



Omega Services

Construction • Environmental • Petroleum

rec'd by Ecology
12/28/95

**KEY BANK OF WASHINGTON
KIRKLAND BRANCH
MONITORING WELL INSTALLATION & SAMPLING**

**KEY BANK OF WASHINGTON -- KIRKLAND BRANCH
132 KIRKLAND AVENUE
KIRKLAND WA**

December 18, 1995

Prepared by:
**Omega Services
3214 16th Avenue SW
Seattle, Washington 98134**

Prepared for:
**Mr. Milt Donelson
Key Bank of Washington
1323 - 34th Avenue East
Tacoma, Washington 98424**

Project No. 9523-012

Omega Services, Inc.
The Total Compliance Company

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AFFILIATE
PEI
EQUIPMENT INC.

December 18, 1995

Mr. Milt Donelson
Key Bank of Washington
1323 - 34th Avenue East
Tacoma, Washington 98424

phone (206) 593-3939
fax (206) 572-3075

**Subject: Monitoring Well Installation & Sampling
 Key Bank - Kirkland Branch**

Dear Mr. Donelson:

On November 28, 1995, Omega Services (Omega) completed the installation of three (3) groundwater monitoring wells on the Key Bank - Kirkland Branch property. This report documents installation and associated activities.

PROJECT BACKGROUND

On September 15, 1995, Omega completed remedial excavation of petroleum contaminated soil on the subject property (refer to Omega's *Independent Cleanup Action Report*, dated October 30, 1995, Project No. 2655-027). Prior to entering into the Washington State Department of Ecology's (Ecology) Independent Remedial Action Program (IRAP), a meeting between Ms. Elaine Atkinson of Ecology with representatives of Omega and Key Bank took place at the subject property on November 14, 1995. This meeting identified the need to determine the former locations of USTs and pump islands on the subject property. Also discussed was the need to evaluate the subject property's groundwater through the installation of groundwater monitoring wells.

Omega recommended that three (3) groundwater monitoring wells be installed on the subject property. On November 17, 1995, Key Bank contracted Omega to install the three (3) monitoring wells.

MONITORING WELL LOCATIONS

The locations of the three (3) wells are shown in Figure 1 (attached) and are labeled as MW1, MW2 & MW3. Based on Omega's aerial photographic investigation (refer to Omega's report dated December 15, 1995, Project No. 9523-012), well MW1 was located adjacent and west of the former pump island and UST locations. Well MW2 was located north of the limit of remedial excavation, near the northern property boundary. Well MW3 was located in the southwest corner of the remedial excavation area. Monitoring well completion logs for MW1, MW2, and MW3 are included with this report.

SOIL BORING AND SAMPLING

Borings for all of the monitoring wells were drilled to a depth of 20 feet below ground surface (BGS). During the installation of monitoring wells MW1 and MW2, soil samples were collected every five (5) feet. Because well MW3 was placed within the remedial excavation, it was not necessary to collect soil samples from its location.

Soil samples from borings MW1 and MW2 were screened in the field for volatile organics, using a photo ionization detector (PID) and headspace technique. Only one sample, a water-saturated soil sample taken at 10 feet BGS in boring MW1, had a measurable organic vapor headspace, with a concentration of 10.6 parts per million (ppm).

WELL INSTALLATION & GROUNDWATER FLOW DIRECTION

After installation, the monitoring wells were allowed to equilibrate for approximately 48 hours. On November 30, 1995, Omega measured depth to groundwater in each well and surveyed the tops of the well casings (see attached well completion logs). Depth to groundwater ranged from approximately 6.5 feet BGS (MW2) to 10 feet BGS (MW3). The groundwater flow direction was determined to be from east to west (Figure 1).

WELL DEVELOPMENT & SAMPLING

Each well was purged of approximately 10 well volumes of water prior to sampling. Purge water was collected and stored on-site in 55-gallon steel drums. After purging, each well was allowed to recover. Two (2) groundwater samples were collected from each monitoring well using disposable bailers. The groundwater samples were submitted to American Analytical Laboratories of Seattle, Washington.

GROUNDWATER SAMPLE RESULTS

The groundwater samples from each well were analyzed for total dissolved lead, gasoline range (C_6 to C_{12}) total petroleum hydrocarbons (TPH) and BTEX (benzene, toluene, ethylbenzene, and total xylenes). Results of these analyses are summarized in Table 1. The chain of custody and copies of the certificates of analysis are included with this report.

Of the three (3) groundwater samples taken from wells MW1, MW2, and MW3, only samples from monitoring wells MW1 and MW3 had gasoline range TPH and BTEX concentrations just above Ecology's MTCA Groundwater Method A Cleanup Level of 1.0 ppm. Gasoline range TPH concentrations from MW1 and MW3 were 3.2 and 3.7 ppm, respectively. Groundwater sample MW1 had benzene, ethylbenzene, and xylene concentrations of 25, 48 and 34 parts per billion (ppb), respectively. Groundwater sample MW3 had benzene and xylene concentrations of 38 and 24 ppb, respectively. The Method A Groundwater Cleanup Levels for benzene, toluene, ethylbenzene, and total xylenes are 5, 40, 30 and 20 ppb, respectively. Concentrations of total dissolved lead in all three groundwater samples were below detection limits of 0.1 ppm. Free product was not encountered in any of the three (3) wells.

SUMMARY OF FINDINGS

On November 28, 1995, Omega installed three (3) groundwater monitoring wells on the subject property. Depth to groundwater ranged from approximately 6 feet to 10 feet BGS. The groundwater flow direction beneath the subject property was from east to west. Wells MW1 and MW3 were positioned down-gradient from the subject property's former USTs and/or pump island locations (refer to Omega's report dated December 15, 1995, Project No. 9523-012).

Laboratory analysis of groundwater samples indicated that groundwater beneath the subject property had been impacted by gasoline range TPH and BTEX compounds. Monitoring well MW2, located in the northwest corner of the subject property, had gasoline range TPH and BTEX concentrations below Method A Groundwater Cleanup Levels. In the remaining two wells, MW1 and MW3, the concentration of gasoline range TPH and BTEX compounds were just above Ecology's most stringent Method A Cleanup Levels.

Ecology's Method A Cleanup Levels are designed to be the most protective of human health and the environment. Exceedance of Method A Cleanup Levels does not necessarily trigger the need for additional cleanup action. Approximately 250 cubic yards of potential groundwater impacting source material has been excavated and removed from the subject property. Free product (posing a potential explosive hazard in nearby utility trenches, basements, crawl spaces, etc. if present) was not encountered in any of the monitoring wells. In addition there is no threat to human health due to the absence of nearby drinking water wells. Based on these findings and relatively low concentrations of TPH and BTEX compounds in the subject property groundwater, Omega concludes that further investigation and/or remediation of the subject property groundwater is not warranted at this time.

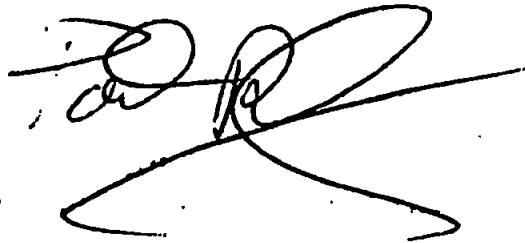
Omega Services

Any questions regarding our work or this report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned.

Very Truly Yours,
OMEGA SERVICES



Robert B. Roe
Project Hydrogeologist

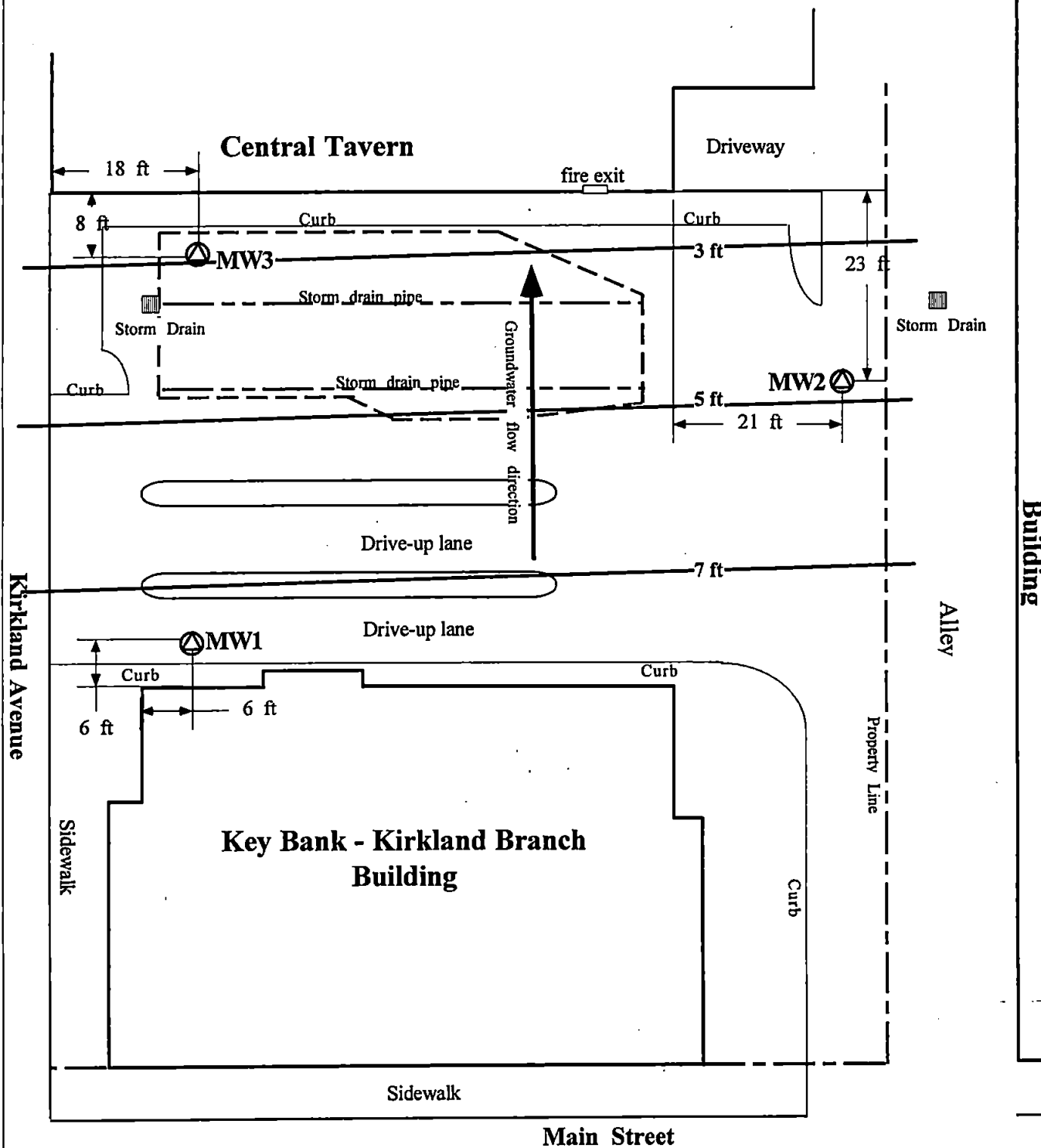


Paul Riley
Environmental Services Manager

attachments

cc: *Ms. Elaine Atkinson
Washington State Department of Ecology, Northwest Region
Toxics Cleanup Program
3190 160th Avenue SE
Bellevue, WA 98008-5452*

Key Bank - Kirkland Branch Site & Water Table Contour Map



- ⊙ Monitoring Well & Sample location
- 5 ft — *Water table contour
- - - Limits of remedial excavation
- - - Approximate location of property line

* water level elevations based on arbitrary surface elevation of 15 feet



8 0 16
feet

Omega Services
Geologists, Environmental
Specialists & General Contractor
Seattle, WA 98134

Scale 1:216

Site address: 132 Kirkland Avenue, Kirkland, WA

12/5/95

Figure 1

Table 1: Summary of Analytical Results for Monitoring Well Groundwater Samples. Key Bank-Kirkland Independent Cleanup Action Project.

Monitoring Well Name	TOC Elev.	Depth to Water	Water Level	Gas (ppm)	Lead (ppm)	B (ppb)	T (ppb)	E B (ppb)	X (ppb)
Samples collected from monitoring wells on 11/30/95									
MW1	15	7.12	7.88	3.2	<0.1	25	3	48	34
MW2	11.37	6.46	4.91	0.8	<0.1	<2	<2	<2	<2
MW3	13.22	10.29	2.93	3.7	<0.1	38	4	10	24
MTCA Method A Cleanup Guidelines									
MTCA-Groundwater			---	1	5	5	40	30	20

Samples collected by Omega Services' Site Assessor Registered with Ecology.

TOC, top of casing elevation based on arbitrary reference datum of 100 feet above sea level

Depth to water, measured in feet from TOC to static water table

Groundwater elevation, elevation of static water table based on reference datum

Gas, gas TPH determined using Washington State Test Method WTPH-G/BTEX.

Lead, Total dissolved lead.

TPH, Total petroleum hydrocarbons.

B, Benzene.

T, Toluene.

E B, Ethylbenzene.

X, Xylenes.

ppm, parts per million (mg/liter).

ppb, parts per billion (ug/liter).

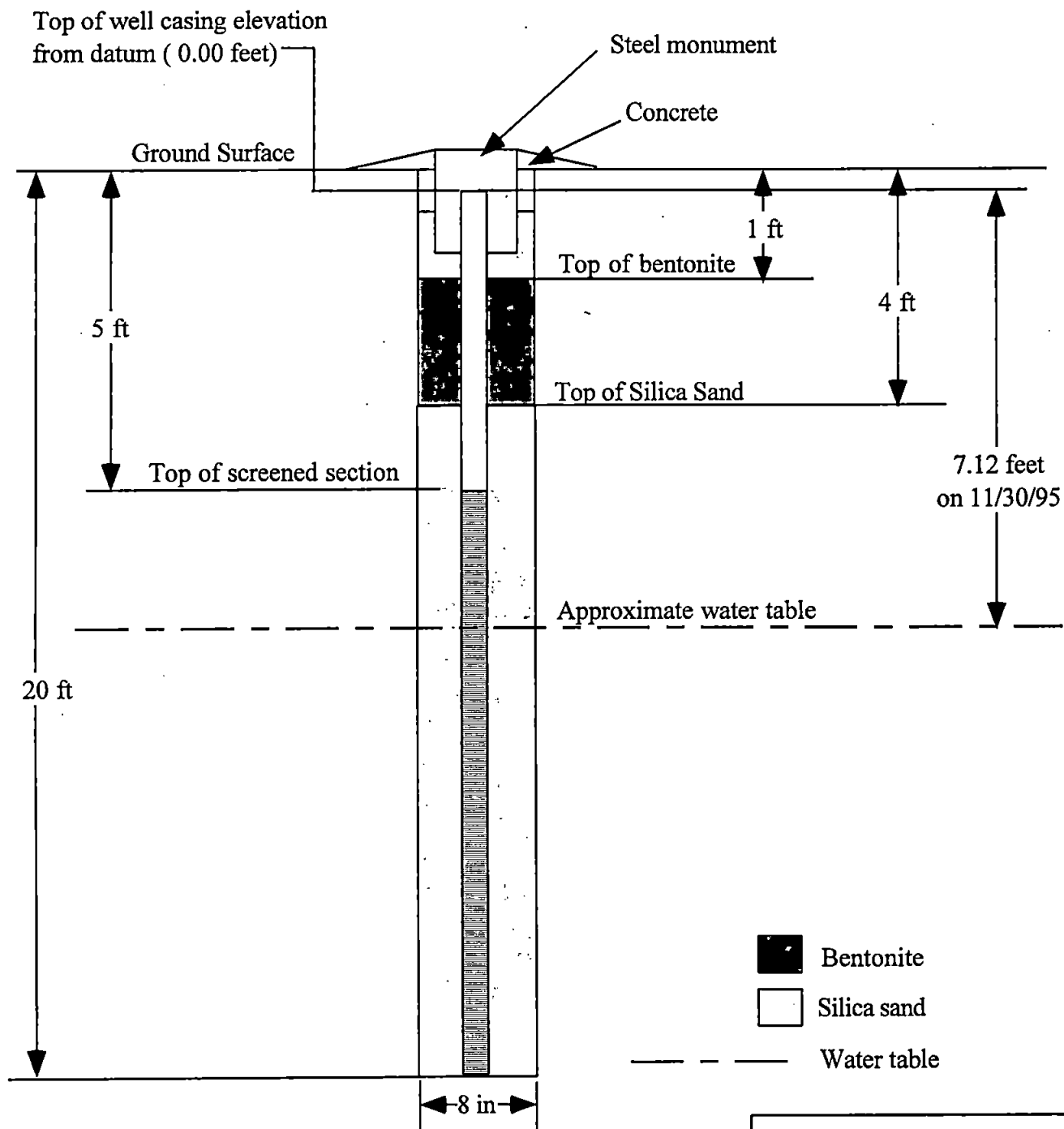
BGS, below ground surface.

---, not applicable.

MTCA, Ecology's Model Toxics Control Act Method A Soil Cleanup Levels for gas TPH's in groundwater (WAC 173-340).

Shaded, Bold and Italics indicate concentrations above Ecology MTCA Method A Soil/Groundwater Cleanup Levels.

Key Bank - Kirkland Branch Well Completion Log (MW1)



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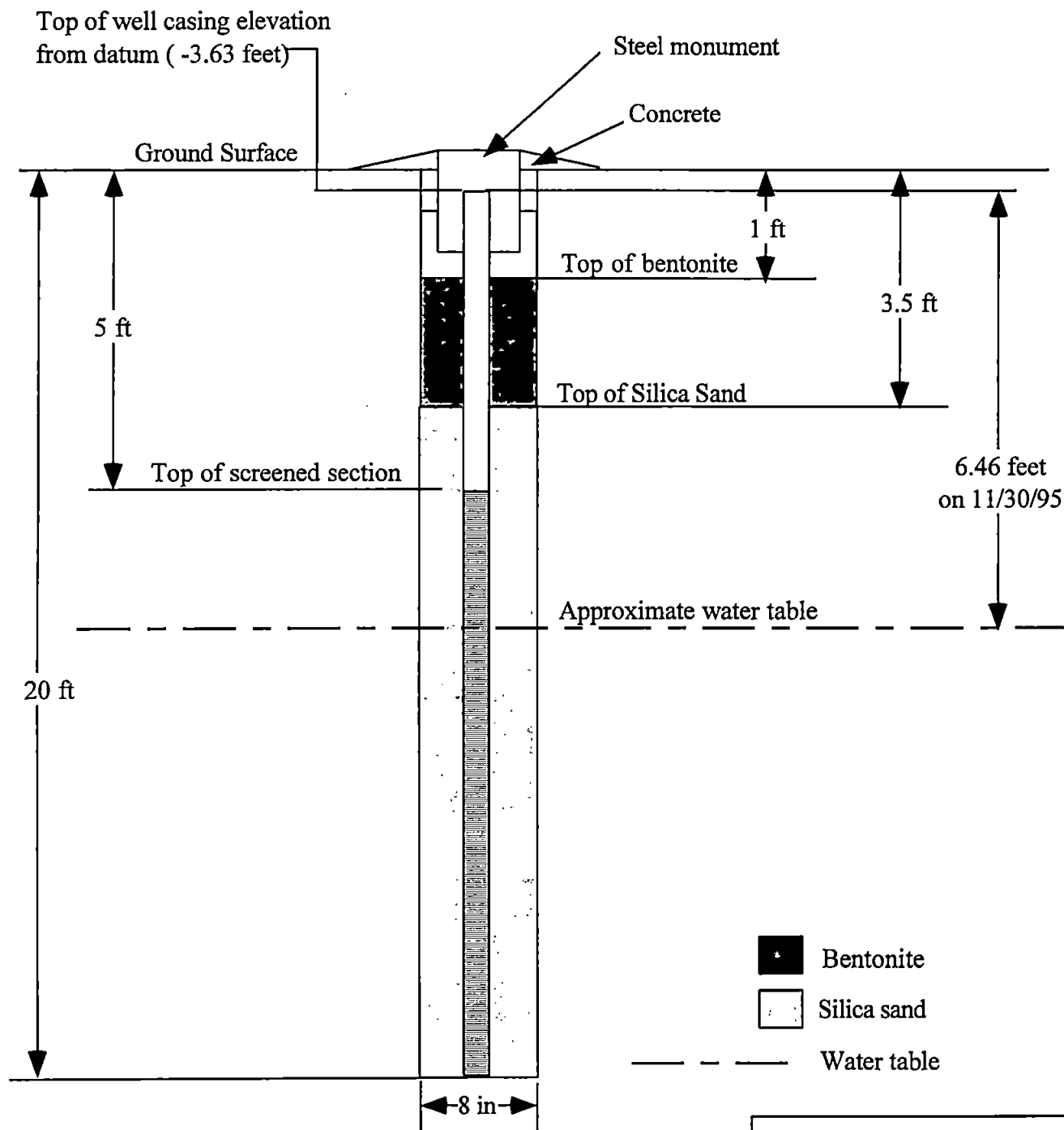
not to scale

site address: 132 Kirkland Avenue, Kirkland, WA.

date: 12/6/95

MW1

Key Bank - Kirkland Branch Well Completion Log (MW2)



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Seattle, WA 98134

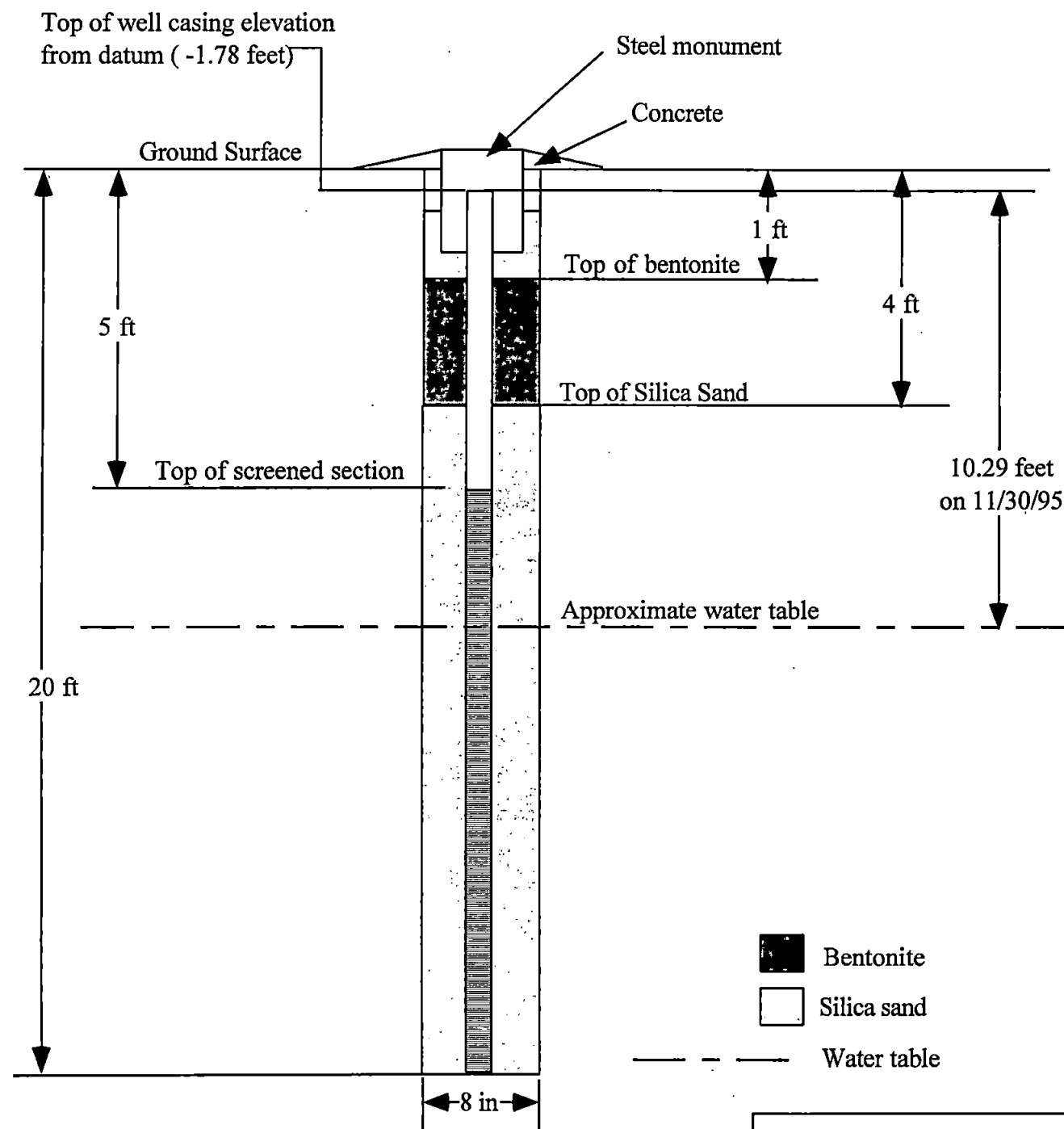
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site address: 132 Kirkland Avenue, Kirkland, WA.

date: 12/6/95

MW2

Key Bank - Kirkland Branch Well Completion Log (MW3)



Omega Services
Geologists, Environmental
Specialists & General Contractor
Seattle, WA 98134

not to scale

site address: 132 Kirkland Avenue, Kirkland, WA.

date: 12/6/95

MW3

Appendix A

ANALYTICAL REPORTS

AMERICAN

ANALYTICAL LABORATORIES, INC.

OMEGA SERVICES, INC.

12/4/95

December 4, 1995

Omega Services
3214 16th Ave SW
Seattle, WA 98134
Attn.: Robert Roe

Dear Robert:

Enclosed are the results of the analyses of samples submitted on 11/30/95 from your Key Bank-Wells Project.

We appreciate the opportunity to be of service to you on this project. If you have any questions regarding the reported results, please feel free to call me.

Sincerely,



Todd Salamonsen
Laboratory Director

enclosures



Date of Analysis: 12/3/95
Samples Submitted: 11/30/95
File ID: 11-111
Analysis: WTPH-G/BTEX
Units: mg/L (ppm)

Client: Omega Services
Project: Key Bank-Wells
Project #: 9523-012
Matrix: Water

Results

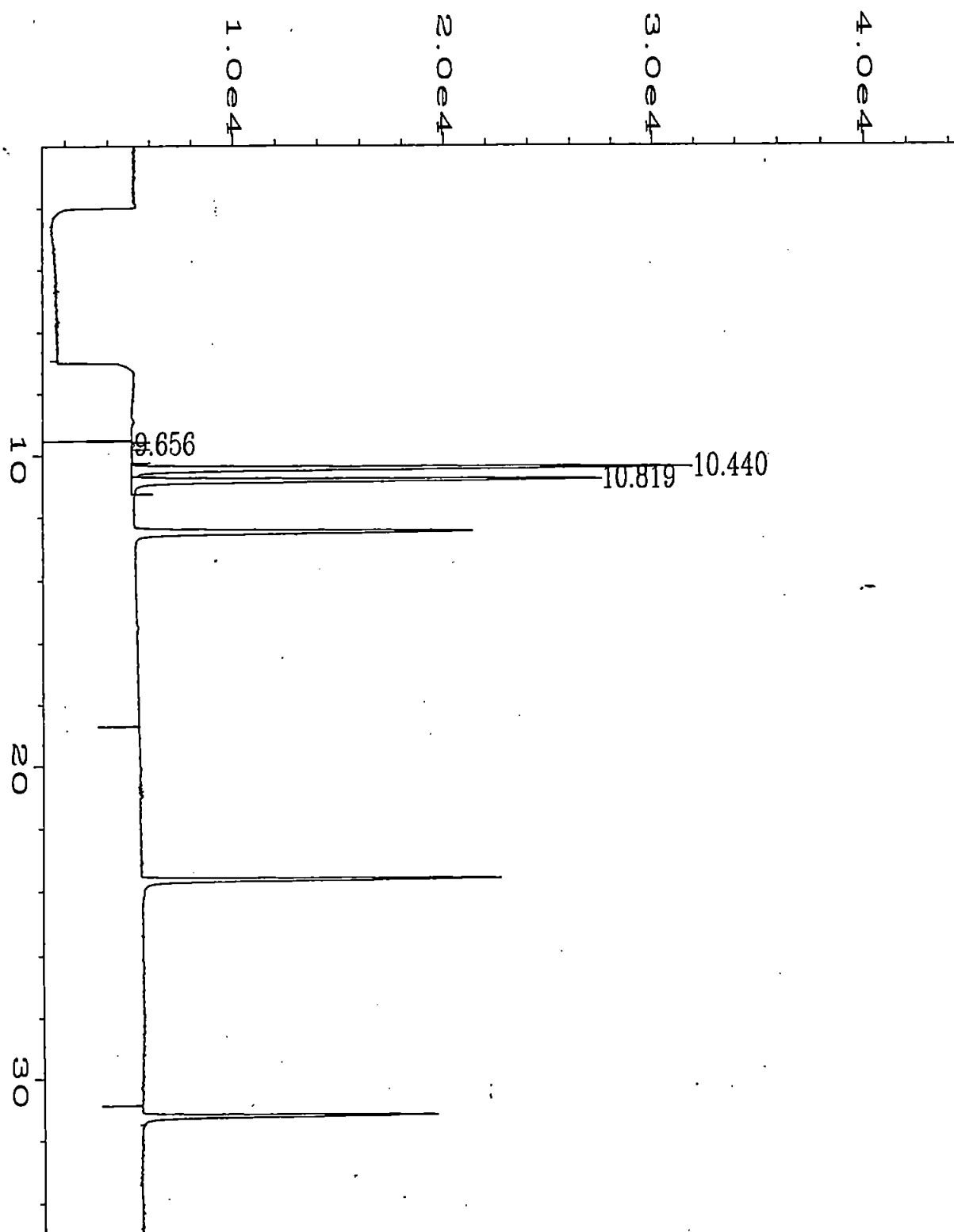
Lab ID	Client ID	Gasoline	Benzene	Toluene	Ethyl Benzene	Xylenes	FB % Surrogate Recovery	BFB% Surrogate Recovery
11-111-1	MW1	3.2	0.025	0.003	0.048	0.034	97	101
11-111-2	MW2	0.8	<0.002	<0.002	<0.002	<0.002	93	90
11-111-3	MW3	3.7	0.038	0.004	0.010	0.024	96	100

Quality Assurance

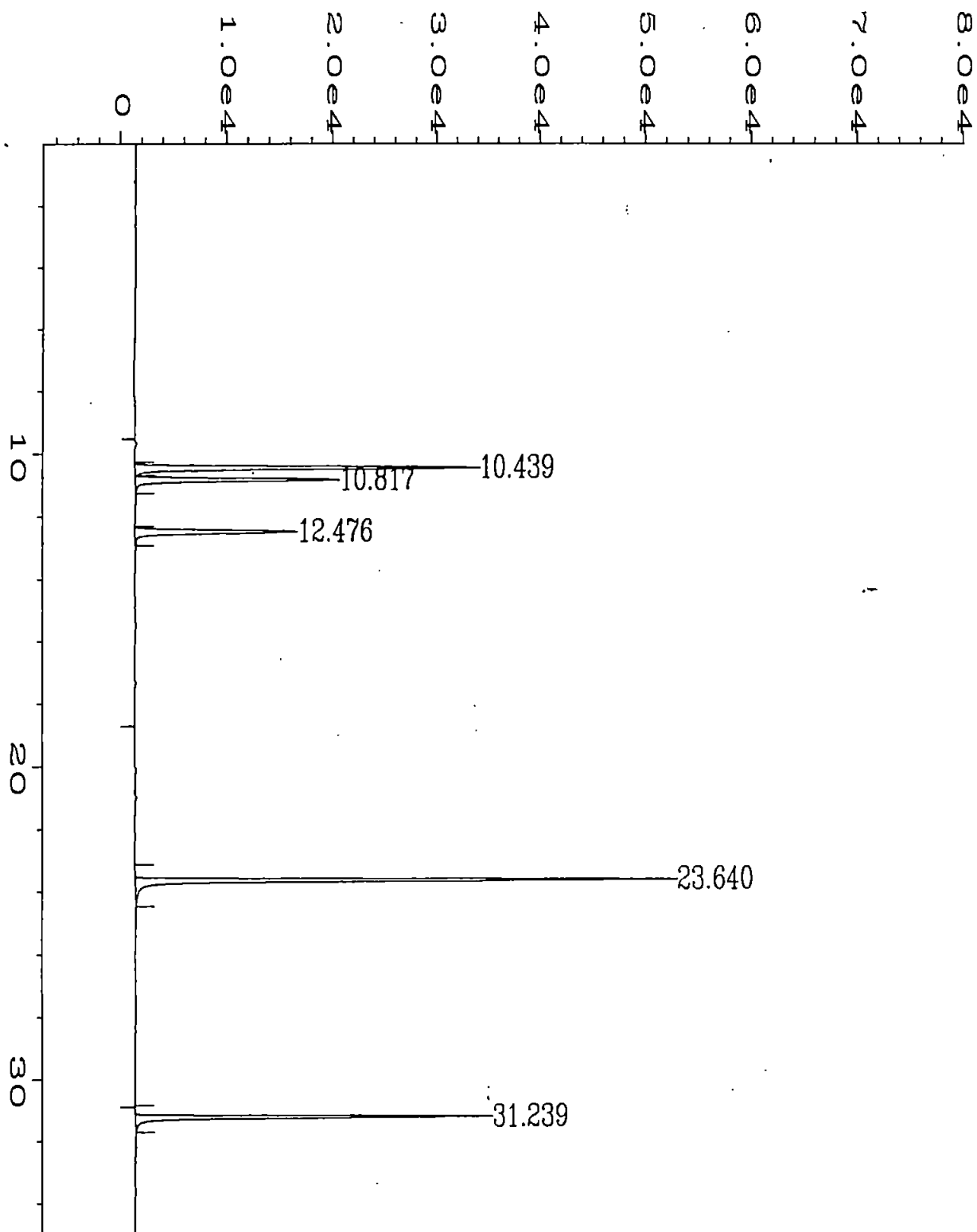
11-111-1 Duplicate	3.7	0.024	0.003	0.051	0.044	94	99
Method Blank	<0.2	<0.002	<0.002	<0.002	<0.002	96	96
11-111-1 Matrix Spike	---	72%	74%	---	---	96	98

ppm - parts per million

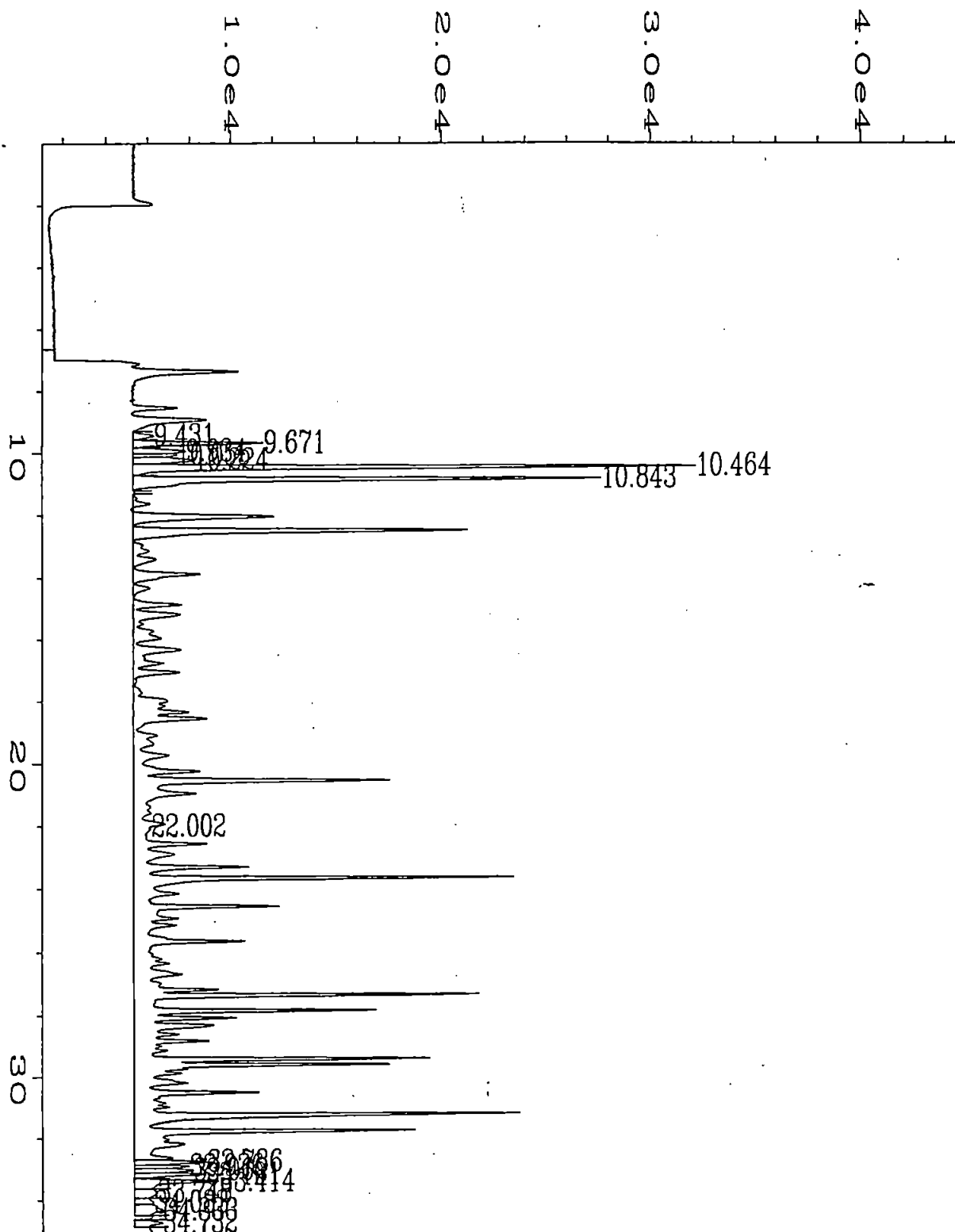




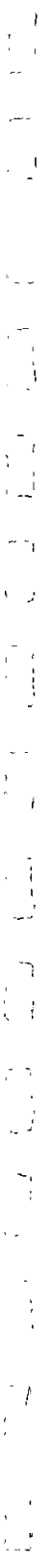
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Operator	: T. Meadows	Vial Number	: 4
Instrument	: GC3	Injection Number	: 1
Sample Name	: 12/03/95-MB	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	GAS-H2C.MTH
Acquired on	: 03 Dec 95 07:11 PM	Analysis Method	: GAS-H2C.MTH
Report Created on:	04 Dec 95 08:40 AM	Sample Amount	: 0
Last Recalib on	: 15 NOV 95 10:27 AM	ISTD Amount	:
Multiplier	: 1		



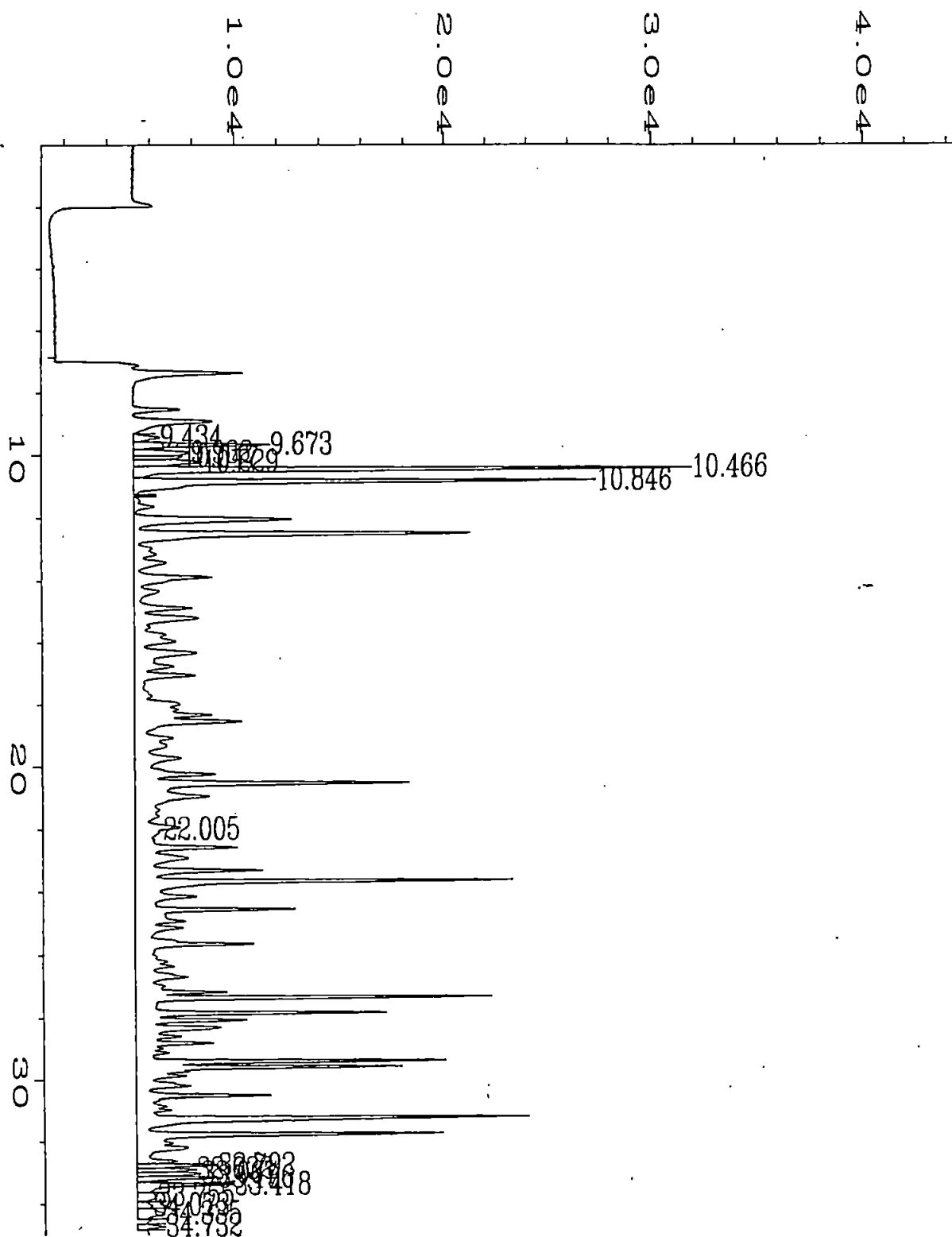
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Instrument	: GC3	Injection Number	: 1
Sample Name	: 12/03/95-MB	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	GAS-H2C.MTH
Acquired on	: 03 Dec 95 07:11 PM	Analysis Method	: BTEX-H2D.MTH
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Last Recalib on	: 20 OCT 95 10:05 AM	ISTD Amount	:
Multiplier	: 1		

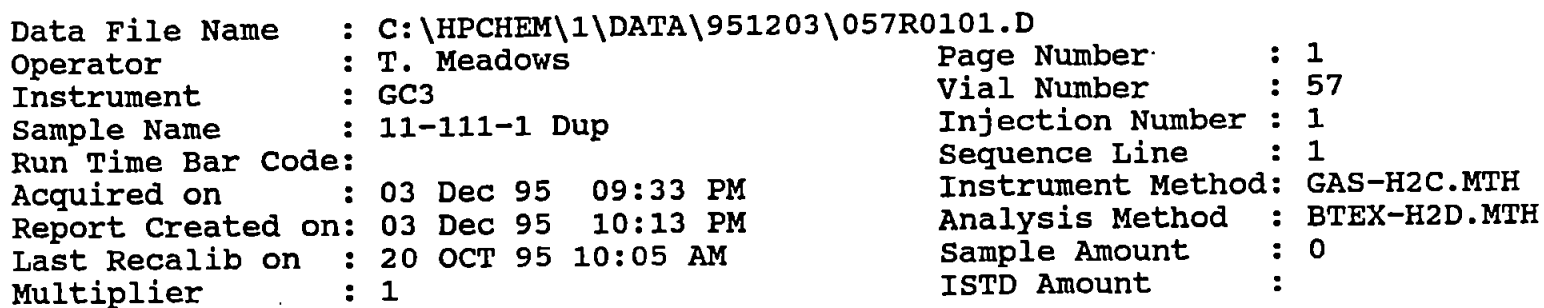


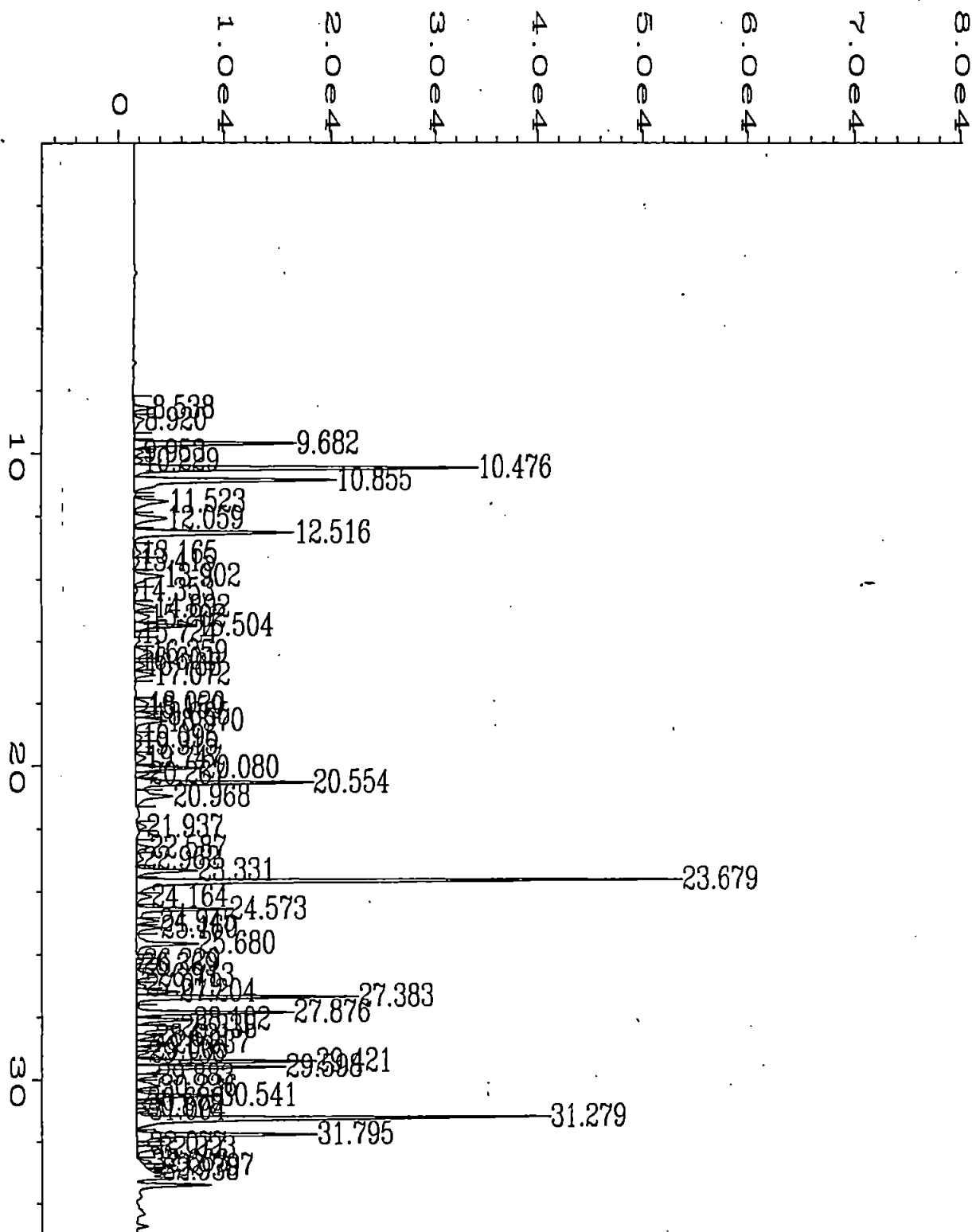
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Instrument	: GC3	Injection Number	: 1
Sample Name	: 11-111-1	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	GAS-H2C.MTH
Acquired on	: 03 Dec 95 08:45 PM	Analysis Method	: GAS-H2C.MTH
Report Created on:	03 Dec 95 09:24 PM	Sample Amount	: 0
Last Recalib on	: 15 NOV 95 10:27 AM	ISTD Amount	:
Multiplier	: 1		



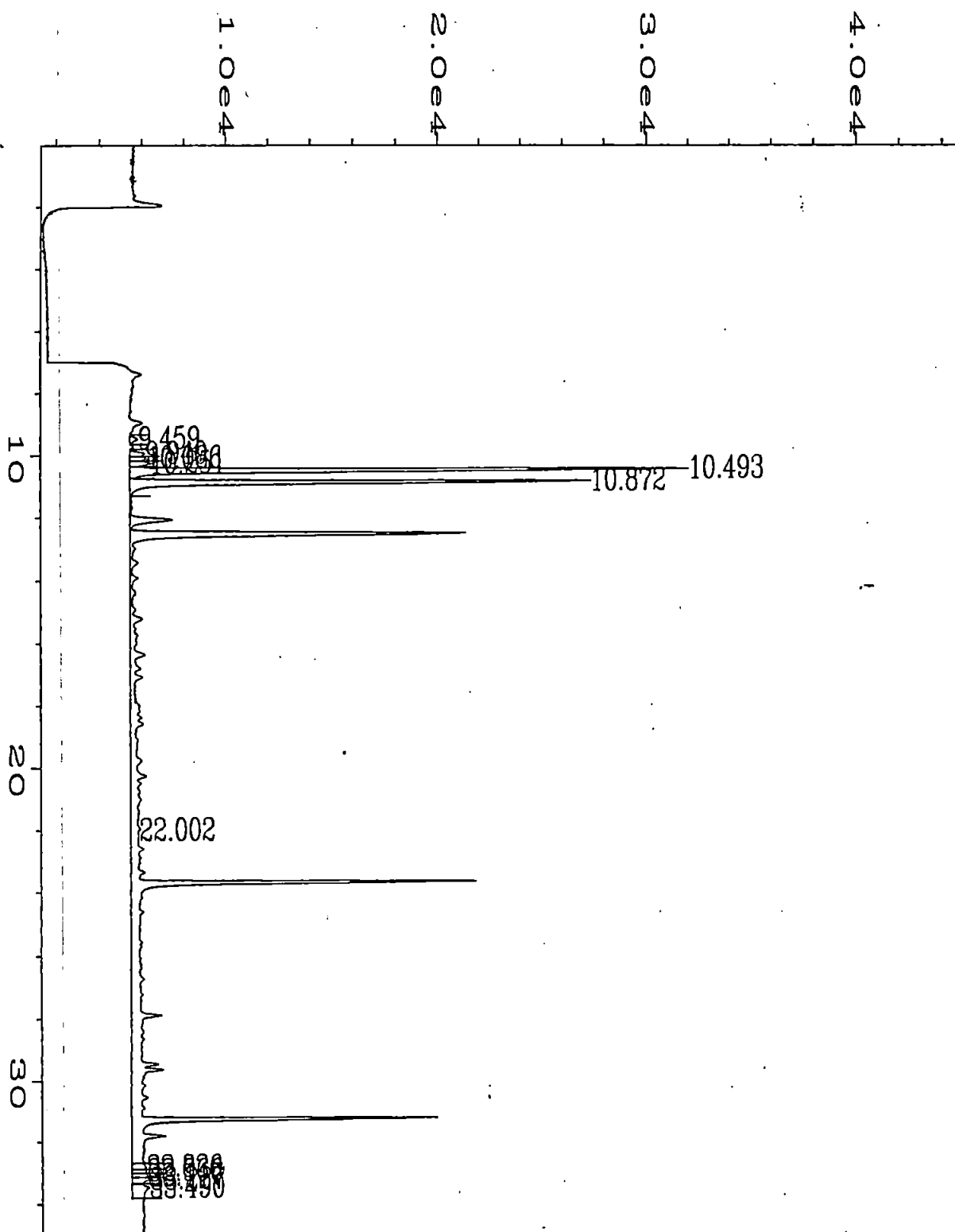
ISTD Amount :



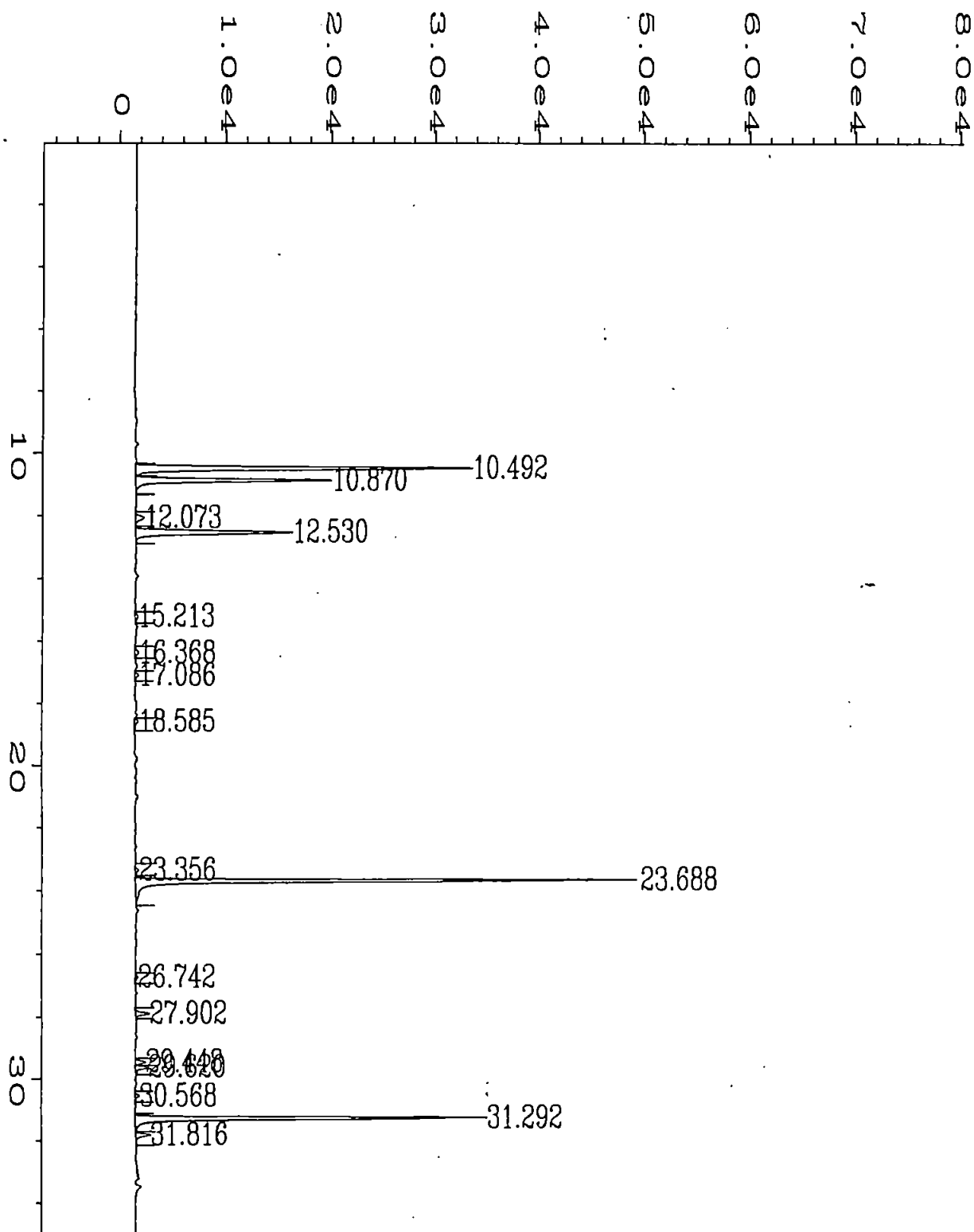




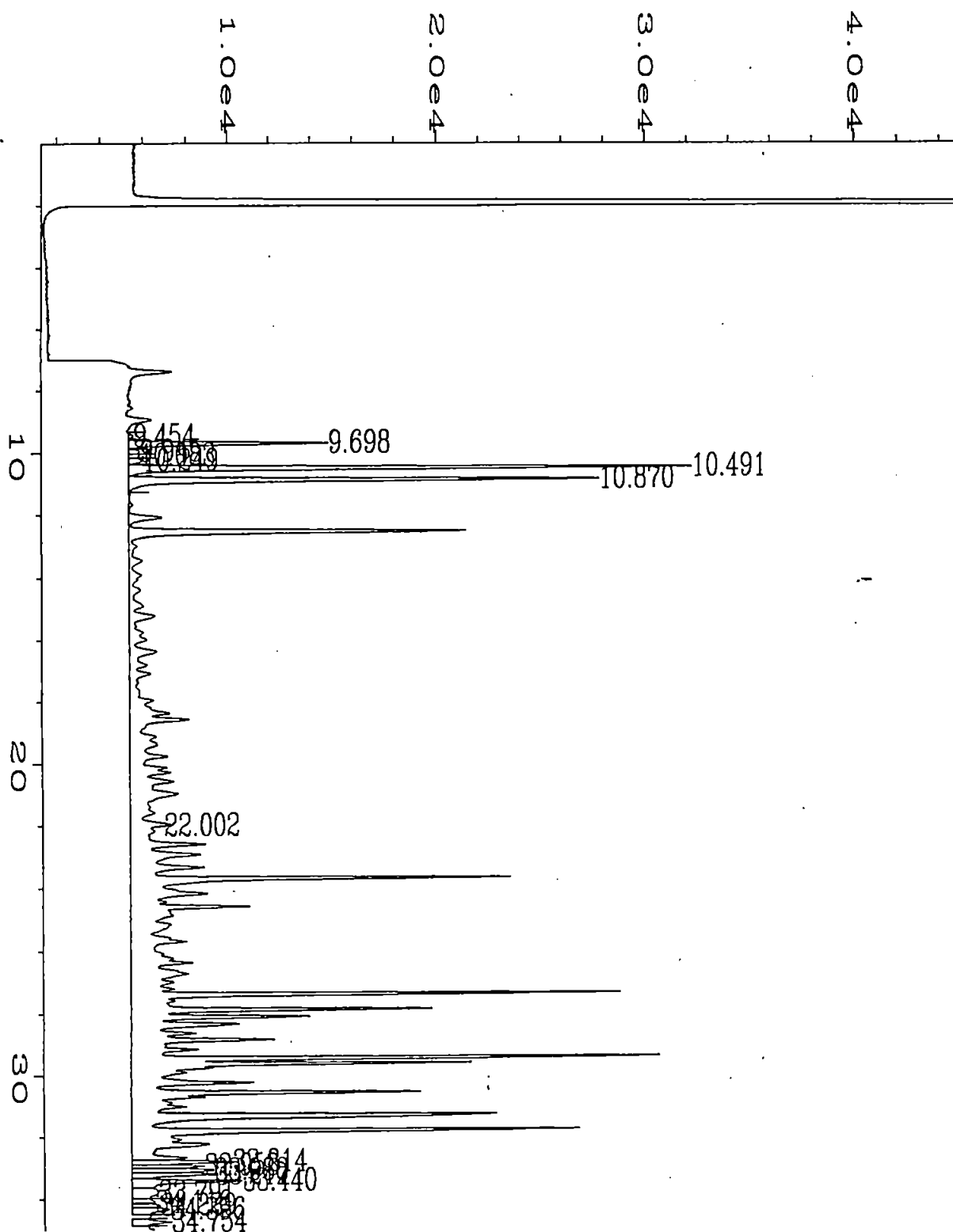
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Sample Name	: 11-111-1 MS	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	GAS-H2C.MTH
Acquired on	: 03 Dec 95 10:20 PM	Analysis Method	: BTEX-H2D.MTH
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Multiplier	: 1		



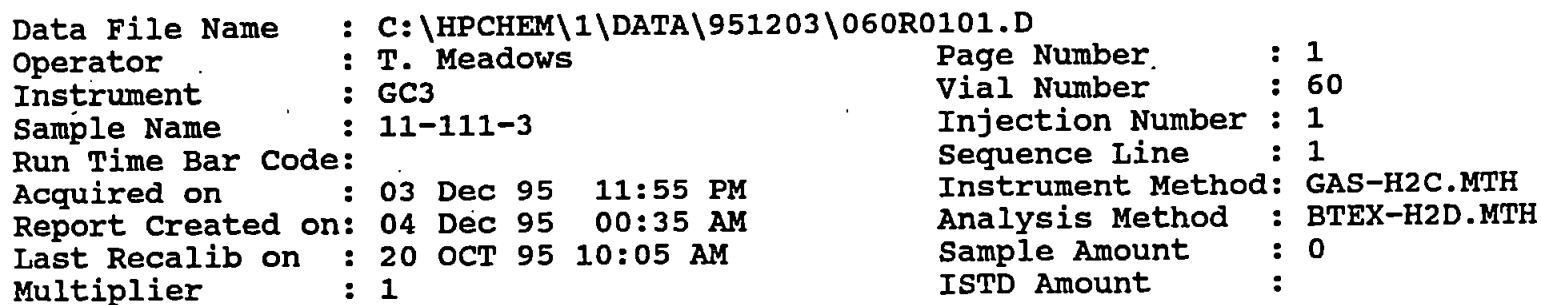
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Sample Name	: 11-111-2	Sequence Line	: 1
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Multiplier	: 1		



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Sample Name	: 11-111-2	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	GAS-H2C.MTH
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Multiplier	: 1		



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Sample Name	: 11-111-3	Sequence Line	: 1
Run Time Bar Code:		Instrument Method	: GAS-H2C.MTH
Acquired on	: 03 Dec 95 11:55 PM	Analysis Method	: GAS-H2C.MTH
Report Created on:	: 04 Dec 95 00:34 AM	Sample Amount	: 0
Last Recalib on	: 15 NOV 95 10:27 AM	ISTD Amount	:
Multiplier	: 1		



Date of Analysis: 12/1/95
Samples Submitted: 11/30/95
File ID: 11-111
Analysis: Dissolved Lead
Units: mg/L (ppm)

Client: Omega Services
Project: Key Bank-Wells
Project #: 9523-012
Matrix: Water

Lab ID	Client ID	Result
11-111-1	MW1	<0.10
11-111-2	MW2	<0.10
11-111-3	MW3	<0.10

Quality Assurance

11-111-1 Duplicate	<0.10
Method Blank	<0.10
11-111-1 Matrix Spike	107.6%

ppm - parts per million



