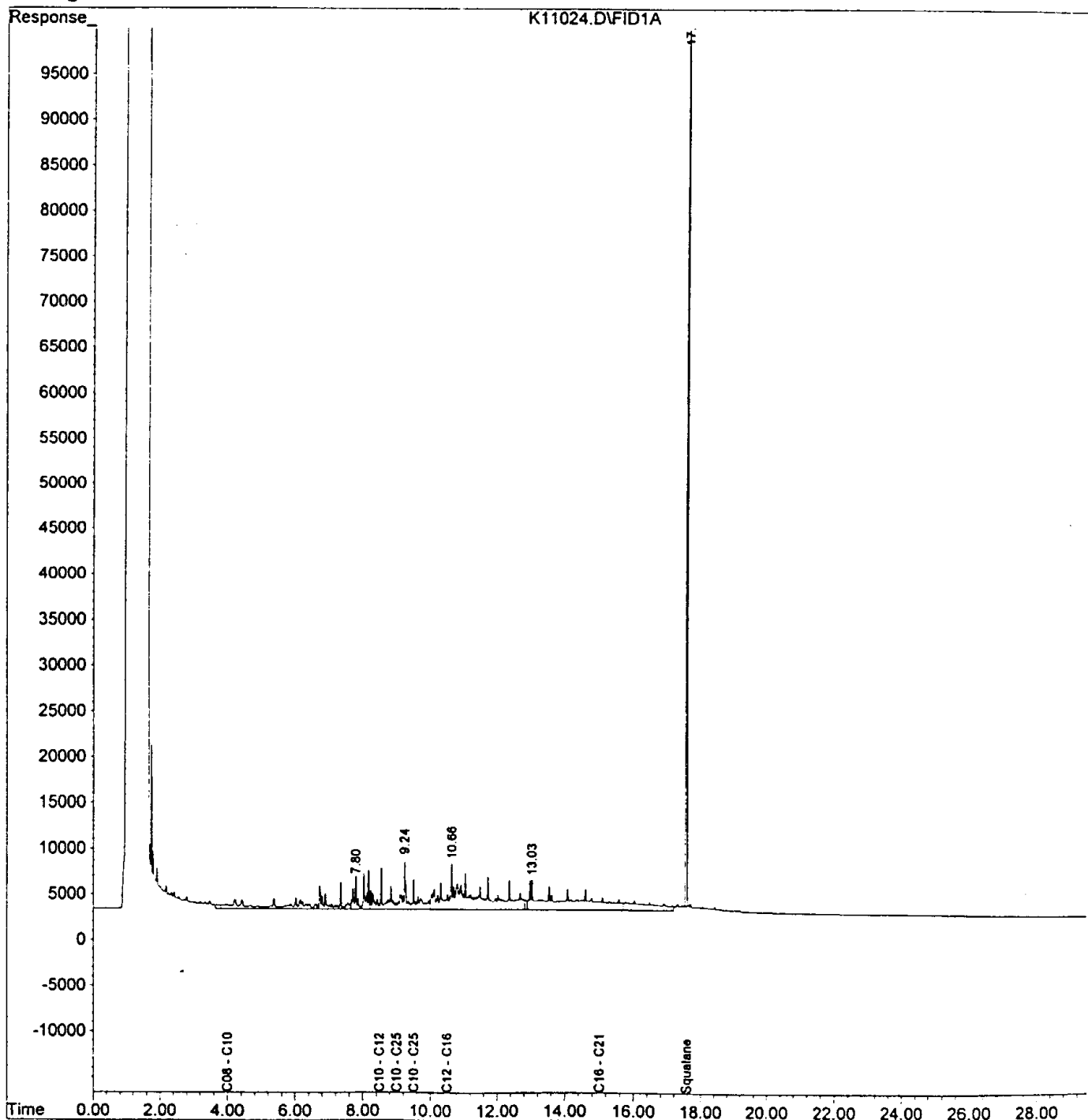
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



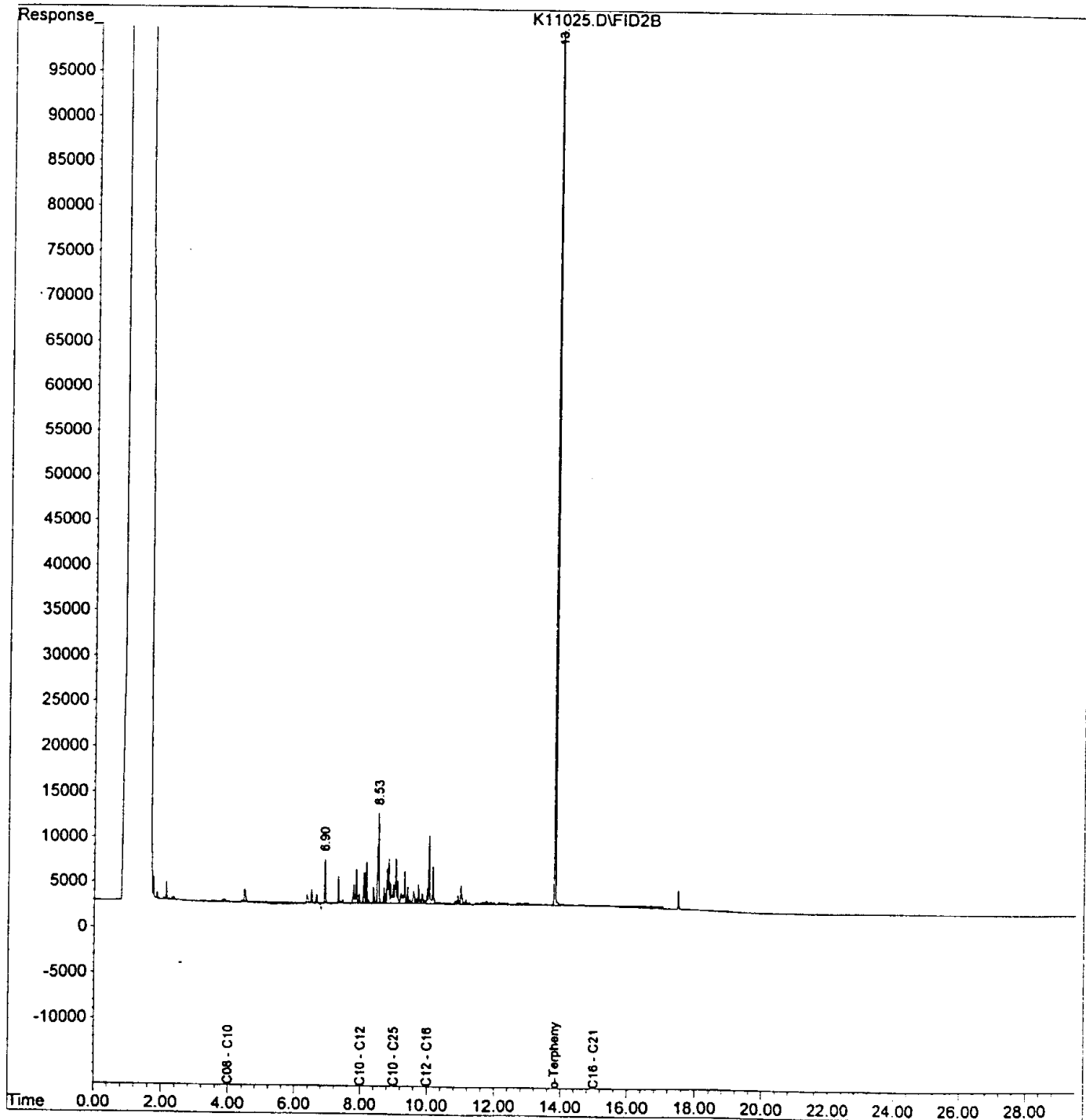
Data File : C:\HPCHEM\3\DATA.SEC\K11025.D  
Acq On : 11 Nov 1999 5:03 pm  
Sample : b9k0037-18 ar  
Misc : s  
IntFile : SURR.E  
Quant Time: Nov 11 17:49 1999 Quant Results File: EPH2.RES

Vial: 22  
Operator: MC  
Inst : GC #5  
Multiplr: 1.00

0099

Quant Method : C:\HPCHEM\3\METHODS\EPH2.M (Chemstation Integrator)  
Title : EPH Rear Method  
Last Update : Thu Nov 11 16:12:23 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Data File : C:\HPCHEM\3\DATA\K11026.D

Acq On : 11 Nov 1999 5:03 pm

Sample : b9k0037-18 al

Misc : s

IntFile : SURR.E

Quant Time: Nov 11 17:51 1999 Quant Results File: EPH.RES

Vial: 23

Operator: MC

Inst : GC #5

Multiplr: 1.00

Quant Method : C:\HPCHEM\3\METHODS\EPH.M (Chemstation Integrator)

Title : EPH Front Method

Last Update : Thu Nov 11 17:50:44 1999

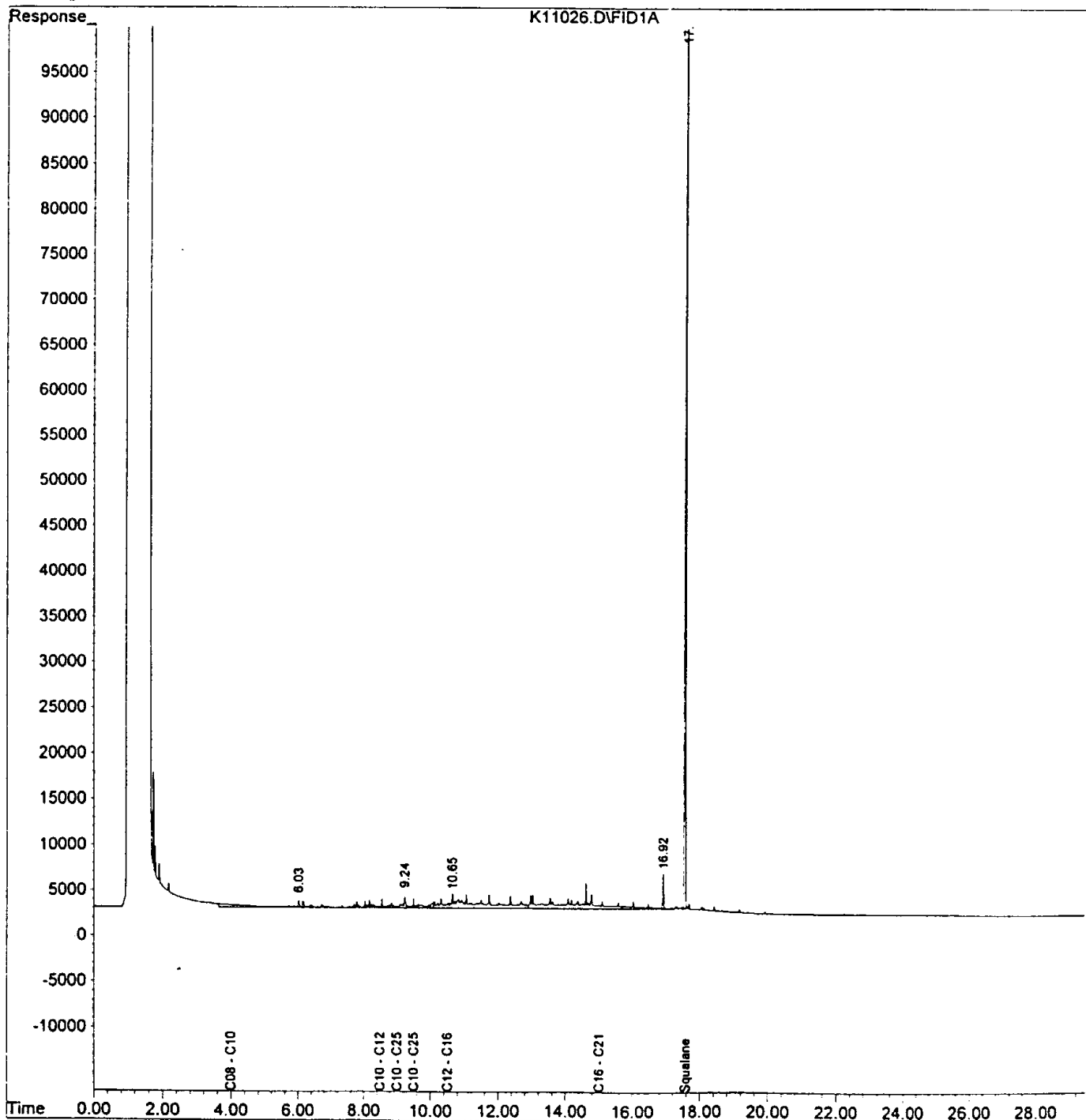
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :





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1000 S W Numbas Avenue NE Suite 101 Redfish Valley Office 780-643-9996 FAX 780-643-9997  
1000 S W Numbas Avenue Suite B Spokane WA 99206-4779 509-643-9200 FAX 509-643-9201  
1000 S W Numbas Avenue Beaverton OR 97005-7112 503-643-9200 FAX 503-643-9201

Work Order # 51K0237

[illegible]



**NORTH CREEK ANALYTICAL**  
Environmental Laboratory Services

11250 120 9200 FAX 120 9210  
15000 924 9200 FAX 924 9200  
15033 906 9200 FAX 906 9210

# CHAIN OF CUSTODY REPORT

## Work Order #

REPORT TO: <b>Geo Engineers</b>		INVOICE TO: <b>Equine Services, LLC</b>	
ATTENTION: <b>Laure Duran</b>		CLIENT: <b>Tony Palacios</b>	
ADDRESS: <b>4951 Regla St</b>		CITY: <b>AK102, AK101, AK102, AK101, AK102, AK101, AK102, AK101</b>	
PROJECT: <b>Anchorage AK 49503</b>		PROJECT: <b>AK102, AK101, AK102, AK101, AK102, AK101, AK102, AK101</b>	
PHONE: <b>907/581-3478</b>		PHONE: <b>907/581-5723</b>	
PROJECT NAME: <b>Big Corners Texas</b>		PROJECT NAME: <b>Big Corners Texas</b>	
PROJECT NUMBER: <b>0401-064-01</b>		PROJECT NUMBER: <b>0401-064-01</b>	
SAMPLE ID: <b>LJD</b>		SAMPLE ID: <b>LJD</b>	
CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NO. SAMPLES LAB. COLLECTED	LAB. ANALYSIS
49833-3.5'	10/28 9:10	1	10/28 9:10
49833-6.5'	10/28 9:15	1	10/28 9:15
49833-9.0'	10/28 9:20	1	10/28 9:20
49833-11.0'	10/28 9:30	1	10/28 9:30
49833-13.5'	10/28 9:40	1	10/28 9:40
49833-16.0'	10/28 10:50	1	10/28 10:50
49833-18.0'	10/28 11:20	1	10/28 11:20
Trip Blank	—	1	—
49835-3.5'	10/27 9:15	1	10/27 9:15
49835-6.5'	10/27 9:30	1	10/27 9:30

RETURNED BY: <b>Laure Duran</b>	DATE: <b>10/29/99</b>	RECEIVED BY: <b>S. Wideen</b>	DATE: <b>11-2</b>
PRINT NAME: <b>Laure Duran</b>	FIRM: <b>GEL</b>	PRINT NAME: <b>S. Wideen</b>	FIRM: <b>NCA</b>
RETURNED BY: <b>Laure Duran</b>	DATE: <b>10/29/99</b>	RECEIVED BY: <b>S. Wideen</b>	DATE: <b>11-2</b>
PRINT NAME: <b>Laure Duran</b>	FIRM: <b>GEL</b>	PRINT NAME: <b>S. Wideen</b>	FIRM: <b>NCA</b>
ADDITIONAL REMARKS			

TURNAROUND REQUEST in Business Days

Organic Analysis	5	4	3	2	1
Trace Metals Analysis	5	4	3	2	1

OTHER

MAINT	WASH	CONTAINERS	COMMENTS
3	3	3	Hold
3	3	3	Hold
3	3	3	Hold
4	4	4	Hold
4	4	4	Hold
4	4	4	Hold
4	4	4	Hold
1	1	1	Hold
3	3	3	Hold
4	4	4	Hold

# CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO: Greene, L. J.  
 ATTENTION: Lauri Jean Dwan  
 ADDRESS: 4951 Eagle St  
Anchorage AK 99503  
 PHONE: 907/561-3478 FAX: 907/561-5123  
 PROJECT NAME: Big Carvers Texas  
 PROJECT NUMBER: 0401-064-01  
 SAMPLED BY: LJD

INVOICE TO: Equiva Services LLC  
 ATTENTION: Tony Palayzo  
 ADDRESS: At 102-1120  
 PO NUMBER: AKH01/2120  
 ANALYSIS REGION: Alaska/Northern

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCAS SAMPLE ID (LABORATORY USE ONLY)	ANALYSIS REGION	DATE/TIME	RECEIVED BY	DATE	TIME	FIRM	DATE	TIME	FIRM
99055-9.0'	10/27 9:40										
99055-11.0'	10/27 9:45										
99055-13.5'	10/27 9:55										
99056-3.5'	10/27 11:05										
99056-6.5'	11:20										
99056-9.0'	11:30										
99056-11.0'	11:40										
99056-13.5'	11:45										
99056-16.0'	12:40										
Thp Blank											

RECEIVED BY: S. Wideen DATE: 11/2  
 PRINT NAME: Lauri Jean Dwan FIRM: GCT DATE: 13/30 TIME: 9:00  
 RECEIVED BY: S. Wideen FIRM: NCA DATE: 11/2 TIME: 9:00  
 PRINT NAME: S. Wideen FIRM: NCA DATE: 11/2 TIME: 9:00  
 ADDITIONAL REMARKS: At 102-1120  
Alaska/Northern  
Big Carvers Texas  
0401-064-01  
LJD



0104

**Seattle** 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508  
425.420.9200 fax 425.420.9210  
**Spokane** East 11115 Montgomery, Suite B, Spokane, WA 99206-4776  
509.924.9200 fax 509.924.9290  
**Portland** 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132  
503.906.9200 fax 503.906.9210  
**Bend** 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711  
541.383.9310 fax 541.382.7588

29 December, 1999

Laurie Jean Dworian  
Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage, AK 99503-7432

GeoEngineers  
ANCHORAGE

JAN 3 2000

Routing ☒ ☒ ☐ ☐  
File... 0401:064:01...

RE: Equilon SAP #120686

Enclosed are the results of analyses for samples received by the laboratory on 12/10/99 09:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Steve Davis  
Project Manager

0105

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
12/29/99 12:13

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	B9L0196-01	Water	12/07/99 09:10	12/10/99 09:30
MW-A	B9L0196-02	Water	12/07/99 08:15	12/10/99 09:30
MW-B	B9L0196-03	Water	12/07/99 09:55	12/10/99 09:30
MW-C	B9L0196-04	Water	12/07/99 11:00	12/10/99 09:30
MW-D	B9L0196-05	Water	12/07/99 10:30	12/10/99 09:30
Duplicate	B9L0196-06	Water	12/07/99 12:00	12/10/99 09:30

North Creek Analytical - Bothell

*Steve Davis*  
Steve Davis, Project Manager

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



0106

 Geo Engineers - Alaska  
 4951 Eagle Street  
 Anchorage AK, 99503-7432

 Project: Equilon SAP #120686  
 Project Number: 0401-064-01  
 Project Manager: Laurie Jean Dworian

 Reported:  
 12/29/99 12:13

### Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101

#### North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-C (B9L0196-04) Water</b> Sampled: 12/07/99 11:00 Received: 12/10/99 09:30									
Gasoline Range Hydrocarbons	30800	5000	ug/l	100	9L15010	12/15/99	12/15/99	AK 101	
Benzene	ND	50.0	"	"	"	"	"	"	
Toluene	72.3	50.0	"	"	"	"	"	"	
Ethylbenzene	789	50.0	"	"	"	"	"	"	
Xylenes (total)	9560	100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		94.8 %	60-120		"	"	"	"	
Surrogate: 4-BFB (PID)		93.8 %	60-120		"	"	"	"	
<b>MW-D (B9L0196-05) Water</b> Sampled: 12/07/99 10:30 Received: 12/10/99 09:30									
Gasoline Range Hydrocarbons	2730	100	ug/l	2	9L15010	12/15/99	12/16/99	AK 101	
Benzene	ND	28.6	"	"	"	"	"	"	R-03
Toluene	ND	14.6	"	"	"	"	"	"	R-03
Ethylbenzene	ND	3.40	"	"	"	"	"	"	R-03
Xylenes (total)	84.4	2.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		82.1 %	60-120		"	"	"	"	
Surrogate: 4-BFB (PID)		102 %	60-120		"	"	"	"	
<b>Duplicate (B9L0196-06) Water</b> Sampled: 12/07/99 12:00 Received: 12/10/99 09:30									
Gasoline Range Hydrocarbons	30600	2500	ug/l	50	9L15010	12/15/99	12/15/99	AK 101	
Benzene	27.9	25.0	"	"	"	"	"	"	
Toluene	120	25.0	"	"	"	"	"	"	
Ethylbenzene	801	25.0	"	"	"	"	"	"	
Xylenes (total)	9470	50.0	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		102 %	60-120		"	"	"	"	
Surrogate: 4-BFB (PID)		97.1 %	60-120		"	"	"	"	

North Creek Analytical - Bothell

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Steve Davis, Project Manager

 North Creek Analytical, Inc.  
 Environmental Laboratory Network

Page 2 of 11

0107

Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508  
425.420.9200 fax 425.420.9210  
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776  
509.924.9200 fax 509.924.9290  
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132  
503.906.9200 fax 503.906.9210  
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711  
541.383.9310 fax 541.382.7588

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
01/25/00 13:45

**Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-1 (B9L0196-01) Water Sampled: 12/07/99 09:10 Received: 12/10/99 09:30</b>									
Diesel Range Hydrocarbons	1.34	0.100	mg/l	1	9L12002	12/12/99	12/15/99	AK102/103	D-09
Heavy Oil Range Hydrocarbons	3.57	0.750	"	"	"	"	12/15/99	"	
Surrogate: 2-FBP	65.7 %	50-150			"	"	"	"	
Surrogate: Octacosane	89.4 %	50-150			"	"	"	"	
<b>MW-A (B9L0196-02) Water Sampled: 12/07/99 08:15 Received: 12/10/99 09:30</b>									
Diesel Range Hydrocarbons	ND	0.100	mg/l	1	9L12002	12/12/99	12/15/99	AK102/103	
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP	66.8 %	50-150			"	"	"	"	
Surrogate: Octacosane	84.2 %	50-150			"	"	"	"	
<b>MW-B (B9L0196-03) Water Sampled: 12/07/99 09:55 Received: 12/10/99 09:30</b>									
Diesel Range Hydrocarbons	0.112	0.100	mg/l	1	9L12002	12/12/99	12/15/99	AK102/103	
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP	72.0 %	50-150			"	"	"	"	
Surrogate: Octacosane	86.8 %	50-150			"	"	"	"	
<b>MW-C (B9L0196-04) Water Sampled: 12/07/99 11:00 Received: 12/10/99 09:30</b>									
Diesel Range Hydrocarbons	1.89	0.100	mg/l	1	9L12002	12/12/99	12/15/99	AK102/103	D-08
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP	72.7 %	50-150			"	"	"	"	
Surrogate: Octacosane	80.3 %	50-150			"	"	"	"	
<b>MW-D (B9L0196-05) Water Sampled: 12/07/99 10:30 Received: 12/10/99 09:30</b>									
Diesel Range Hydrocarbons	0.829	0.100	mg/l	1	9L12002	12/12/99	12/15/99	AK102/103	
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP	68.5 %	50-150			"	"	"	"	
Surrogate: Octacosane	80.3 %	50-150			"	"	"	"	

GeoEngineers  
ANCHORAGE

JAN 28 2000

Routing: ☒ ☐ ☐ ☐ ☐  
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File: .....

North Creek Analytical - Bothell

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

Page 3 of 11



0108

Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508  
425.420.9200 fax 425.420.9210  
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776  
509.924.9200 fax 509.924.9290  
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132  
503.906.9200 fax 503.906.9210  
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711  
541.383.9310 fax 541.382.7588

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworlan

Reported:  
12/29/99 12:13

**Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Duplicate (B9L0196-06) Water Sampled: 12/07/99 12:00 Received: 12/10/99 09:30									
Diesel Range Hydrocarbons	2.05	0.100	mg/l	1	9L12002	12/12/99	12/15/99	AK102/103	D-08
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP		73.4 %	50-150		"	"	"	"	
Surrogate: Octacosane		87.8 %	50-150		"	"	"	"	

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

Page 4 of 11

0109

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
12/29/99 12:13

**Dissolved Metals by EPA 6000/7000 Series Methods**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-1 (B9L0196-01) Water</b> Sampled: 12/07/99 09:10 Received: 12/10/99 09:30									
Silver	ND	0.00100	mg/l	1	9L10006	12/10/99	12/14/99	EPA 6020	
Arsenic	ND	0.00100	"	"	"	"	"	"	
Barium	0.0237	0.00100	"	"	"	"	12/16/99	"	
Cadmium	ND	0.00100	"	"	"	"	12/14/99	"	
Chromium	0.00207	0.00100	"	"	"	"	"	"	
Mercury	ND	0.00100	"	"	9L13025	12/13/99	12/13/99	EPA 7470A	
Lead	ND	0.00100	"	"	9L10006	12/10/99	12/14/99	EPA 6020	
Selenium	ND	0.00100	"	"	"	"	"	"	
<b>MW-A (B9L0196-02) Water</b> Sampled: 12/07/99 08:15 Received: 12/10/99 09:30									
Silver	ND	0.00100	mg/l	1	9L10006	12/10/99	12/14/99	EPA 6020	
Arsenic	ND	0.00100	"	"	"	"	"	"	
Barium	0.0335	0.00100	"	"	"	"	12/16/99	"	
Cadmium	ND	0.00100	"	"	"	"	12/14/99	"	
Chromium	ND	0.00100	"	"	"	"	"	"	
Mercury	ND	0.00100	"	"	9L13025	12/13/99	12/13/99	EPA 7470A	
Lead	ND	0.00100	"	"	9L10006	12/10/99	12/14/99	EPA 6020	
Selenium	ND	0.00100	"	"	"	"	"	"	
<b>MW-B (B9L0196-03) Water</b> Sampled: 12/07/99 09:55 Received: 12/10/99 09:30									
Silver	ND	0.00100	mg/l	1	9L10006	12/10/99	12/14/99	EPA 6020	
Arsenic	ND	0.00100	"	"	"	"	"	"	
Barium	0.0251	0.00100	"	"	"	"	12/16/99	"	
Cadmium	ND	0.00100	"	"	"	"	12/14/99	"	
Chromium	ND	0.00100	"	"	"	"	"	"	
Mercury	ND	0.00100	"	"	9L13025	12/13/99	12/13/99	EPA 7470A	
Lead	ND	0.00100	"	"	9L10006	12/10/99	12/14/99	EPA 6020	
Selenium	ND	0.00100	"	"	"	"	"	"	

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworian

Reported:  
12/29/99 12:13

**Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101 - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 9L15010: Prepared 12/15/99 Using EPA 5030B (P/T)</b>										
<b>Blank (9L15010-BLK1)</b>										
Gasoline Range Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	1.00	"							
Surrogate: 4-BFB (FID)	40.7		"	48.0		84.8	60-120			
Surrogate: 4-BFB (PID)	43.5		"	48.0		90.6	60-120			
<b>Blank (9L15010-BLK2)</b>										
Gasoline Range Hydrocarbons	ND	50.0	ug/l							
Benzene	ND	0.500	"							
Toluene	ND	0.500	"							
Ethylbenzene	ND	0.500	"							
Xylenes (total)	ND	1.00	"							
Surrogate: 4-BFB (FID)	39.9		"	48.0		83.1	60-120			
Surrogate: 4-BFB (PID)	43.5		"	48.0		90.6	60-120			
<b>LCS (9L15010-BS1)</b>										
Gasoline Range Hydrocarbons	524	50.0	ug/l	500		105	60-120			
Surrogate: 4-BFB (FID)	44.0		"	48.0		91.7	60-120			
<b>Duplicate (9L15010-DUP1)</b>										
					<b>Source: B9L0269-01</b>					
Gasoline Range Hydrocarbons	247000	10000	ug/l		247000			0	20	
Surrogate: 4-BFB (FID)	43.3		"	48.0		90.2	60-120			
<b>Duplicate (9L15010-DUP2)</b>										
					<b>Source: B9L0269-10</b>					
Gasoline Range Hydrocarbons	ND	50.0	ug/l		ND				20	
Surrogate: 4-BFB (FID)	36.5		"	48.0		76.0	60-120			

North Creek Analytical - Bothell

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Environmental Laboratory Network

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Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508  
 425.420.9200 fax 425.420.9210  
 Spokane East 11115 Montgomerly, Suite 8, Spokane, WA 99206-4776  
 509.924.9200 fax 509.924.9290  
 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132  
 503.906.9200 fax 503.906.9210  
 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711  
 541.383.9310 fax 541.382.7588

Geo Engineers - Alaska  
 4951 Eagle Street  
 Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
 Project Number: 0401-064-01  
 Project Manager: Laurie Jean Dworjan

Reported:  
 12/29/99 12:13

**Gasoline Hydrocarbons (n-Hexane to <n-Decane) and BTEX by AK101 - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 9L15010: Prepared 12/15/99 Using EPA 5030B (P/T)**

**Matrix Spike (9L15010-MS1)**

**Source: B9L0269-06**

Benzene	10.6	0.500	ug/l	10.0	0.0674	105	60-120			
Toluene	10.9	0.500	"	10.0	0.114	108	60-120			
Ethylbenzene	9.75	0.500	"	10.0	ND	97.5	60-120			
Xylenes (total)	29.3	1.00	"	30.0	0.263	96.8	60-120			
Surrogate: 4-BFB (PID)	43.9		"	48.0		91.5	60-120			

**Matrix Spike Dup (9L15010-MSD1)**

**Source: B9L0269-06**

Benzene	10.5	0.500	ug/l	10.0	0.0674	104	60-120	0.948	20	
Toluene	10.2	0.500	"	10.0	0.114	101	60-120	6.64	20	
Ethylbenzene	9.74	0.500	"	10.0	ND	97.4	60-120	0.103	20	
Xylenes (total)	28.7	1.00	"	30.0	0.263	94.8	60-120	2.07	20	
Surrogate: 4-BFB (PID)	42.9		"	48.0		89.4	60-120			

North Creek Analytical - Bothell

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North Creek Analytical, Inc.  
 Environmental Laboratory Network

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Geo Engineers - Alaska  
 4951 Eagle Street  
 Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
 Project Number: 0401-064-01  
 Project Manager: Laurie Jean Dworjan

Reported:  
 12/29/99 12:13

**Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103 - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 9L12002: Prepared 12/12/99 Using EPA 3520C/600 Series</b>										
<b>Blank (9L12002-BLK1)</b>										
Diesel Range Hydrocarbons	ND	0.100	mg/l							
Heavy Oil Range Hydrocarbons	ND	0.750	"							
Surrogate: 2-FBP	0.196		"	0.320		61.2	50-150			
Surrogate: Octacosane	0.251		"	0.320		78.4	50-150			
<b>LCS (9L12002-BS1)</b>										
Diesel Range Hydrocarbons	1.57	0.100	mg/l	2.00		78.5	60-120			
Surrogate: 2-FBP	0.220		"	0.320		68.8	50-150			
<b>LCS (9L12002-BS2)</b>										
Heavy Oil Range Hydrocarbons	1.37	0.750	mg/l	2.00		68.5	60-100			
Surrogate: Octacosane	0.295		"	0.320		92.2	50-150			
<b>LCS Dup (9L12002-BSD1)</b>										
Diesel Range Hydrocarbons	1.72	0.100	mg/l	2.00		86.0	60-120	9.12	20	
Surrogate: 2-FBP	0.248		"	0.320		77.5	50-150			
<b>LCS Dup (9L12002-BSD2)</b>										
Heavy Oil Range Hydrocarbons	1.54	0.750	mg/l	2.00		77.0	60-100	11.7	20	
Surrogate: Octacosane	0.270		"	0.320		84.4	50-150			

North Creek Analytical - Bothell

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Steve Davis, Project Manager

North Creek Analytical, Inc.  
 Environmental Laboratory Network

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 Geo Engineers - Alaska  
 4951 Eagle Street  
 Anchorage AK, 99503-7432

 Project: Equilon SAP #120686  
 Project Number: 0401-064-01  
 Project Manager: Laurie Jean Dworlan

 Reported:  
 12/29/99 12:13

## Dissolved Metals by EPA 6000/7000 Series Methods - Quality Control

### North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9L10006: Prepared 12/10/99 Using EPA 3005A

#### Blank (9L10006-BLK1)

Arsenic	ND	0.00100	mg/l
Barium	ND	0.00100	"
Cadmium	ND	0.00100	"
Chromium	ND	0.00100	"
Lead	ND	0.00100	"
Selenium	ND	0.00100	"
Silver	ND	0.00100	"

#### LCS (9L10006-BS1)

Arsenic	0.199	0.00100	mg/l	0.200	99.5	80-120
Barium	0.191	0.00100	"	0.200	95.5	80-120
Cadmium	0.191	0.00100	"	0.200	95.5	80-120
Chromium	0.203	0.00100	"	0.200	101	80-120
Lead	0.198	0.00100	"	0.200	99.0	80-120
Selenium	0.197	0.00100	"	0.200	98.5	80-120
Silver	0.182	0.00100	"	0.200	91.0	80-120

#### Matrix Spike (9L10006-MS1)

Source: B9L0196-01						
Arsenic	0.220	0.00100	mg/l	0.200	0.000428	110 75-125
Barium	0.219	0.00100	"	0.200	0.0237	97.6 75-125
Cadmium	0.201	0.00100	"	0.200	0.000213	100 75-125
Chromium	0.223	0.00100	"	0.200	0.00207	110 75-125
Lead	0.211	0.00100	"	0.200	0.000377	105 75-125
Selenium	0.201	0.00100	"	0.200	0.000760	100 75-125
Silver	0.162	0.00100	"	0.200	0.000113	80.9 75-125

#### Matrix Spike Dup (9L10006-MSD1)

Source: B9L0196-01						
Arsenic	0.225	0.00100	mg/l	0.200	0.000428	112 75-125 2.25 20
Barium	0.222	0.00100	"	0.200	0.0237	99.1 75-125 1.36 20
Cadmium	0.215	0.00100	"	0.200	0.000213	107 75-125 6.73 20
Chromium	0.227	0.00100	"	0.200	0.00207	112 75-125 1.78 20
Lead	0.227	0.00100	"	0.200	0.000377	113 75-125 7.31 20
Selenium	0.213	0.00100	"	0.200	0.000760	106 75-125 5.80 20
Silver	0.171	0.00100	"	0.200	0.000113	85.4 75-125 5.41 20

North Creek Analytical - Bothell

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 North Creek Analytical, Inc.  
 Environmental Laboratory Network

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0114

**Seattle** 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508  
425.420.9200 fax 425.420.9210  
**Spokane** East 11115 Montgomery, Suite B, Spokane, WA 99206-4776  
509.924.9200 fax 509.924.9290  
**Portland** 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132  
503.906.9200 fax 503.906.9210  
**Bend** 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711  
541.383.9310 fax 541.382.7588

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
12/29/99 12:13

**Dissolved Metals by EPA 6000/7000 Series Methods - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9L13025: Prepared 12/13/99 Using EPA 7470A										
Blank (9L13025-BLK1)										
Mercury	ND	0.00100	mg/l							
LCS (9L13025-BS1)										
Mercury	0.00483	0.00100	mg/l	0.00500		96.6	70-130			
Matrix Spike (9L13025-MS1)										
					Source: B9L0147-01					
Mercury	0.00328	0.00100	mg/l	0.00500	0.000300	59.6	75-125			Q-13
Matrix Spike Dup (9L13025-MSD1)										
					Source: B9L0147-01					
Mercury	0.00331	0.00100	mg/l	0.00500	0.000300	60.2	75-125	0.910	20	Q-13

North Creek Analytical - Bothell

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North Creek Analytical, Inc.  
Environmental Laboratory Network

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0115

Geo Engineers - Alaska  
4951 Eagle Street  
Anchorage AK, 99503-7432

Project: Equilon SAP #120686  
Project Number: 0401-064-01  
Project Manager: Laurie Jean Dworjan

Reported:  
01/25/00 13:45

### Notes and Definitions

- D-08 Results in the diesel organics range are primarily due to overlap from a gasoline range product.
- D-09 Results in the diesel organics range are primarily due to overlap from a heavy oil range product.
- Q-13 Multiple analyses indicate the percent recovery is outside the control limits due to a matrix effect.
- R-03 The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- 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

North Creek Analytical - Bothell



Steve Davis, Project Manager

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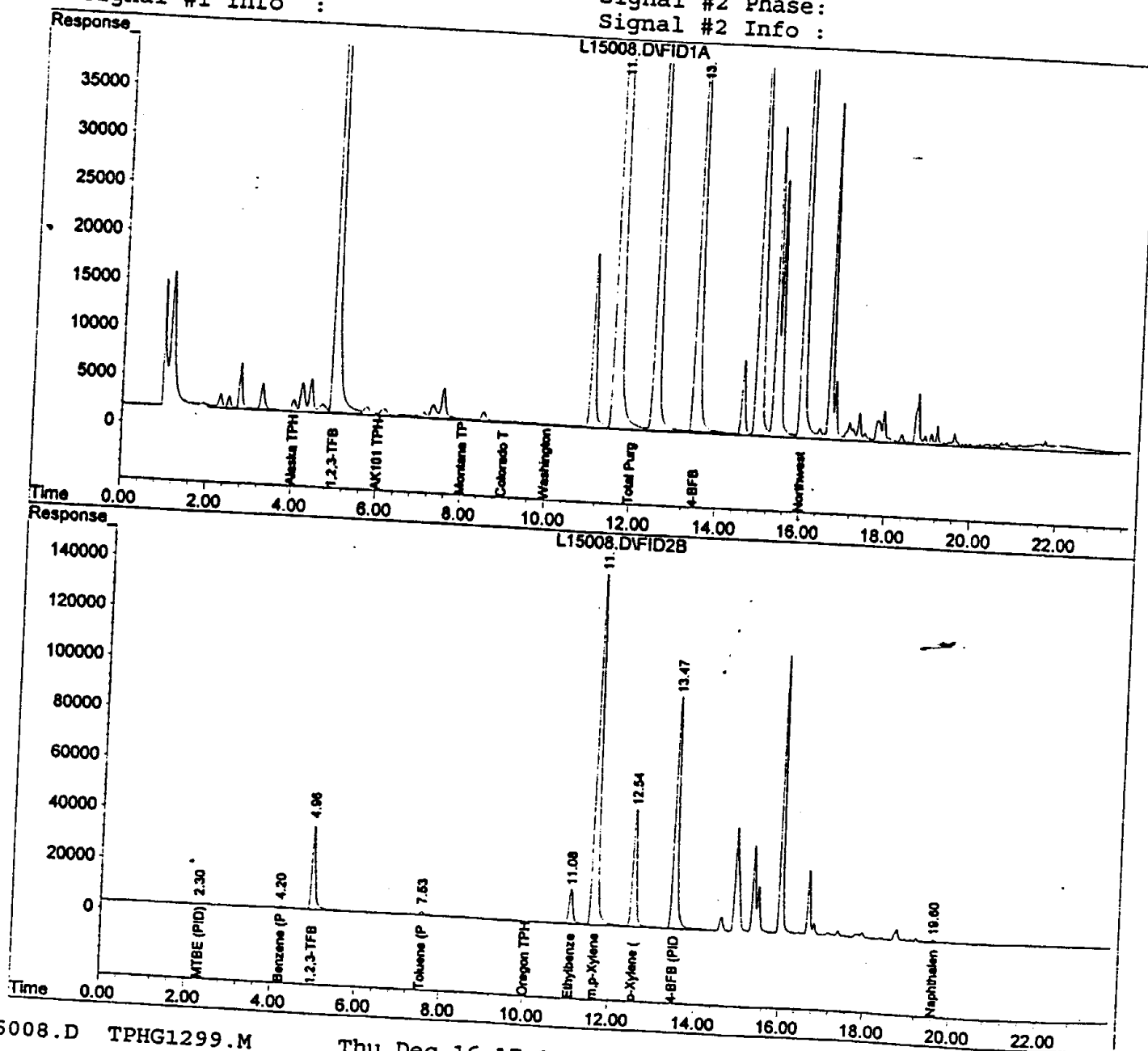
Acq On : 15 Dec 1999 10:51 am Vial: 8  
Sample : B9L0196-04 Operator: ys  
Misc : 50 uL Inst : GC #6  
IntFile : SURR.E Multiplr: 100.00

Data File : C:\HPCHEM\3\DATA\121599\L15008.D\FID1A.CH Vial: 8  
Acq On : 15 Dec 99 10:51 am Operator: ys  
Sample : B9L0196-04 Inst : GC #6  
Misc : 50 uL Multiplr: 100.00  
IntFile : SURR2.E

Quant Time: Dec 15 11:15 1999 Quant Results File: TPHG1299.RES

Quant Method : C:\HPCHEM\3\METHODS\TPHG1299.M (Chemstation Integrator)  
Title : TPH-G Water Method  
Last Update : Mon Dec 13 16:12:21 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1299.M

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



L15008.D TPHG1299.M

Thu Dec 16 17:37:25 1999

# Quantitation Report

Data File : C:\HPCHEM\3\DATA\121699\L16032.D\FID1A.CH Vial: 32  
 Acq On : 16 Dec 1999 10:16 pm Operator: ys  
 Sample : B9L0196-05 r1 Inst : GC #6  
 Misc : 2.5 ml Multiplr: 2.00  
 IntFile : SURR.E

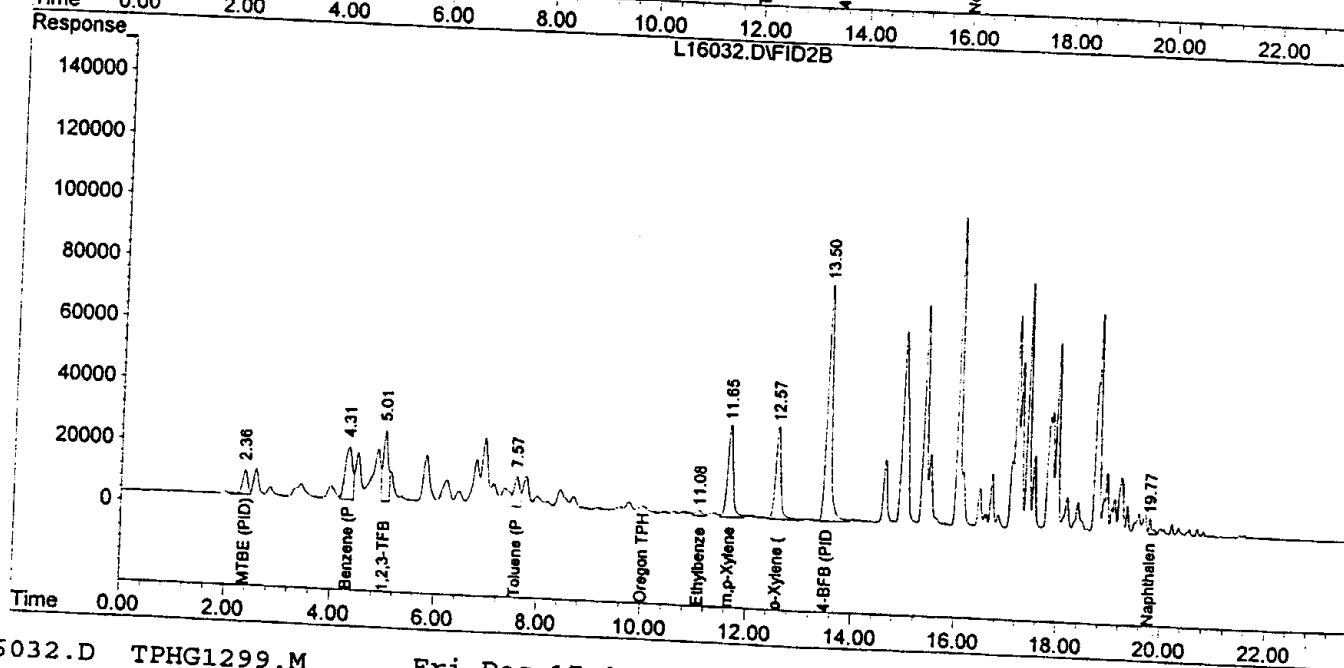
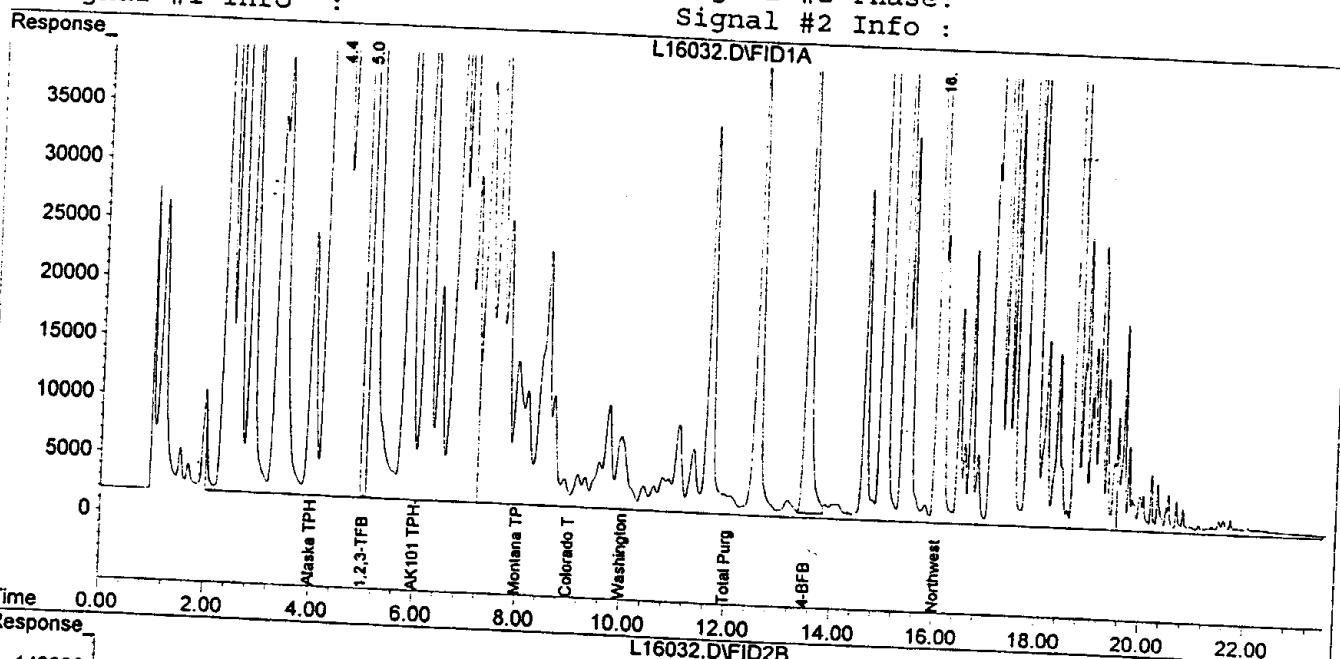
0117

Data File : C:\HPCHEM\3\DATA\121699\L16032.D\FID2B.CH Vial: 32  
 Acq On : 16 Dec 99 10:16 pm Operator: ys  
 Sample : B9L0196-05 r1 Inst : GC #6  
 Misc : 2.5 ml Multiplr: 2.00  
 IntFile : SURR2.E

Quant Time: Dec 17 6:31 1999 Quant Results File: TPHG1299.RES

Quant Method : C:\HPCHEM\3\METHODS\TPHG1299.M (Chemstation Integrator)  
 Title : TPH-G Water Method  
 Last Update : Mon Dec 13 16:12:21 1999  
 Response via : Multiple Level Calibration  
 DataAcq Meth : TPHG1299.M

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



Acq On : 15 Dec 1999 11:51 am Vial: 10  
Sample : B9L0196-06 Operator: ys  
Misc : 100 uL Inst : GC #6  
IntFile : SURR.E Multiplr: 50.00

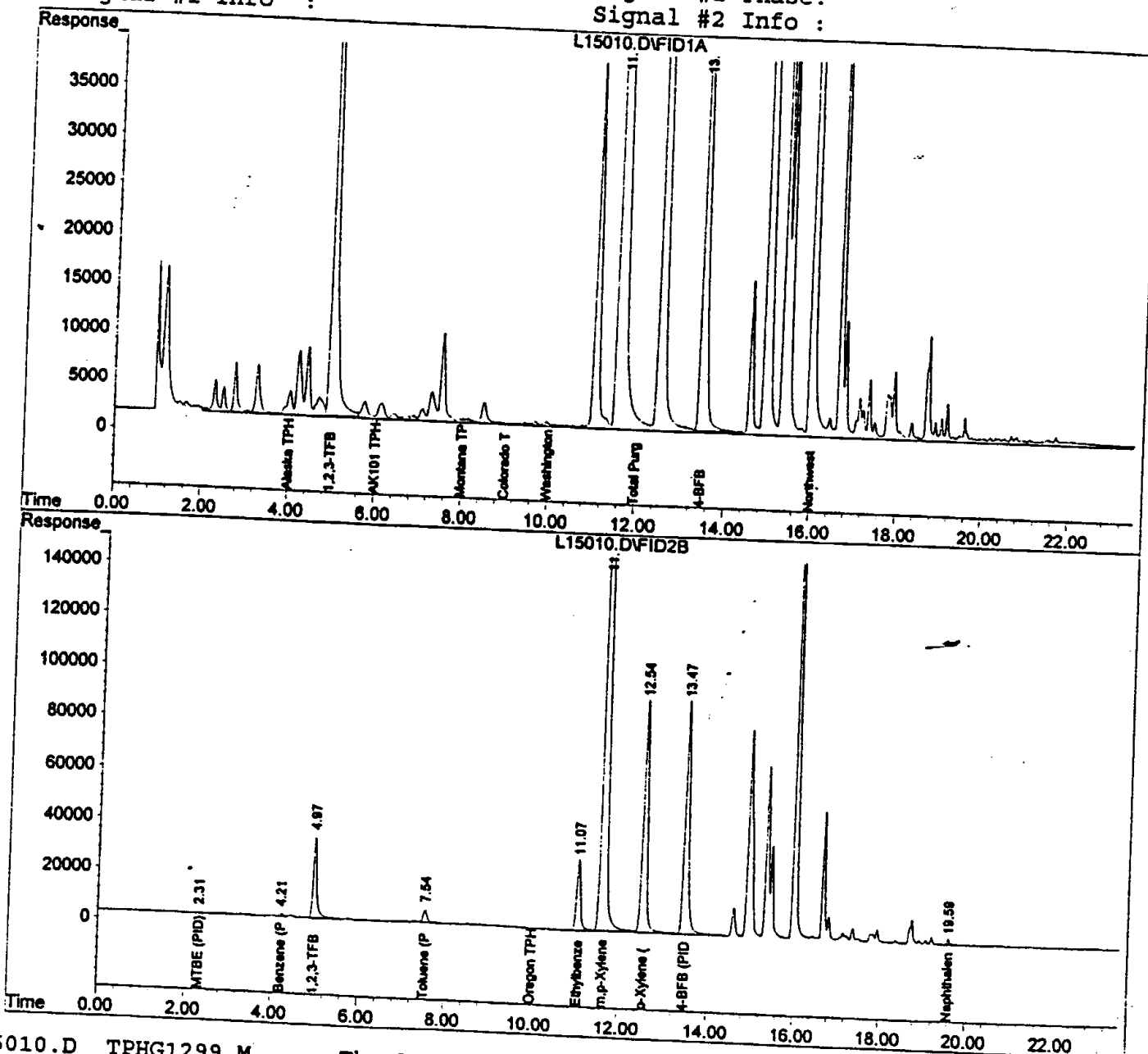
0118

Data File : C:\HPCHEM\3\DATA\121599\L15010.D\FID2B.CH Vial: 10  
Acq On : 15 Dec 99 11:51 am Operator: ys  
Sample : B9L0196-06 Inst : GC #6  
Misc : 100 uL Multiplr: 50.00  
IntFile : SURR2.E

Quant Time: Dec 15 12:15 1999 Quant Results File: TPHG1299.RES

Quant Method : C:\HPCHEM\3\METHODS\TPHG1299.M (Chemstation Integrator)  
Title : TPH-G Water Method  
Last Update : Mon Dec 13 16:12:21 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHG1299.M

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



Data file : C:\HPCHEM\4\DATA\L15016.D  
Acq On : 12-15-99 1:07:39 PM  
Sample : b910196-01  
Misc : w  
IntFile : SURR.E  
Quant Time: Dec 15 13:28 1999

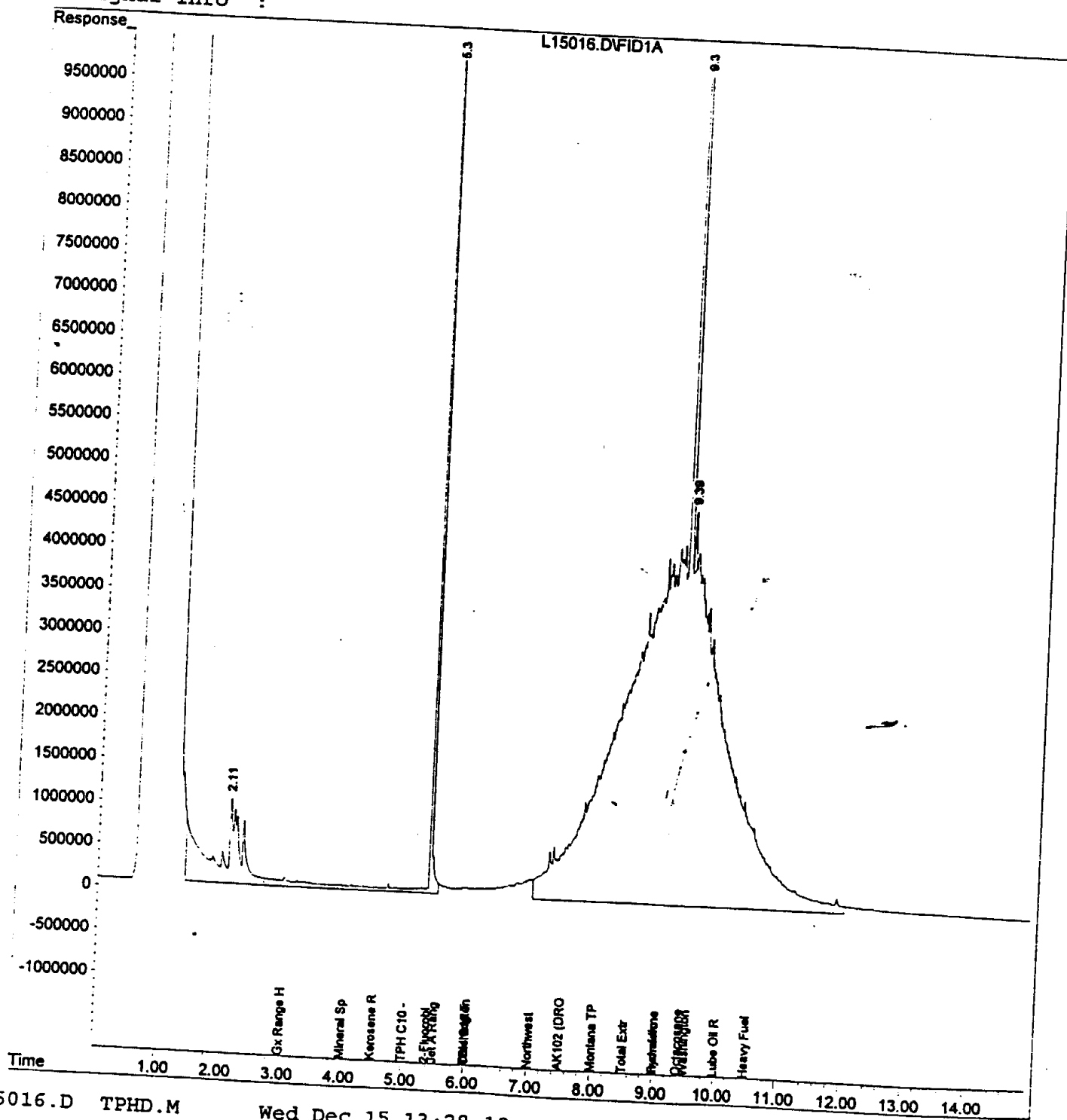
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Operator: mc  
Inst : GC #7  
Multiplr: 1.00

0119

Quant Results File: TPHD.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)  
Title : TPH-D Front Method  
Last Update : Wed Dec 01 15:41:01 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



L15016.D TPHD.M

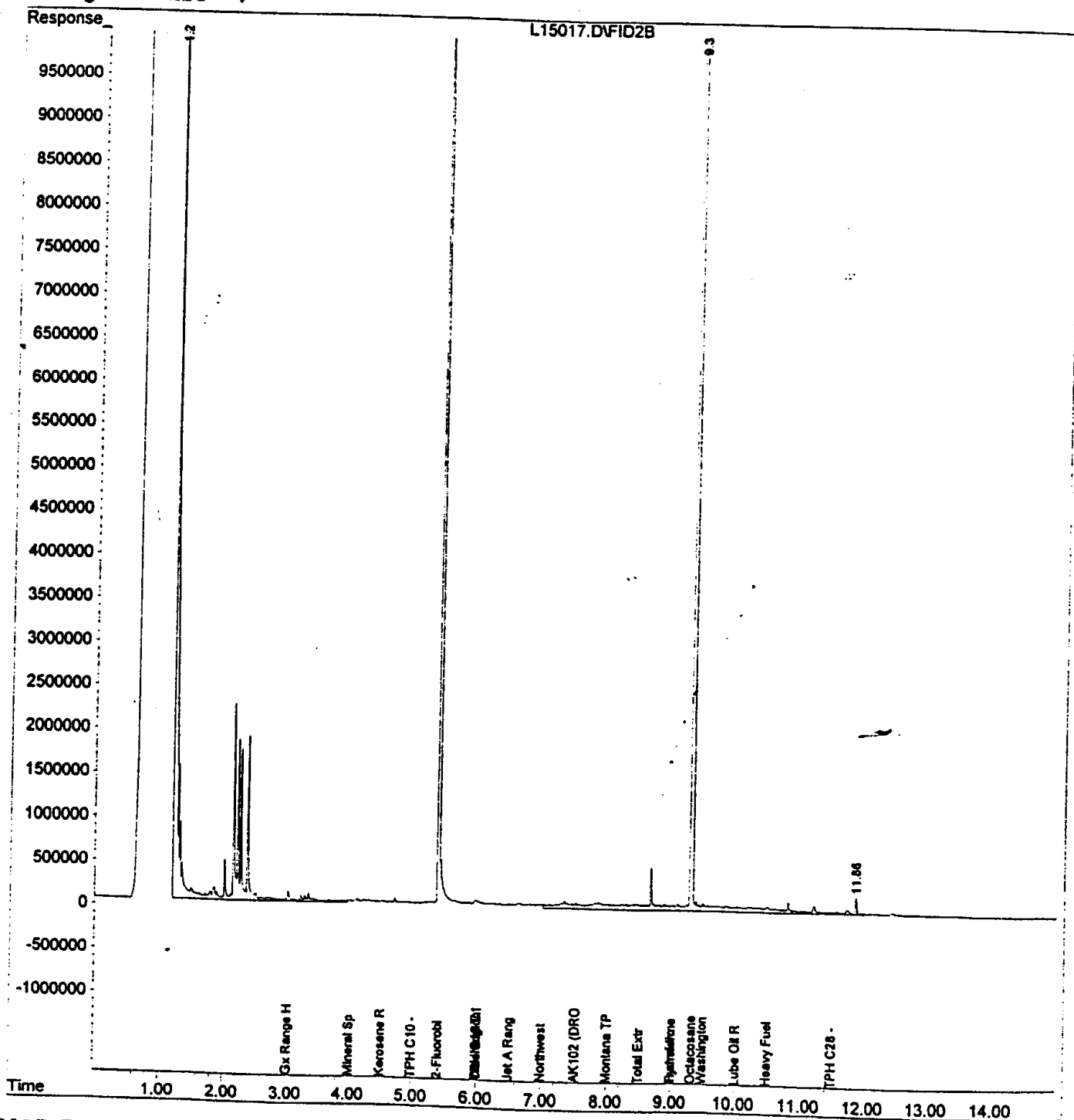
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Data File : C:\HPCHEM\4\DATA.SEC\L15017.D  
Acq On : 12-15-99 1:31:21 PM  
Sample : b910196-02  
Misc : w  
IntFile : SURR.E  
Quant Time: Dec 15 13:55 1999

Vial: 12  
Operator: mc  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD2.RES  
Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)  
Title : TPH-D Rear Method  
Last Update : Mon Nov 15 10:22:08 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Data File : C:\HPCHEM\4\DATA\L15018.D  
Acq On : 12-15-99 1:31:21 PM  
Sample : b910196-03  
Misc : w  
IntFile : SURR.E  
Quant Time: Dec 15 13:58 1999

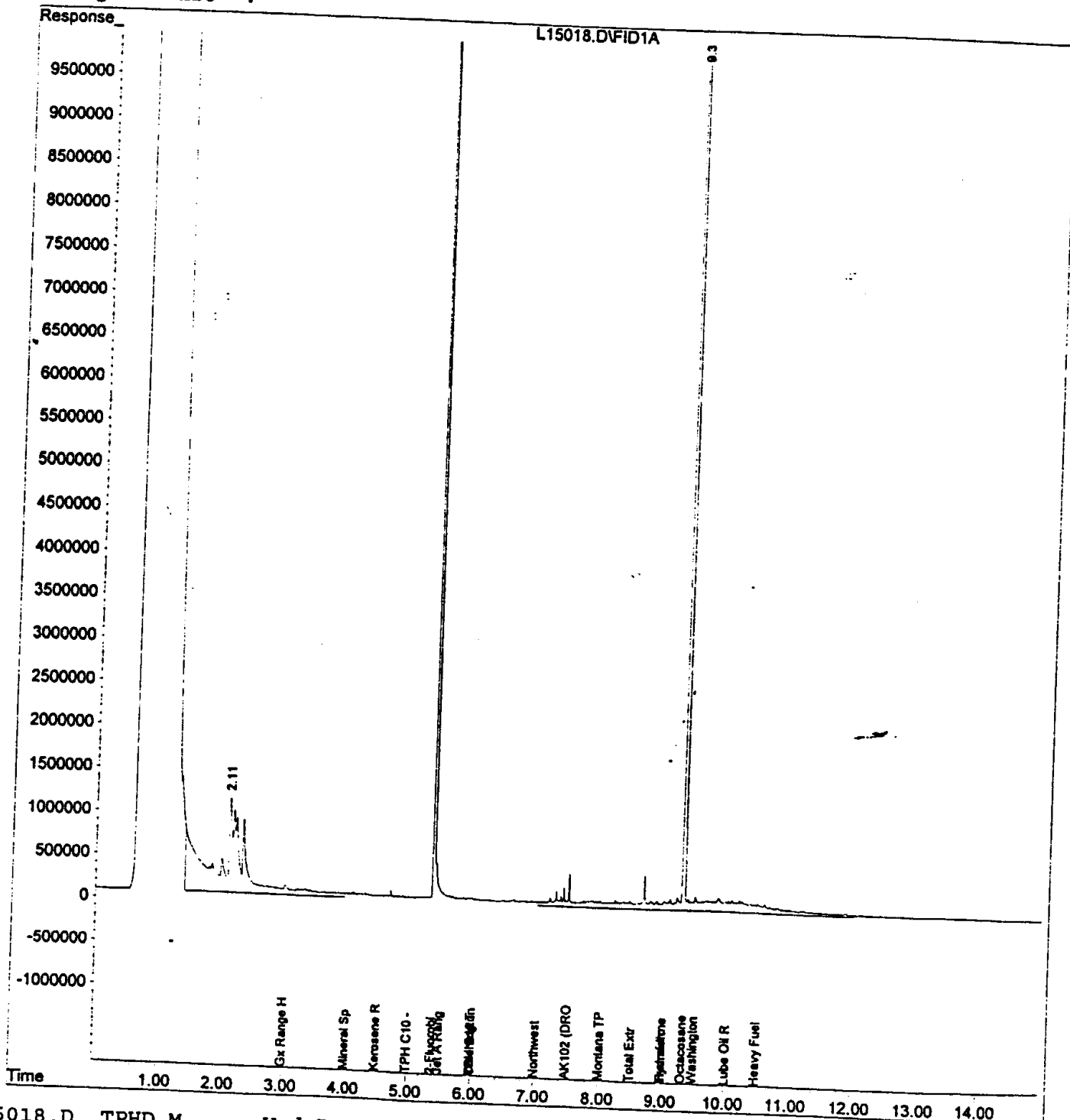
Vial: 13  
Operator: mc  
Inst : GC #7  
Multiplr: 1.00

0121

Quant Results File: TPHD.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)  
Title : TPH-D Front Method  
Last Update : Wed Dec 01 15:41:01 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :





Data File : C:\HPCHEM\4\DATA.SEC\L15021.D

Acq On : 12-15-99 2:18:47 PM

Sample : b910196-04

Misc :

IntFile : SURR.E

Quant Time: Dec 15 15:15 1999 Quant Results File: TPHD2.RES

Vial: 14

Operator: mc

Inst : GC #7

Multiplr: 1.00

0122

Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)

Title : TPH-D Rear Method

Last Update : Mon Nov 15 10:22:08 1999

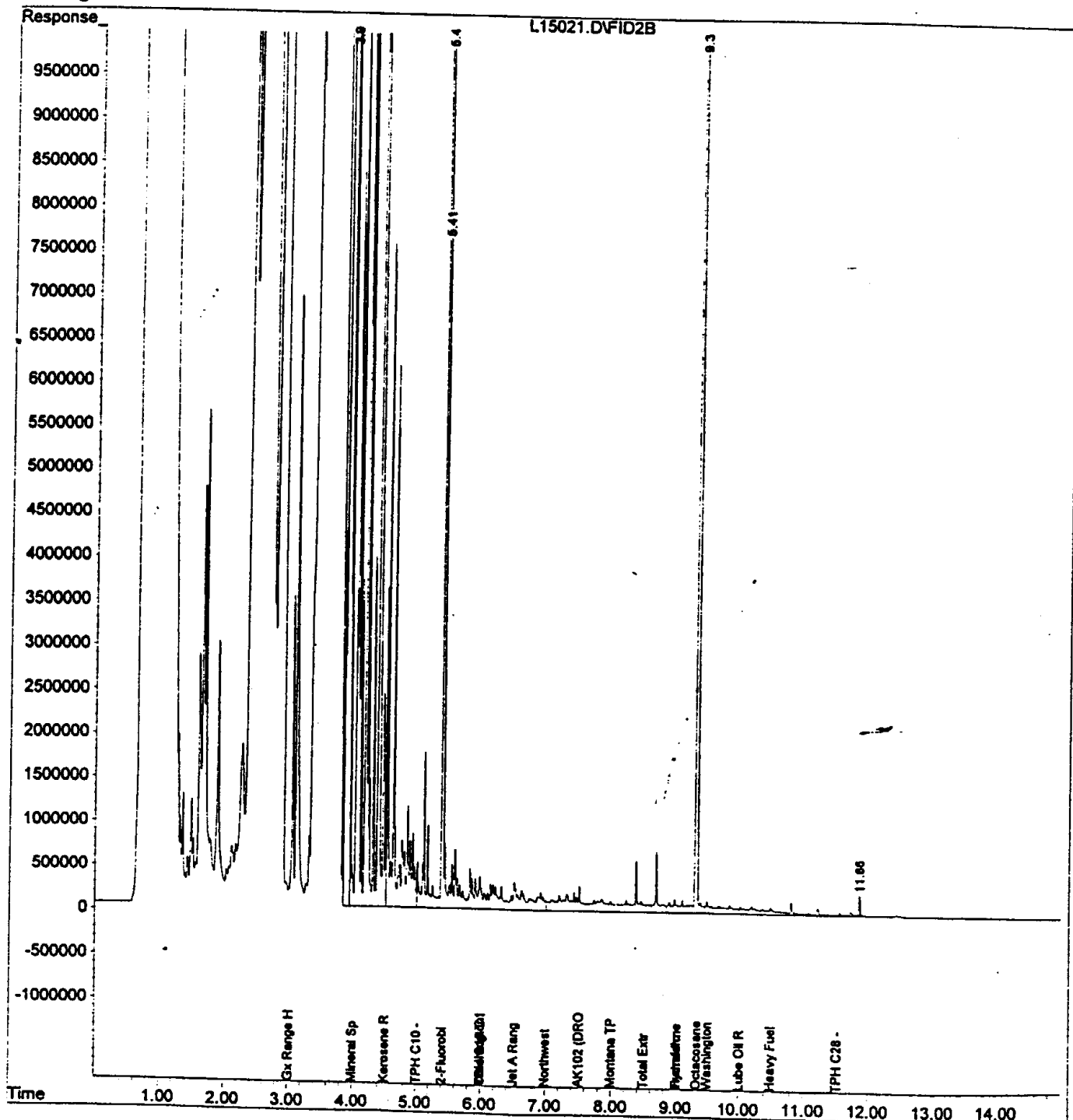
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\4\DATA\L15022.D

Acq On : 12-15-99 2:18:48 PM

Sample : b910196-05

Misc :

IntFile : SURR.E

Quant Time: Dec 15 15:17 1999 Quant Results File: TPHD.RES

Vial: 15

Operator: mc

Inst : GC #7

Multiplr: 1.00

0123

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)

Title : TPH-D Front Method

Last Update : Wed Dec 01 15:41:01 1999

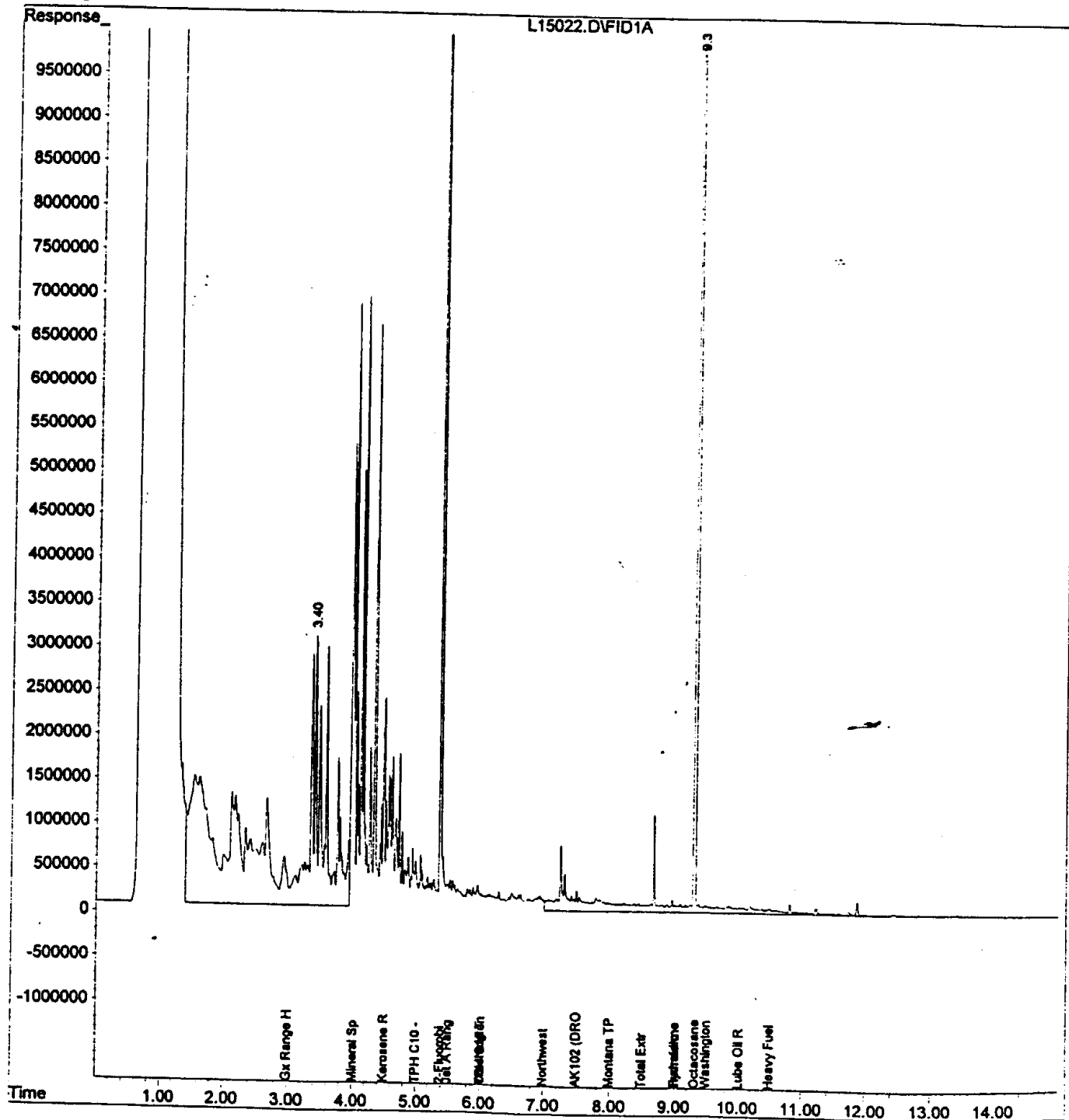
Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :



Data File : C:\HPCHEM\4\DATA.SEC\L15023.D

Acq On : 12-15-99 2:42:36 PM

Sample : b910196-06

Misc :

IntFile : SURR.E

Quant Time: Dec 15 15:16 1999 Quant Results File: TPHD2.RES

Vial: 16

Operator: mc

Inst : GC #7

Multiplr: 1.00

Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)

Title : TPH-D Rear Method

Last Update : Mon Nov 15 10:22:08 1999

Response via : Multiple Level Calibration

DataAcq Meth : TPHD.M

Volume Inj. :

Signal Phase :

Signal Info :

