GEOMATRIX

GROUNDWATER SCREENING RESULTS AND SCOPE OF WORK FOR ADDITIONAL GROUNDWATER INVESTIGATION

Clark's Home and Garden
23040 Clawiter Road
Hayward, California

Prepared for:

Clark's Home and Garden
Hayward, California

June 1996
Project No. 2611

Geomatrix Consultants

100 Pine Street, 10th Floor
San Francisco, CA 94111
(415) 434-9400 • FAX (415) 434-1365

GEOMATRIX

19 June 1996
Project 2611

Ms. Amy Leach
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502

Subject: Groundwater Screening Results and Scope of Work
for Additional Groundwater Investigation
Clark's Home and Garden
23040 Clawiter Road
Hayward, California

Dear Ms. Leach:

On behalf of Mr. Chester Clark, Geomatrix Consultants, Inc. (Geomatrix), has prepared the enclosed report documenting the results of our recent groundwater screening investigation at the subject site, and presenting our scope of work to conduct an additional phase of groundwater investigation activities. The work completed was conducted in compliance with the Alameda County Health Care Services Agency (ACHCSA) 1 November 1993 request for an additional groundwater investigation at the subject site. This work was conducted in accordance with Geomatrix's 15 April 1994 Groundwater Investigation Work Plan that was approved by the ACHCSA, with conditions, in a letter dated 5 May 1994.

Please call either of the undersigned if you have any questions regarding this report.

Sincerely,

GEOMATRIX CONSULTANTS, INC.

Preston G. Gaines
Project Engineer

Tom E. Graf, P.E.
Principal Engineer

PGG/TEG/cll
2611\GWSCREEN.LTR

cc: Mr. Chester Clark
Mr. Bob Price

Gary Foote
will call.

Enclosure

GEOMATRIX

GROUNDWATER SCREENING RESULTS AND SCOPE OF WORK FOR ADDITIONAL GROUNDWATER INVESTIGATION

Clark's Home and Garden
23040 Clawiter Road
Hayward, California

Prepared for:

Clark's Home and Garden
Hayward, California

June 1996
Project No. 2611

Geomatrix Consultants

GEOMATRIX

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
1.1 BACKGROUND	1
1.2 REGIONAL HYDROGEOLOGIC SETTING	2
1.3 APPROACH TO GROUNDWATER INVESTIGATION	2
2.0 INVESTIGATION METHODS	3
2.1 GROUNDWATER SAMPLING OF SITE MONITORING WELL MW-1	3
2.2 WATER-LEVEL MEASUREMENTS	4
2.3 DRILLING AND GROUNDWATER SAMPLING METHODS	4
2.4 ANALYTICAL METHODS	5
3.0 INVESTIGATION RESULTS	6
3.1 HYDROGEOLOGIC CONDITIONS	6
3.2 FINGERPRINT CHARACTERIZATION	6
3.3 SHALLOW GROUNDWATER	7
4.0 CONCLUSIONS AND RECOMMENDATIONS	8
5.0 SCHEDULE AND REPORTING	9
6.0 REFERENCES	10

LIST OF TABLES

Table 1	Summary of Historical Groundwater Analytical Results for Monitoring Well MW-1
Table 2	Summary of Groundwater Analytical Results of Grab Groundwater Samples Collected on 22 November 1996

LIST OF FIGURES

Figure 1 Site Location Map
Figure 2 Site Plan with Recent and Proposed Groundwater Sampling Locations

LIST OF APPENDICES

Appendix A Drilling Permit
Appendix B Lithologic logs
Appendix C Analytical Reports and Chain-of-Custody Records

GEOMATRIX

GROUNDWATER SCREENING RESULTS AND SCOPE OF WORK FOR ADDITIONAL GROUNDWATER INVESTIGATION

Clarks Home and Garden
23040 Clawiter Road Site
Hayward, California

1.0 INTRODUCTION

On behalf of Mr. Chester Clark of Clark's Home and Garden, Geomatrix Consultants Inc. (Geomatrix) has prepared this report to document results of our 22 November 1995 groundwater screening investigation at the subject site (Figure 1). This investigation was performed in response to the Alameda County Health Care Services Agency's (ACHCSA) 1 November 1993 request for an additional on-site groundwater investigation. The investigation was conducted in accordance with Geomatrix's 15 April 1994 Groundwater Investigation Work Plan (Work Plan) that was approved by the ACHCSA, with conditions, in a letter dated 5 May 1994. Also presented is our scope of work to conduct an additional groundwater screening investigation downgradient of the former underground storage tank (UST) locations.

1.1 BACKGROUND

On 4 November 1988, two USTs (a 3000-gallon unleaded gasoline tank and a 1000-gallon diesel tank), formerly located north of the main office building at the site, were removed. Kaprealian Engineering, Inc., (KEI) of Benicia, California, removed the tanks and observed no holes or leaks in the gasoline tank but did observe several small pin-size holes in the diesel tank. KEI removed soil from the UST excavations when the tanks were removed and again on 19 December 1988. A monitoring well (MW-1, Figure 2) was installed approximately 5 feet west of the western edge of the former gasoline UST excavation and, based on data available to Geomatrix, was initially sampled on 7 August 1991. Table 1 presents a summary of the historical groundwater analytical data available to Geomatrix for monitoring well MW-1. Previous work performed at the site is discussed in detail in our 15 April 1995 Work Plan.

1.2 REGIONAL HYDROGEOLOGIC SETTING

Based on historical depths to groundwater measured in four monitoring wells at a facility formerly operated by McKesson Water Products Inc. (McKesson) located immediately north of the site, groundwater typically occurs at depths between approximately 14 and 16 feet below ground surface (bgs) (Treadwell and Rollo, Inc., [TRI], 1993). The locations of the four McKesson monitoring wells are shown on Figure 2.

Historically, the regional groundwater flow in the site vicinity is to the west, or towards San Francisco Bay (TRI, 1993). Local groundwater flow directions reported at surrounding properties include: northwest-southwest at the McKesson facility (TRI, 1993); west-southwest at the Berkeley Farms facility, located approximately 600 feet to the southeast of the site (Juliet Shin, ACHCSA, personal communication, 1994); southwest at the Hayward Air National Guard, located 1500 feet to the north of the site (TRI, 1993); and northwest at the Oliver de Silva facility, located approximately 250 feet to the northwest of the site (TRI, 1993). In addition, there are a total of nine production wells within approximately 600 feet of the site (TRI, 1993). Although no information was acquired regarding the pumping history of these wells, they may affect local groundwater gradients and flow directions in the area.

1.3 APPROACH TO GROUNDWATER INVESTIGATION

As stated in the Work Plan, there were four objectives for the additional on-site investigation performed on 22 November 1995: (1) verify that analytical results from on-site monitoring well MW-1 represent groundwater impact by the former USTs at the site; (2) identify the presence of other petroleum hydrocarbon compounds (PHCs) existing in site groundwater, if any, and acknowledge their contribution to concentrations of TPHg and TPHd previously measured in samples from MW-1; (3) confirm local hydraulic gradient direction; and (4) assess the lateral extent of groundwater impact by the former USTs relative to background PHC concentrations.

The following work was executed by Geomatrix to address the above objectives. To address objectives (1) and (2), a petroleum hydrocarbon fingerprint characterization analysis was

performed on a groundwater sample collected from on-site monitoring well MW-1. To address objective (3) DTWs were measured in the four McKesson monitoring wells located north of the site. To address objective (4), grab groundwater samples were collected from four on-site borings drilled on 22 November 1995, one drilled upgradient to the east of the former UST locations (boring B-3), one drilled near the northern property boundary to assess potential off-site sources (B-2), and two drilled downgradient to assess the extent of PHCs associated with the former USTs (B-1 and B-2). Monitoring well and boring locations are shown on Figure 2.

2.0 INVESTIGATION METHODS

This section documents the methods used to perform the work described above. Collection of groundwater samples from monitoring well MW-1 for petroleum hydrocarbon fingerprint characterization is described in Section 2.1. Measurement of DTW in wells at the adjacent McKesson site is documented in Section 2.2. Methods used to collect grab groundwater samples from four temporary on-site wells installed in boreholes drilled using a direct-push (DP) technology are described in Section 2.3. Grab groundwater samples collected from these borings were analyzed for total petroleum hydrocarbons as gasoline, diesel, and motor oil (TPHg, TPHd, and TPHmo) and benzene, toluene, ethylbenzene, and xylenes (BTEX) constituents; analytical methods are described in Section 2.4.

2.1 GROUNDWATER SAMPLING OF SITE MONITORING WELL MW-1

On 31 October 1994, groundwater samples were collected from on-site monitoring well MW-1 by Blaine Tech Services, Inc. (Blaine), of San Jose, California. Three casing-volumes of water were removed from the well prior to sample collection. Samples were delivered under chain-of-custody to Friedman and Bruya Laboratory, Inc. (F&B), of Seattle, Washington, for petroleum hydrocarbon fingerprint characterization. F&B is a State-of-California certified laboratory.

2.2 WATER-LEVEL MEASUREMENTS

On 5 June 1996, Geomatrix received permission from McKesson to collect DTW measurements in the four monitoring wells located on their property. On 6 June 1996, Geomatrix measured DTW in these four monitoring wells using an electronic sounder.

2.3 DRILLING AND GROUNDWATER SAMPLING METHODS

Prior to conducting the 22 November 1995 groundwater investigation, Geomatrix prepared a site-specific health and safety plan and obtained a drilling permit from ACFCWCD Zone 7 Water Agency. A copy of this permit is included in Appendix A. To check for underground utilities, Underground Service Alert (USA) was notified at least 48 hours prior to drilling and Cruz Brothers of Milpitis, California, performed a utility search at each drilling location. All downhole drilling and sampling equipment was decontaminated prior to each use, either by steam cleaning or by washing with an Alconox-water solution and rinsing once with municipal water and once with deionized water.

Borings were advanced to an approximate depth of 22 feet (approximately 6 feet below the water table) using a DP technology that generates few soil residuals. The DP technology used a hydraulic hammer to advance a 2.4-inch-diameter drive casing containing a 3-foot-long core barrel lined with 6-inch-long, 1.7-inch-diameter, stainless steel liners. After advancing the casing and filling the core barrel, the core barrel was retrieved while the drive casing remained in the borehole. The brass liners containing soil were removed from the core barrel, and the soil was extracted from the liners. This procedure was repeated until the total depth of the borehole was reached, thereby providing a continuous core of the borehole. Soil (continuous core) was visually classified by a Geomatrix geologist and/or engineer using the Unified Soil Classification System (USCS). Lithologic logs are presented in Appendix B.

After the drive casing was advanced to the total depth of the borehole, a 1-inch-diameter temporary PVC well consisting of a 10-foot-long, 0.01-inch-slot well screen attached to blank

PVC was placed inside the drive casing. The drive casing was then withdrawn to expose the screen to water-yielding sediments.

After a temporary well was installed in a borehole, groundwater samples were collected. Groundwater samples analyzed for TPHg and BTEX were collected with a 0.75-inch-diameter PVC bailer and the samples were transferred into 40-milliliter HCl-acidified volatile organic analysis (VOA) vials using a bailer bottom emptying device. Groundwater analyzed for TPHd and TPHmo was collected using a stainless steel bailer; the groundwater was transferred directly into 1-liter amber bottles. Sample containers were labeled, stored in an ice-cooled chest, and delivered under Geomatrix chain-of-custody procedures to F&B.

Field quality assurance/quality control (QA/QC) samples collected include: (1) one blind field duplicate sample from boring B-2 (called B-12); (2) one matrix spike/matrix spike duplicate (MS/MSD) sample from boring B-1; (3) one blind equipment blank (called BB-1); and (4) one laboratory-prepared travel blank per cooler for BTEX analysis only.

Each borehole was backfilled to the surface with a cement-bentonite grout, using the PVC well screen as a tremie. The investigation-derived soil was contained in two 5-gallon buckets, and the investigation-derived decontamination water was transferred to two 55-gallon drums. All four containers were labeled and are temporarily stored on site awaiting appropriate disposal upon completion of the proposed additional investigation (Section 5.1).

2.4 ANALYTICAL METHODS

A petroleum hydrocarbon fingerprint characterization of the groundwater sample collected from monitoring well MW-1 was performed by capillary gas chromatography using a flame ionization detector (FID) and electron capture detector (ECD). Groundwater samples collected during the 22 November 1995 investigation were analyzed for TPHg, TPHd, and TPHmo using modified EPA Method 8015, and BTEX using EPA Method 8020. TPHd and TPHmo analyses were performed following silica gel cleanup, which removes polar dissolved biogenic material that may cause positive interference in analytical results (Zemo and Synowiec, 1995).

3.0 INVESTIGATION RESULTS

The following sections summarize results of: (1) DTW measurements in the McKesson monitoring wells (Section 3.1); (2) petroleum hydrocarbon fingerprint characterization of a groundwater sample collected from on-site monitoring well MW-1 (Section 3.2); and (3) analyses of shallow grab groundwater samples collected at the site (Section 3.3).

3.1 HYDROGEOLOGIC CONDITIONS

Based on lithologic data obtained from borings drilled during the 22 November 1995 investigation, the upper 1 to 2 feet of sediments are generally fill material consisting of a silty-sand with gravel. The fill material is underlain by 5 to 9 feet of black to brown native lean clay or lean clay with sand, which in turn is underlain by 2 to 9 feet of a brown clayey sand or silty-sand with gravel. Below this relatively more permeable zone, fine-grained sediments were again encountered, including olive brown to dark greenish grey silt or clay. In borings B-1 and B-4, residual petroleum was noted in soil near the top of the water table.

During the 22 November 1995 investigation, depth to groundwater encountered during drilling was approximately 16 feet bgs in all four borings. This is consistent with historical DTWs measured in on-site monitoring well MW-1 (15.5 to 18 feet bgs). On 6 June 1996, DTWs in the four McKesson wells and on-site monitoring well MW-1 ranged from approximately 13.6 to 14.6 feet bgs, which is shallower than previously observed. Groundwater flow direction on this date was generally west-northwest.

3.2 FINGERPRINT CHARACTERIZATION

The petroleum hydrocarbon fingerprint characterization performed on the groundwater sample from on-site monitoring well MW-1 indicated that the sample contained very heavily weathered gasoline and diesel fuel that has undergone chemical/biological degradation. Such petroleum hydrocarbons are not likely to contain significant concentrations of constituents that are volatile, water-soluble, or mobile. This finding is supported by the historical analytical results

for samples collected from this monitoring well, which generally have shown relatively low concentrations of BTEX constituents (Table 1). Copies of the laboratory analytical report, chromatograms, and chain-of-custody records for this analysis are included in Appendix C.

3.3 SHALLOW GROUNDWATER

Grab groundwater sample analytical results are shown in Table 2 and summarized as follows. In the sample from upgradient boring B-3, only xylenes were detected at 0.6 micrograms per liter (µg/l), which is slightly above the method reporting limit of 0.5 µg/l. In the sample duplicate pair from transgradient boring B-2, TPHg and TPHd were detected at maximum concentrations of 2.5 and 0.75 milligrams per liter (mg/l), respectively, and ethylbenzene was detected at 8.3 µg/l. In downgradient borings B-1 and B-4, elevated concentrations of TPHg, TPHd, and TPHmo were detected in grab groundwater samples (up to 11, 270, and 3.3 mg/l, respectively). These elevated detections likely do not represent dissolved constituents in groundwater. As described above, residual petroleum hydrocarbons were encountered in soil above the water table in these two borings. It is likely that the grab groundwater samples, which were highly turbid, contained non-dissolved hydrocarbons bound to sediment in the sample or non-dissolved separate-phase material that was carried into the borehole during the drilling process. In samples from these two borings, BTEX constituents were detected at relatively low concentrations (up to 18, 18, 150, and 81 µg/l, respectively). It should be noted that the processes that may have caused artificially elevated TPH concentrations also may have caused elevated BTEX concentrations that do not reflect concentrations of dissolved constituents in groundwater. Nevertheless, it should be noted that BTEX concentrations in these two samples were generally well below their maximum contaminant levels (MCLs) of 1, 150, 700, and 1750 µg/l, respectively. Only benzene in the sample from boring B-1 (18 µg/l) exceeded the benzene MCL of 1 µg/l.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on results of the investigation, the following conclusions can be made:

- residual separate-phase petroleum hydrocarbons are present in the vadose zone in the vicinity of borings B-1 and B-4 drilled approximately 20 to 30 feet downgradient of the former USTs;
- the petroleum hydrocarbon fingerprint characterization of a groundwater sample from on-site monitoring well MW-1 indicates that these petroleum hydrocarbons are a very heavily degraded gasoline or diesel fuel, and likely do not contain sufficient soluble material to be a significant source of constituents to groundwater; and
- the petroleum hydrocarbon fingerprint characterization results are supported by historical results for groundwater samples collected from on-site monitoring well MW-1 and grab groundwater samples collected by Geomatrix, which contained relatively low concentrations of BTEX constituents.

"Low risk gw case"?

Based on the above, it appears that the site may meet criteria defining a "low risk soil case", as described in recent RWQCB guidance pertaining to management of petroleum hydrocarbon sites (RWQCB, 1996)[1]. The management strategy recommended by RWQCB in the guidance is that low risk soil cases should be closed when it is determined that site conditions conform to the specified criteria. To confirm that the site conforms with these criteria, Geomatrix recommends the following:

- Collect a groundwater sample from on-site monitoring well MW-1 to confirm that groundwater near the former USTs is minimally impacted by petroleum hydrocarbons. Samples will be analyzed for TPHd, TPHg, and BTEX. TPHd analysis will be performed following silica gel cleanup, which removes polar biogenic material. Such non-petroleum material may have caused positive interference with previous TPHd analyses on samples collected from this monitoring well.

include PNAs analysis

[1] *In a 5 January 1996 letter from RWQCB to San Francisco Bay Area Agencies Overseeing UST Cleanup,* RWQCB provides supplemental instructions and a fact sheet with questions and answers pertaining to SWRCB 8 December 1994 interim guidance on required cleanup at low risk fuel sites. The interim guidance is based on a Lawrence Livermore National Laboratory (LLNL) report "Recommendations to Improve the Cleanup Process for California's Leaking Underground Fuel Tanks" (LLNL, 1995).

- Collect a grab groundwater sample from a boring to be drilled between B-1 and B-4 to better assess dissolved petroleum hydrocarbons in groundwater downgradient of the former USTs. An attempt will be made to avoid incorporating residual material from vadose zone sediments in the sample. Samples will be collected and analyzed for TPHg, TPHd (following silica gel cleanup), and BTEX constituents. In addition to the conventional TPHd analysis, a second set of samples will be collected and analyzed following laboratory filtration with a 0.7-micron glass fiber filter. Filtration will remove non-dissolved petroleum hydrocarbons that adhere to sediment in the sample.

Do PNAs
MW1 have
PNAs

- Drill two off-site borings in Clawiter Road to better establish the extent of residual hydrocarbons in vadose zone soil. Grab groundwater samples also will be collected from each boring to further confirm the extent of dissolved petroleum hydrocarbons in groundwater. Samples will be analyzed for TPHg, TPHd (following silica gel cleanup), and BTEX. If residual petroleum hydrocarbons are encountered in the vadose zone, a second set of samples may be collected for TPHd analysis following laboratory filtration.

5.0 SCHEDULE AND REPORTING

The proposed off-site groundwater investigation can be initiated within three weeks of receiving approval of the recommended additional work from the California Environmental Protection Agency, State Water Resources Control Board, depending on subcontractor availability. We anticipate a one-day level of effort for the additional groundwater investigation program and a standard laboratory turnaround time of two weeks for chemical analyses. Geomatrix anticipates submitting a report documenting the findings of the groundwater investigation within four weeks after receipt of all final analytical results.

6.0 REFERENCES

California Regional Water Quality Control Board, San Francisco Bay Region RWQCB, January 1996, Supplemental Instructions to State Water Board December 8, 1995, Interim Guidance on Required Cleanup at Low Risk Fuel Sites, 5 January.

Geomatrix Consultants, Inc., 1994, Groundwater Investigation Work Plan, Clark's Home and Garden, 23040 Clawiter Road, Hayward, California, 15 April.

Treadwell and Rollo, Inc., 1993, Subsurface Investigation, 22990 Clawiter Road, Hayward, California, 30 June.

Terratech, Inc., 1991, Initial Investigation of Ground Water Contamination, Clark's Home and Garden, 23040 Clawiter Road, Hayward, California, 5 September.

Zemo, D.A. and K.A. Synowiec, 1995, TPH detections in groundwater: identification and elimination of positive interferences; Petroleum Hydrocarbons and Organic Chemicals in Groundwater: Prevention, Detection, and Remediation Conference and Exposition, API and NGWA, Houston, Texas, December.

TABLES

GEOMATRIX

TABLE 1

SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL RESULTS[1] FOR MONITORING WELL MW-1

Clark's Home and Garden
23040 Clawiter Road Site
Hayward, California

Concentrations in micrograms per liter (µg/l) unless otherwise noted.

Date	TPH as Diesel (mg/l)	TPH as Gasoline (mg/l)	Benzene	Toluene	Ethyl-Benzene	Total Xylenes
8/7/91	7.1	5.9	45	<25	130	520
9/5/91	2.8[2]	47.0	<50	<50	230	660
10/15/91	13.0	24.0	<50	<50	<50	390
1/7/92	9.0[2]	23.0[3]	<50	<50	270	800
4/8/92	3.5[2]	8.1	19	<5	350	210
7/7/92	6.3	7.0	<5	<5	190	170
11/23/93	1.6	2.4	1.5	3.7	41	24
1/31/94	1.9	3.9	1.9	4.2	56	49
4/11/94	3.0	2.2	1.2	4.6	11	11
7/27/94	4.4[4]	6.2	<1	<1	50	74
10/31/94	1.8	1.7	2.1	4.9	20	42
1/17/96	---[5]	---	10[6]	<5[6]	17[6]	22.3[6]

Notes:

1. Water samples analyzed by Curtis and Thomkins Laboratory of Berkeley, California, for total petroleum hydrocarbons (TPH) as diesel and gasoline using modified Environmental Protection Agency (EPA) Method 8015, and for benzene, toluene, ethylbenzene, and xylenes using EPA Method 8020.
2. Laboratory notes that TPH detected as diesel due to both diesel and a petroleum hydrocarbon lighter than diesel.
3. Laboratory notes that TPH as gasoline does not appear to have a typical gasoline pattern.
4. Laboratory reports quantitation in the kerosene range, diesel range not reported due to overlap of hydrocarbon ranges.
5. Sample not analyzed by this method.
6. Sample analyzed for volatile organic compounds using EPA Method 8240.

GEOMATRIX

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS[1] OF GRAB GROUNDWATER SAMPLES COLLECTED ON 22 NOVEMBER 1996

Clark's Home and Garden
23040 Clawiter Road
Hayward, California

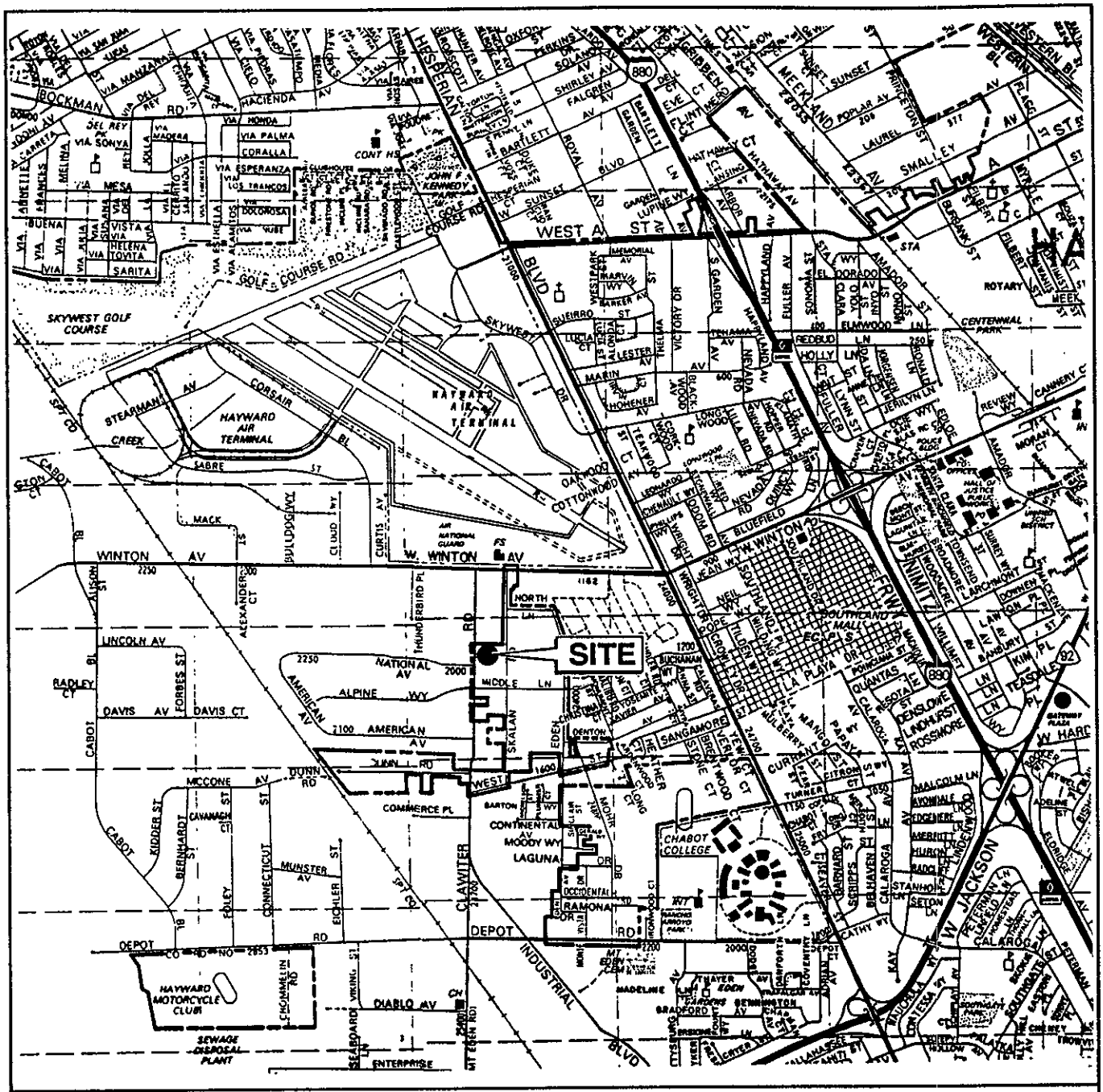
Concentrations in micrograms per liter (µg/l) unless otherwise indicated.

Sample Name	Date	TPH[2] as Gasoline[3] (mg/l)	TPH as Diesel[3] (mg/l)	TPH as Motor Oil[3] (mg/l)	Benzene[4]	Toluene[4]	Ethyl-benzene[4]	Total Xylenes[4]
B-1	11/22/95	9.2	51.0	0.84	18	15	80	8
B-2/B-12[5]	11/22/95	2.5/1.2	0.75/0.22	<0.2/<0.2	<0.5/<0.5	<0.5/<0.5	7.1/8.3	<0.5/<0.5
B-3	11/22/95	<0.05	<0.05	<0.2	<0.5	<0.5	<0.5	0.6
B-4	11/22/95	11.0	270.0	3.3	<1[6]	18	150	81

Notes:

1. Analyses conducted by Friedman & Bruya, Inc., of Seattle, Washington.
2. TPH = total petroleum hydrocarbon.
3. TPH as gasoline, diesel, and motor oil analyzed using modified EPA Method 8015 (silica gel cleanup performed on extractions prior to analysis for TPH as diesel and motor oil).
4. Benzene, toluene, ethylbenzene, and total xylenes analyzed using EPA Method 8020.
5. Duplicate sample result.
6. Sample was diluted by the laboratory and detection limit raised due to dilution.
7. Recent analytical results of samples collected from monitoring well MW-1 by Blaine Tech Services, Inc.

FIGURES



Base map from *The Thomas Brothers Maps; Alameda County 1990 edition.* Reproduced with permission granted by THOMAS BROS. MAPS® 1996. This map is copyrighted by THOMAS BROS. MAPS®. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission. All rights reserved.

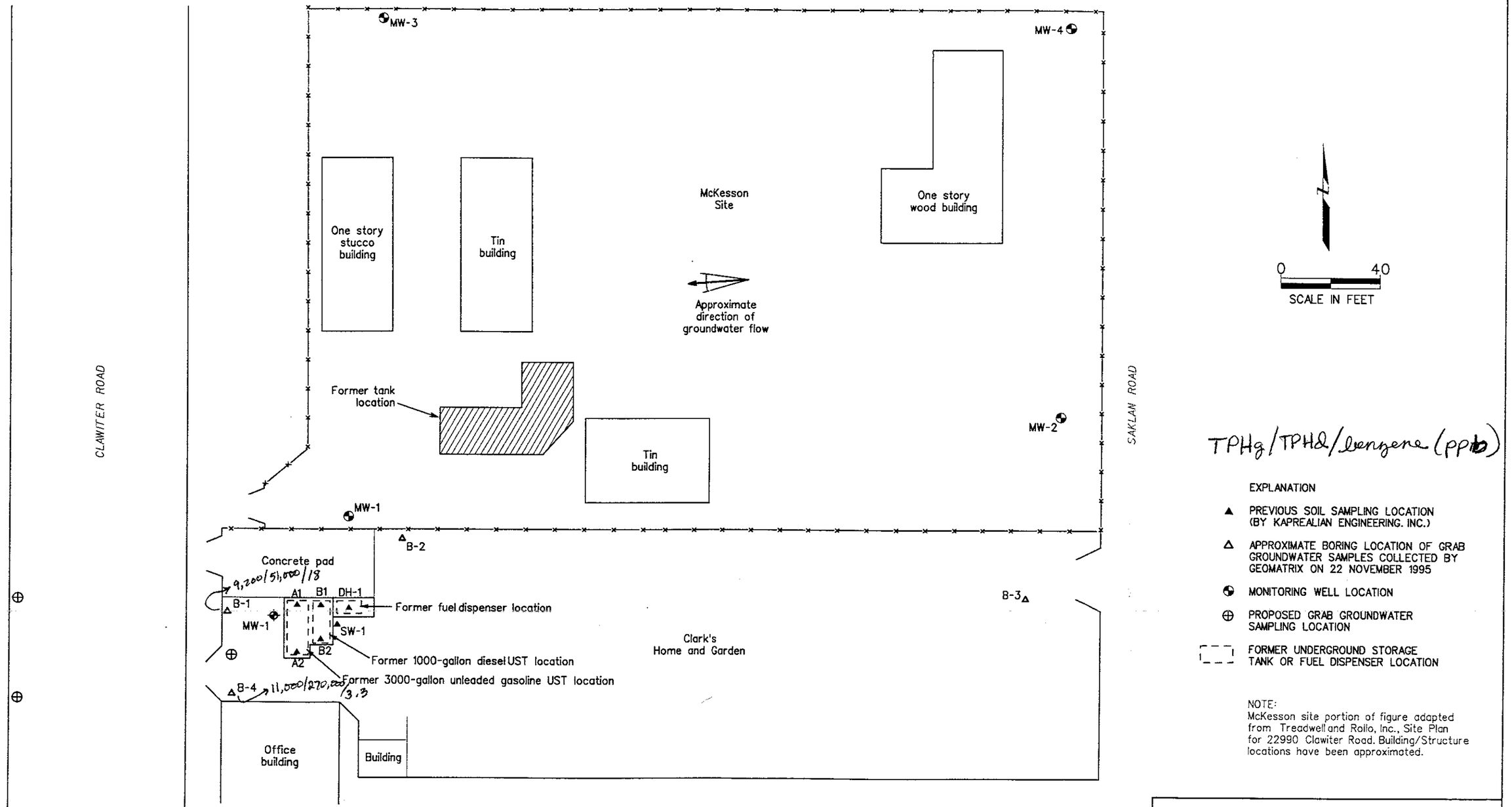
0 2200 Feet

GEOMATRIX

SITE LOCATION MAP
Clark's Home and Garden
23040 Clawiter Road
Hayward, California

Figure
1

Project No.
2611



TPHg/TPHd/benzene (ppb)

EXPLANATION

- ▲ PREVIOUS SOIL SAMPLING LOCATION (BY KAPREALIAN ENGINEERING. INC.)
- △ APPROXIMATE BORING LOCATION OF GRAB GROUNDWATER SAMPLES COLLECTED BY GEOMATRIX ON 22 NOVEMBER 1995
- ⊕ MONITORING WELL LOCATION
- ⊕ PROPOSED GRAB GROUNDWATER SAMPLING LOCATION
- ┌ ┐ FORMER UNDERGROUND STORAGE TANK OR FUEL DISPENSER LOCATION

NOTE:
McKesson site portion of figure adapted from Treadwell and Rollo, Inc., Site Plan for 22990 Clawiter Road. Building/Structure locations have been approximated.

SITE PLAN WITH RECENT AND PROPOSED GROUNDWATER SAMPLING LOCATIONS
Clark's Home and Garden
23040 Clawiter Road
Hayward, California

GEOMATRIX	Project No. 2611	Figure 2

GEOMATRIX

APPENDIX A

DRILLING PERMIT

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Clark's Home And Garden
3240 Clawiter Road
Hayward, California (see attached site location maps).

CLIENT
Name Mr. Chester Clark.
Address 521 Triller Lane Phone
City Grants Pass, Oregon Zip 97527

APPLICANT
Name Nathaniel A. Taylor
GeoMatrix Consultants
Address 100 Pine St. Fl. 10th Phone (415) 434-9400
City San Francisco Zip 94111

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	___
Water Supply	___	Contamination	___
Monitoring	X	Well Destruction	___

- grab groundwater temporary wells.

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger ___
Cable ___ Other Hydraulic Push

DRILLER'S LICENSE NO. 636387

WELL PROJECTS

Drill Hole Diameter	2	in.	Maximum		
Casing Diameter	1"	in.	Depth	20	ft.
Surface Seal Depth	___	ft.	Number	4	

GEOTECHNICAL PROJECTS

Number of Borings	___		Maximum		
Hole Diameter	___	in.	Depth	___	ft.

ESTIMATED STARTING DATE 11/17/95
ESTIMATED COMPLETION DATE 11/17/95

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Nathaniel A. Taylor Date 11/7/95

FOR OFFICE USE

PERMIT NUMBER 95763
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

A. GENERAL
(1.) A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
(3.) Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

(C.) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 15 Nov 95
Wyman Hong

31992

GEOMATRIX

APPENDIX B

LITHOLOGIC LOGS

PROJECT: Clarks Home And Garden -2611	**Log of Boring No.** B-1
BORING LOCATION: 23040 Clawiter Rd. Hayward	ELEVATION AND DATUM: ground surface.
DRILLING CONTRACTOR: Precision Sampling, Inc.	DATE STARTED: 11-22-95 / DATE FINISHED: 11-22-95
DRILLING METHOD: Envirocore EC-3	TOTAL DEPTH: 22 bgs / MEASURING POINT: ground surface.
DRILLING EQUIPMENT: XD-3	DEPTH TO WATER: FIRST ~16' bgs / COMPL. / 24 HRS.
SAMPLING METHOD: Direct Push (1"/16" I.D)	LOGGED BY: Nathaniel Taylor
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: Tom Grant / REG. NO.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
0					3" Concrete.	
1					Silty sand w/ Gravel (SM) grey (10YR, 5/1) dry, 55% fine-med sand 30% red plastic fines, 15% fine subangular gravel	[+11]
2					Lean clay (CL) very dark grey (10 YR, 3/1) dry, 90% med-high plasticity fines, 10% fine sands, hard	
3					▽ color change to very dark brown (10 YR, 2/2)	
4		NR				
5						
6					Lean clay w/sand (CL) dark yellowish brown (10YR, 4/4), moist, 80% med-high plasticity fines, 20% fine sands, hard	
7		NR				
8					▽ Brown (10YR 4/3)	
9					Clayey Sand (SC) Brown (10YR 4/3), moist, 70% fine sand 30% fines of med.-high plasticity.	
10					zone of Poorly graded sand with clay [SP-SC]	
11					Sandy Silt (ML) olive Brown (2.5Y 4/4) moist 55% med plastic fines, 45% fine sands, med. stiff	
12		NR				
13						
14						

B-1 (11/92)

Geomatrix Consultants	Project No. 2611	Figure

PROJECT: NAME

Log of Boring No. B-1

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15					wet color change to: dark greenish grey (GLEY 4/1) -zone of (SP-SC)	Rust mottling rootlets ?
16					▽	visible staining and strong petroleum odor.
17					Fat clay (CH) olive grey (5Y, 4/2) wet, 95% high plasticity fines, 5% fine sand, medium stiff.	
18				707 ppm		
19		NR			color change to dark grey (5Y 4/1)	
20						
21						
22					B.O.B. @ 22' @ 1100	

B-2 (11/92)

Geomatrix Consultants	Project No. 2611	Figure

PROJECT: Clark's Home And Garden.	**Log of Boring No.** B-2
BORING LOCATION: 23040 Clawiter Rd, Hayward	ELEVATION AND DATUM: Ground Surface.
DRILLING CONTRACTOR: Precision Sampling, Inc.	DATE STARTED: 11-22-95 / DATE FINISHED: 11-22-95
DRILLING METHOD: Envirocor EC-3.	TOTAL DEPTH: 22' bgs / MEASURING POINT:
DRILLING EQUIPMENT: XD-3	DEPTH TO WATER: FIRST, 16' / COMPL. / 24 HRS.
SAMPLING METHOD: Direct Push (1"/16" I.D)	LOGGED BY: Nathaniel Taylor
HAMMER WEIGHT: NA / DROP: NA.	RESPONSIBLE PROFESSIONAL: Tom Graf / REG. NO.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
					4" Concrete.	
1		1			Silty Sand w/gravel, trMS grey (10YR 5/1) dry 60% sand (fine-med) 30% m. plastic fines. [Fill]	
2					Loam clay (CL) Black (7.5 YR)(2.5/1) dry, 90% med-high plasticity fines 10% fine sands, hard.	
3						
4					color change to: dark brown (7.5 YR 3/2)	
5						
6					color change to: brown (10 YR 4/3)	
7						
8						
9						
10					Clayey Sand (SC)	
11					Brown (10YR 4/3) dry 65% fine sands 35% med plasticity fines.	
12						
13						
14						

B-1 (11/92)

Geomatrix Consultants	Project No. 2611	Figure

PROJECT: NAME

Log of Boring No. B-2

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15					Lean clay w/sand (CL) Olive Brown (2.5Y 4/4) moist 75% med-hvy Plasticity fines 25% fine sand, med stiff.	
16						
17					Lean clay (CL) olive brown (2.5Y 4/4) moist 90% med-high plasticity fines 10% fine sands, Stiff.	
18					color change to: dark grey (5Y 4/1)	
19						
20						
22					color change to: dark olive grey (5Y 3/2)	
22					B.O.B @ 22' @ 1200	

B-2 (11/92)

Geomatrix Consultants | Project No. 2611 | Figure

PROJECT: Clark's Home & Garden	**Log of Boring No. B-3**
BORING LOCATION: 23040 Clawiter Rd. Hayward.	ELEVATION AND DATUM: ground surface
DRILLING CONTRACTOR: Precision Sampling, Inc.	DATE STARTED: 11-22-95 / DATE FINISHED: 11-22-95
DRILLING METHOD: Envirocore EC-3	TOTAL DEPTH: 22' bgs / MEASURING POINT: ground surface
DRILLING EQUIPMENT: XD-3	DEPTH TO WATER: FIRST ~16 bgs / COMPL. / 24 HRS.
SAMPLING METHOD: Direct push (1 11/16" I.D.)	LOGGED BY: Preston Grainer
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: Tom Graf / REG. NO.

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
0					asphalt	
1		NR			[fill] Silty sand w/ gravel (SM) gray (10YR, 5/1), dry, 55% fine sand 25% low plastic fines, 20% subrounded fine gravel trace coarse sand	
2					Lean clay w/ sand (CL) black (10YR, 2/1), moist, 80% med-high plasticity fines, 20% fine sand, hard	
3						
4					↓ color change to brown (10YR, 4/3)	
5						
6		NR			Sandy lean clay (CL) brown (10YR, 4/3), moist, 60% medium plastic fines, 40% fine sand, hard	
7						
8					Clayey Sand (SC)	
9					brown (10YR, 4/3), moist, 70% fine sand 30% medium plastic fines	
10					zone of poorly graded sand w/ clay, trace coarse sand & gravel	
11					↓ medium plastic fines increase to 45%	
12						
13					Silty sand w/ gravel (SM) brown (10YR, 4/3), moist, 60% fine sand, 25% fine to coarse subrounded gravel, 15% low-med. plastic fines	
14						

PROJECT: NAME

Log of Boring No. B-3

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
14					Silty sand w/ gravel (SC) (cont.)	
15		NR				
16					▽ Clayey sand (SC) Olive brown (7.5 Y, 4/3), wet, 85% fine - medium sand, 15% med. plastic fines,	
17					Silt with sand (ML) Olive brown (7.5 Y, 4/6), wet, 75% low plasticity fines, 25% fine sand, medium stiff	
18						
19						
20						
21					Fat clay (CH) olive brown (7.5 Y, 4/3), wet, 95% high plasticity fines, 5% fine sand, medium stiff	
22					BOB @ 22.0 @ 0850	

B-2 (11/92)

Geomatrix Consultants	Project No. 2611	Figure

PROJECT: Clark's Hare And Garden	**Log of Boring No.** B-4
BORING LOCATION: 23040 Clawiter Rd. Hayward	ELEVATION AND DATUM: Ground surface
DRILLING CONTRACTOR: Precision Sampling, Inc.	DATE STARTED: 11/22/95 / DATE FINISHED: 11/22/95
DRILLING METHOD: Enviracore EC-3	TOTAL DEPTH: 22' bgs / MEASURING POINT:
DRILLING EQUIPMENT: XD-3	DEPTH TO WATER: FIRST ~16' / COMPL. / 24 HRS.
SAMPLING METHOD: Direct Push 1 "/16" I.D	LOGGED BY: Nathaniel Taylor
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: Tom Graf / REG. NO.

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. interp.	REMARKS
1					silty sand w/ gravel (SM) grey (10 yr 5/1) dry 50% med sand ≥0% plastic (med) fines 30% sub angular gravel.	[FILL]
2					lean clay Black (7.5 YR 2.5/1) dry 90% med plastic fines 10% fine sands, hard.	
3						
4					↓ color change to: Brown (10 YR 4/3)	
5						
6						
7					Silty sands (SM) Brown (10 YR 5/3) moist, 70% fine sands 30% low plasticity fines.	
8						
9					clayey sands (SC) Brown (10 YR 5/3) moist 70% fine sands 30% med-high plasticity fines.	
10						
11					↳ zone of lean clay. 85% med-high plasticity fines. 15% fine sands. med stf.	
12						
13						
14						

B-1 (11/92)

Geomatrix Consultants	Project No. 2611	Figure

PROJECT: NAME

Log of Boring No. B-4

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15					well graded sands with silts (SW-SM) Brown. (10 YR 5/3) moist 90% medium-fine grained sands 10% fines.	
16					lean clay with sands (CL) dark greenish grey (1 GLEY 4/1) moist. 90% med.-high plasticity fines. 10% fine sands.	▽ visible petroleum staining ↓
17						
18				100		
19						
20					↓ color change: very dark grey (10 YR 3/1)	
21						
22					B.O.B. @ 22' @ 1530	

B-2 (11/92)

Geomatrix Consultants | Project No. 261 | Figure

GEOMATRIX

APPENDIX C

ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS

2611 / 8140

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3012 16th Avenue West
Seattle, WA 98119-2029
FAX: (206) 283-5044

November 10, 1994

Greg Kamman, Project Leader
Geomatrix Consultants, Inc.
100 Pine Street, Suite 1000
San Francisco, CA 94111-5112

Dear Mr. Kamman:

Enclosed are the results from the testing of material submitted on November 2, 1994 from your project 2611.

Both products appear to be very heavily degraded.

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.

Kelley Wilt

Kelley Wilt
Chemist

jdp
Enclosures

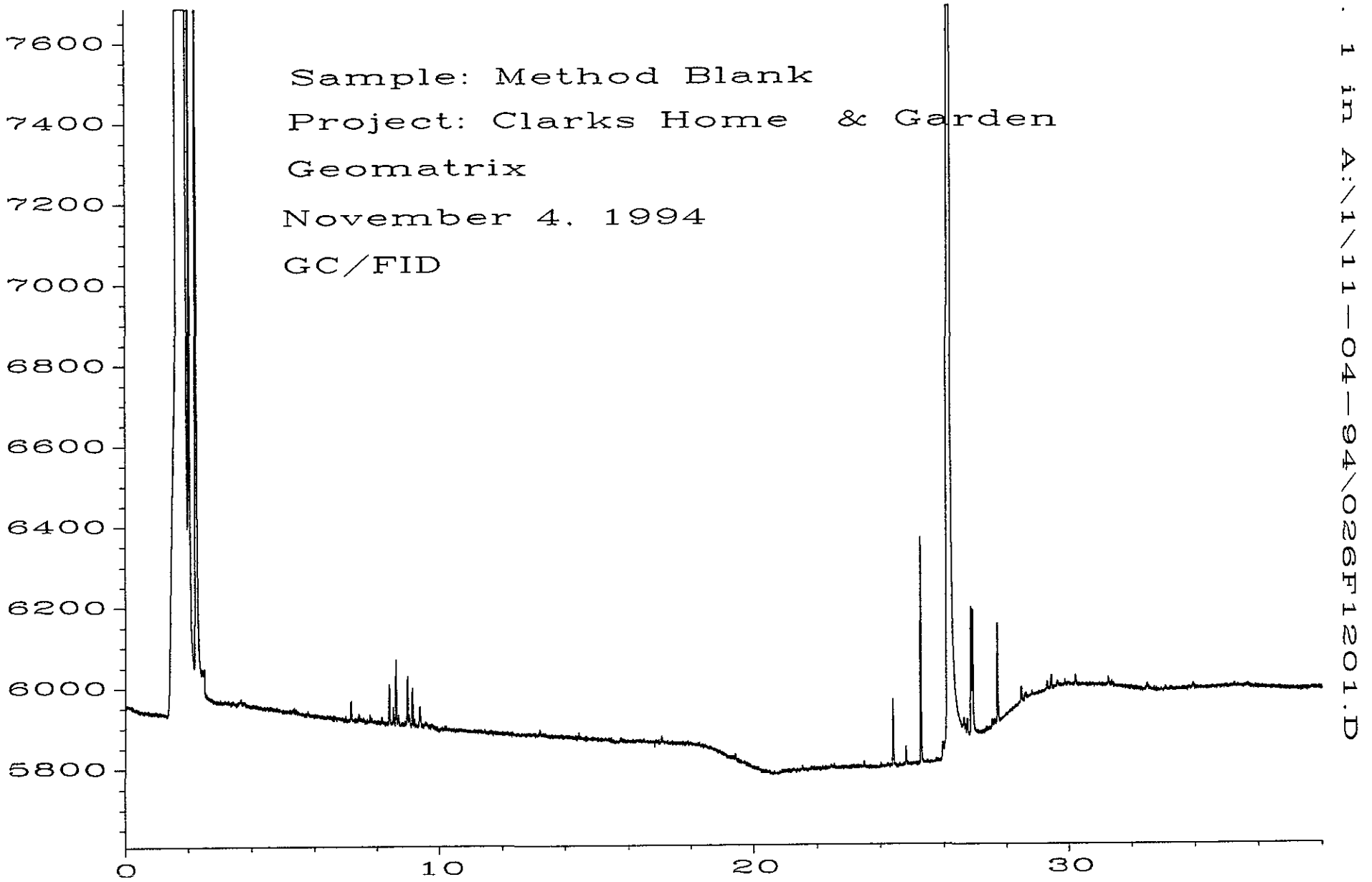
FRIEDMAN & BRUYA, INC.

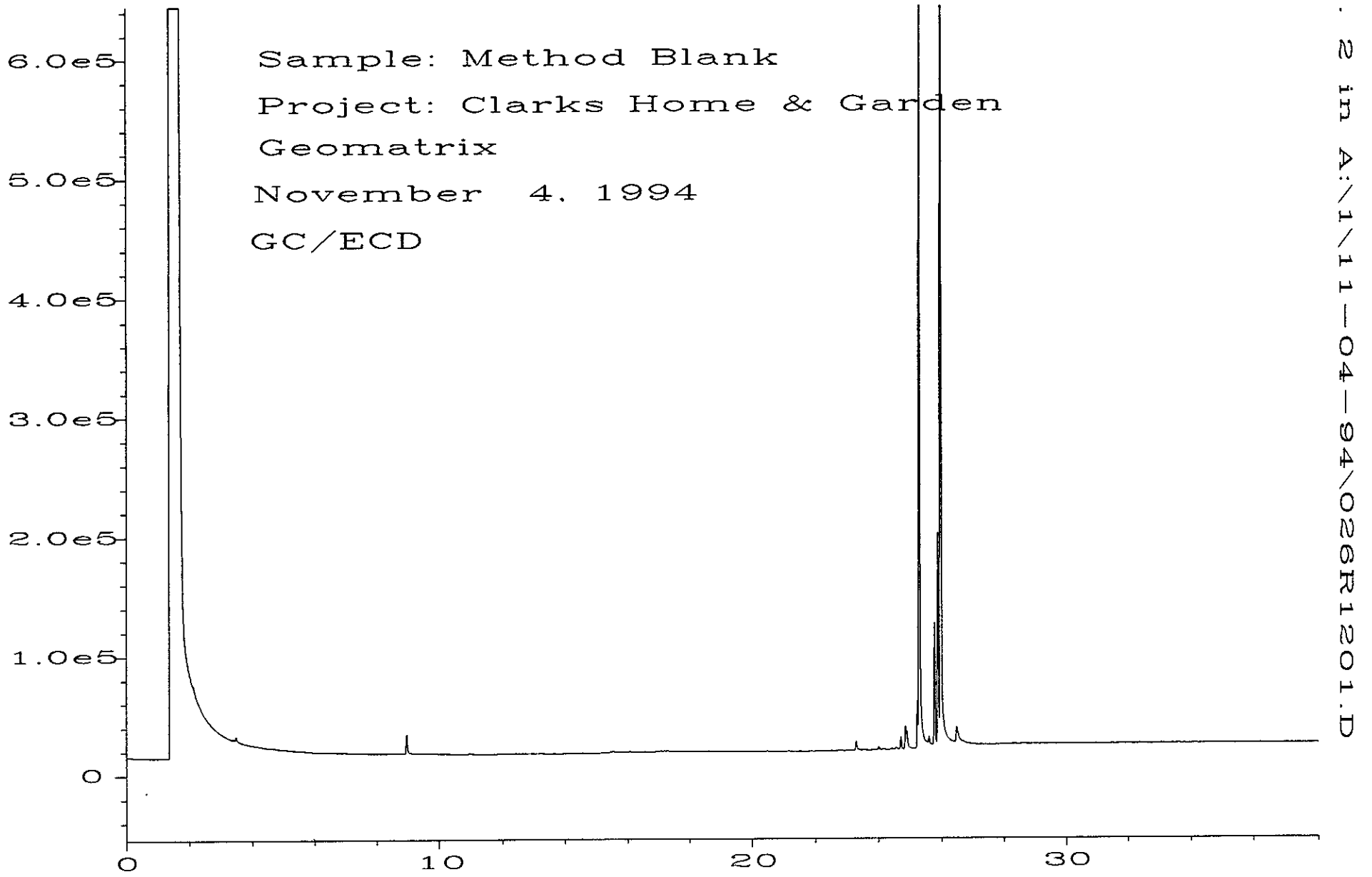
ENVIRONMENTAL CHEMISTS

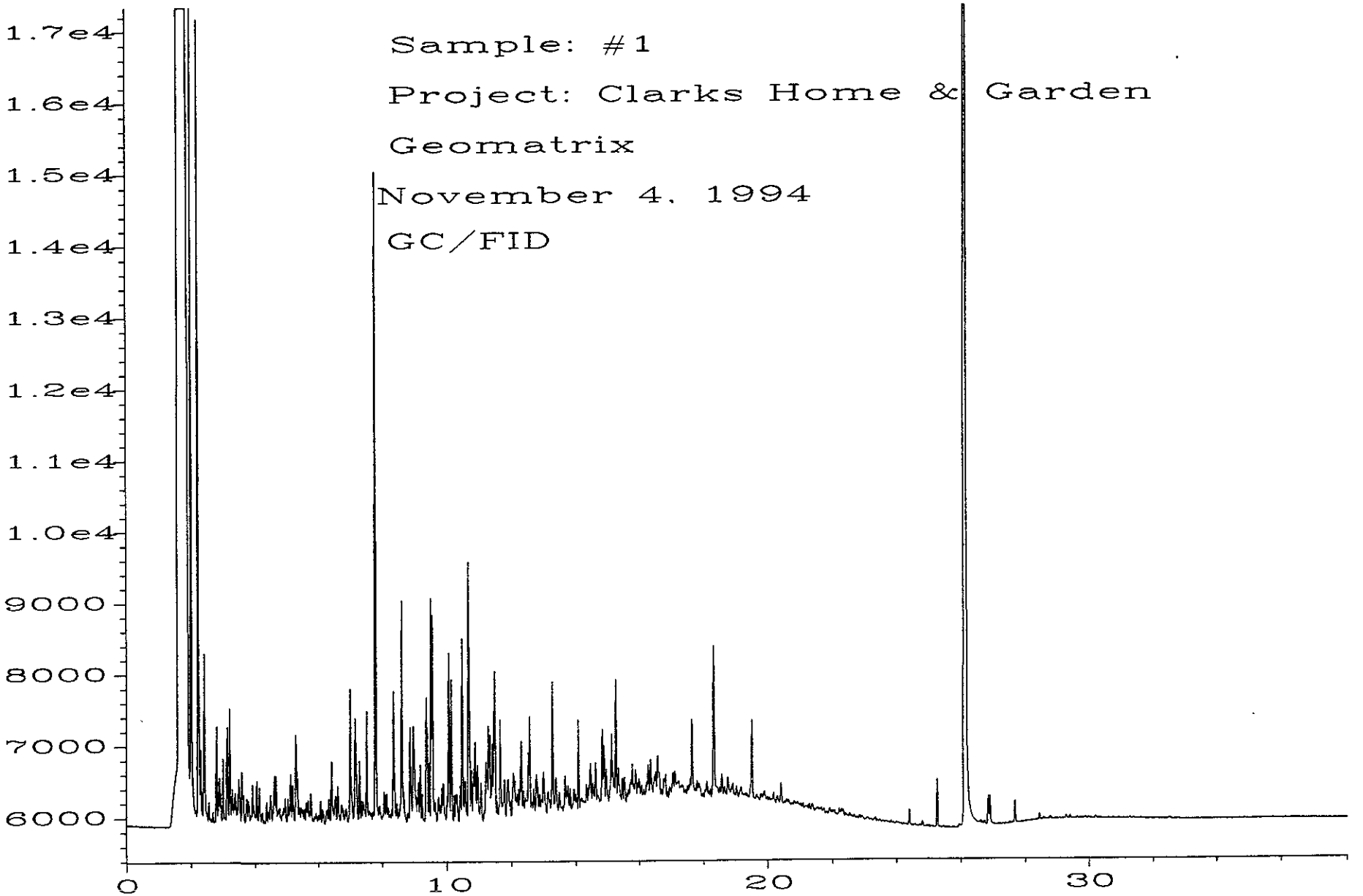
Date of Report: November 10, 1994
Date Received: November 2, 1994
Project: 2611

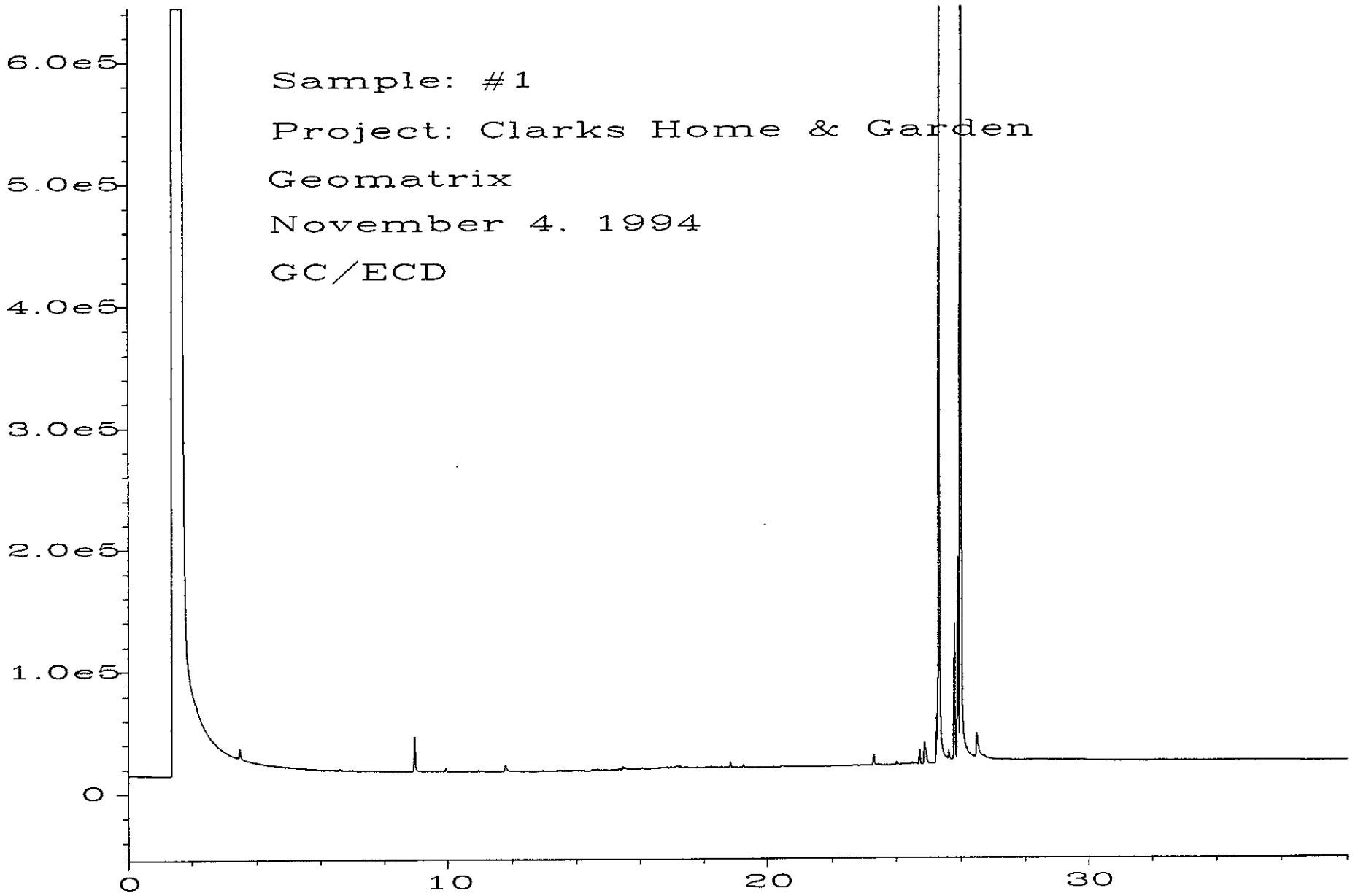
RESULTS FROM THE ANALYSIS OF THE WATER SAMPLE FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
#1	The GC trace using the flame ionization detector (FID) showed the presence of low and medium boiling compounds. The patterns displayed by these peaks are indicative of gasoline and diesel fuel. The low and medium boiling compounds appeared as a ragged pattern of peaks eluting from *n*-C_7 to *n*-C_{18} showing a maximum near *n*-C_{11}. A regular pattern of the *n*-alkanes is not seen for this product. The product appears to have undergone chemical or biological degradation. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second internal standard peak seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate.


Sample: Method Blank
Project: Clarks Home & Garden
Geomatrix
November 4, 1994
GC/FID
7600
7400
7200
7000
6800
6600
6400
6200
6000
5800
0
10
20
30
Sig. 1 in A:\1\11-04-94\026F1201.D


Sig. 2 in A:\1\11-04-94\026R1201.D
Sample: Method Blank
Project: Clarks Home & Garden
Geomatrix
November 4, 1994
GC/ECD
6.0e5
5.0e5
4.0e5
3.0e5
2.0e5
1.0e5
0
0
10
20
30


Sample: #1
Project: Clarks Home & Garden
Geomatrix
November 4, 1994
GC/FID
1.7e4
1.6e4
1.5e4
1.4e4
1.3e4
1.2e4
1.1e4
1.0e4
9000
8000
7000
6000
0
10
20
30
Sig. 1 in A:\1\11-04-94\027F1201.D


Sample: #1
Project: Clarks Home & Garden
Geomatrix
November 4, 1994
GC/ECD
6.0e5
5.0e5
4.0e5
3.0e5
2.0e5
1.0e5
0
0
10
20
30
Sig. 2 in A:\1\11-04-94\027R1201.D

BLAINE TECH SERVICES INC

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

CHAIN OF CUSTODY 941031-H2

CLIENT Chester Clark

SITE Clarks Home & Garden
23040 Clawiter Rd
Hayward, CA.

CONDUCT ANALYSIS TO DETECT

LAB Friedman & Bruya DHS#

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

- ☐ EPA
- ☐ LIA
- ☐ OTHER
- ☐ WQCB REGION

10:40

SPECIAL INSTRUCTIONS
Invoice to Chester Clark
Report
cc Report to Greg Kamman @ Geomatrix

SAMPLE I.D	MATRIX S = SOIL W = H2O	CONTAINERS TOTAL		C = COMPOSITE ALL CONTAINERS	Hydrocarbon Fingerprint	ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
#1		5	3-VOAs 2-Liters		X				94587-91

SAMPLING COMPLETED DATE 10/31/94 TIME 1040

SAMPLING PERFORMED BY Troy Horner

RESULTS NEEDED NO LATER THAN As Contracted

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Troy Horner	11/1/94	0800	Kathy Mills FedEx	11/2/94	10:35

SHIPPED VIA Federal Express | DATE SENT 11/1/94 | TIME SENT — | COOLER # —

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3012 16th Avenue West
Seattle, WA 98119-2029
FAX: (206) 283-5044

December 8, 1995

Preston Gaines, Project Leader
Geomatrix Consultants, Inc.
100 Pine Street, Suite 1000
San Francisco, CA 94111-5112

Dear Mr. Gaines:

Enclosed are the results from the testing of material submitted on November 27, 1995 from your 2611 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.

Beth Albertson

Beth Albertson
Chemist

keh
Enclosures
FAX: (415) 434-1365
GMC1208R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 8, 1995
Date Received: November 27, 1995
Project: 2611
Date Samples Extracted: December 5, 1995

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL BY GC/FID (Modified 8015)
Sample Extracts Passed Through a Silica Gel Column Prior to Analysis
Results Reported as µg/L (ppb)

Sample ID	Diesel	Motor Oil	Surrogate (% Recovery)
B-3	<50	<200	111
B-1	51,000	840	102
B-2	750	<200	89
B-12 (B-2 Duplicate) PGG	220	<200	103
BB-1 (Equipment Blank) PGG	<50	<200	99
B-4	270,000	3,300	[b]
Method Blank	<50	<200	96

[b] Samples were diluted making surrogate recoveries meaningless.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 8, 1995
Date Received: November 27, 1995
Project: 2611

QUALITY ASSURANCE RESULTS FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL BY GC/FID (Modified 8015)

Laboratory Code: 64258 (Duplicate)

Analyte:	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Diesel	ug/L (ppb)	51,000	30,000	52[a]	0-20

Laboratory Code: Spike Blank

Analyte:	Reporting Units	Spike Level	% Recovery MS	Acceptance Criteria
Diesel	ug/L (ppb)	2,500	92	65-135

[a] RPD fell out of normal control limit. We believe this is due to the presence of free product.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 8, 1995
Date Received: November 27, 1995
Project: 2611

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 8020 AND 8015

Results Reported as µg/L (ppb)

Sample #	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline	Surrogate % Recovery
B-3	<0.5	<0.5	<0.5	0.6	<50	103
B-1	18	15	80	8	9,200	102
B-2	<0.5	<0.5	7.1	<0.5	2,500	100
B-12 (B-2 Duplicate) PGG	<0.5	<0.5	8.3	<0.5	1,200	99
BB-1 (Equipment Blank) PGG	<0.5	0.5	<0.5	<0.5	<50	99
B-4	<1[a]	18	150	81	11,000	100
Method Blank	<0.5	<0.5	<0.5	<0.5	<50	106

[a] Sample was diluted due to high levels of contamination. Detection limits are raised due to dilution.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 8, 1995
Date Received: November 27, 1995
Project: 2611

QUALITY ASSURANCE RESULTS FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 8020 AND 8015

Laboratory Code: 64245 (Duplicate)

Analyte:	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Benzene	ug/L (ppb)	<0.5	<0.5	nm	0-20
Toluene	ug/L (ppb)	<0.5	<0.5	nm	0-20
Ethylbenzene	ug/L (ppb)	<0.5	<0.5	nm	0-20
Xylenes	ug/L (ppb)	0.6	<0.5	nm	0-20
Gasoline	ug/L (ppb)	<50	<50	nm	0-20

Laboratory Code: Spike Blank

Analyte:	Reporting Units	Spike Level	% Recovery MS	% Recovery MSD	Acceptance Criteria	Relative Percent Difference
Benzene	ug/L (ppb)	100	101	101	79-111	0
Toluene	ug/L (ppb)	100	106	106	77-114	0
Ethylbenzene	ug/L (ppb)	100	110	110	78-118	0
Xylenes	ug/L (ppb)	300	112	112	79-121	0
Gasoline	ug/L (ppb)	1,000	99	101	78-132	2

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

Chain-of-Custody Record

№ 7681 | 12:10 | Date 22 November 1995 | Page 1 of 1

Project No: 2611

Samplers (Signatures): Preston Gaines, Nathaniel A. Taylor 1995

ANALYSES

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX (8020)	TPH as motor oil	HOLD	MS/MSD	Cooled	Soil (S) or water (W)	Acidified	Number of containers
11-22	1000	B-3	64245-52				X	X	X	X			X	W	Y/N	8
	1200	B-1	64253-60				X	X	X	X		X	X	W	Y/N	8
	1400	B-2	64261-64				X	X	X	X			X	W	Y/N	7
	1430	B-12	64267-71				X	X	X	X			X	W	Y/N	6
	1450	BB-1	64272-76				X	X	X	X			X	W	Y/N	5
	1530	B-4	64277-84				X	X	X	X			X	W	Y/N	8
		Trip Blank	64285-86								X			W		2

Sample #64264 arrived w/ broken cap. Replaced Cap. CO

arrived Broken (1-liter)

arrived Broken (1-liter)

REMARKS

Additional comments

Y/N = VOAs w/ HC

1 x liter ambers non-preserved

Total Petroleum Hydrocarbons as gasoline, diesel and motor oil by modified EPA Method 8015 and BTEX by EPA Method 8020.

Perform silica-gel cleanup on samples for TPH as diesel and motor oil prior to analyzing.

Fax results to Preston Gaines @ 415 / 434-1365

Conduct ms/msd on Sample B-1.

Turnaround time: Standard

Results to: Preston Gaines

Total No of containers: 44

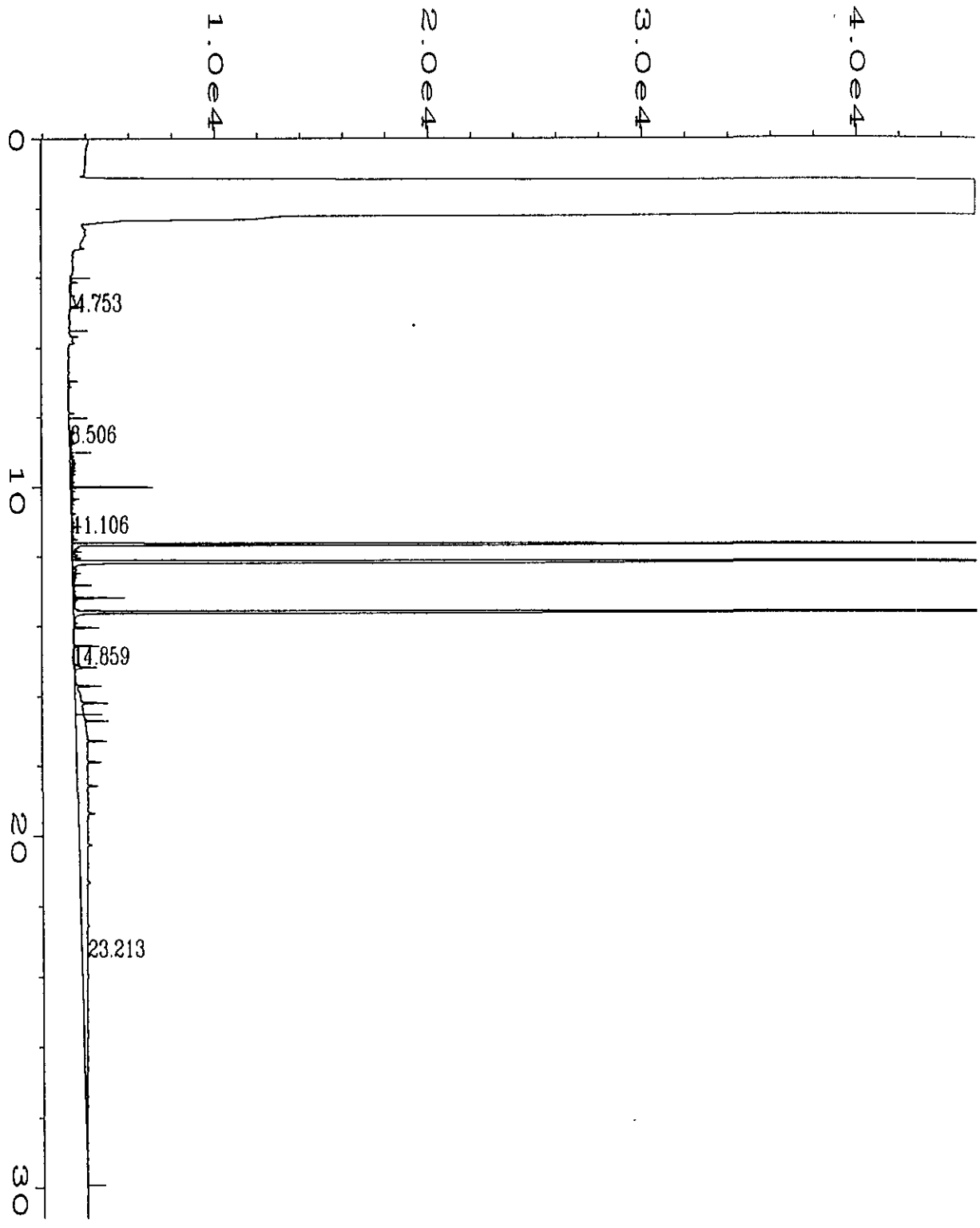
Relinquished by	Date	Relinquished by	Date	Relinquished by	Date
Signature: Nathaniel A. Taylor	11/22	Signature		Signature	
Printed name: NATHANIEL A. TAYLOR	1800	Printed name		Printed name	
Company: GEOMATRIX		Company		Company	
Received by	**Time**	**Received by**	**Time**	**Received by**	**Time**
Signature: [illegible]	8:40	Signature		Signature	
Printed name: DAVID	11-23-95	Printed name		Printed name	
Company		Company		Company	

Method of shipment: Fed Ex.

Laboratory comments and Log No

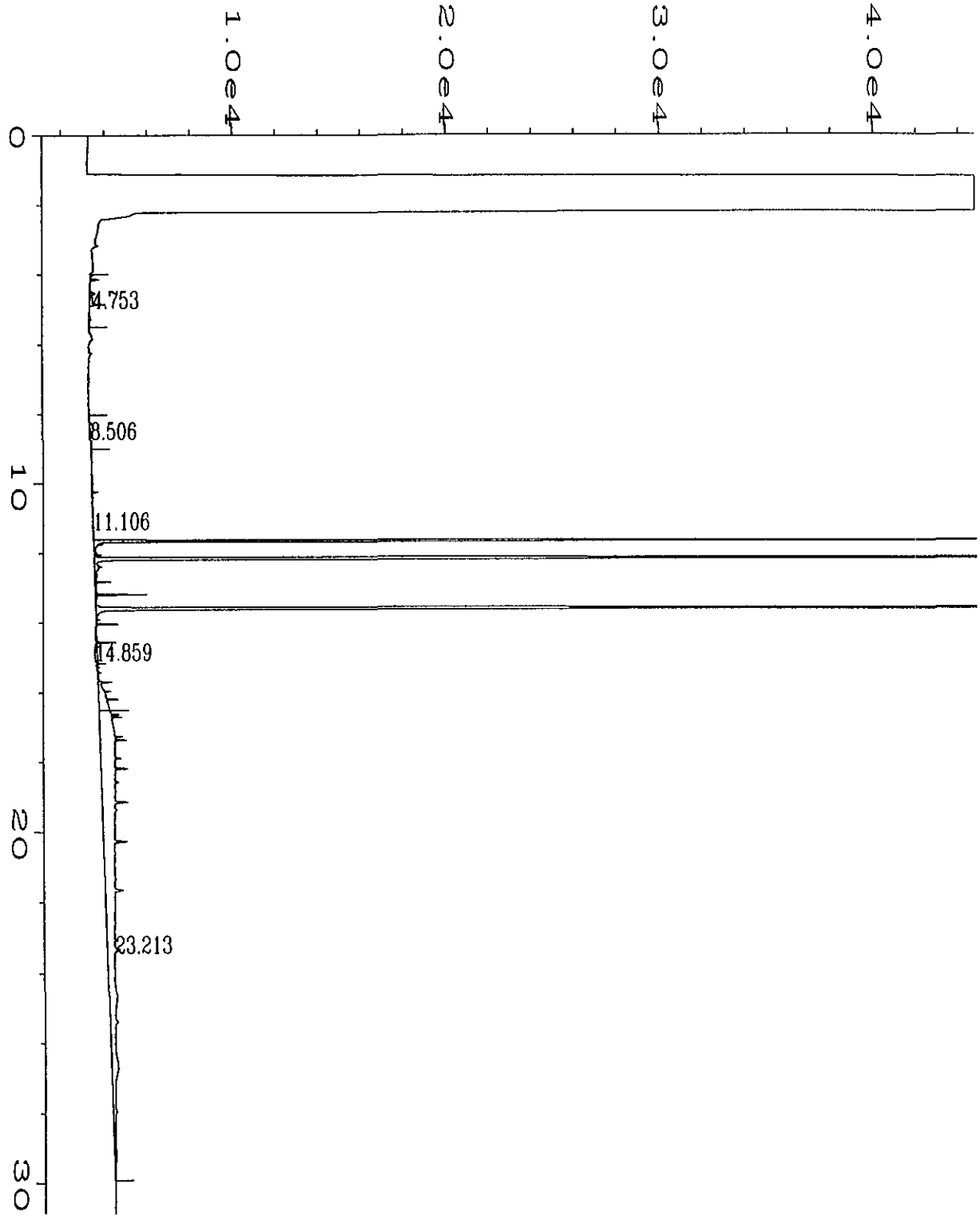
64245-48 VOAs
64249-52 Liters
64253-56 VOAs
64257-60 Liters
64261-64 VOAs
64265-66 Liters
64267-69 VOAs
64270-71 Liters
64272-74 VOAs
64275-76 Liters
64277-80 VOAs
64281-84 Liters
64285-86 VOAs

Geomatrix Consultants
100 Pine St 10th Floor
San Francisco, CA 94111



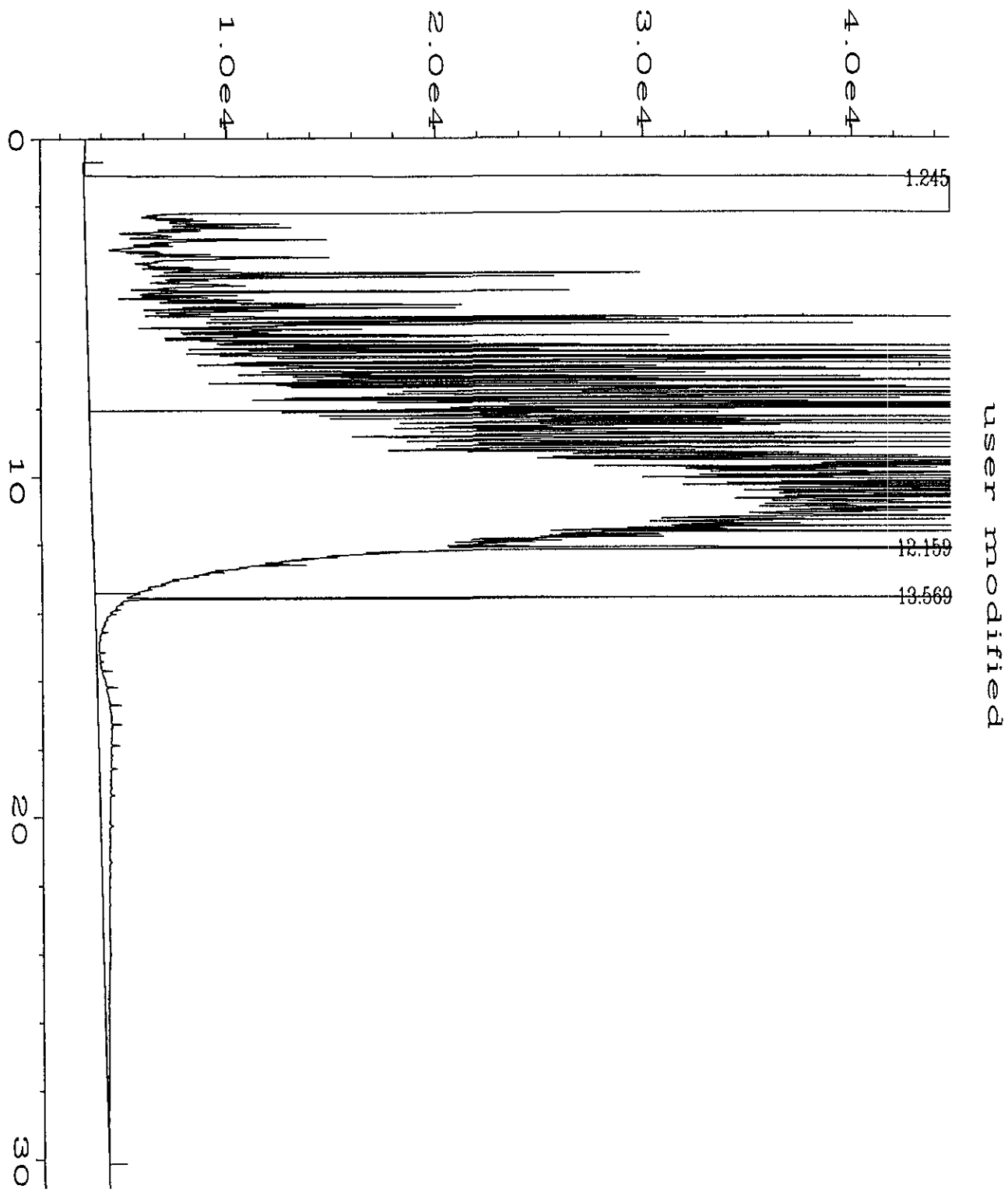
Data File Name : M:\HPCHEM\6\DATA\12-01-95\016F1301.D
Operator : TRR
Instrument : GC #6
Sample Name : TR 1128 MB3
Run Time Bar Code:
Acquired on : 04 Dec 95 01:51 PM
Report Created on: 04 Dec 95 03:41 PM

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



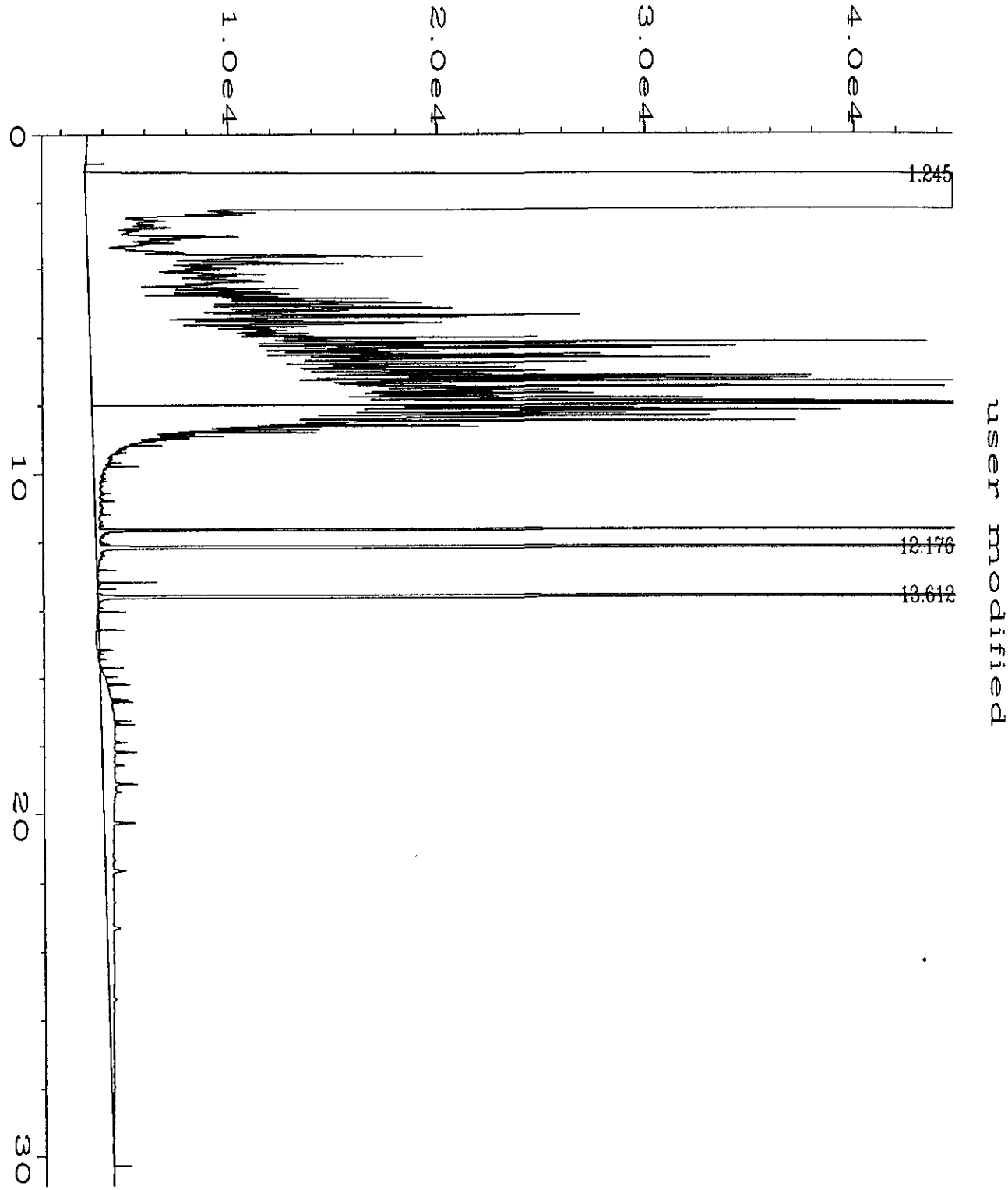
Data File Name : M:\HPCHEM\6\DATA\12-01-95\019F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64249
Run Time Bar Code:
Acquired on : 04 Dec 95 09:18 AM
Report Created on: 04 Dec 95 03:41 PM

Page Number : 1
Vial Number : 19
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



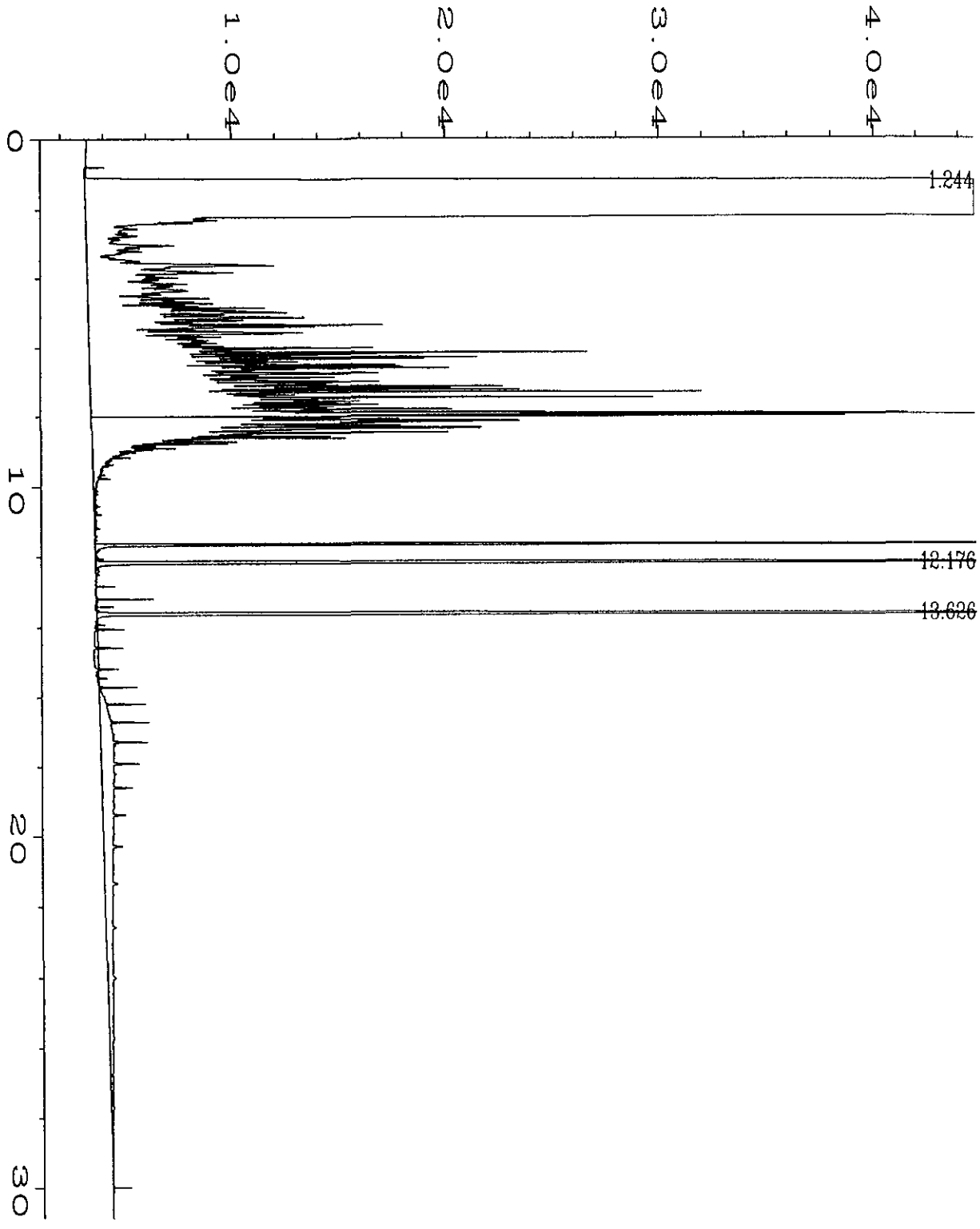
Data File Name : M:\HPCHEM\6\DATA\12-01-95\023F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64257 DIL
Run Time Bar Code:
Acquired on : 04 Dec 95 11:49 AM
Report Created on: 04 Dec 95 12:25 PM

Page Number : 1
Vial Number : 23
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



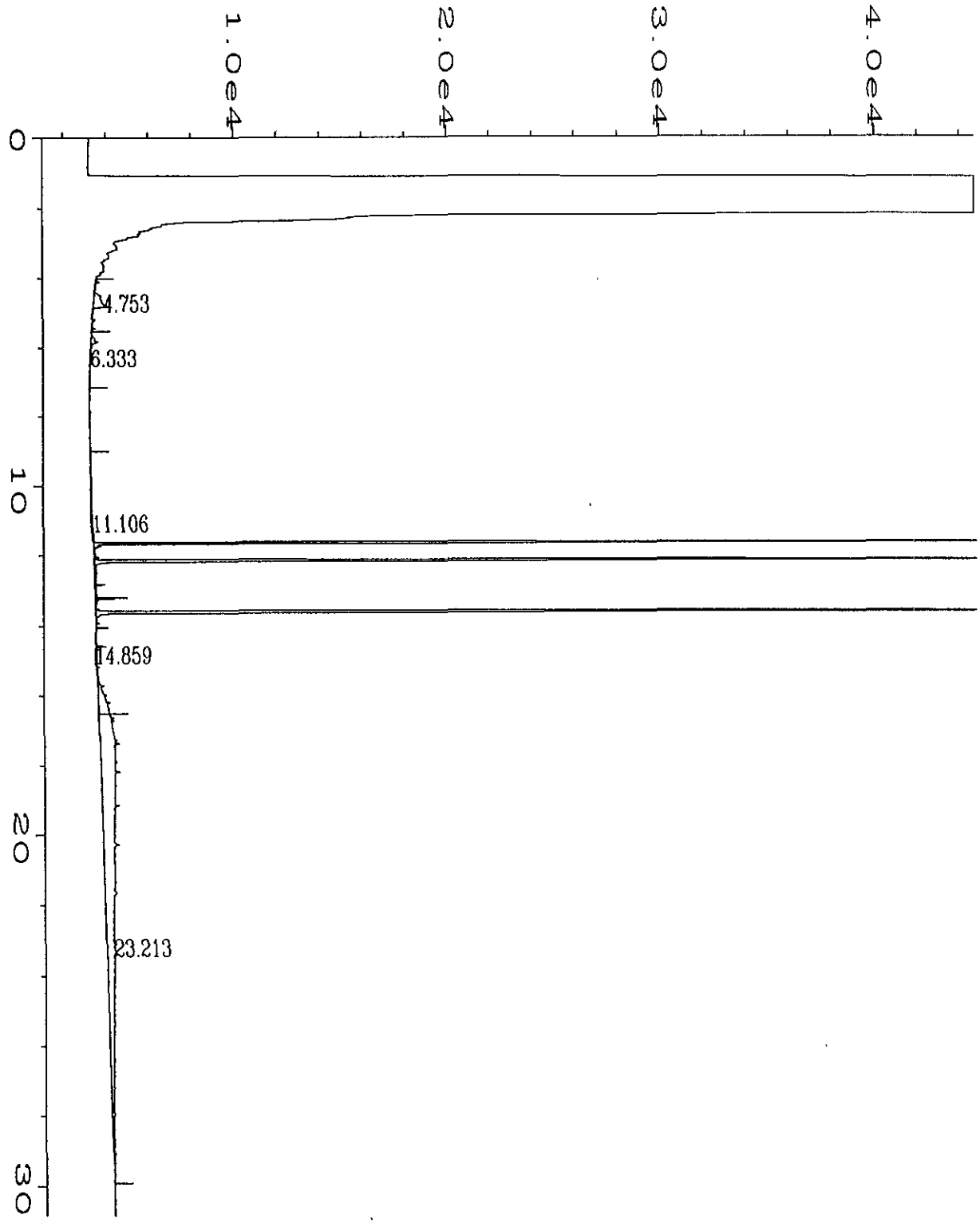
Data File Name : M:\HPCHEM\6\DATA\12-01-95\020F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64265
Run Time Bar Code:
Acquired on : 04 Dec 95 09:55 AM
Report Created on: 04 Dec 95 11:55 AM

Page Number : 1
Vial Number : 20
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



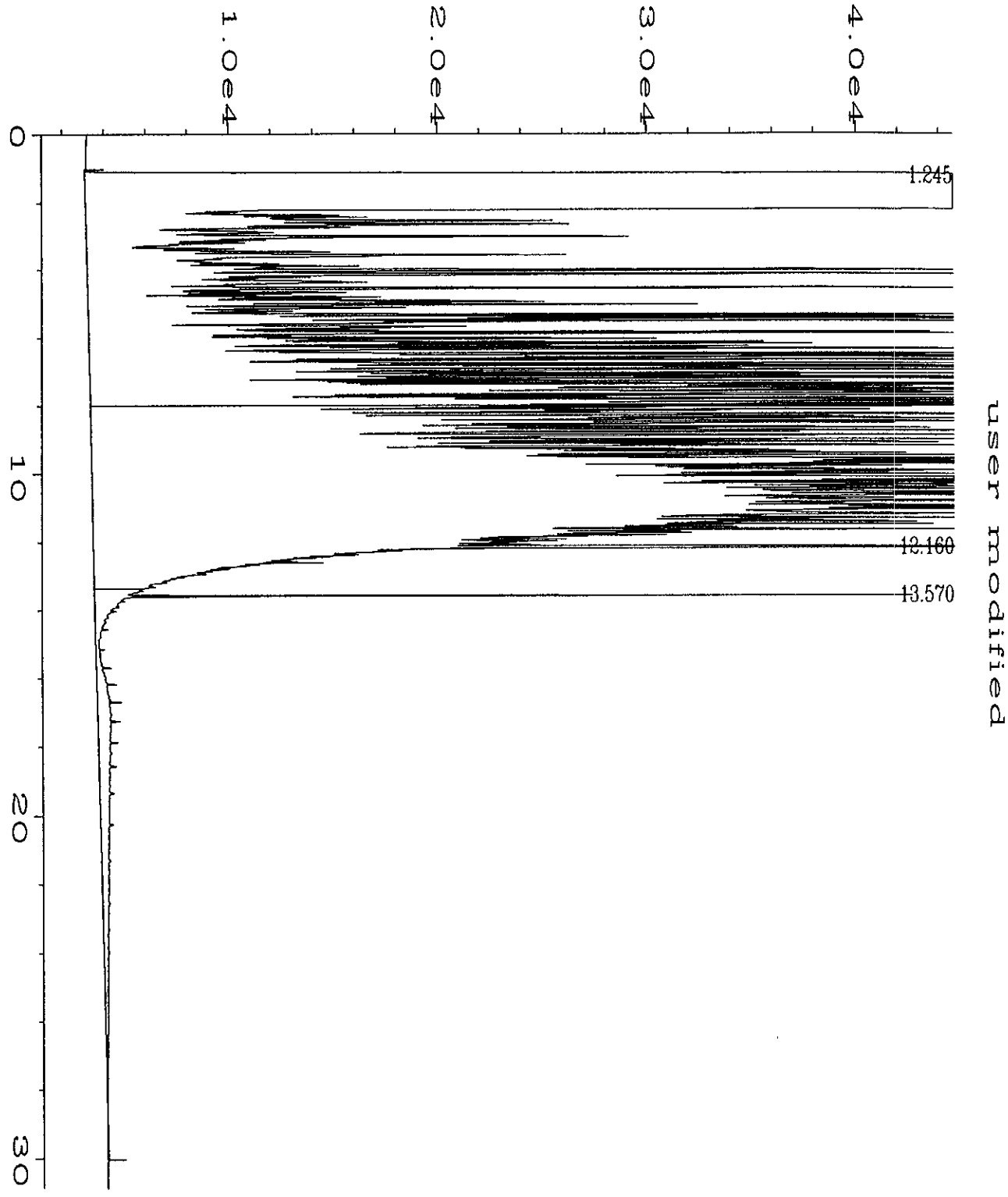
Data File Name : M:\HPCHEM\6\DATA\12-01-95\021F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64270
Run Time Bar Code:
Acquired on : 04 Dec 95 10:33 AM
Report Created on: 04 Dec 95 11:58 AM

Page Number : 1
Vial Number : 21
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



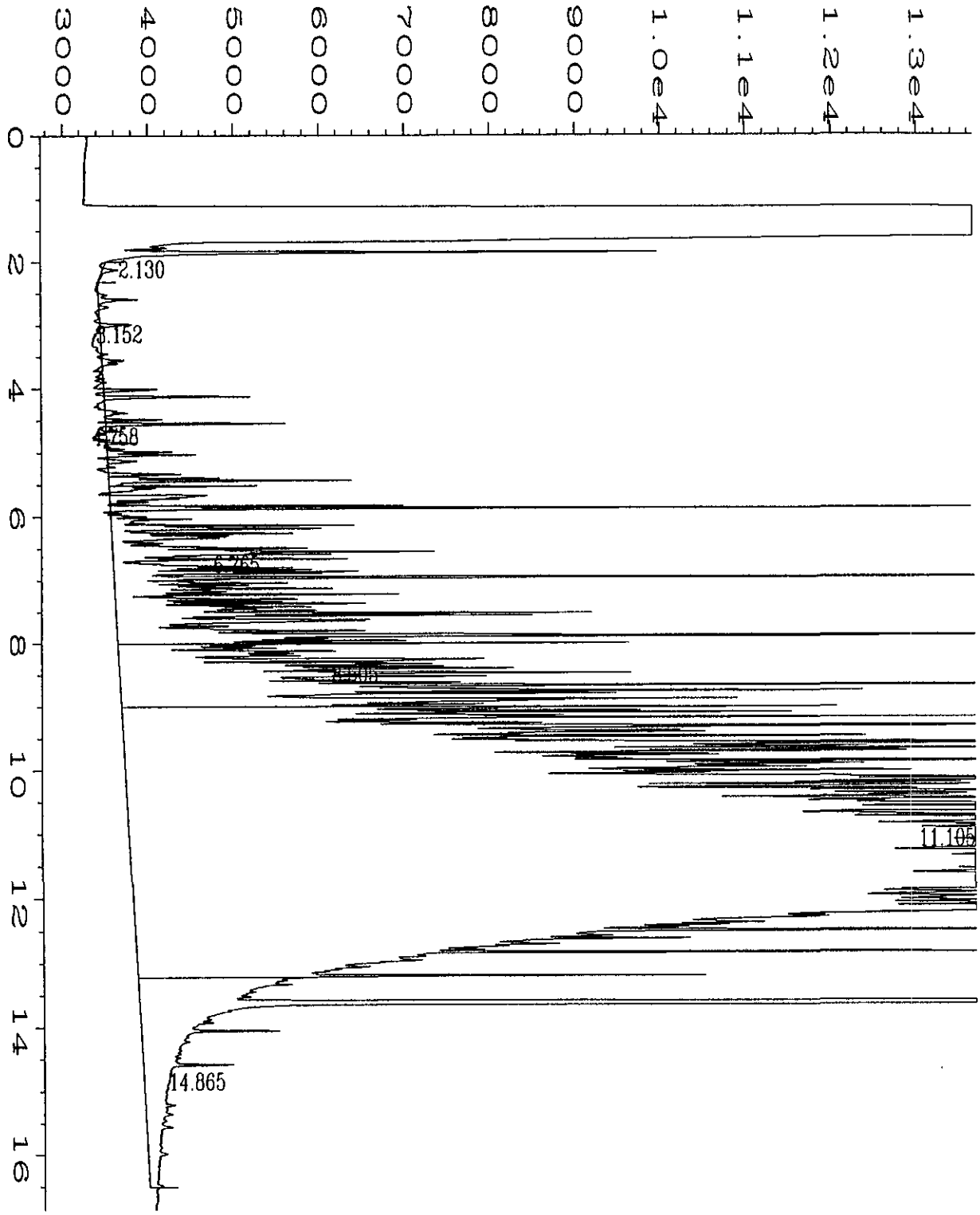
Data File Name : M:\HPCHEM\6\DATA\12-01-95\022F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64275
Run Time Bar Code:
Acquired on : 04 Dec 95 11:11 AM
Report Created on: 04 Dec 95 03:42 PM

Page Number : 1
Vial Number : 22
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



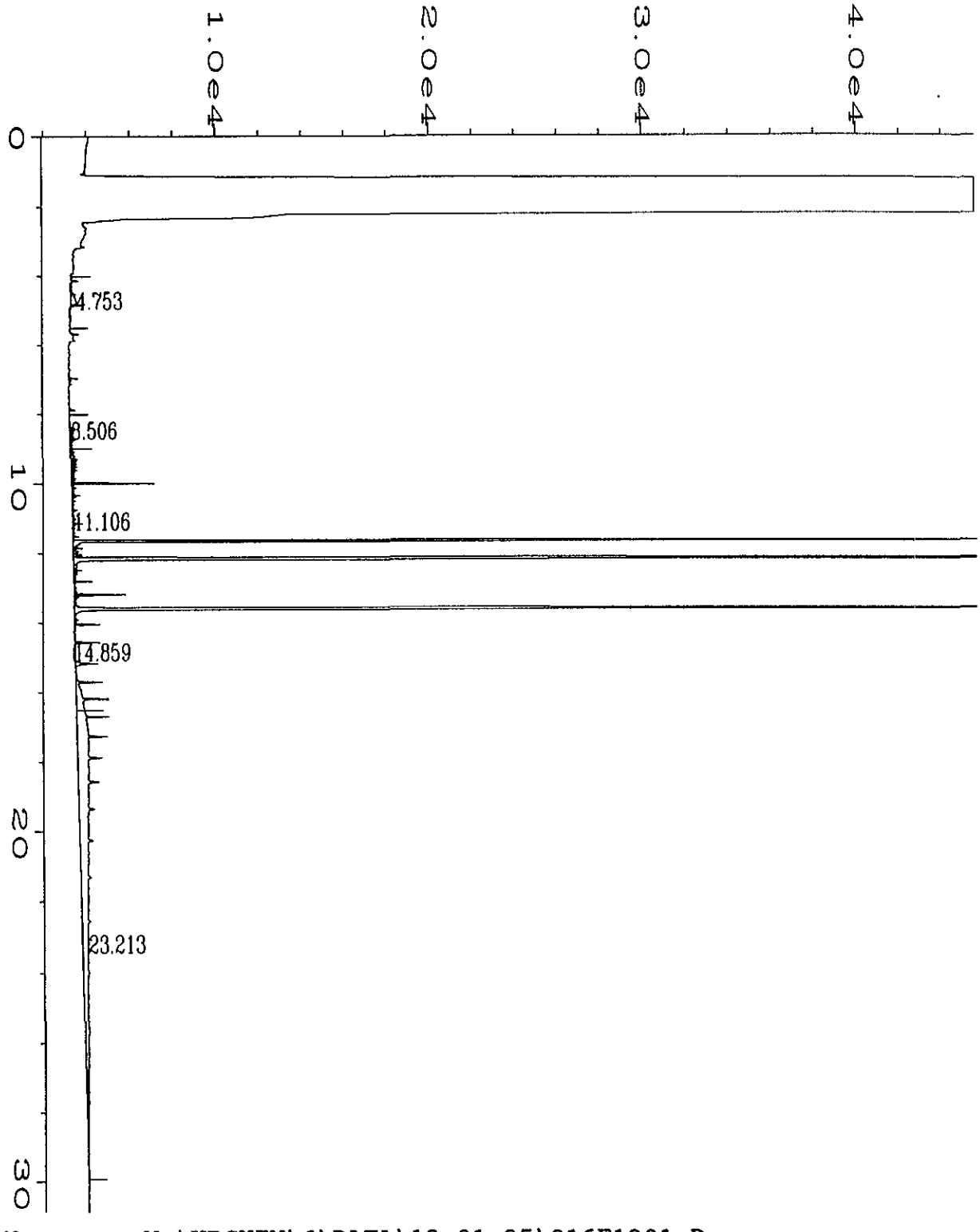
Data File Name : M:\HPCHEM\6\DATA\12-01-95\024F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64281 DIL
Run Time Bar Code:
Acquired on : 04 Dec 95 12:27 PM
Report Created on: 04 Dec 95 01:05 PM

Page Number : 1
Vial Number : 24
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



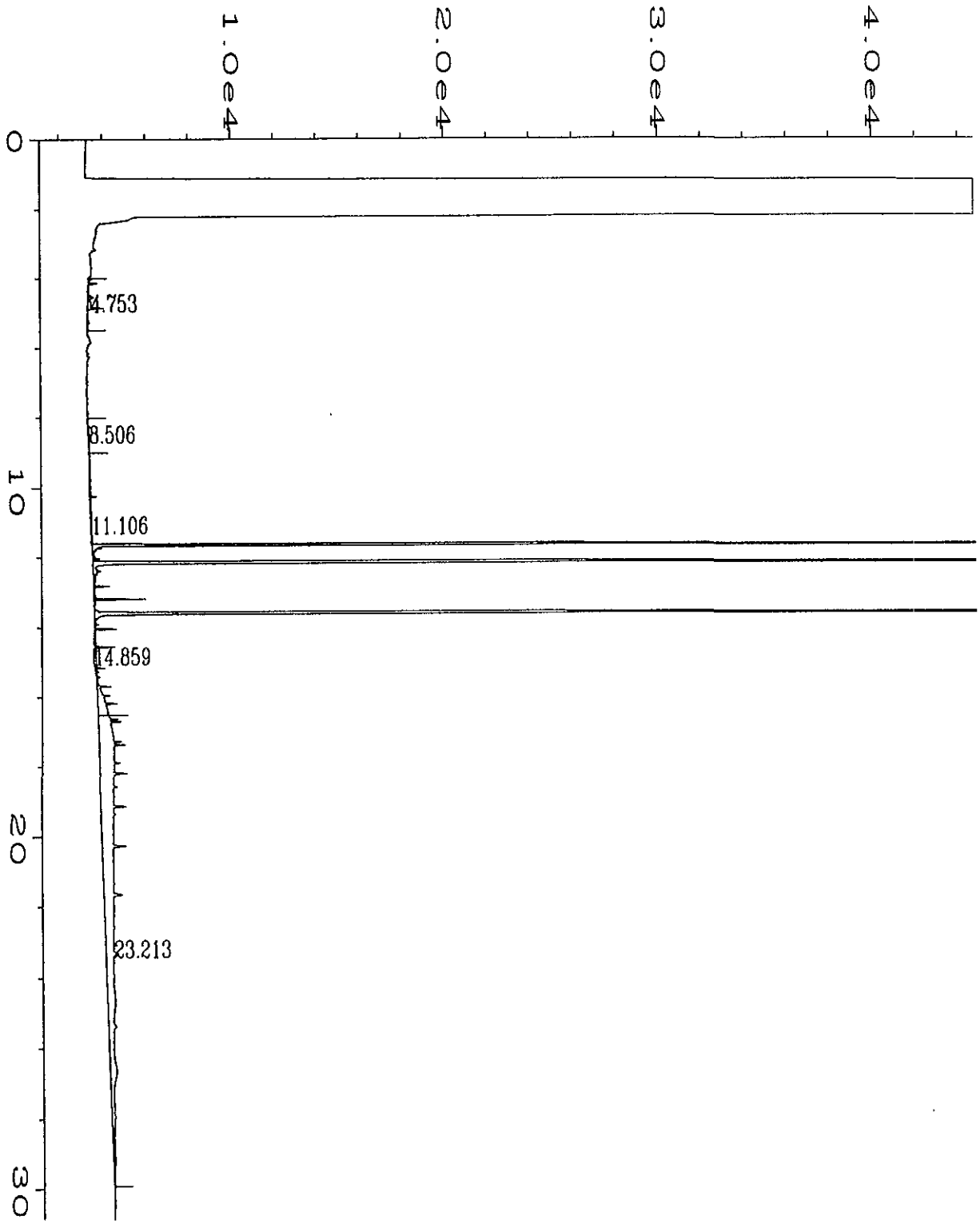
Data File Name : M:\HPCHEM\6\DATA\12-01-95\005F0301.D
Operator : TRR
Instrument : GC #6
Sample Name : 500 WADF
Run Time Bar Code:
Acquired on : 01 Dec 95 04:02 PM
Report Created on: 04 Dec 95 03:44 PM

Page Number : 1
Vial Number : 5
Injection Number : 1
Sequence Line : 3
Instrument Method: TPHD.MTH
Analysis Method : TPHMO.MTH



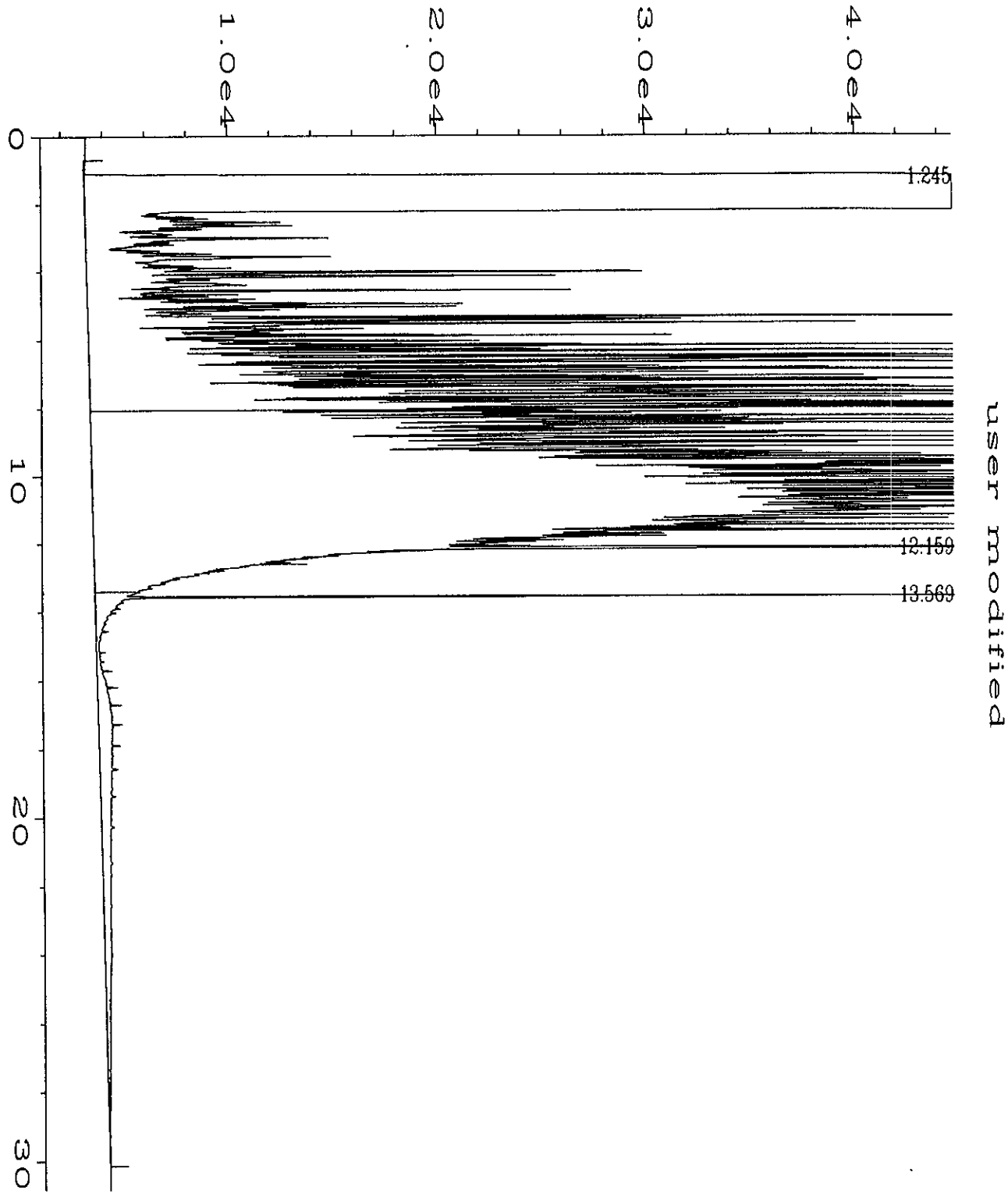
Data File Name : M:\HPCHEM\6\DATA\12-01-95\016F1301.D
Operator : TRR
Instrument : GC #6
Sample Name : TR 1128 MB3
Run Time Bar Code:
Acquired on : 04 Dec 95 01:51 PM
Report Created on: 04 Dec 95 03:41 PM

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



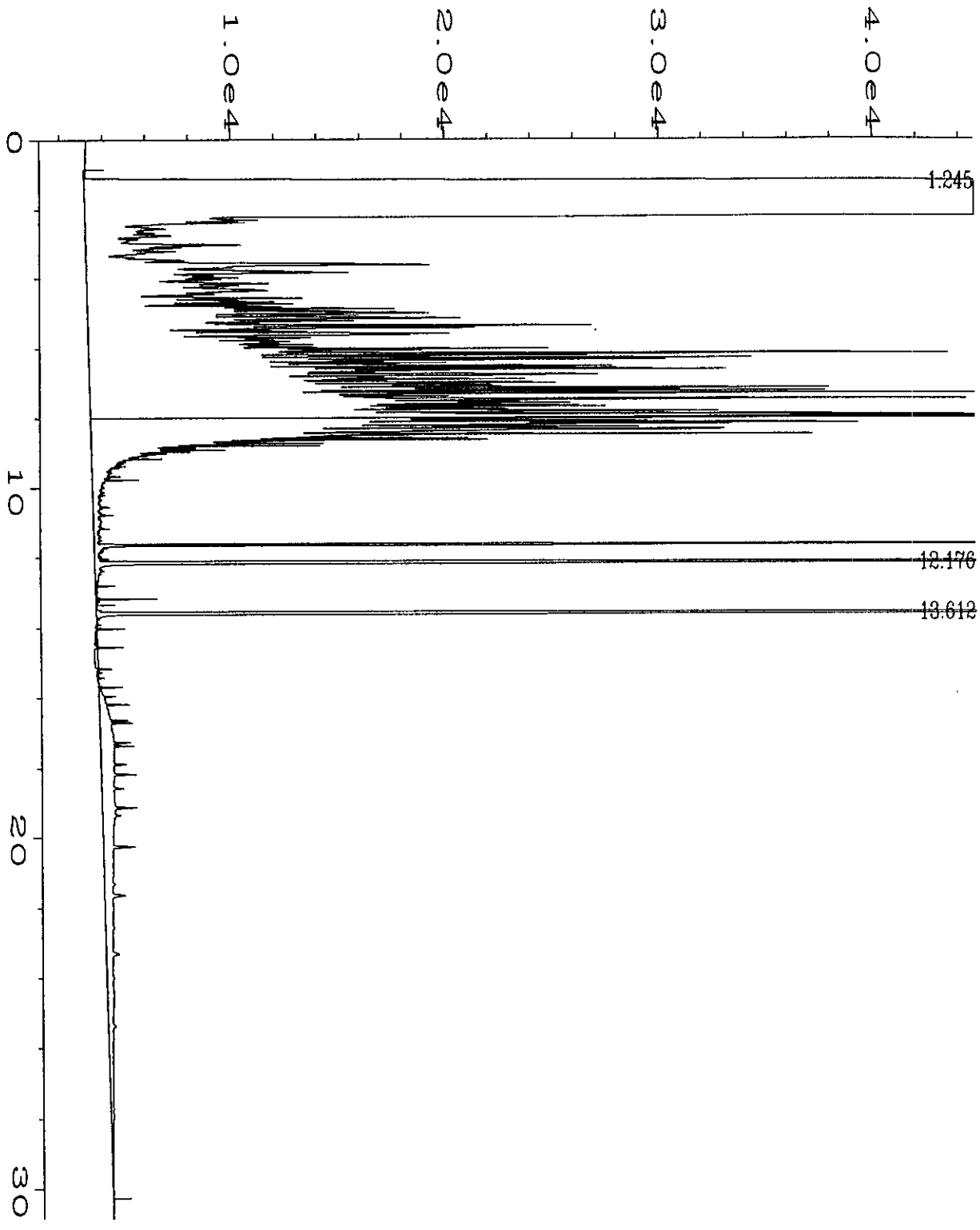
Data File Name : M:\HPCHEM\6\DATA\12-01-95\019F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64249
Run Time Bar Code:
Acquired on : 04 Dec 95 09:18 AM
Report Created on: 04 Dec 95 03:41 PM

Page Number : 1
Vial Number : 19
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



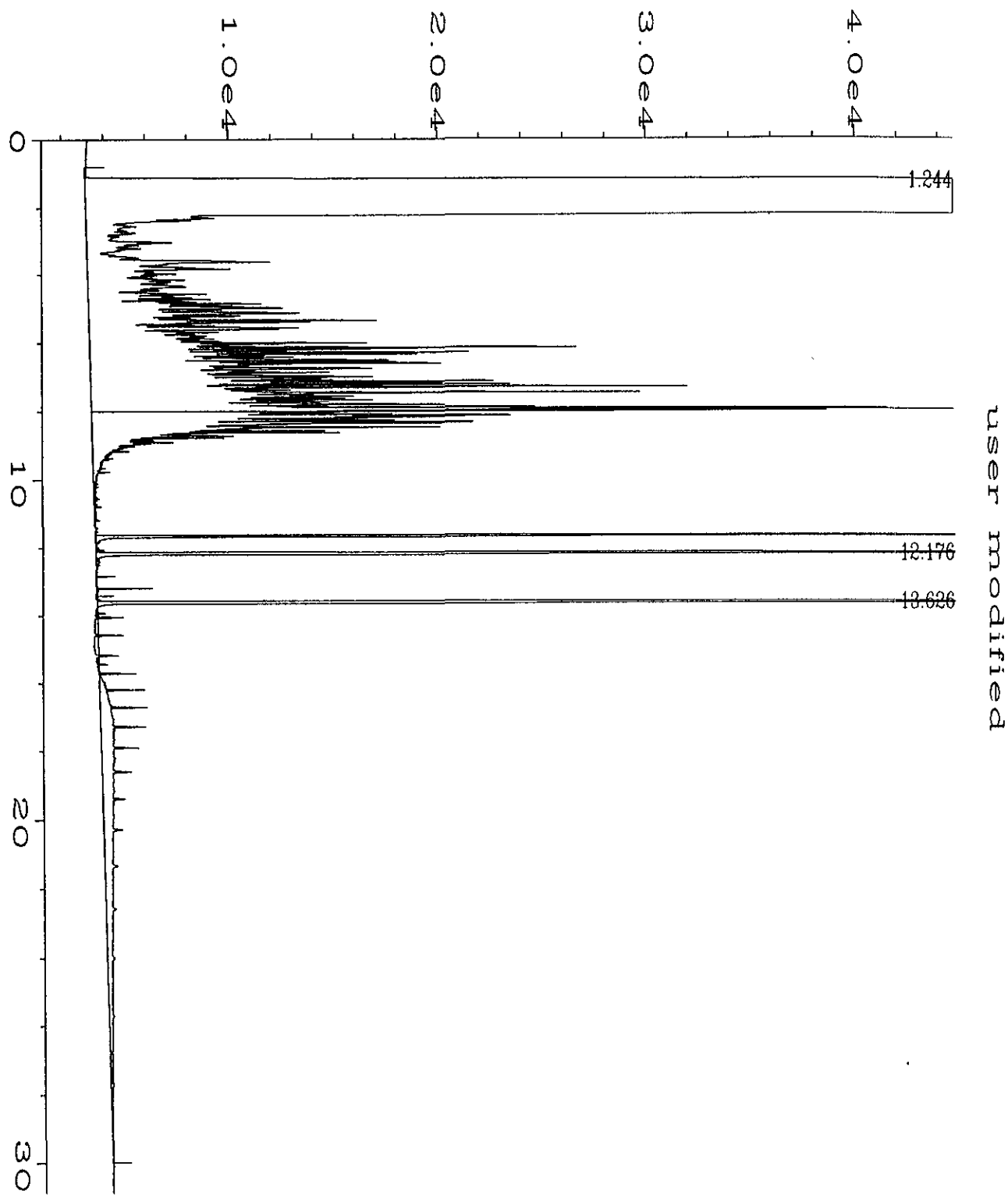
Data File Name : M:\HPCHEM\6\DATA\12-01-95\023F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64257 DIL
Run Time Bar Code:
Acquired on : 04 Dec 95 11:49 AM
Report Created on: 04 Dec 95 12:25 PM

Page Number : 1
Vial Number : 23
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



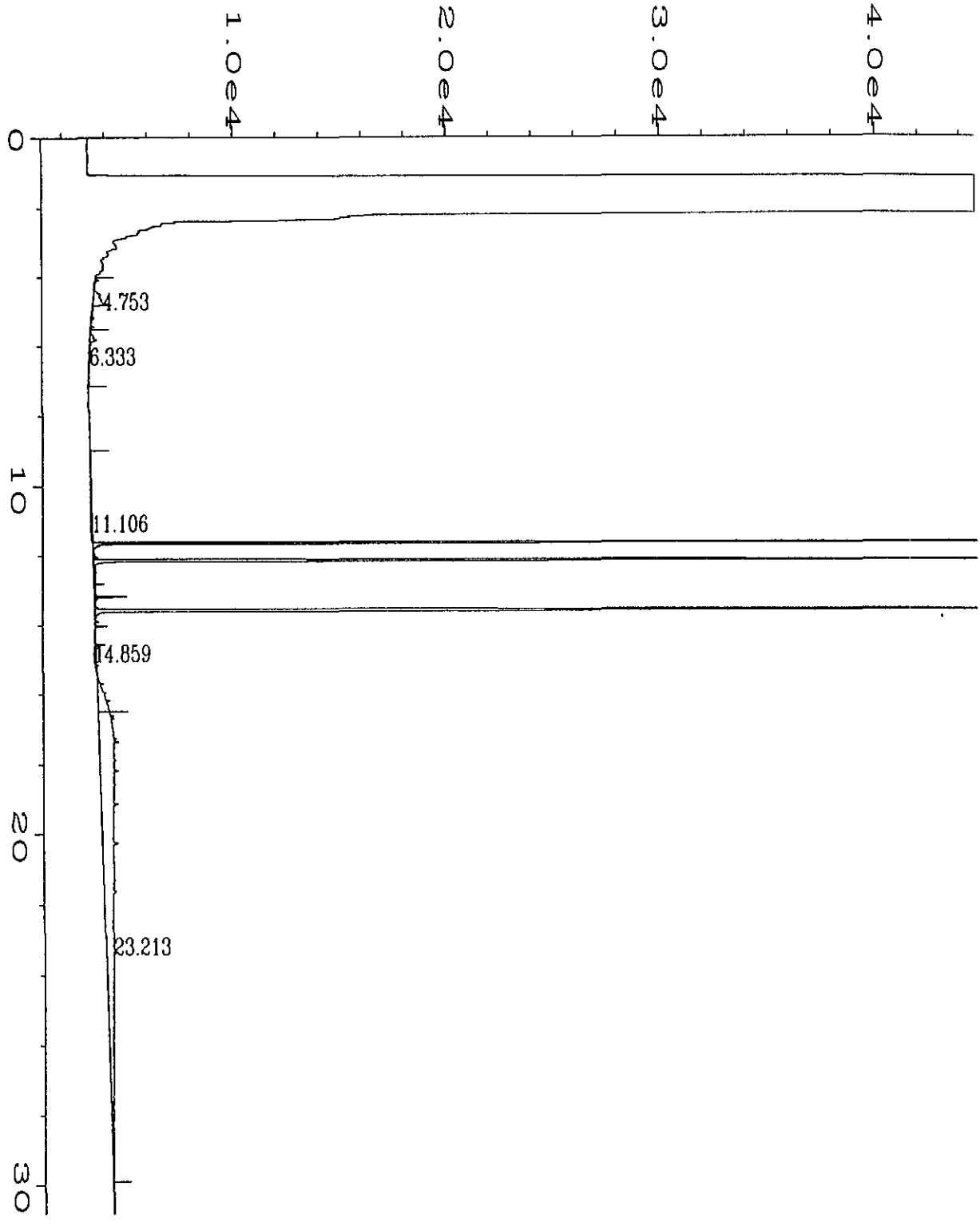
Data File Name : M:\HPCHEM\6\DATA\12-01-95\020F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64265
Run Time Bar Code:
Acquired on : 04 Dec 95 09:55 AM
Report Created on: 04 Dec 95 11:55 AM

Page Number : 1
Vial Number : 20
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



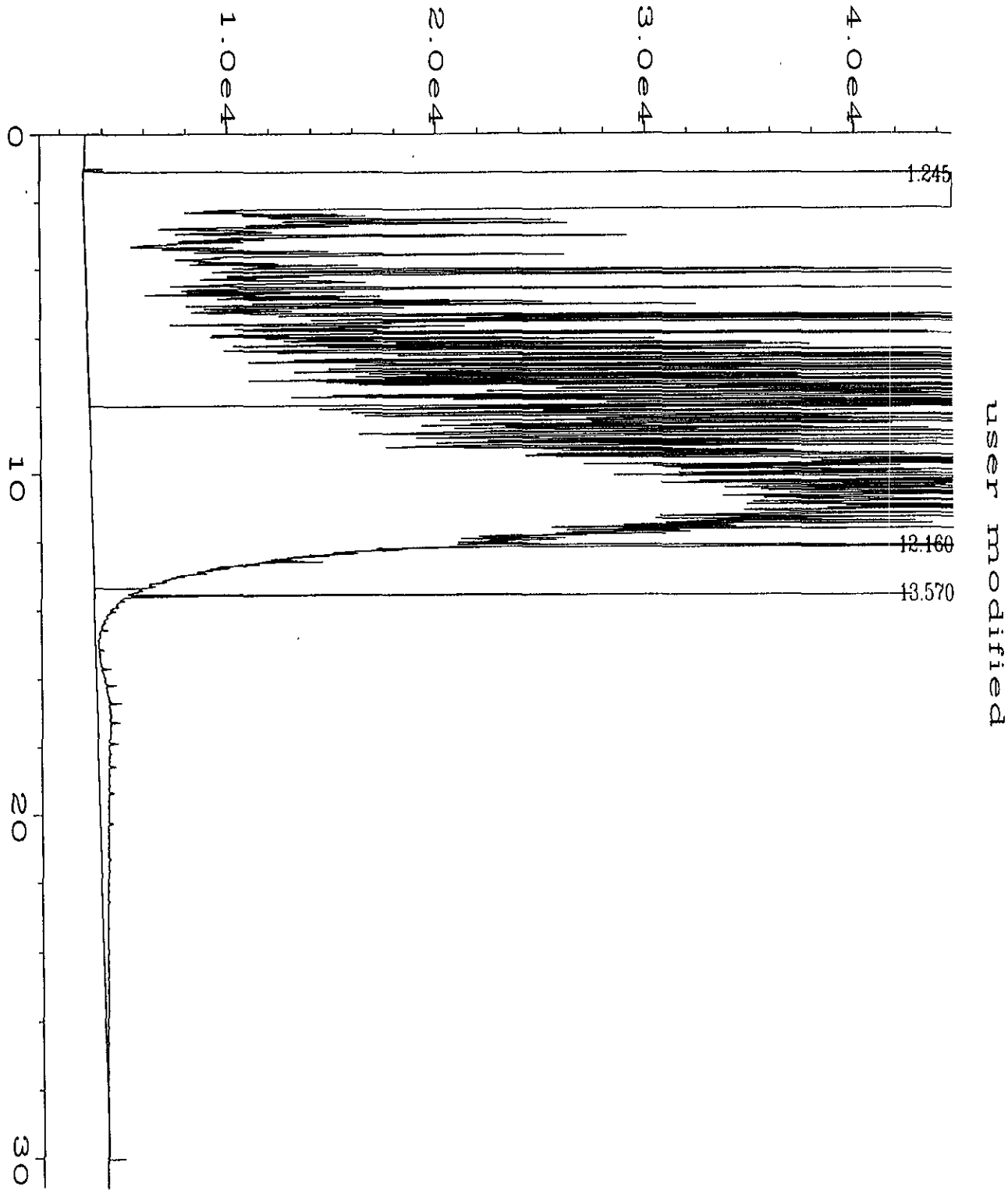
Data File Name : M:\HPCHEM\6\DATA\12-01-95\021F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64270
Run Time Bar Code:
Acquired on : 04 Dec 95 10:33 AM
Report Created on: 04 Dec 95 11:58 AM

Page Number : 1
Vial Number : 21
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



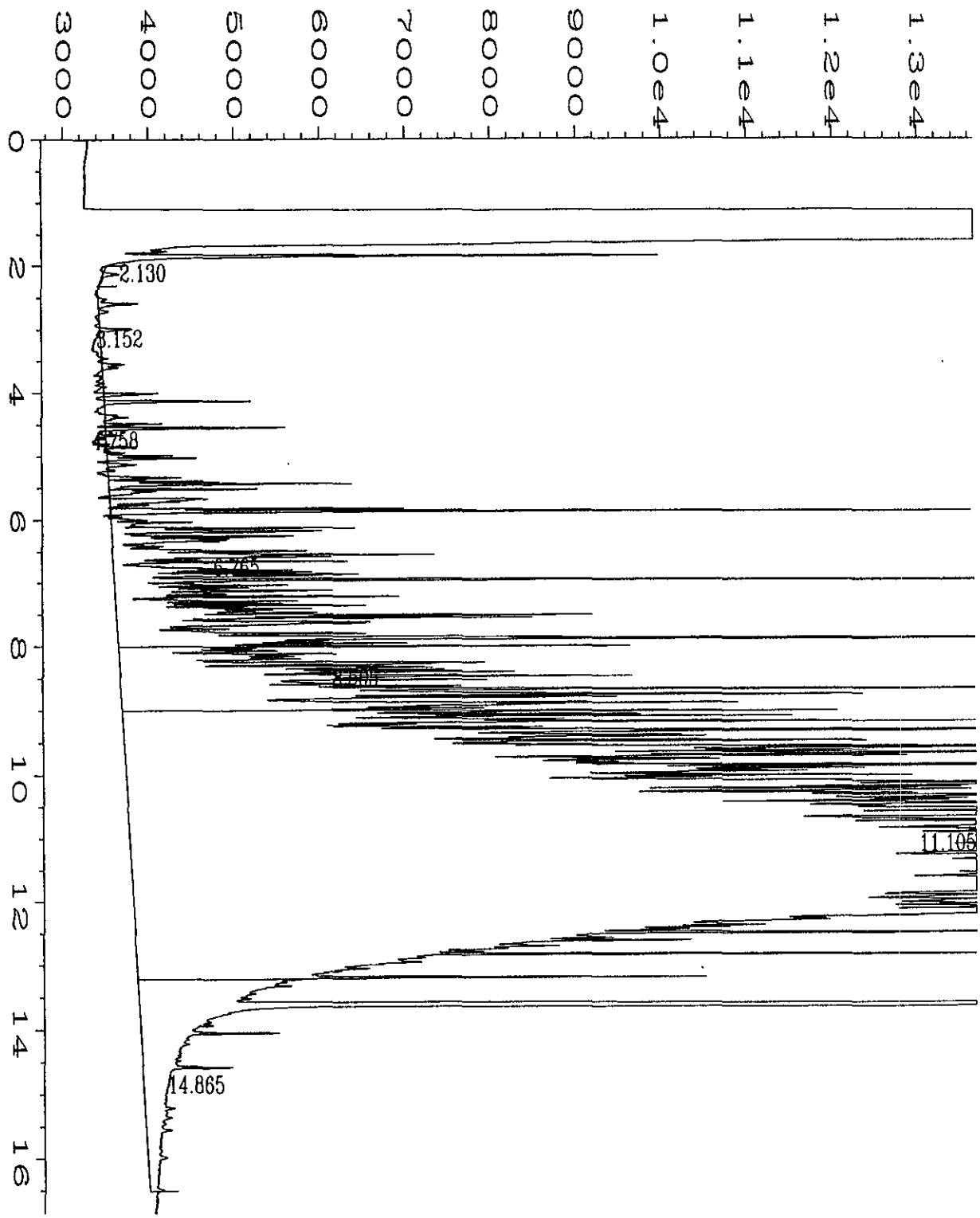
Data File Name : M:\HPCHEM\6\DATA\12-01-95\022F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64275
Run Time Bar Code:
Acquired on : 04 Dec 95 11:11 AM
Report Created on: 04 Dec 95 03:42 PM

Page Number : 1
Vial Number : 22
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



Data File Name : M:\HPCHEM\6\DATA\12-01-95\024F1001.D
Operator : TRR
Instrument : GC #6
Sample Name : 64281 DIL
Run Time Bar Code:
Acquired on : 04 Dec 95 12:27 PM
Report Created on: 04 Dec 95 01:05 PM

Page Number : 1
Vial Number : 24
Injection Number : 1
Sequence Line : 10
Instrument Method: TPHMO.MTH
Analysis Method : TPHMO.MTH



Data File Name : M:\HPCHEM\6\DATA\12-01-95\005F0301.D
Operator : TRR
Instrument : GC #6
Sample Name : 500 WADF
Run Time Bar Code:
Acquired on : 01 Dec 95 04:02 PM
Report Created on: 04 Dec 95 03:44 PM

Page Number : 1
Vial Number : 5
Injection Number : 1
Sequence Line : 3
Instrument Method: TPHD.MTH
Analysis Method : TPHMO.MTH