



May 23, 2001
Project 6262.000.0

Mr. Hugh J. Murphy
City of Hayward Fire Department
777 B Street
Hayward, California 94541-5007

Subject: Soil Sampling Results – Occupied Residential Lots
Canterbury Residential Development
Hayward, California

Dear Mr. Murphy:

On behalf of the City of Hayward, Geomatrix Consultants, Inc. (Geomatrix) has prepared this summary of the results of a soil sampling program performed on occupied lots in the Canterbury Residential Development in Hayward, California (Figure 1). The scope of work described herein was based on Geomatrix's September 1, 2000 work plan ("the work plan").¹

Geomatrix's sampling effort was focussed to evaluate the quality of soil likely to be contacted by residents during typical landscaping activities. Soil samples collected from previous investigations conducted at adjacent unoccupied lots in the Canterbury development have indicated the presence of petroleum hydrocarbon-related compounds in the soil. SummerHill Homes offered to collect soil samples from occupied lots that had not been sampled during previous investigations in the area. Residents at 20 of 28 lots accepted the offer.

This report is divided into four sections. The first section describes the methods used to collect the soil samples. The second section describes the analytical methods used by the laboratories. The third section presents the results of the field and analytical programs. The fourth section compares the detected concentrations to U.S. Environmental Protection Agency (U.S. EPA) Preliminary Remediation Goals (PRGs) for residential land use.

FIELD PROGRAM

Prior to performing the field investigation, Geomatrix reviewed the existing Health and Safety Plan to ensure its applicability to planned field activities. The Hayward Fire Department obtained access agreements from the homeowners of the lots that were sampled.

¹ Geomatrix Consultants, Inc., 2000, Work Plan for Subsurface Investigation: Unoccupied Lots, Canterbury Residential Development, Hayward, California, April 6.

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Field Sampling Activities

On September 21, 22 and 28, 2000, Geomatrix advanced 19 shallow soil borings on 19 occupied lots. This included Lots 16 to 18, 20 to 23, 25 to 27, 30 to 31, 41 to 45, and 46 to 48. These borings were advanced to 0.5 feet below ground surface (bgs) using a hand auger. A hand-operated drive sampler lined with a 2-inch diameter by 6-inch brass sleeves was used to collect soil samples at the bottom of each hand-augered boring. After retrieval of the soil core, the borehole was screened for volatile organic compounds (VOCs) using an organic vapor monitor equipped with a photoionization detector (PID). Soil descriptions, OVM readings and sample identifications were recorded on a shallow soil-sampling log (Attachment B). The boreholes were backfilled with surrounding soil and the yard was restored to its original condition. Photographs were taken before and after sample collection.

Analysis of the initial soil sample results indicated elevated levels of total petroleum hydrocarbons quantified as motor oil (TPHmo) greater than 1000 milligrams per kilogram (mg/kg) and/or polycyclic aromatic hydrocarbons (PAHs) greater than U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) on eight of the 19 lots sampled.

In accordance with the work plan Geomatrix advanced three additional shallow soil borings on each of the 8 lots (24 additional soil borings) on October 24 and 26, 2000 (Figure 2). The goal of the additional borings was to determine the lateral and vertical extent of the elevated concentrations of total petroleum hydrocarbon as motor oil (TPHmo) and/or PAHs. In general, a boring was advanced on each lot in the approximate location of the previous boring and a sample was collected at approximately 0.5 and 3 feet bgs. Two other borings were advanced about twenty feet away from the original boring to 0.5 feet bgs and a sample was collected from each boring.

Between sampling activities, Lot 27 was landscaped, which included a concrete pad over the original boring location. The follow-up boring was advanced at the closest possible location to the original sample. In addition, the owner of Lot 44, which had not been sampled, requested that samples be collected from his lot. Four soil samples were collected from three borings on Lot 44 in a configuration similar to the other lots. A shallow sample was analyzed, while the remaining two shallow samples and one deep sample were put on hold. The initial sample exceeded 1000 mg/kg of TPH so the additional samples were also analyzed. In addition, an aliquot from the opposite end of the sampling tube from the original sample also was analyzed.

After retrieval of the soil sample, each borehole was screened for VOCs using a PID. Soil descriptions, PID readings and sample identifications were recorded on a shallow soil-sampling log (Attachment B). The boreholes were backfilled with surrounding soil and the yard was restored to its original condition. Photographs were taken before and after the sample collection.

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The soil samples were packaged for laboratory analysis by covering the ends of the sample sleeves with Teflon™ sheets and plastic caps. The caps were secured with silicon tape. The soil samples were labeled, placed in resealable plastic bags, and stored in coolers with ice, pending delivery to an analytical laboratory under Geomatrix chain-of-custody.

All downhole equipment including hand auger bucket and rods, drive sampler, and sleeves, were washed with an Alconox solution, rinsed with deionized water, and then rinsed again with deionized water. Cleaning water was placed in a 55-gallon drum for characterization and disposal by SummerHill Homes.

Analytical Program

As outlined in the work plan, soil samples were submitted to Friedman & Bruya, a California-certified analytical laboratory in Seattle, Washington for analysis of:

- total petroleum hydrocarbons quantified as motor oil (TPHmo), in accordance with U.S. EPA Method 8015 modified, after a silica gel cleanup;
- polycyclic aromatic hydrocarbons (PAHs), in accordance with U.S. EPA Method 8270C SIM (selected ion mode).

For quality assurance/quality control (QA/QC) purposes, Friedman and Bruya analyzed duplicate samples, method blanks, matrix spike/matrix spike duplicate samples, and laboratory control samples.

RESULTS OF FIELD PROGRAM

This section presents the results of the field program. A summary of the soil types observed during sampling and a discussion of the analytical results follow.

Soil Classification

Soil observed during sampling is generally consistent with soil observed during sampling activities in other portions of the development.² Site stratigraphy consists of a fill unit underlain by lean clay. Soil boring logs for the 46 borings advanced are included as Attachment A.

The fill unit typically consists of firm gray to brown lean clay with minor amounts of fine to coarse sand and fine gravel. Shallow soil sampled consisted of clayey sand with gravel and appeared to be imported aggregate base material. The fill material is underlain at approximately 3 feet bgs by lean clay and lean clay with sand that typically grades in color from dark gray to light gray to brown.

² Geomatrix Consultants, 2000, Soil Sampling Results, Canterbury Residential Development, Hayward, California, March 30.

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Analytical Laboratory Results

Analytical results for TPHmo and PAHs are summarized in Table 1. Laboratory analytical reports from Friedman and Bruya are presented in Attachments B. A review of the Quality Assurance/Quality Control data is presented in Attachment C.

TPHmo was detected in 49 of the 54 soil samples at concentrations ranging from 50 to 3500 mg/kg. Of the 49 samples containing TPHmo, 45 were collected at approximately 1-foot bgs (all 45 shallow samples) and four were collected at approximately 3 feet bgs (out of nine 3-foot samples).

Forty-one (41) of the 54 samples contained at least one PAH (Table 1); concentrations ranged from 5 to 2300 micrograms per kilogram ($\mu\text{g}/\text{kg}$). Thirty-nine (39) of these samples were collected at approximately 1 foot bgs and 2 were collected at approximately 3 feet bgs.

Of the eight lots that were resampled, benzo(a)pyrene (BaP) concentrations exceeded the PRG at two lots (27 and 30) with the maximum concentration of 420 $\mu\text{g}/\text{kg}$ at GMX-TRN-30A-1.0. TPHmo exceeded 1000 mg/kg in all eight lots (16, 17, 21, 30, 41, 44, 45, and 47) with the maximum concentration of 3500 mg/kg at GMX-TRN-47A-1.0. The additional samples from these lots resulted in both higher and lower concentrations of TPHmo and benzo(a)pyrene (BbP) although the approximately 3-foot sample was lower than the shallow samples in all cases except for TPHmo at GMX-TRN-27B-3.5. Average concentrations of TPHmo in shallow soil in the eight lots ranged from 360 to 1550 mg/kg (Table 2). These values are within the range of TPHmo concentrations (up to 1600 mg/kg) considered acceptable for occupancy of lots previously sampled for this project.³

DISCUSSION OF RESULTS

In accordance with the work plan, concentrations of PAHs detected at the site were compared with residential Preliminary Remediation Goals (PRGs) established by U.S. EPA Region 9.⁴ Total petroleum hydrocarbon measurements, such as TPHmo, represent mixtures of chemicals that, because of their potentially highly variable composition, have no associated health criteria. Therefore, the toxicity of these mixtures is best described by the aggregate toxicity of key individual chemicals in the mixture. As is the practice in California,⁵ only petroleum hydrocarbon constituents detected in soil, i.e., PAHs, were considered for comparison to PRGs.

³ Geomatrix, 2000, Final Soil Sampling Results – Unoccupied Residential Lots, Canterbury Residential Development, Hayward, California, April.

⁴ U.S. EPA, 1999, Region 9 Preliminary Remediation Goals (PRGs), October 1.

⁵ California Environmental Protection Agency, 1994, Preliminary Endangerment Assessment Guidance Manual: Department of Toxic Substances control, Sacramento, California.

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PRGs combine current U.S. EPA toxicity values with standard exposure factors to estimate concentrations in environmental media (e.g., soil) that are protective of human health, including sensitive subgroups, over a lifetime. For some chemicals, variations in exposure or toxicity assessment required in California have been applied and a "Cal-modified" PRG has been published. The Cal-modified PRGs have been used in this assessment, where available. If chemicals are present at concentrations below the PRGs, then exposure to these chemicals should not result in adverse health effects. If multiple chemicals are present, then the potential for adverse health effects associated with cumulative exposure may need to be evaluated. The presence of chemicals at concentrations exceeding PRGs does not indicate that adverse health effects will occur, but "suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate."⁵ The PRGs are listed at the bottom of the Tables 1 and 2 for detected chemicals.

With the exception of benzo(a)pyrene and benz(a)anthracene, concentrations of the remaining PAHs were at least 4 times lower than their respective PRGs. One sample (GMX-TRN-30A-1.0) contained benzo(a)anthracene above the PRG. Seven samples contained benzo(a)pyrene above the PRG (GMX-TRN-21D-2.0, GMX-TRN-27A-1.0, GMX-TRN-27C-1.0, GMX-TRN-27D-1.0, GMX-TRN-30A-1.0, GMX-TRN-30B-1.0, and GMX-TRN-30D-1.0).

To further evaluate potential health risk, the data was provided to the Department of Toxic Substances Control (DTSC). Based on information provided by representatives of DTSC, their evaluation was based on the calculation of benzo(a)pyrene equivalents for the seven carcinogenic PAHs in shallow soil at each lot. Because these PAHs are considered to have cumulative effects, the Office of Environmental Health Hazard Assessment (OEHHA) of California Environmental Protection Agency (Cal-EPA) has developed equivalency factors for the carcinogenic PAHs related to the most toxic component, benzo(a)pyrene⁶. As presented in Table 2, DTSC multiplied the concentration of each PAH detected in soil by the appropriate equivalency factor, which resulted in a concentration in terms of BaP equivalents. If a PAH was not detected, DTSC multiplied one-half the detection limit times the corresponding equivalency factor. By summing the BaP equivalents for each PAH, DTSC developed a total BaP equivalent for each sample. DTSC used an average of the total BaP equivalents used as the representative concentration for each lot. DTSC compared these representative concentrations to the total BaP equivalent PRG for all the carcinogenic PAHs. As shown on Table 2, the representative concentration for each lot was well below the total BaP equivalent PRG of 432 µg/kg. As described in DTSC's letter dated April 16, 2001, "Exposure to contaminant levels found below PRGs will not cause adverse health effects. Based on the benzo(a)pyrene equivalents calculated for the subjects lots, no cleanup for this contaminant is required by DTSC."

⁶ An equivalency factor for dibenzo(a,h)anthracene has not been published by OEHHA. To be conservative, a factor of 1 was used based on the PRGs for dibenzo(a,h)anthracene and benzo(a)pyrene.

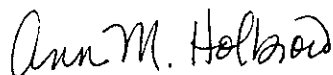
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CONCLUSIONS

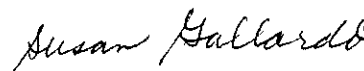
Based on data presented in this report and comparisons of detected soil concentrations to levels considered acceptable by U.S. EPA for residential site use and evaluation provided by DTSC, no further action is recommended.

Geomatrix appreciates this opportunity to provide consulting services to the City of Hayward. If you have any further questions, please contact any of the undersigned.

Sincerely yours,
GEOMATRIX CONSULTANTS, INC.



Ann M. Holbrow
Senior Scientist



Susan M. Gallardo, P.E.
Principal Engineer

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Attachments:

- Table 1 – Soil Analytical Results for Total Petroleum Hydrocarbons as Motor Oil and Polycyclic Aromatic Hydrocarbons
- Table 2 – Average TPHmo And Benzo(A)Pyrene Equivalent Concentrations in Shallow Soil
- Figure 1 – Site Location Map
- Figure 2 – Sampling Locations
- Attachment A – Shallow Soil Sampling Log
- Attachment B – Laboratory Analytical Results – Friedman & Bruya
- Attachment C – Results of Quality Assurance/Quality Control
- Attachment D – Department of Toxic Substances Control letter dated April 16, 2001

cc: Susan Hugo – Alameda County Health Care Services
Denise Tsuji – Department of Toxic Substances Control
Roger Brewer – RWQCB, San Francisco Bay Region
Mark Beskind – SummerHill Homes
Kim Brandt – LFR Levine*Fricke

TABLE 1

SOIL ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL AND POLYCYCLIC AROMATIC HYDROCARBONS¹
 Canterbury Residential Development
 Hayward, California

Polycyclic aromatic hydrocarbon concentrations are reported in micrograms per kilogram (µg/kg); total petroleum hydrocarbon concentrations are reported in milligrams per kilogram (mg/kg).

Sample ID	Depth (feet)	Date Sampled	TPHmo ²	Acenaph-thene	Acenaph-thylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoran-thene	Benzo (g,h,i) perylene	Benzo(k) fluoran-thene	Chrysene	Dibenzo (a,h) anthracene	Fluoran-thene	Fluorene	Indeno (1,2,3-cd) pyrene	Naph-thalene	Phenan-threne	Pyrene
GMX-TRN-16A-1.0	1.0	9/22/00	1800	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
GMX-TRN-16B-1.0	1.0	10/24/00	370	<5	<5	<5	12	16	15	14	12	22	6	17	<5	9	<5	8	21
GMX-TRN-16B-3.5	3.5	10/24/00	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
GMX-TRN-16C-1.0	1.0	10/24/00	600	<5		<5	20	22	19	24	10	56	7	20	<5	13	<5	12	34
GMX-TRN-16D-1.0	1.0	10/24/00	150	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5
GMX-TRN-17A-1.0	1.0	9/22/00	1500	<50	<50	<50	<50	<50	<50	63	<50	63	<50	58	<50	<50	<50	<50	63
GMX-TRN-17B-1.0	1.0	10/24/00	1100	<5	<5	<5	7	11	11	14	7	16	6	9	<5	8	<5	<5	13
GMX-TRN-17B-3.5	3.5	10/24/00	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
GMX-TRN-17C-1.0	1.0	10/24/00	580	<5	<5	<5	6	10	8	7	<5	14	<5	9	<5	<5	<5	9	16
GMX-TRN-17D-1.0	1.0	10/24/00	1100	<5	<5	<5	19	25	22	16	17	32	<5	55	<5	12	<5	22	59
GMX-TRN-18A-1.0	1.0	9/21/00	590	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	74
GMX-TRN-20A-1.0	1.0	9/22/00	860	<5	<5	<5	7	11	<5	19	<5	18	<5	<5	<5	<5	<5	7	8
GMX-TRN-21A-1.0	1.0	9/28/00	1200	<50	<50	<50	<50	<50	<50	64	<50	<50	<50	<50	<50	<50	<50	<50	<50
GMX-TRN-21B-1.0	1.0	10/26/00	2300	<50d	<50d	<50d	<50d	<50d	56d	59d	<50d	88d	<50d	82d	<50d	<50d	<50d	<50d	100d
GMX-TRN-21B-3.5	3.5	10/26/00	700	<5	<5	<5	<5	<5	6	<5	<5	8	<5	8	<5	<5	<5	6	9
GMX-TRN-21C-1.0	1.0	10/26/00	700	<5	<5	5	22	29	29	22	22	35	5	48	<5	16	<5	26	50
GMX-TRN-21D-1.0	1.0	10/26/00	2000	<50d	<50d	<50d	71d	100d	92d	68d	75d	110d	<50d	170d	<50d	<50d	<50d	85d	180d
GMX-TRN-23A-1.0	1.0	9/21/00	770	<50	<50	<50	<50	<50	50	64	<50	63	<50	110	<50	<50	<50	110	96
GMX-TRN-25A-1.0	1.0	9/21/00	210	<5	<5	<5	20	20	18	10	13	25	<5	33	<5	11	<5	14	33
GMX-TRN-26A-1.0	1.0	9/22/00	<50	<5	<5	<5	12	15	15	11	12	16	<5	29	<5	12	<5	13	27
GMX-TRN-27A-1.0	1.0	9/21/00	190	<5	<5	7	54	72	79	33	48	74	19	120	<5	43	<5	47	110
GMX-TRN-27B-1.0	1.0	10/26/00	310	<5	<5	10	50	62	60	27	45	75	11	91	<5	25	<5	39	100
GMX-TRN-27B-3.5	3.5	10/26/00	520	<5	<5	<5	10	17	14	10	15	14	<5	20	<5	10	<5	14	21
GMX-TRN-27C-1.0	1.0	10/26/00	230	29	6	36	71	69	62	24	37	130	8	78	56	22	<5	350	180
GMX-TRN-27D-1.0	1.0	10/26/00	710	10	<5	25	94	130	140	46	130	130	23	240	9	51	6	120	230
GMX-TRN-30A-1.0	1.0	9/22/00	1500	370	<50	500	660	420	220	270	<50	1200	<50	180	490	130	84	2300	1300
GMX-TRN-30B-1.0	1.0	10/24/00	230	<50d	<50d	<50d	75d	72d	65d	53d	59d	100d	<50d	210d	<50d	<50d	<50d	68d	230d
GMX-TRN-30B-3.0	3.0	10/24/00	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
GMX-TRN-30C-1.0	1.0	10/24/00	2900	<50d	<50d	<50d	89d	<50d	<50d	66d	<50d	190d	<50d	<50d	59d	<50d	<50d	210d	140d
GMX-TRN-30D-1.0	1.0	10/24/00	740	<50d	<50d	<50d	67d	69d	55d	59d	<50d	140d	<50d	71d	<50d	<50d	<50d	110d	120d
GMX-TRN-31A-1.0	1.0	9/21/00	410	<5	<5	<5	16	20	22	18	15	23	8	39	<5	19	<5	18	34
GMX-TRN-32A-1.0	1.0	9/21/00	120	<5	<5	<5	20	26	29	25	17	31	11	39	<5	22	<5	16	39
GMX-TRN-41A-1.0	1.0	9/21/00	1100	<5	<5	<5	<5	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	<5	6
GMX-TRN-41B-1.0	1.0	10/26/00	220	<5	<5	<5	15	25	17	20	19	26	9	18	<5	15	12	12	20
GMX-TRN-41B-3.5	3.5	10/26/00	88	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
GMX-TRN-41C-1.0	1.0	10/26/00	570	<5	<5	<5	21	30	27	22	19	44	9	46	<5	14	6	20	49

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Polycyclic aromatic hydrocarbon concentrations are reported in micrograms per kilogram (µg/kg); total petroleum hydrocarbon concentrations are reported in milligrams per kilogram (mg/kg).

Sample ID	Depth (feet)	Date Sampled	TPHmo ²	Acenaph-thene	Acenaph-thylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoran-thene	Benzo(g,h,i)perylene	Benzo(k)fluoran-thene	Chrysene	Dibenzo(a,h)anthracene	Fluoran-thene	Fluorene	Indeno(1,2,3-cd)pyrene	Naph-thalene	Phenan-threne	Pyrene
GMX-TRN-41D-1.0	1.0	10/26/00	130	<5	<5	<5	<5	7	8	8	<5	17	<5	6	<5	<5	9	17	9
GMX-TRN-42A-1.0	1.0	9/28/00	1000	<5	<5	6	43	42	46	19	35	69	11	19	<5	14	<5	13	26
GMX-TRN-43A-1.0	1.0	9/21/00	620	<5	<5	<5	7	10	12	14	7	15	<5	8	<5	8	<5	<5	11
GMX-TRN-44B-1.5	1.5	10/26/00	1400	<5	<5	<5	9	22	15	14	8	26	6	14	<5	7	<5	8	21
GMX-TRN-44B-1.5 ^{6,7}	1.5	10/26/00	320	<5	<5	<5	9	<5	13	8	11	15	<5	19	<5	5	<5	11	25
GMX-TRN-44B-3.5 ⁷	3.5	10/26/00	130	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d
GMX-TRN-44C-1.0 ⁷	1.0	10/26/00	150	<50d	<50d	<50d	55	<50d	<50d	<50d	<50d	<50d	<50d	71	<50d	<50d	<50d	<50d	81
GMX-TRN-44D-1.0 ⁷	1.0	10/26/00	1200	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d
GMX-TRN-45A-1.0	1.0	9/28/00	1900	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
GMX-TRN-45B-1.0	1.0	10/24/00	1200	<5	<5	<5	9	13	18	22	6	26	7	10	<5	8	<5	7	16
GMX-TRN-45B-3.5	3.5	10/24/00	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
GMX-TRN-45C-1.0	1.0	10/24/00	380	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d
GMX-TRN-45D-1.0	1.0	10/24/00	1400	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d	<50d
GMX-TRN-46A-1.0	1.0	9/22/00	380	<5	<5	<5	<5	6	8	<5	<5	8	<5	<5	<5	<5	<5	<5	5
GMX-TRN-47A-1.0	1.0	9/21/00	3500	<5	<5	<5	10	<5	<5	21	<5	43	<5	6	<5	<5	<5	<5	16
GMX-TRN-47B-1.0	1.0	10/24/00	150	<5	<5	<5	<5	<5	<5	5	<5	10	<5	<5	<5	<5	<5	<5	<5
GMX-TRN-47B-3.5	3.5	10/24/00	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
GMX-TRN-47C-1.0	1.0	10/24/00	270	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
GMX-TRN-47D-1.0	1.0	10/24/00	540	<5	<5	<5	<5	<5	<5	8	<5	13	<5	<5	<5	<5	<5	<5	5
GMX-TRN-48A-1.0	1.0	9/21/00	140	<5	<5	<5	6	7	8	7	5	11	<5	16	<5	6	<5	14	16
PRGs ⁵			NA ⁸	3,700,000	2,600,000 ⁹	22,000,000	620	62	620	3,700,000 ⁹	6200	6100	62	2,300,000	2,600,000	620	56000	22,000,000 ⁹	2,300,000

Notes:

- d = The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.
- * Replicate analysis of sample using soil from the other end of the sample container.
- 1. Analyzed in accordance with U.S. EPA Methods 8015 modified (TPHmo) and 8270 SIMS (polycyclic aromatic hydrocarbon), respectively.
- 2. TPHmo - Total Petroleum Hydrocarbons as Motor Oil
- 3. Detected values highlighted in bold.
- 4. NA - Not analyzed.
- 5. PRGs - Residential Preliminary Remediation Goals (U.S. EPA, 1999).
- 6. Analysis of sample GMX-TRN-44B-1.5 were taken from the opposite end of the sampling tube than that used for the previous analysis of the sample.
- 7. Samples were analyzed outside of normal holding time. All other quality control requirements were within acceptable limits.
- 8. Not available; PRGs have not been developed for mixtures. TPHmo evaluated based on the individual constituents detected.
- 9. A surrogate PRG was used because a PRG was not available for this compound. The surrogate selected based on physico-chemical properties was:
 - Acenaphthene for benzo(g,h,i)perylene;
 - Anthracene for phenanthrene.
 - Fluorene for acenaphthylene

TABLE 2

AVERAGE TPH_{mo} AND BENZO(A)PYRENE EQUIVALENT CONCENTRATIONS IN SHALLOW SOIL¹

Canterbury Residential Development
Hayward, California

Polycyclic aromatic hydrocarbon concentrations are reported in micrograms per kilogram (µg/kg)

Sample ID	Depth (feet)	Date Sampled	TPH _{mo} ²	Average TPH _{mo}	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total BaP Equivalent	Average BaP Equivalent
GMX-TRN-16A-1.0	1.0	9/22/00	1800		2.5	25	2.5	2.5	0.25	25.00	2.5	60.3	
GMX-TRN-16B-1.0	1.0	10/24/00	370		1.2	16	1.5	1.2	0.22	6.00	0.9	27.0	
GMX-TRN-16C-1.0	1.0	10/24/00	600		2	22	1.9	1	0.56	7.00	1.3	35.8	
GMX-TRN-16D-1.0	1.0	10/24/00	150	730	0.25	2.5	0.25	0.25	0.025	2.50	0.25	6.0	32
GMX-TRN-17A-1.0	1.0	9/22/00	1500		2.5	25	2.5	2.5	0.63	25.00	2.5	60.6	
GMX-TRN-17B-1.0	1.0	10/24/00	1100		0.7	11	1.1	0.7	0.16	6.00	0.8	20.5	
GMX-TRN-17C-1.0	1.0	10/24/00	580		0.6	10	0.8	0.25	0.14	2.50	0.25	14.5	
GMX-TRN-17D-1.0	1.0	10/24/00	1100	1070	1.9	25	2.2	1.7	0.32	2.50	1.2	34.8	33
GMX-TRN-18A-1.0	1.0	9/21/00	590	590	2.5	25	2.5	2.5	0.25	25.00	2.5	60.3	60.3
GMX-TRN-20A-1.0	1.0	9/22/00	860	860	0.7	11	0.25	0.25	0.18	2.50	0.25	15.1	15.1
GMX-TRN-21A-1.0	1.0	9/28/00	1200		2.5	25	2.5	2.5	0.25	25.00	2.5	60.3	
GMX-TRN-21B-1.0	1.0	10/26/00	2300		2.5	25	5.6	2.5	0.88	25.00	2.5	64.0	
GMX-TRN-21C-1.0	1.0	10/26/00	700		2.2	29	2.9	2.2	0.35	5.00	1.6	43.3	
GMX-TRN-21D-1.0	1.0	10/26/00	2000	1550	7.1	100	9.2	7.5	1.1	25.00	2.5	152.4	80
GMX-TRN-23A-1.0	1.0	9/21/00	770	770	2.5	25	5	2.5	0.63	25.00	2.5	63.1	63.1
GMX-TRN-25A-1.0	1.0	9/21/00	210	210	2	20	1.8	1.3	0.25	2.50	1.1	29.0	29.0
GMX-TRN-26A-1.0	1.0	9/22/00	25	25	1.2	15	1.5	1.2	0.16	2.50	1.2	22.8	22.8
GMX-TRN-27A-1.0	1.0	9/21/00	190		5.4	72	7.9	4.8	0.74	19.00	4.3	114.1	
GMX-TRN-27B-1.0	1.0	10/26/00	310		5	62	6	4.5	0.75	11.00	2.5	91.8	
GMX-TRN-27C-1.0	1.0	10/26/00	230		7.1	69	6.2	3.7	1.3	8.00	2.2	97.5	
GMX-TRN-27D-1.0	1.0	10/26/00	710	360	9.4	130	14	13	1.3	23.00	5.1	196	125
GMX-TRN-30A-1.0	1.0	9/22/00	1500		66	420	22	2.5	12	25.00	13	561	
GMX-TRN-30B-1.0	1.0	10/24/00	230		7.5	72	6.5	5.9	1	25.00	2.5	120	
GMX-TRN-30C-1.0	1.0	10/24/00	2900		8.9	25	2.5	2.5	1.9	25.00	2.5	68.3	
GMX-TRN-30D-1.0	1.0	10/24/00	740	1343	6.7	69	5.5	2.5	1.4	25.00	2.5	112.6	215
GMX-TRN-31A-1.0	1.0	9/21/00	410	410	1.6	20	2.2	1.5	0.23	8.00	1.9	35.4	35.4
GMX-TRN-32A-1.0	1.0	9/21/00	120	120	2	26	2.9	1.7	0.31	11.00	2.2	46.1	46.1
GMX-TRN-41A-1.0	1.0	9/21/00	1100		0.25	2.5	0.25	0.25	0.025	2.50	0.25	6.0	
GMX-TRN-41B-1.0	1.0	10/26/00	220		1.5	25	1.7	1.9	0.26	9.00	1.5	40.9	
GMX-TRN-41C-1.0	1.0	10/26/00	570		2.1	30	2.7	1.9	0.44	9.00	1.4	47.5	
GMX-TRN-41D-1.0	1.0	10/26/00	130	505	0.25	7	0.8	0.25	0.17	2.50	0.25	11.2	26
GMX-TRN-42A-1.0	1.0	9/28/00	1000	1000	4.3	42	4.6	3.5	0.69	11.00	1.4	67.5	67.5
GMX-TRN-43A-1.0	1.0	9/21/00	620	620	0.7	10	1.2	0.7	0.15	2.50	0.8	16.1	16.1

TABLE 2

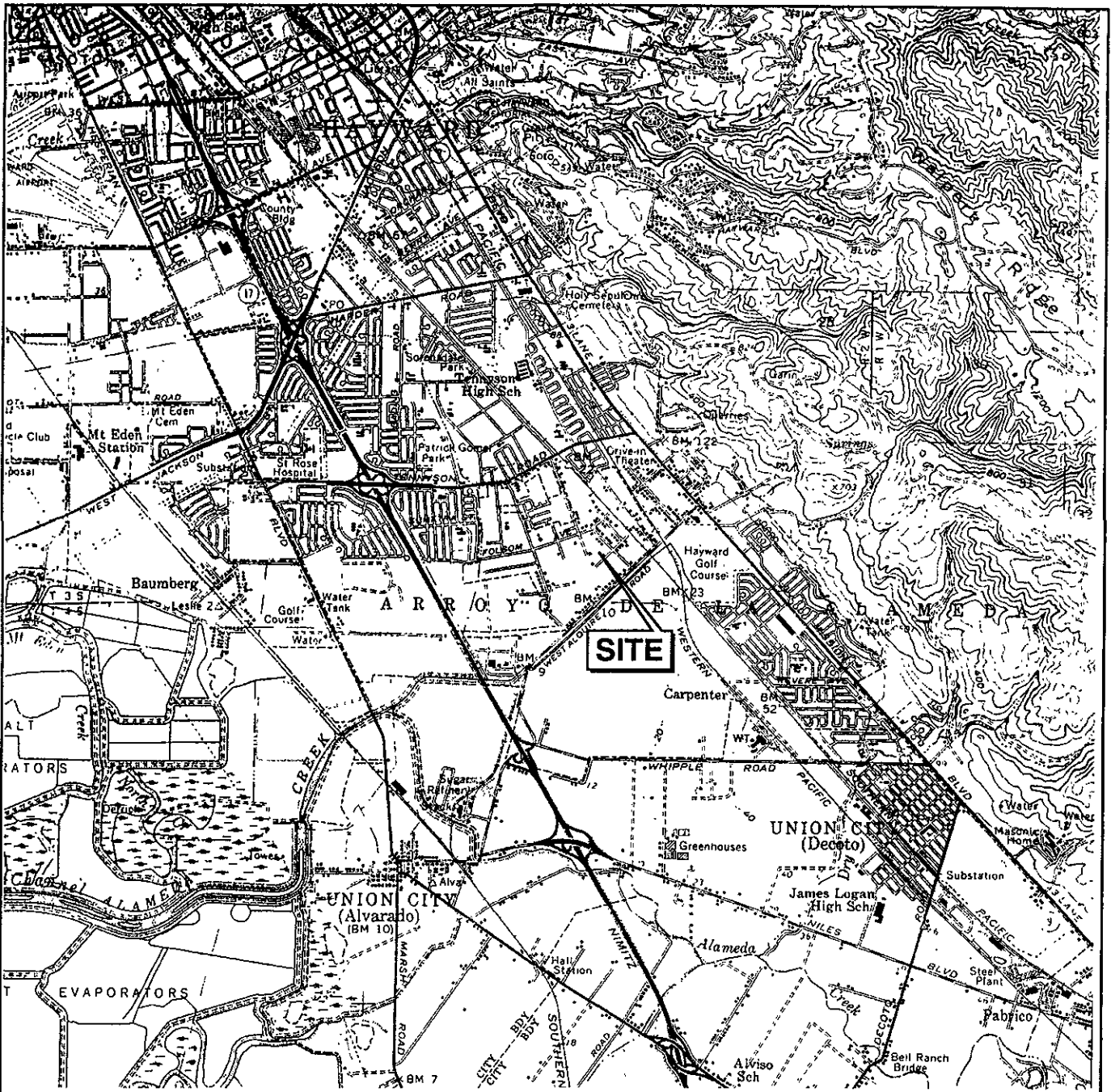
AVERAGE TPH_{mo} AND BENZO(A)PYRENE EQUIVALENT CONCENTRATIONS IN SHALLOW SOIL¹
 Canterbury Residential Development
 Hayward, California

Polycyclic aromatic hydrocarbon concentrations are reported in micrograms per kilogram (ug/kg)

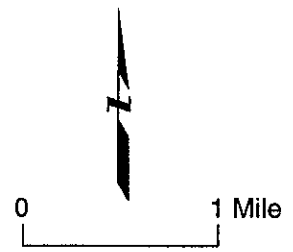
Sample ID	Depth (feet)	Date Sampled	TPH _{mo} ²	Average TPH _{mo}	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total BaP Equivalent	Average BaP Equivalent
GMX-TRN-44B-1.5	1.5	10/26/00	1400	768	0.9	22	1.5	0.8	0.26	6.00	0.7	32.2	41
GMX-TRN-44B-1.5	1.5	10/26/00	320		0.9	2.5	1.3	1.1	0.15	2.50	0.5	9.0	
GMX-TRN-44C-1.0	1.0	10/26/00	150		5.5	25	2.5	2.5	0.25	25.00	2.5	63.3	
GMX-TRN-44D-1.0	1.0	10/26/00	1200		2.5	25	2.5	2.5	0.25	25.00	2.5	60.3	
GMX-TRN-45A-1.0	1.0	9/28/00	1900	1220	2.5	25	2.5	2.5	0.25	25.00	2.5	60.3	51
GMX-TRN-45B-1.0	1.0	10/24/00	1200		0.9	13	1.8	0.6	0.26	7.00	0.8	24.4	
GMX-TRN-45C-1.0	1.0	10/24/00	380		2.5	25	2.5	2.5	0.25	25.00	2.5	60.3	
GMX-TRN-45D-1.0	1.0	10/24/00	1400		2.5	25	2.5	2.5	0.25	25.00	2.5	60.3	
GMX-TRN-46A-1.0	1.0	9/22/00	380	380	0.25	6	0.8	0.25	0.08	2.50	0.25	10.1	10.1
GMX-TRN-47A-1.0	1.0	9/21/00	3500	1115	1	2.5	0.25	0.25	0.43	2.50	0.25	7.2	6
GMX-TRN-47B-1.0	1.0	10/24/00	150		0.25	2.5	0.25	0.25	0.1	2.50	0.25	6.1	
GMX-TRN-47C-1.0	1.0	10/24/00	270		0.25	2.5	0.25	0.25	0.025	2.50	0.25	6.0	
GMX-TRN-47D-1.0	1.0	10/24/00	540		0.25	2.5	0.25	0.25	0.13	2.50	0.25	6.1	
GMX-TRN-48A-1.0	1.0	9/21/00	140	140	0.6	7	0.8	0.5	0.11	2.50	0.6	12.1	12.1
PRGs ³					620	62	620	610	6100	62	620	432	
Equivalency Factors ⁴					0.1	1	0.1	0.1	0.01	1	0.1		

Notes:

- The concentrations of TPH_{mo} are the measured concentration. The concentrations of PAHs are the measured concentration multiplied by the corresponding equivalency factors. If a PAH was not detected, one-half the detection limit was multiplied times the corresponding equivalency factor.
- TPH_{mo} - Total Petroleum Hydrocarbons as Motor Oil
- PRGs - Residential Preliminary Remediation Goals (U.S. EPA, 1999)
- Cal-EPA, 1999, Technical Support Document Describing Cancer Potency Factors. Office of Environmental Health Hazard Assessment



Base map from U.S. Geological Survey; Hayward Quadrangle (California), 15 Minute series (topographic), 1959.



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SITE VICINITY MAP
 Canterbury Residential Development
 Olympic Avenue
 Hayward, California

Project No.
 6262
 Figure
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EXPLANATION
 ● HAND AUGER SOIL SAMPLING LOCATION

SAMPLING LOCATIONS Canterbury Development Hayward, California		
	Project No. 6262.000 8	Figure 2

Appendix A

Shallow Soil Sampling Log

ATTACHMENT A
SHALLOW SOIL SAMPLING LOG
 Canterbury Residential Development
 Hayward, California

Date	Time	Borehole Identification ¹	Depth Interval ²	Soil Description	OVM ³ (ppm)	Yard Landscaped?	Sample ID ⁴
22-Sep-00	13:35	GMX-TRN-16A	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), brown, moist	0	Yes	GMX-TRN-16A-1.0
24-Oct-00	8:55	GMX-TRN-16B	0.0-1.5	CLAYEY SAND WITH GRAVEL (SC) brown, moist	NA	Yes	GMX-TRN-16B-1.0
	9:35		1.5-3.5	CLAYEY SAND (SC) dark brown, moist			GMX-TRN-16B-3.5
24-Oct-00	8:55	GMX-TRN-16C	0.0-0.2	TOP SOIL	NA	Yes	GMX-TRN-16C-1.0
			0.2-1.0	SILTY SAND (SM), dark brown, wet			
24-Oct-00	9:35	GMX-TRN-16D	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	Yes	GMX-TRN-16D-1.0
22-Sep-00	9:20	GMX-TRN-17A	0.0-0.2 0.2-1.0	LEAN CLAY WITH SAND (CL), light brown, moist CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	0	Yes	GMX-TRN-17A-1.0
24-Oct-00	10:20 10:50	GMX-TRN-17B	0.0-0.5	LEAN CLAY WITH SAND (CL), brown, moist	NA	Yes	GMX-TRN-17B-1.0
			0.5-2.5	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist			GMX-TRN-17B-3.5
			2.5-3.5	LEAN CLAY (CL), dark brown, moist			
24-Oct-00	10:20	GMX-TRN-17C	0.0-0.5	TOP SOIL	NA	Yes	GMX-TRN-17C-1.5
			0.5-1.5	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist			
24-Oct-00	10:45	GMX-TRN-17D	0.0-0.2	GRASS	NA	Yes	GMX-TRN-17D-1.0
			0.2-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist			
21-Sep-00	16:00	GMX-TRN-18A	0.0-0.2	TOP SOIL	0	Yes	GMX-TRN-18A-1.0
			0.2-0.6	SILTY SAND (SC), light gray, moist			
			0.6-1.6	LEAN CLAY WITH SAND (CLL), dark gray, moist			
21-Sep-00	7:30	GMX-TRN-20A	0.0-0.4	CLAYEY SAND WITH GRAVEL (SC), brown, moist	0	Partial	GMX-TRN-20A-1.0
			0.4-0.5	LEAN CLAY WITH SAND (CL), light brown, moist			
			0.5-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist			
28-Sep-00	16:40	GMX-TRN-21A	0.0-1.0	SILTY SAND (SM), dark brown, moist	0	Yes	GMX-TRN-21A-1.0
26-Oct-00	10:40 11:15	GMX-TRN-21B	0.0-1.0	SILTY SAND WITH GRAVEL (SM), dark brown, wet	0	Yes	GMX-TRN-21B-1.0
			1.0-3.5	SILTY SAND WITH GRAVEL (SM), dark brown, moist			GMX-TRN-21B-3.5
26-Oct-00	10:35	GMX-TRN-21C	0.0-0.5	SILTY SAND WITH GRAVEL (SM), dark brown, wet, pieces of asphalt in boring	0	Yes	GMX-TRN-21C-1.0
			0.5-1.0	SILTY SAND WITH GRAVEL (SM), dark brown, moist			
26-Oct-00	11:10	GMX-TRN-21D	0.0-0.5	SILTY SAND WITH GRAVEL (SM), dark brown, wet	0	Yes	GMX-TRN-21D-1.0
			0.5-1.0	SILTY SAND WITH GRAVEL (SM), dark brown, moist			
21-Sep-00	9:00	GMX-TRN-23A	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), brown, wet, next to heavily watered lawn	0	Yes	GMX-TRN-23A-1.0
21-Sep-00	15:25	GMX-TRN-25A	0.0-0.2	CLAYEY SAND WITH GRAVEL (SC), brown, moist	0	Yes	GMX-TRN-25A-1.0
			0.2-1.0	LEAN CLAY WITH SAND (CL), dark brown, moist			
22-Sep-00	10:50	GMX-TRN-26A	0.0-1.0	LEAN CLAY WITH SAND (CL), dark brown, moist	0	Yes	GMX-TRN-26A-1.0
21-Sep-00	16:40	GMX-TRN-27A	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), brown, moist	0	No	GMX-TRN-27A-1.0
26-Oct-00	11:15-13:10	GMX-TRN-27B	0.0-0.5	CLAYEY SAND WITH GRAVEL (SC), dark brown, wet	NA	Yes	GMX-TRN-27B-1.0
			0.5-3.5	Asphalt pieces in boring and bottom of sample shoe			GMX-TRN-27B-3.5

ATTACHMENT A
SHALLOW SOIL SAMPLING LOG
 Canterbury Residential Development
 Hayward, California

Date	Time	Borehole Identification ¹	Depth Interval ²	Soil Description	OVM ³ (ppm)	Yard Landscaped?	Sample ID ⁴
26-Oct-00	12:15	GMX-TRN-27C	0.0-0.5 0.5-3.5	CLAYEY SAND WITH GRAVEL (SC), dark brown, wet CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	Yes	GMX-TRN-27C-1 0
26-Oct-00	12:45	GMX-TRN-27D	0.0-0.5 0.5-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, wet CLAYEY SAND WITH GRAVEL (SC), dark brown, moist, pieces of asphalt in boring	0	Yes	GMX-TRN-27D-1.0
22-Sep-00	12:35	GMX-TRN-30A	0.0-0.4 0.4-1.0	CLAYEY SAND WITH GRAVEL (SC), brown, moist LEAN CLAY WITH SAND (CL), dark brown, moist	0	No	GMX-TRN-30A-1.0
24-Oct-00	11:50 12:50	GMX-TRN-30B	0.0-0.2 0.2-3.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist CLAYEY SAND (SC), dark brown, moist	NA	Partial	GMX-TRN-30B-1.0 GMX-TRN-30B-3.0
24-Oct-00	11:55	GMX-TRN-30C	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	Partial	GMX-TRN-30C-1.0
24-Oct-00	12:30	GMX-TRN-30D	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	Partial	GMX-TRN-30D-1 0
21-Sep-00	8:00	GMX-TRN-31A	0.0-0.4 0.4-1.0	TOP SOIL and mulch SILTY SAND (SM), brown, moist	0	Yes	GMX-TRN-31A-1.0
21-Sep-00	9:40	GMX-TRN-32A	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	0	No	GMX-TRN-32A-1.0
21-Sep-00	14:00	GMX-TRN-41A	0.0-0.4 0.4-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown moist LEAN CLAY WITH SAND (CL), dark brown moist	0	Partial	GMX-TRN-41A-1.0
26-Oct-00	9:15 10:00	GMX-TRN-41B	0.0-2.8 2.8-3.5	CLAYEY SAND WITH GRAVEL (SC), dark brown, wet, pieces of brick in boring LEAN CLAY WITH SAND (CL), dark brown, moist	0	Partial deck	GMX-TRN-41B-1.0 GMX-TRN-41B-3.5
26-Oct-00	9:00	GMX-TRN-41C	0.0-0.4 0.4-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, wet, pieces of asphalt in boring CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	0	Partial deck	GMX-TRN-41C-1 0
26-Oct-00	9:40	GMX-TRN-41D	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	0	Partial deck	GMX-TRN-41D-1.0
28-Sep-00	17:05	GMX-TRN-42A	0.0-1.0	SILTY SAND (SM), dark brown, moist	0	No	GMX-TRN-42A-1.0
21-Sep-00	10:20	GMX-TRN-43A	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	0	Yes	GMX-TRN-43A-1.0
26-Oct-00	14:25 14:55	GMX-TRN-44B	0.0-0.5 0.5-2.5 2.5-3.5	TOP SOIL, wet CLAYEY SAND WITH GRAVEL (SC), dark brown, moist LEAN CLAY (CL), dark brown, moist	NA	Yes	GMX-TRN-44B-1.5 GMX-TRN-44B-3 5
26-Oct-00	14:55	GMX-TRN-44C	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	Yes	GMX-TRN-44C-1 0
26-Oct-00	14:30	GMX-TRN-44D	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	Yes	GMX-TRN-44D-1.0
28-Sep-00	17:40	GMX-TRN-45A	0.0-1.0	SILTY SAND (SM), dark brown, moist	0	No	GMX-TRN-45A-1.0
24-Oct-00	14:45	GMX-TRN-45C	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	No	GMX-TRN-45C-1.0
24-Oct-00	15:50 16:20	GMX-TRN-45D	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	Partial	GMX-TRN-45D-1.0
24-Oct-00	15:20	GMX-TRN-45D	0.0-1.0	CLAYEY SAND WITH GRAVEL (SC), dark brown, moist	NA	No	GMX-TRN-45D-1.0
22-Sep-00	10:00	GMX-TRN-46A	0.0-1.0	LEAN CLAY WITH SAND (CL), brown, moist	0	Yes	GMX-TRN-46A-1.0

ATTACHMENT A
SHALLOW SOIL SAMPLING LOG
 Canterbury Residential Development
 Hayward, California

Date	Time	Borehole Identification ¹	Depth Interval ²	Soil Description	OVM ³ (ppm)	Yard Landscaped?	Sample ID ⁴
21-Sep-00	10:50	GMX-TRN-47A	0.0-1.5	SILTY SAND (SM), brown, moist	0	Yes	GMX-TRN-47A-1.0 GMX-TRN-47A-1.5
24-Oct-00	16:20 16:55	GMX-TRN-47B	0.0-3.5	SILTY SAND (SC) dark brown, moist	NA	Yes	GMX-TRN-47B-1.0 GMX-TRN-47B-3.5
24-Oct-00	16:25	GMX-TRN-47C	0.0-1.0	SILTY SAND (SC) dark brown, moist	NA	Yes	GMX-TRN-47C-1.0
24-Oct-00	16:55	GMX-TRN-47D	0.0-1.0	SILTY SAND (SC) dark brown, moist	NA	Yes	GMX-TRN-47D-1.0
21-Sep-00	14:45	GMX-TRN-48A	0.0-0.2 0.2-1.0	POTTING SOIL LEAN CLAY WITH SAND (CL), dark brown, moist	0	Yes	GMX-TRN-48A-1.0

Notes:

- ¹ Borehole identification includes tract identification (TRN = Tract 7069; TRS = Tract 7124), lot number (e.g. 4), and boring identification (e.g. A, B).
- ² For shallow samples, borings were advanced from 0.0 to 0.5 feet below ground surface (bgs) with a hand auger. Drive samples were collected for chemical analysis from 0.5 to 1.0 feet bgs.
For deep samples, borings advanced to 3.0 feet bgs with a hand auger. Drive samples were collected from 3.0 to 3.5 feet bgs or 2.5 to 3.0 feet bgs.
- ³ OVM = organic vapor meter, Thermo Environmental Instruments 580B PID calibrated with a 100 ppm isobutylene standard. Borehole screened with OVM after retrieval of drive sample.
- ⁴ Sample identification uses the borehole identification number and adds the sample depth in feet at the end.

Appendix B

Laboratory Analytical Results Friedman & Bruya

010157

CS 10/27/00 003

CHAIN-OF-CUSTODY RECORD

No 0908

Date: 10/26/00

Page 1 of 2

Project No.: 6262

ANALYSES

REMARKS

Samplers (Signatures):

Bryan Turner
Ann Holbrow

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8020 (BTEX only)	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as	TPH as	TPH as	TPH as	TPH as	TPH as	TPH as	TPH as	TPH as	Cooled	Soil (S), Water (W), or Vapor (V)	Acidified	Number of containers
10/26/00	0900	GMX-TRN-41C-1.0																	Y	S	N	1
	0915	GMX-TRN-41B-1.0																	Y	S	N	1
	0940	GMX-TRN-41D-1.0																	Y	S	N	1
	1000	GMX-TRN-41B-3.5																	Y	S	N	1
	1035	GMX-TRN-21C-1.0																	Y	S	N	1
	1040	GMX-TRN-21B-1.0																	Y	S	N	1
	1110	GMX-TRN-21D-1.0																	Y	S	N	1
	1115	GMX-TRN-21B-3.5																	Y	S	N	1
	1215	GMX-TRN-27B-1.0																	Y	S	N	1
	1215	GMX-TRN-27C-1.0																	Y	S	N	1
	1245	GMX-TRN-27D-1.0																	Y	S	N	1
	1310	GMX-TRN-27B-3.5																	Y	S	N	1

2"x6" brass soil tube

SAT

Friedman and Brya

Turnaround time: Standard

Results to Ann Holbrow

Total No of containers 12

Relinquished by (signature):

Bryan Turner
Printed Name: 520.696
Bryan Turner-4531

Company: Geomatrix

Date: 10/26/00
Time: 1645

Relinquished by (signature):

Printed Name:

Company:

Date:

Time:

Relinquished by (signature):

Printed Name:

Company:

Date:

Time:

Method of Shipment:

FE Ex 8200 7653 1994

Laboratory Comments and Log No..

Received by (signature):

Ann Holbrow
Printed Name:

Company:

Date: 10/26/00
Time: 9:30 AM

Received by (signature):

Printed Name:

Company:

Date:

Time:

Received by (signature):

Printed Name:

Company:

Date:

Time:



2/10/57

MS 10/27/00 103

CHAIN-OF-CUSTODY RECORD

No 0909

Date: 10/26/00

Page 2 of 2

Project No.: 6262

ANALYSES

REMARKS

Samplers (Signatures):
Bryan Turner
B. Smith

EPA Method 8010	EPA Method 8020	EPA Method 8020 (BTEX only)	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	PHMS	PAHS	SEM	TOC	THMS	Cooled	Soil (S), Water (W), or Vapor (V)	Acidified	Number of containers
							X	X				Y	S	N	1
							X	X				Y	S	N	1
							X	X				Y	S	N	1
							X	X				Y	S	N	1

Additional Comments

2" x 6" brass soil tube
↓

~~Blank~~

Date	Time	Sample Number
10/26/00	1425	GMX-TRN-44B-1.5
	1430	GMX-TRN-44D-1.0
	1455	GMX-TRN-44B-3.5
	1455	GMX-TRN-44C-1.0

Friedman + Brya

Turnaround time: Standard

Results to: Ann Holbrow

Total No of containers: 4

Relinquished by (signature): *Bryan Turner*

Date: 10/26/00

Printed Name: Bryan Turner

Time: 1645

Company: Geomatrix

Received by (signature): *Ann Holbrow*

Date: 10/27/00

Printed Name: ..

Time: 1:30

Company: ..

Relinquished by (signature):

Date:

Printed Name:

Company:

Received by (signature):

Date:

Method of Shipment: Fed Ex 8200 7653 1994

Laboratory Comments and Log No.:



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Jensen, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

November 10, 2000

Ann Holbrow, Project Manager
Geomatrix Consultants, Inc.
2101 Webster Street, 12th Floor
Oakland, CA 94612

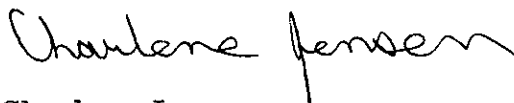
Dear Ms. Holbrow:

Included are the results from the testing of material submitted on October 27, 2000 from your 6262 project. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Charlene Jensen
Chemist

Enclosures
GMC1110R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 27, 2000 by Friedman & Bruya, Inc. from the Geomatrix Consultants, Inc. 6262 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Geomatrix Consultants, Inc.</u>
010157-01	GMX-TRN-41C-1.0
010157-02	GMX-TRN-41B-1.0
010157-03	GMX-TRN-41D-1.0
010157-04	GMX-TRN-41B-3.5
010157-05	GMX-TRN-21C-1.0
010157-06	GMX-TRN-21B-1.0
010157-07	GMX-TRN-21D-1.0
010157-08	GMX-TRN-21B-3.5
010157-09	GMX-TRN-27B-1.0
010157-10	GMX-TRN-27C-1.0
010157-11	GMX-TRN-27D-1.0
010157-12	GMX-TRN-27B-3.5
010157-13	GMX-TRN-44B-1.5
010157-14	GMX-TRN-44D-1.0
010157-15	GMX-TRN-44B-3.5
010157-16	GMX-TRN-44C-1.0

All quality control requirements were within acceptable limits.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00
 Date Received: 10/27/00
 Project: 6262
 Date Extracted: 11/1/00
 Date Analyzed: 11/04/00

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
 USING EPA METHOD 8015M
 Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u> Laboratory ID	<u>Motor Oil Range</u>	<u>Surrogate</u> (% Recovery)
GMX-TRN-41C-1.0 010157-01 d	570	90
GMX-TRN-41B-1.0 010157-02	220	87
GMX-TRN-41D-1.0 010157-03	130	84
GMX-TRN-41B-3.5 010157-04	88	86
GMX-TRN-21C-1.0 010157-05 d	700	92
GMX-TRN-21B-1.0 010157-06 d	2,300	93
GMX-TRN-21D-1.0 010157-07 d	2,000	97
GMX-TRN-21B-3.5 010157-08 d	700	95
GMX-TRN-27B-1.0 010157-09	310	86
GMX-TRN-27C-1.0 010157-10	230	93
GMX-TRN-27D-1.0 010157-11 d	710	102
GMX-TRN-27B-3.5 010157-12	520	80
GMX-TRN-44B-1.5 010157-13 d	1,400	86
Method Blank	<50	82

d - The sample was diluted. Detection limits are raised due to dilution.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-41C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-01
Date Analyzed:	11/08/00	Data File:	110819.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	86	31	123
Benzo(a)anthracene-d12	107	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	6
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	20
Anthracene	<5
Fluoranthene	46
Pyrene	49
Benz(a)anthracene	21
Chrysene	44
Benzo(b)fluoranthene	27
Benzo(k)fluoranthene	19
Benzo(a)pyrene	30
Indeno(1,2,3-cd)pyrene	14
Dibenzo(a,h)anthracene	9
Benzo(g,h,i)perylene	22

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-41B-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-02
Date Analyzed:	11/07/00	Data File:	110727.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	93	31	123
Benzo(a)anthracene-d12	112	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	12
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	12
Anthracene	<5
Fluoranthene	18
Pyrene	20
Benz(a)anthracene	15
Chrysene	26
Benzo(b)fluoranthene	17
Benzo(k)fluoranthene	19
Benzo(a)pyrene	25
Indeno(1,2,3-cd)pyrene	15
Dibenzo(a,h)anthracene	9
Benzo(g,h,i)perylene	20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-41D-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-03
Date Analyzed:	11/07/00	Data File:	110728.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	94	31	123
Benzo(a)anthracene-d12	109	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	9
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	17
Anthracene	<5
Fluoranthene	6
Pyrene	9
Benz(a)anthracene	<5
Chrysene	17
Benzo(b)fluoranthene	8
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	7
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-41B-3.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-04
Date Analyzed:	11/07/00	Data File:	110729.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	99	31	123
Benzo(a)anthracene-d12	106	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-21C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-05
Date Analyzed:	11/07/00	Data File:	110730.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	88	31	123
Benzo(a)anthracene-d12	110	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	26
Anthracene	5
Fluoranthene	48
Pyrene	50
Benz(a)anthracene	22
Chrysene	35
Benzo(b)fluoranthene	29
Benzo(k)fluoranthene	22
Benzo(a)pyrene	29
Indeno(1,2,3-cd)pyrene	16
Dibenzo(a,h)anthracene	5
Benzo(g,h,i)perylene	22

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-21B-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-06 1/10
Date Analyzed:	11/07/00	Data File:	110731.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	107	31	123
Benzo(a)anthracene-d12	83	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	82
Pyrene	100
Benz(a)anthracene	<50
Chrysene	88
Benzo(b)fluoranthene	56
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	59

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-21D-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-07 1/10
Date Analyzed:	11/07/00	Data File:	110732.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	110	31	123
Benzo(a)anthracene-d12	95	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	85
Anthracene	<50
Fluoranthene	170
Pyrene	180
Benz(a)anthracene	71
Chrysene	110
Benzo(b)fluoranthene	92
Benzo(k)fluoranthene	75
Benzo(a)pyrene	100
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	68

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-21B-3.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-08
Date Analyzed:	11/07/00	Data File:	110733.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	90	31	123
Benzo(a)anthracene-d12	110	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	6
Anthracene	<5
Fluoranthene	8
Pyrene	9
Benzo(a)anthracene	<5
Chrysene	8
Benzo(b)fluoranthene	6
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-27B-1.0	Client:	Geomatrix Consultants, Inc
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-09
Date Analyzed:	11/07/00	Data File:	110734.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	88	31	123
Benzo(a)anthracene-d12	111	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	39
Anthracene	10
Fluoranthene	91
Pyrene	100
Benz(a)anthracene	50
Chrysene	75
Benzo(b)fluoranthene	60
Benzo(k)fluoranthene	45
Benzo(a)pyrene	62
Indeno(1,2,3-cd)pyrene	25
Dibenzo(a,h)anthracene	11
Benzo(g,h,i)perylene	27

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-27C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-10
Date Analyzed:	11/07/00	Data File:	110735.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	85	31	123
Benzo(a)anthracene-d12	111	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	6
Acenaphthene	29
Fluorene	56
Phenanthrene	350
Anthracene	36
Fluoranthene	78
Pyrene	180
Benz(a)anthracene	71
Chrysene	130
Benzo(b)fluoranthene	62
Benzo(k)fluoranthene	37
Benzo(a)pyrene	69
Indeno(1,2,3-cd)pyrene	22
Dibenzo(a,h)anthracene	8
Benzo(g,h,i)perylene	24

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID: GMX-TRN-27D-1.0	Client: Geomatrix Consultants, Inc.
Date Received: 10/27/00	Project: 6262
Date Extracted: 11/01/00	Lab ID: 010157-11
Date Analyzed: 11/07/00	Data File: 110736.D
Matrix: Soil	Instrument: GCMS3
Units: ug/kg (ppb)	Operator: YA

	% Recovery	Lower Limit	Upper Limit
Surrogates:			
Anthracene-d10	93	31	123
Benzo(a)anthracene-d12	115	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	6
Acenaphthylene	<5
Acenaphthene	10
Fluorene	9
Phenanthrene	120
Anthracene	25
Fluoranthene	240
Pyrene	230
Benz(a)anthracene	94
Chrysene	130
Benzo(b)fluoranthene	140
Benzo(k)fluoranthene	130
Benzo(a)pyrene	130
Indeno(1,2,3-cd)pyrene	51
Dibenzo(a,h)anthracene	23
Benzo(g,h,i)perylene	46

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-27B-3.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-12
Date Analyzed:	11/07/00	Data File:	110737.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	87	31	123
Benzo(a)anthracene-d12	104	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	14
Anthracene	<5
Fluoranthene	20
Pyrene	21
Benz(a)anthracene	10
Chrysene	14
Benzo(b)fluoranthene	14
Benzo(k)fluoranthene	15
Benzo(a)pyrene	17
Indeno(1,2,3-cd)pyrene	10
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-44B-1.5	Client:	Geomatrix Consultants, Inc
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	010157-13
Date Analyzed:	11/08/00	Data File:	110820.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	81	31	123
Benzo(a)anthracene-d12	102	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	8
Anthracene	<5
Fluoranthene	14
Pyrene	21
Benz(a)anthracene	9
Chrysene	26
Benzo(b)fluoranthene	15
Benzo(k)fluoranthene	8
Benzo(a)pyrene	22
Indeno(1,2,3-cd)pyrene	7
Dibenzo(a,h)anthracene	6
Benzo(g,h,i)perylene	14

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/01/00	Lab ID:	00-701b3
Date Analyzed:	11/03/00	Data File:	110320.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	82	31	123
Benzo(a)anthracene-d12	95	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00

Date Received: 10/27/00

Project: 6262

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING EPA METHOD 8015M**

Laboratory Code: 010157-12 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Motor Oil	µg/g (ppm)	520	620	18	0-20

Laboratory Code: 010157-12 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	Acceptance Criteria
Motor Oil	µg/g (ppm)	250	520	104	65-135

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	Relative Percent Difference
Motor Oil	µg/g (ppm)	250	82	84	65-135	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00

Date Received: 10/27/00

Project: 6262

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 010090-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD	Acceptance Criteria
Napthalene	µg/kg (ppb)	<5	<5	nm	0-20
Acenaphthylene	µg/kg (ppb)	<5	<5	nm	0-20
Acenaphthene	µg/kg (ppb)	<5	<5	nm	0-20
Fluorene	µg/kg (ppb)	<5	<5	nm	0-20
Phenanthrene	µg/kg (ppb)	<5	<5	nm	0-20
Anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Benz(a)anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Chrysene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(b)fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(k)fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(a)pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Dibenzo(a,h)anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(g,h,i)perylene	µg/kg (ppb)	<5	<5	nm	0-20

Laboratory Code: 010090-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	% Recovery MSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	<5	67	71	56-117	7
Acenaphthylene	µg/kg (ppb)	170	<5	60	61	59-115	2
Acenaphthene	µg/kg (ppb)	170	<5	74	80	59-114	8
Fluorene	µg/kg (ppb)	170	<5	68	74	61-113	8
Phenanthrene	µg/kg (ppb)	170	<5	69	75	51-122	7
Anthracene	µg/kg (ppb)	170	<5	54	58	50-116	7
Fluoranthene	µg/kg (ppb)	170	<5	68	74	52-124	9
Pyrene	µg/kg (ppb)	170	<5	68	75	49-124	9
Benz(a)anthracene	µg/kg (ppb)	170	<5	68	76	50-122	11
Chrysene	µg/kg (ppb)	170	<5	61	67	48-121	9
Benzo(b)fluoranthene	µg/kg (ppb)	170	<5	81	89	52-144	9
Benzo(k)fluoranthene	µg/kg (ppb)	170	<5	63	69	55-135	9
Benzo(a)pyrene	µg/kg (ppb)	170	<5	72	78	49-128	8
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	<5	74	82	37-132	10
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	<5	73	80	37-136	9
Benzo(g,h,i)perylene	µg/kg (ppb)	170	<5	72	79	28-132	8

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00

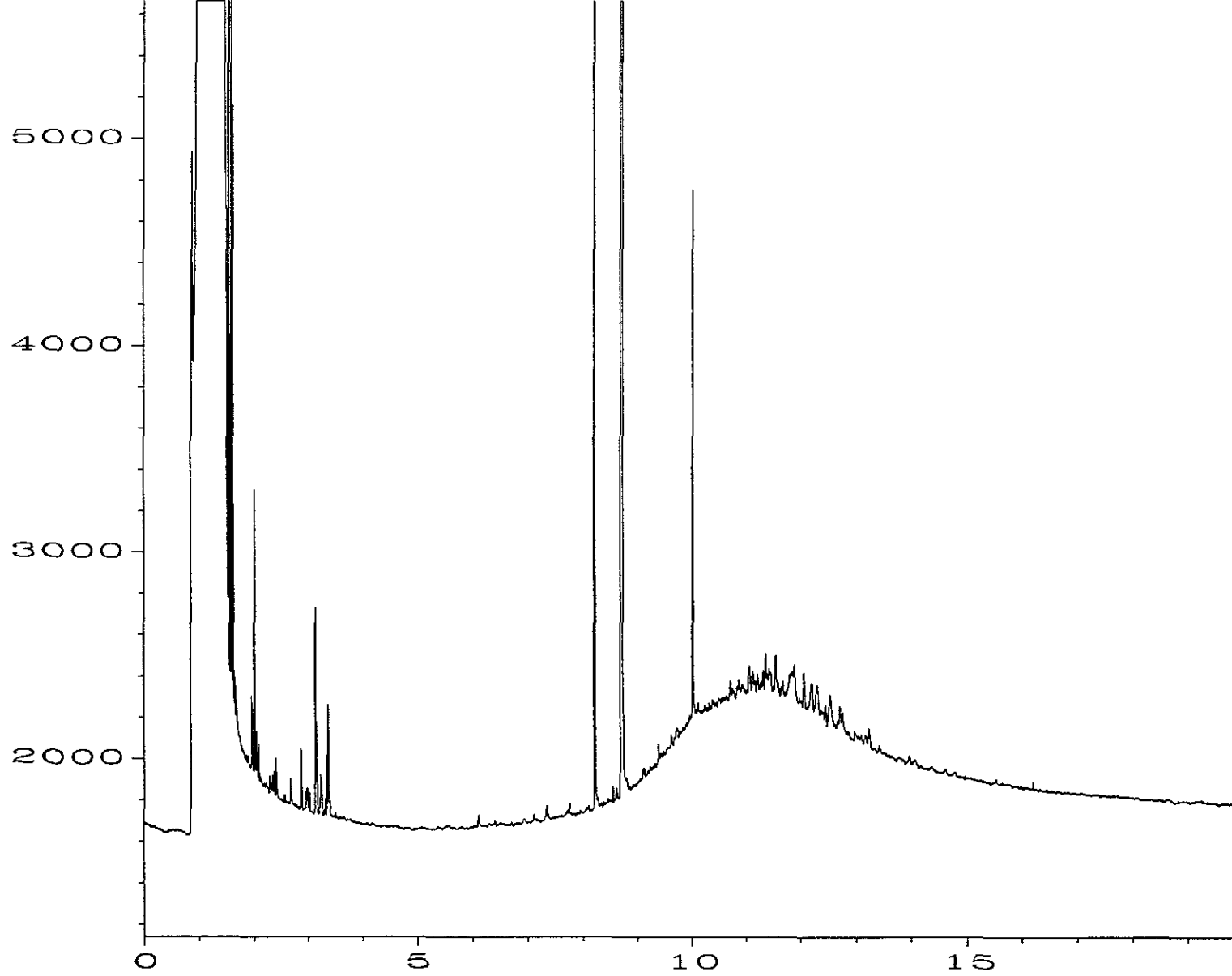
Date Received: 10/27/00

Project: 6262

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	78	79	58-121	1
Acenaphthylene	µg/kg (ppb)	170	72	73	54-122	1
Acenaphthene	µg/kg (ppb)	170	95	95	58-119	0
Fluorene	µg/kg (ppb)	170	88	88	57-122	0
Phenanthrene	µg/kg (ppb)	170	88	88	57-123	1
Anthracene	µg/kg (ppb)	170	64	65	44-125	1
Fluoranthene	µg/kg (ppb)	170	84	81	54-127	4
Pyrene	µg/kg (ppb)	170	84	81	56-123	3
Benz(a)anthracene	µg/kg (ppb)	170	88	88	50-124	0
Chrysene	µg/kg (ppb)	170	78	78	51-122	1
Benzo(b)fluoranthene	µg/kg (ppb)	170	106	105	44-149	1
Benzo(k)fluoranthene	µg/kg (ppb)	170	80	80	52-140	0
Benzo(a)pyrene	µg/kg (ppb)	170	93	93	42-129	0
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	100	104	48-134	4
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	97	101	49-136	4
Benzo(g,h,i)perylene	µg/kg (ppb)	170	97	101	46-134	5



Data File Name : E:\GC4\11-03-00\016F1801.D

Operator : ME

Instrument : GC4

Sample Name : 010157-01 1:10

Run Time Bar Code:

Acquired on : 04 Nov 00 02:00 AM

Report Created on: 09 Jul 48 12:36 PM

Page Number : 1

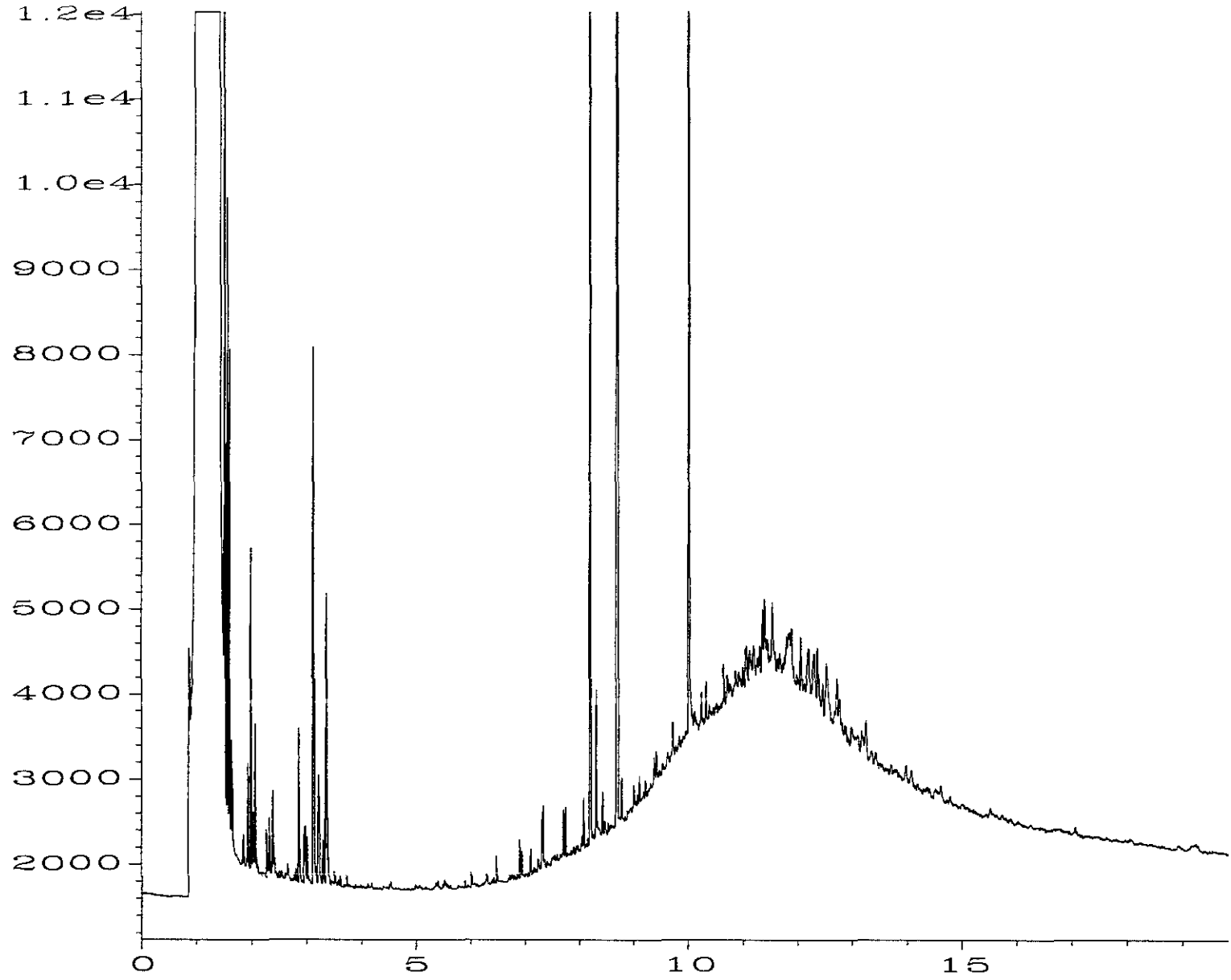
Vial Number : 16

Injection Number : 1

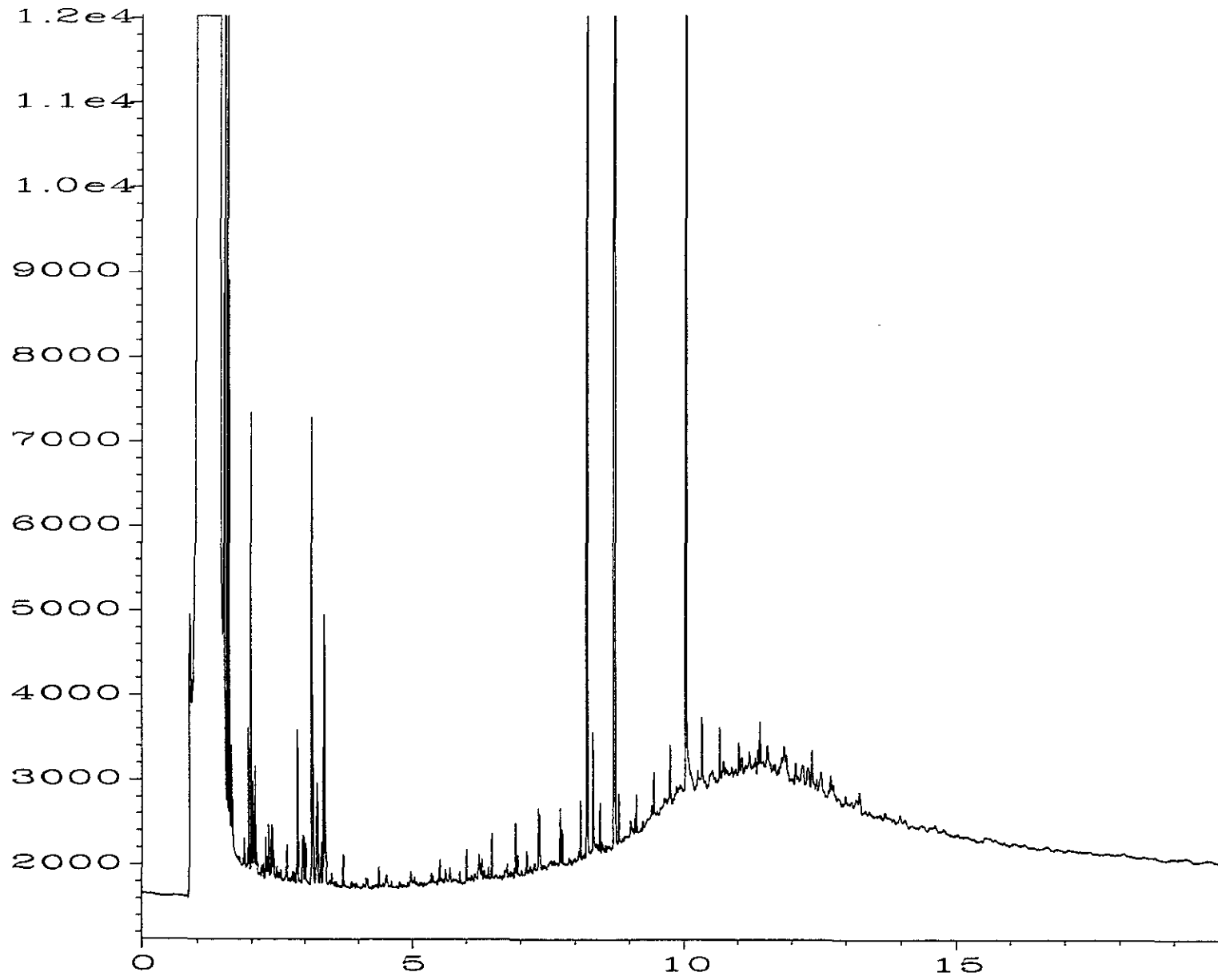
Sequence Line : 18

Instrument Method: TPHD.MTH

Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\017F1801.D
 Operator : ME
 Instrument : GC4
 Sample Name : 010157-02
 Run Time Bar Code : 04 Nov 00 02:31 AM
 Acquired on : 09 Jul 48 12:36 PM
 Report Created on: 09 Jul 48 12:36 PM
 Page Number : 1
 Vial Number : 17
 Injection Number : 1
 Sequence Line : 18
 Instrument Method: TPHD.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\018F1801.D

Operator : ME

Instrument : GC4

Sample Name : 010157-03

Run Time Bar Code:

Acquired on : 04 Nov 00 02:58 AM

Report Created on: 09 Jul 48 12:37 PM

Page Number : 1

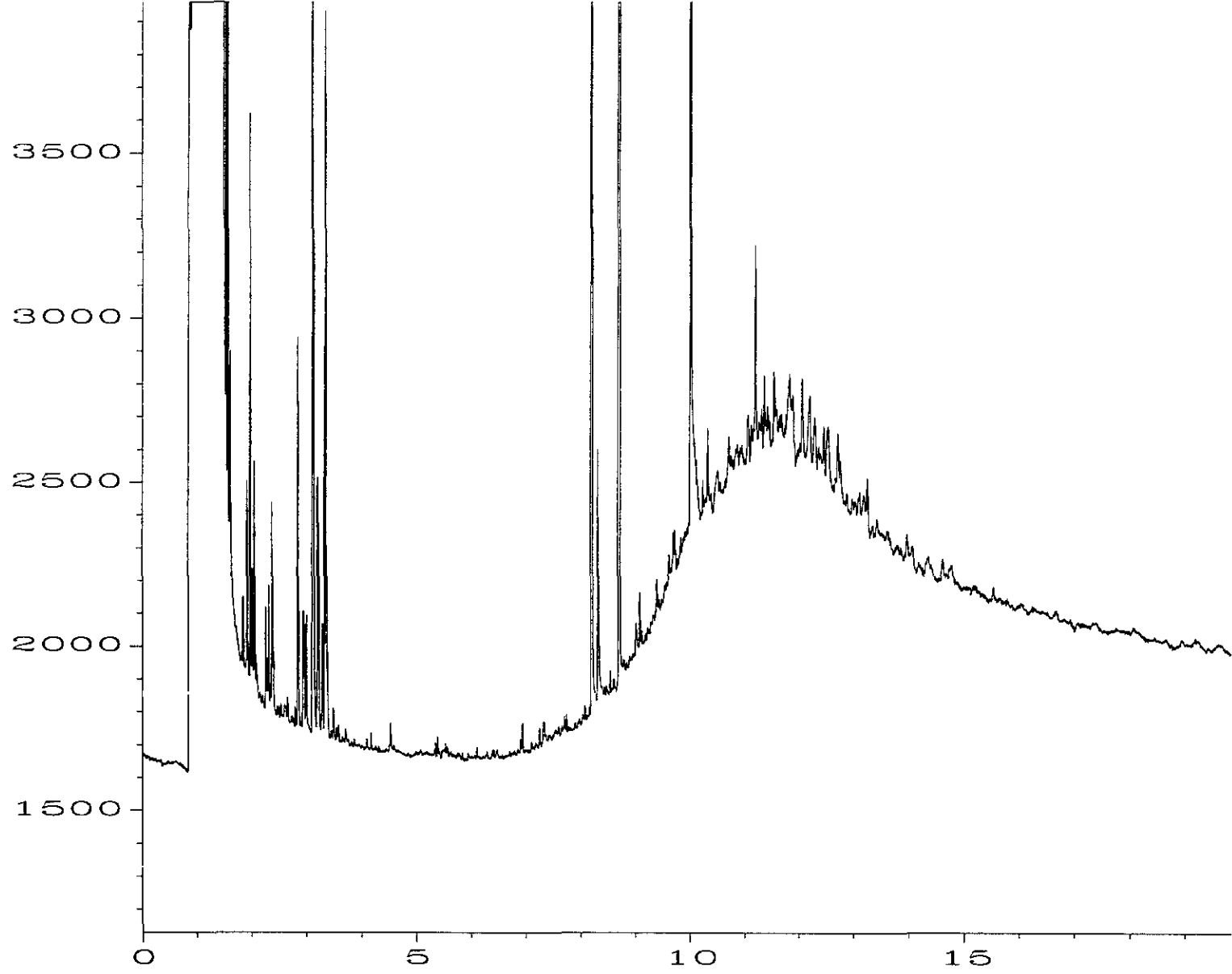
Vial Number : 18

Injection Number : 1

Sequence Line : 18

Instrument Method: TPHD.MTH

Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\019F1801.D

Operator : ME

Instrument : GC4

Sample Name : 010157-04

Run Time Bar Code:

Acquired on : 04 Nov 00 03:25 AM

Report Created on: 09 Jul 48 12:37 PM

Page Number : 1

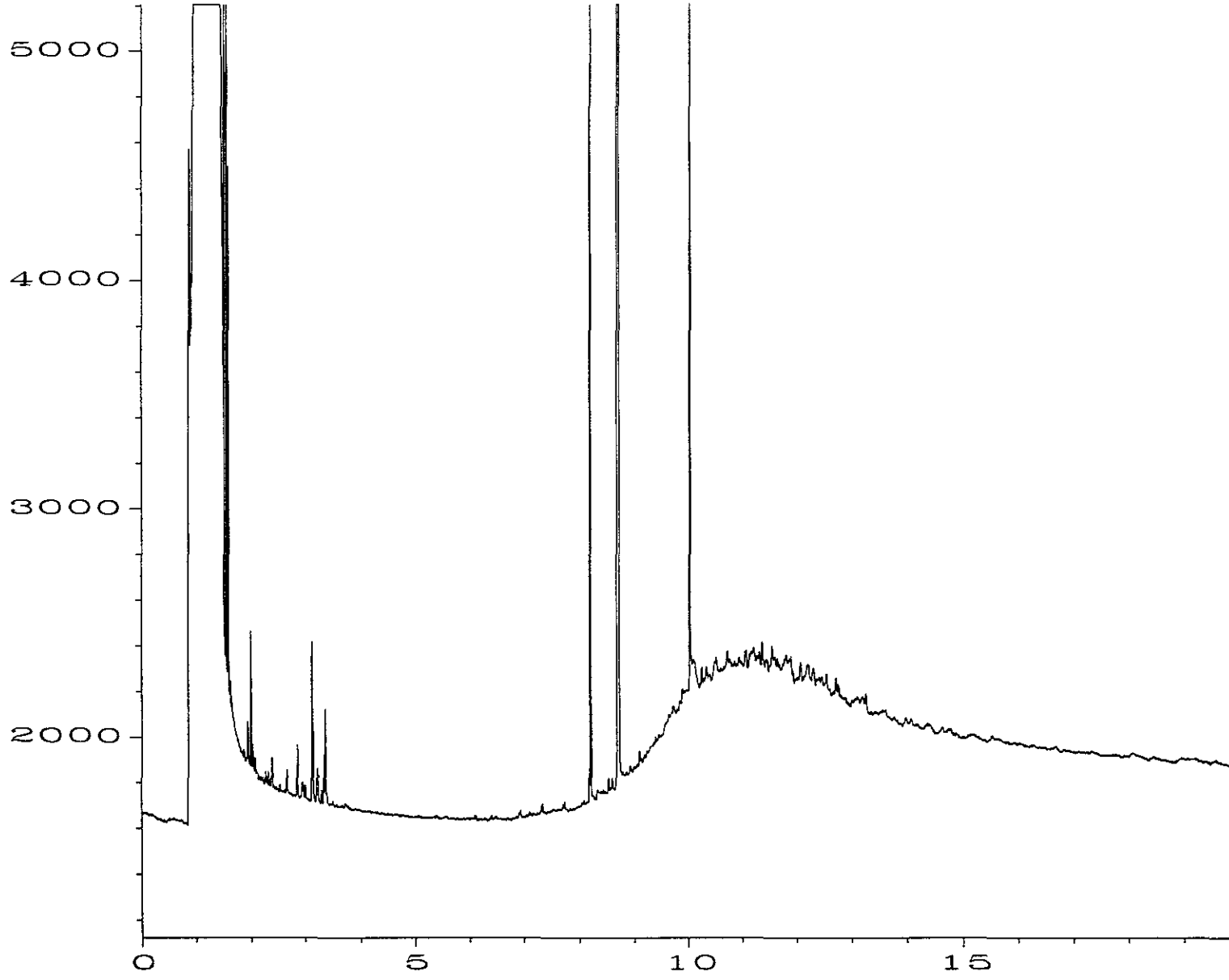
Vial Number : 19

Injection Number : 1

Sequence Line : 18

Instrument Method: TPHD.MTH

Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\020F1801.D

Operator : ME

Instrument : GC4

Sample Name : 010157-05 1:10

Run Time Bar Code:

Acquired on : 04 Nov 00 03:51 AM

Report Created on: 09 Jul 48 12:37 PM

Page Number : 1

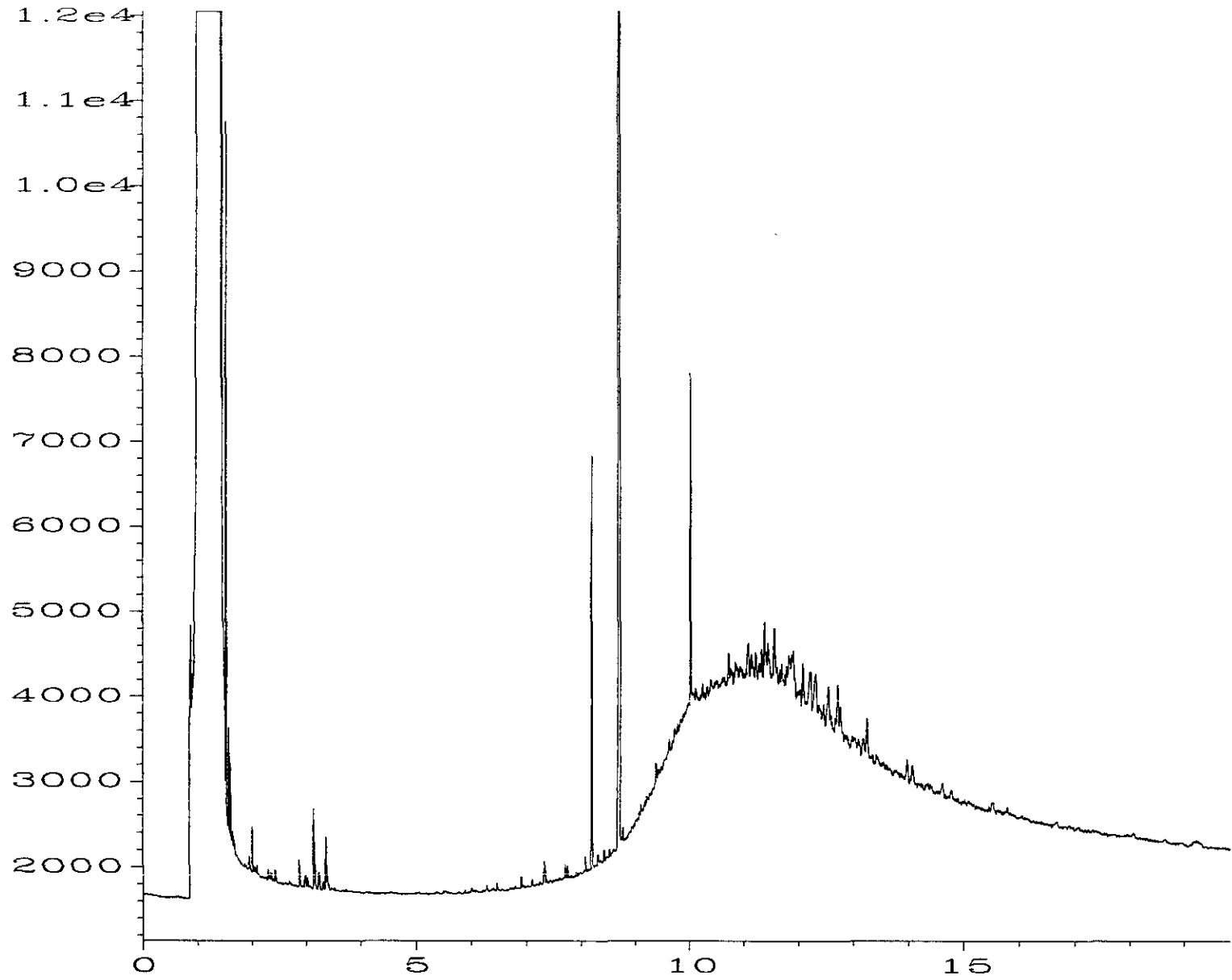
Vial Number : 20

Injection Number : 1

Sequence Line : 18

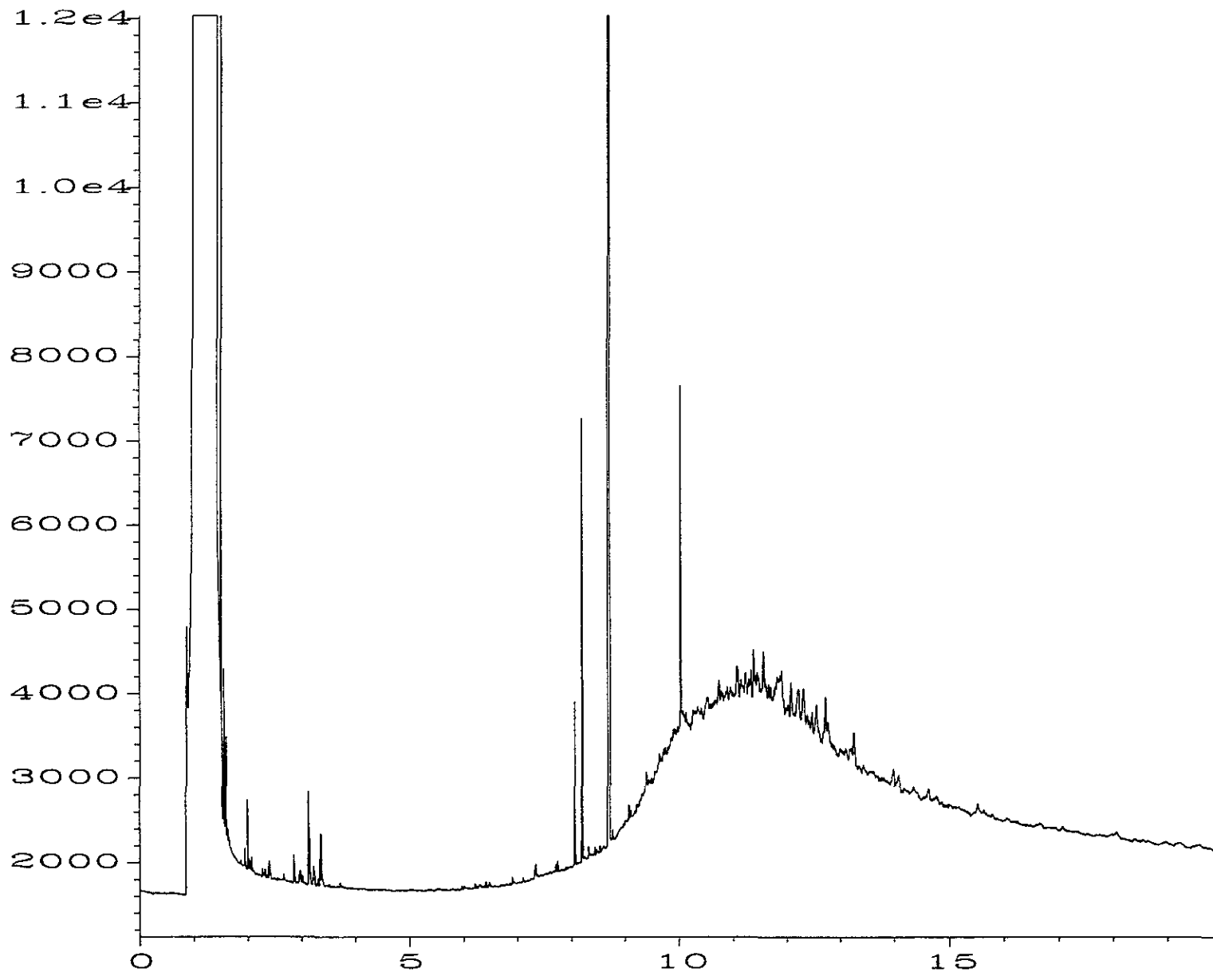
Instrument Method: TPHD.MTH

Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\021F2001.D
Operator : ME
Instrument : GC4
Sample Name : 010157-06 1:10
Run Time Bar Code : 04 Nov 00 04:43 AM
Report Created on: 09 Jul 48 12:37 PM

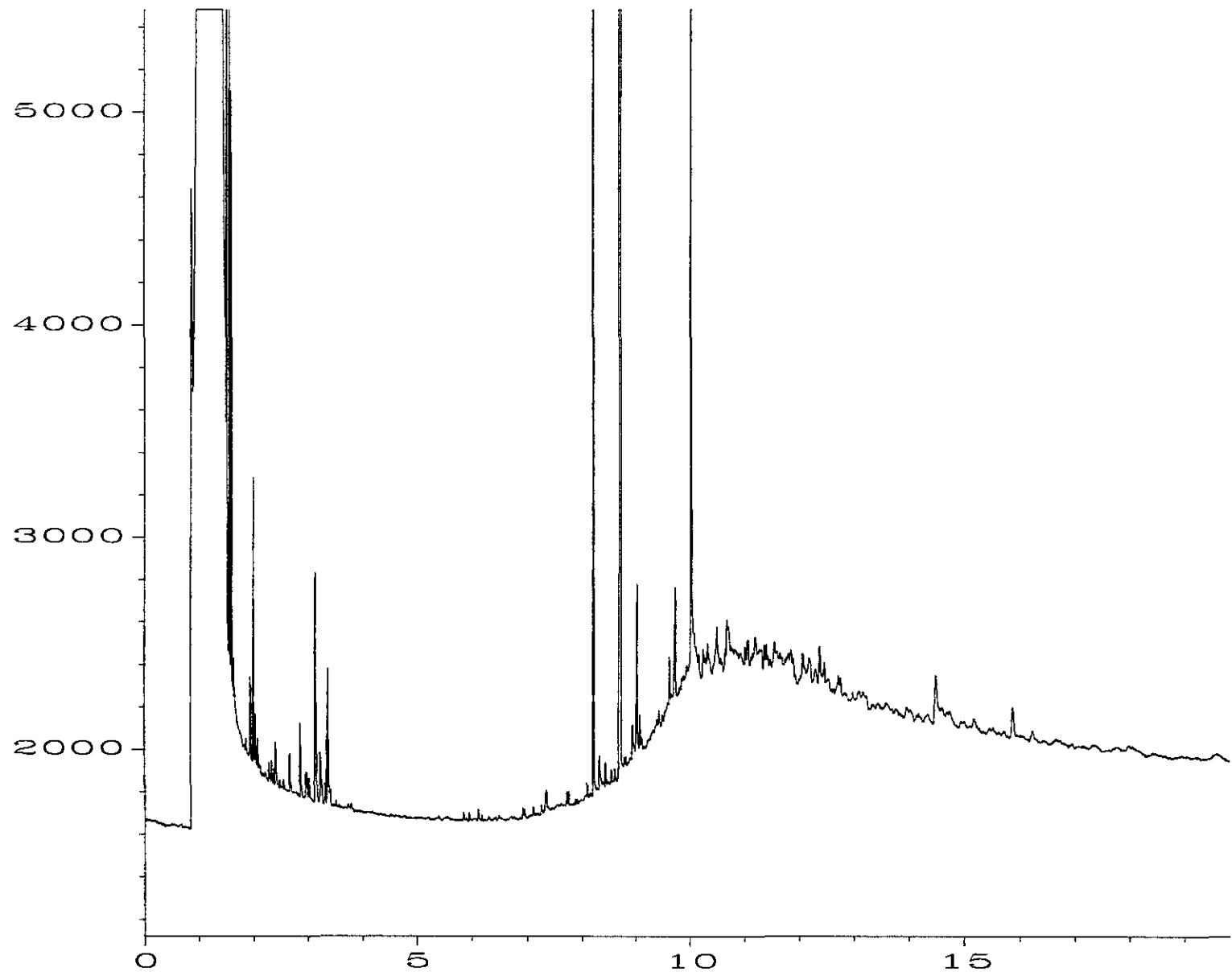
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Vial Number : 21
Injection Number : 1
Sequence Line : 20
Instrument Method: TPHD.MTH
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\022F2001.D

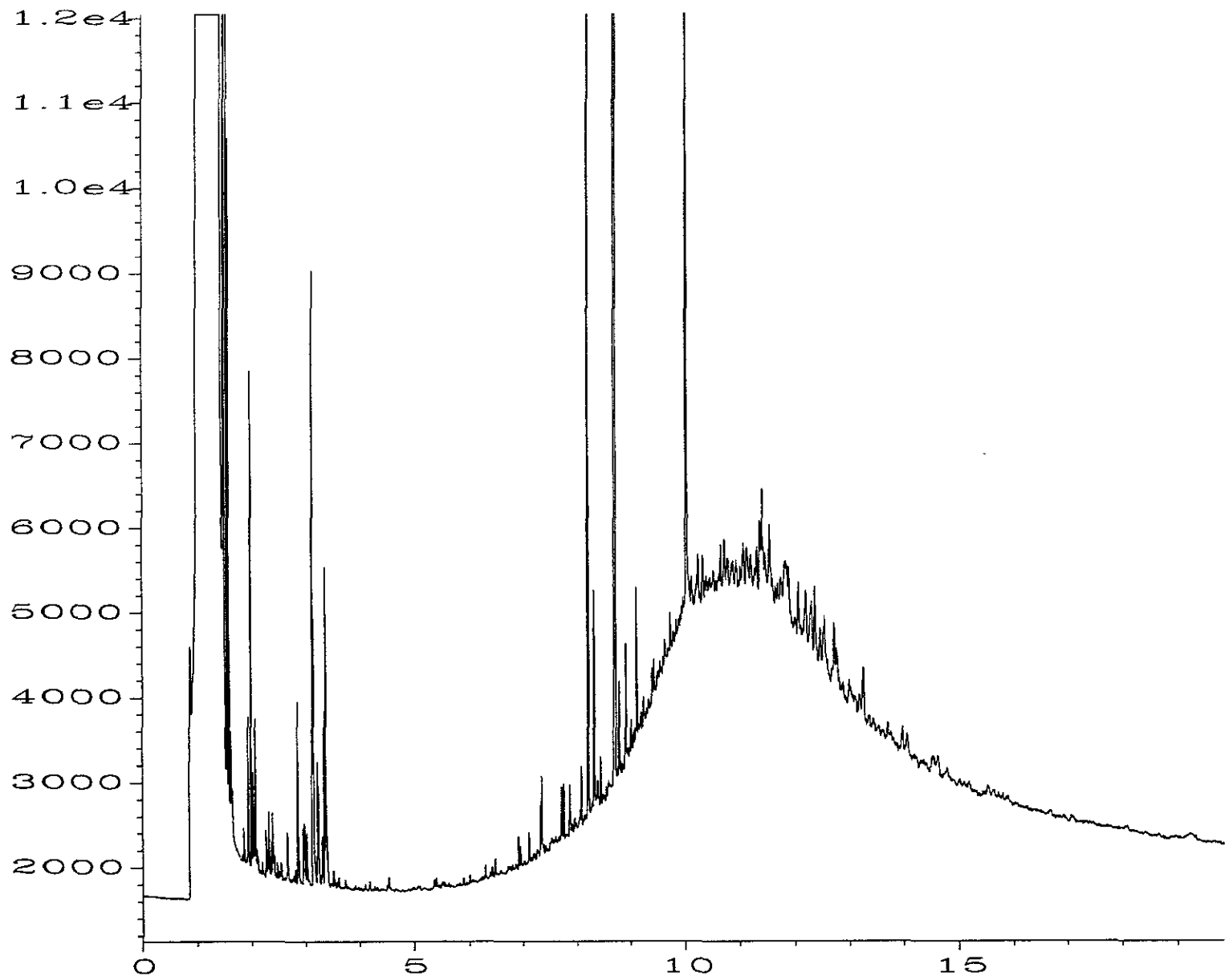
Operator : ME
 Instrument : GC4
 Sample Name : 010157-07 1:10
 Run Time Bar Code:
 Acquired on : 04 Nov 00 05:14 AM
 Report Created on: 09 Jul 48 12:38 PM

Page Number : 1
 Vial Number : 22
 Injection Number : 1
 Sequence Line : 20
 Instrument Method: TPHD.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\023F2001.D
Operator : ME
Instrument : GC4
Sample Name : 010157-08 1:10
Run Time Bar Code : 04 Nov 00 05:41 AM
Report Created on: 09 Jul 48 12:38 PM

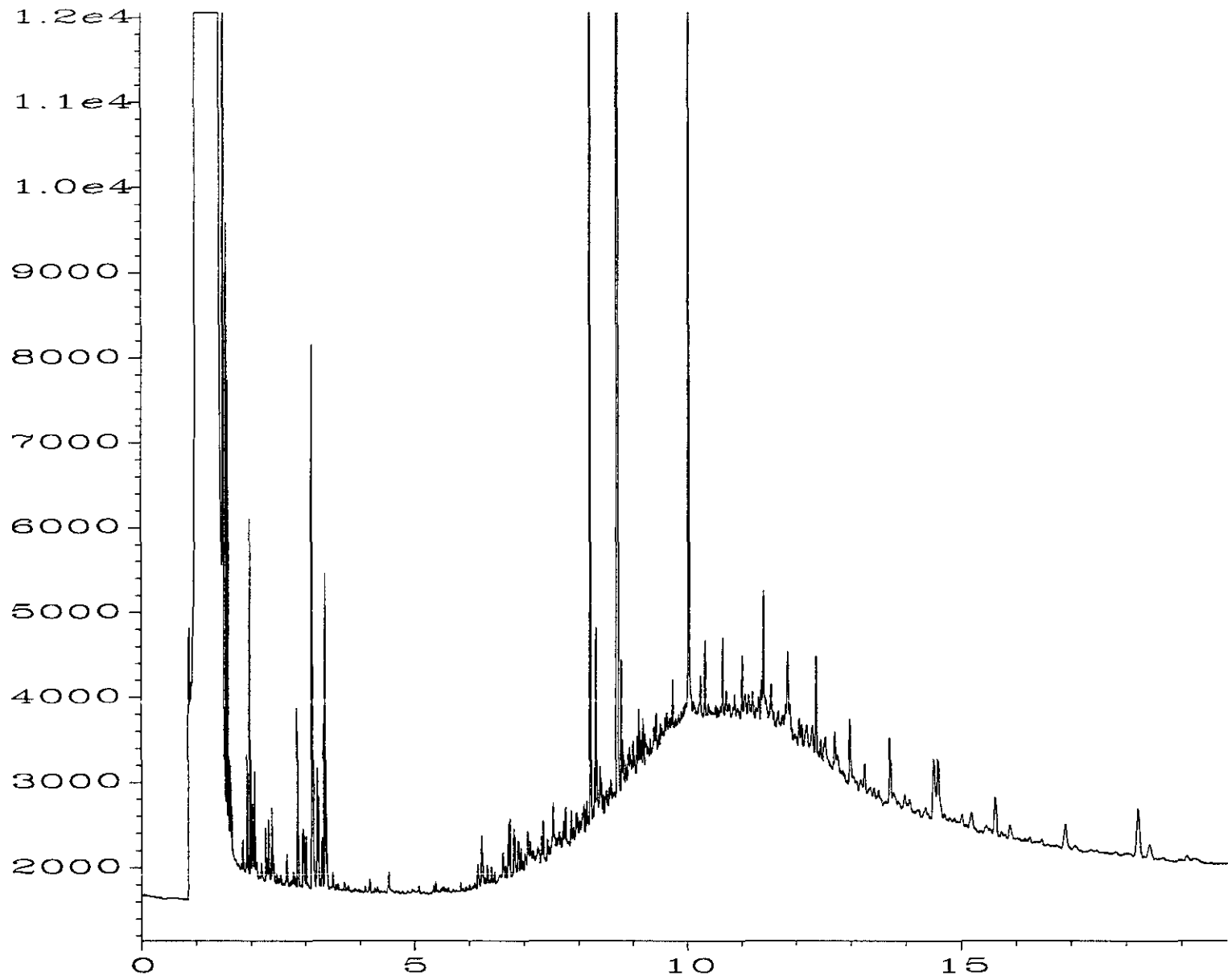
Page Number : 1
Vial Number : 23
Injection Number : 1
Sequence Line : 20
Instrument Method: TPHD.MTH
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\024F2001.D

Operator : ME
 Instrument : GC4
 Sample Name : 010157-09
 Run Time Bar Code: 04 Nov 00 06:08 AM
 Report Created on: 09 Jul 48 12:38 PM

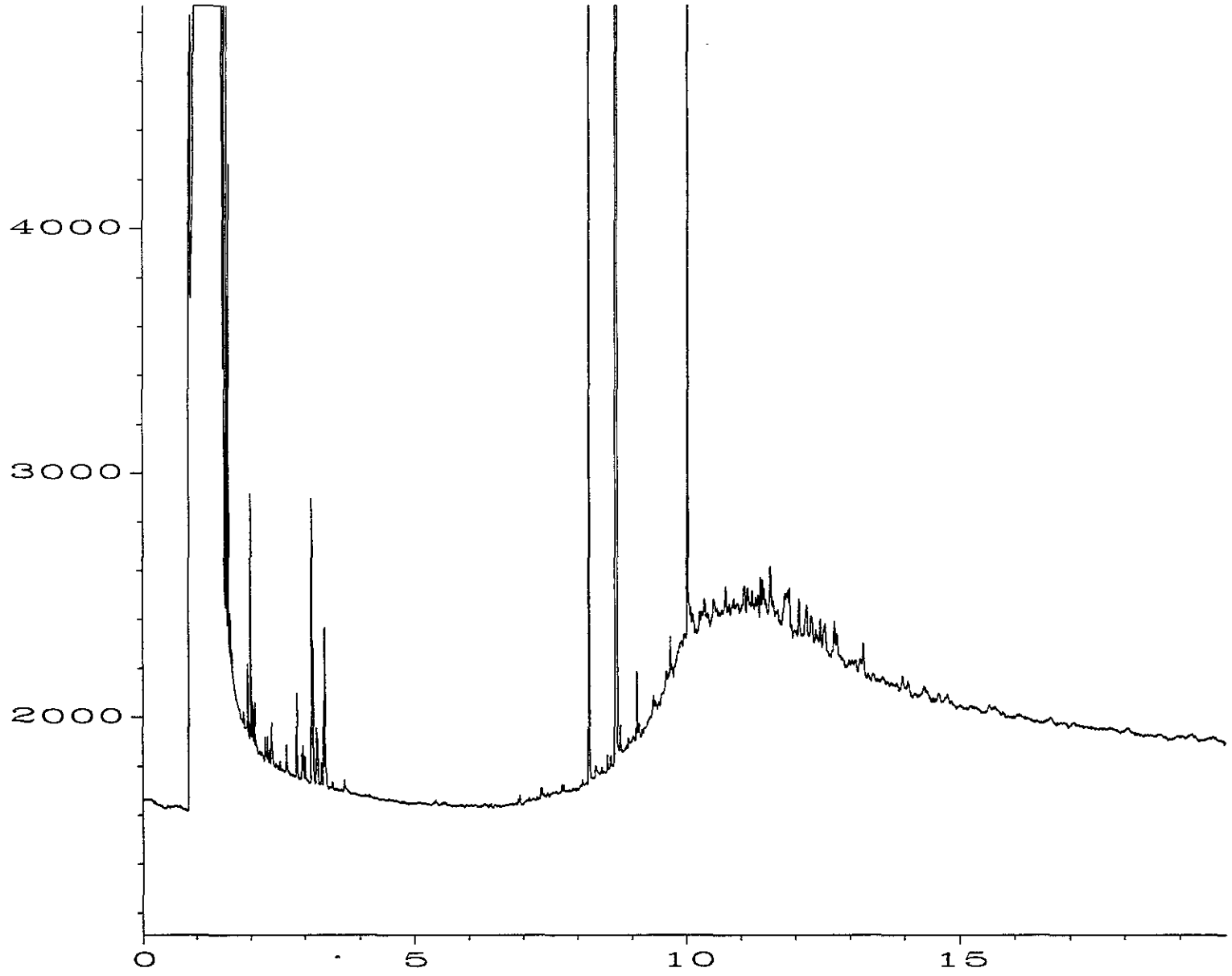
Page Number : 1
 Vial Number : 24
 Injection Number : 1
 Sequence Line : 20
 Instrument Method: TPHD.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\025F2401.D

Operator : ME
 Instrument : GC4
 Sample Name : 010157-10
 Run Time Bar Code : 04 Nov 00 08:49 AM
 Acquired on : 09 Jul 48 12:38 PM
 Report Created on:

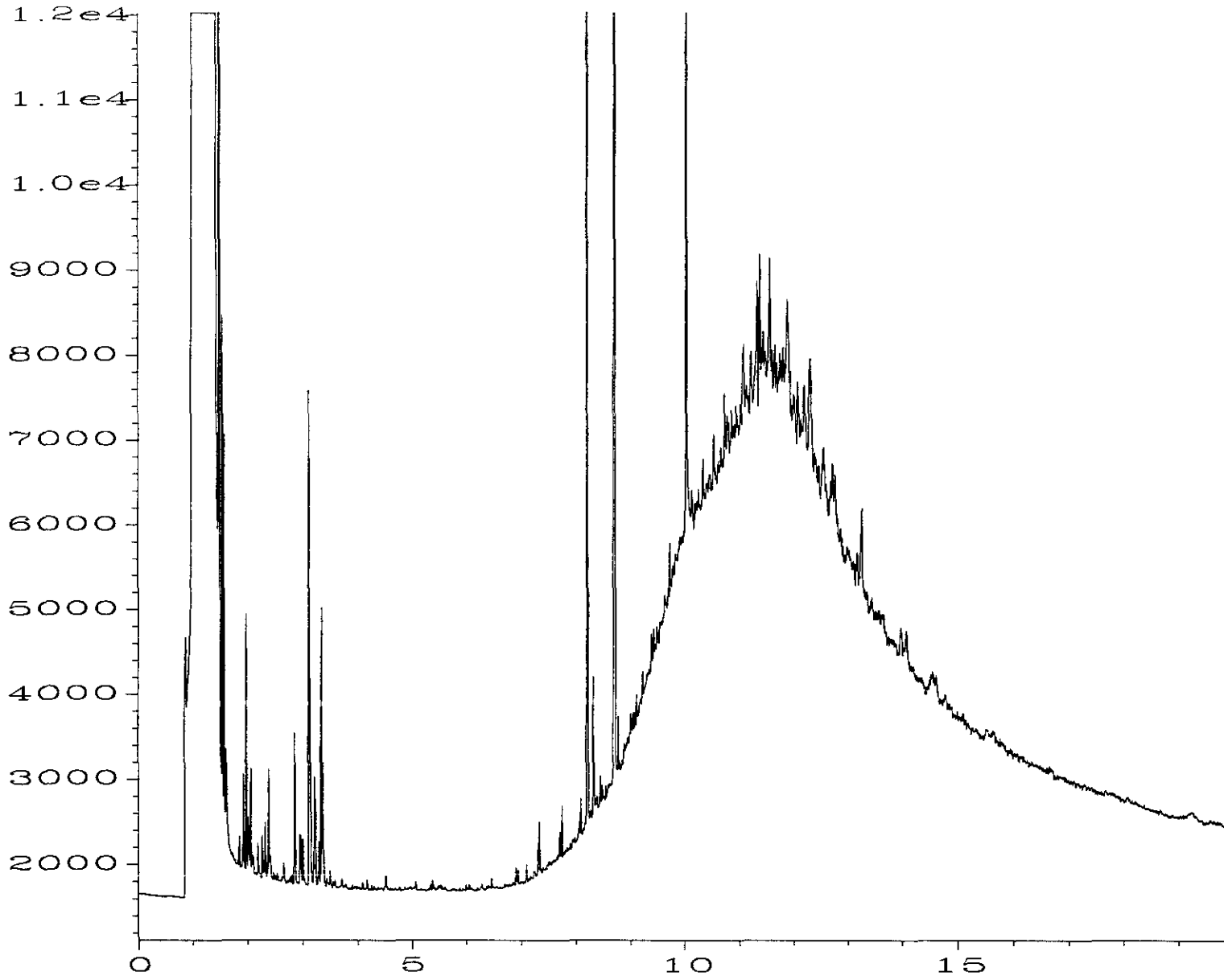
Page Number : 1
 Vial Number : 25
 Injection Number : 1
 Sequence Line : 24
 Instrument Method: TPHD.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\026F2401.D

Operator : ME
Instrument : GC4
Sample Name : 010157-11 1:10
Run Time Bar Code : 04 NOV 00 09:20 AM
Acquired on : 09 Jul 48 12:39 PM
Report Created on:

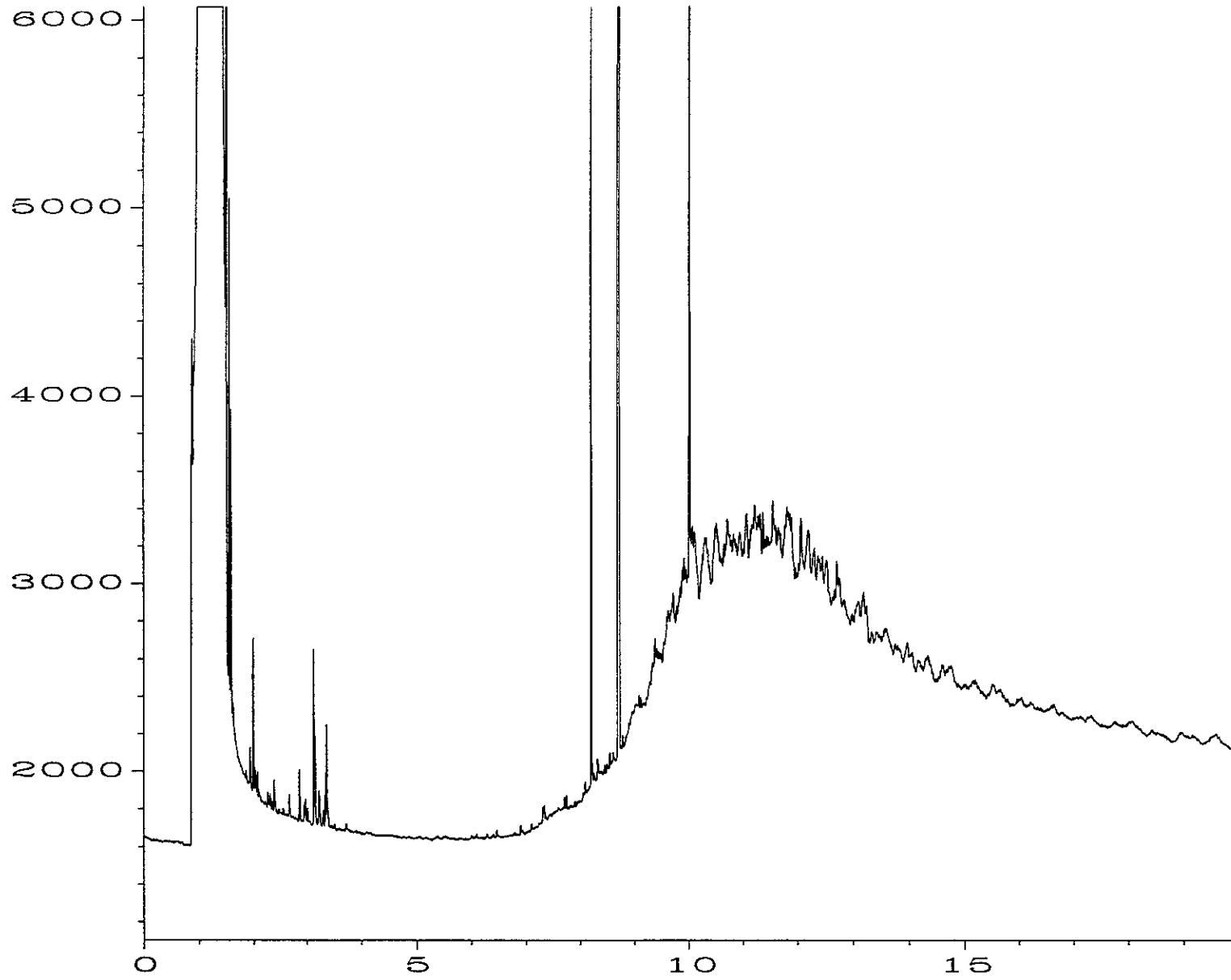
Page Number : 1
Vial Number : 26
Injection Number : 1
Sequence Line : 24
Instrument Method: TPHD.MTH
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\027F2401.D

Operator : ME
 Instrument : GC4
 Sample Name : 010157-12 qc
 Run Time Bar Code :
 Acquired on : 04 Nov 00 09:47 AM
 Report Created on: 09 Jul 48 12:39 PM

Page Number : 1
 Vial Number : 27
 Injection Number : 1
 Sequence Line : 24
 Instrument Method: TPHD.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\030F2401.D

Operator : ME

Instrument : GC4

Sample Name : 010157-13 1:10

Run Time Bar Code:

Acquired on : 04 Nov 00 11:07 AM

Report Created on: 09 Jul 48 12:48 PM

Page Number : 1

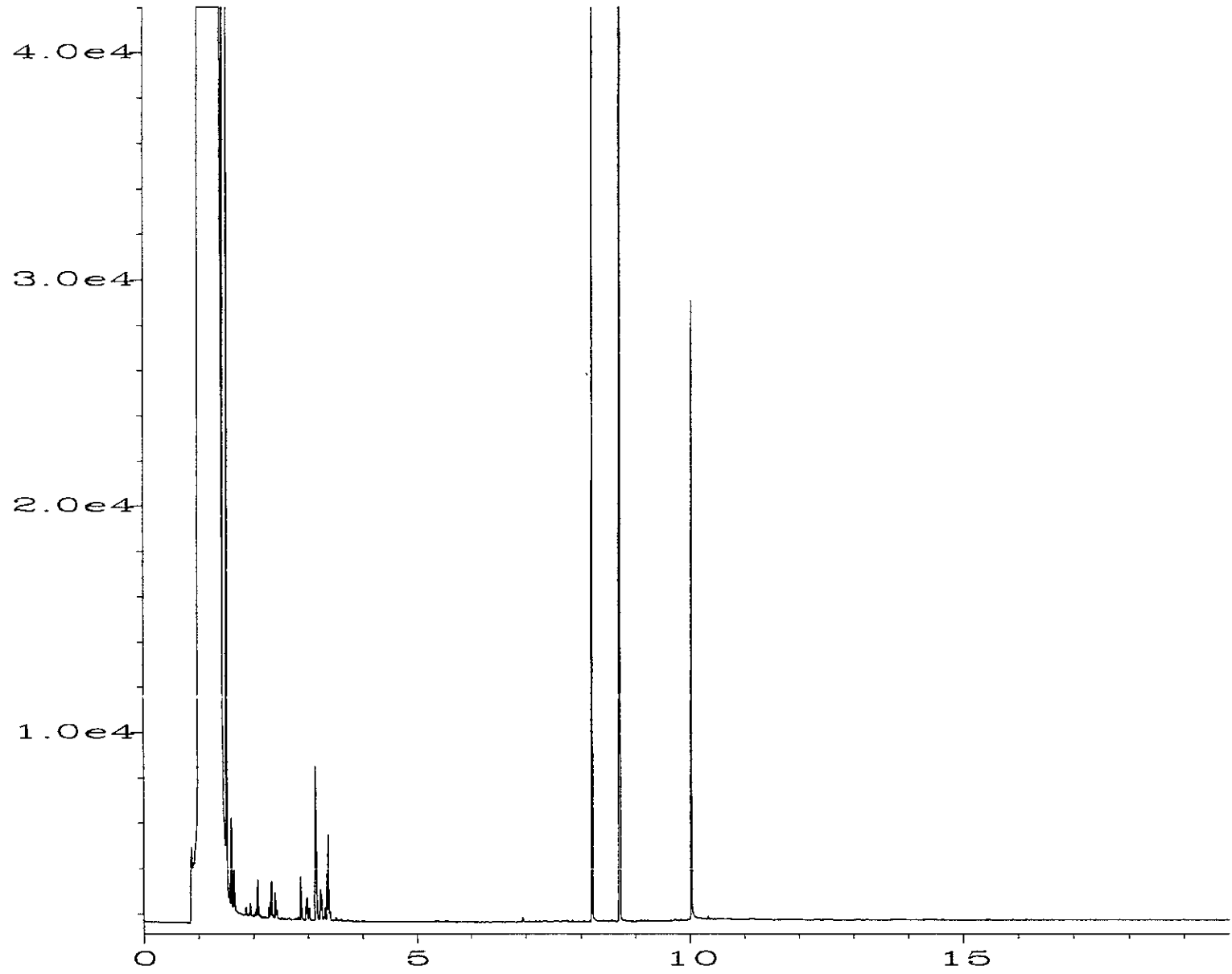
Vial Number : 30

Injection Number : 1

Sequence Line : 24

Instrument Method: TPHD.MTH

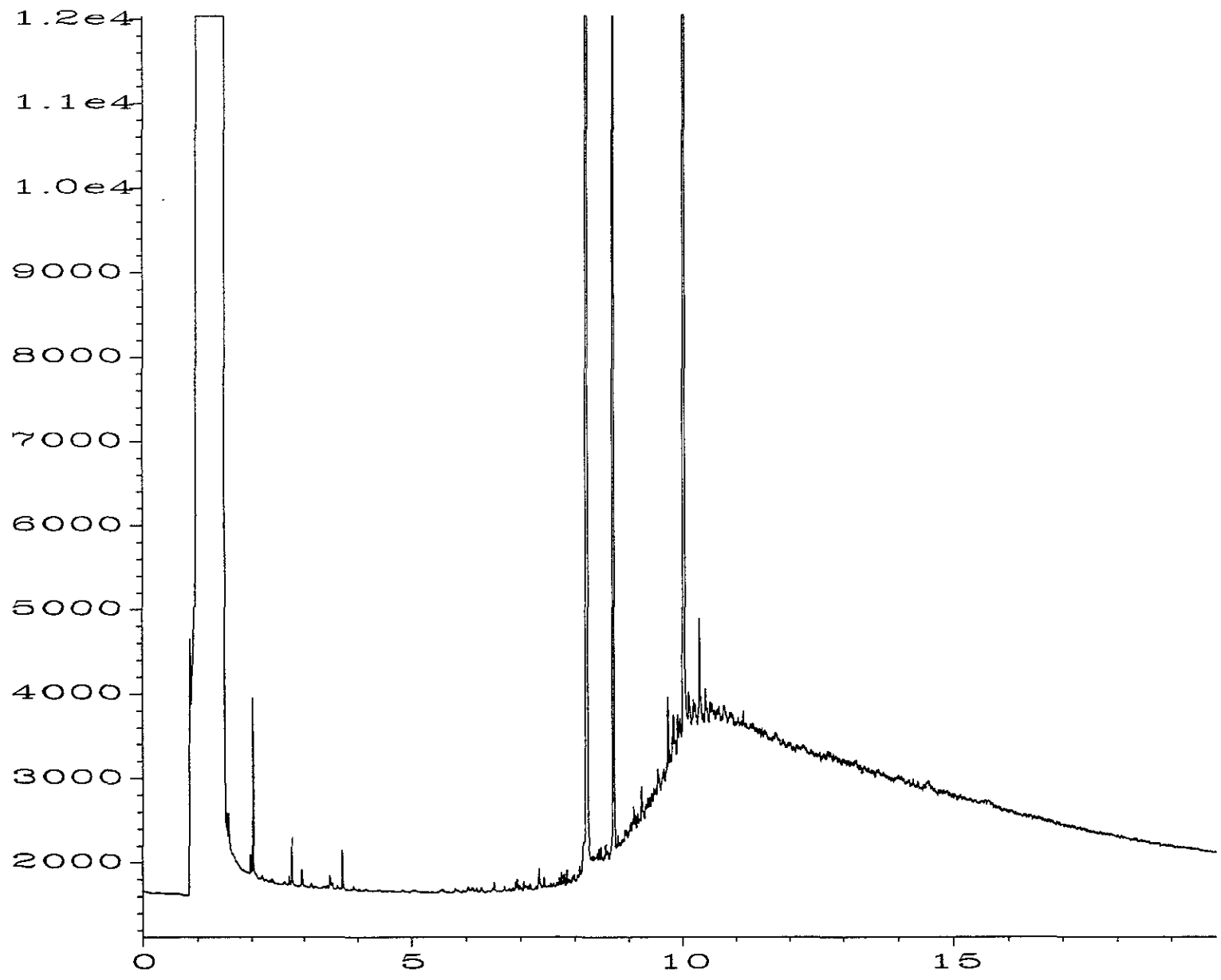
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\013F1601.D

Operator : ME
 Instrument : GC4
 Sample Name : 00-720 mb
 Run Time Bar Code: : 04 Nov 00 00:10 AM
 Report Created on: 09 Jul 48 12:36 PM

Page Number : 1
 Vial Number : 13
 Injection Number : 1
 Sequence Line : 16
 Instrument Method: TPHD.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC4\11-03-00\011F1401.D

Operator : ME
Instrument : GC4
Sample Name : 500 mo 9-109
Run Time Bar Code :
Acquired on : 03 Nov 00 10:50 PM
Report Created on: 09 Jul 48 12:36 PM

Page Number : 1
Vial Number : 11
Injection Number : 1
Sequence Line : 14
Instrument Method: TPHD.MTH
Analysis Method : DEFAULT.MTH

010145

105 10/26/00 002

CHAIN-OF-CUSTODY RECORD

No 0906

Date: 10/24/00

Page 1 of 2

Project No.: 6262

Samplers (Signatures):

Bryan Turner
Pat Smith

ANALYSES

REMARKS

Additional Comments

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8020 (BTEX only)	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as 8015M	PAHs 3270C SIMS	Cooled	Soil (S), Water (W), or Vapor (V)	Acidified	Number of containers
10/24/00	0855	GMX-TRU-16B-1.0								X	X	Y	S	N	1
	0855	GMX-TRU-16C-1.0								X	X	Y	S	N	1
	0935	GMX-TRU-16B-3.5								X	X	Y	S	N	1
	0935	GMX-TRU-16D-1.0								X	X	Y	S	N	1
	1020	GMX-TRU-17A-1.0								X	X	Y	S	N	1
	1020	GMX-TRU-17B-1.0								X	X	Y	S	N	1
	1050	GMX-TRU-17B-3.5								X	X	Y	S	N	1
	1045	GMX-TRU-17E-1.0								X	X	Y	S	N	1
	1150	GMX-TRU-30B-1.0								X	X	Y	S	N	1
	1155	GMX-TRU-30C-1.0								X	X	Y	S	N	1
	1230	GMX-TRU-30D-1.0								X	X	Y	S	N	1
✓	1250	GMX-TRU-30B-3.0								X	X	Y	S	N	1

brass 2"x6" soil tube

Friedman + Bruya

Turnaround time: Standard

Results to: Ann Holbrow

Total No. of containers

12

Relinquished by (signature):

Bryan Turner

Printed Name:

Bryan Turner

Company:

Geomatrix

Received by (signature):

Pam Fitzpatrick

Printed Name:

Pam Fitzpatrick

Company:

Date:

10/24/00

Time:

1900

Relinquished by (signature):

Printed Name:

Company:

Date:

Time:

Relinquished by (signature):

Printed Name:

Company:

Date:

Time:

Date:

10/26/00

Time:

9:30

Received by (signature):

Printed Name:

Company:

Date:

Time:

Received by (signature):

Printed Name:

Company:

Method of Shipment:

Fed Ex # 8200 7653 2008

Laboratory Comments and Log No



010145

CS 10/26/00 102

CHAIN-OF-CUSTODY RECORD

Nº 0907

Date: 10/24/00

Page 2 of 2

Project No.: 6262

ANALYSES

REMARKS

Samplers (Signatures):
Bryan Turner
Ann Holbrow

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8020 (BTEX only)	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH inc 8015M	TPH 8015M	8270C SEMS	Other	Cooled	Soil (S), Water (W), or Vapor (V)	Acidified	Number of containers
10/24/00	1445	GMX-TRN-457-1.0								X	X	X		Y	S	N	1
	1520	GMX-TRN-457-1.0								X	X	X		Y	S	N	1
	1530	GMX-TRN-458-1.0								X	X	X		Y	S	N	1
	1555	GMX-TRN-458-3.5								X	X	X		Y	S	N	1
	1620	GMX-TRN-476-1.0								X	X	X		Y	S	N	1
	1625	GMX-TRN-47C-1.0								X	X	X		Y	S	N	1
	1655	GMX-TRN-47B35								X	X	X		Y	S	N	1
↓	1655	GMX-TRN-47D-1.0								X	X	X		Y	S	N	1
	1645	GMX-TRN-47D-0.5												Y	O	N	1

Additional Comments
Note: GMX-TRN-47D-0.5 has been removed and is not included

brass 2"x6" soil tube

Piece of asphalt in plastic bag

Friedman + Bruya

Turnaround time: Standard

Results to: Ann Holbrow

Total No. of containers: 8

Relinquished by (signature): *Bryan Turner*
 Date: 10/24/00
 Printed Name: Bryan Turner
 Time: 1900
 Company: Geomatrix

Relinquished by (signature):
 Date:
 Printed Name:
 Time:
 Company:

Relinquished by (signature):
 Date:
 Printed Name:
 Time:
 Company:


Method of Shipment: Fed Ex # 8200 7653 2008

Received by (signature): *Tom L...*
 Date: 10/24/00
 Printed Name: Tom L...
 Time: 9:30
 Company:

Received by (signature):
 Date:
 Printed Name:
 Time:
 Company:

Received by (signature):
 Date:
 Printed Name:
 Time:
 Company:

Laboratory Comments and Log No.:



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Jensen, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

November 10, 2000

Ann Holbrow, Project Manager
Geomatrix Consultants, Inc.
2101 Webster Street, 12th Floor
Oakland, CA 94612

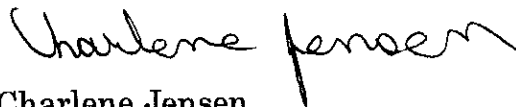
Dear Ms. Holbrow:

Included are the results from the testing of material submitted on October 26, 2000 from your 6262 project. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Charlene Jensen
Chemist

Enclosures
GMC1110R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 26, 2000 by Friedman & Bruya, Inc. from the Geomatrix Consultants, Inc. 6262 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Geomatrix Consultants, Inc.</u>
010145-01	GMX-TRN-16B-1.0
010145-02	GMX-TRN-16C-1.0
010145-03	GMX-TRN-16B-3.5
010145-04	GMX-TRN-16D-1.0
010145-05	GMX-TRN-17C-1.0
010145-06	GMX-TRN-17B-1.0
010145-07	GMX-TRN-17B-3.5
010145-08	GMX-TRN-17D-1.0
010145-09	GMX-TRN-30B-1.0
010145-10	GMX-TRN-30C-1.0
010145-11	GMX-TRN-30D-1.0
010145-12	GMX-TRN-30B-3.0
010145-13	GMX-TRN-45C-1.0
010145-14	GMX-TRN-45D-1.0
010145-15	GMX-TRN-45B-1.0
010145-16	GMX-TRN-45B-3.5
010145-17	GMX-TRN-47B-1.0
010145-18	GMX-TRN-47C-1.0
010145-19	GMX-TRN-47B-3.5
010145-20	GMX-TRN-47D-1.0

All quality control requirements were within acceptable limits.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00
 Date Received: 10/26/00
 Project: 6262
 Date Extracted: 10/26/00
 Date Analyzed: 10/30/00 and 10/31/00

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
 USING EPA METHOD 8015M**
 Results Reported as µg/g (ppm)

<u>Sample ID</u> Laboratory ID	<u>Motor Oil Range</u>	<u>Surrogate</u> (% Recovery)
GMX-TRN-16B-1.0 010145-01	370	100
GMX-TRN-16C-1.0 010145-02	600	89
GMX-TRN-16B-3.5 010145-03	<50	102
GMX-TRN-16D-1.0 010145-04	150	108
GMX-TRN-17C-1.0 010145-05	580	95
GMX-TRN-17B-1.0 010145-06 d	1,100	84
GMX-TRN-17B-3.5 010145-07	<50	102
GMX-TRN-17D-1.0 010145-08 d	1,100	94
GMX-TRN-30B-1.0 010145-09	230	99
GMX-TRN-30C-1.0 010145-10 d	2,900	110
GMX-TRN-30D-1.0 010145-11	740	108

d - The sample was diluted. Surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00
 Date Received: 10/26/00
 Project: 6262
 Date Extracted: 10/26/00
 Date Analyzed: 10/30/00 and 10/31/00

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
 USING EPA METHOD 8015M
 Results Reported as µg/g (ppm)**

<u>Sample ID</u> Laboratory ID	<u>Motor Oil Range</u>	<u>Surrogate</u> (% Recovery)
GMX-TRN-30B-3.0 010145-12	<50	92
GMX-TRN-45C-1.0 010145-13	380	103
GMX-TRN-45D-1.0 010145-14 d	1,400	99
GMX-TRN-45B-1.0 010145-15 d	1,200	101
GMX-TRN-45B-3.5 010145-16	<50	124
GMX-TRN-47B-1.0 010145-17	150	98
GMX-TRN-47C-1.0 010145-18	270	112
GMX-TRN-47B-3.5 010145-19	<50	100
GMX-TRN-47D-1.0 010145-20 d	540	102
Method Blank	<50	100

d - The sample was diluted. Surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-16B-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-01
Date Analyzed:	11/03/00	Data File:	110238.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	70	31	123
Benzo(a)anthracene-d12	86	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	8
Anthracene	<5
Fluoranthene	17
Pyrene	21
Benz(a)anthracene	12
Chrysene	22
Benzo(b)fluoranthene	15
Benzo(k)fluoranthene	12
Benzo(a)pyrene	16
Indeno(1,2,3-cd)pyrene	9
Dibenzo(a,h)anthracene	6
Benzo(g,h,i)perylene	14

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-16C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-02
Date Analyzed:	11/03/00	Data File:	110321.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	78	31	123
Benzo(a)anthracene-d12	96	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	12
Anthracene	<5
Fluoranthene	20
Pyrene	34
Benz(a)anthracene	20
Chrysene	56
Benzo(b)fluoranthene	19
Benzo(k)fluoranthene	10
Benzo(a)pyrene	22
Indeno(1,2,3-cd)pyrene	13
Dibenzo(a,h)anthracene	7
Benzo(g,h,i)perylene	24

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-16B-3.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-03 qc
Date Analyzed:	10/30/00	Data File:	103024.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	77	31	123
Benzo(a)anthracene-d12	75	47	127

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-16D-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-04
Date Analyzed:	10/31/00	Data File:	103028.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	75	31	123
Benzo(a)anthracene-d12	92	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-17C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-05
Date Analyzed:	11/03/00	Data File:	110239.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	82	31	123
Benzo(a)anthracene-d12	102	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	9
Anthracene	<5
Fluoranthene	9
Pyrene	16
Benz(a)anthracene	6
Chrysene	14
Benzo(b)fluoranthene	8
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	10
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-17B-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-06
Date Analyzed:	11/03/00	Data File:	110322.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	76	31	123
Benzo(a)anthracene-d12	91	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	9
Pyrene	13
Benz(a)anthracene	7
Chrysene	16
Benzo(b)fluoranthene	11
Benzo(k)fluoranthene	7
Benzo(a)pyrene	11
Indeno(1,2,3-cd)pyrene	8
Dibenzo(a,h)anthracene	6
Benzo(g,h,i)perylene	14

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-17B-3.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-07
Date Analyzed:	10/31/00	Data File:	103029.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	72	31	123
Benzo(a)anthracene-d12	94	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-17D-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-08
Date Analyzed:	11/03/00	Data File:	110330.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	80	31	123
Benzo(a)anthracene-d12	96	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	22
Anthracene	<5
Fluoranthene	55
Pyrene	59
Benz(a)anthracene	19
Chrysene	32
Benzo(b)fluoranthene	22
Benzo(k)fluoranthene	17
Benzo(a)pyrene	25
Indeno(1,2,3-cd)pyrene	12
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	16

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-30B-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-09 1/10
Date Analyzed:	11/03/00	Data File:	110233.D
Matrix:	Soil	Instrument:	GCMS8
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	100	31	123
Benzo(a)anthracene-d12	102	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	68
Anthracene	<50
Fluoranthene	210
Pyrene	230
Benz(a)anthracene	75
Chrysene	100
Benzo(b)fluoranthene	65
Benzo(k)fluoranthene	59
Benzo(a)pyrene	72
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	53

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-30C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-10 1/10
Date Analyzed:	11/03/00	Data File:	110234.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	84	31	123
Benzo(a)anthracene-d12	103	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	59
Phenanthrene	210
Anthracene	<50
Fluoranthene	<50
Pyrene	140
Benz(a)anthracene	89
Chrysene	190
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	66

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-30D-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-11 1/10
Date Analyzed:	11/03/00	Data File:	110235.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	85	31	123
Benzo(a)anthracene-d12	99	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	110
Anthracene	<50
Fluoranthene	71
Pyrene	120
Benz(a)anthracene	67
Chrysene	140
Benzo(b)fluoranthene	55
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	69
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	59

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-30B-3.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-12
Date Analyzed:	11/03/00	Data File:	110236.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	80	31	123
Benzo(a)anthracene-d12	99	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-45C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-13 1/10
Date Analyzed:	11/08/00	Data File:	110818.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	129 vo	31	123
Benzo(a)anthracene-d12	80	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	<50
Pyrene	<50
Benz(a)anthracene	<50
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	<50

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

vo - The value reported fell outside the control limits established for this analyte.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-45D-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-14 1/10
Date Analyzed:	11/08/00	Data File:	110740.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	132 vo	31	123
Benzo(a)anthracene-d12	77	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	<50
Pyrene	<50
Benz(a)anthracene	<50
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	<50

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

vo - The value reported fell outside the control limits established for this analyte.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-45B-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-15
Date Analyzed:	11/03/00	Data File:	110237.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	79	31	123
Benzo(a)anthracene-d12	99	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	7
Anthracene	<5
Fluoranthene	10
Pyrene	16
Benz(a)anthracene	9
Chrysene	26
Benzo(b)fluoranthene	18
Benzo(k)fluoranthene	6
Benzo(a)pyrene	13
Indeno(1,2,3-cd)pyrene	8
Dibenzo(a,h)anthracene	7
Benzo(g,h,i)perylene	22

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-45B-3.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-16
Date Analyzed:	10/31/00	Data File:	103032.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	71	31	123
Benzo(a)anthracene-d12	84	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-47B-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-17
Date Analyzed:	11/02/00	Data File:	110230.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	90	31	123
Benzo(a)anthracene-d12	107	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	10
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-47C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-18
Date Analyzed:	11/02/00	Data File:	110231.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	85	31	123
Benzo(a)anthracene-d12	103	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-47B-3.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-19
Date Analyzed:	10/31/00	Data File:	103030.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	68	31	123
Benzo(a)anthracene-d12	83	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-47D-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/26/00	Project:	6262
Date Extracted:	10/27/00	Lab ID:	010145-20
Date Analyzed:	11/03/00	Data File:	110232.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	88	31	123
Benzo(a)anthracene-d12	109	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	5
Benz(a)anthracene	<5
Chrysene	13
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID: Method Blank	Client: Geomatrix Consultants, Inc.
Date Received: 10/26/00	Project: 6262
Date Extracted: 10/27/00	Lab ID: 00-709mb
Date Analyzed: 10/30/00	Data File: 103021.D
Matrix: Soil	Instrument: GCMS3
Units: ug/kg (ppb)	Operator: YA

	% Recovery	Lower Limit	Upper Limit
Surrogates:			
Anthracene-d10	77	31	123
Benzo(a)anthracene-d12	77	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00

Date Received: 10/26/00

Project: 6262

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING EPA METHOD 8015M**

Laboratory Code: 010145-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Motor Oil	µg/g (ppm)	<50	<50	nm	0-20

Laboratory Code: 010145-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	Acceptance Criteria
Motor Oil	µg/g (ppm)	250	<50	84	65-135

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	Acceptance Criteria
Motor Oil	µg/g (ppm)	250	74	65-135

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00

Date Received: 10/26/00

Project: 6262

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 010145-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD	Acceptance Criteria
Napthalene	µg/kg (ppb)	<5	<5	nm	0-20
Acenaphthylene	µg/kg (ppb)	<5	<5	nm	0-20
Acenaphthene	µg/kg (ppb)	<5	<5	nm	0-20
Fluorene	µg/kg (ppb)	<5	<5	nm	0-20
Phenanthrene	µg/kg (ppb)	<5	<5	nm	0-20
Anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Benz(a)anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Chrysene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(b)fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(k)fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(a)pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Dibenzo(a,h)anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(g,h,i)perylene	µg/kg (ppb)	<5	<5	nm	0-20

Laboratory Code: 010145-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	% Recovery MSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	<5	86	85	56-117	1
Acenaphthylene	µg/kg (ppb)	170	<5	103	103	59-115	0
Acenaphthene	µg/kg (ppb)	170	<5	98	101	59-114	3
Fluorene	µg/kg (ppb)	170	<5	97	97	61-113	1
Phenanthrene	µg/kg (ppb)	170	<5	87	93	51-122	6
Anthracene	µg/kg (ppb)	170	<5	90	93	50-116	4
Fluoranthene	µg/kg (ppb)	170	<5	93	101	52-124	8
Pyrene	µg/kg (ppb)	170	<5	97	104	49-124	7
Benz(a)anthracene	µg/kg (ppb)	170	<5	94	97	50-122	4
Chrysene	µg/kg (ppb)	170	<5	84	88	48-121	4
Benzo(b)fluoranthene	µg/kg (ppb)	170	<5	94	98	52-144	3
Benzo(k)fluoranthene	µg/kg (ppb)	170	<5	105	109	55-135	4
Benzo(a)pyrene	µg/kg (ppb)	170	<5	92	96	49-128	4
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	<5	103	109	37-132	5
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	<5	103	108	37-136	4
Benzo(g,h,i)perylene	µg/kg (ppb)	170	<5	98	103	28-132	5

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/10/00

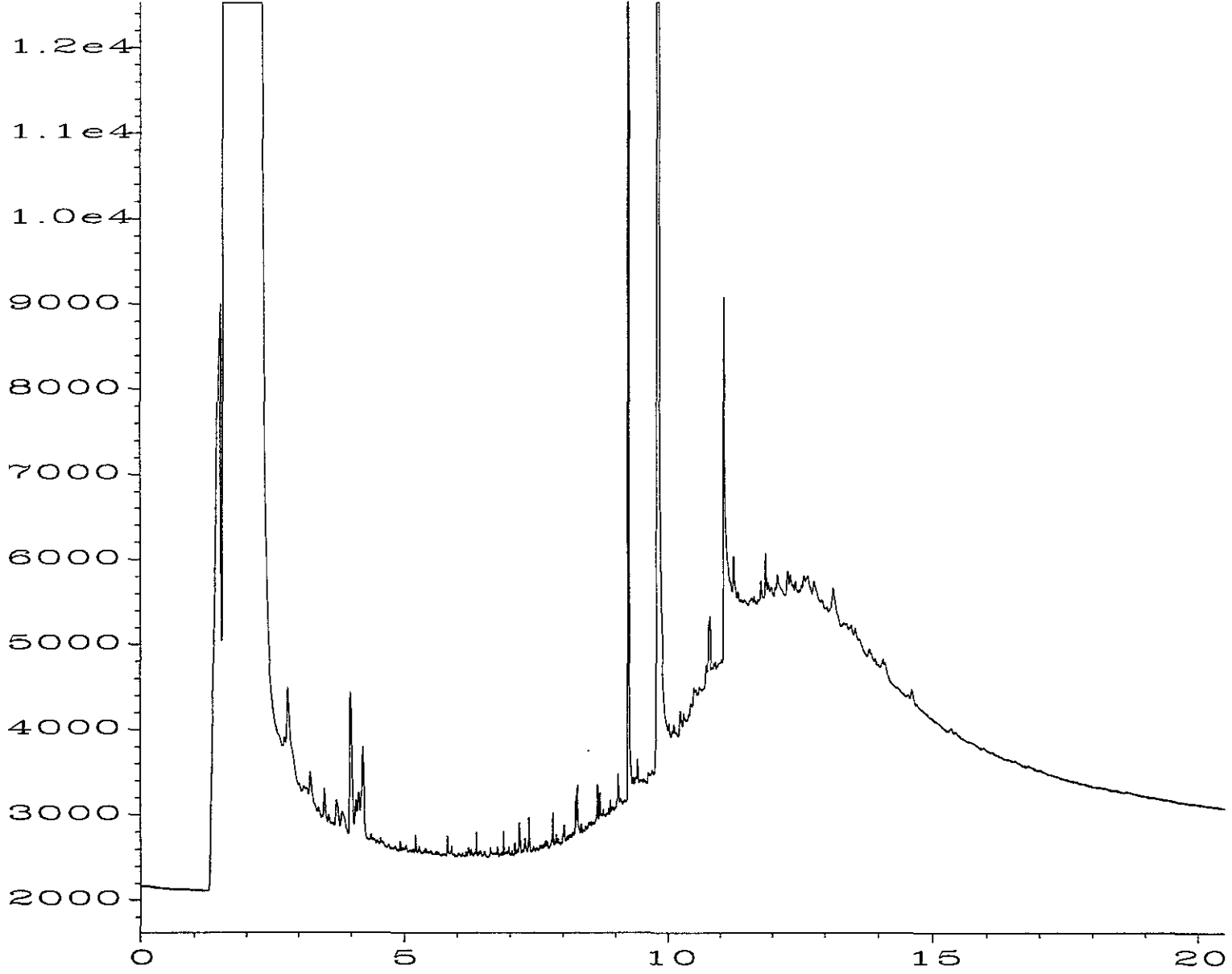
Date Received: 10/26/00

Project: 6262

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	79	86	58-121	8
Acenapthylene	µg/kg (ppb)	170	93	103	54-122	10
Acenapthene	µg/kg (ppb)	170	90	103	58-119	13
Fluorene	µg/kg (ppb)	170	90	99	57-122	9
Phenanthrene	µg/kg (ppb)	170	82	89	57-123	9
Anthracene	µg/kg (ppb)	170	82	93	44-125	13
Fluoranthene	µg/kg (ppb)	170	87	94	54-127	8
Pyrene	µg/kg (ppb)	170	88	95	56-123	8
Benz(a)anthracene	µg/kg (ppb)	170	88	95	50-124	8
Chrysene	µg/kg (ppb)	170	79	86	51-122	8
Benzo(b)fluoranthene	µg/kg (ppb)	170	88	94	44-149	7
Benzo(k)fluoranthene	µg/kg (ppb)	170	100	108	52-140	7
Benzo(a)pyrene	µg/kg (ppb)	170	79	89	42-129	13
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	97	105	48-134	7
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	98	105	49-136	7
Benzo(g,h,i)perylene	µg/kg (ppb)	170	92	99	46-134	7

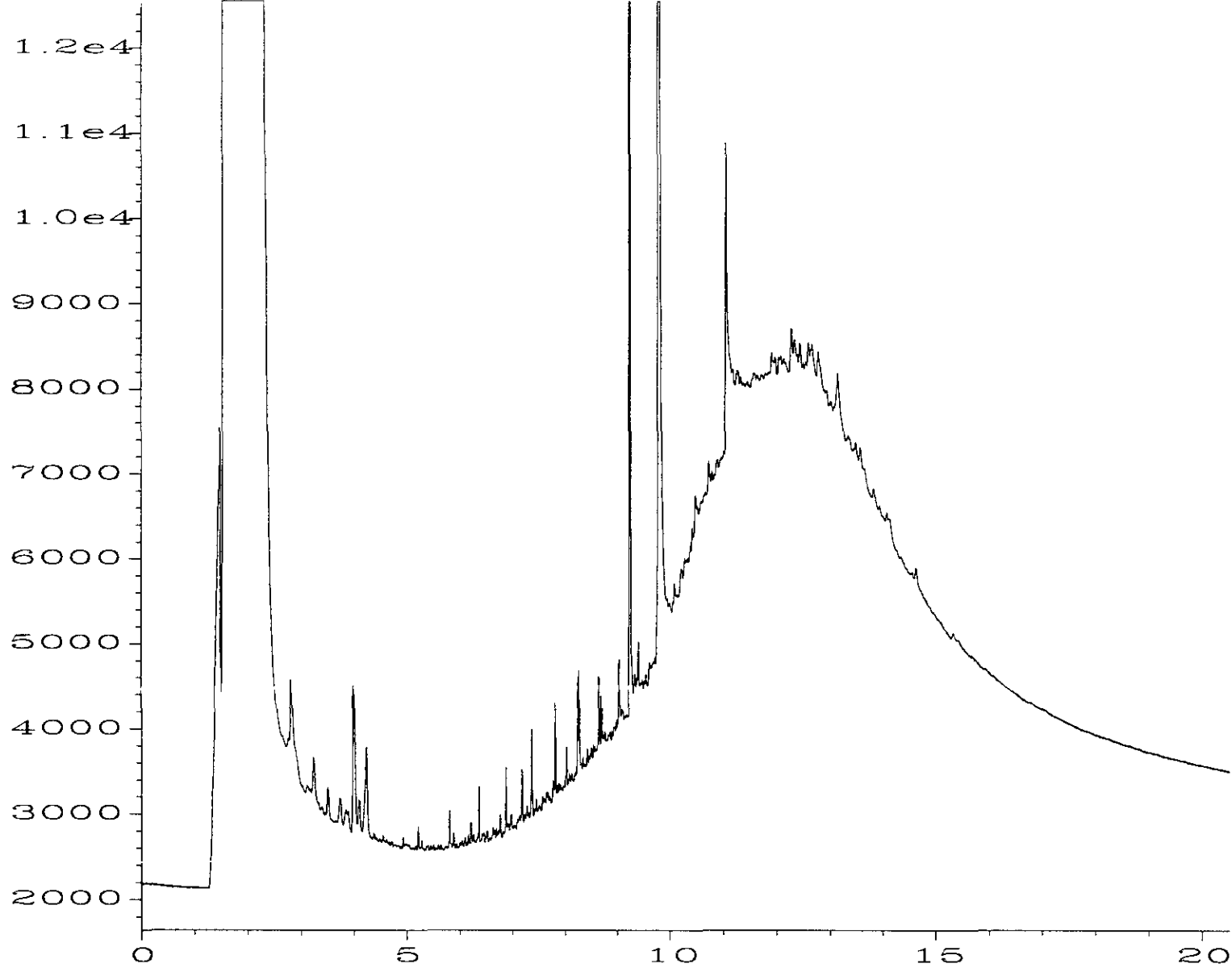


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Operator : me
 Instrument : GC #6
 Sample Name : 010145-01
 Run Time Bar Code:

Acquired on : 30 Oct 00 06:56 PM
 Report Created on: 31 Oct 00 02:27 PM

Page Number : 1
 Vial Number : 6
 Injection Number : 1
 Sequence Line : 6
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH

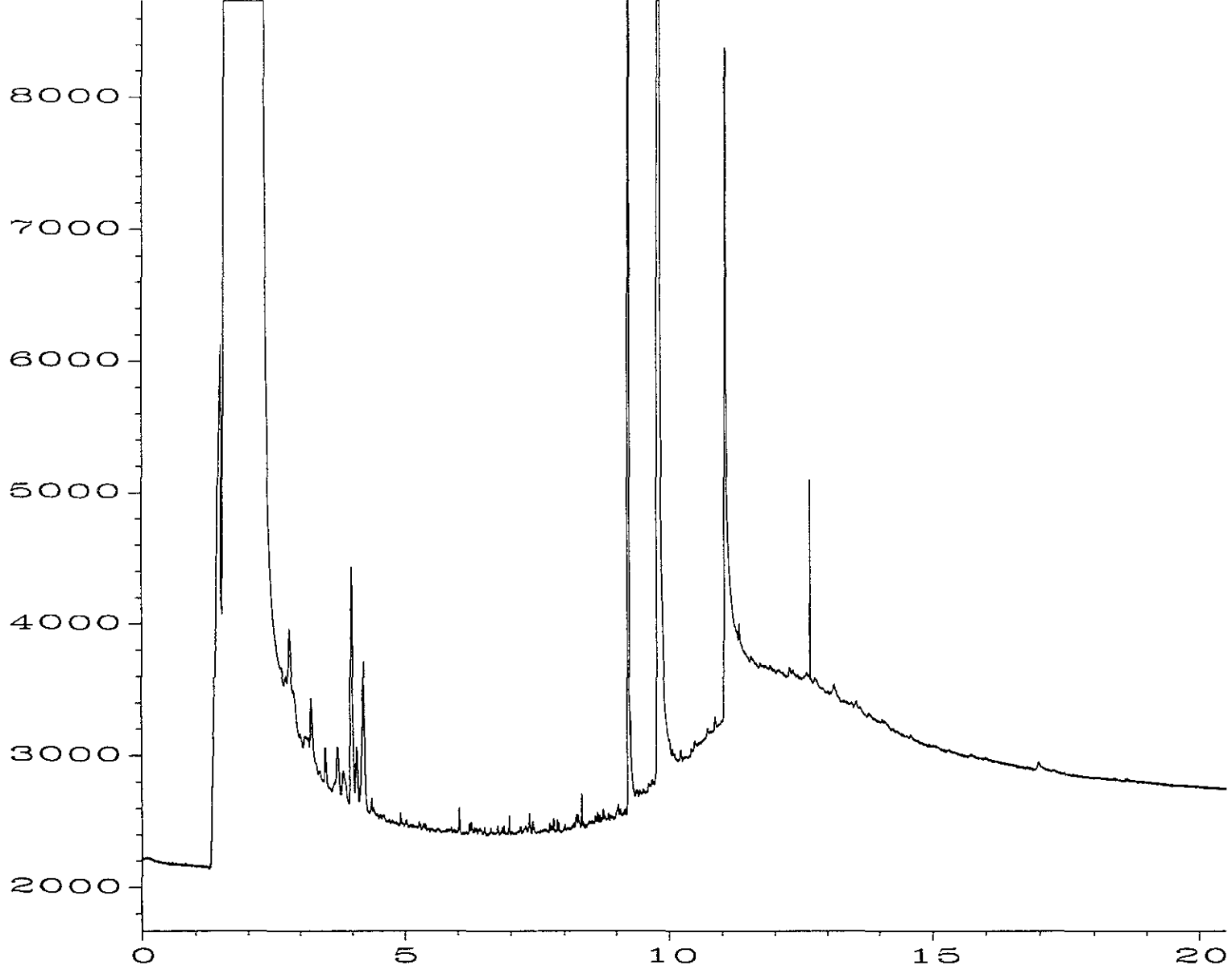


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Operator : me
 Instrument : GC #6
 Sample Name : 010145-02
 Run Time Bar Code:

Acquired on : 30 Oct 00 07:22 PM
 Report Created on: 31 Oct 00 02:28 PM

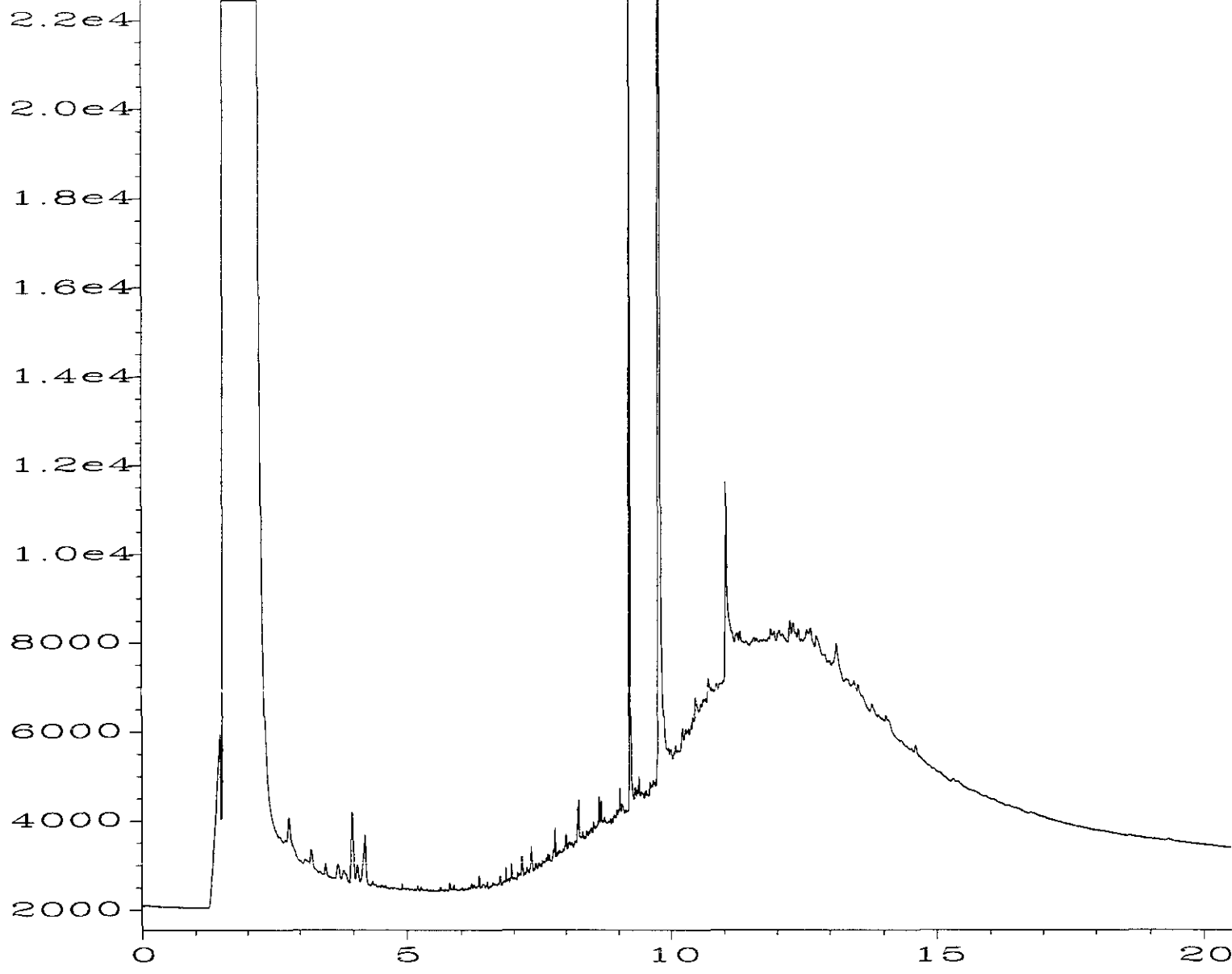
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 Vial Number : 7
 Injection Number : 1
 Sequence Line : 6
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\012F0801.D

Operator : me
 Instrument : GC #6
 Sample Name : 010145-04
 Run Time Bar Code :
 Acquired on : 30 Oct 00 10:02 PM
 Report Created on: 31 Oct 00 02:30 PM

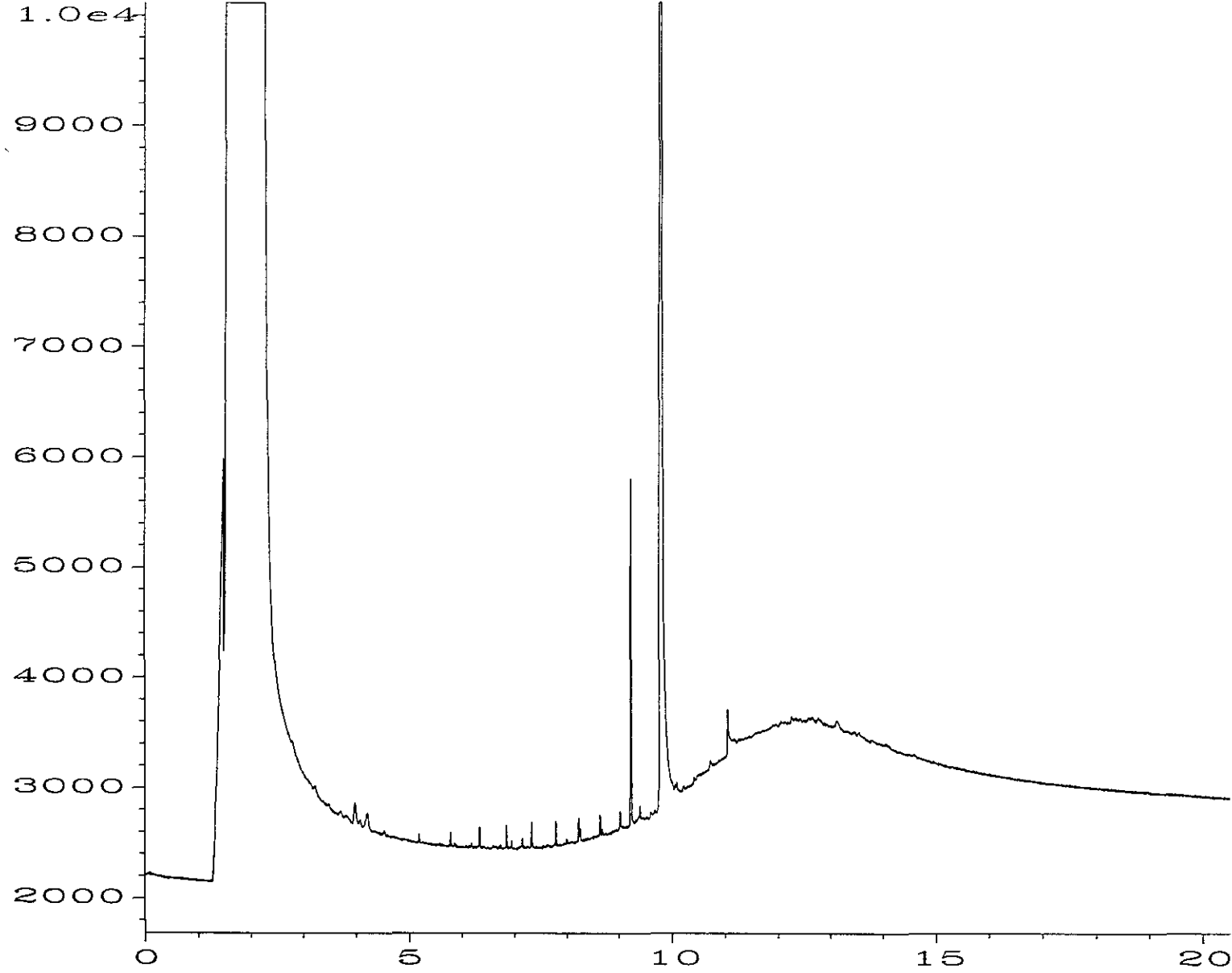
Page Number : 1
 Vial Number : 12
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\013F0801.D

Operator : me
 Instrument : GC #6
 Sample Name : 010145-05
 Run Time Bar Code : 30 Oct 00 10:31 PM
 Acquired on : 31 Oct 00 02:30 PM
 Report Created on:

Page Number : 1
 Vial Number : 13
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\014F0801.D

Operator : me

Instrument : GC #6

Sample Name : 010145-06 1:10

Run Time Bar Code:

Acquired on : 30 Oct 00 10:58 PM

Report Created on: 31 Oct 00 02:31 PM

Page Number : 1

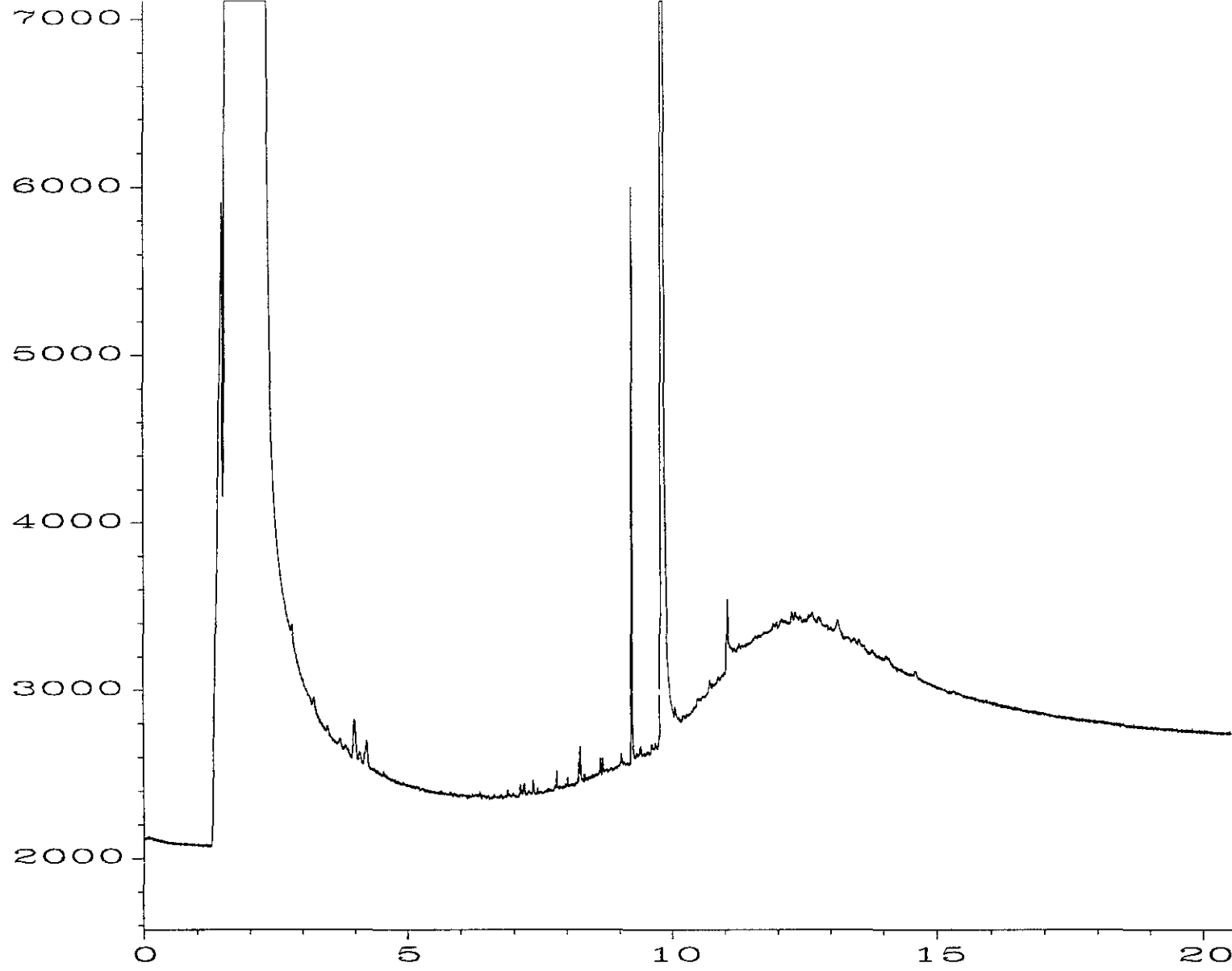
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Injection Number : 1

Sequence Line : 8

Instrument Method: TPHDX.MTH

Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\016F0801.D

Operator : me

Instrument : GC #6

Sample Name : 010145-08 1:10

Run Time Bar Code:

Acquired on : 30 Oct 00 11:51 PM

Report Created on: 31 Oct 00 02:31 PM

Page Number : 1

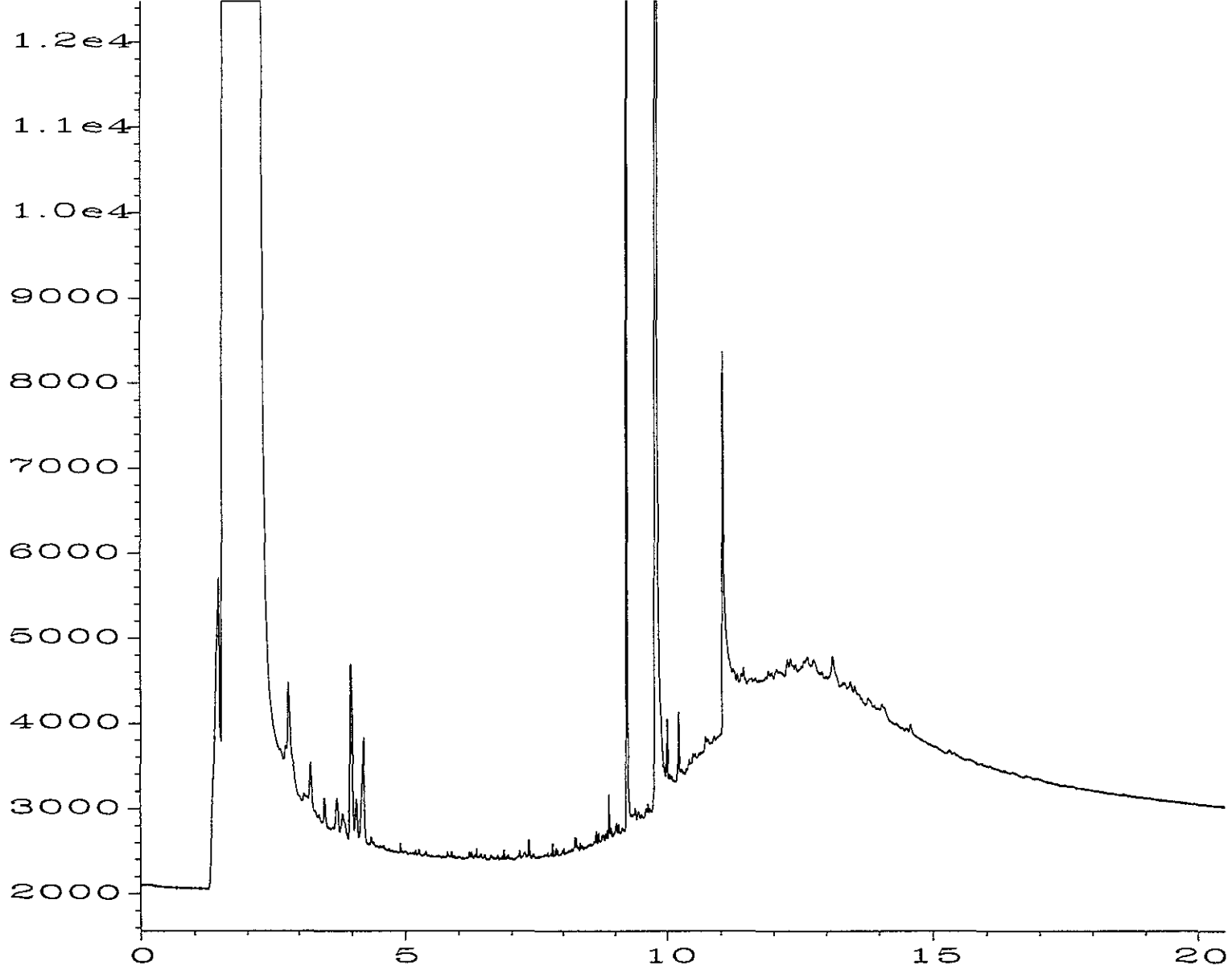
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Injection Number : 1

Sequence Line : 8

Instrument Method: TPHDX.MTH

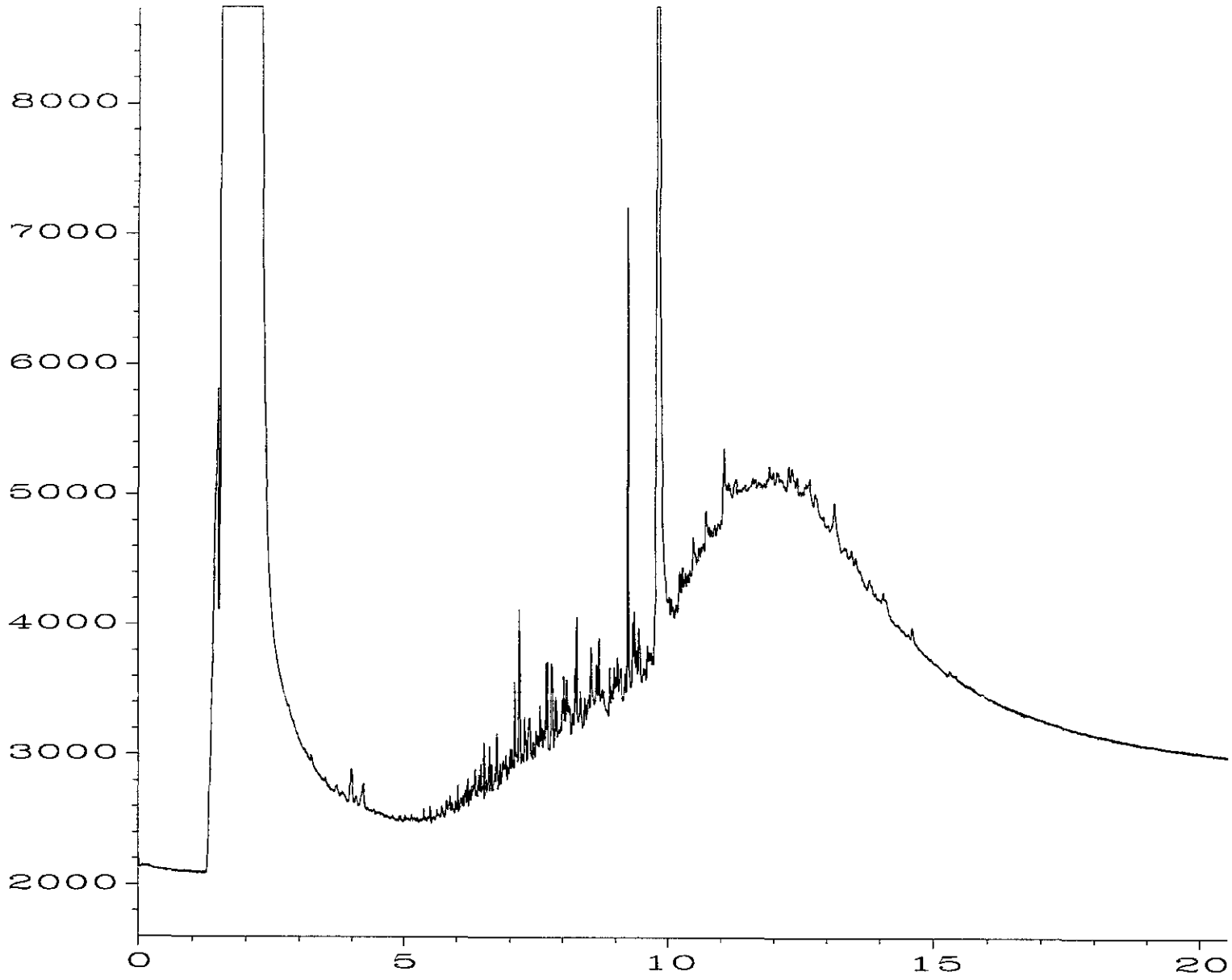
Analysis Method : DEFAULT.MTH



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Operator : me
 Instrument : GC #6
 Sample Name : 010145-09
 Run Time Bar Code :
 Acquired on : 31 Oct 00 00:17 AM
 Report Created on: 31 Oct 00 02:32 PM

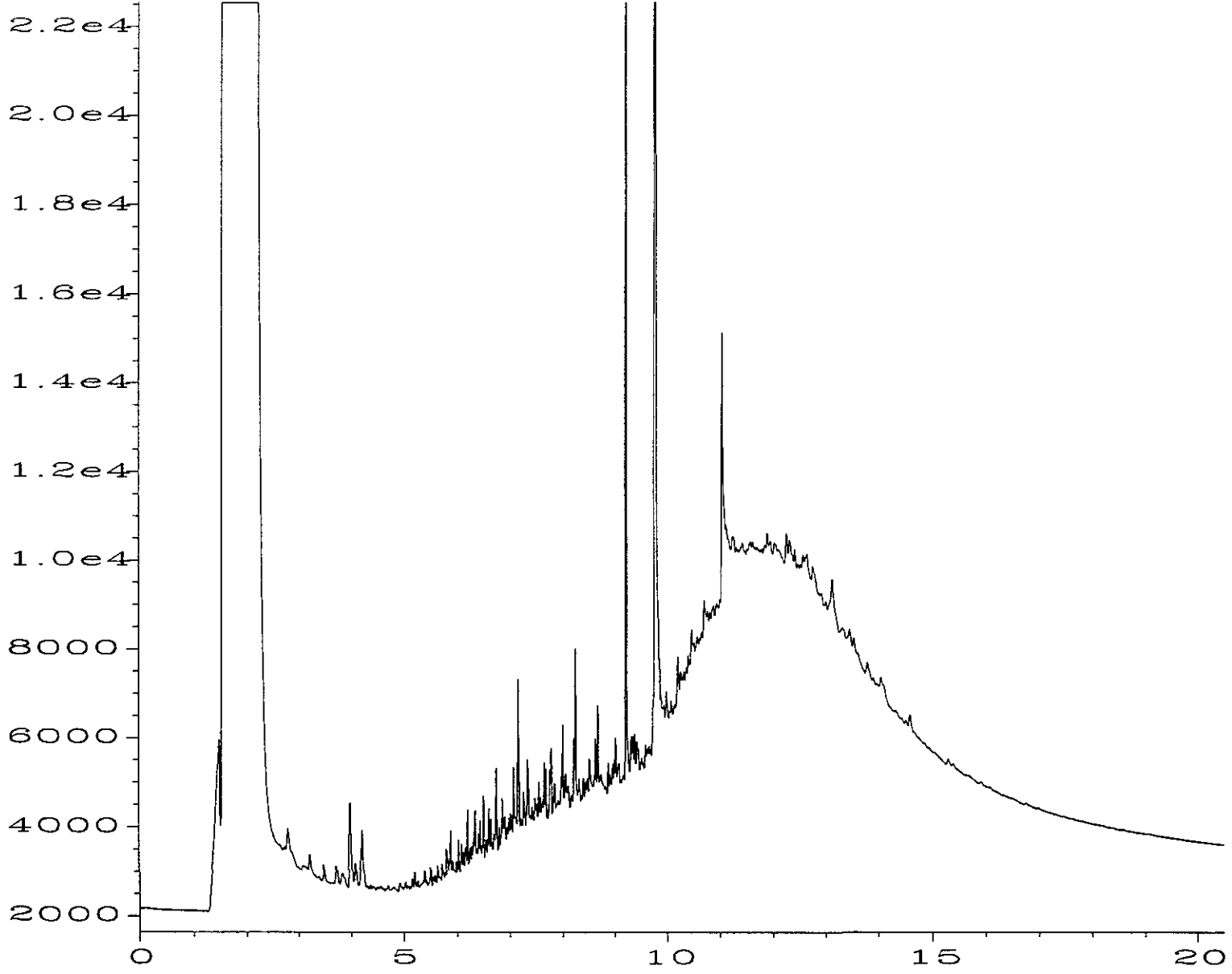
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 Vial Number : 17
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\018F0801.D

Operator : me
 Instrument : GC #6
 Sample Name : 010145-10 1:10
 Run Time Bar Code : 31 Oct 00 00:44 AM
 Report Created on: 31 Oct 00 02:35 PM

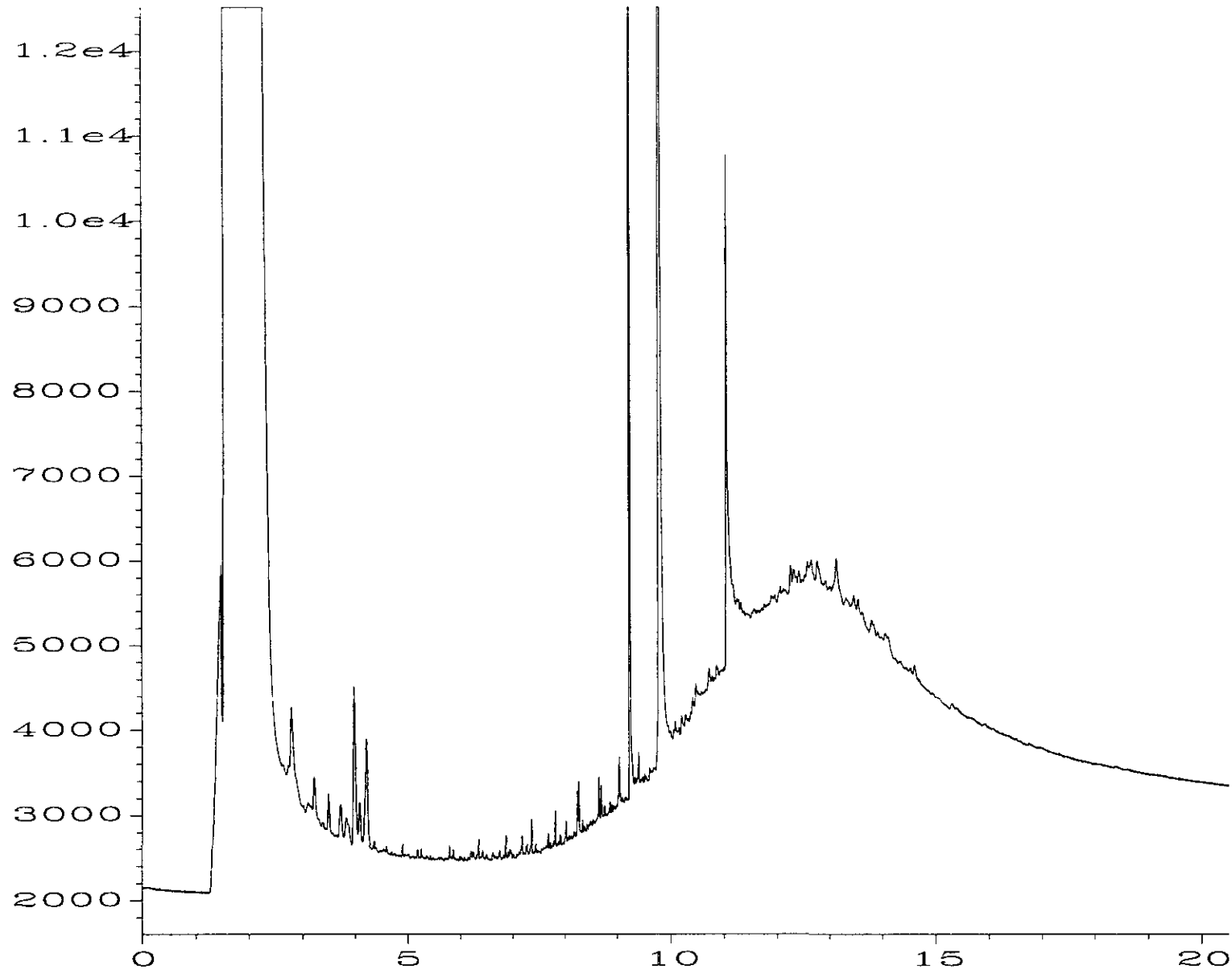
Page Number : 1
 Vial Number : 18
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\019F1201.D

Operator : me
 Instrument : GC #6
 Sample Name : 010145-11
 Run Time Bar Code : 31 Oct 00 02:59 AM
 Acquired on : 31 Oct 00 02:35 PM
 Report Created on: 31 Oct 00 02:35 PM

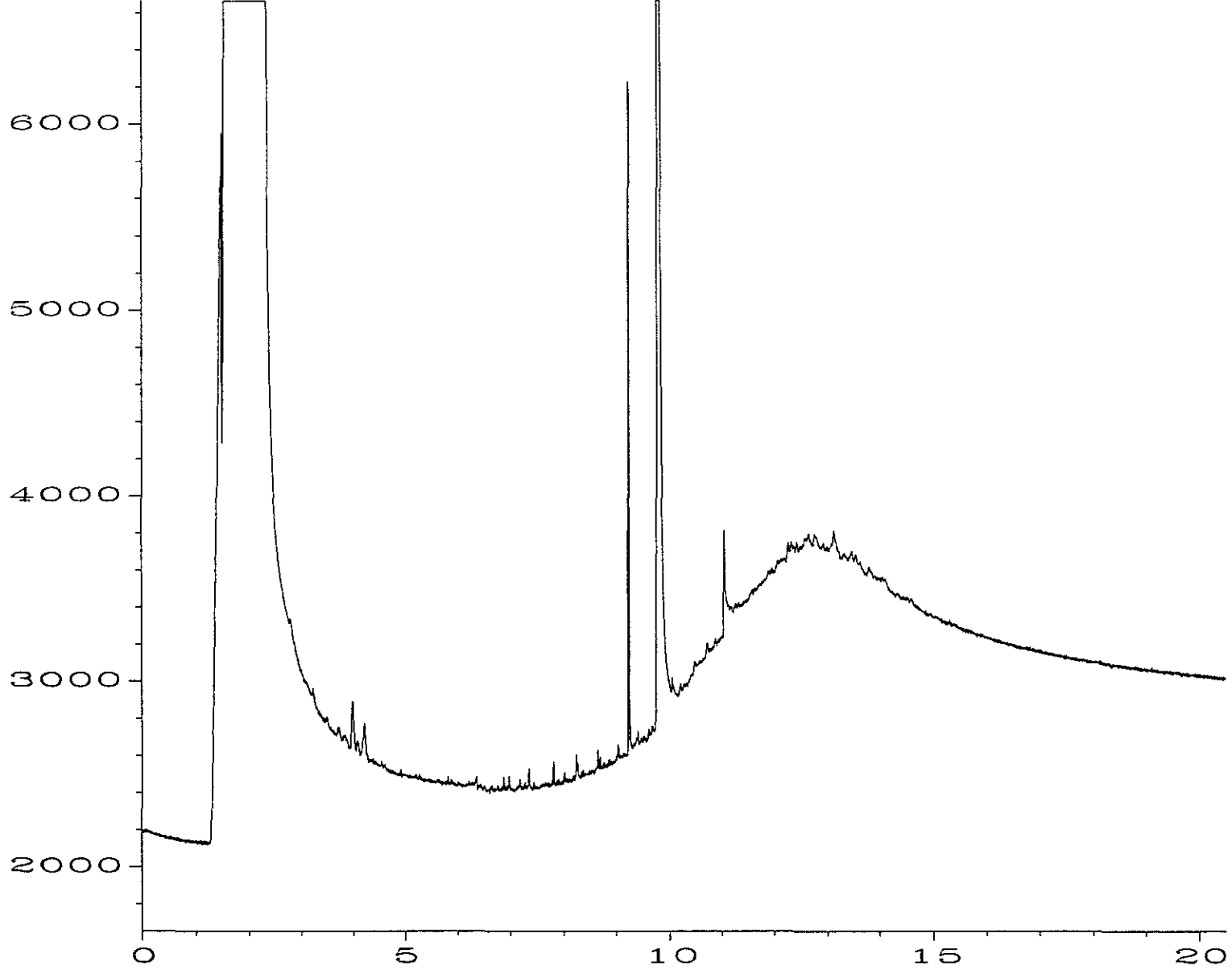
Page Number : 1
 Vial Number : 19
 Injection Number : 1
 Sequence Line : 12
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\021F1201.D

Operator : me
 Instrument : GC #6
 Sample Name : 010145-13
 Run Time Bar Code : 31 Oct 00 03:55 AM
 Acquired on : 31 Oct 00 02:35 PM
 Report Created on: 31 Oct 00 02:35 PM

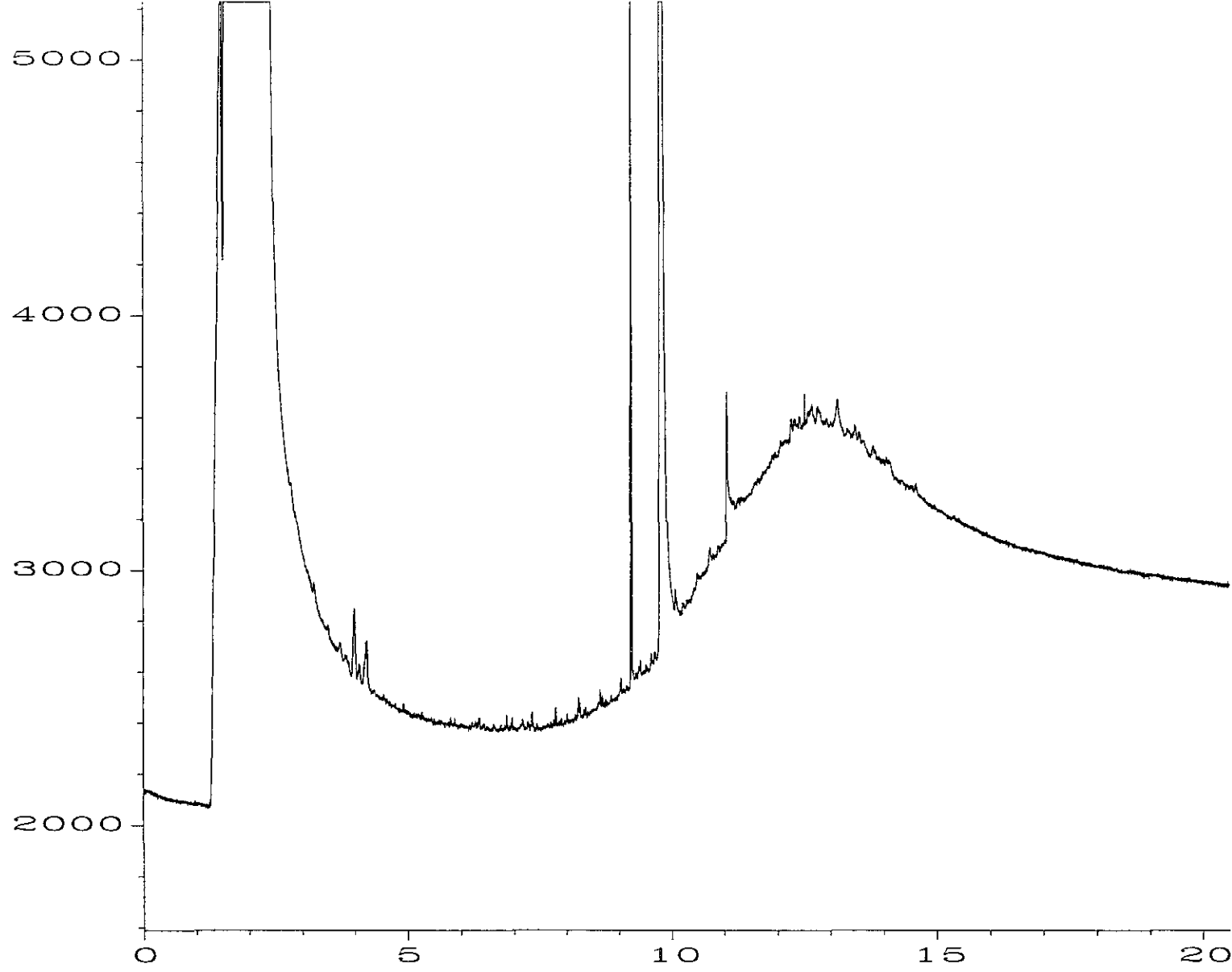
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 Vial Number : 21
 Injection Number : 1
 Sequence Line : 12
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\022F1201.D

Operator : me
Instrument : GC #6
Sample Name : 010145-14 1:10
Run Time Bar Code : 31 Oct 00 04:21 AM
Report Created on: 31 Oct 00 02:36 PM

Page Number : 1
Vial Number : 22
Injection Number : 1
Sequence Line : 12
Instrument Method: TPHDX.MTH
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\023F1201.D

Operator : me

Instrument : GC #6

Sample Name : 010145-15 1:10

Run Time Bar Code:

Acquired on : 31 Oct 00 04:48 AM

Report Created on: 31 Oct 00 02:36 PM

Page Number : 1

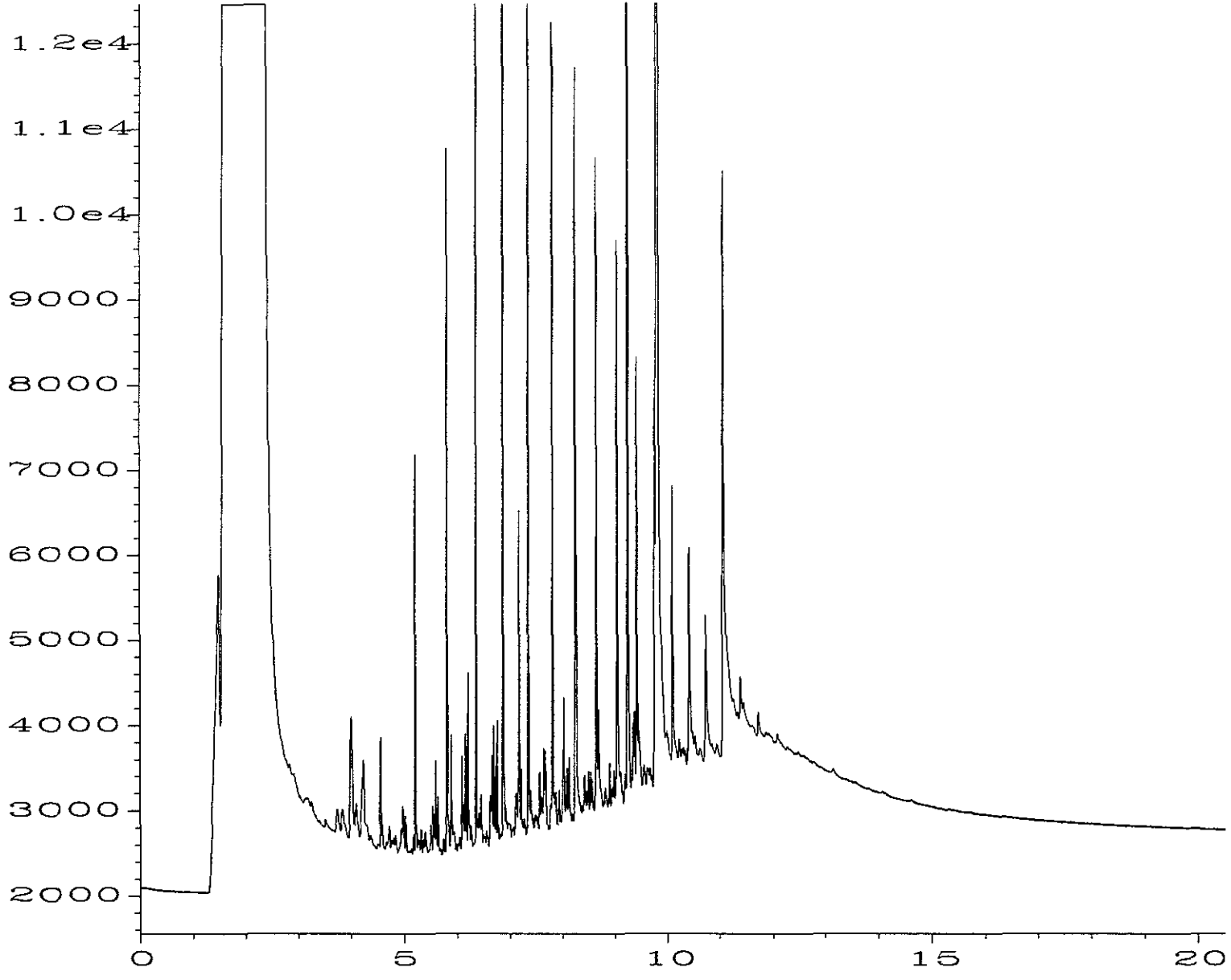
Vial Number : 23

Injection Number : 1

Sequence Line : 12

Instrument Method: TPHDX.MTH

Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\025F1201.D

Operator : me

Instrument : GC #6

Sample Name : 010145-17

Run Time Bar Code:

Acquired on : 31 Oct 00 05:39 AM

Report Created on: 31 Oct 00 02:36 PM

Page Number : 1

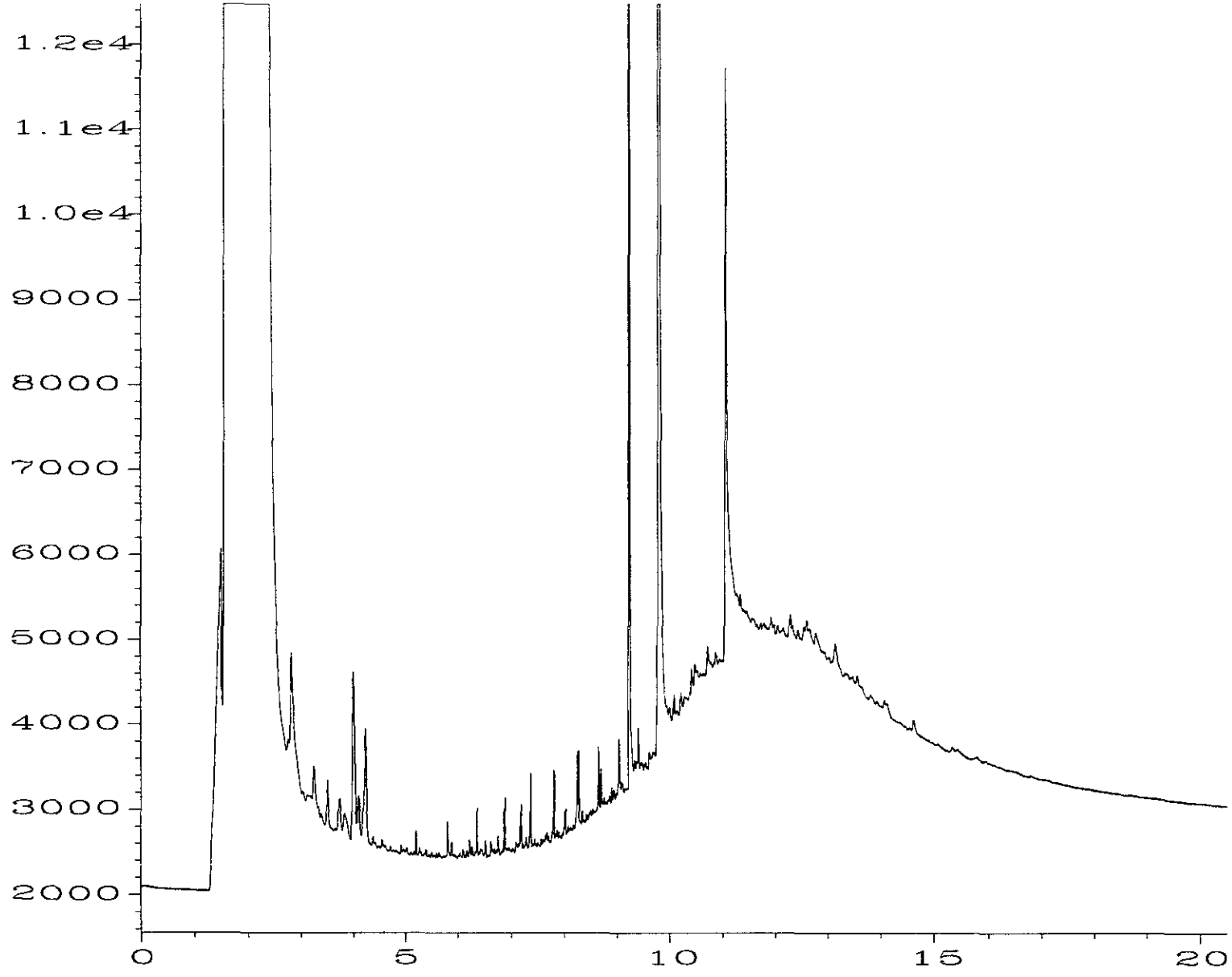
Vial Number : 25

Injection Number : 1

Sequence Line : 12

Instrument Method: TPHDX.MTH

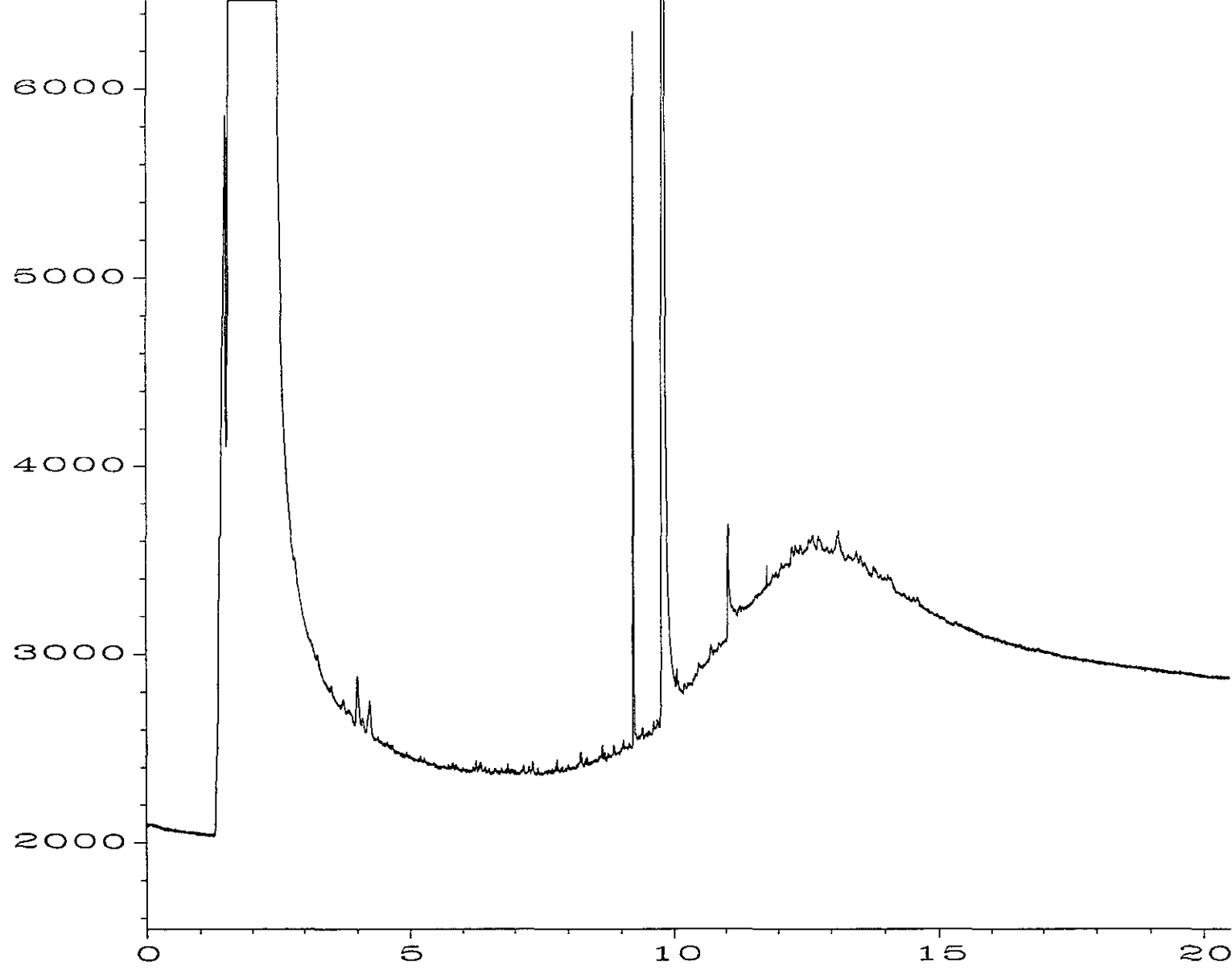
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\026F1201.D

Operator : me
 Instrument : GC #6
 Sample Name : 010145-18
 Run Time Bar Code : 31 Oct 00 06:06 AM
 Acquired on : 31 Oct 00 02:37 PM
 Report Created on: 31 Oct 00 02:37 PM

Page Number : 1
 Vial Number : 26
 Injection Number : 1
 Sequence Line : 12
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\028F1201.D

Operator : me

Instrument : GC #6

Sample Name : 010145-20 1:10

Run Time Bar Code:

Acquired on : 31 Oct 00 06:58 AM

Report Created on: 31 Oct 00 02:37 PM

Page Number : 1

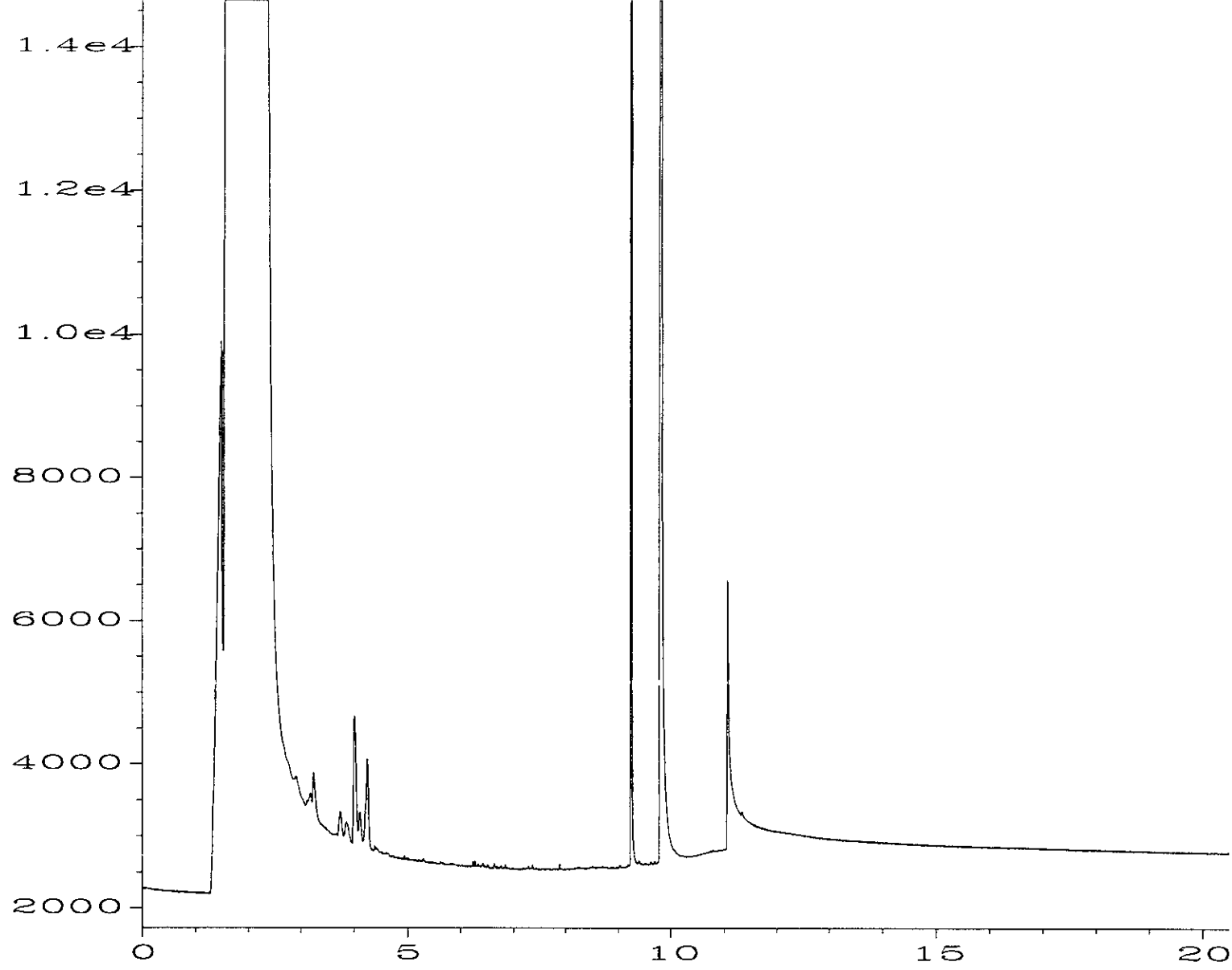
Vial Number : 28

Injection Number : 1

Sequence Line : 12

Instrument Method: TPHDX.MTH

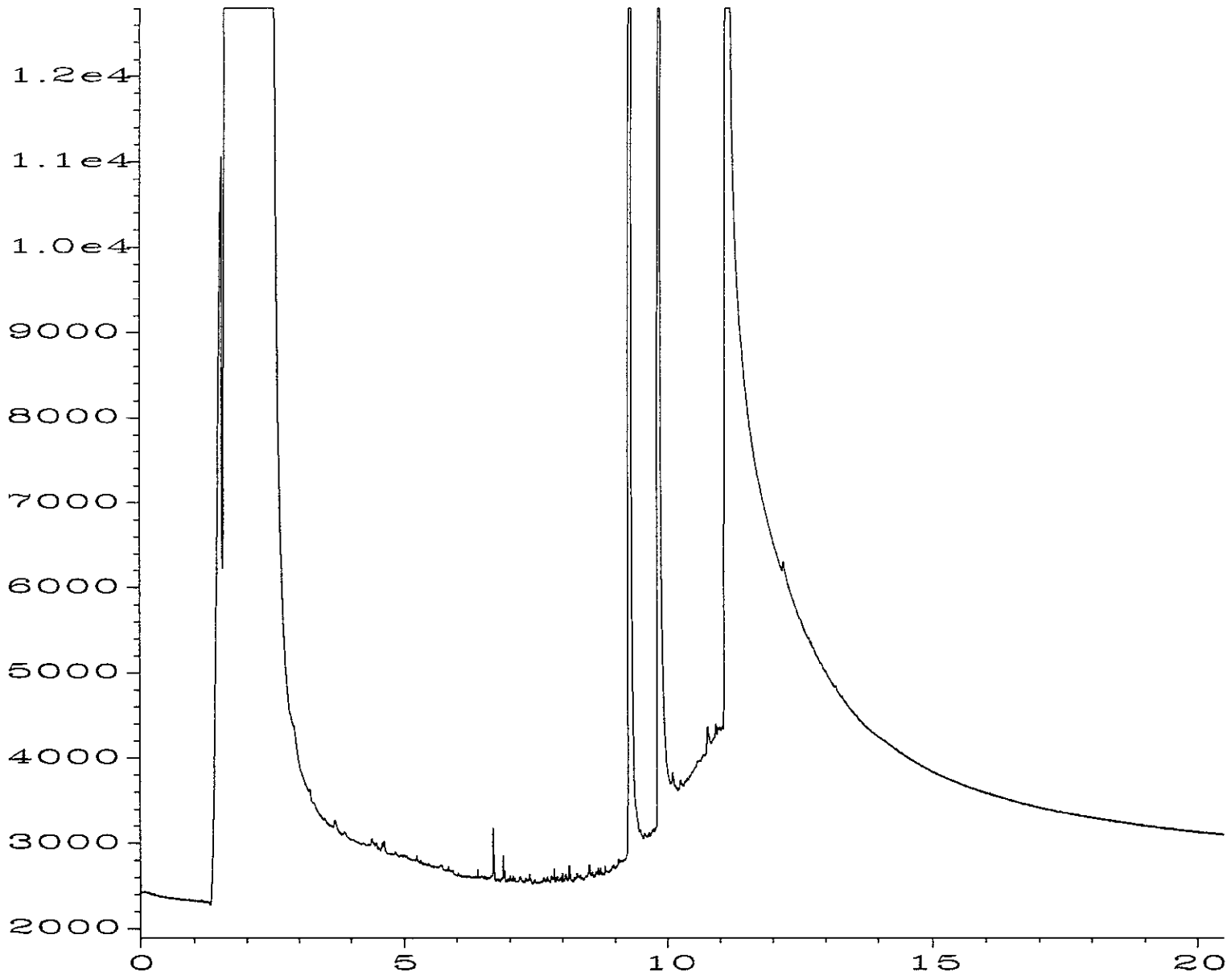
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\10-30-00\004F0401.D

Operator : me
 Instrument : GC #6
 Sample Name : 00-710 MB
 Run Time Bar Code : 30 Oct 00 05:34 PM
 Acquired on : 31 Oct 00 02:27 PM
 Report Created on:

Page Number : 1
 Vial Number : 4
 Injection Number : 1
 Sequence Line : 4
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH




Data File Name : E:\GC6\10-30-00\002F0201.D

Operator : me
 Instrument : GC #6
 Sample Name : 500 MO 9-109
 Run Time Bar Code:
 Acquired on : 30 Oct 00 03:44 PM
 Report Created on: 31 Oct 00 02:26 PM

Page Number : 1
 Vial Number : 2
 Injection Number : 1
 Sequence Line : 2
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH

010001 / CJ 10/28/00 @ CO1

CHAIN-OF-CUSTODY RECORD			№ 0902										Date: 9/28/00		Page 1 of 1		
Project No.: 0262			ANALYSES										REMARKS				
Samplers (Signatures): <i>Bryan Turner</i>			EPA Method 8010	EPA Method 8020	EPA Method 8020 (BTEX only)	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	PAHs USEPA method 8015A	USEPA method 8270 SVOCs	Cooled	Soil (S), Water (W), or Vapor (V)	Acidified	Number of containers	Additional Comments	
Date	Time	Sample Number															
01 9/28/00	1640	GMX-TRN-21A-1.0											Y	S	N	1	2"x6" brass soil sample tube ↓
02 9/28/00	1705	GMX-TRN-42A-1.0											Y	S	N	1	
03 9/28/00	1710	GMX-TRN-45A-1.0											Y	S	N	1	
<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); opacity: 0.5;"> <p>BAT</p> </div>																	
F+B			Turnaround time: Standard				Results to: Ann Holbrow				Total No. of containers: 3						
Relinquished by (signature): <i>Bryan Turner</i>			Date: 9/29/00		Relinquished by (signature):			Date:		Relinquished by (signature):			Date:		Method of Shipment: FEDEX		
Printed Name: Bryan Turner			Time: 1030		Printed Name:			Time:		Printed Name:			Time:		Laboratory Comments and Log No.:		
Company: Geomatrix			Company:			Company:			Company:								
Received by (signature): <i>Eric Young</i>			Date: 9/28/00		Received by (signature):			Date:		Received by (signature):			Date:				
Printed Name: ERIC YOUNG			Time: 9:51		Printed Name:			Time:		Printed Name:			Time:				
Company: F+B			Company:			Company:			Company:								

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Jensen, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

October 13, 2000

Ann Holbrow, Project Manager
Geomatrix Consultants, Inc.
2101 Webster Street, 12th Floor
Oakland, CA 94612

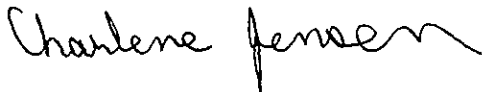
Dear Ms. Holbrow:

Included are the results from the testing of material submitted on October 2, 2000 from your 6262 project. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Charlene Jensen
Chemist

Enclosures
GMC1013R DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 2, 2000 by Friedman & Bruya, Inc. from the Geomatrix Consultants, Inc. 6262 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Geomatrix Consultants, Inc.</u>
010001-01	GMX-TRN-21A-1.0
010001-02	GMX-TRN-42A-1.0
010001-03	GMX-TRN-45A-1.0

All quality control requirements were within acceptable limits.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/13/00
Date Received: 10/02/00
Project: 6262
Date Extracted: 10/2/00
Date Analyzed: 10/4/00

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING EPA METHOD 8015M**

Results Reported on a Dry Weight Basis
Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u> Laboratory ID	<u>Motor Oil Range</u>	<u>Surrogate</u> (% Recovery)
GMX-TRN-21A-1.0 010001-01	1,200 d	89
GMX-TRN-42A-1.0 010001-02	1,000 d	94
GMX-TRN-45A-1.0 010001-03	1,900 d	90
Method Blank	<50	101

d - The sample was diluted. Surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-21A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/02/00	Project:	6262
Date Extracted:	10/03/00	Lab ID:	010001-01 1/10
Date Analyzed:	10/05/00	Data File:	100433.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	87	31	123
Benzo(a)anthracene-d12	95	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	<50
Pyrene	<50
Benz(a)anthracene	<50
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	64

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-42A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/02/00	Project:	6262
Date Extracted:	10/03/00	Lab ID:	010001-02
Date Analyzed:	10/05/00	Data File:	100442.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	64	31	123
Benzo(a)anthracene-d12	81	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	13
Anthracene	6
Fluoranthene	19
Pyrene	26
Benz(a)anthracene	43
Chrysene	69
Benzo(b)fluoranthene	46
Benzo(k)fluoranthene	35
Benzo(a)pyrene	42
Indeno(1,2,3-cd)pyrene	14
Dibenzo(a,h)anthracene	11
Benzo(g,h,i)perylene	19

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-45A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/02/00	Project:	6262
Date Extracted:	10/03/00	Lab ID:	010001-03 1/10
Date Analyzed:	10/05/00	Data File:	100434.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	80	31	123
Benzo(a)anthracene-d12	89	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	<50
Pyrene	<50
Benz(a)anthracene	<50
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	<50

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Geomatrix Consultants, Inc.
Date Received:	10/02/00	Project:	6262
Date Extracted:	10/03/00	Lab ID:	mb 00-651
Date Analyzed:	10/04/00	Data File:	100414.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	62	31	123
Benzo(a)anthracene-d12	81	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/13/00

Date Received: 10/02/00

Project: 6262

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING EPA METHOD 8015M

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	Relative Percent Difference
Motor Oil	µg/g (ppm)	250	97	106	60-120	9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/13/00

Date Received: 10/02/00

Project: 6262

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 009123-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD	Acceptance Criteria
Napthalene	µg/kg (ppb)	<5	<5	nm	0-20
Acenaphthylene	µg/kg (ppb)	<5	<5	nm	0-20
Acenaphthene	µg/kg (ppb)	<5	<5	nm	0-20
Fluorene	µg/kg (ppb)	22	16	32 a	0-20
Phenanthrene	µg/kg (ppb)	14	11	24 a	0-20
Anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Benz(a)anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Chrysene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(b)fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(k)fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(a)pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Dibenzo(a,h)anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(g,h,i)perylene	µg/kg (ppb)	<5	<5	nm	0-20

Laboratory Code: 009123-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	% Recovery MSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	<5	82	81	56-117	1
Acenaphthylene	µg/kg (ppb)	170	<5	87	88	59-115	1
Acenaphthene	µg/kg (ppb)	170	<5	96	94	59-114	1
Fluorene	µg/kg (ppb)	170	<5	93	91	61-113	2
Phenanthrene	µg/kg (ppb)	170	<5	84	89	51-122	5
Anthracene	µg/kg (ppb)	170	<5	80	86	50-116	7
Fluoranthene	µg/kg (ppb)	170	<5	86	91	52-124	6
Pyrene	µg/kg (ppb)	170	<5	85	90	49-124	6
Benz(a)anthracene	µg/kg (ppb)	170	<5	84	88	50-122	5
Chrysene	µg/kg (ppb)	170	<5	83	87	48-121	6
Benzo(b)fluoranthene	µg/kg (ppb)	170	<5	99	104	52-144	5
Benzo(k)fluoranthene	µg/kg (ppb)	170	<5	88	92	55-135	5
Benzo(a)pyrene	µg/kg (ppb)	170	<5	88	95	49-128	8
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	<5	98	105	37-132	8
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	<5	102	111	37-136	8
Benzo(g,h,i)perylene	µg/kg (ppb)	170	<5	101	109	28-132	8

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/13/00

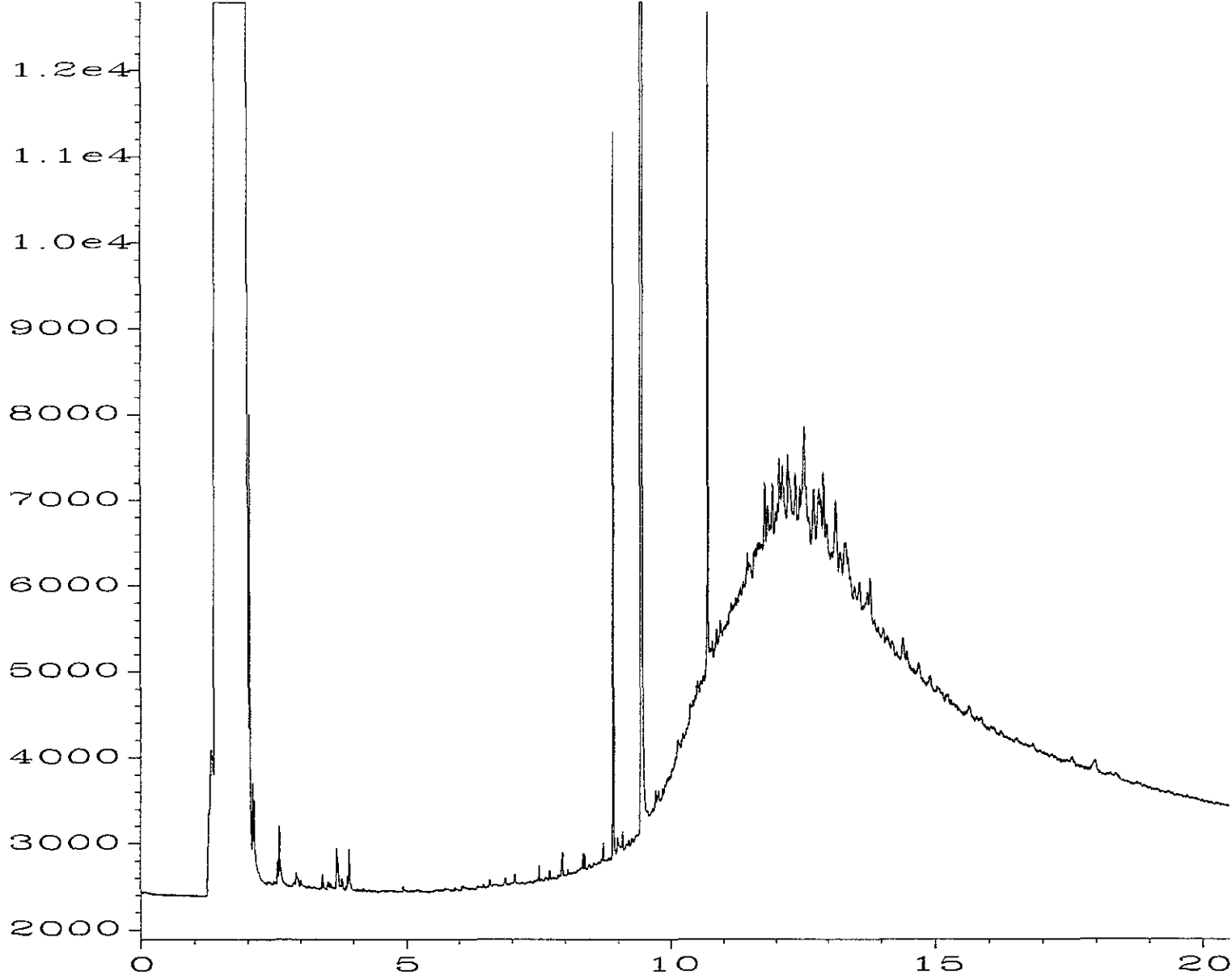
Date Received: 10/02/00

Project: 6262

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting	Spike	% Recovery		Acceptance	RPD
	Units		Level	LCS		
Napthalene	µg/kg (ppb)	170	68	77	58-121	12
Acenapthylene	µg/kg (ppb)	170	79	85	54-122	8
Acenapthene	µg/kg (ppb)	170	78	85	58-119	9
Fluorene	µg/kg (ppb)	170	81	88	57-122	8
Phenanthrene	µg/kg (ppb)	170	76	82	57-123	8
Anthracene	µg/kg (ppb)	170	68	75	44-125	10
Fluoranthene	µg/kg (ppb)	170	80	87	54-127	8
Pyrene	µg/kg (ppb)	170	80	86	56-123	7
Benz(a)anthracene	µg/kg (ppb)	170	73	79	50-124	8
Chrysene	µg/kg (ppb)	170	76	82	51-122	7
Benzo(b)fluoranthene	µg/kg (ppb)	170	89	98	44-149	10
Benzo(k)fluoranthene	µg/kg (ppb)	170	80	87	52-140	7
Benzo(a)pyrene	µg/kg (ppb)	170	70	77	42-129	10
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	81	89	48-134	9
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	84	91	49-136	8
Benzo(g,h,i)perylene	µg/kg (ppb)	170	82	89	46-134	9



Data File Name : H:\HPCHEM\6\DATA\10-04-00\008F0601.D

Operator : ME

Instrument : GC #6

Sample Name : 010001-01 1:5

Run Time Bar Code:

Acquired on : 04 Oct 00 02:37 PM

Report Created on: 16 Jan 09 10:55 AM

Page Number : 1

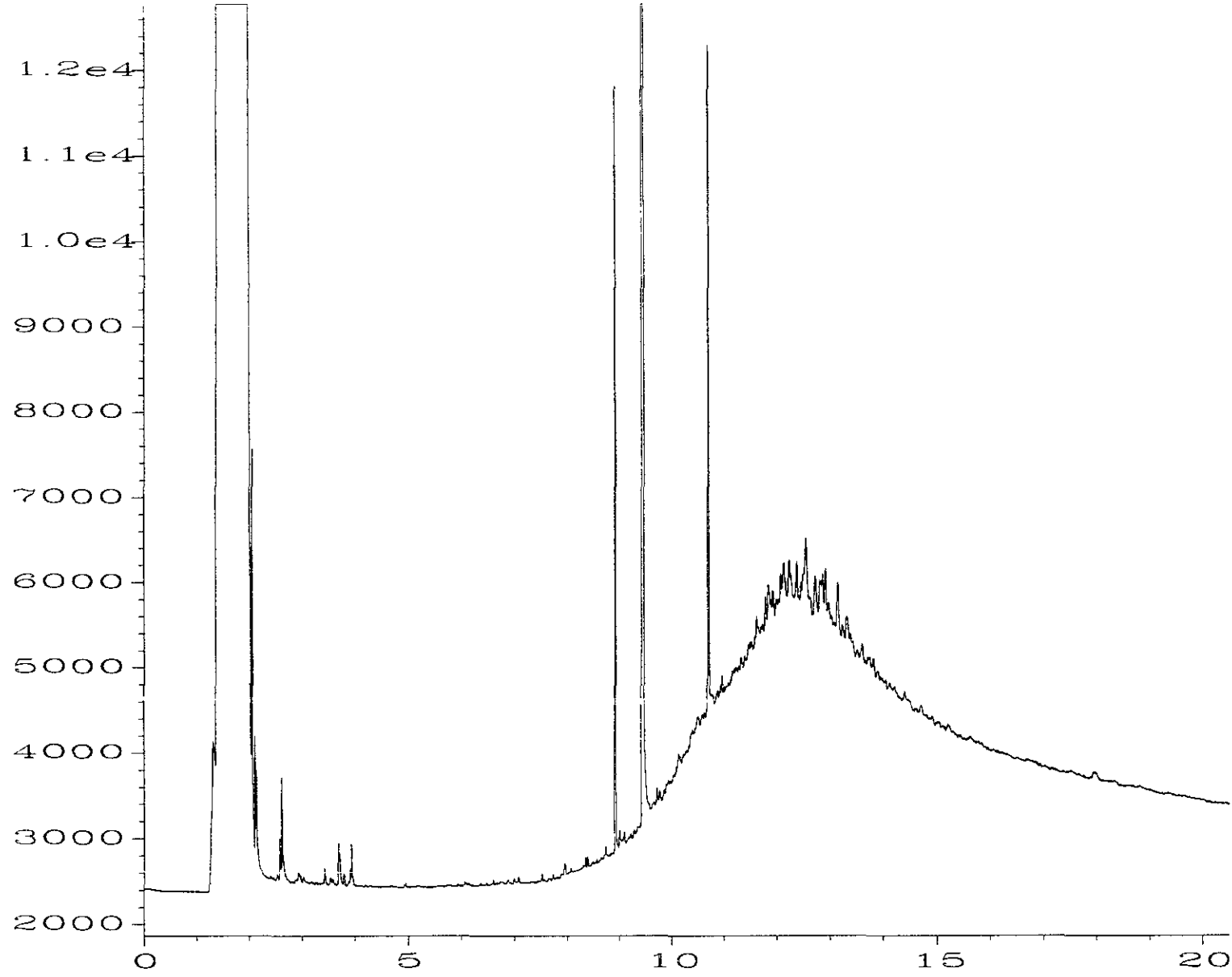
Vial Number : 8

Injection Number : 1

Sequence Line : 6

Instrument Method: TPHDX.MTH

Analysis Method : DEFAULT.MTH



Data File Name : H:\HPCHEM\6\DATA\10-04-00\009F0601.D

Operator : ME

Instrument : GC #6

Sample Name : 010001-02 1:5

Run Time Bar Code:

Acquired on : 04 Oct 00 03:04 PM

Report Created on: 16 Jan 09 10:56 AM

Page Number : 1

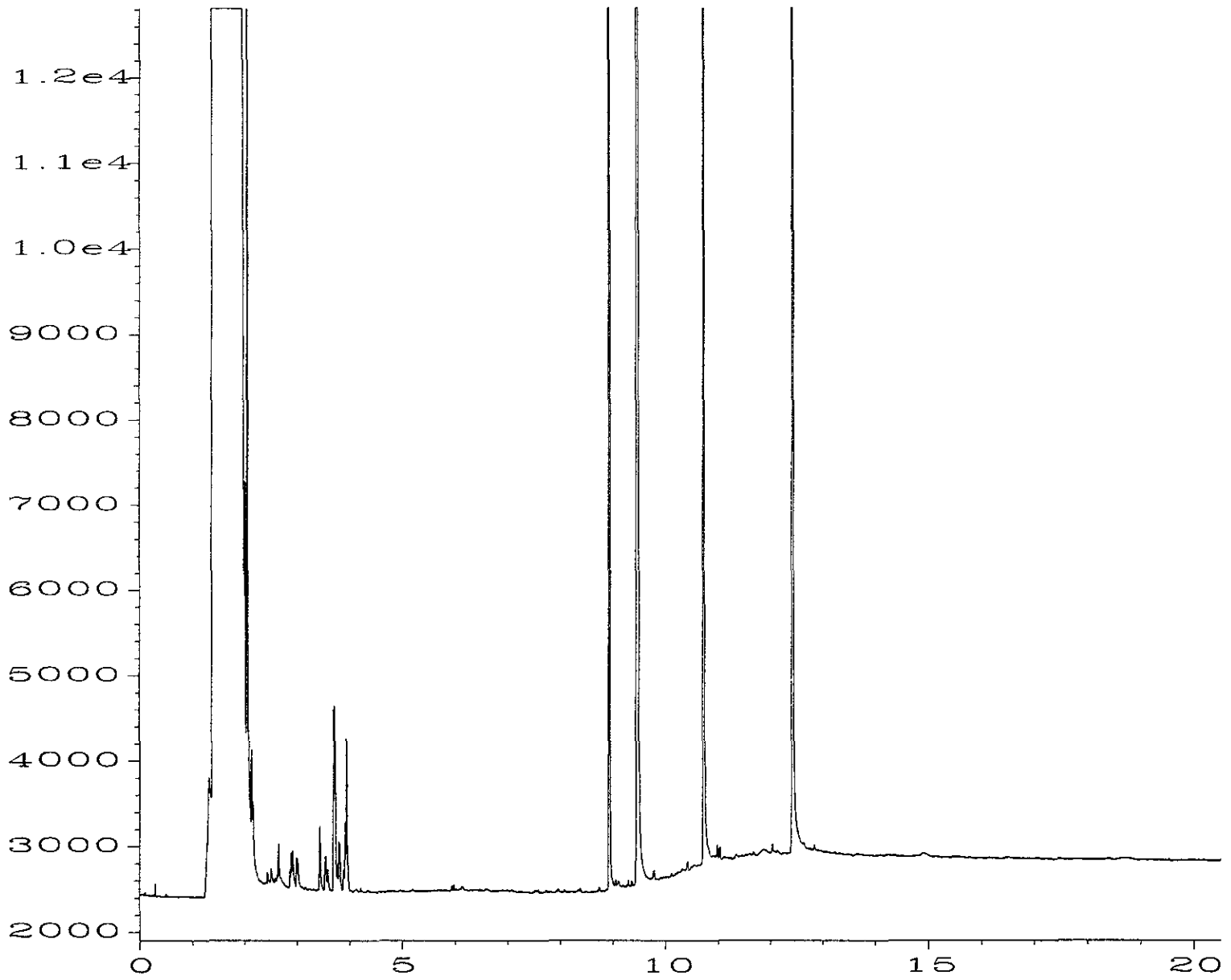
Vial Number : 9

Injection Number : 1

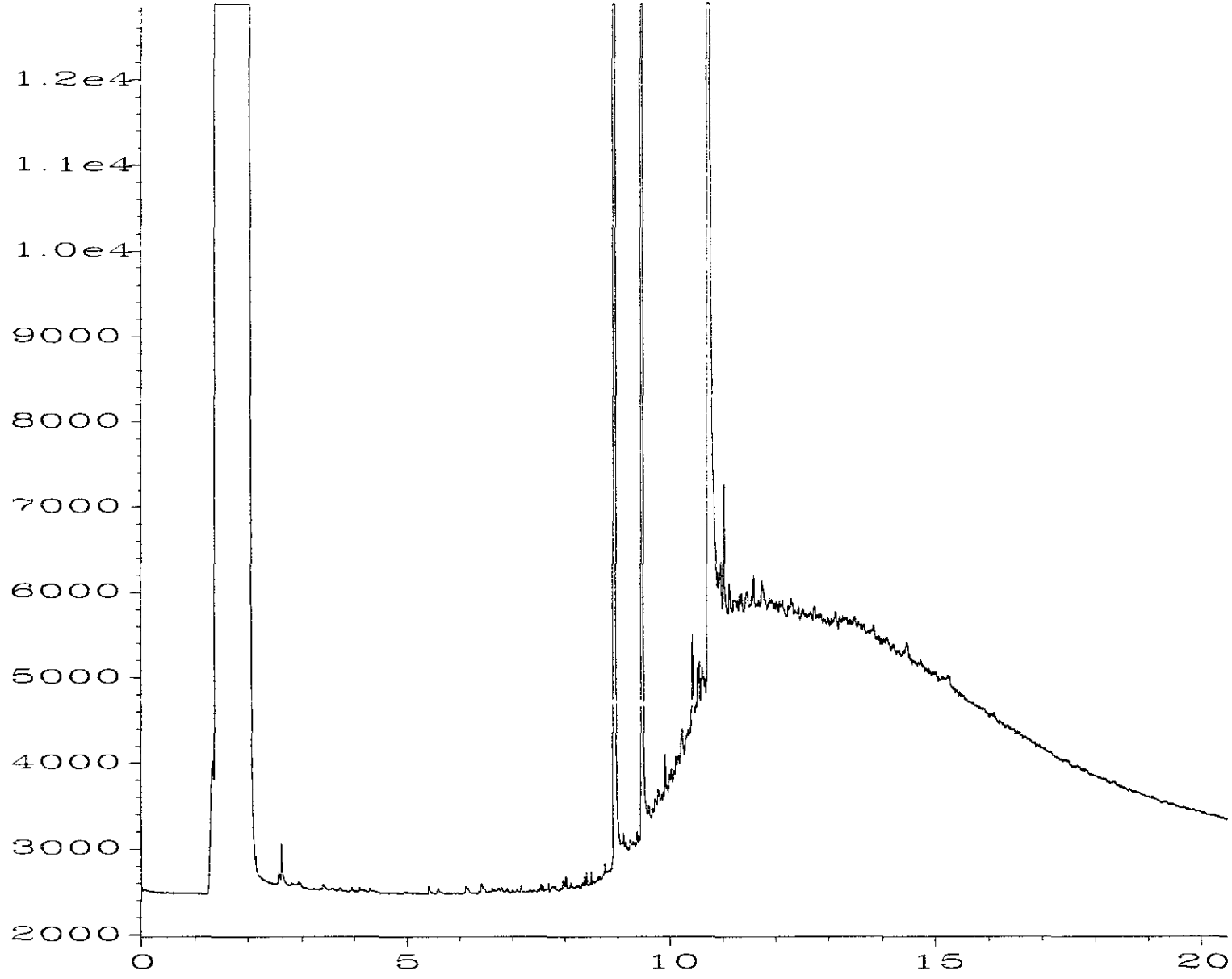
Sequence Line : 6

Instrument Method: TPHDX.MTH

Analysis Method : DEFAULT.MTH



Data File Name : H:\HPCHEM\6\DATA\10-03-00\006F0601.D
Operator : ME
Instrument : GC #6
Sample Name : 00-645 mb
Run Time Bar Code : 03 Oct 00 11:54 AM
Acquired on : 16 Jan 09 10:57 AM
Page Number : 1
Vial Number : 6
Injection Number : 1
Sequence Line : 6
Instrument Method: TPHDX.MTH
Analysis Method : DEFAULT.MTH



Data File Name : H:\HPCHEM\6\DATA\10-03-00\004F0401.D

Operator : ME

Instrument : GC #6

Sample Name : 500 MO 9-109

Run Time Bar Code:

Acquired on : 03 Oct 00 09:15 AM

Report Created on: 16 Jan 09 10:57 AM

Page Number : 1

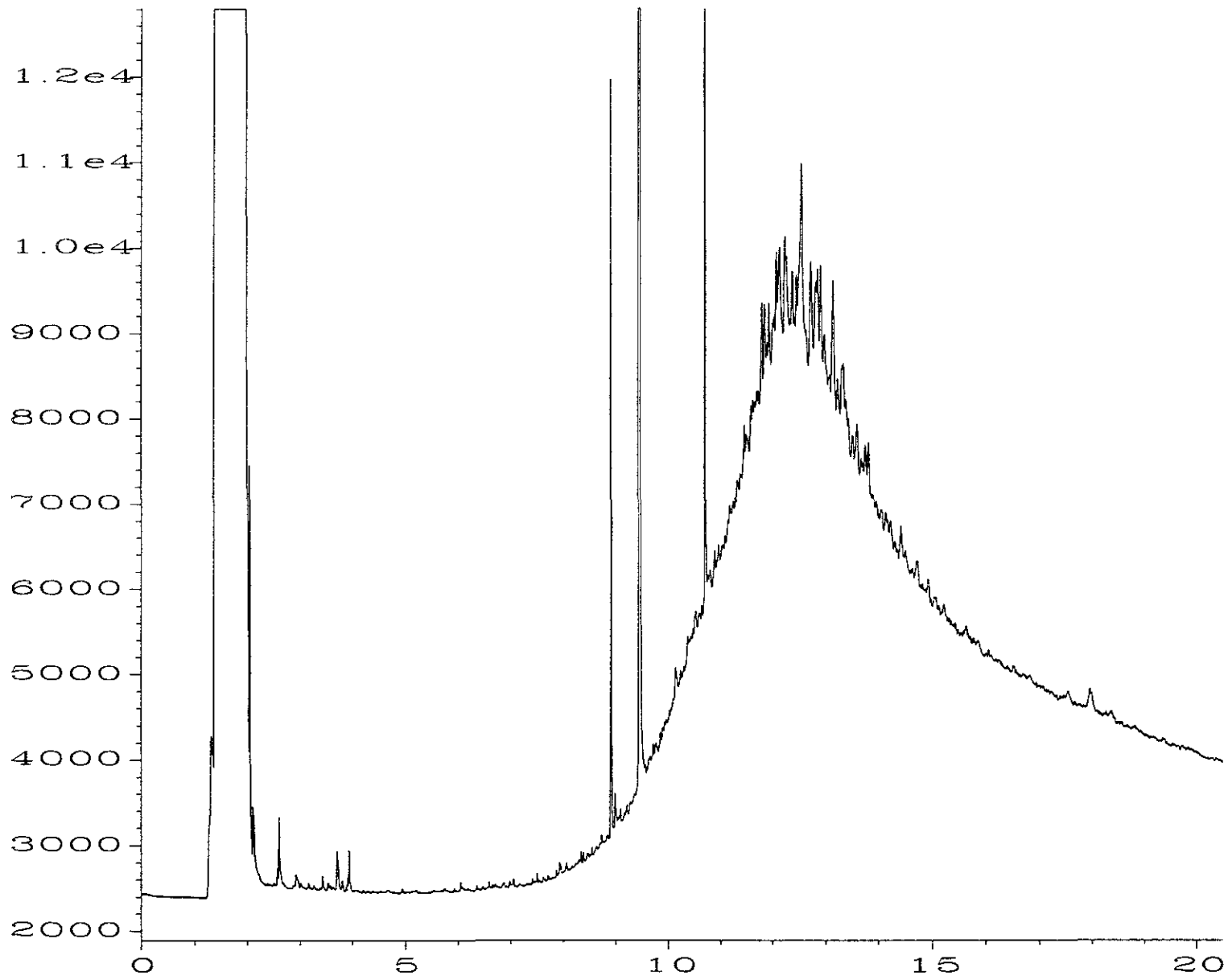
Vial Number : 4

Injection Number : 1

Sequence Line : 4

Instrument Method: TPHDX.MTH

Analysis Method : DEFAULT.MTH



Data File Name : H:\HPCHEM\6\DATA\10-04-00\010F0601.D

Operator : ME

Page Number : 1

Instrument : GC #6

Vial Number : 10

Sample Name : 010001-03 1:5

Injection Number : 1

Run Time Bar Code:

Sequence Line : 6


Acquired on : 04 Oct 00 03:30 PM

Instrument Method: TPHDX.MTH

Report Created on: 16 Jan 09 10:56 AM

Analysis Method : DEFAULT.MTH

00902 CJ 9/25/00 B03

CHAIN-OF-CUSTODY RECORD				№ 0901		Date: 9/21/00		Page 1 of 2													
Project No.: 6262				ANALYSES						REMARKS											
Samplers (Signatures): <i>[Signature]</i>				EPA Method 8010	EPA Method 8020	EPA Method 8020 (BTEX only)	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as US EPA 8015M	PAHs US EPA 8270.5MMS	MS/msd	Cooled	Soil (S), Water (W), or Vapor (V)	Acidified	Number of containers	Additional Comments			
Date	Time	Sample Number																			
9/21/00	0830	GMX-TRN-31A-1.0									X	X		Y	S	N	1	2"x6" brass soil sample tube ↓			
	0900	GMX-TRN-32A-1.0									X	X		Y	S	N	1				
	0940	GMX-TRN-33A-1.0									X	X		Y	S	N	1				
	1020	GMX-TRN-43A-1.0									X	X		Y	S	N	1				
	1050	GMX-TRN-47A-1.0									X	X		Y	S	N	1				
	1055	GMX-TRN-47A-1.5									X	X		Y	S	N	1				
	1400	GMX-TRN-41A-1.0									X	X		Y	S	N	1				
	1445	GMX-TRN-48A-1.0									X	X		Y	S	N	1				
	1525	GMX-TRN-25A-1.0									X	X		Y	S	N	1				
	1600	GMX-TRN-18A-1.0									X	X		Y	S	N	1				
9/22	0730	GMX-TRN-20A-1.0									X	X		Y	S	N	1				
F+B			Turnaround time: Standard			Results to: Ann Holbrow			Total No. of containers: 12			<i>[Signature]</i>									
Relinquished by (signature): <i>[Signature]</i>		Date: 9/22	Relinquished by (signature):		Date:	Relinquished by (signature):		Date:	Method of Shipment: Fed Ex												
Printed Name: Bryan Turner		Time: 1515	Printed Name:		Time:	Printed Name:		Time:	Laboratory Comments and Log No.:												
Company: Geomatrix			Company:			Company:															
Received by (signature): <i>[Signature]</i>		Date: 9/20/00	Received by (signature):		Date:	Received by (signature):		Date:													
Printed Name: Eric Young		Time: 11:00	Printed Name:		Time:	Printed Name:		Time:													
Company: F+B			Company:			Company:															

CHAIN-OF-CUSTODY RECORD

Nº 0915

Date: 9/22/00

Page 2 of 2

009102 CJ 9/25/00 BOD

Project No.: 6262

ANALYSES

REMARKS

Samplers (Signatures):
Bryan Turner

Date	Time	Sample Number
9/22/00	0920	GMK-TRN-17A-1.0
	1000	GMK-TRN-46A-1.0
	1050	GMK-TRN-26A-1.0
	1235	GMK-TRN-30A-1.0
V.	1525	GMK-TRN-16A-1.0

EPA Method 8010	EPA Method 8020	EPA Method 8020 (BTEX only)	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as by US EPA 8015M	TPH as by USEPA 8017D SIMS	Cooled	Soil (S), Water (W), or Vapor (V)	Acidified	Number of containers
							X	X	X	S	N	1
							X	X	X	S	N	1
							X	X	X	S	N	1
							X	X	X	S	N	1
							X	X	X	S	N	1

Additional Comments

2"x6" brass soil sample tube
↓

BHO

F+B

Turnaround time: Standard

Results to: Ann Halbrun

Total No. of containers: 5

Relinquished by (signature): *Bryan Turner*
Printed Name: Bryan Turner
Company: Geomatrix

Date: 9/22/00
Time: 1515
Relinquished by (signature):
Printed Name:
Company:

Date:
Time:
Relinquished by (signature):
Printed Name:
Company:


Date: Method of Shipment: Fed Ex

Received by (signature): *Eric Young*
Printed Name: Eric Young
Company: F+B

Date: 9/25/00
Time: 11:00
Received by (signature):
Printed Name:
Company:

Date:
Time:
Received by (signature):
Printed Name:
Company:

Laboratory Comments and Log No.:



GEOMATRIX

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Jensen, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

October 5, 2000

Ann Holbrow, Project Manager
Geomatrix Consultants, Inc.
2101 Webster Street, 12th Floor
Oakland, CA 94612

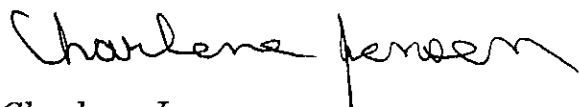
Dear Ms. Holbrow:

Included are the results from the testing of material submitted on September 25, 2000 from your 6262 project. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Charlene Jensen
Chemist

Enclosures
GMC1005R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 25, 2000 by Friedman & Bruya, Inc. from the Geomatrix Consultants, Inc. 6262 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Geomatrix Consultants, Inc.</u>
009102-01	GMX-TRN-31A-1.0
009102-02	GMX-TRN-23A-1.0
009102-03	GMX-TRN-32A-1.0
009102-04	GMX-TRN-43A-1.0
009102-05	GMX-TRN-47A-1.0
009102-06	GMX-TRN-47A-1.5
009102-07	GMX-TRN-41A-1.0
009102-08	GMX-TRN-48A-1.0
009102-09	GMX-TRN-25A-1.0
009102-10	GMX-TRN-18A-1.0
009102-11	GMX-TRN-27A-1.0
009102-12	GMX-TRN-20A-1.0
009102-13	GMX-TRN-17A-1.0
009102-14	GMX-TRN-46A-1.0
009102-15	GMX-TRN-26A-1.0
009102-16	GMX-TRN-30A-1.0
009102-17	GMX-TRN-16A-1.0

All quality control requirements were within acceptable limits.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/05/00
 Date Received: 09/25/00
 Project: 6262
 Date Extracted: 09/27/00
 Date Analyzed: 09/28/00 and 09/29/00

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
 USING EPA METHOD 8015M**
 Results Reported as µg/g (ppm)

<u>Sample ID</u> Laboratory ID	<u>Motor Oil</u>	<u>Surrogate</u> (% Recovery)
GMX-TRN-31A-1.0 009102-01	410 d	92
GMX-TRN-23A-1.0 009102-02	770 d	96
GMX-TRN-32A-1.0 009102-03	120	91
GMX-TRN-43A-1.0 009102-04	620 d	93
GMX-TRN-47A-1.0 009102-05	3,500 d	95
GMX-TRN-41A-1.0 009102-07	1,100 d	104
GMX-TRN-48A-1.0 009102-08	140	113
GMX-TRN-25A-1.0 009102-09	210	95
GMX-TRN-18A-1.0 009102-10	590 d	98
GMX-TRN-27A-1.0 009102-11	190	106
GMX-TRN-20A-1.0 009102-12	860 d	100

d - The sample was diluted. Surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/05/00
Date Received: 09/25/00
Project: 6262
Date Extracted: 09/27/00
Date Analyzed: 09/28/00 and 09/29/00

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING EPA METHOD 8015M**
Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u> Laboratory ID	<u>Motor Oil</u>	<u>Surrogate</u> (% Recovery)
GMX-TRN-17A-1.0 009102-13	1,500 d	107
GMX-TRN-46A-1.0 009102-14	380	101
GMX-TRN-26A-1.0 009102-15	<50	110
GMX-TRN-30A-1.0 009102-16	1,500 d	124
GMX-TRN-16A-1.0 009102-17	1,800 d	97
Method Blank	<50	91

d - The sample was diluted. Surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-31A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-01
Date Analyzed:	09/29/00	Data File:	092907.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	64	31	123
Benzo(a)anthracene-d12	88	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	18
Anthracene	<5
Fluoranthene	39
Pyrene	34
Benz(a)anthracene	16
Chrysene	23
Benzo(b)fluoranthene	22
Benzo(k)fluoranthene	15
Benzo(a)pyrene	20
Indeno(1,2,3-cd)pyrene	19
Dibenzo(a,h)anthracene	8
Benzo(g,h,i)perylene	18

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-23A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-02 1/10
Date Analyzed:	09/28/00	Data File:	092812.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	87	31	123
Benzo(a)anthracene-d12	105	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	110
Anthracene	<50
Fluoranthene	110
Pyrene	96
Benz(a)anthracene	<50
Chrysene	63
Benzo(b)fluoranthene	50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	64

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-32A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-03
Date Analyzed:	09/29/00	Data File:	092908.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	73	31	123
Benzo(a)anthracene-d12	105	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	16
Anthracene	<5
Fluoranthene	39
Pyrene	39
Benz(a)anthracene	20
Chrysene	31
Benzo(b)fluoranthene	29
Benzo(k)fluoranthene	17
Benzo(a)pyrene	26
Indeno(1,2,3-cd)pyrene	22
Dibenzo(a,h)anthracene	11
Benzo(g,h,i)perylene	25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-43A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-04
Date Analyzed:	09/29/00	Data File:	092909.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	55	31	123
Benzo(a)anthracene-d12	76	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	8
Pyrene	11
Benz(a)anthracene	7
Chrysene	15
Benzo(b)fluoranthene	12
Benzo(k)fluoranthene	7
Benzo(a)pyrene	10
Indeno(1,2,3-cd)pyrene	8
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	14

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-47A-1.0	Client:	Geomatrix Consultants, Inc
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-05
Date Analyzed:	09/28/00	Data File:	092823.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	57	31	123
Benzo(a)anthracene-d12	79	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	6
Pyrene	16
Benz(a)anthracene	10
Chrysene	43
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	21

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-41A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-07
Date Analyzed:	09/29/00	Data File:	092910.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	60	31	123
Benzo(a)anthracene-d12	85	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	6
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-48A-1.0	Client:	Geomatrix Consultants. Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-08
Date Analyzed:	09/28/00	Data File:	092822.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	68	31	123
Benzo(a)anthracene-d12	93	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	14
Anthracene	<5
Fluoranthene	16
Pyrene	16
Benz(a)anthracene	6
Chrysene	11
Benzo(b)fluoranthene	8
Benzo(k)fluoranthene	5
Benzo(a)pyrene	7
Indeno(1,2,3-cd)pyrene	6
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-25A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-09
Date Analyzed:	09/28/00	Data File:	092824.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	72	31	123
Benzo(a)anthracene-d12	96	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	14
Anthracene	<5
Fluoranthene	33
Pyrene	33
Benz(a)anthracene	20
Chrysene	25
Benzo(b)fluoranthene	18
Benzo(k)fluoranthene	13
Benzo(a)pyrene	20
Indeno(1,2,3-cd)pyrene	11
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-18A-1.0	Client:	Geomatrix Consultants. Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-10 1/10
Date Analyzed:	09/28/00	Data File:	092817.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	80	31	123
Benzo(a)anthracene-d12	109	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	<50
Pyrene	74
Benz(a)anthracene	<50
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	<50

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-27A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-11
Date Analyzed:	09/28/00	Data File:	092825.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	71	31	123
Benzo(a)anthracene-d12	102	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	47
Anthracene	7
Fluoranthene	120
Pyrene	110
Benz(a)anthracene	54
Chrysene	74
Benzo(b)fluoranthene	79
Benzo(k)fluoranthene	48
Benzo(a)pyrene	72
Indeno(1,2,3-cd)pyrene	43
Dibenzo(a,h)anthracene	19
Benzo(g,h,i)perylene	33

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-20A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-12
Date Analyzed:	09/29/00	Data File:	092911.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	59	31	123
Benzo(a)anthracene-d12	85	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	7
Anthracene	<5
Fluoranthene	<5
Pyrene	8
Benz(a)anthracene	7
Chrysene	18
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	11
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	19

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-17A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-13 1/10
Date Analyzed:	09/28/00	Data File:	092819.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	86	31	123
Benzo(a)anthracene-d12	105	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	58
Pyrene	63
Benz(a)anthracene	<50
Chrysene	63
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	63

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-46A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-14
Date Analyzed:	09/28/00	Data File:	092826.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	75	31	123
Benzo(a)anthracene-d12	104	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	5
Benz(a)anthracene	<5
Chrysene	8
Benzo(b)fluoranthene	8
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	6
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-26A-1.0	Client:	Geomatrix Consultants, Inc
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-15
Date Analyzed:	09/28/00	Data File:	092821.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	71	31	123
Benzo(a)anthracene-d12	101	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	13
Anthracene	<5
Fluoranthene	29
Pyrene	27
Benz(a)anthracene	12
Chrysene	16
Benzo(b)fluoranthene	15
Benzo(k)fluoranthene	12
Benzo(a)pyrene	15
Indeno(1,2,3-cd)pyrene	12
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	11

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-30A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-16 1/10
Date Analyzed:	09/28/00	Data File:	092815.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	79	31	123
Benzo(a)anthracene-d12	130	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	84
Acenaphthylene	<50
Acenaphthene	370
Fluorene	490
Phenanthrene	2,300
Anthracene	500
Fluoranthene	180
Pyrene	1,300
Benz(a)anthracene	660
Chrysene	1,200
Benzo(b)fluoranthene	220
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	420
Indeno(1,2,3-cd)pyrene	130
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	270

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-16A-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	09/25/00	Project:	6262
Date Extracted:	09/27/00	Lab ID:	009102-17 1/10
Date Analyzed:	09/28/00	Data File:	092820.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	85	31	123
Benzo(a)anthracene-d12	110	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	<50
Pyrene	<50
Benz(a)anthracene	<50
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	<50

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID: QQQ-62	Client: Geomatrix Consultants, Inc
Date Received: 09/25/00	Project: 6262
Date Extracted: 09/27/00	Lab ID: mb 2 00-621
Date Analyzed: 09/28/00	Data File: 092810.D
Matrix: Soil	Instrument: GCMS3
Units: ug/kg (ppb)	Operator: YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	52	31	123
Benzo(a)anthracene-d12	73	47	157

Compounds:	Concentration ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/05/00

Date Received: 09/25/00

Project: 6262

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING EPA METHOD 8015M**

Laboratory Code: 009102-05 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Motor Oil	µg/g (ppm)	3,500	1,300	92 ip	0-20

Laboratory Code: 009102-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	% Recovery MSD	Acceptance Criteria	Relative Percent Difference
Motor Oil	µg/g (ppm)	250	3,500	b	b	60-187	b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	Acceptance Criteria
Motor Oil	µg/g (ppm)	250	73	67-140

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ip - Recovery fell outside of normal control limits due to uneven matrix.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/05/00

Date Received: 09/25/00

Project: 6262

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 009038-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD	Acceptance Criteria
Napthalene	µg/kg (ppb)	<5	<5	nm	0-20
Acenapthylene	µg/kg (ppb)	<5	<5	nm	0-20
Acenapthene	µg/kg (ppb)	<5	<5	nm	0-20
Fluorene	µg/kg (ppb)	29	32	10	0-20
Phenanthrene	µg/kg (ppb)	18	21	15	0-20
Anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Benz(a)anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Chrysene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(b)fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(k)fluoranthene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(a)pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	<5	<5	nm	0-20
Dibenzo(a,h)anthracene	µg/kg (ppb)	<5	<5	nm	0-20
Benzo(g,h,i)perylene	µg/kg (ppb)	<5	<5	nm	0-20

Laboratory Code: 009038-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	% Recovery MSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	<5	84	87	56-117	3
Acenapthylene	µg/kg (ppb)	170	<5	90	93	59-115	3
Acenapthene	µg/kg (ppb)	170	<5	94	97	59-114	3
Fluorene	µg/kg (ppb)	170	29	90	92	61-113	3
Phenanthrene	µg/kg (ppb)	170	18	90	94	51-122	3
Anthracene	µg/kg (ppb)	170	<5	68	71	50-116	5
Fluoranthene	µg/kg (ppb)	170	<5	90	94	52-124	4
Pyrene	µg/kg (ppb)	170	<5	88	91	49-124	4
Benz(a)anthracene	µg/kg (ppb)	170	<5	96	97	50-122	1
Chrysene	µg/kg (ppb)	170	<5	91	91	48-121	1
Benzo(b)fluoranthene	µg/kg (ppb)	170	<5	107	112	52-144	5
Benzo(k)fluoranthene	µg/kg (ppb)	170	<5	87	92	55-135	6
Benzo(a)pyrene	µg/kg (ppb)	170	<5	102	106	49-128	4
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	<5	107	111	37-132	4
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	<5	103	107	37-136	4
Benzo(g,h,i)perylene	µg/kg (ppb)	170	<5	96	100	28-132	4

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/05/00

Date Received: 09/25/00

Project: 6262

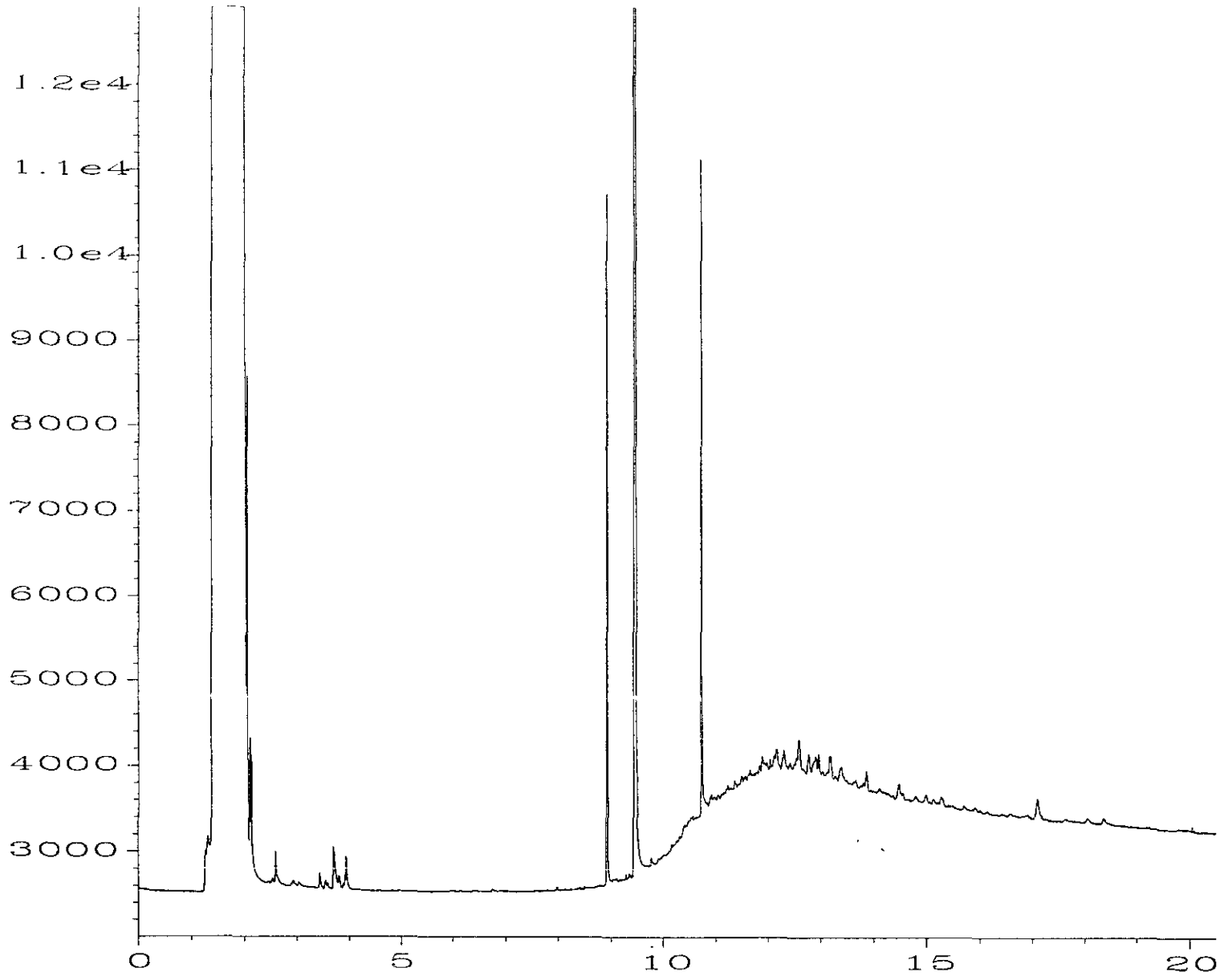
QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 009102-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	% Recovery MSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	<5	80	87	56-117	8
Acenapthylene	µg/kg (ppb)	170	<5	87	94	59-115	9
Acenapthene	µg/kg (ppb)	170	<5	86	93	59-114	8
Fluorene	µg/kg (ppb)	170	<5	91	99	61-113	8
Phenanthrene	µg/kg (ppb)	170	<5	84	89	51-122	6
Anthracene	µg/kg (ppb)	170	<5	75	81	50-116	7
Fluoranthene	µg/kg (ppb)	170	6	111	104	52-124	7
Pyrene	µg/kg (ppb)	170	16	113	103	49-124	9
Benz(a)anthracene	µg/kg (ppb)	170	10	95	86	50-122	10
Chrysene	µg/kg (ppb)	170	43	84	70	48-121	19
Benzo(b)fluoranthene	µg/kg (ppb)	170	<5	141	144	52-144	2
Benzo(k)fluoranthene	µg/kg (ppb)	170	<5	99	98	55-135	2
Benzo(a)pyrene	µg/kg (ppb)	170	<5	123	110	49-128	11
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	<5	72	76	37-132	5
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	<5	64	67	37-136	4
Benzo(g,h,i)perylene	µg/kg (ppb)	170	21	50	50	28-132	1

Laboratory Code: Laboratory Control Sample

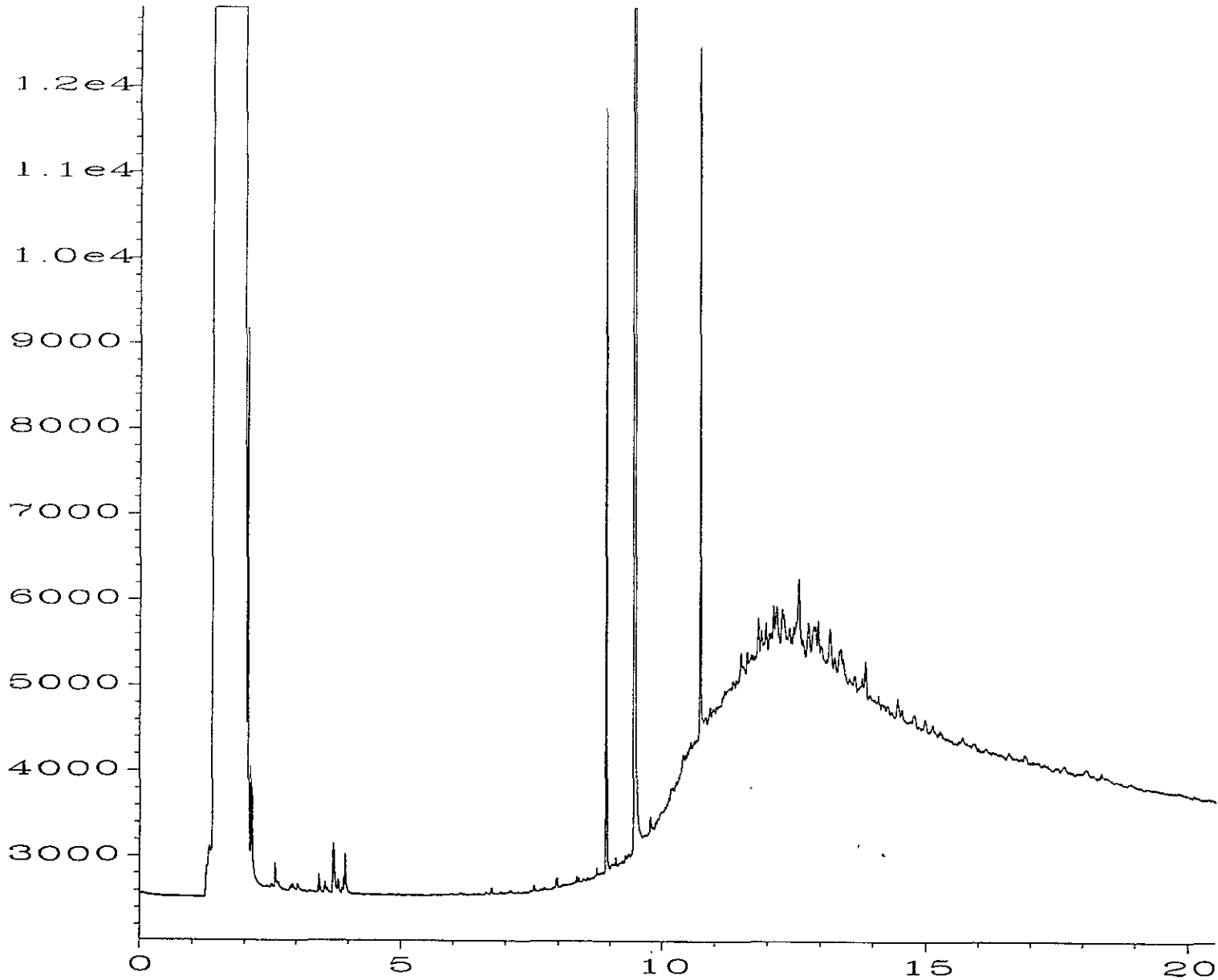
Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	82	88	58-121	7
Acenapthylene	µg/kg (ppb)	170	91	98	54-122	7
Acenapthene	µg/kg (ppb)	170	89	97	58-119	8
Fluorene	µg/kg (ppb)	170	93	100	57-122	7
Phenanthrene	µg/kg (ppb)	170	88	95	57-123	8
Anthracene	µg/kg (ppb)	170	79	85	44-125	7
Fluoranthene	µg/kg (ppb)	170	93	101	54-127	8
Pyrene	µg/kg (ppb)	170	90	97	56-123	7
Benz(a)anthracene	µg/kg (ppb)	170	93	99	50-124	6
Chrysene	µg/kg (ppb)	170	90	94	51-122	5
Benzo(b)fluoranthene	µg/kg (ppb)	170	111	122	44-149	9
Benzo(k)fluoranthene	µg/kg (ppb)	170	93	97	52-140	4
Benzo(a)pyrene	µg/kg (ppb)	170	98	104	42-129	6
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	111	117	48-134	5
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	107	112	49-136	5
Benzo(g,h,i)perylene	µg/kg (ppb)	170	99	105	46-134	6



Data File Name : E:\GC6\09-28-00\015F1301.D

Operator : ME
 Instrument : GC #6
 Sample Name : 009102-01 1:5
 Run Time Bar Code : 29 Sep 00 06:45 AM
 Acquired on : 14 Jan 09 07:44 AM
 Report Created on:

Page Number : 1
 Vial Number : 15
 Injection Number : 1
 Sequence Line : 13
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-28-00\016F1301.D

Operator : ME

Instrument : GC #6

Sample Name : 009102-02 1:5

Run Time Bar Code:

Acquired on : 29 Sep 00 07:12 AM

Report Created on: 14 Jan 09 07:45 AM

Page Number : 1

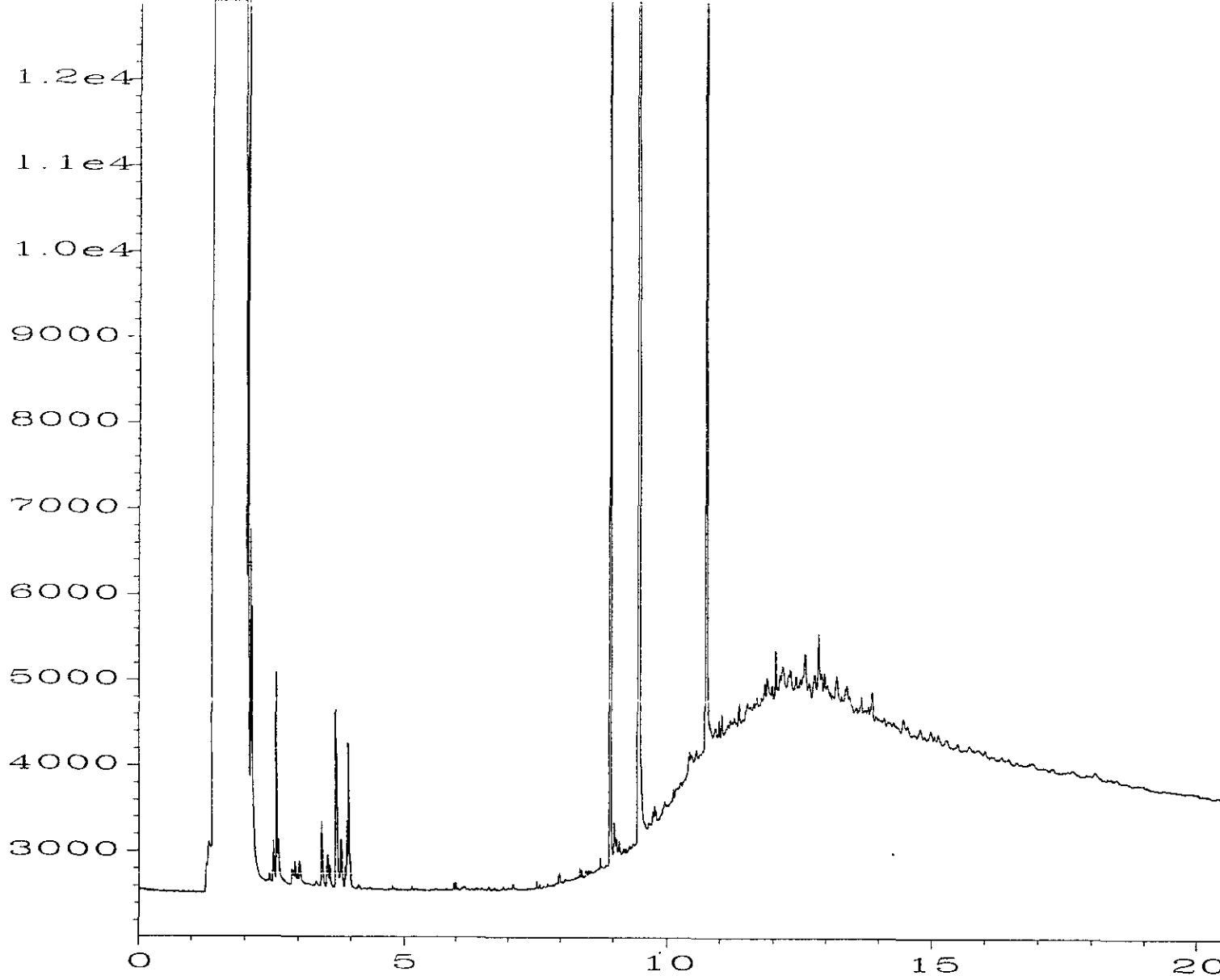
Vial Number : 16

Injection Number : 1

Sequence Line : 13

Instrument Method: TPHDX.MTH

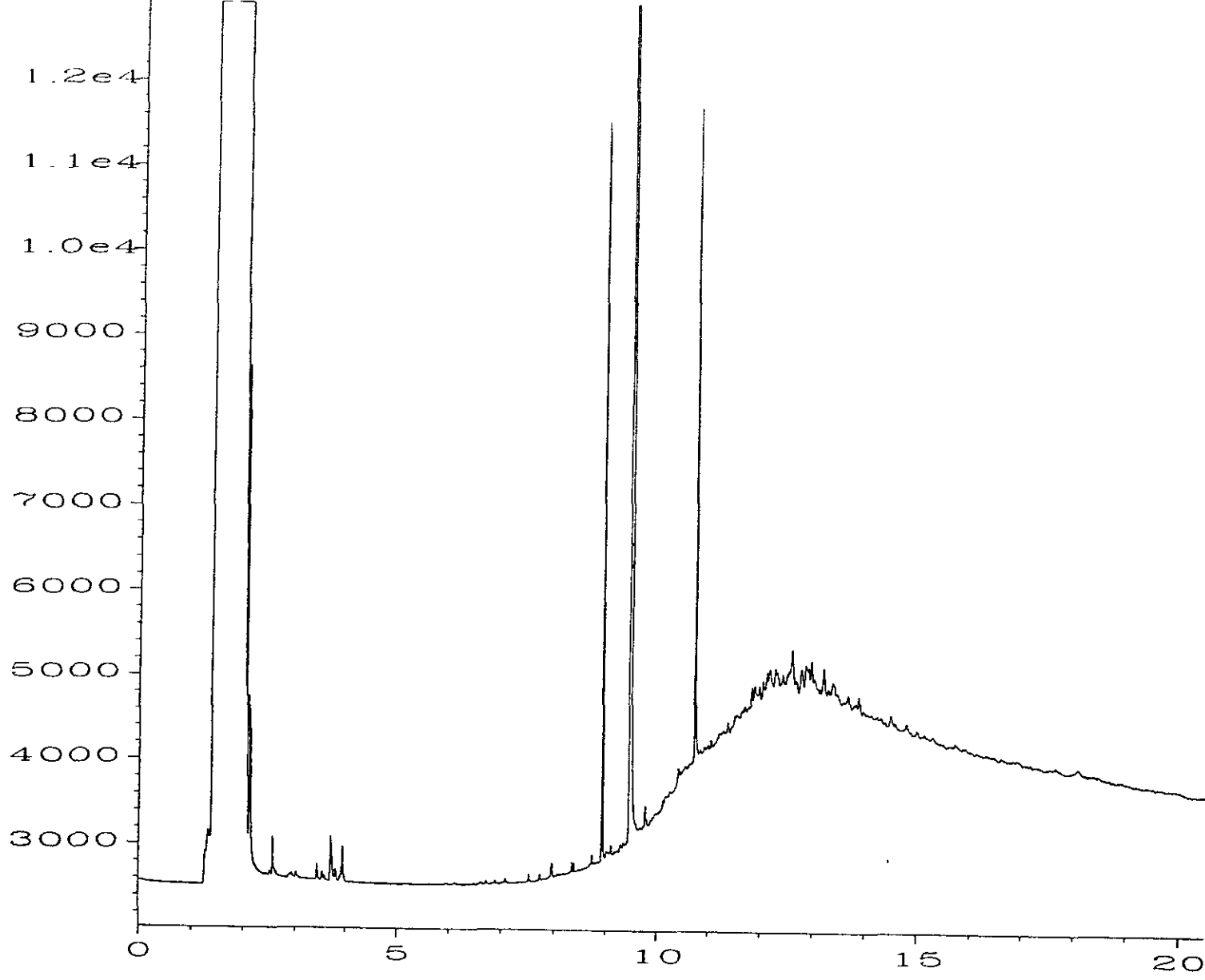
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-28-00\017F1301.D

Operator : ME
 Instrument : GC #6
 Sample Name : 009102-03
 Run Time Bar Code :
 Acquired on : 29 Sep 00 07:40 AM
 Report Created on: 14 Jan 09 07:45 AM

Page Number : 1
 Vial Number : 17
 Injection Number : 1
 Sequence Line : 13
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-28-00\018F1301.D

Operator : ME

Instrument : GC #6

Sample Name : 009102-04 1:5

Run Time Bar Code:

Acquired on : 29 Sep 00 08:05 AM

Report Created on: 14 Jan 09 07:46 AM

Page Number : 1

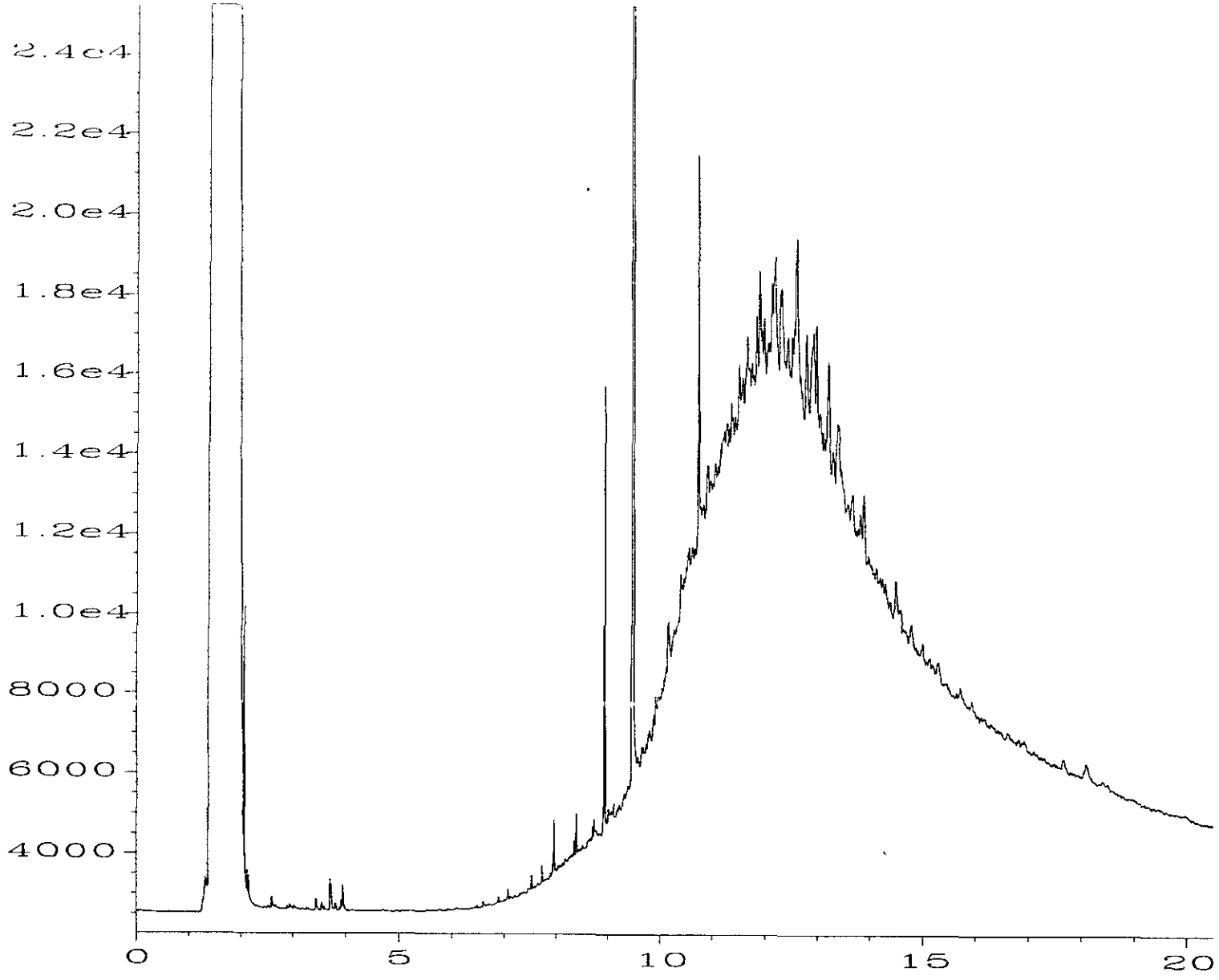
Vial Number : 18

Injection Number : 1

Sequence Line : 13

Instrument Method: TPDHX.MTH

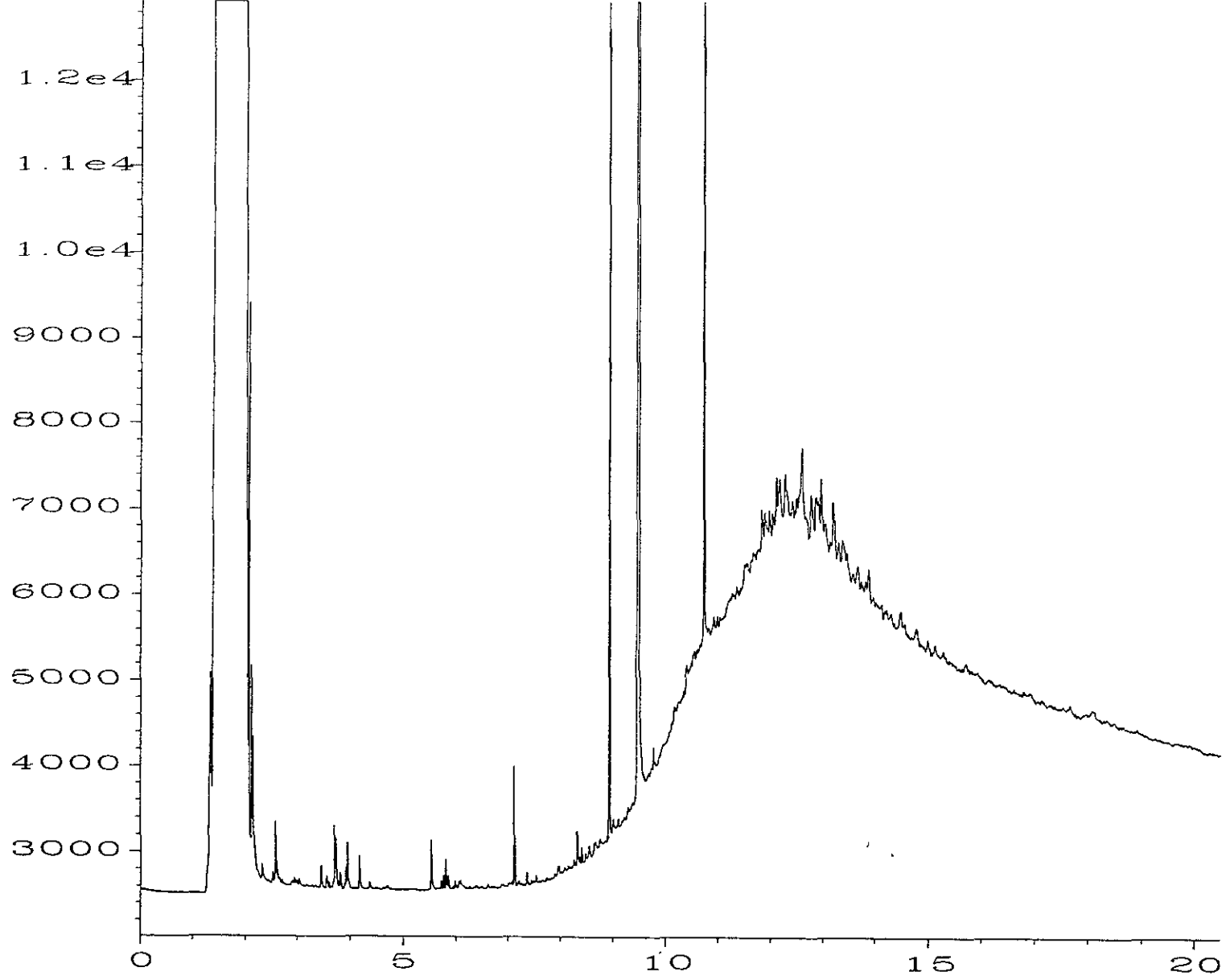
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-28-00\020F1301.D

Operator : ME
 Instrument : GC #6
 Sample Name : 009102-05 dup1:5
 Run Time Bar Code:
 Acquired on : 29 Sep 00 08:58 AM
 Report Created on: 14 Jan 09 07:46 AM

Page Number : 1
 Vial Number : 20
 Injection Number : 1
 Sequence Line : 13
 Instrument Method: TPDHX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-28-00\023F1301.D

Operator : ME

Instrument : GC #6

Sample Name : 009102-07 1:5

Run Time Bar Code:

Acquired on : 29 Sep 00 10:17 AM

Report Created on: 14 Jan 09 07:46 AM

Page Number : 1

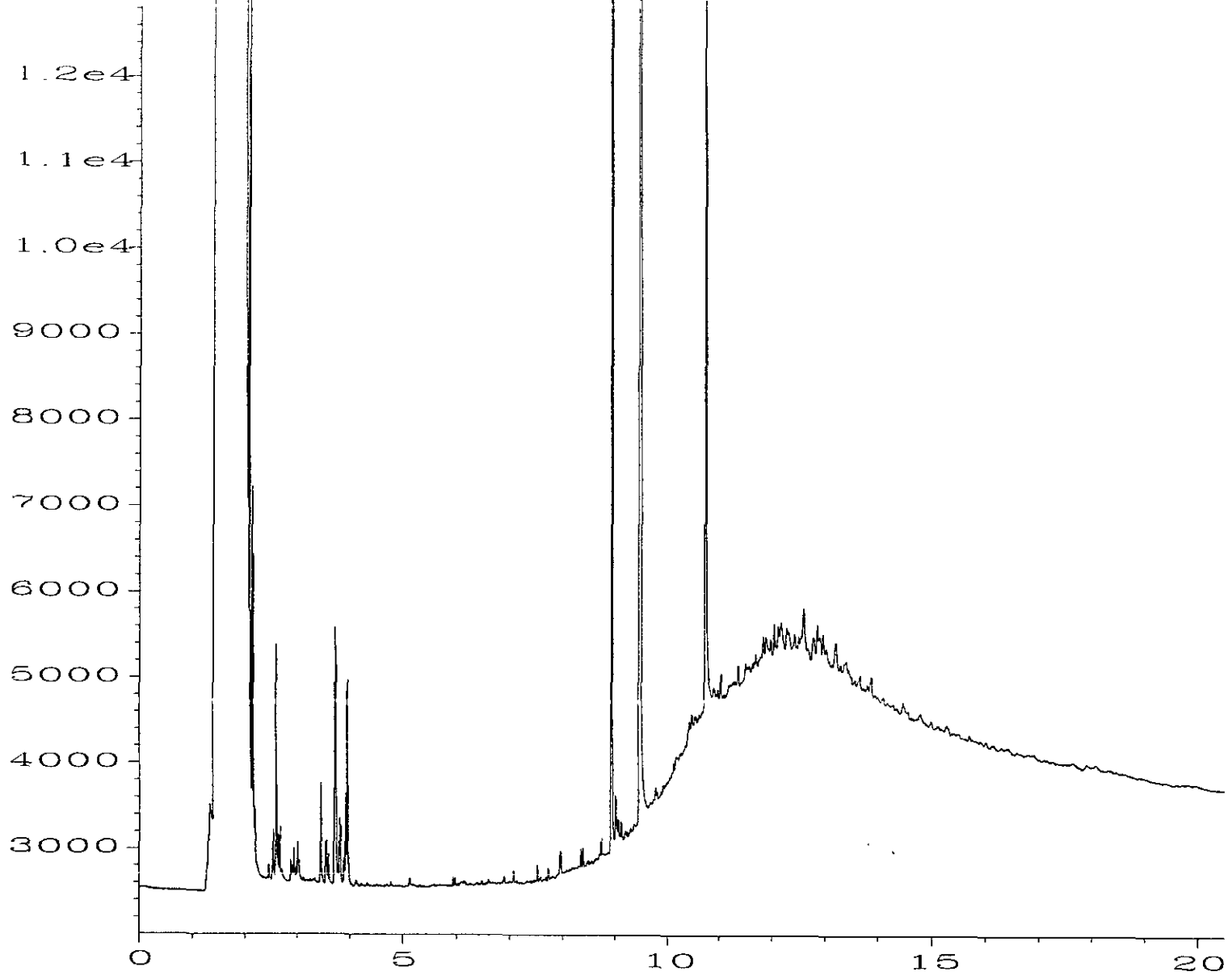
Vial Number : 23

Injection Number : 1

Sequence Line : 13

Instrument Method: TPHDX.MTH

Analysis Method : DEFAULT.MTH

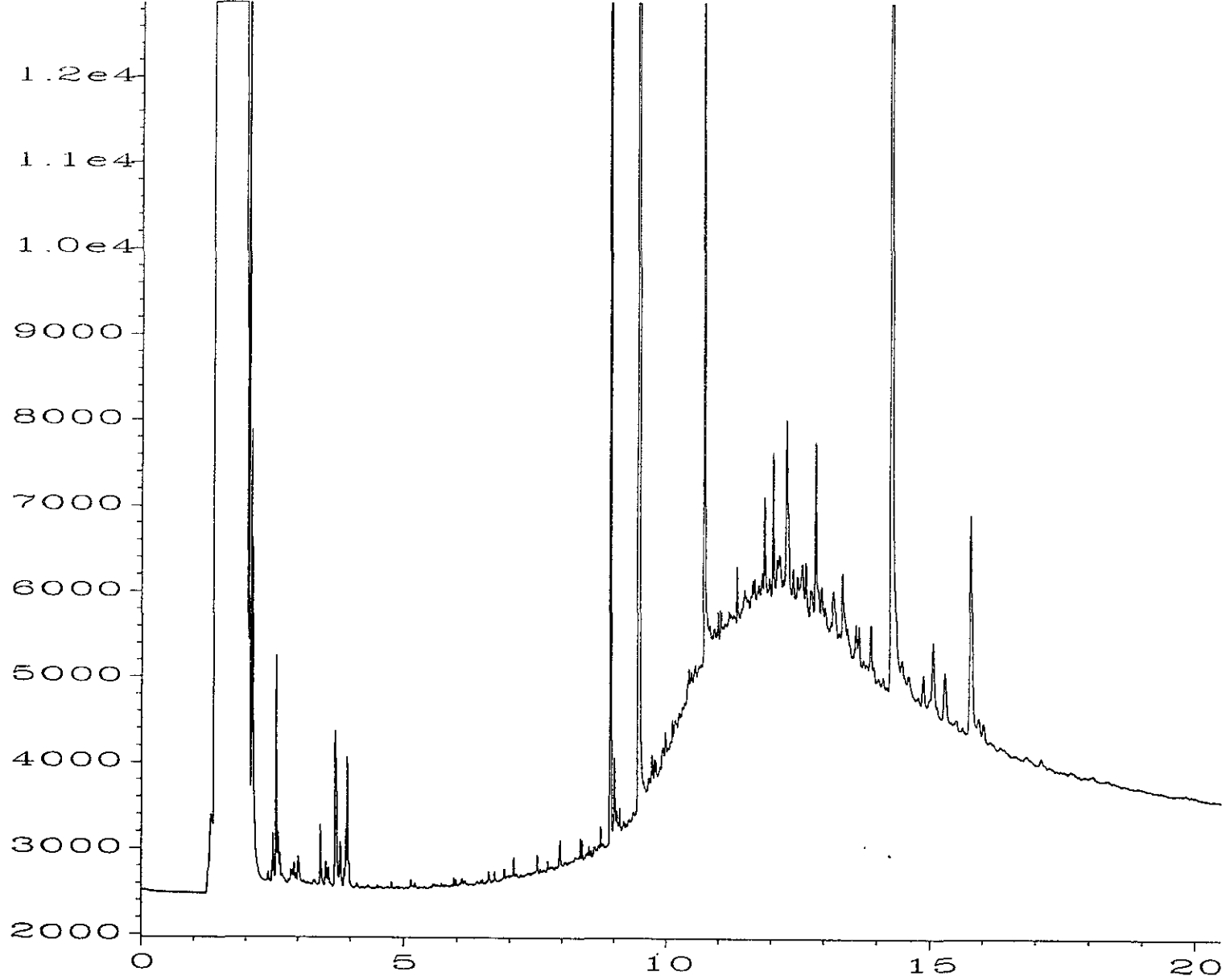


Data File Name : E:\GC6\09-28-00\024F1301.D

Operator : ME
 Instrument : GC #6
 Sample Name : 009102-08
 Run Time Bar Code :

Acquired on : 29 Sep 00 10:44 AM
 Report Created on: 14 Jan 09 07:47 AM

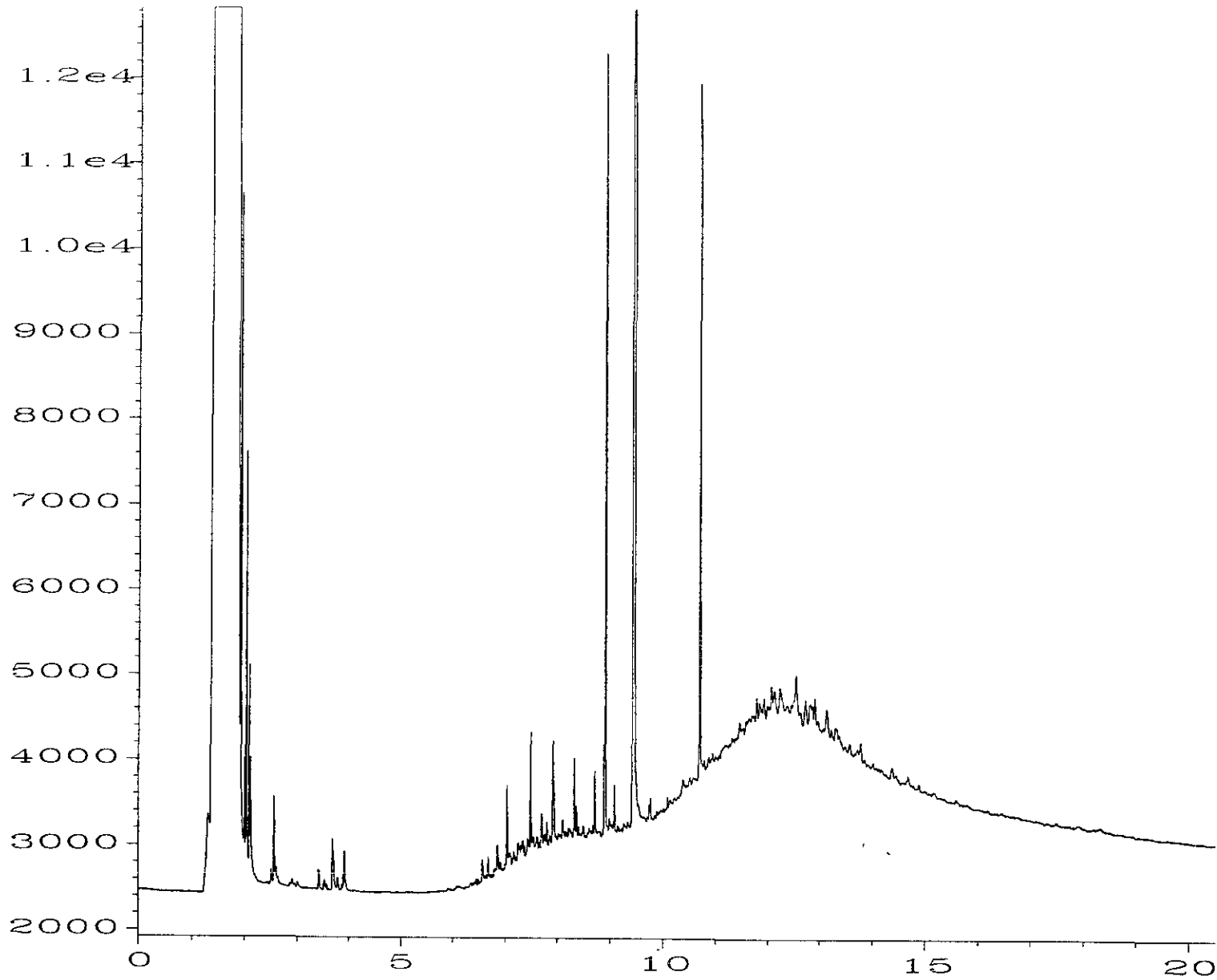
Page Number : 1
 Vial Number : 24
 Injection Number : 1
 Sequence Line : 13
 Instrument Method: TPDHX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-28-00\025F1301.D

Operator : ME
 Instrument : GC #6
 Sample Name : 009102-09
 Run Time Bar Code :
 Acquired on : 29 Sep 00 11:15 AM
 Report Created on: 14 Jan 09 07:47 AM

Page Number : 1
 Vial Number : 25
 Injection Number : 1
 Sequence Line : 13
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-29-00\006F0801.D

Operator : MC

Instrument : GC #6

Sample Name : 009102-10 1:5

Run Time Bar Code:

Acquired on : 30 Sep 00 06:35 AM

Report Created on: 14 Jan 09 06:45 AM

Page Number : 1

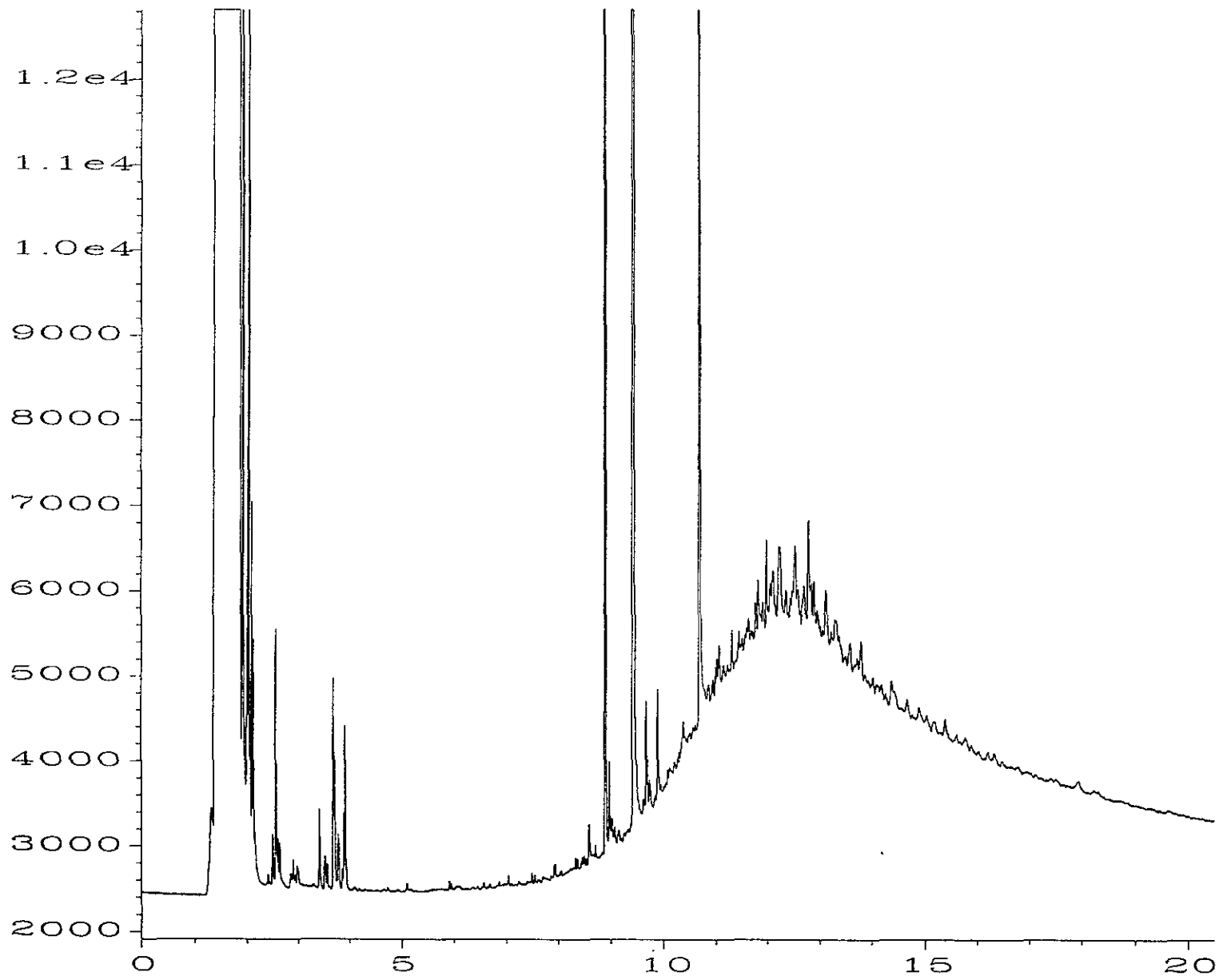
Vial Number : 6

Injection Number : 1

Sequence Line : 8

Instrument Method: TPHDX.MTH

Analysis Method : DEFAULT.MTH

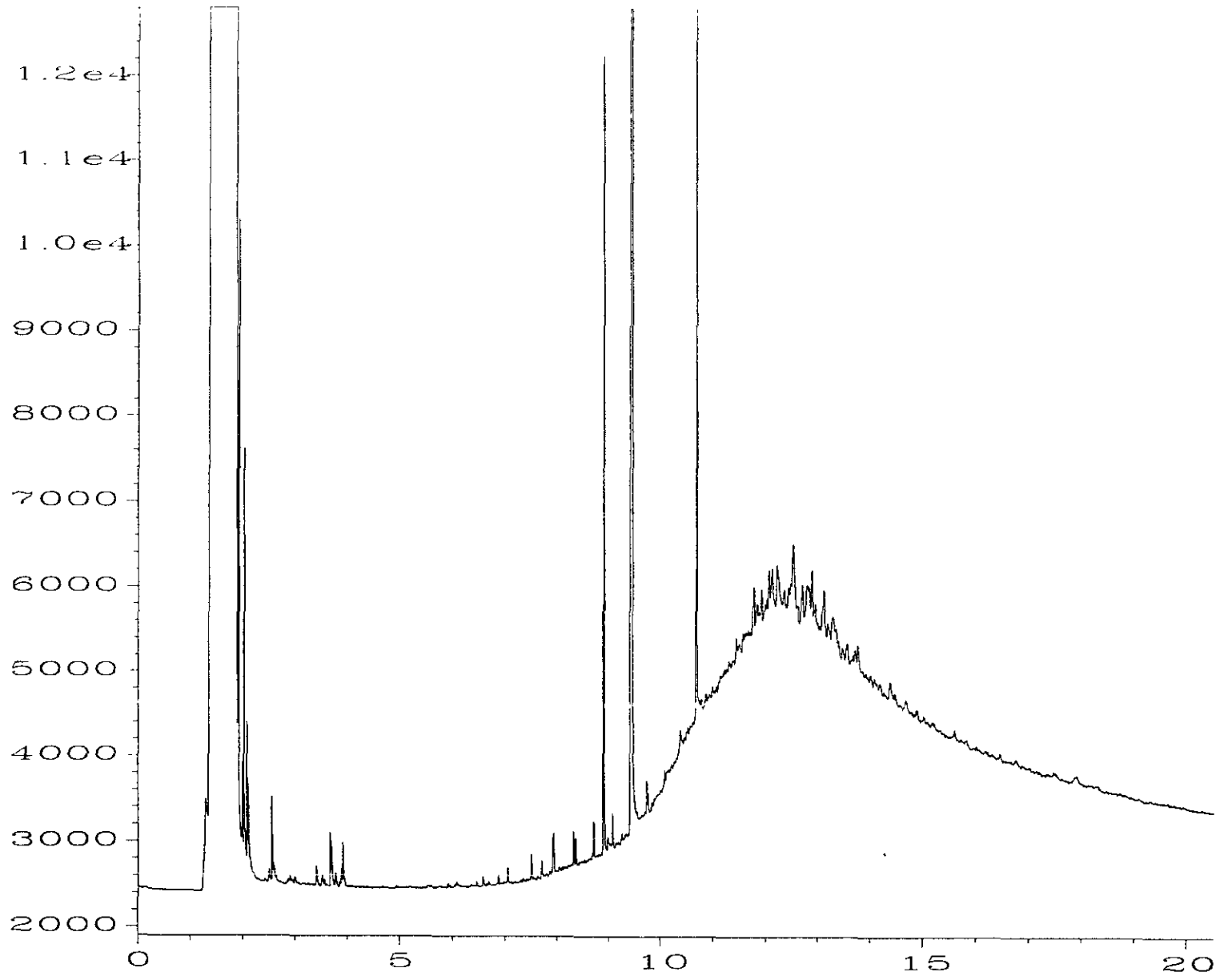


Data File Name : E:\GC6\09-29-00\007F0801.D

Operator : MC
 Instrument : GC #6
 Sample Name : 009102-11
 Run Time Bar Code:

Acquired on : 30 Sep 00 07:03 AM
 Report Created on: 14 Jan 09 06:46 AM

Page Number : 1
 Vial Number : 7
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-29-00\008F0801.D

Operator : MC

Instrument : GC #6

Sample Name : 009102-12 1:5

Run Time Bar Code:

Acquired on : 30 Sep 00 07:30 AM

Report Created on: 14 Jan 09 07:48 AM

Page Number : 1

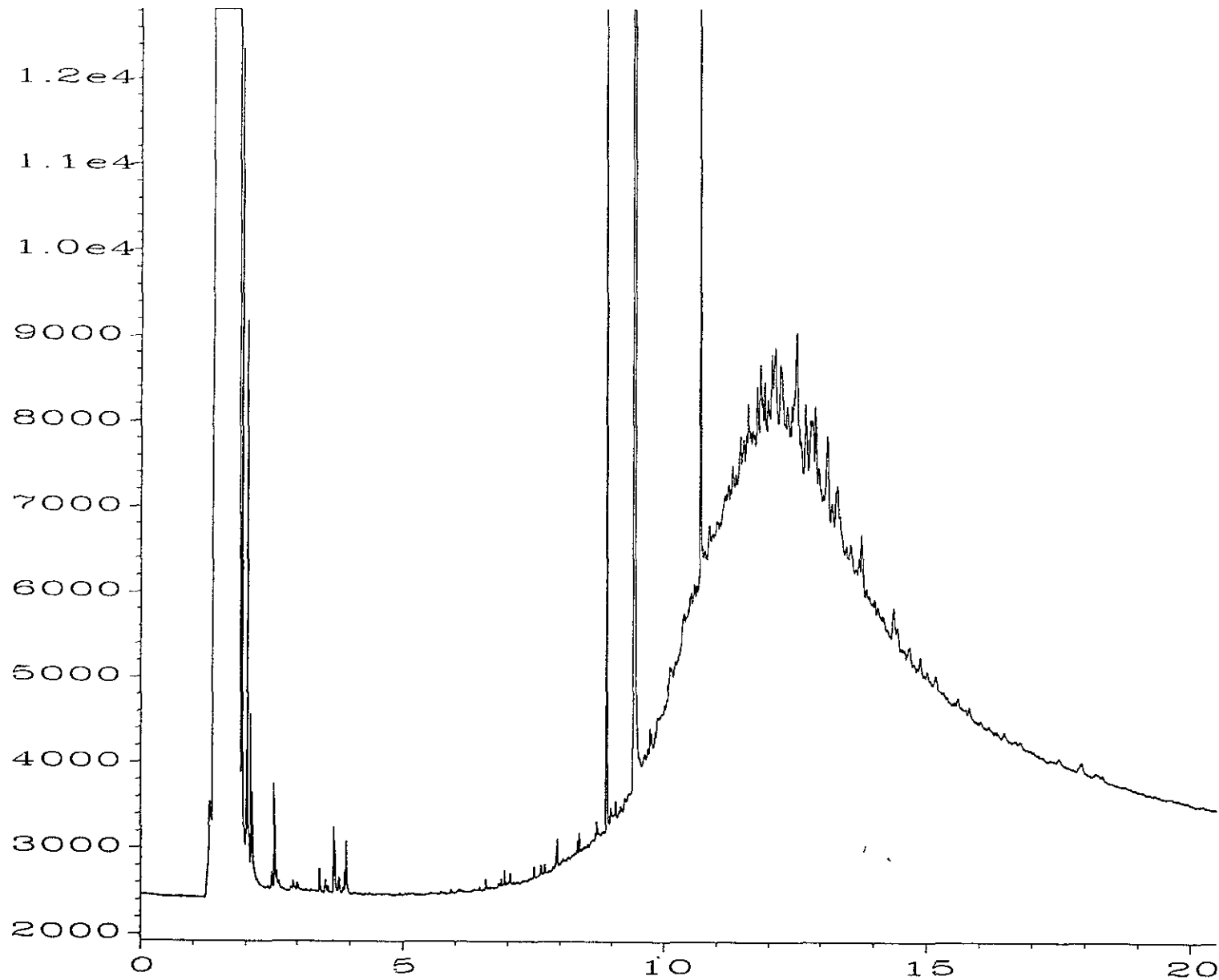
Vial Number : 8

Injection Number : 1

Sequence Line : 8

Instrument Method: TPHDX.MTH

Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-29-00\009F0801.D

Operator : MC

Instrument : GC #6

Sample Name : 009102-13 1:5

Run Time Bar Code:

Acquired on : 30 Sep 00 07:57 AM

Report Created on: 14 Jan 09 07:48 AM

Page Number : 1

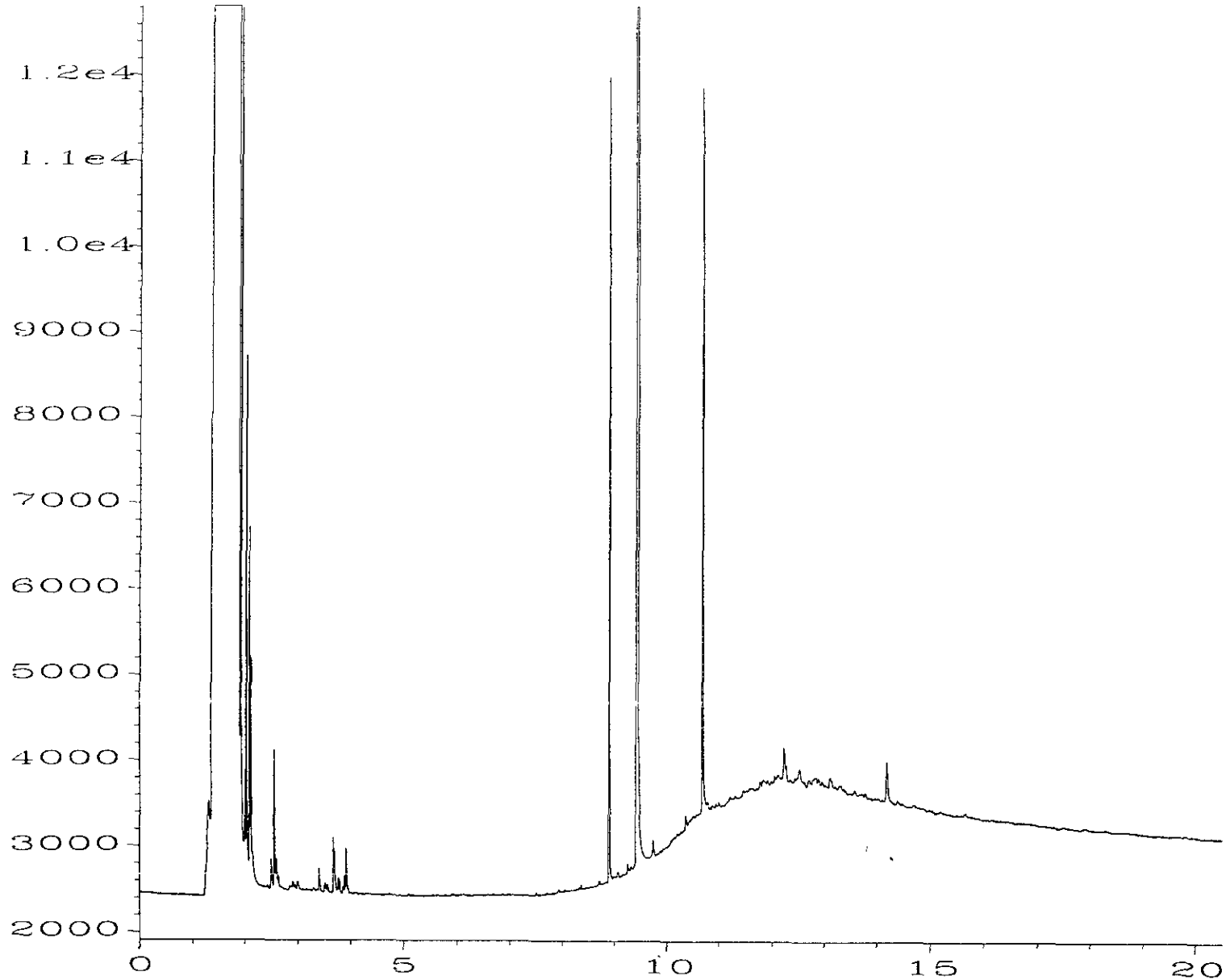
Vial Number : 9

Injection Number : 1

Sequence Line : 8

Instrument Method: TPHDX.MTH

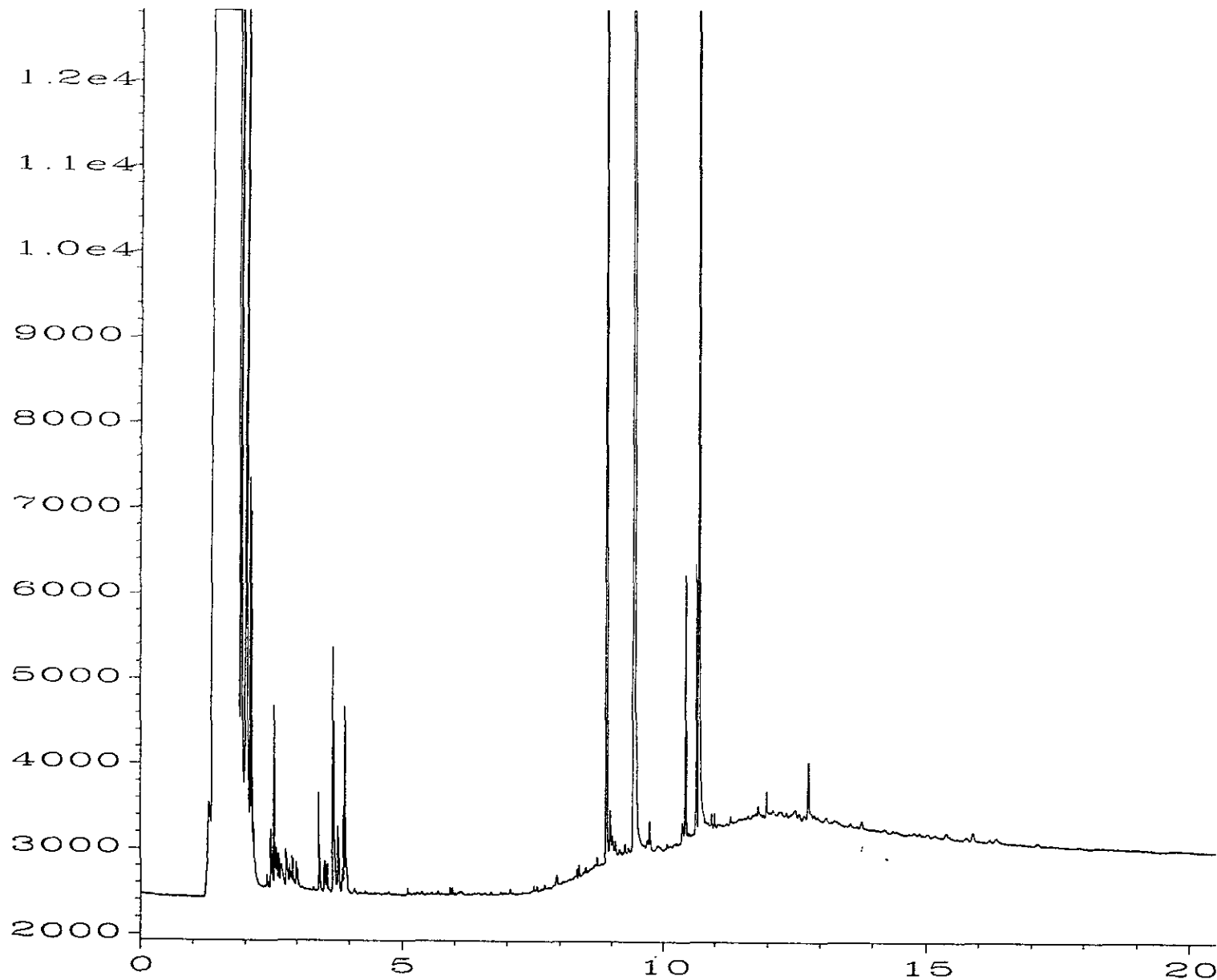
Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-29-00\010F0801.D

Operator : MC
 Instrument : GC #6
 Sample Name : 009102-14 1:5
 Run Time Bar Code:
 Acquired on : 30 Sep 00 08:24 AM
 Report Created on: 14 Jan 09 07:49 AM

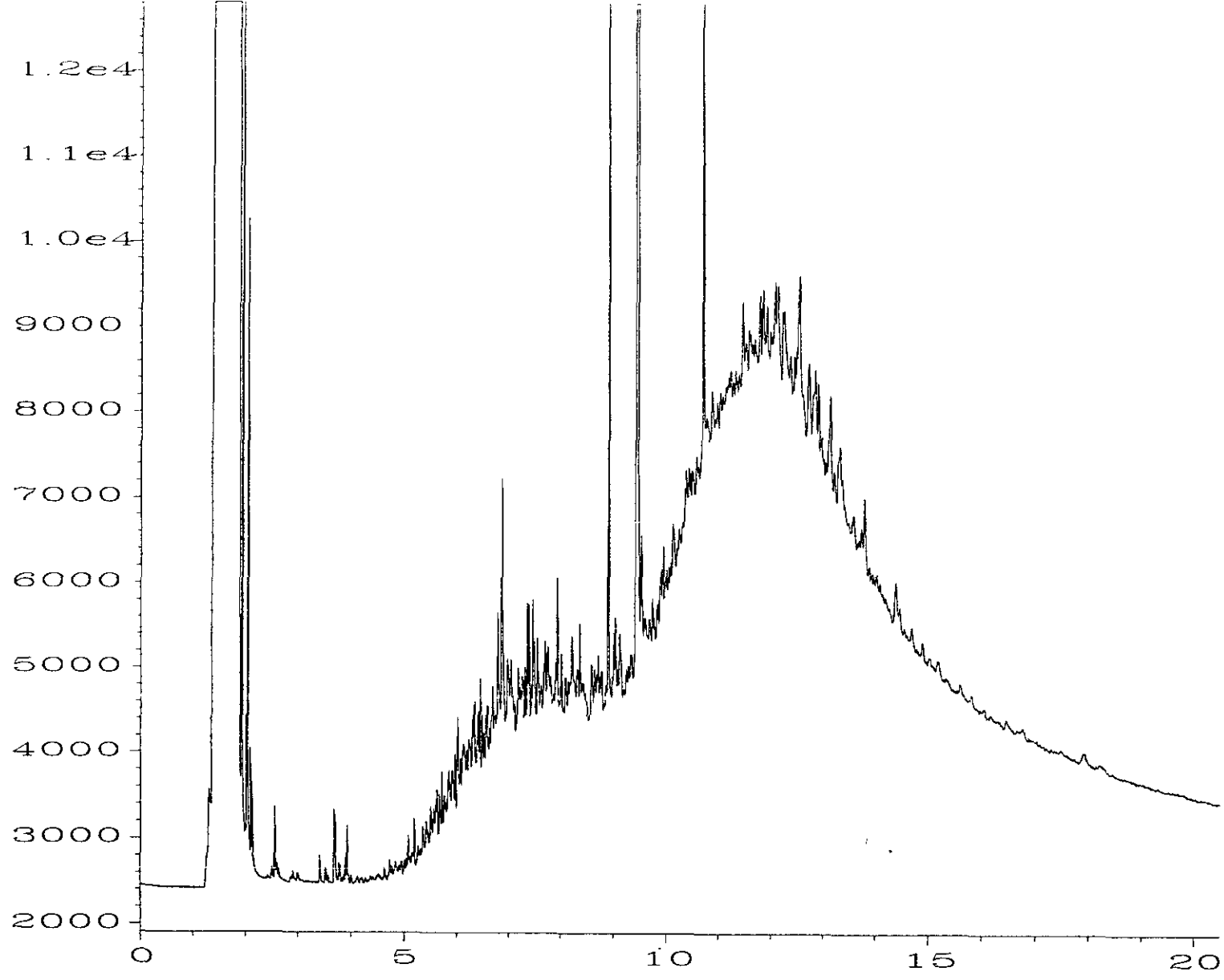
Page Number : 1
 Vial Number : 10
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-29-00\011F0801.D

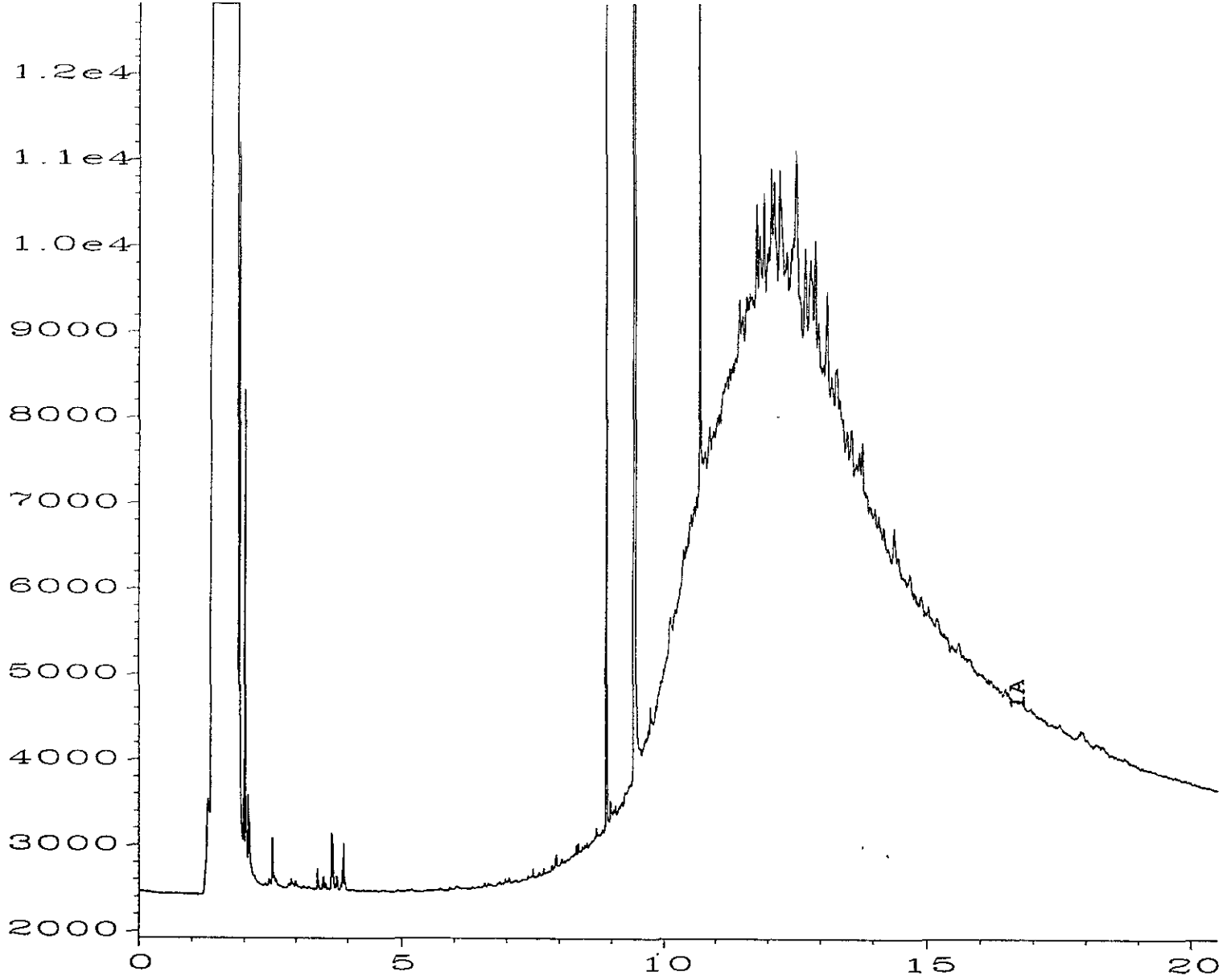
Operator : MC
 Instrument : GC #6
 Sample Name : 009102-15
 Run Time Bar Code:
 Acquired on : 30 Sep 00 08:51 AM
 Report Created on: 14 Jan 09 07:49 AM

Page Number : 1
 Vial Number : 11
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-29-00\012F0801.D

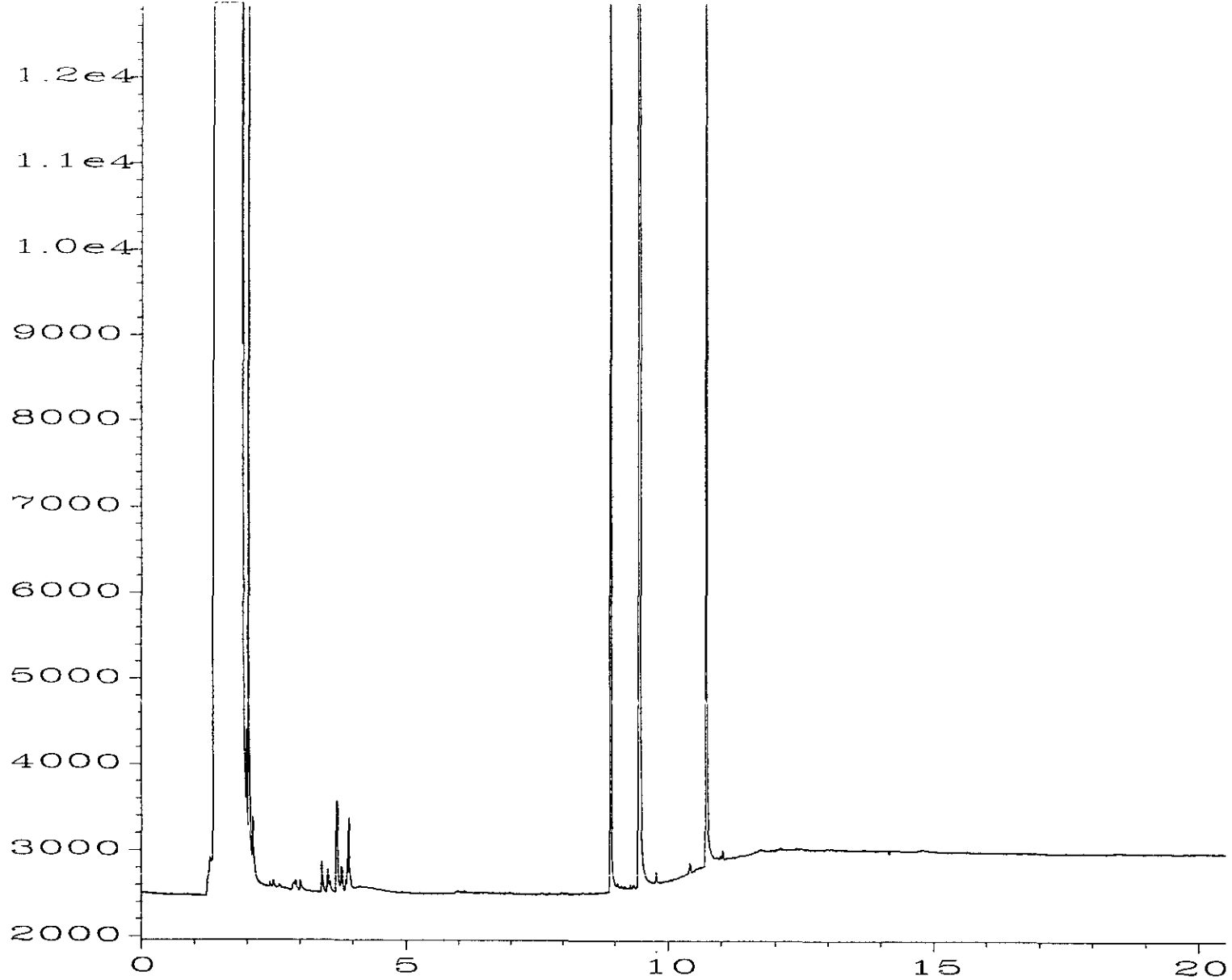
Operator : MC
 Instrument : GC #6
 Sample Name : 009102-16 1:5
 Run Time Bar Code : 30 Sep 00 09:18 AM
 Acquired on : 14 Jan 09 07:49 AM
 Page Number : 1
 Vial Number : 12
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-29-00\013F0801.D

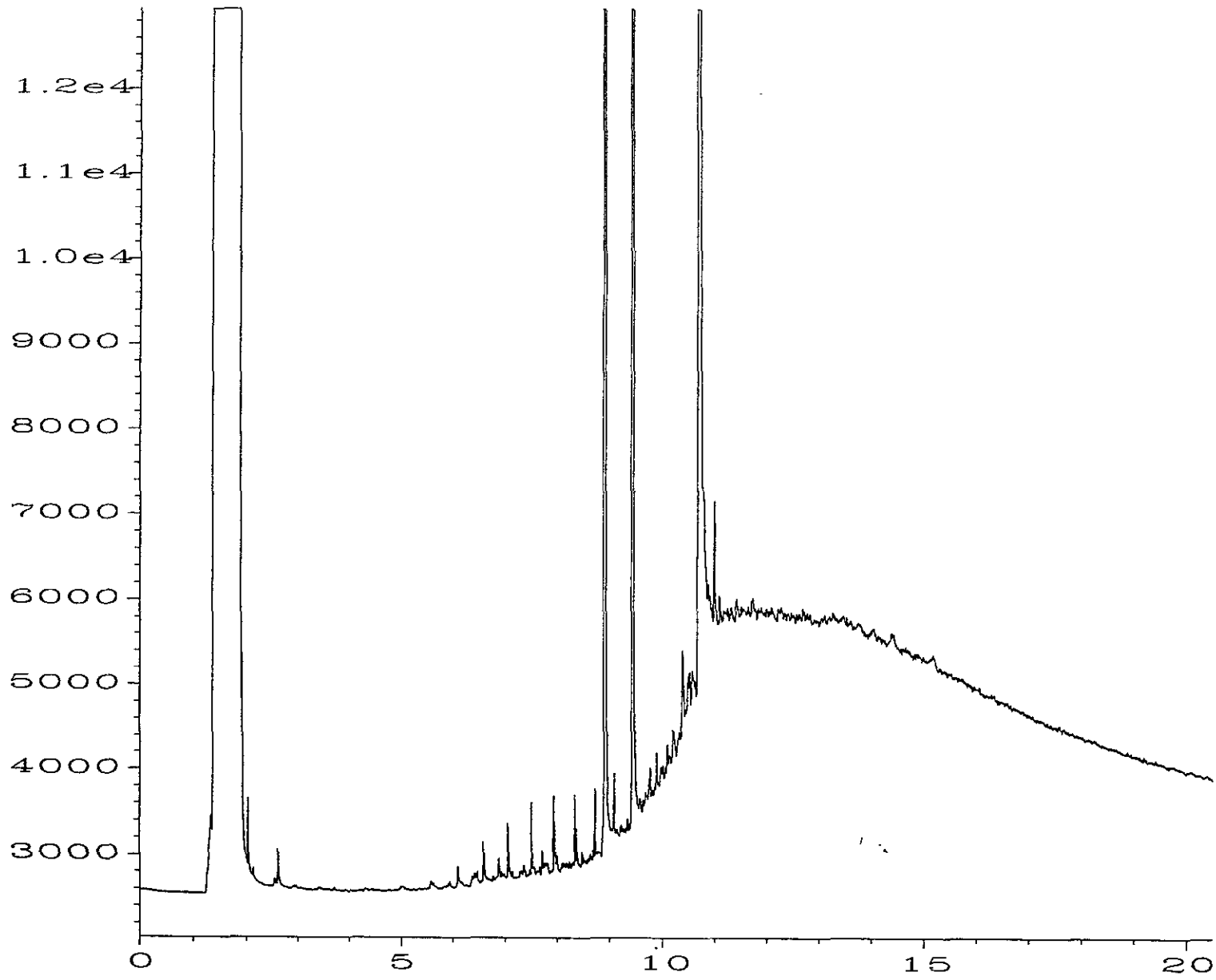
Operator : MC
 Instrument : GC #6
 Sample Name : 009102-17 1:5
 Run Time Bar Code : 30 Sep 00 09:46 AM
 Report Created on: 14 Jan 09 07:49 AM

Page Number : 1
 Vial Number : 13
 Injection Number : 1
 Sequence Line : 8
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-28-00\013F1101.D

Operator : ME
 Instrument : GC #6
 Sample Name : 00-641 mb
 Run Time Bar Code : 29 Sep 00 05:27 AM
 Acquired on : 14 Jan 09 07:44 AM
 Page Number : 1
 Vial Number : 13
 Injection Number : 1
 Sequence Line : 11
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH



Data File Name : E:\GC6\09-28-00\004F0701.D

Operator : ME
 Instrument : GC #6
 Sample Name : 500 MO 9-109
 Run Time Bar Code :
 Acquired on : 29 Sep 00 00:10 AM
 Report Created on: 14 Jan 09 07:44 AM

Page Number : 1
 Vial Number : 4
 Injection Number : 1
 Sequence Line : 7
 Instrument Method: TPHDX.MTH
 Analysis Method : DEFAULT.MTH

010157

CS 10/27/00 103

CHAIN-OF-CUSTODY RECORD

No 0909

Date: 10/26/00

Page 2 of 2

Project No.: 6262

Samplers (Signatures):
[Signatures]

Date	Time	Sample Number
10/26/00	1425	GMX-TRN-44B-1.5
	1430	GMX-TRN-44D-1.0
	1455	GMX-TRN-44B-3.5
	1455	GMX-TRN-44C-1.0

ANALYSES

EPA Method 8010	EPA Method 8020	EPA Method 8020 (BTEX only)	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	THMs	PAHs	8270C STMS	Other	Cooled	Soil (S), Water (W), or Vapor (V)	Acidified	Number of containers	
							X	X		HOLD		Y	S	N	1
							✓	✓		X		Y	S	N	1
							✓	✓		X		Y	S	N	1
							✓	✓		X		Y	S	N	1

REMARKS

Additional Comments

2" x 6" brass soil tube
↓

[Large X mark]

Friedman + Bruya

Turnaround time: Standard

Results to: Ann Holbrow

Total No. of containers: 4

Relinquished by (signature): *[Signature]*
 Printed Name: Bryan Turner
 Company: Geomatrix

Date: 10/26/00
 Time: 1645

Relinquished by (signature):
 Printed Name:
 Company:

Date:
 Time:
 Method of Shipment: Fed Ex 8200 7653 1994
 Laboratory Comments and Log No.:
 Analyte 14, 15, 16 and 13 from other end of tube per Ann Holbrow 11-16-00
 5 day TAT
 ✓

Received by (signature): *[Signature]*
 Printed Name:
 Company:

Date: 10/27/00
 Time: 1:30

Received by (signature):
 Printed Name:
 Company:



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Jensen, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

November 27, 2000

Ann Holbrow, Project Manager
Geomatrix Consultants, Inc.
2101 Webster Street, 12th Floor
Oakland, CA 94612

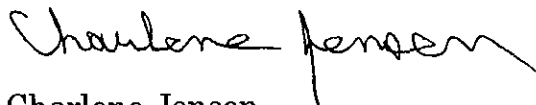
Dear Ms. Holbrow:

Included are the results from the additional testing of material submitted on October 27, 2000 from your 6262 project.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Charlene Jensen
Chemist

Enclosures
GMC1127R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses additional testing of samples received on October 27, 2000 by Friedman & Bruya, Inc. from the Geomatrix Consultants, Inc. 6262 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Geomatrix Consultants, Inc.</u>
010157-13	GMX-TRN-44B-1.5
010157-14	GMX-TRN-44D-1.0
010157-15	GMX-TRN-44B-3.5
010157-16	GMX-TRN-44C-1.0

As requested the portions used for analysis of sample GMX-TRN-44B-1.5 were taken from the opposite end of the sampling tube than that used for the previous analysis of the sample.

As discussed, samples were analyzed outside of normal holding time. All other quality control requirements were within acceptable limits.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/27/00
Date Received: 10/27/00
Project: 6262
Date Extracted: 11/20/00
Date Analyzed: 11/22/00

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING EPA METHOD 8015M**
Results Reported as $\mu\text{g/g}$ (ppm)

<u>Sample ID</u> Laboratory ID	<u>Motor Oil Range</u>	<u>Surrogate</u> (% Recovery)
GMX-TRN-44B-1.5 010157-13	320	95
GMX-TRN-44D-1.0 d 010157-14	1,200	85
GMX-TRN-44B-3.5 010157-15	130	94
GMX-TRN-44C-1.0 010157-16	150	99
Method Blank	<50	90

d - The sample was diluted. Detection limits are raised due to dilution.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-44B-1.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/20/00	Lab ID:	010157-13
Date Analyzed:	11/22/00	Data File:	112136.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	76	31	123
Benzo(a)anthracene-d12	87	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	11
Anthracene	<5
Fluoranthene	19
Pyrene	25
Benz(a)anthracene	9
Chrysene	15
Benzo(b)fluoranthene	13
Benzo(k)fluoranthene	11
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-44D-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/20/00	Lab ID:	010157-14 1/10
Date Analyzed:	11/22/00	Data File:	112133.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	134 vo	31	123
Benzo(a)anthracene-d12	84	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	<50
Pyrene	<50
Benz(a)anthracene	<50
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	<50

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

vo - The value reported fell outside the control limits established for this analyte.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-44B-3.5	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/20/00	Lab ID:	010157-15 1/10
Date Analyzed:	11/22/00	Data File:	112134.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	154 vo	31	123
Benzo(a)anthracene-d12	79	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	<50
Pyrene	<50
Benz(a)anthracene	<50
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	<50

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful

vo - The value reported fell outside the control limits established for this analyte.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	GMX-TRN-44C-1.0	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/20/00	Lab ID:	010157-16 1/10
Date Analyzed:	11/22/00	Data File:	112135.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	187 vo	31	123
Benzo(a)anthracene-d12	78	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<50
Acenaphthylene	<50
Acenaphthene	<50
Fluorene	<50
Phenanthrene	<50
Anthracene	<50
Fluoranthene	71
Pyrene	81
Benz(a)anthracene	55
Chrysene	<50
Benzo(b)fluoranthene	<50
Benzo(k)fluoranthene	<50
Benzo(a)pyrene	<50
Indeno(1,2,3-cd)pyrene	<50
Dibenzo(a,h)anthracene	<50
Benzo(g,h,i)perylene	<50

Note: The sample was diluted due to high levels of interfering compounds. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

vo - The value reported fell outside the control limits established for this analyte.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PNA Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Geomatrix Consultants, Inc.
Date Received:	10/27/00	Project:	6262
Date Extracted:	11/20/00	Lab ID:	mb 00-763
Date Analyzed:	11/22/00	Data File:	112131.D
Matrix:	Soil	Instrument:	GCMS3
Units:	ug/kg (ppb)	Operator:	YA

Surrogates:	% Recovery	Lower Limit	Upper Limit
Anthracene-d10	80	31	123
Benzo(a)anthracene-d12	71	47	157

Compounds:	Concentration: ug/kg (ppb)
Naphthalene	<5
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Benzo(a)pyrene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenzo(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/27/00

Date Received: 10/27/00

Project: 6262

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
USING EPA METHOD 8015M**

Laboratory Code: 010157-15 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	% Recovery MS	Acceptance Criteria
Motor Oil	µg/g (ppm)	250	130	89	65-135

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	Relative Percent Difference
Motor Oil	µg/g (ppm)	250	67	70	65-135	4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/27/00

Date Received: 10/27/00

Project: 6262

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR PNA'S BY EPA METHOD 8270C SIM

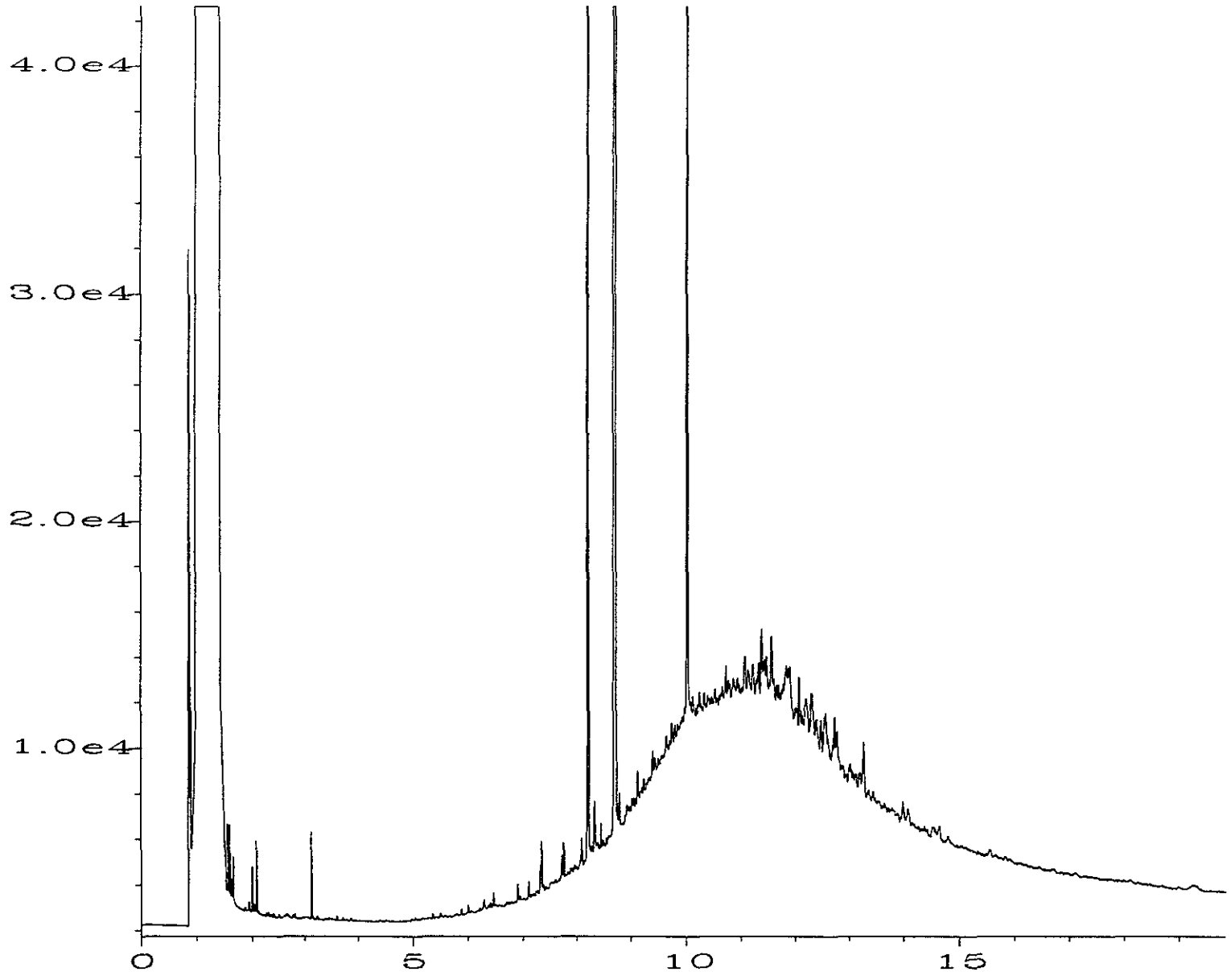
Laboratory Code: 010157-15 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD	Acceptance Criteria
Napthalene	µg/kg (ppb)	<50	<50	nm	0-20
Acenapthylene	µg/kg (ppb)	<50	<50	nm	0-20
Acenapthene	µg/kg (ppb)	<50	<50	nm	0-20
Fluorene	µg/kg (ppb)	<50	<50	nm	0-20
Phenanthrene	µg/kg (ppb)	<50	<50	nm	0-20
Anthracene	µg/kg (ppb)	<50	<50	nm	0-20
Fluoranthene	µg/kg (ppb)	<50	<50	nm	0-20
Pyrene	µg/kg (ppb)	<50	<50	nm	0-20
Benz(a)anthracene	µg/kg (ppb)	<50	<50	nm	0-20
Chrysene	µg/kg (ppb)	<50	<50	nm	0-20
Benzo(b)fluoranthene	µg/kg (ppb)	<50	<50	nm	0-20
Benzo(k)fluoranthene	µg/kg (ppb)	<50	<50	nm	0-20
Benzo(a)pyrene	µg/kg (ppb)	<50	<50	nm	0-20
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	<50	<50	nm	0-20
Dibenzo(a,h)anthracene	µg/kg (ppb)	<50	<50	nm	0-20
Benzo(g,h,i)perylene	µg/kg (ppb)	<50	<50	nm	0-20

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	RPD
Napthalene	µg/kg (ppb)	170	73	69	58-121	5
Acenapthylene	µg/kg (ppb)	170	92	89	54-122	3
Acenapthene	µg/kg (ppb)	170	89	87	58-119	3
Fluorene	µg/kg (ppb)	170	75	75	57-122	0
Phenanthrene	µg/kg (ppb)	170	77	78	57-123	2
Anthracene	µg/kg (ppb)	170	93	86	44-125	7
Fluoranthene	µg/kg (ppb)	170	90	90	54-127	0
Pyrene	µg/kg (ppb)	170	91	90	56-123	1
Benz(a)anthracene	µg/kg (ppb)	170	79	79	50-124	0
Chrysene	µg/kg (ppb)	170	76	77	51-122	2
Benzo(b)fluoranthene	µg/kg (ppb)	170	78	78	44-149	1
Benzo(k)fluoranthene	µg/kg (ppb)	170	107	111	52-140	4
Benzo(a)pyrene	µg/kg (ppb)	170	85	80	42-129	5
Indeno(1,2,3-cd)pyrene	µg/kg (ppb)	170	79	80	48-134	2
Dibenzo(a,h)anthracene	µg/kg (ppb)	170	77	79	49-136	2
Benzo(g,h,i)perylene	µg/kg (ppb)	170	72	74	46-134	2

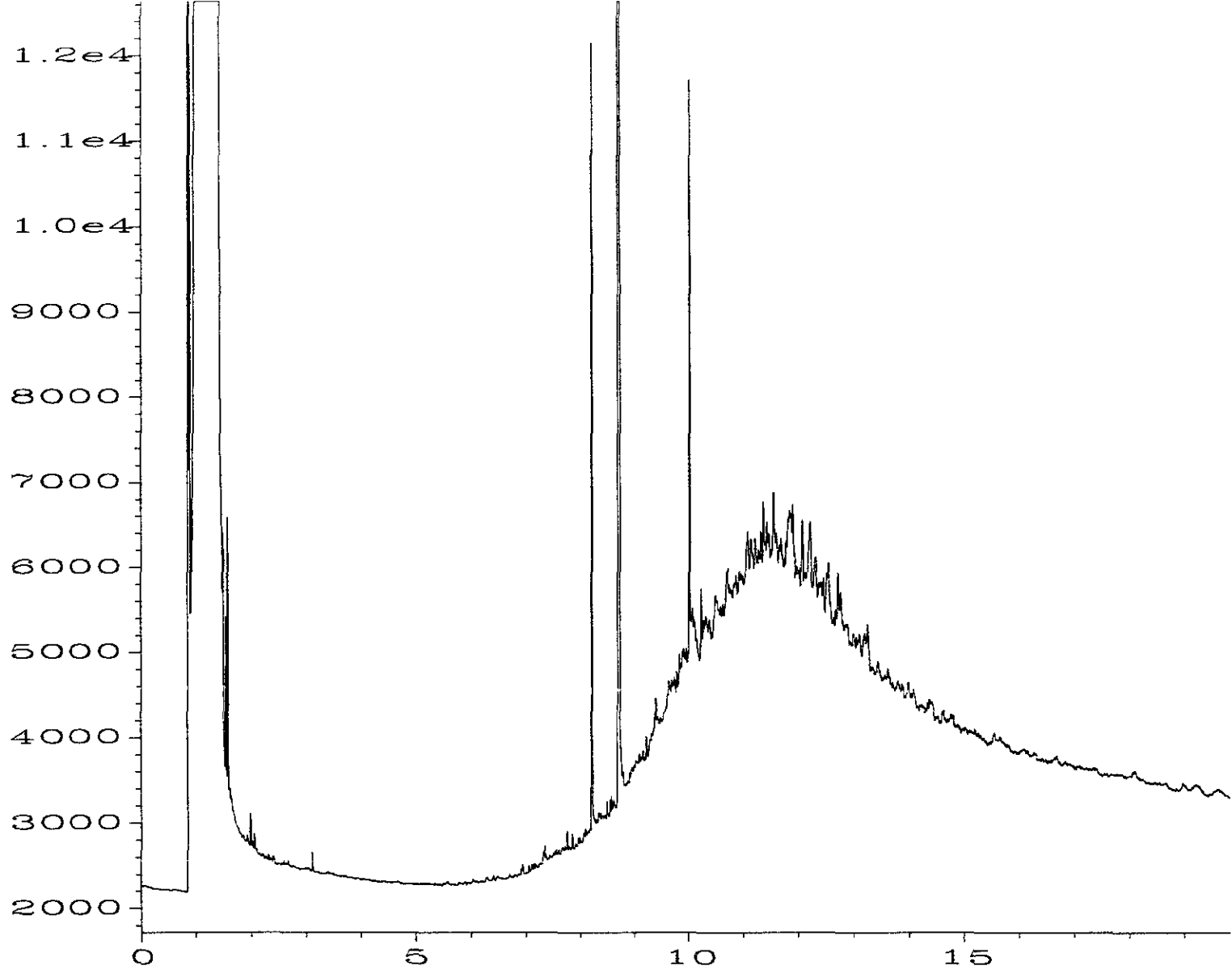
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.



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Report Created on:

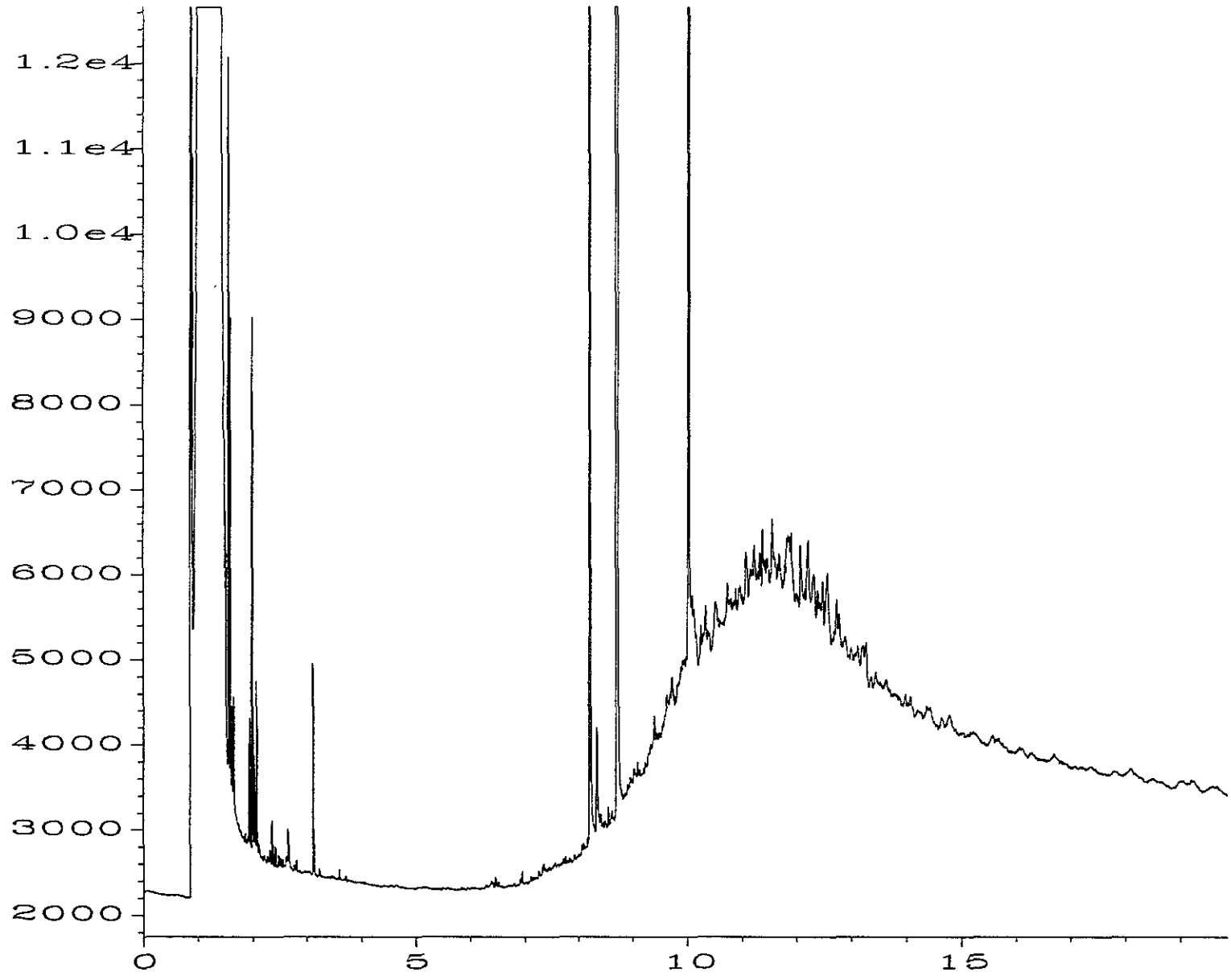
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Analysis Method : CGRAM.MTH



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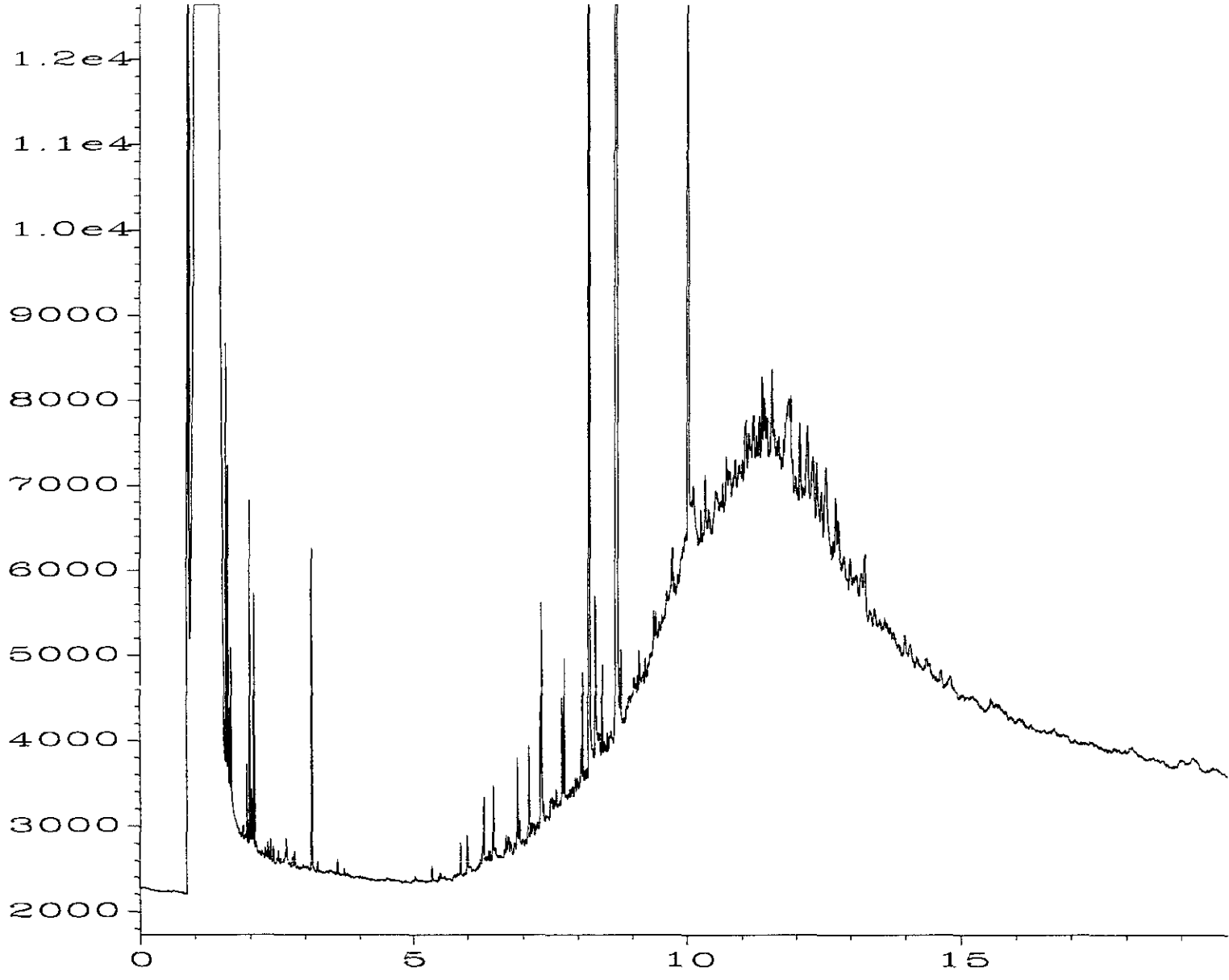
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 Instrument : ANALYZER1
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 Report Created on: 18 Jan 15 11:09 PM

Page Number : 1
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 Injection Number : 1
 Sequence Line : 14
 Instrument Method: TPHD.MTH
 Analysis Method : CGRAM.MTH



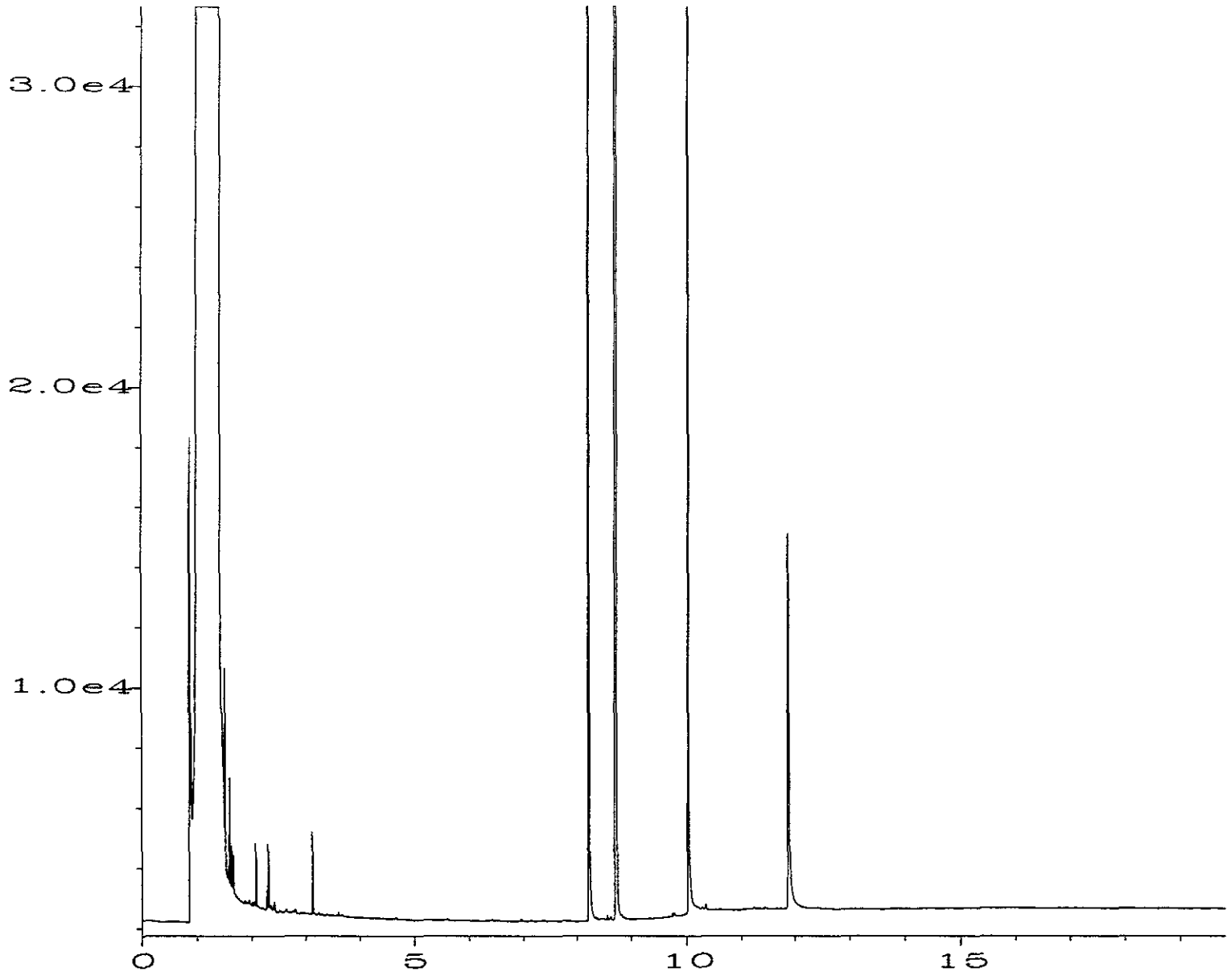
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Instrument : ANALYZER1
Sample Name : 010157-15 dup
Run Time Bar Code :
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Report Created on: 18 Jan 15 11:09 PM

Page Number : 1
Vial Number : 21
Injection Number : 1
Sequence Line : 14
Instrument Method: TPHD.MTH
Analysis Method : CGRAM.MTH



Data File Name : E:\GC4\11-21-00\023F1401.D
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 Instrument : ANALYZER1
 Sample Name : 010157-16
 Run Time Bar Code:
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 Report Created on: 18 Jan 15 11:09 PM

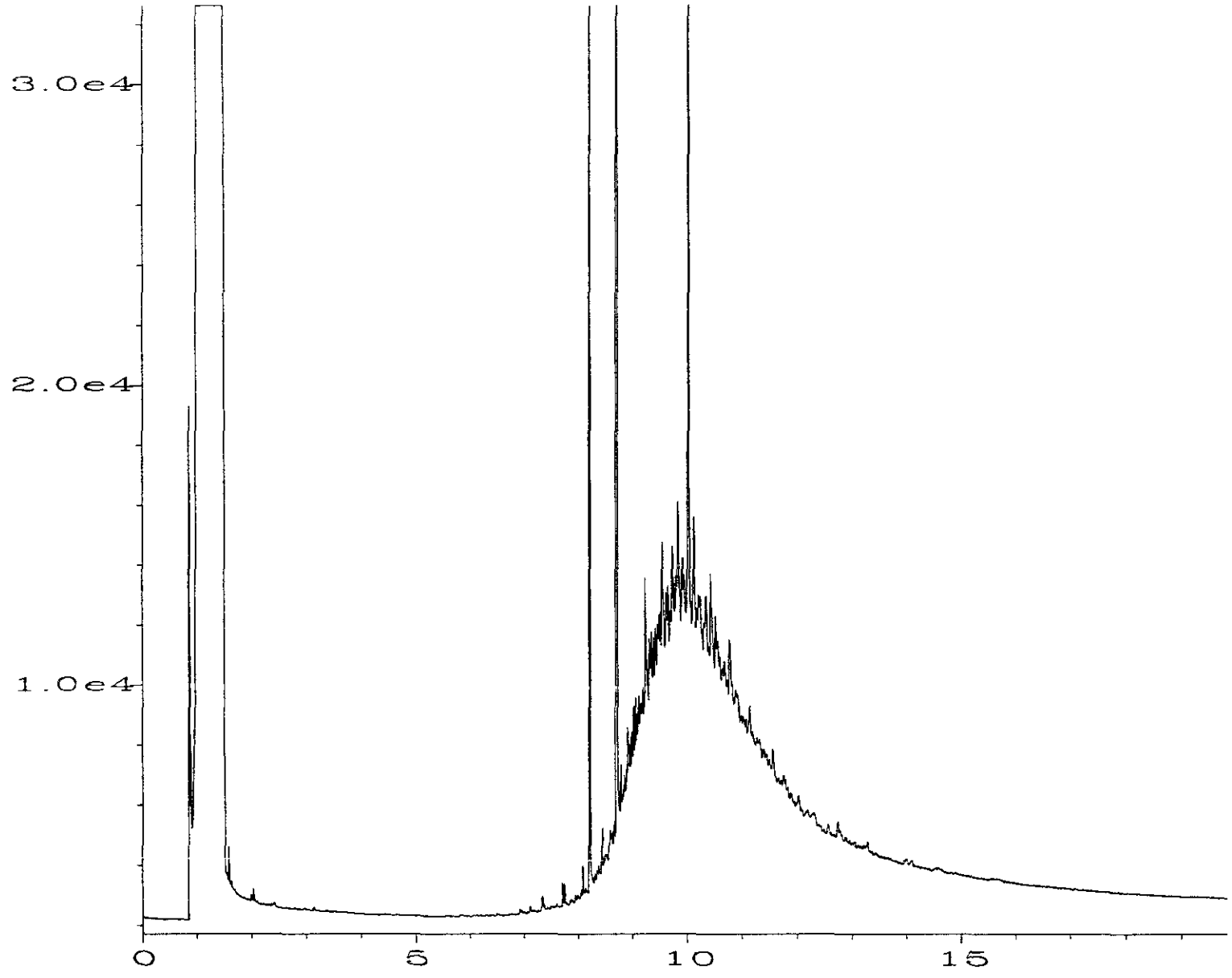
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 Injection Number : 1
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 Instrument Method: TPHD.MTH
 Analysis Method : CGRAM.MTH



Data File Name : E:\GC4\11-21-00\006F0501.D

Operator : ME
 Instrument : ANALYZER1
 Sample Name : 00-762 mb
 Run Time Bar Code: 21 Nov 00 01:39 PM
 Acquired on : 18 Jan 15 11:06 PM
 Report Created on:

Page Number : 1
 Vial Number : 6
 Injection Number : 1
 Sequence Line : 5
 Instrument Method: TPHD.MTH
 Analysis Method : CGRAM.MTH



Data File Name : E:\GC4\11-21-00\004F0301.D

Operator : ME
Instrument : ANALYZER1
Sample Name : 500 mo 9-109
Run Time Bar Code: 21 Nov 00 12:21 PM
Acquired on : 18 Jan 15 11:06 PM
Report Created on:

Page Number : 1
Vial Number : 4
Injection Number : 1
Sequence Line : 3
Instrument Method: TPHD.MTH
Analysis Method : CGRAM.MTH

Appendix C

Results of Quality Assurance/Quality Control

ATTACHMENT C

RESULTS OF QUALITY ASSURANCE/QUALITY CONTROL

Canterbury Residential Development
Hayward, California

The parameters used to evaluate data quality are as follows:

- **Accuracy:** The agreement of a measurement with an accepted reference or true value. Accuracy was assessed using the laboratory method blanks, laboratory control samples, and matrix spike samples. Laboratory method blanks test for false positive results. For laboratory control samples, the laboratory adds a known quantity of a chemical to deionized water, which is then analyzed. For matrix spike samples, a known quantity of a chemical is added to a site-specific sample designated on the chain-of-custody. In addition, the laboratory adds surrogates (chemicals with similar characteristics that are unlikely to be detected in environmental media) to each sample to test the accuracy of the measurements for these surrogate compounds. The accuracy goal for each analyte is specified by the laboratory on the laboratory data sheets (Attachment D).
- **Precision:** A measurement of the degree of agreement of replicate data, which is quantitatively assessed, based on the relative percent difference or standard deviation. Precision was assessed using matrix spike/matrix spike duplicate samples, laboratory control/duplicate samples, and site-specific duplicate samples selected by the laboratory. The precision goal for the relative percent difference for these samples was set at 20%.
- **Completeness:** The amount of valid data obtained from a prescribed measurement system throughout the project, as compared with that expected and required to meet the project goals.

Documentation of calculations for accuracy (percent recovery) and precision (relative percent difference) are presented in the laboratory data sheets for the appropriate quality assurance/quality control (QA/QC) sample (Attachment D).

Accuracy

Five method blanks were run for total petroleum hydrocarbons in the motor oil range (TPHmo), and five method blanks were run for polycyclic aromatic hydrocarbons (PAHs). For method blank samples all analyte concentrations were below method reporting limits, indicating that the laboratory results represented the contents of the sample.

Surrogates were run in every sample analyzed. Surrogate recoveries were within analyte-specific control limits with the following exception:

- In five PAH samples (GMX-TRN-45C-1.0, GMX-TRN-45D-1.0, GMX-TRN-44D-1.0, GMX-TRN-44B-3.5, and GMX-TRN-44C-1.0) one of two surrogate recoveries exceeded control limits established for the analytes. This indicates results reported may be higher than actual concentrations. These samples were also diluted because of high levels of interfering compounds, and as a result, surrogate recoveries may not be meaningful.

Based on the volume of data collected for the site, these surrogate recovery issues are not considered to significantly affect the conclusions of the assessment, as they would only bias sampling results higher.

Matrix spike samples were also analyzed to evaluate the accuracy of the analytical results. All matrix spike/matrix spike duplicate (MS/MSD) samples for polycyclic aromatic hydrocarbons (PAHs) were within control limits. Of the four MS/MSD samples for TPHmo, one was spiked at a level that was less than five times that present in the sample, the result was not meaningful. The accuracy of the laboratory control sample results were within the analyte-specific control limits for each method, supporting the conclusion that matrix interference, and not laboratory procedures or instrumentation, resulted in the differences for PAHs.

Precision

To evaluate precision, matrix spike/matrix spike duplicate samples, laboratory control samples, and laboratory duplicate samples were analyzed using each analysis method as discussed previously. Up to five laboratory duplicates, MS/MSD samples, and laboratory control samples were run for each analysis. The relative percent differences for these samples were within analyte-specific control limits with the following exceptions:

- RPDs for one total petroleum hydrocarbon as motor oil (TPHmo) were outside acceptance limits for one MS/MSD sample. The results were not considered meaningful as the spike level was less than five times that present in the sample, as discussed in accuracy section.
- The RPD results for one laboratory duplicate for PAHs were slightly above the acceptance criteria (20) for the two compounds detected (32 for fluorene and 24 for phenanthrene). These results may not reflect the variability of the analysis at low concentrations because the analytes were detected at less than five times the reporting limit.

The majority of the analyses used to evaluate precision were within their respective control limits. As such, these results are not considered to significantly affect the conclusions from this assessment.

Completeness

Data generated during the project were evaluated for completeness, that is, the amount of data meeting project QA/QC goals. Data generated for this project were considered complete for the purpose of the evaluation conducted.

Appendix D

Department of Toxic Substances Control
letter dated April 16, 2001



Department of Toxic Substances Control



Edwin F. Lowry, Director
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Gray Davis
Governor

Winston H. Hickox
Agency Secretary
California
Environmental
Protection Agency

April 16, 2001

Mr. Hugh J. Murphy
City of Hayward Fire Department
777 B Street
Hayward, California 94541-5007

Dear Mr. Murphy:

The Department of Toxic Substances Control (DTSC) has reviewed the laboratory report submitted for soil sampling activities discussed during our meeting on December 19, 2000. The data reviewed were gathered from twenty (20) occupied lots at the Canterbury Residential Development in Hayward, California.

Soil sampling analytical results showed benzo(a)pyrene in seventeen (17) out of the twenty (20) lots sampled. The other three (3) lots showed non-detectable levels of benzo(a)pyrene. Current DTSC procedures require that benzo(a)pyrene equivalents be calculated if polynuclear aromatic hydrocarbons (PAHs) are present. This procedure was completed for the samples. Analytical results from each individual lot were evaluated using this procedure. For lots where multiple samples were collected, the arithmetic mean was calculated rather than the 95% upper confidence level (UCL) on that mean (US EPA Publication 9825.7-081, May 1992) due to the small number of samples from the individual residential lots. The US EPA Region IX's Preliminary Remedial Goal (PRG) for benzo(a)pyrene in residential soil is 0.062 ppm. We have used 0.062 ppm as the screening value for the sampled lots. The mean benzo(a)pyrene equivalents for the soil samples collected from the seventeen lots were all below PRGs.

DTSC has also reviewed additional data packages for the analysis of Total Petroleum Hydrocarbons (TPH) as motor oil and PAHs. The data packages included laboratory reports, quality control (QC) summaries and raw data for the samples collected. No contamination was found in method blanks.

As discussed in earlier letters from DTSC, PRGs are health based screening values. Exposure to contaminant levels found below PRGs will not cause adverse health effects. Based on the benzo(a)pyrene equivalents calculated for the subject lots, no cleanup for this contaminant is required by DTSC.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov.

Mr. Murphy
April 16, 2001
Page Two

If you have any questions or comments, please call Annina Antonio at (510) 540-3844.

Sincerely,



Barbara J. Cook, P.E., Chief
Northern California
Coastal Cleanup Operations Branch

cc: Susan L. Hugo
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Roger Brewer
San Francisco Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612