193001

OPERATIONS AND INTERPRETATION REPORT

GEOCHEMICAL EXPLORATION PROGRAM
BASS BASIN - Block T/22P

FEBRUARY 1989

PREPARED FOR

AMOCO AUSTRALIA PETROLEUM COMPANY

TRANSGLOBAL EXPLORATION & GEOSCIENCE, INC.

193002

TABLE OF CONTENTS

SUMMARY OF THE REPORT NOTEBOOK SECTIONS

SUMMARY OF THE REPORT NOTEBOOK SECTIONS

The following materials are contained in separate sections in this report notebook.

. Operations and interpretation report.

. Cross plots of the bottom-water data from the Bass T/22P block and Gippsland Basins.

. Histograms of the geochemical data.

. Summary statistics of the geochemical data.

. Profile plots of the geochemical data for each survey line and for several lines from the Gippsland Basin.

. Survey log sheets.

• Gippsland Data.

193004

OPERATIONS & INTERPRETATION REPORT

EXECUTIVE SUMMARY

In February 1989, Transglobal Exploration & Geoscience Inc. (TEG) conducted a proprietary geochemical bottom water exploration survey in the Bass Basin over block T/22P for Amoco Australia Production Company. The survey was conducted aboard the RV Rig Seismic. Data collection commenced on February 3 and concluded on February 15, 1989. A total of 1298 light hydrocarbon analyses were collected over approximately 500 kilometers of survey track.

Anomalous hydrocarbons in the water column were not detected in any portion of the survey area. The measured hydrocarbon levels were extremely low and consistent with levels created by natural marine processes. If migration pathways exist from the subsurface to the surface seafloor, the results of this survey would indicate a lack of subsurface petroleum at depth.

FIELD METHODS

This exploration program searched for hydrocarbon seepage into the water column. A general description of the exploration methodolgy and analytical system follow.

Bottom Water Geochemical Method

A bottom water exploration survey searches for evidence of hydrocarbon seepage from the sediments into the near-bottom seawater (Figure 1). A submersible unit containing sensors and a water pump was towed at speeds ranging from 5 to 6.5 knots. Near-bottom seawater was continuously pumped up to the ship by the submersible unit. The unit was generally kept within 10 meters of the bottom in the survey area to maximum water depths of 70 meters.

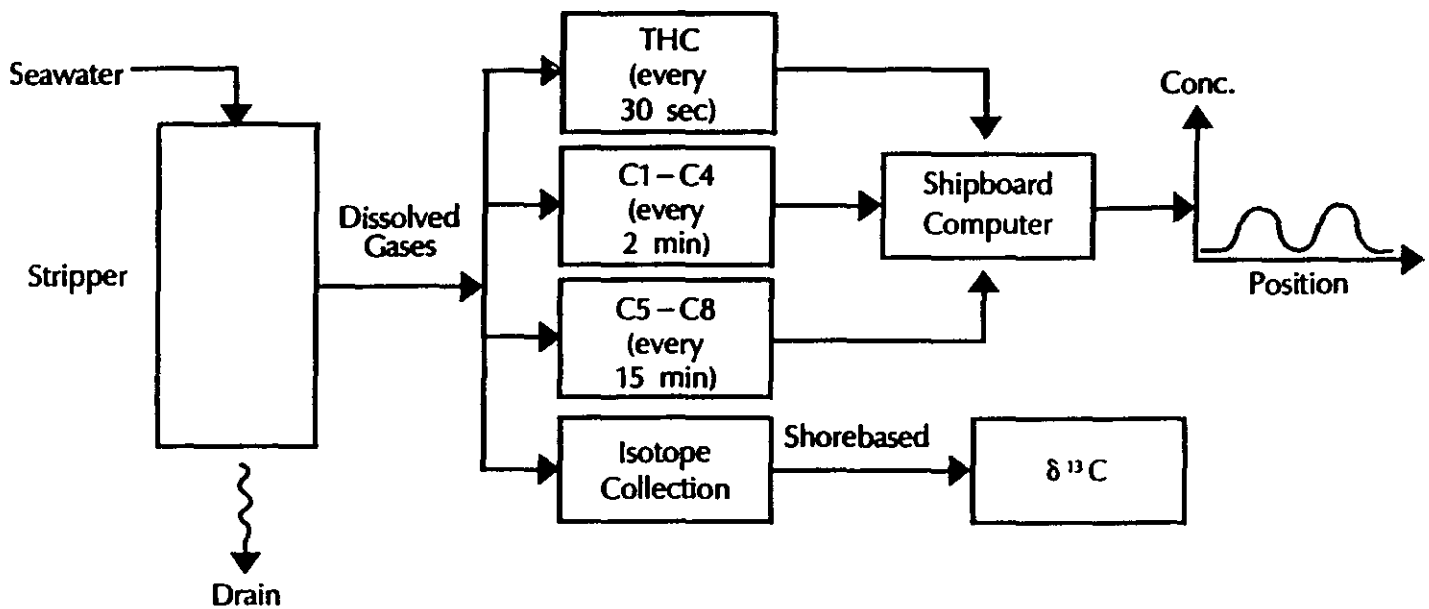
On board ship, the seawater was continuously degassed under vacuum in a closed chamber. Approximately 12 liters of water per minute were degassed, yielding approximately 200 ml of dissolved gas per minute. The stripped gases were passed through a series of analytical instruments for measurement of hydrocarbon compounds of interest (Figure 1). The following data were collected throughout the survey:

. Light hydrocarbons (C1-C4) every 2 minutes.
. Total hydrocarbons every 30 seconds.
. Salinity, temperature, and depth every 30 seconds.
. Gasoline-range hydrocarbons (C5-C8) every 10 minutes.
. Carbon dioxide every 2 minutes.

Calibration standards and system blanks with zero nitrogen were performed once each day. Calibrations were within 10% for the entire program and system blanks were less than 2 ppm for methane and 5 ppb for the C2+ compounds. Minimum detection limits were approximately 10 parts per billion in the stripped gas (equivalent to 0.02 nl/l). Characteristic chromatograms for all of the analytical analyses are shown in Figure 2.

All measured parameters were recorded by a shipboard computer and displayed immediately after the conclusion of each analysis to ensure data quality and to allow immediate recognition of anomalies.

BOTTOM-WATER GEOCHEMICAL EXPLORATION METHOD



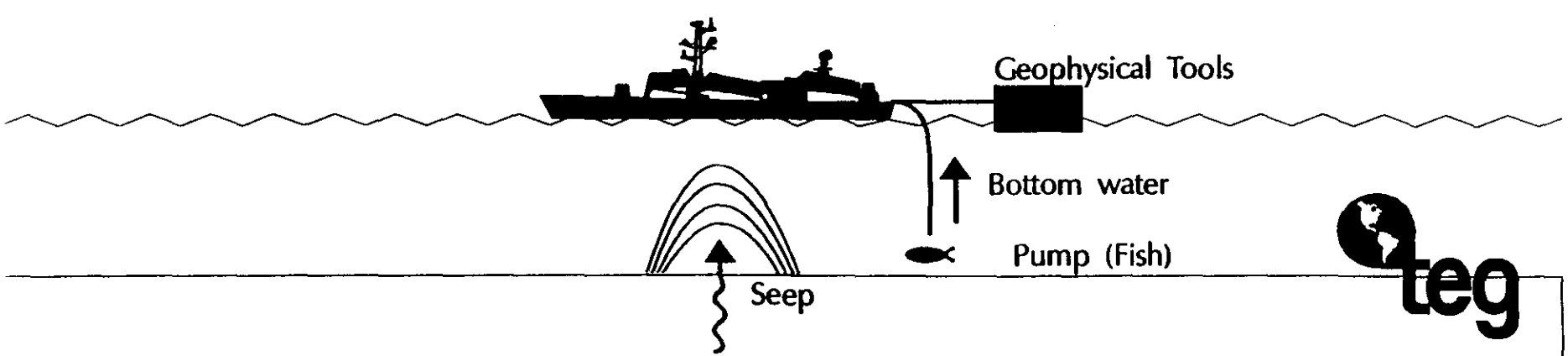


FIGURE 1

193008

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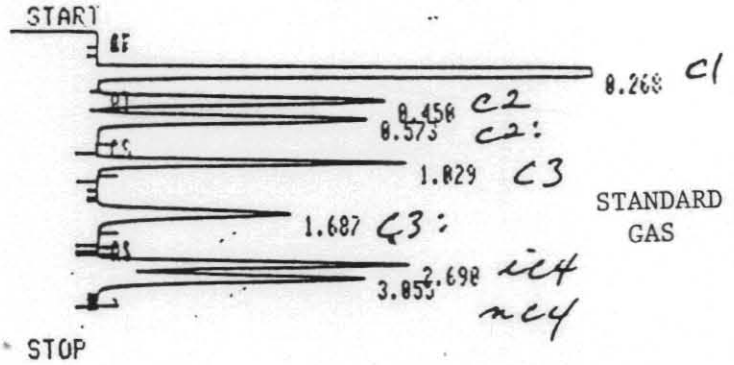

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   1.029     336346  BB     4R         .921
   1.687     319748  PB     5R         .826
   2.696     423370  PV     6R         .879
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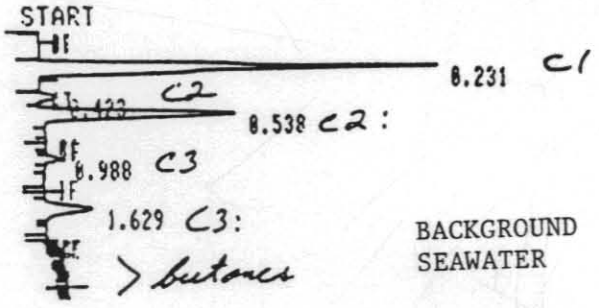

BACKGROUND SEAWATER

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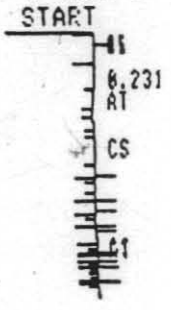

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ZERO NITROGEN

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GIPPSLAND BASIN ANOMALY

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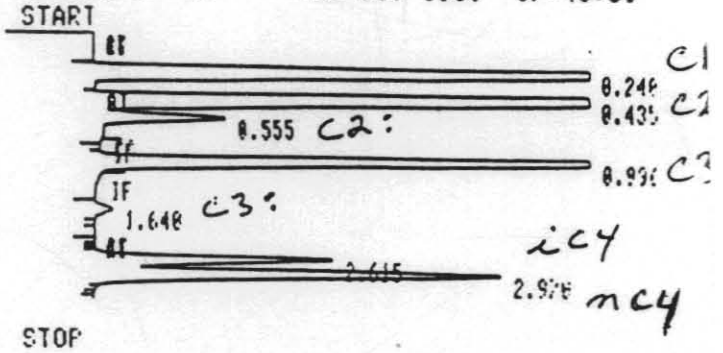


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    .996     502685  PB     4R        1.332
   1.648       7911  BV     5R         .020
   2.615      79503  VV     6R         .158
   2.978     156155  VV     7R         .320
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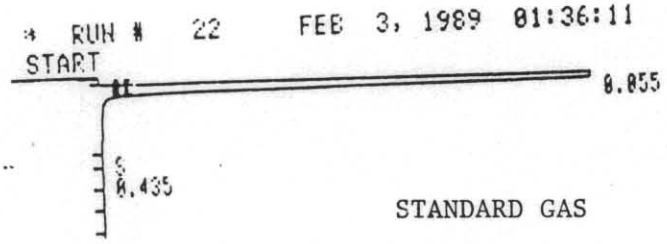
FIGURE 2A. Chromatograms from TEG's C1-C4 hydrocarbon analysis.



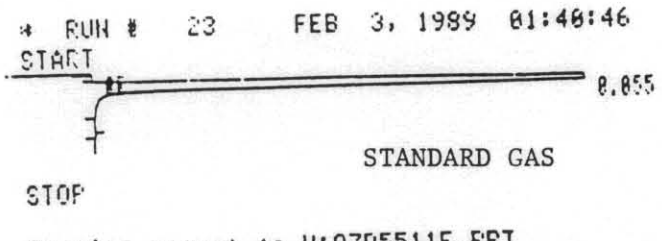


FIGURE 2B. Chromatograms from TEG's Total Hydrocarbon analysis.

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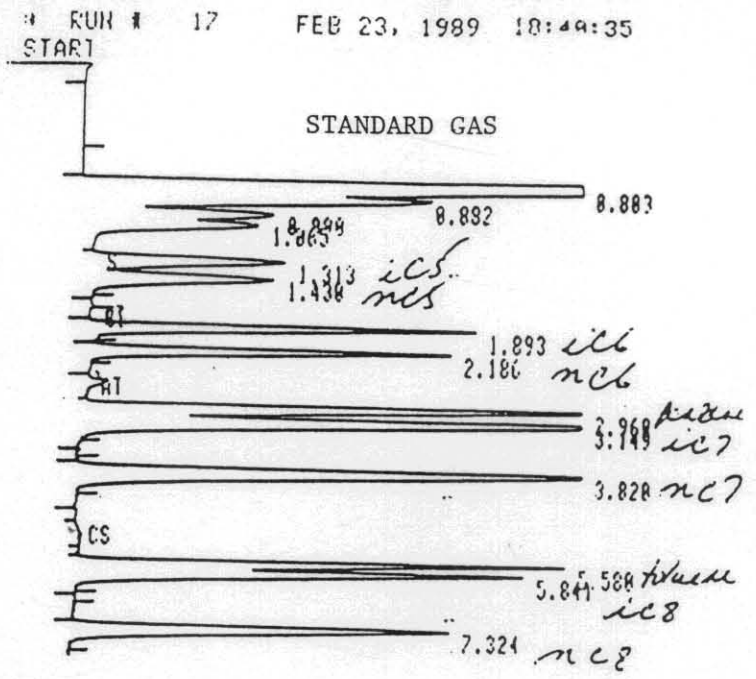

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1.893	110997	BB	3R	.720
2.186	105660	BB	4R	.787
2.960	106943	PV	9R	.884
3.149	126734	VB	5R	.786
3.820	127678	BB	6R	.896
5.580	147130	VV	10R	1.164
5.841	156876	VB	7R	.934
7.324	151292	BB	8R	1.076

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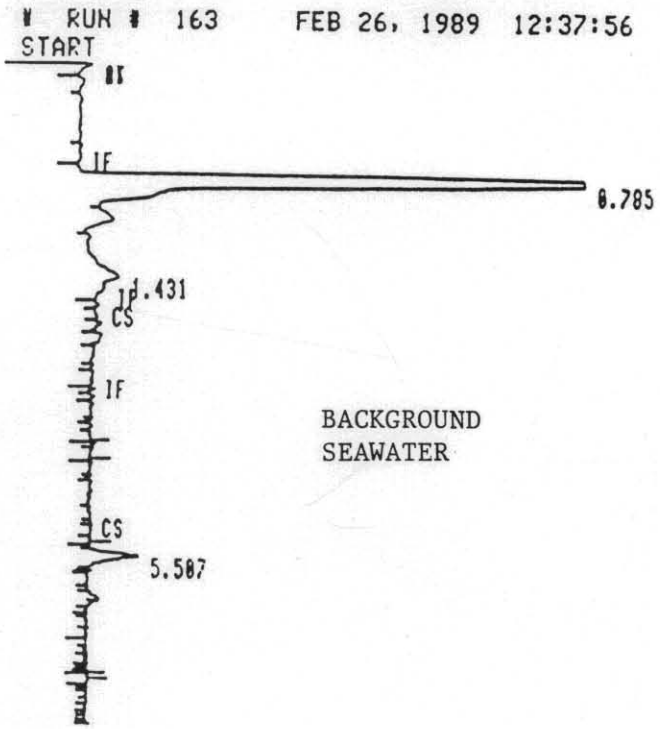

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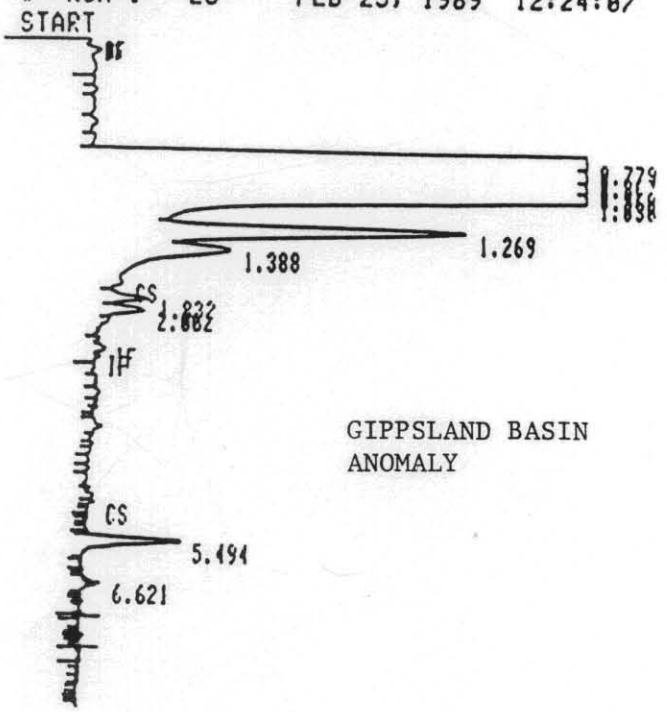

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FIGURE 2C. Chromatograms from TEG's C5-C8 hydrocarbon analysis.

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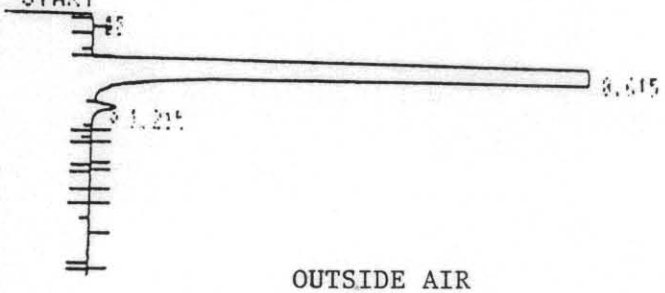

OUTSIDE AIR

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FIGURE 2D. Chromatograms from TEG's carbon dioxide analysis.

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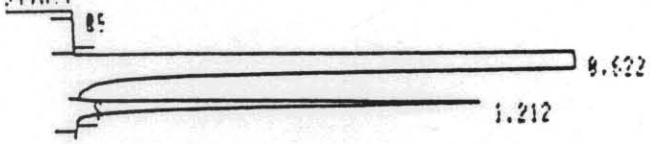

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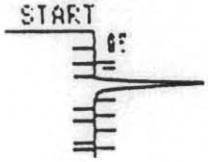

NITROGEN

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REVIEW OF FIELD OPERATIONS

Overview

In February 1989, TEG conducted a proprietary geochemical bottom water exploration survey in the Bass Basin over block T/22P for Amoco Australia Production Company. The survey was conducted aboard the RV Rig Seismic. Data collection commenced on February 3 and concluded on February 15, 1989. A total of 1298 light hydrocarbon analyses were collected over approximately 500 kilometers of survey track. A chronologic log of the bottom-water survey is enclosed in the back of this report notebook.

Navigation

Navigation was provided by a combination of Global Positioning Satellite (GPS), land-based Hi-fix, and transit satellite navigation. Accuracy of the recorded positions are +/- 20 meters when GPS or Hi-fix was operational and +/- 100 meters when transit satellite navigation was on-line.

Operational Problems

Overall, the geochemical analysis system performed trouble-free and operational downtime was minimal throughout the entire program. Low equipment downtime, combined with exceptionally calm weather conditions, resulted in an exceptionally high coverage rate per day (>200 kilometers/day). A few minor problems were incurred throughout the program which did not effect the quality of the program. These problems are described below.

Towbody Fathometer (Digital Depth)

The fathometer in the towbody was non-operational throughout the entire program. Fish height above the bottom (altitude) was monitored with an analog fathometer and the towbody's depth sensor (CTD). Reported altitude readings in the data files and printouts were hand entered by TEG personnel.

Total Hydrocarbons (THC)

Total hydrocarbon values were inaccurate for this program due to contamination from an in-line water drier. This drier was not in-line with the other analytical instruments, and thus did not influence the results from the other analytical instruments.

DESCRIPTION OF THE DELIVERABLE MATERIALS

Bottom Water Data Printout

This printout contains the hydrocarbon data for each of the C1 through C4 compounds, total hydrocarbons, carbon dioxide, salinity, temperature, towbody height, water depth, latitude, longitude, and hydrocarbon wetness. The data are listed by increasing line number. The units for each of these variables are as follows:

Hydrocarbon data: parts per million in the gas phase.
Salinity: parts per thousand.
Temperature: degrees centigrade.
Towbody height: meters.
Depth of submersible unit: meters.
Latitude & longitude: degrees, minutes, seconds.
Hydrocarbon wetness: fractional value (not percent).

Histograms and Statistical Summaries

Histograms and statistical summaries have been prepared for the light hydrocarbon compounds and carbon dioxide and are enclosed in labeled sections of the report notebook.

Survey Track Maps

This map depicts the ship's track during data collection. Line names are posted at the start of each line in blue and every tenth geochemical shotpoint is posted along each line. These maps have been plotted using latitude and longitude coordinates at a scale of 1:250,000.

Concentration Maps

These maps depict the values of the measured hydrocarbons at each sample location. Separate maps have been prepared for each of the C1 through C3 hydrocarbons (maps for the butanes have not been prepared because of the absence of significant quantities of these compounds). The values are color coded to facilitate the recognition of elevated values. Four colors are used, each representing approximately one-fourth of the measured range of each compound.

Black: values less than the statistical mean.
Blue: values lying between the mean and the mean + 1 standard deviation.
Green: values lying between the mean + 1 standard and the mean + 2 standard deviations.
Red: values higher than the mean + 2 standard deviations

Sources and Characteristics of Light Hydrocarbons

As shown in Figure 3, three primary sources of hydrocarbon seepage exist in the marine environment:

1. Biological activity in the shallow sediments and water column.

2. Deep sediments in which hydrocarbons have been produced by the thermal degradation of organic matter (source rocks).

3. Reservoired petroleum (oil and gas).

Each source produces hydrocarbons with different geochemical signatures. Some of the primary differences in the light hydrocarbon signatures are summarized on Figure 4 and are discussed below.

Biologically derived hydrocarbons are predominantly composed of methane. Traces of the higher carbon number compounds (C2+) are produced, but the unsaturated hydrocarbon compounds (ethylene and propylene) are thought to be produced in greater quantities than their saturated homologs (ethane and propane). The ratio of the C2+ compounds to methane, termed the hydrocarbon wetness, generally is less than 0.1%. The carbon isotopic signature of the methane is extremely depleted in carbon-13 relative to carbon-12, having values less than -60 per mil.

Thermal processes produce larger quantities of the C2+ hydrocarbons (higher hydrocarbon wetnesses) and none of the unsaturated compounds. The relative amounts of the C2+ compounds, branched to straight chain compounds, and carbon-13 to carbon-12 of hydrocarbons produced by thermal mechanisms vary depending upon the type of organic matter and thermal maturity.

Hydrocarbon seepage from thermally produced gas generally lacks significant quantities of compounds greater than propane (C3) and tends to have hydrocarbon wetnesses less than 1.0%. Ethane is significantly more abundant than propane with ethane to propane ratios generally exceeding 5. Dry thermogenic gas may be quite similar in hydrocarbon composition to biogenically produced gas, but generally contains larger quantities of ethane and at least a trace of propane. The isotopic signature is helpful in distinguishing between a biogenic dry gas and a thermogenic dry gas.

Hydrocarbon seepage from reservoired oil tends to have the entire suite of light hydrocarbons (C1 through C4) and, depending upon the seepage rate, may contain significant quantities of the gasoline range (C5-C8), longer straight-chained hydrocarbons (C15+ alkanes), and 2-ring and 3-ring aromatic hydrocarbons. Hydrocarbon wetnesses tend to be

PRIMARY SOURCES OF HYDROCARBON SEEPS

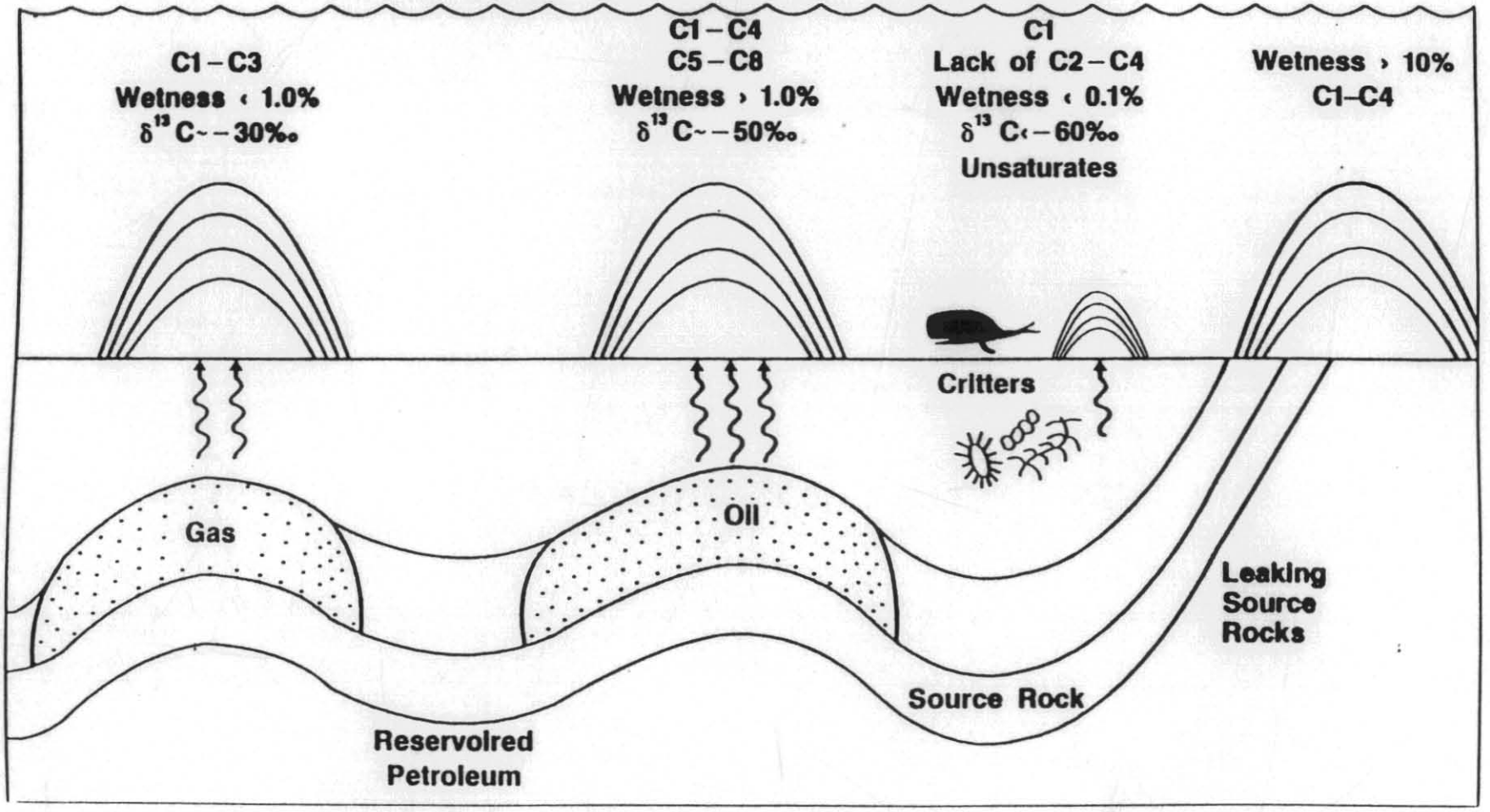


FIGURE 3

greater than 1%, the ratio of ethane to propane is less than 5, and the carbon isotopic signature of the methane is in the neighborhood of -50 per mil.

Seepage from condensates is likely to have a geochemical signature intermediate between thermal gases and oils, i.e., presence of methane, ethane, propane, and possibly butane; wetnesses in the range of 0.5% to 1.0%, and ethane to propane ratios of approximately 5.

The signature of hydrocarbons leaking from near-surface or outcropping source rocks may differ from the typical thermogenic signatures described previously because of the differing mobility of the hydrocarbon compounds. Although the entire suite of light hydrocarbons may be present, hydrocarbon wetnesses may be extremely high due to the preferential loss of methane.

A summary of the light hydrocarbon signatures for the primary sources of hydrocarbons in the marine environment is given in Table 1. Because natural variations exist in light hydrocarbons produced by the different mechanisms and secondary processes (oxidation, differential migration, etc.) may alter hydrocarbon compositions, it is important to realize that these criteria are not rigid. Nevertheless, they allow a geochemical interpretation which can be refined by integration with the subsurface geology and local oceanography.

The Mixing Model Interpretation Method

Interpretation of the source of hydrocarbon anomalies is based upon the differences in the hydrocarbon signatures from the various sources as summarized in Table 1. It is crucial to realize that these characteristic hydrocarbon signatures are applicable only to hydrocarbons from petroleum seepage.

In the natural environment, both marine and terrestrial, low quantities of natural hydrocarbons exist which are unrelated to petroleum seepage from depth (commonly referred to as the "background"). The processes creating and controlling the hydrocarbon background population are not well known, but include biological production and fractionation, photosynthetic production and destruction reactions, and chemical oxidation. Because the relative importance of these processes varies in different areas, the background population has extremely variable characteristics from one location to another, but is always characterized by low concentrations.

In areas where petroleum seepage from depth does occur, the seeping hydrocarbons mix with the natural hydrocarbons in the near-surface sediments and seawater. When hydrocarbon anomalies are measured in the shallow sediments or water column, the anomalies represent a mixture of the pure seepage with this hydrocarbon background. For this reason, it is

Table 1. Primary Light Hydrocarbon Geochemical Criteria Used to Characterize the Source of Hydrocarbon Seeps.

Hydrocarbon Source	Compounds Present	Wetness Ratio (%)	C2:/C2 Ratio	iC4/nC4 Ratio	δC13 (‰)
Oil-Related	C1,C2,C3,nC4	>1	<1	<1	-40 to -50
Wet gas/ condensate	C1,C2,C3	0.3 - 1.0	<1	1	-30 to -50
Thermal Dry Gas	C1,C2	<0.3	<1	<1	-25 to -40
Biogenic Dry Gas	C1,C2:,C3:	<0.1	>1	<1	-90 to -55

Abbreviations:

C1	Methane
C2	Ethane
C2:	Ethylene
C3	Propane
C3:	Propylene
iC4	isobutane
nC4	normal butane
δC13	Carbon isotopic ratio of methane
wetness	Ratio of the ethane and heavier compounds to methane as a %.

necessary to consider the effects that the background hydrocarbons may have on the characteristic ratios before attempting to apply the ratios for source determination of anomalies.

One approach to account for the hydrocarbon background is to define a background concentration (either statistically or graphically) and subtract the defined value from the measured data. This approach is problematic because the background population generally varies throughout the survey area and subtraction of a constant background level leads to erroneous conclusions.

A second and more powerful approach is to construct cross plots of key hydrocarbon parameters and to search for trends in the data indicative of a mixture of seeping hydrocarbons with the background hydrocarbons. The hydrocarbon background population appears on the plot as the majority of data at the lowest hydrocarbon values. When hydrocarbons are added to the background population (as from seepage, for example), a mixture of the two sources results and this appears on the plot as a trend of data extending away from the background (i.e., a mixing line). As the quantity of the hydrocarbons added to the background increases, higher and higher hydrocarbon values result, and the mixing line trends toward the composition of the pure hydrocarbon source. The model described here is identical to the mixing model used by geologists when working with mineral and rock formation from melts and to the model used by oceanographers when determining the relative inputs of fresh and salt water in estuaries.

A cross plot of two compounds (e.g., ethane vs. methane) indicates whether the compounds are being added to the natural hydrocarbons in an area. Positive trends on plots of one compound versus another indicate that both compounds are being added concurrently and thus, the source of the anomaly contains both compounds. The slope of the correlation line represents the ratio of the compound plotted on the y-axis versus the compound on the x-axis. A steep slope indicates a high ratio of the compound plotted on the y-axis versus the compound on the x-axis. In contrast, a gentle or horizontal slope indicates a low ratio of the two components.

Because a mixing trend is created by one hydrocarbon source supplying hydrocarbons to the background, all data on the same trend reflect the same source regardless of the absolute concentrations or absolute ratios. For example, an anomaly with ethane at 0.1 ppm would reflect the same hydrocarbon source as a second anomaly with ethane values at 1.0 ppm if the data from the two anomalies lie on the same mixing trend. Likewise, an anomaly with a wetness of 2% (oil-like) may actually represent a dry gas source if it falls on a mixing trend that has low wetnesses at higher concentrations.

This interpretive approach is illustrated in Figure 5 entitled "Cross-Plot Interpretation Method". This figure shows the expected trends in surface geochemical data if either ethane (C2) or hydrocarbon wetness (ratio of C2+ compounds to methane) is plotted against methane. The background hydrocarbons lie to the left-hand side of the plot (low methane values), and the pure hydrocarbon sources lie to the right side of the plot (high methane values). Based upon the criteria defined in Table 1, data representing hydrocarbons from biogenic and oil-associated sources would follow different mixing lines. Oil-sourced hydrocarbons would show positive trends because of the presence of high quantities of ethane and the higher hydrocarbons. In contrast, biogenic hydrocarbons would show negative trends because hydrocarbons from this source have little to no ethane or heavier compounds. Wet-gases and condensates would lie between these two trends. The exact direction and slope of the mixing lines vary depending upon the characteristics of the background hydrocarbons and the hydrocarbon source.

TEG's interpretation approach is to construct cross plots for all compounds and diagnostic ratios and determine the characteristics of the hydrocarbon sources by extrapolating observed trends to the pure end-member. The determined characteristics are then compared to the criteria in Table 1.

CROSS-PLOT INTERPRETATION METHOD

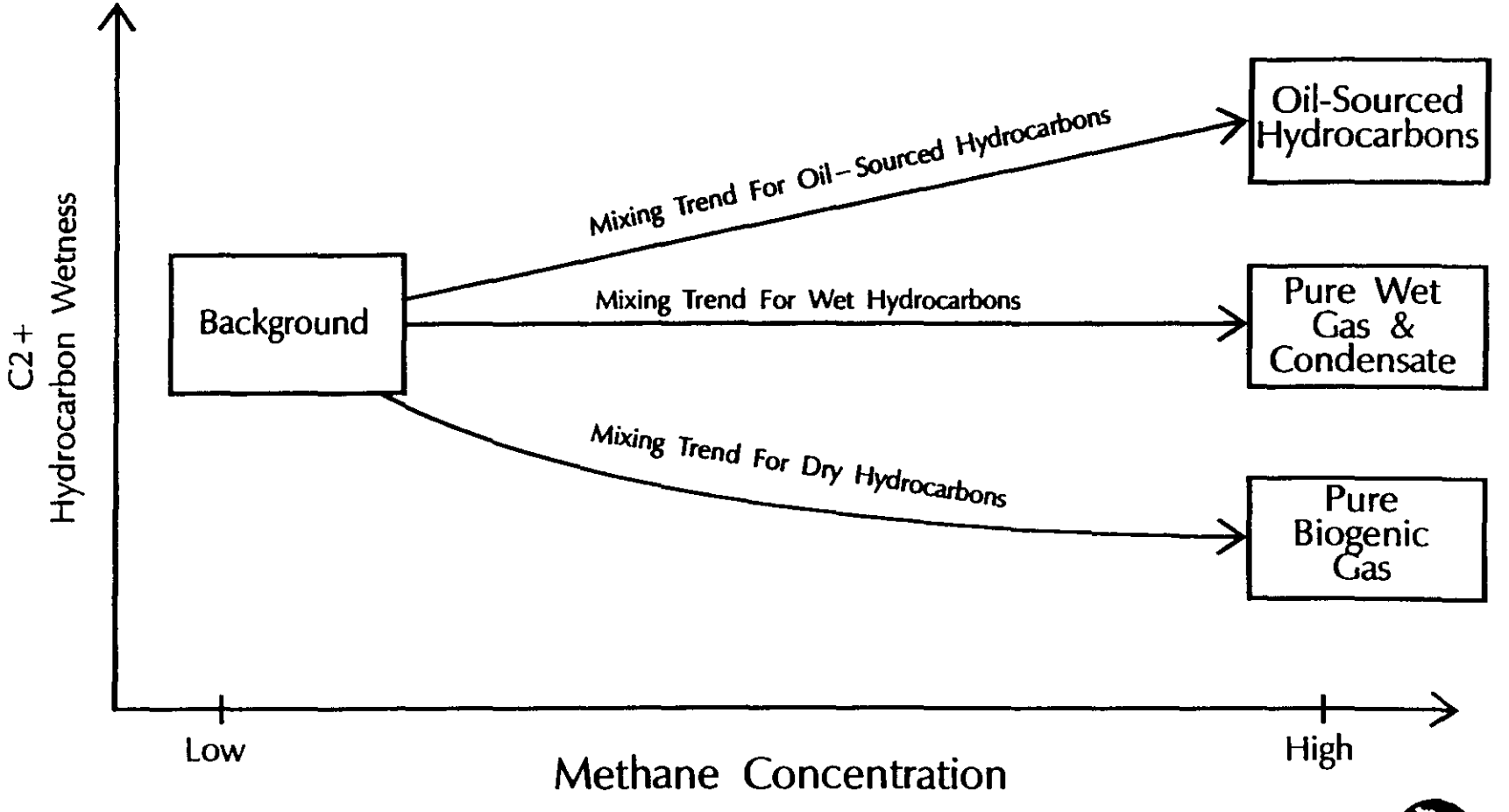


FIGURE 4

Description of the Bass T/22P Data

Cross plots of the light hydrocarbons and carbon dioxide for all the data from the Bass T/22P block, approximately 1300 data points, are enclosed in the report section labeled "cross-plots". Observed concentrations of all the hydrocarbons are extremely low and no significant mixing trends exist on any of the plots. The observed variations, scattered appearance of the plots, and lack of trends are characteristics of natural background variations.

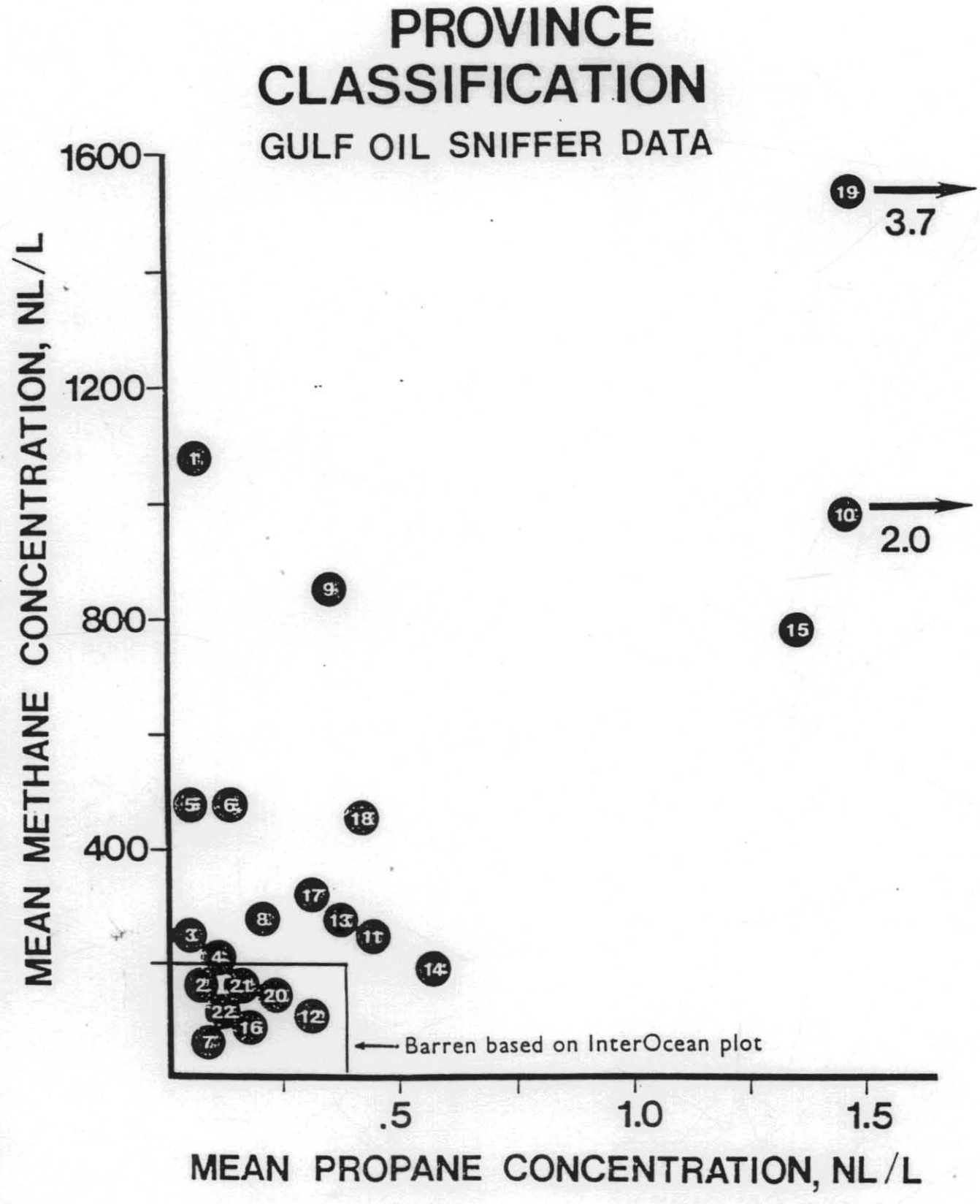
Inspection of the hydrocarbon data for low-level anomalies is possible from the hydrocarbon profile plots for each individual line. No significant anomalies for any of the saturate light hydrocarbons are apparent on any of the survey lines. Variations in ethylene, propylene, and carbon dioxide are apparent and are likely to represent biological activity. In general, these three compounds showed a strong dependance with water depth as typified by survey lines 12 and 13.

The extremely low magnitude of the hydrocarbon values in this area is best illustrated by comparison with data collected in the Gippsland Basin. Cross-plots of data from the Gippsland Basin are included in the section labeled "cross-plots" and plots of hydrocarbons versus shotpoint are included in the section of profile plots. Large values of the light hydrocarbons exhibiting strong mixing trends are apparent on the plots for this area. The high values and strong trends are characteristic of oil-sourced hydrocarbons. To further compare the two areas, a cross-plot of ethane versus methane for the Bass Basin data has been prepared to the same scale as the Gippsland Basin data. It is apparent that this portion of the Bass Basin has extremely low hydrocarbon levels, signifying a lack of hydrocarbon inputs into the water column by bottom seepage or anthropogenic sources.

Summary of the Geochemical Data & Implications on the Petroleum Potential of the Bass Basin T/22P Block

The average hydrocarbon value for the Bass T/22P block is compared to areas surveyed around the world by Gulf Oil Company in Figure 5 (a table of the locations is on the back of the figure). The values measured in this survey cluster with non-productive areas. If migration pathways exist from the subsurface to the surface seafloor, the results of this survey would indicate a lack of appreciable quantities of subsurface petroleum at depth.

193022



Mousseau, R.J. (1981), Role of the Hollis Hedberg in marine hydrocarbon geochemical prospecting on continental margins. Presented at: Hedberg Research Conference on Continental Margin Processes, January 1981.

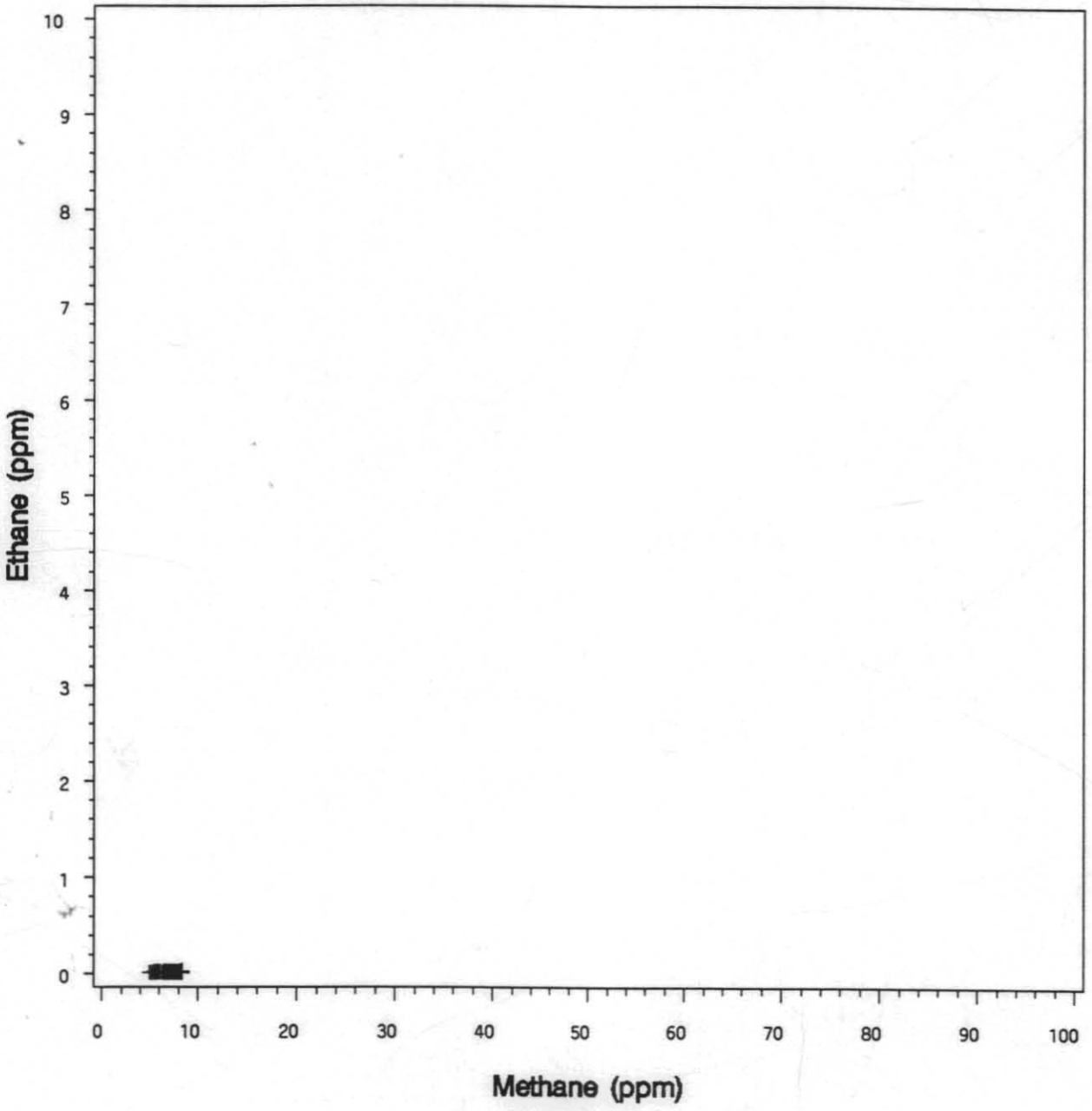
FIGURE 5

193023

CROSS PLOTS OF THE BOTTOM-WATER DATA FROM THE BASS T/22P BLOCK & GIPPSLAND BASINS

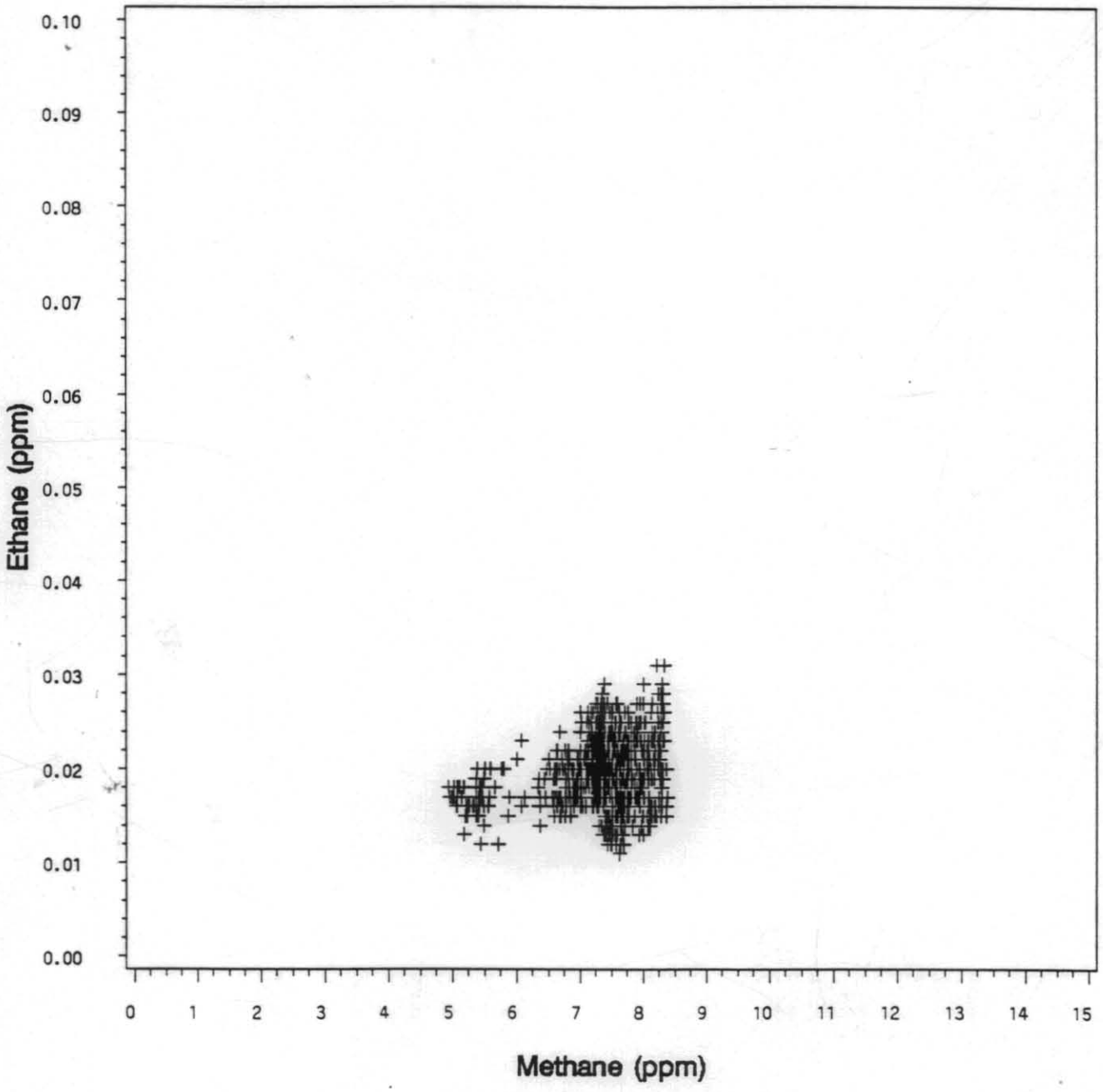
193024

Bass Basin – Block T/22P

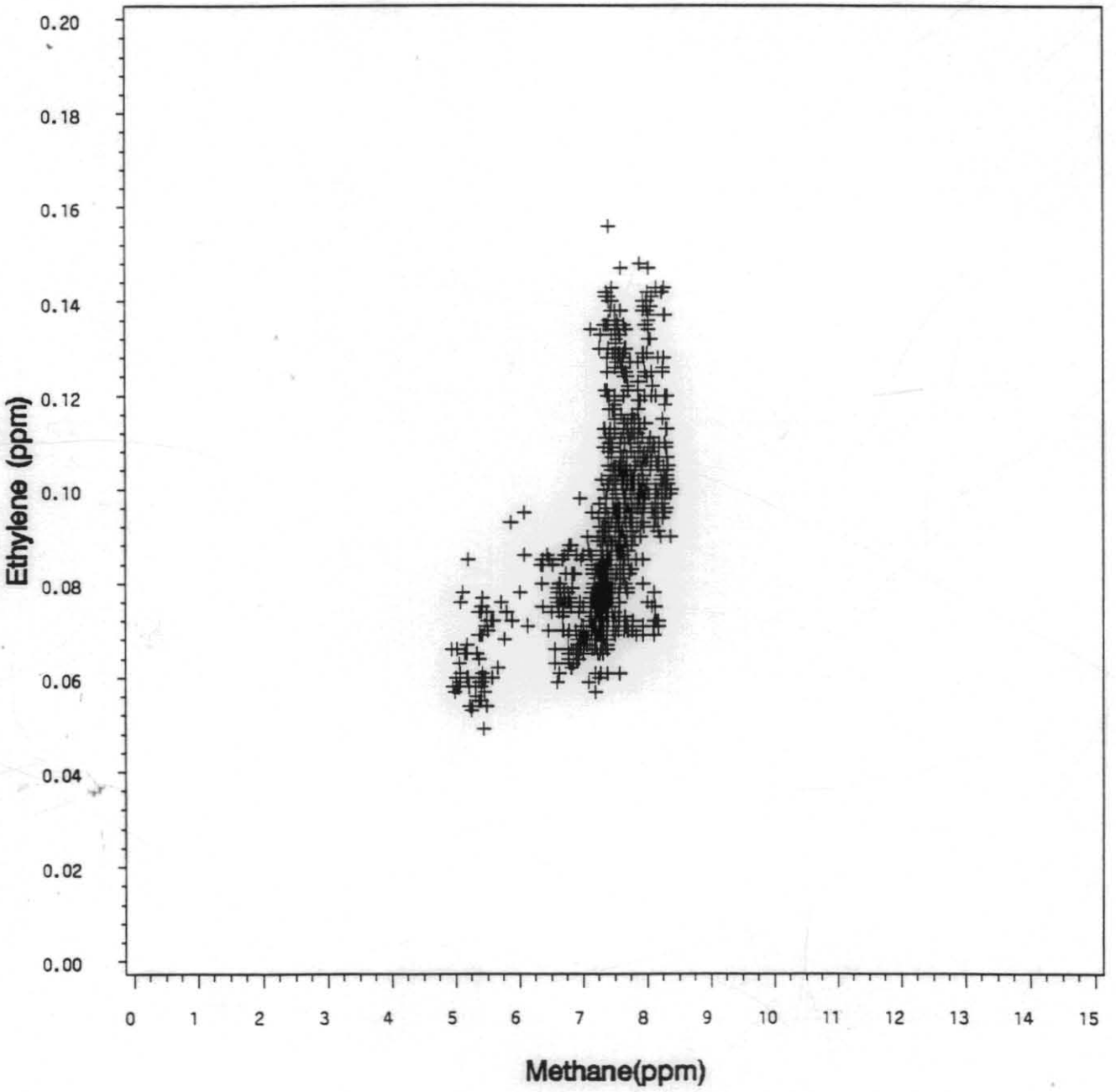


193025

Bass Basin – Block T/22P

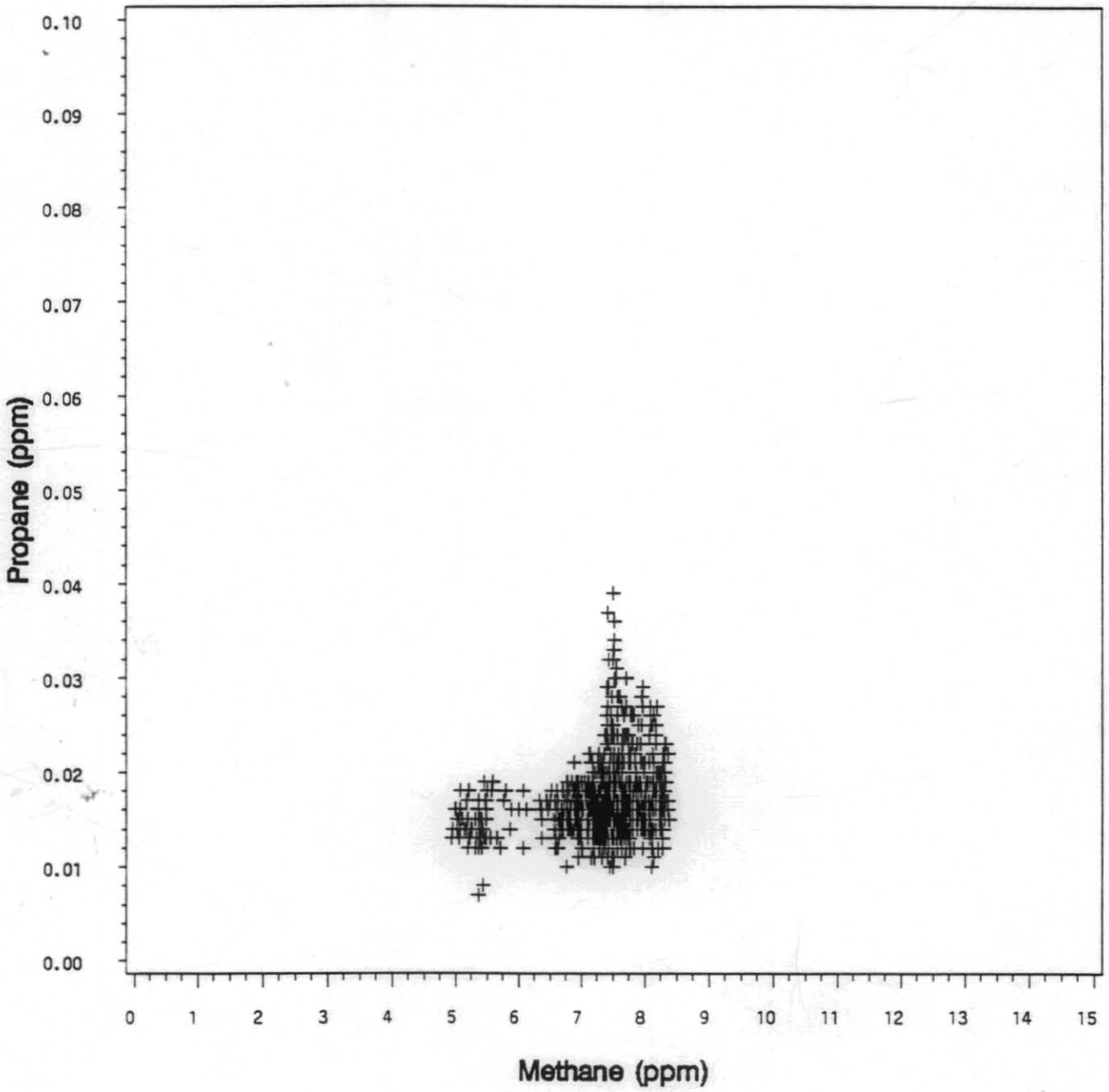


Bass Basin – Block T/22P



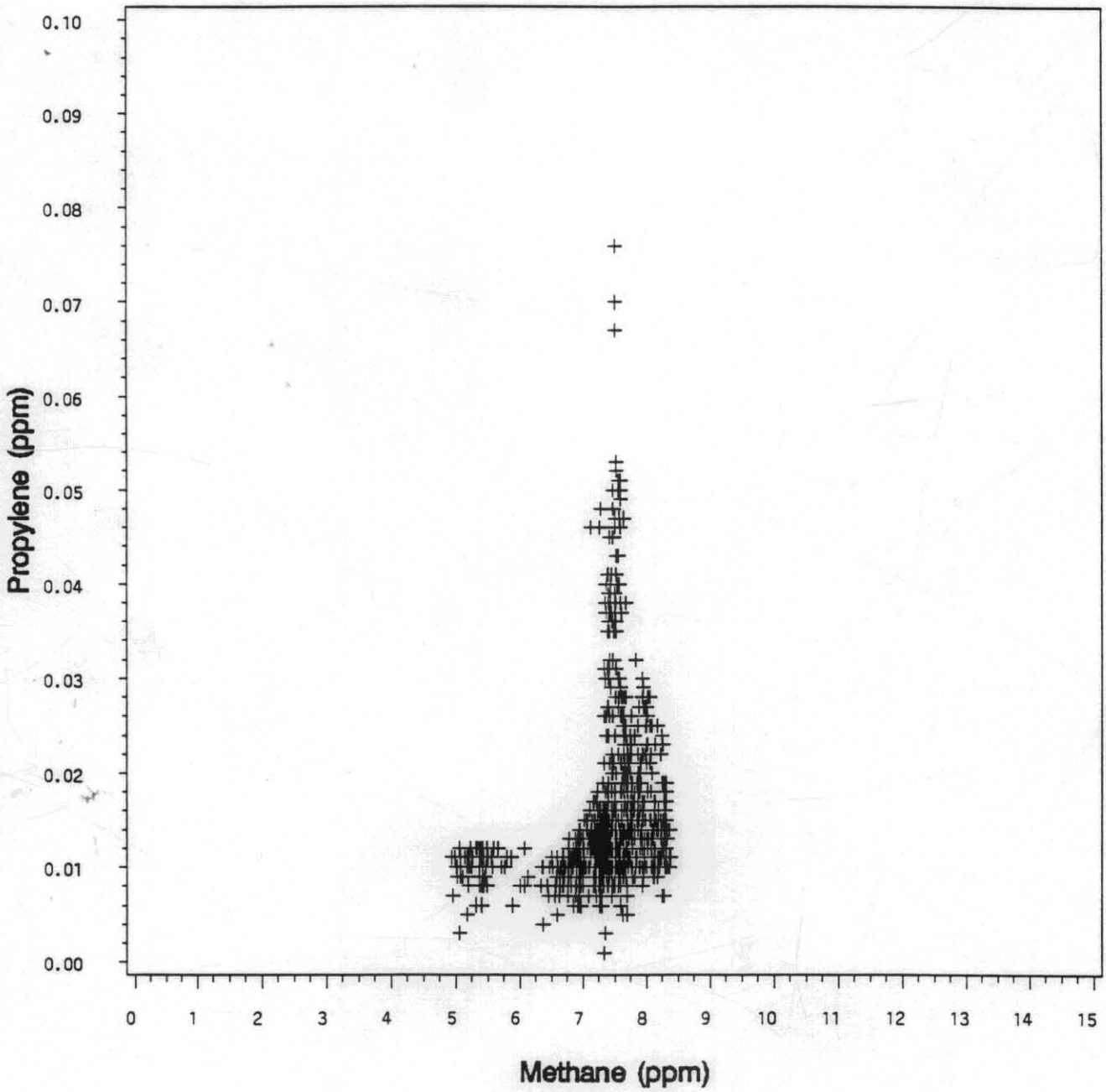
193027

Bass Basin – Block T/22P



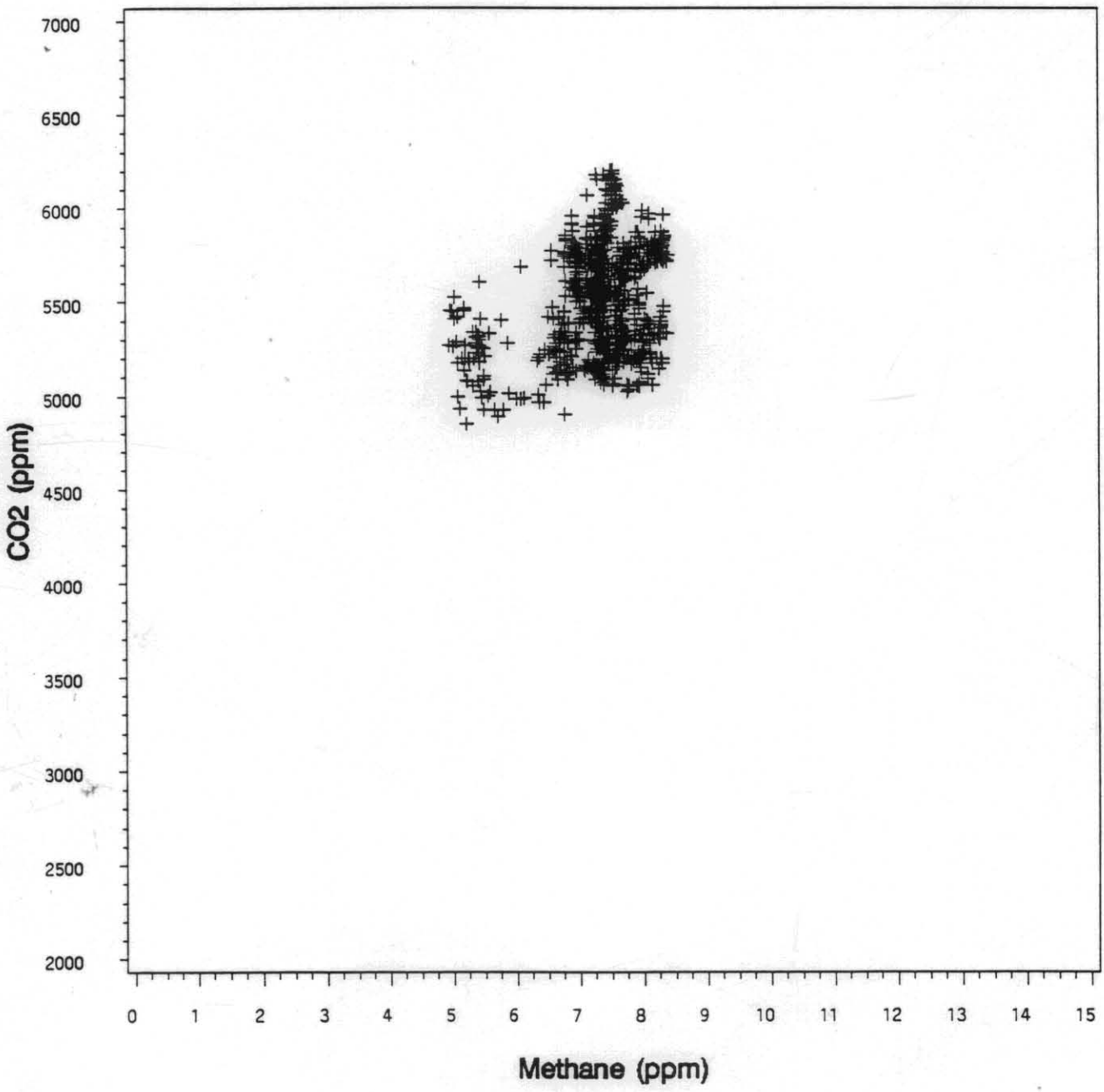
193028

Bass Basin – Block T/22P



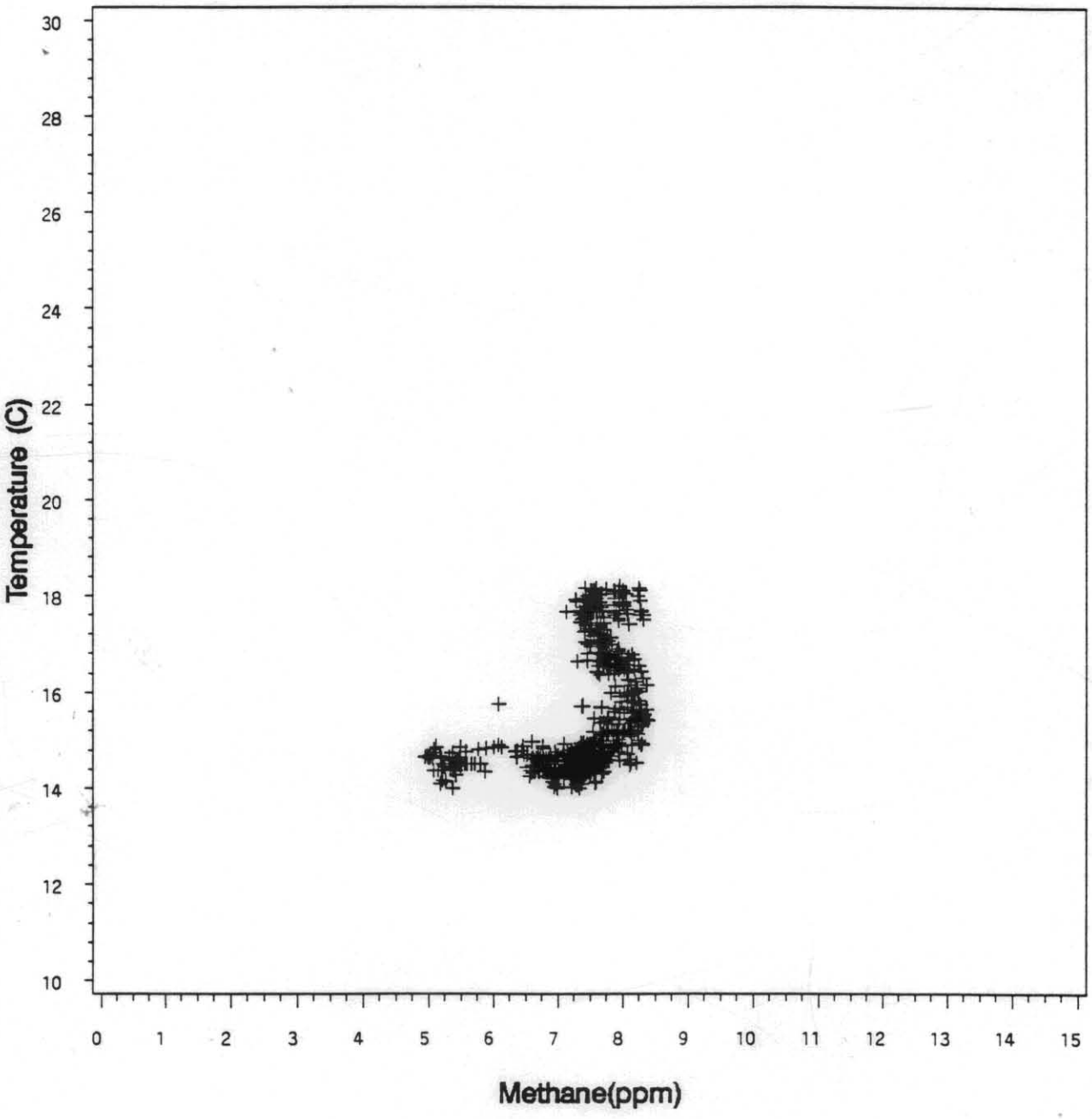
193029

Bass Basin – Block T/22P

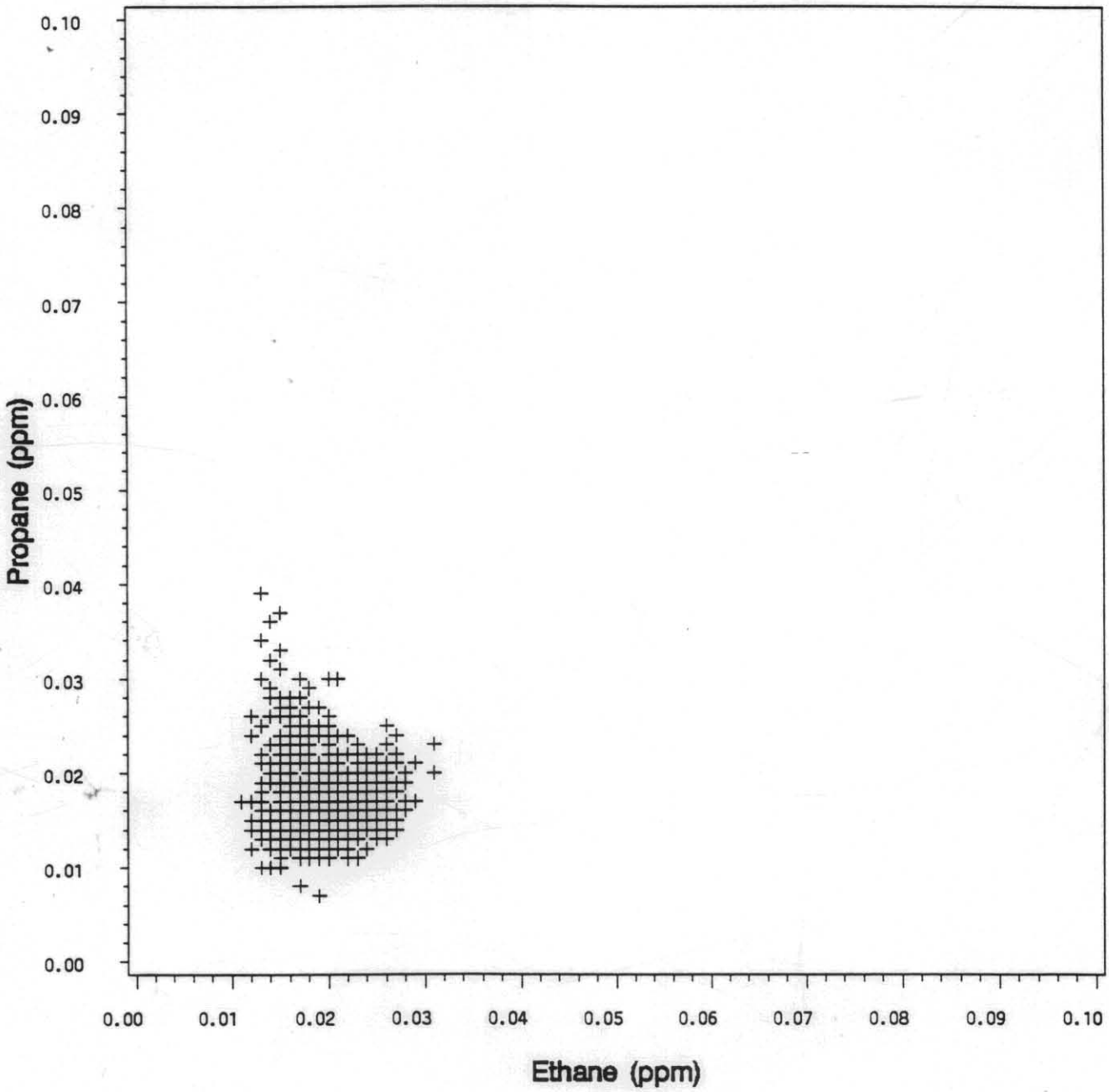


193030

Bass Basin – Block T/22P



Bass Basin – Block T/22P

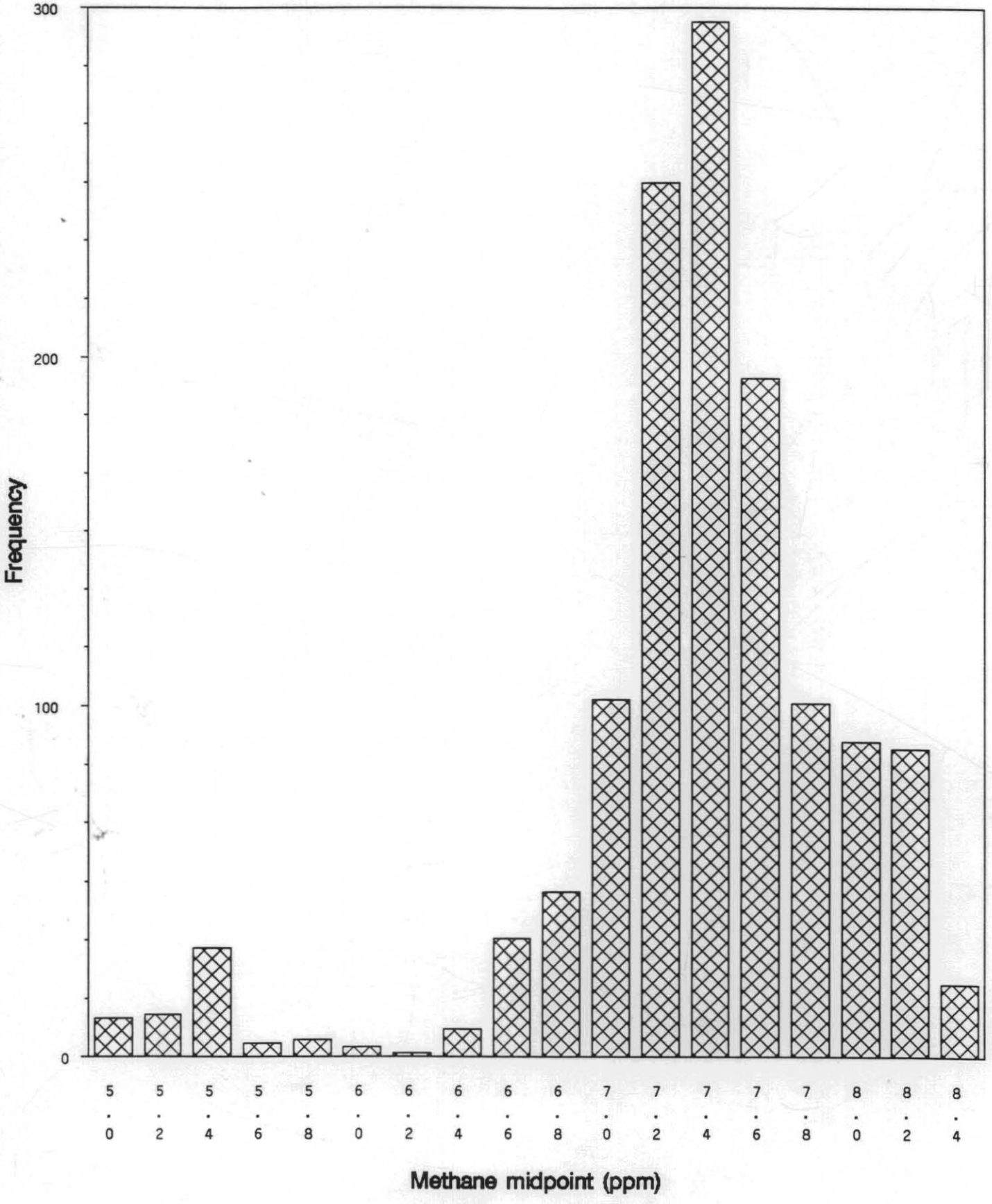


193032

HISTOGRAMS OF THE GEOCHEMICAL DATA

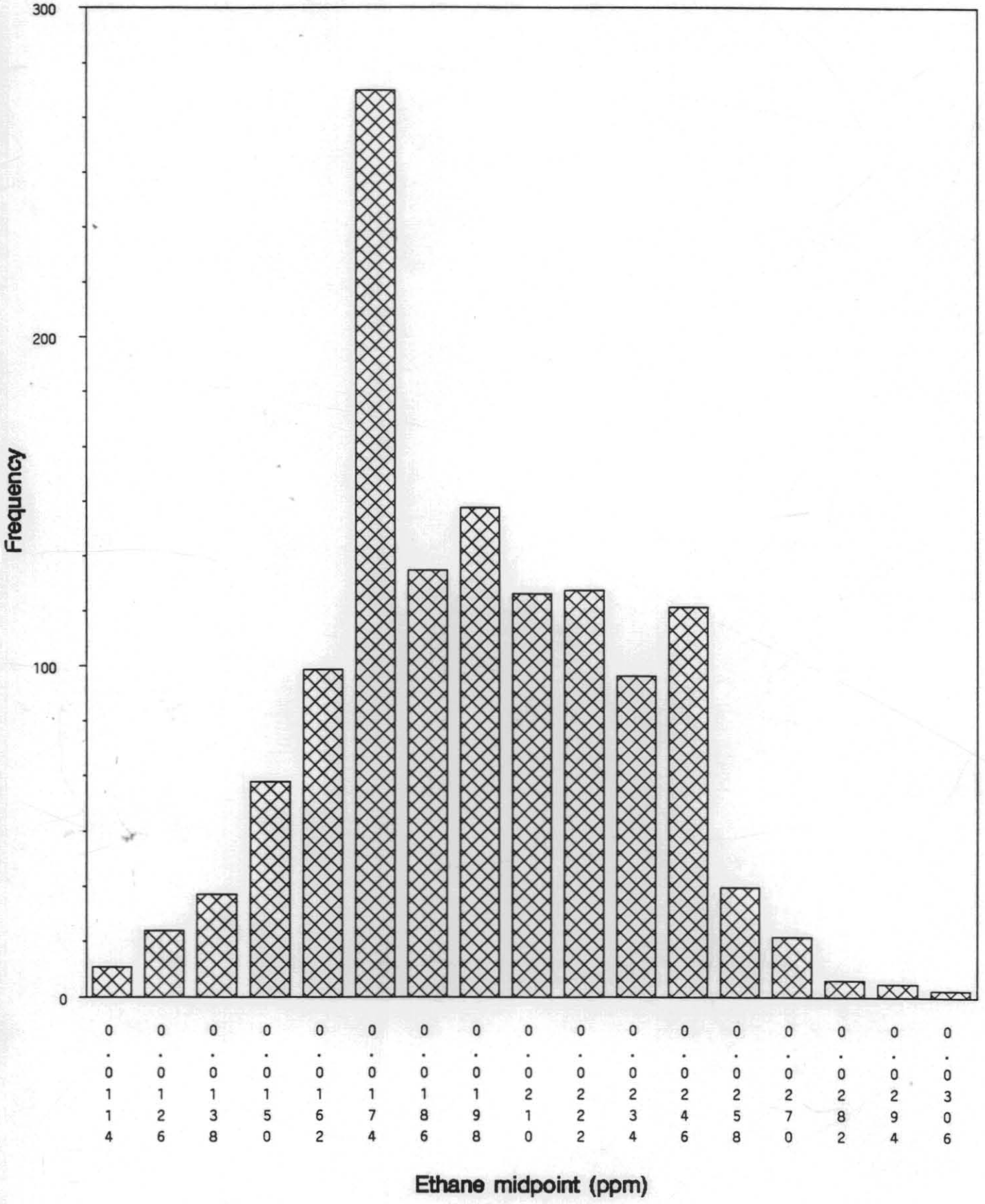
193033

Bass Basin – Block T/22P



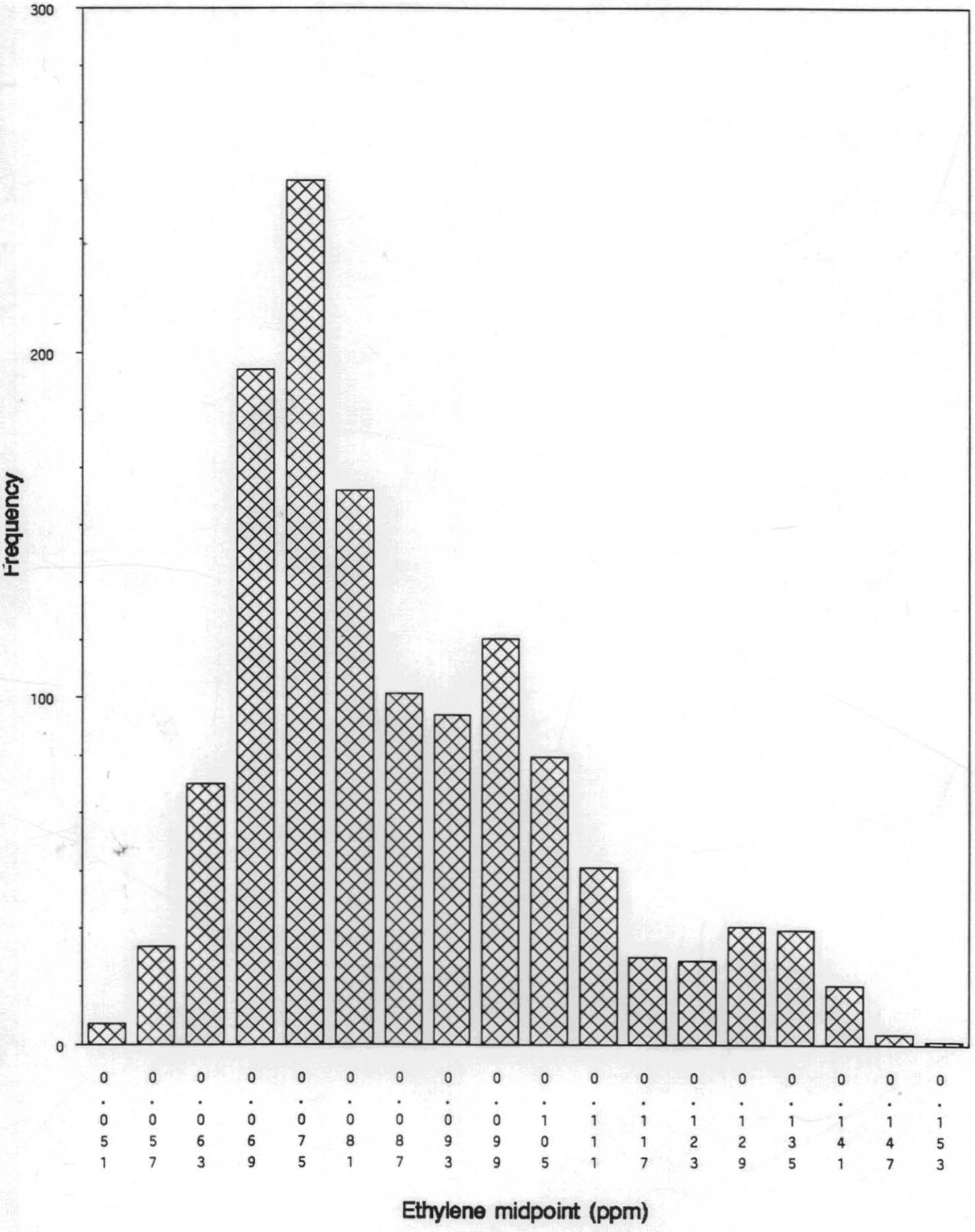
Bass Basin – Block T/22P

193034



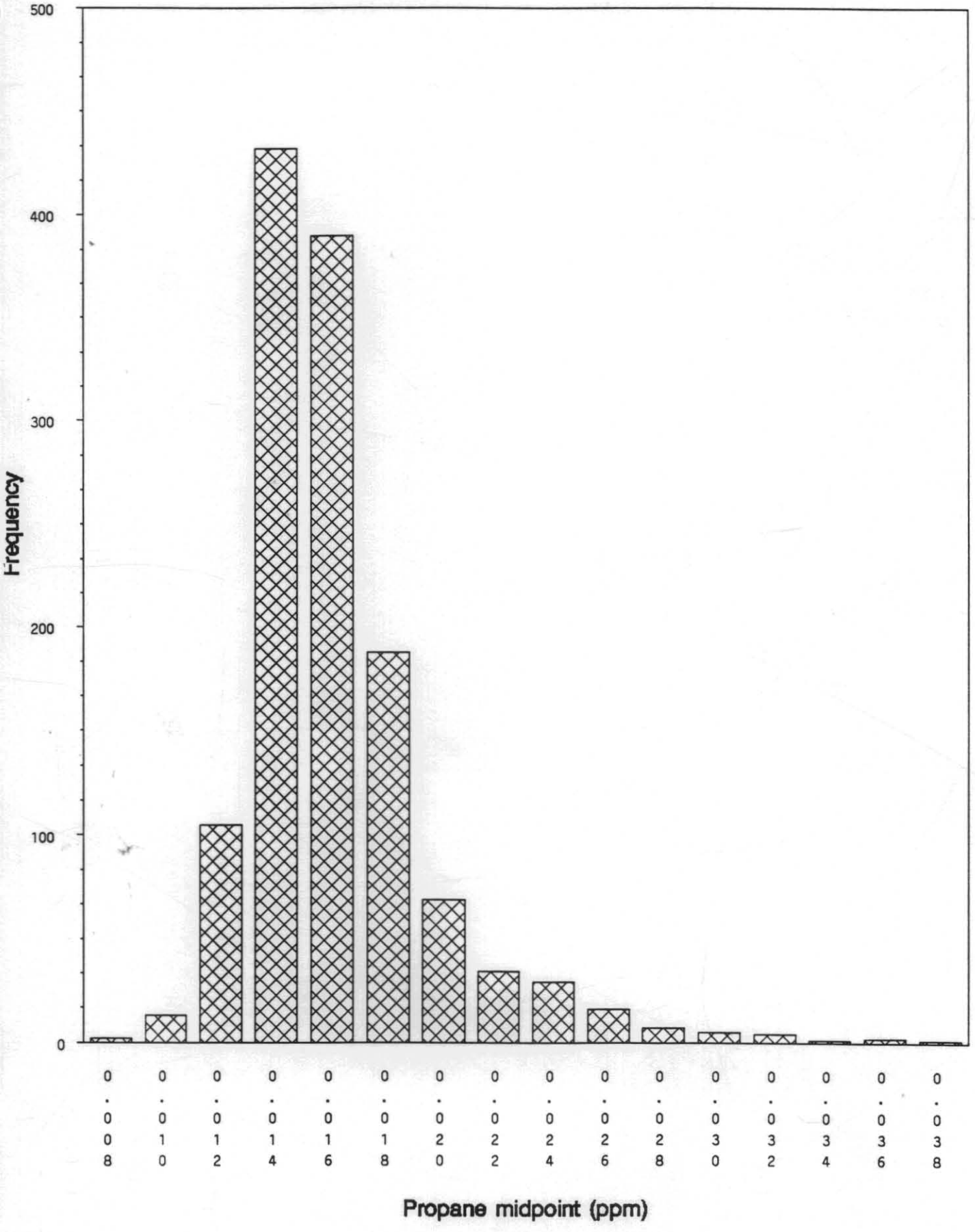
Bass Basin – Block T/22P

193035



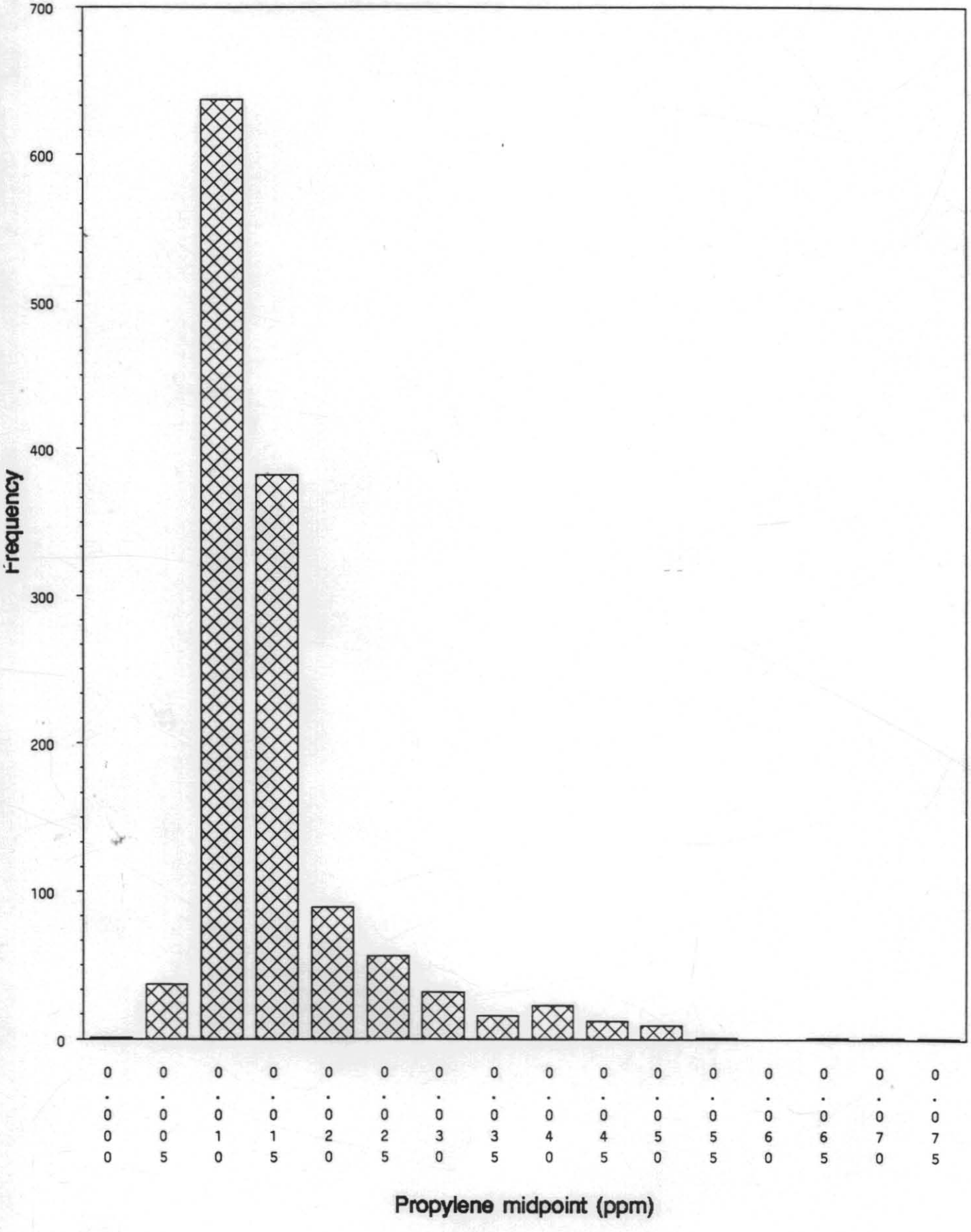
193036

Bass Basin – Block T/22P



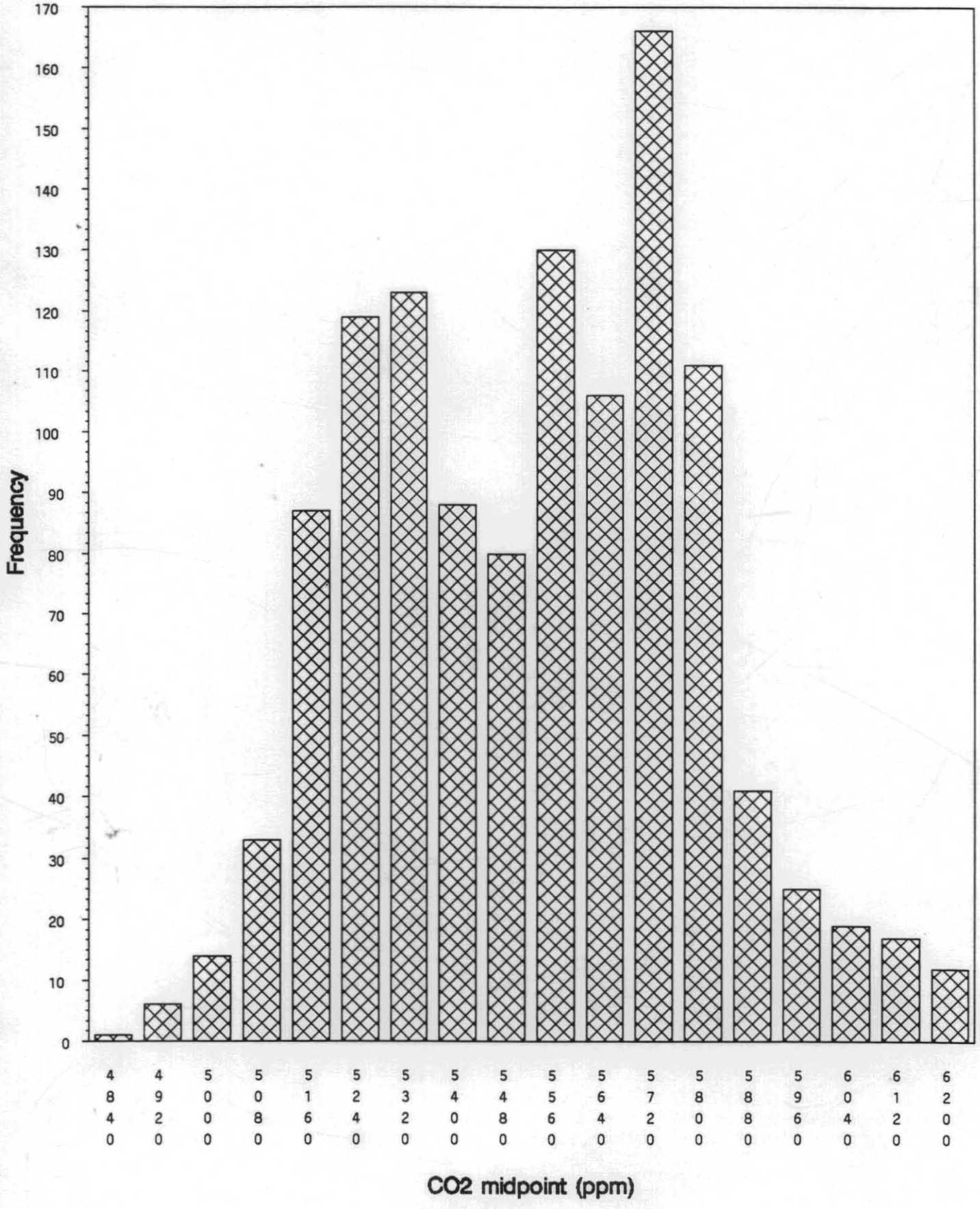
193037

Bass Basin – Block T/22P



193038

Bass Basin – Block T/22P



193039

SUMMARY STATISTICS OF THE GEOCHEMICAL DATA

UNIVARIATE PROCEDURE

Variable = Methane

Moments

N	1298	Sum Wgts	1298
Mean	7.351194	Sum	9541.85
Std Dev	0.60739	Variance	0.368923
Skewness	-1.56913	Kurtosis	3.91751
USS	70622.48	CSS	478.4928
CV	8.262469	Std Mean	0.016859
T:Mean=0	436.0412	Prob>|T|	0.0
Sgn Rank	421525.5	Prob>|S|	0.0
Num ^= 0	1298		

Quantiles(Def=5)

100% Max	8.38	99%	8.32
75% Q3	7.67	95%	8.23
50% Med	7.37	90%	8.05
25% Q1	7.2	10%	6.79
0% Min	4.93	5%	6.07
		1%	5.14
Range	3.45		
Q3-Q1	0.47		
Mode	7.3		

Extremes

Lowest	Obs	Highest	Obs
4.93(	975)	8.33(	284)
4.95(	980)	8.37(	227)
4.99(	978)	8.37(	281)
5.01(	974)	8.37(	864)
5.03(	983)	8.38(	288)

UNIVARIATE PROCEDURE

Variable = Ethane

Moments

N	1298	Sum Wgts	1298
Mean	0.019758	Sum	25.646
Std Dev	0.003348	Variance	0.000011
Skewness	0.187826	Kurtosis	-0.33629
USS	0.52125	CSS	0.014534
CV	16.94253	Std Mean	0.000093
T:Mean=0	212.6469	Prob>|T|	0.0
Sgn Rank	421525.5	Prob>|S|	0.0
Num ^= 0	1298		

Quantiles(Def=5)

100% Max	0.031	99%	0.027
75% Q3	0.022	95%	0.025
50% Med	0.02	90%	0.024
25% Q1	0.017	10%	0.016
0% Min	0.011	5%	0.015
		1%	0.013
Range	0.02		
Q3-Q1	0.005		
Mode	0.02		

Extremes

Lowest	Obs	Highest	Obs
0.011(	183)	0.029(	318)
0.012(	967)	0.029(	389)
0.012(	957)	0.029(	654)
0.012(	179)	0.031(	284)
0.012(	106)	0.031(	299)

Bass Basin - Block T/22 8:47 Monday, March 20, 1989

UNIVARIATE PROCEDURE

Variable = Ethylene

Moments

N	1298	Sum Wgts	1298
Mean	0.087716	Sum	113.855
Std Dev	0.019773	Variance	0.000391
Skewness	0.912219	Kurtosis	0.228701
USS	10.49395	CSS	0.507082
CV	22.54196	Std Mean	0.000549
T:Mean=0	159.8253	Prob>|T|	0.0
Sgn Rank	421525.5	Prob>|S|	0.0
Num ^= 0	1298		

Quantiles(Def=5)

100% Max	0.156	99%	0.141
75% Q3	0.1	95%	0.13
50% Med	0.081	90%	0.117
25% Q1	0.074	10%	0.067
0% Min	0.049	5%	0.065
		1%	0.058
Range	0.107		
Q3-Q1	0.026		
Mode	0.078		

Extremes

Lowest	Obs	Highest	Obs
0.049(	967)	0.143(	854)
0.053(	945)	0.147(	15)
0.054(	953)	0.147(	844)
0.054(	949)	0.148(	804)
0.054(	947)	0.156(	55)

UNIVARIATE PROCEDURE

Variable = Propane

Moments

N	1298	Sum Wgts	1298
Mean	0.016618	Sum	21.57
Std Dev	0.003384	Variance	0.000011
Skewness	1.953323	Kurtosis	6.450197
USS	0.373304	CSS	0.014856
CV	20.36631	Std Mean	0.000094
T:Mean=0	176.8989	Prob>|T|	0.0
Sgn Rank	421525.5	Prob>|S|	0.0
Num ^= 0	1298		

Quantiles(Def=5)

100% Max	0.039	99%	0.03
75% Q3	0.018	95%	0.024
50% Med	0.016	90%	0.021
25% Q1	0.015	10%	0.014
0% Min	0.007	5%	0.013
		1%	0.011
Range	0.032		
Q3-Q1	0.003		
Mode	0.015		

Extremes

Lowest	Obs	Highest	Obs
0.007(	942)	0.033(	32)
0.008(	955)	0.034(	23)
0.01(	889)	0.036(	26)
0.01(	554)	0.037(	40)
0.01(	190)	0.039(	21)

UNIVARIATE PROCEDURE

Variable = Propylene

Moments

N	1298	Sum Wgts	1298
Mean	0.014762	Sum	19.161
Std Dev	0.008161	Variance	0.000067
Skewness	2.71726	Kurtosis	9.54752
USS	0.369245	CSS	0.086391
CV	55.28686	Std Mean	0.000227
T:Mean=0	65.16516	Prob>|T|	0.0
Sgn Rank	421525.5	Prob>|S|	0.0
Num ^= 0	1298		

Quantiles(Def=5)

100% Max	0.076	99%	0.048
75% Q3	0.015	95%	0.032
50% Med	0.012	90%	0.025
25% Q1	0.01	10%	0.009
0% Min	0.001	5%	0.008
		1%	0.006
Range	0.075		
Q3-Q1	0.005		
Mode	0.01		

Extremes

Lowest	Obs	Highest	Obs
0.001(	605)	0.052(	13)
0.003(	977)	0.053(	11)
0.003(	611)	0.067(	4)
0.004(	996)	0.07(	3)
0.005(	1004)	0.076(	2)

UNIVARIATE PROCEDURE

Variable = iButane

Moments

N	1298	Sum Wgts	1298
Mean	0.000047	Sum	0.061
Std Dev	0.000278	Variance	7.72E-8
Skewness	6.218487	Kurtosis	38.73365
USS	0.000103	CSS	0.0001
CV	591.2404	Std Mean	7.712E-6
T:Mean=0	6.09359	Prob>|T|	0.0001
Sgn Rank	410	Prob>|S|	0.0001
Num ^= 0	40		

Quantiles(Def=5)

100% Max	0.002	99%	0.002
75% Q3	0	95%	0
50% Med	0	90%	0
25% Q1	0	10%	0
0% Min	0	5%	0
		1%	0
Range	0.002		
Q3-Q1	0		
Mode	0		

Extremes

Lowest	Obs	Highest	Obs
0(	1298)	0.002(	864)
0(	1297)	0.002(	957)
0(	1296)	0.002(	1076)
0(	1295)	0.002(	1187)
0(	1294)	0.002(	1189)

UNIVARIATE PROCEDURE

Variable = nButane

Moments

N	1298	Sum Wgts	1298
Mean	0.000072	Sum	0.094
Std Dev	0.000422	Variance	1.783E-7
Skewness	7.954935	Kurtosis	80.2228
USS	0.000238	CSS	0.000231
CV	582.9936	Std Mean	0.000012
T:Mean=0	6.179787	Prob>|T|	0.0001
Sgn Rank	663	Prob>|S|	0.0001
Num ^= 0	51		

Quantiles(Def=5)

100% Max	0.006	99%	0.002
75% Q3	0	95%	0
50% Med	0	90%	0
25% Q1	0	10%	0
0% Min	0	5%	0
		1%	0
Range	0.006		
Q3-Q1	0		
Mode	0		

Extremes

Lowest	Obs	Highest	Obs
0(	1298)	0.003(	854)
0(	1297)	0.003(	1201)
0(	1296)	0.004(	1113)
0(	1295)	0.006(	1)
0(	1294)	0.006(	280)

Bass Basin - Block T/22 8:47 Monday, March 20, 1989

UNIVARIATE PROCEDURE

Variable = CO2

Moments

N	1177	Sum Wgts	1177
Mean	5524.779	Sum	6502665
Std Dev	266.1884	Variance	70856.28
Skewness	0.104872	Kurtosis	-0.60356
USS	3.601E10	CSS	83326989
CV	4.818083	Std Mean	7.758914
T:Mean=0	712.0557	Prob>|T|	0.0
Sgn Rank	346626.5	Prob>|S|	0.0
Num ^= 0	1177		

Quantiles(Def=5)

100% Max	6206.5	99%	6160.6
75% Q3	5728.9	95%	5962.3
50% Med	5542.7	90%	5836.1
25% Q1	5299.9	10%	5183.2
0% Min	4851.4	5%	5127
		1%	4991
Range	1355.1		
Q3-Q1	429		
Mode	5235		

Extremes

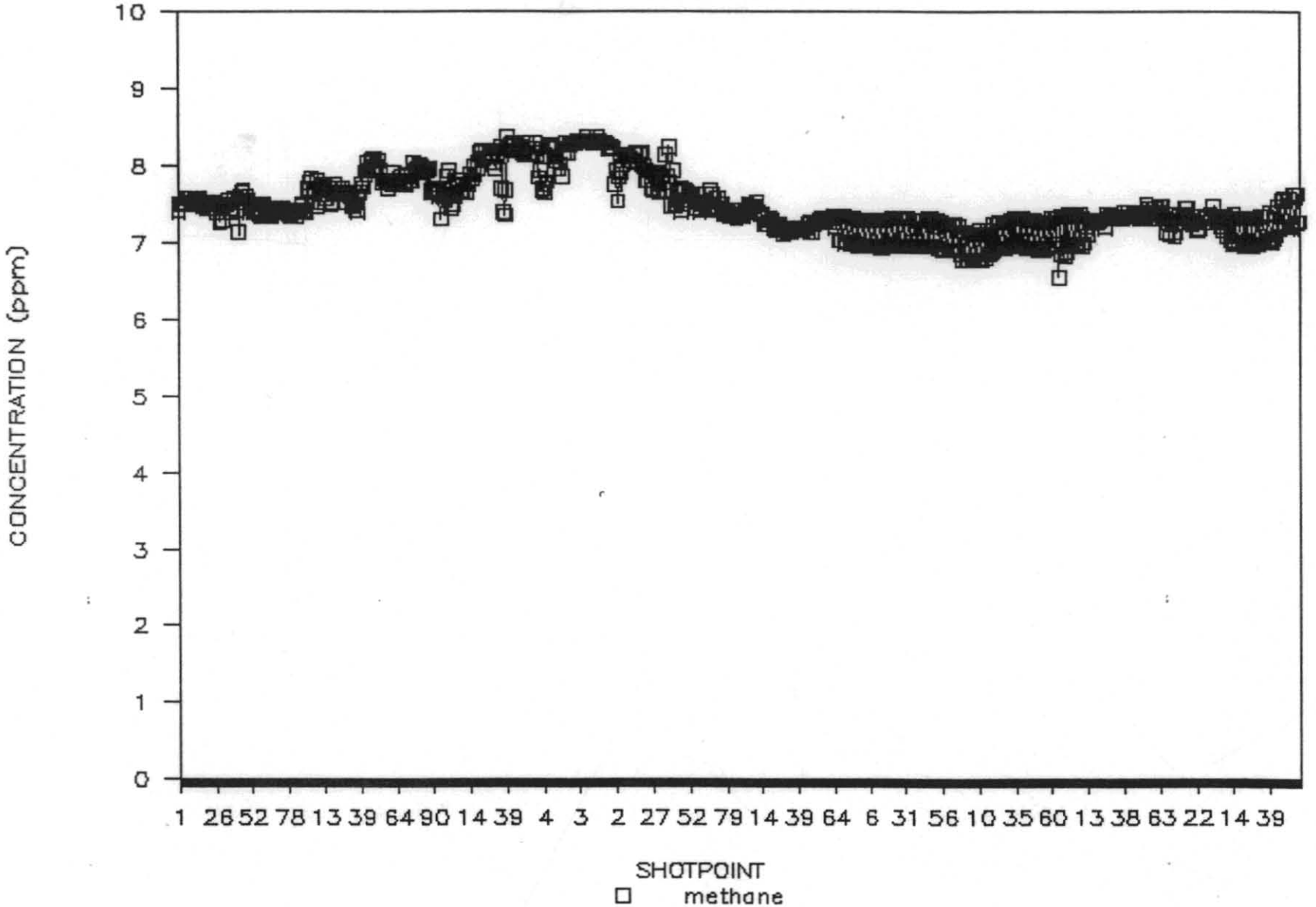
Lowest	Obs	Highest	Obs
4851.4(	955)	6185.1(	25)
4894.4(	956)	6203.2(	30)
4905.5(	996)	6203.8(	26)
4928.5(	990)	6206.5(	23)
4928.5(	957)	6206.5(	24)

Missing Value	.
Count	120
% Count/Nobs	9.25

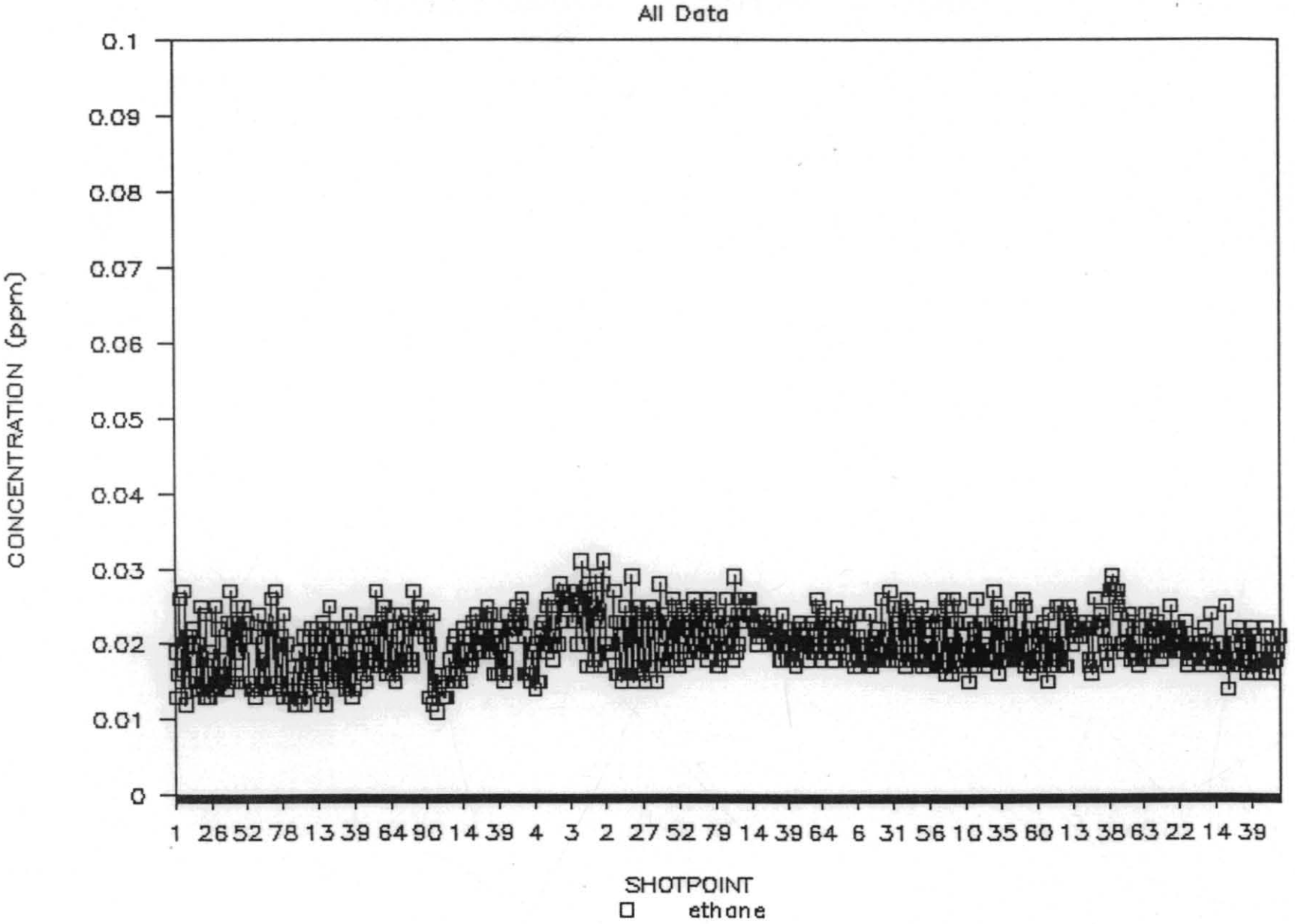
PROFILE PLOTS OF THE GEOCHEMICAL DATA FOR EACH SURVEY LINE & FOR SEVERAL LINES FROM THE GIPPSLAND BASIN

BASS BASIN – BLOCK T/22P

All Data

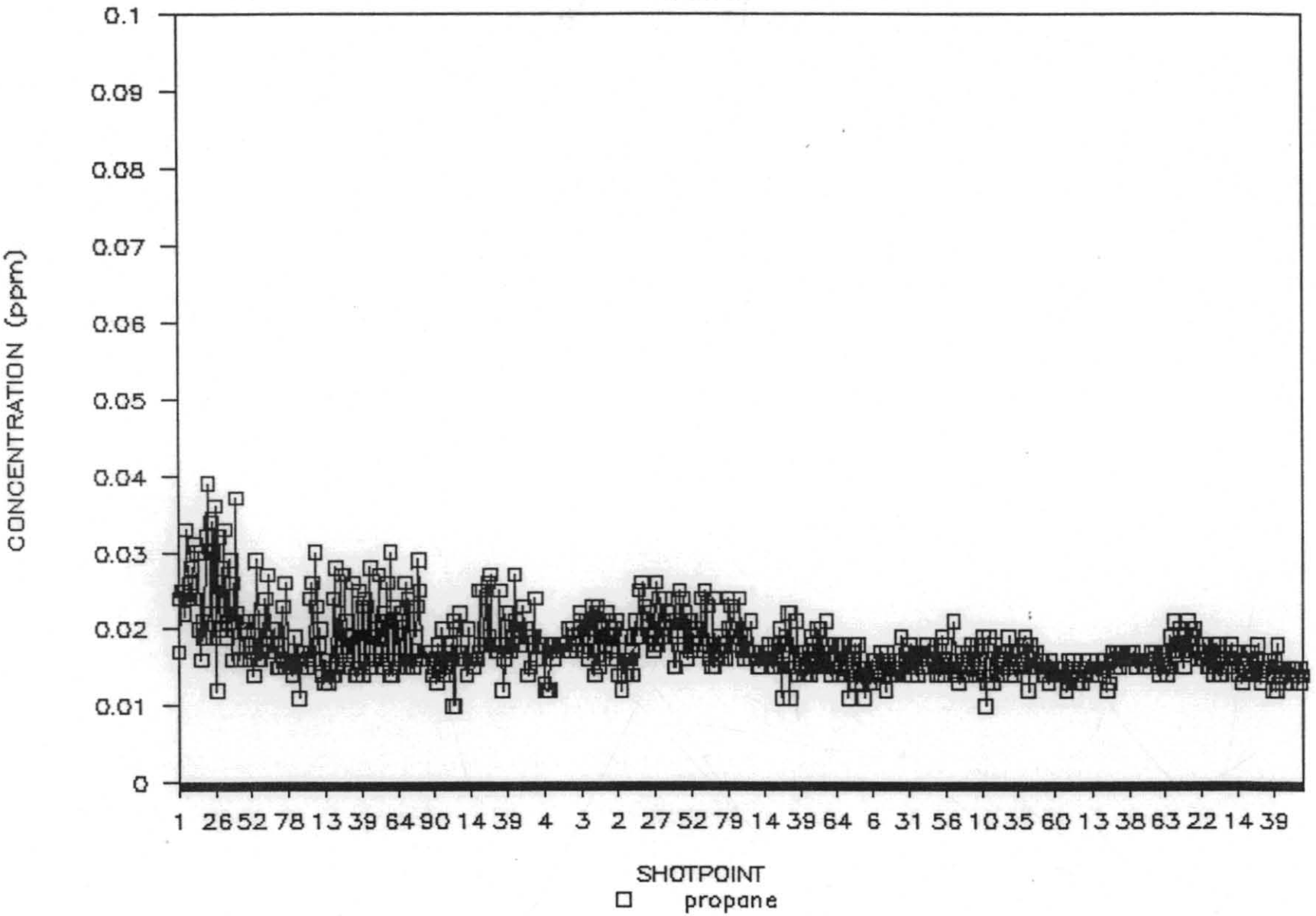


BASS BASIN - BLOCK T/22P



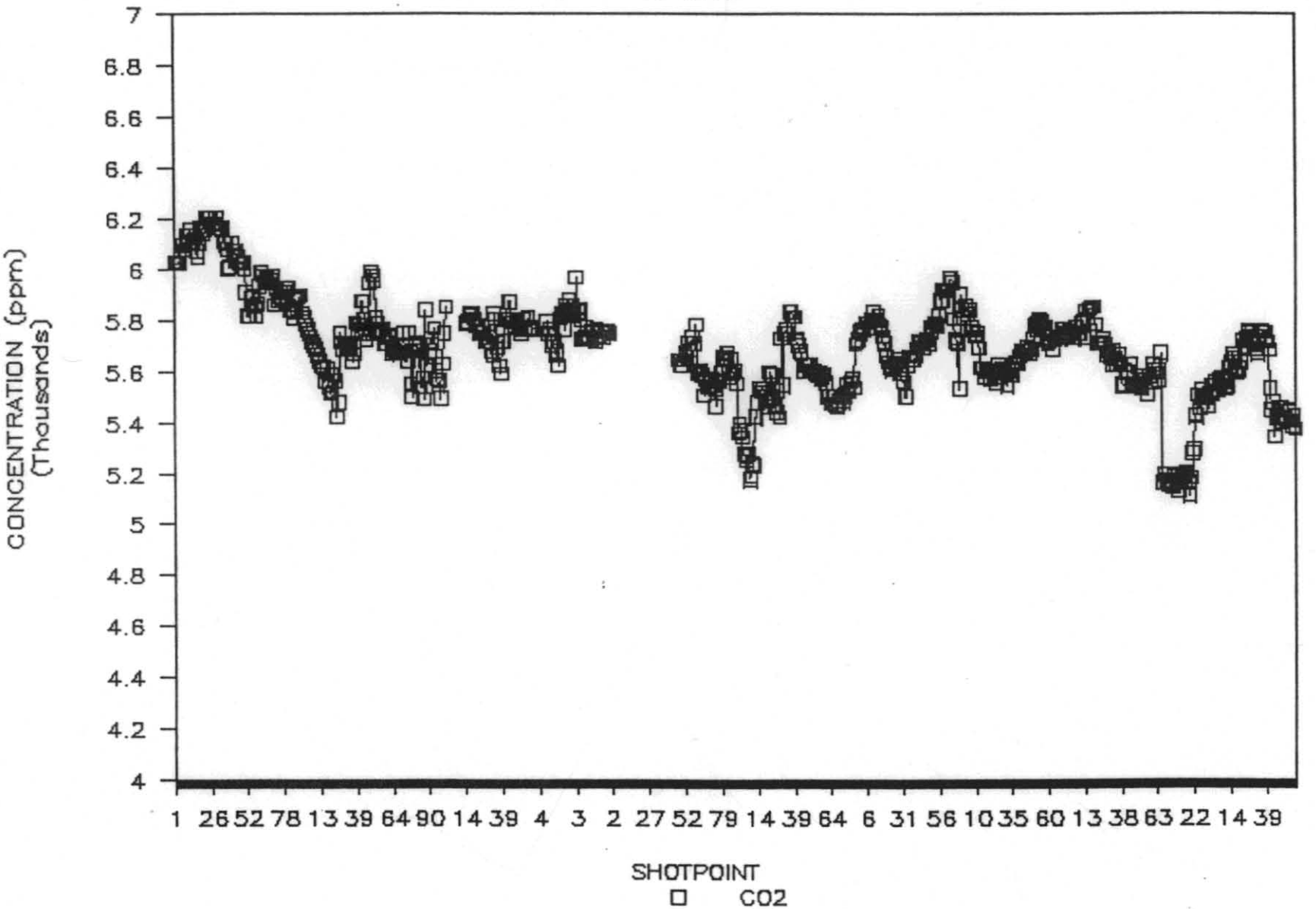
BASS BASIN – BLOCK T/22P

All Data



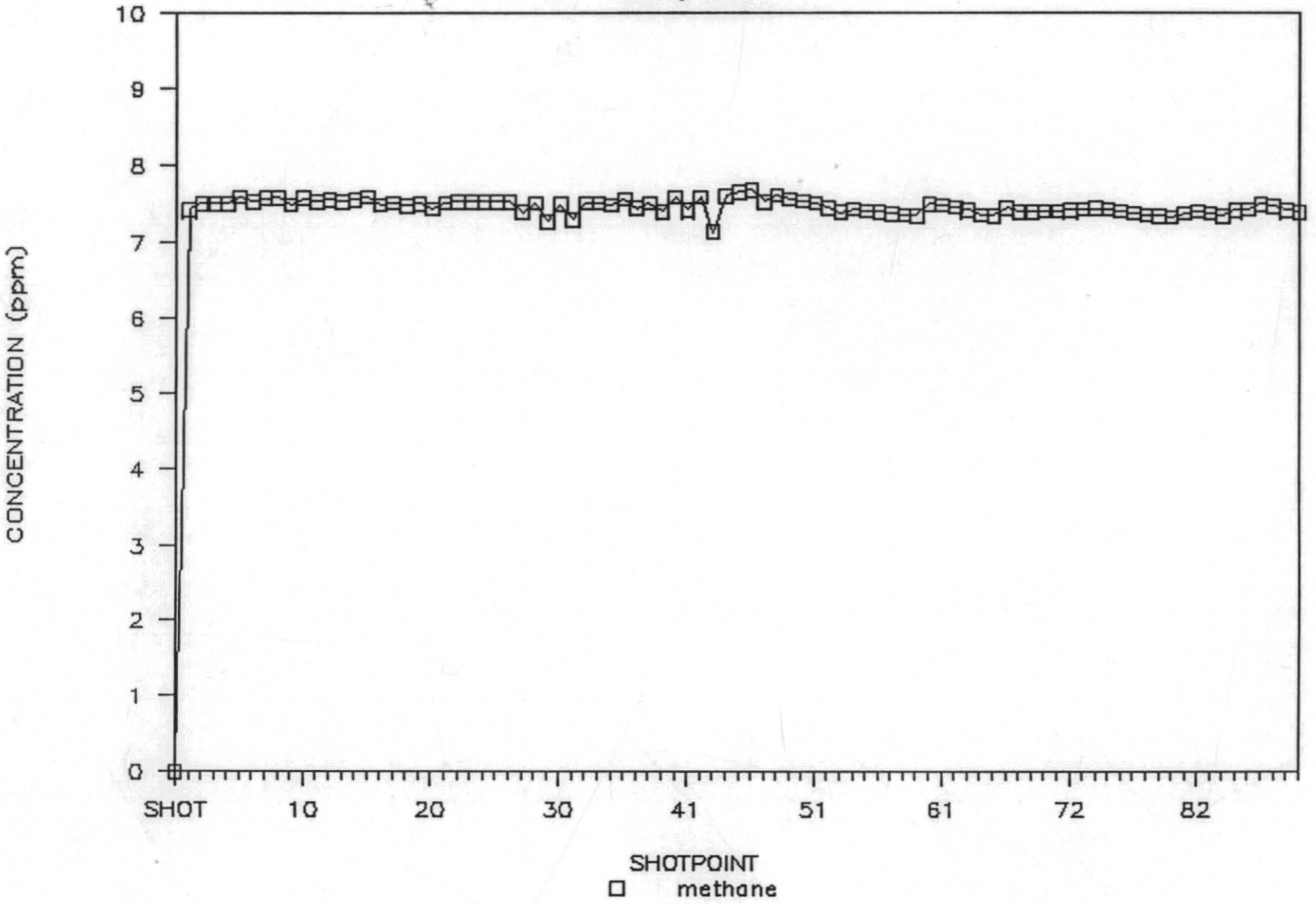
BASS BASIN – BLOCK T/22P

All Data



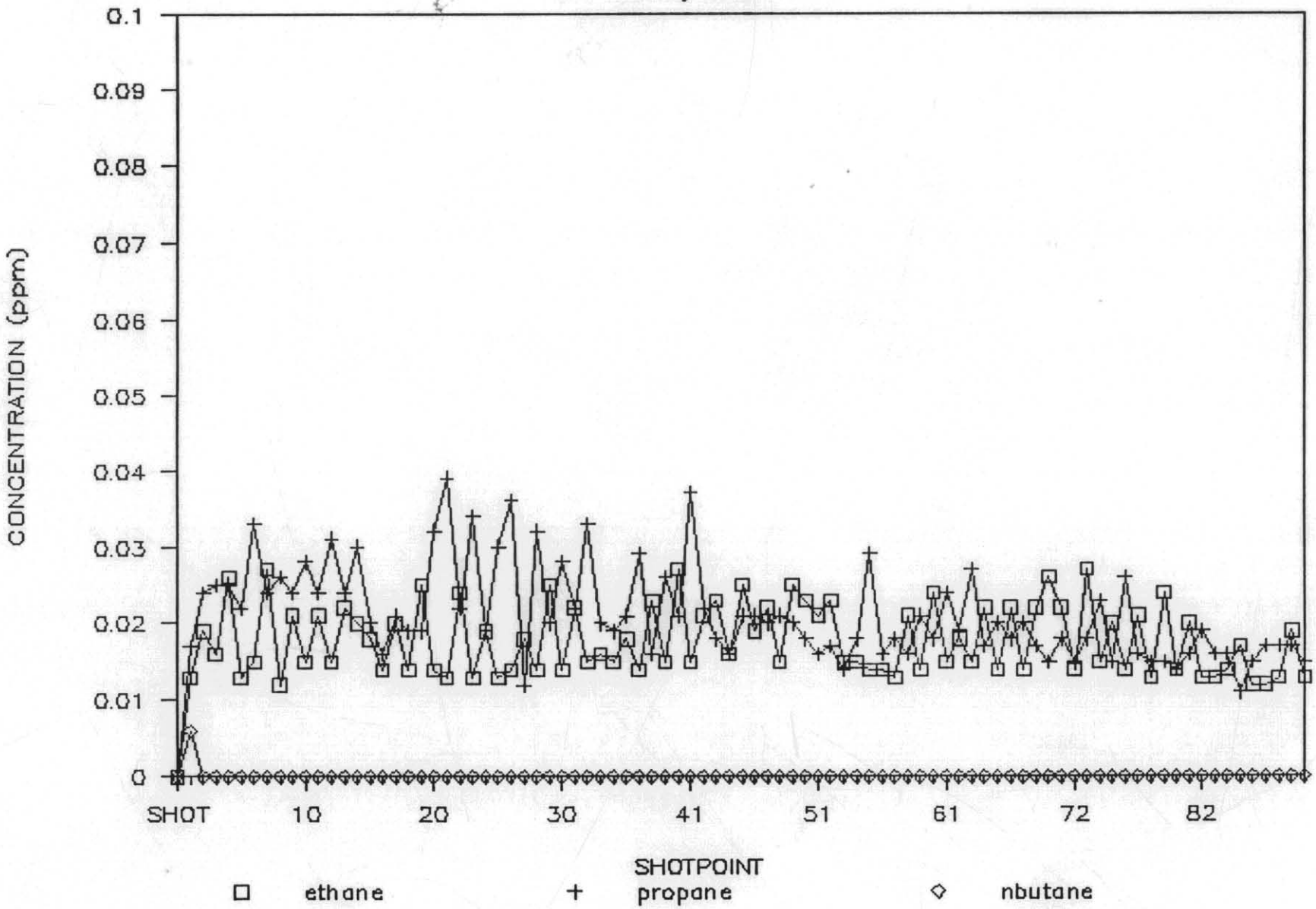
BASS BASIN

Survey Line 1



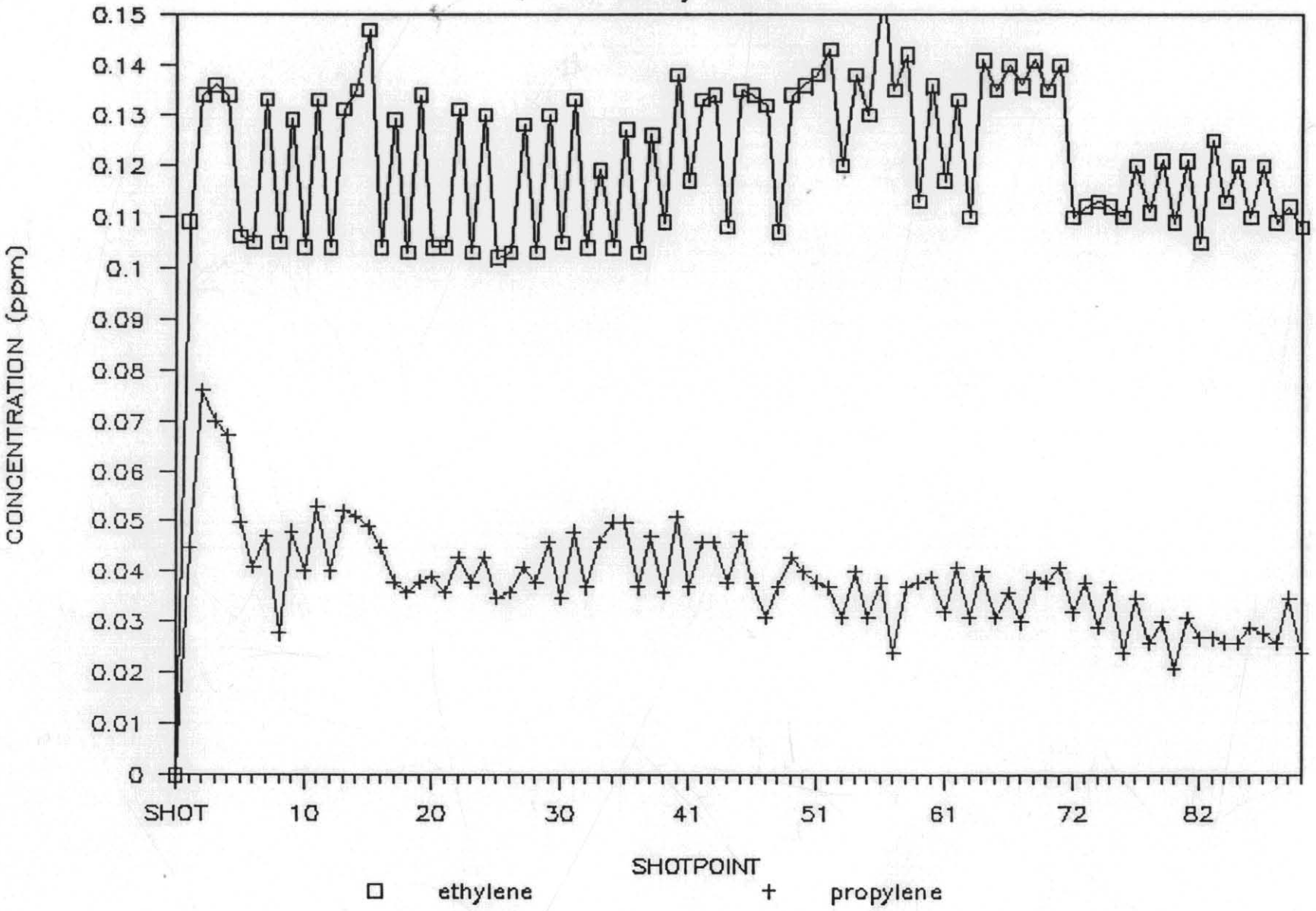
BASS BASIN

Survey Line 1



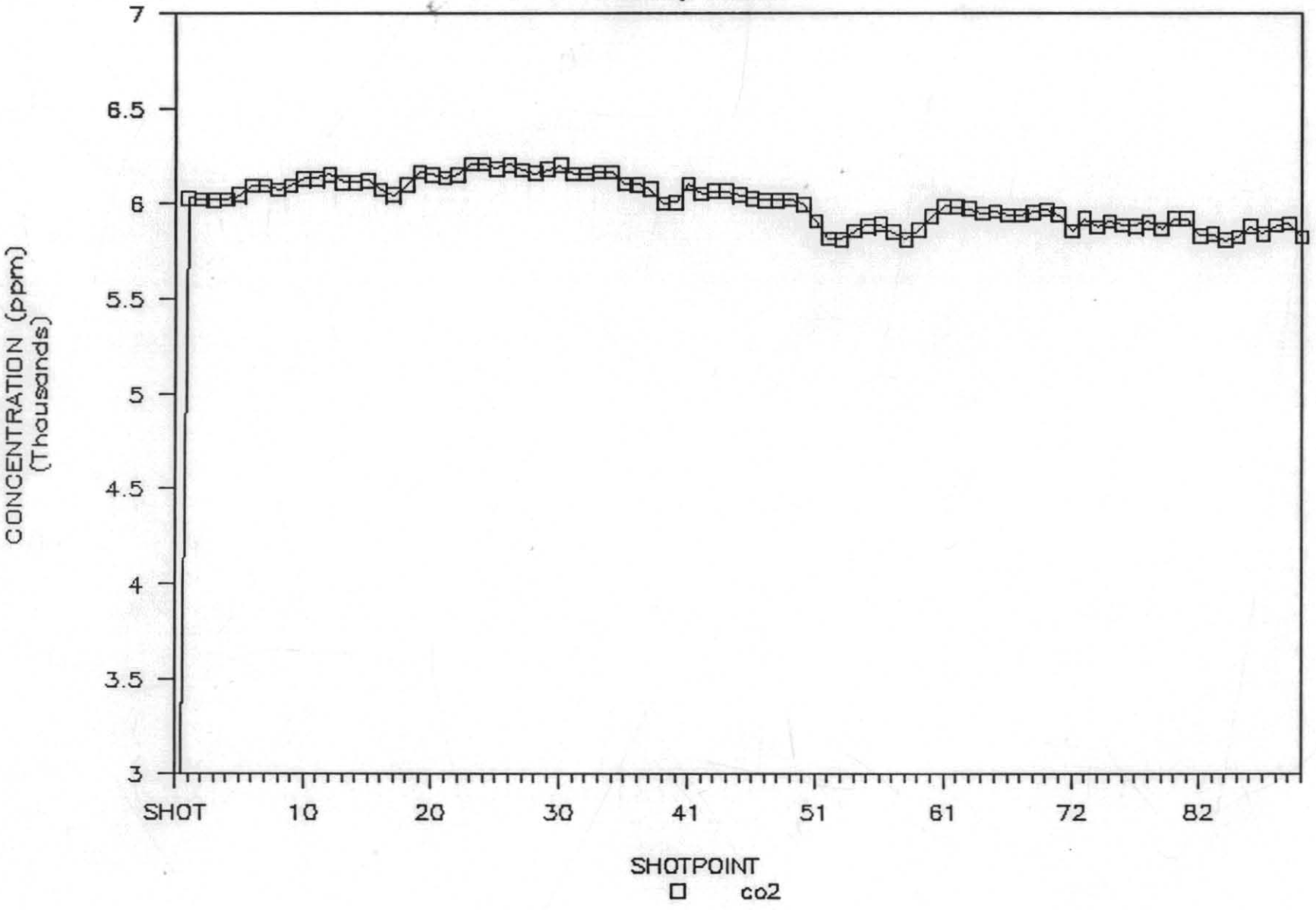
BASS BASIN

Survey Line 1



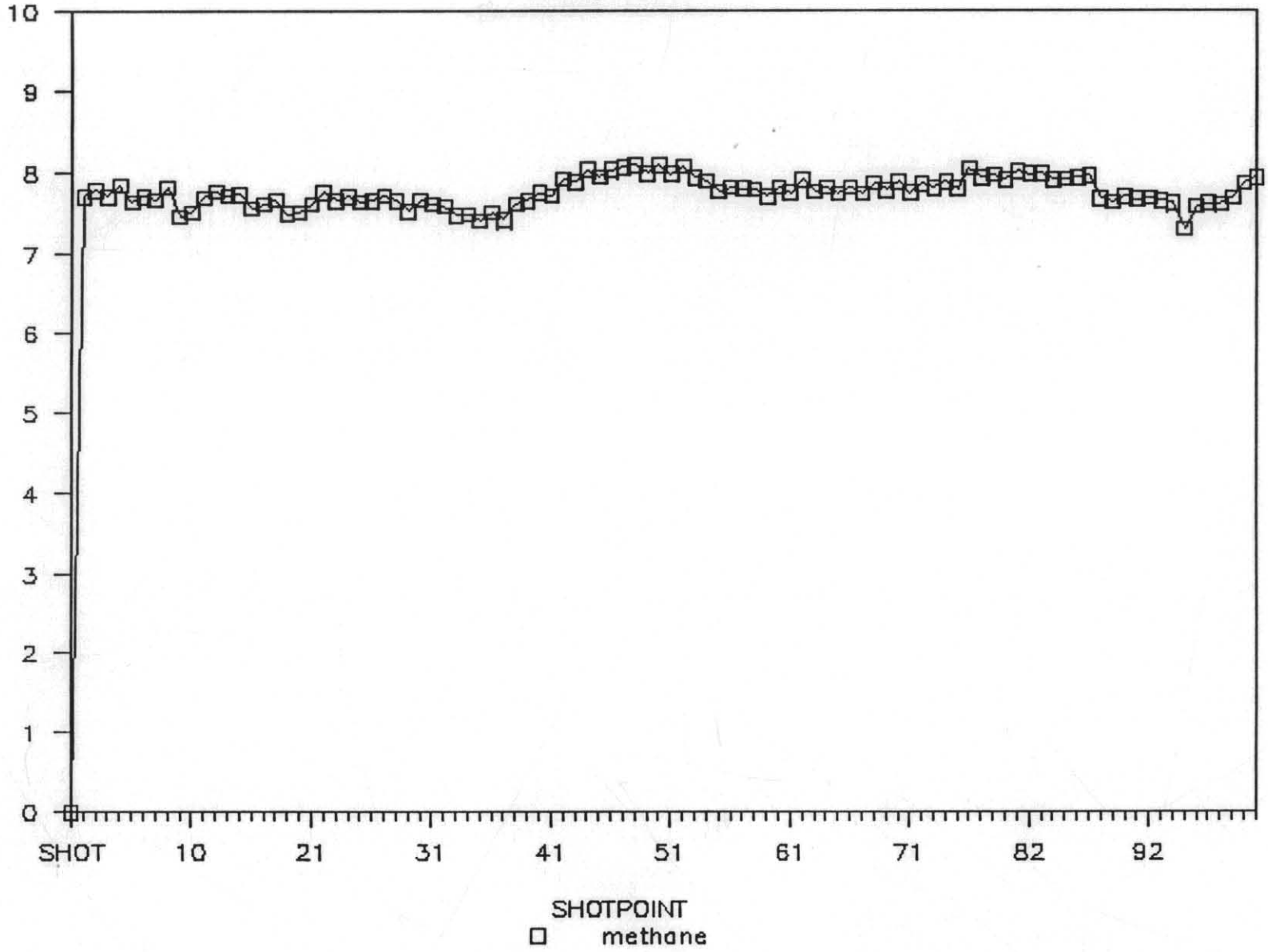
BASS BASIN

Survey Line 1



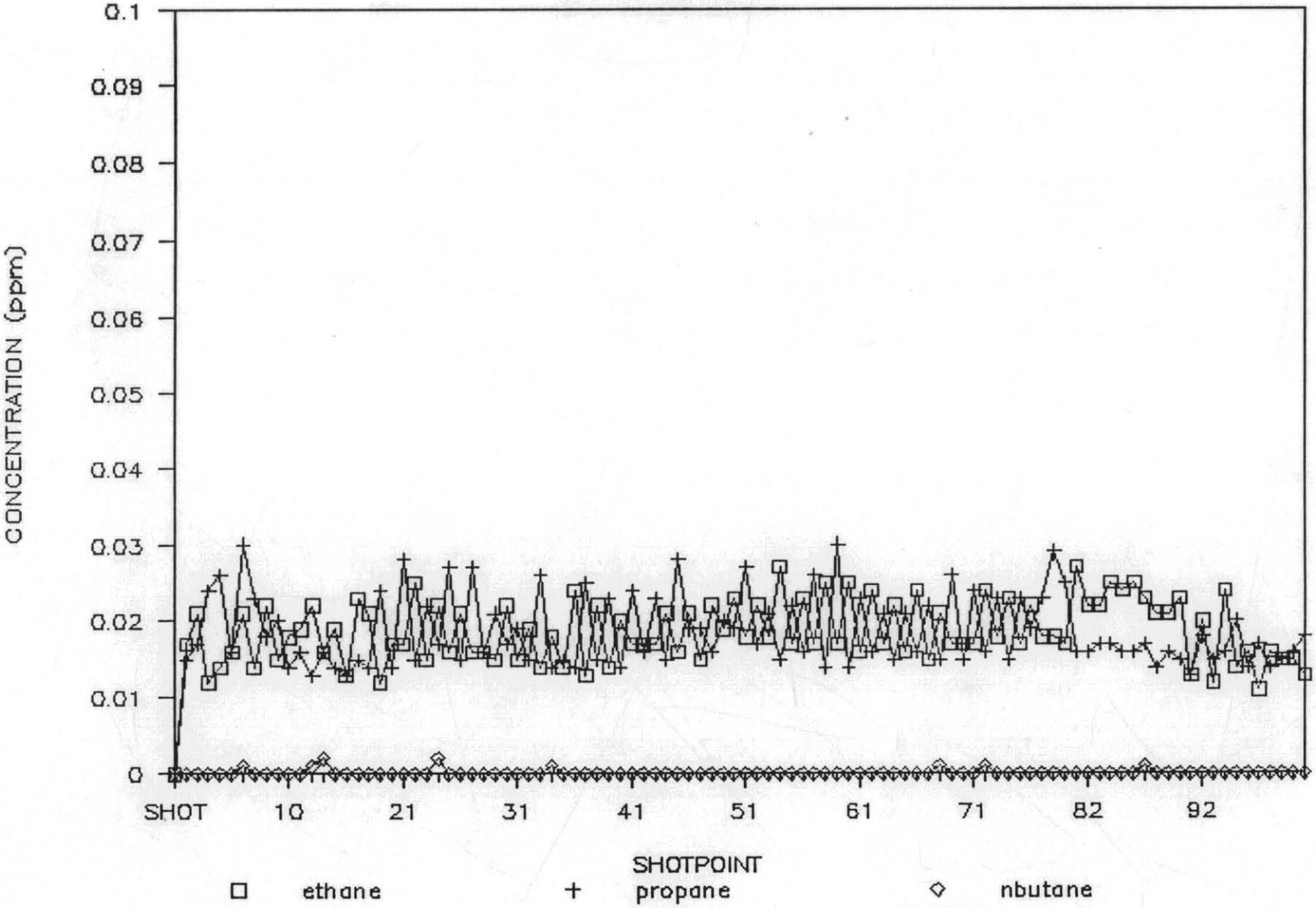
BASS BASIN

Survey Line 2



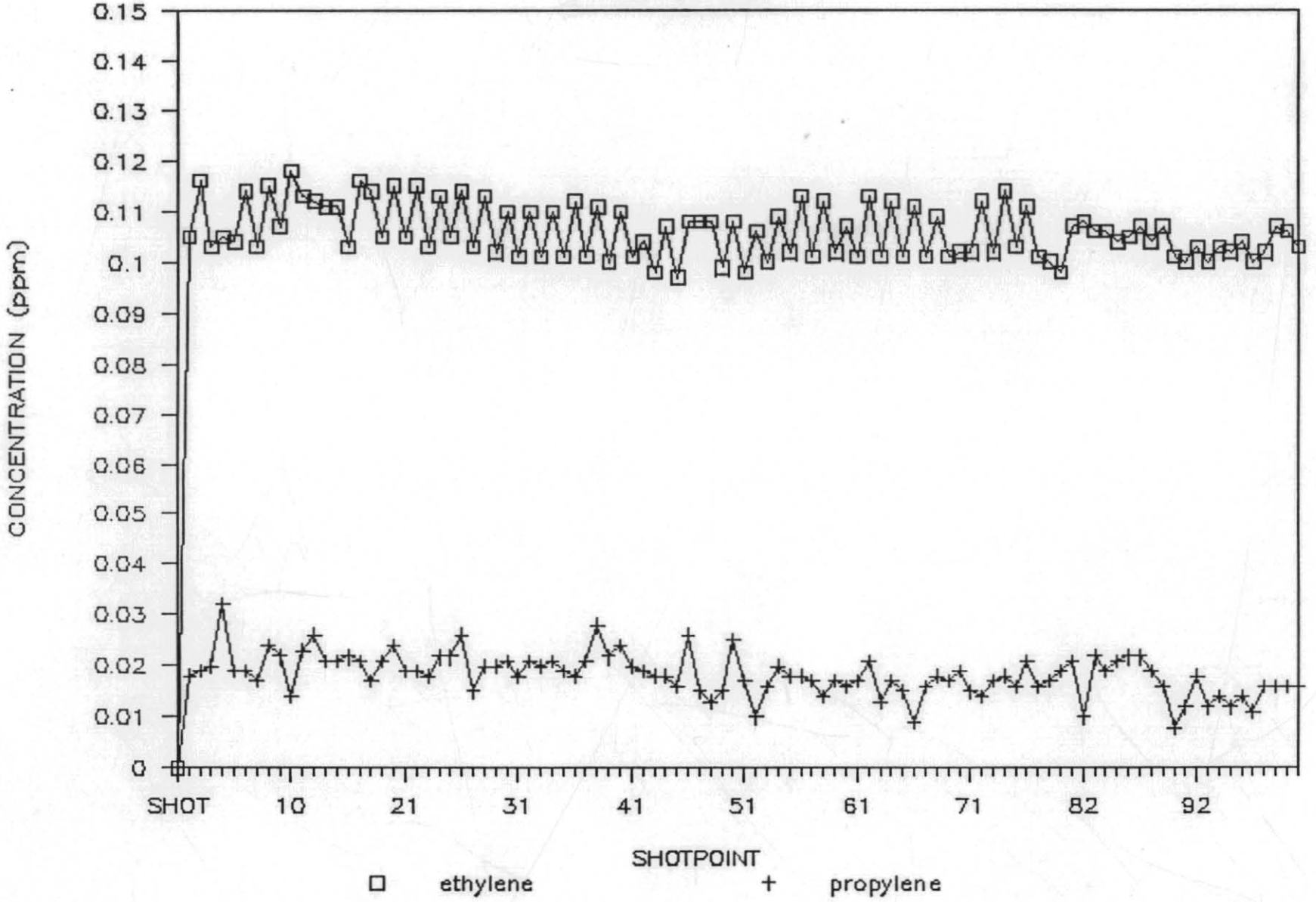
BASS BASIN

Survey Line 2



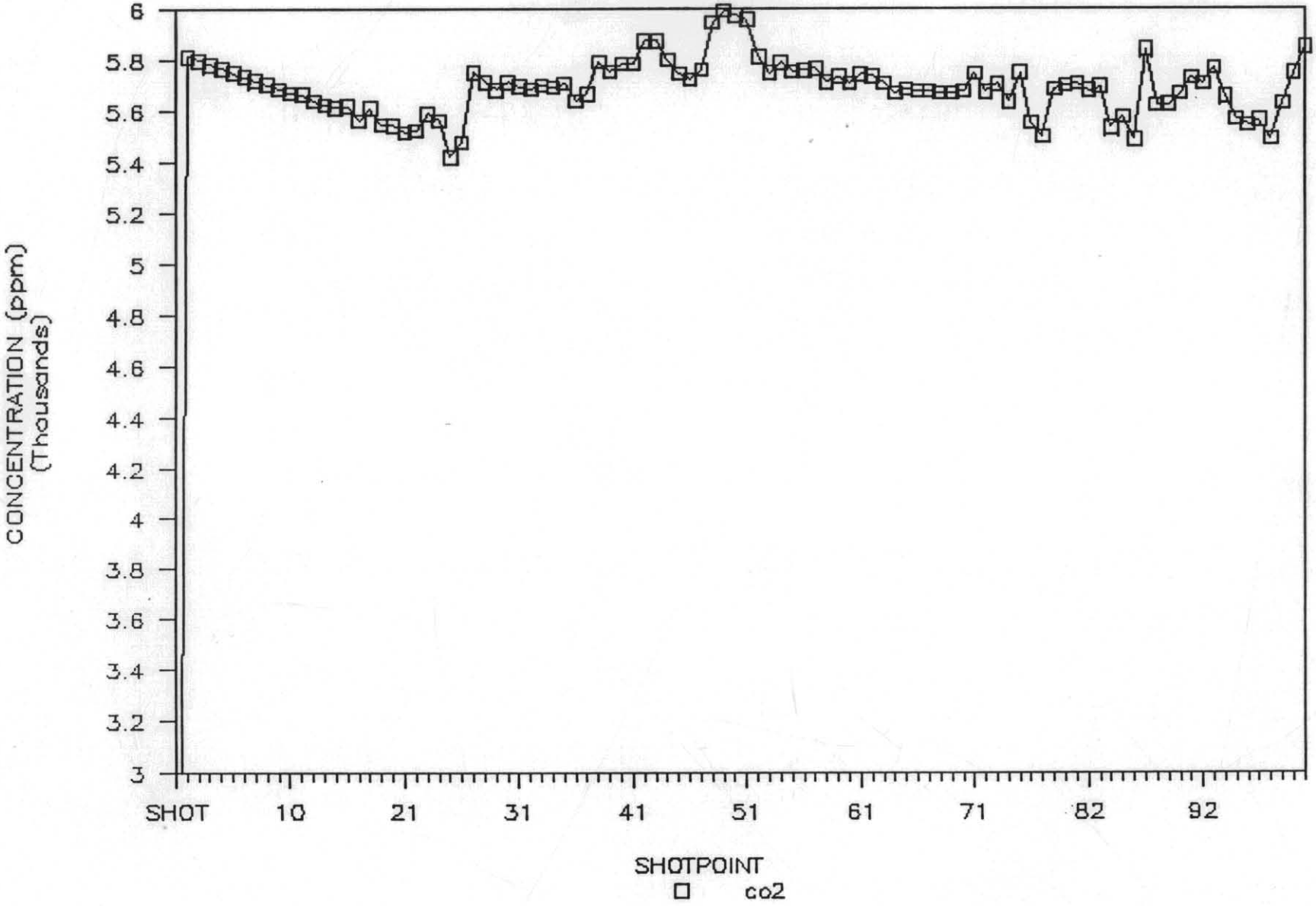
BASS BASIN

Survey Line 2



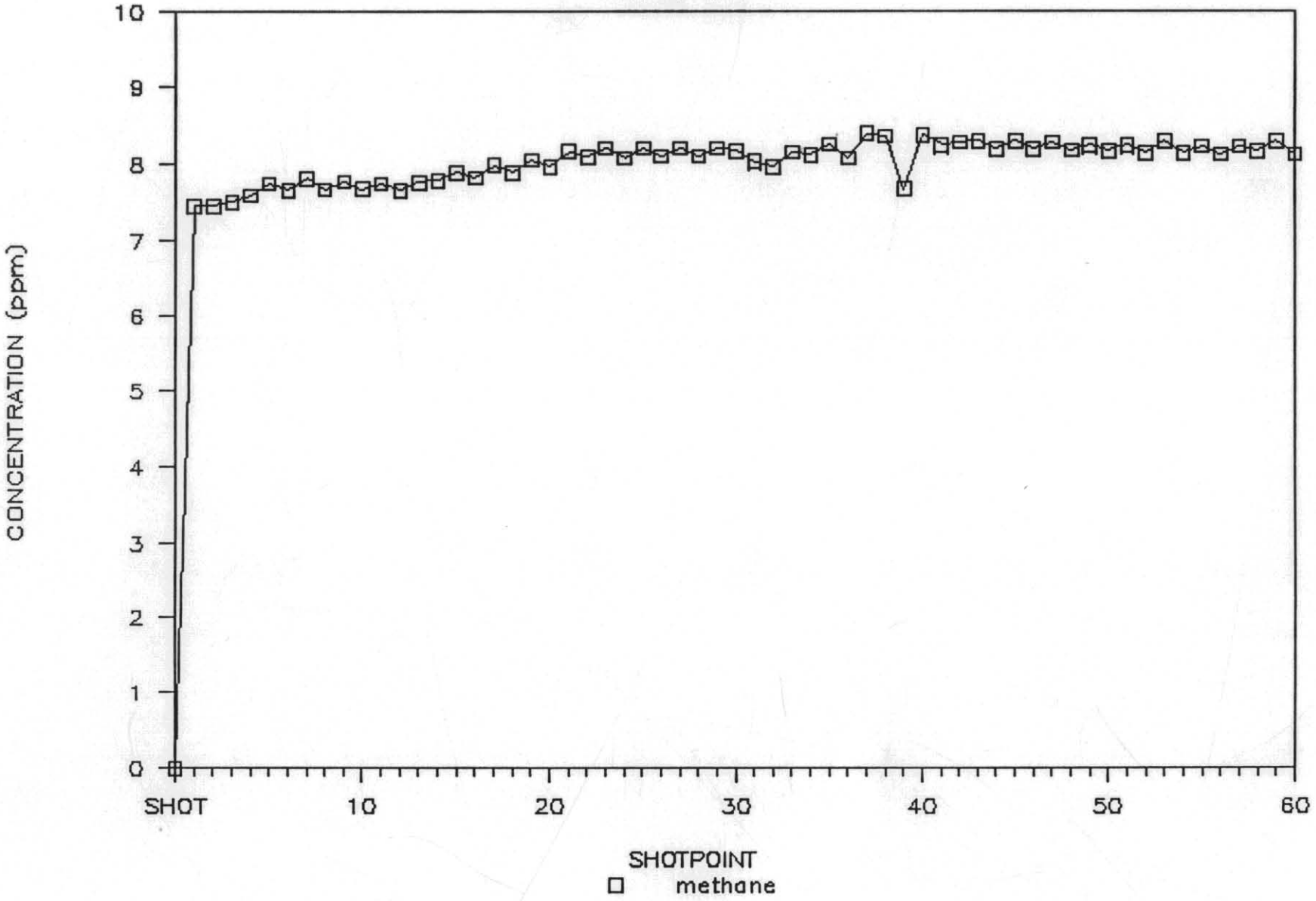
BASS BASIN

Survey Line 2



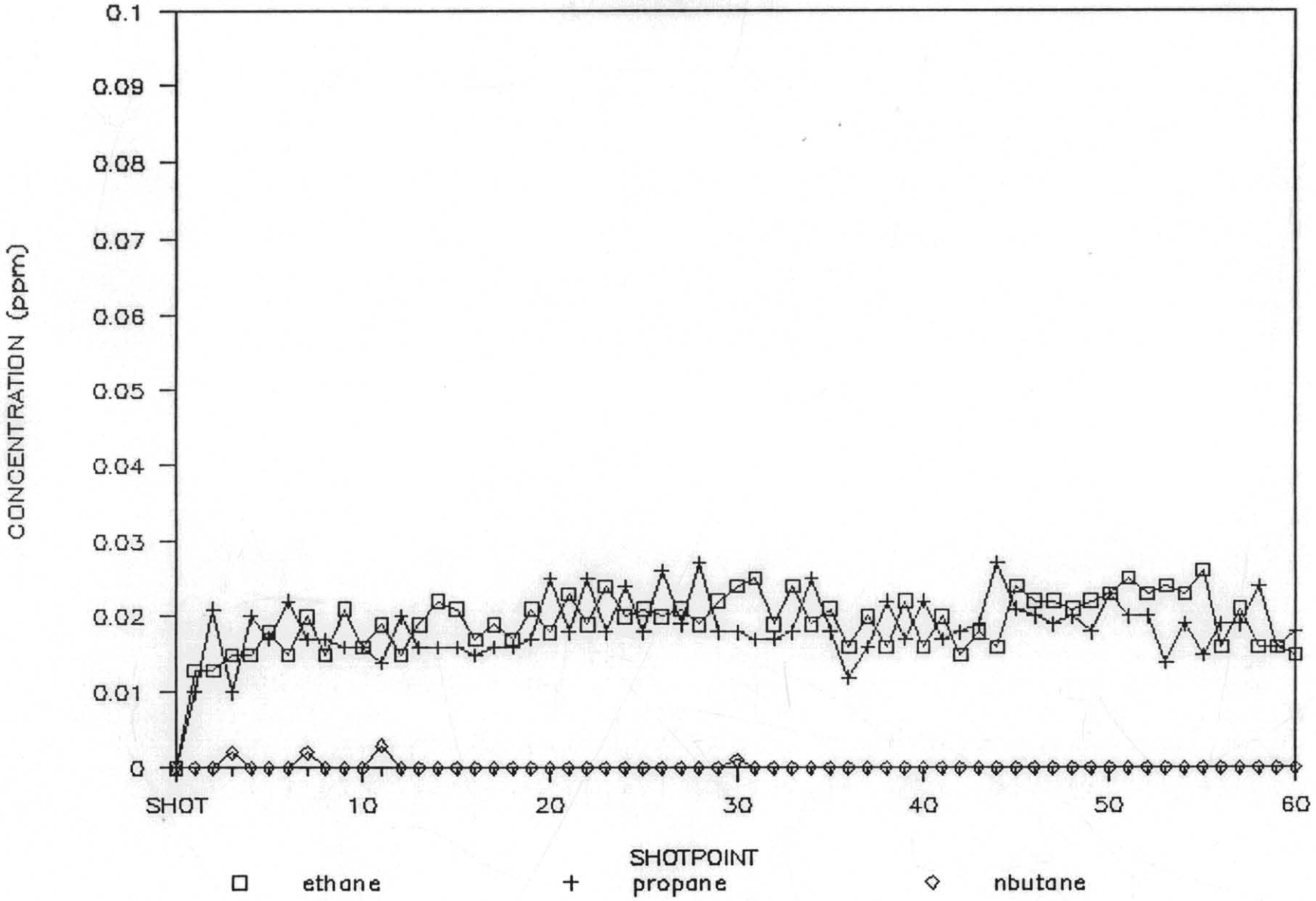
BASS BASIN

Survey Line 3



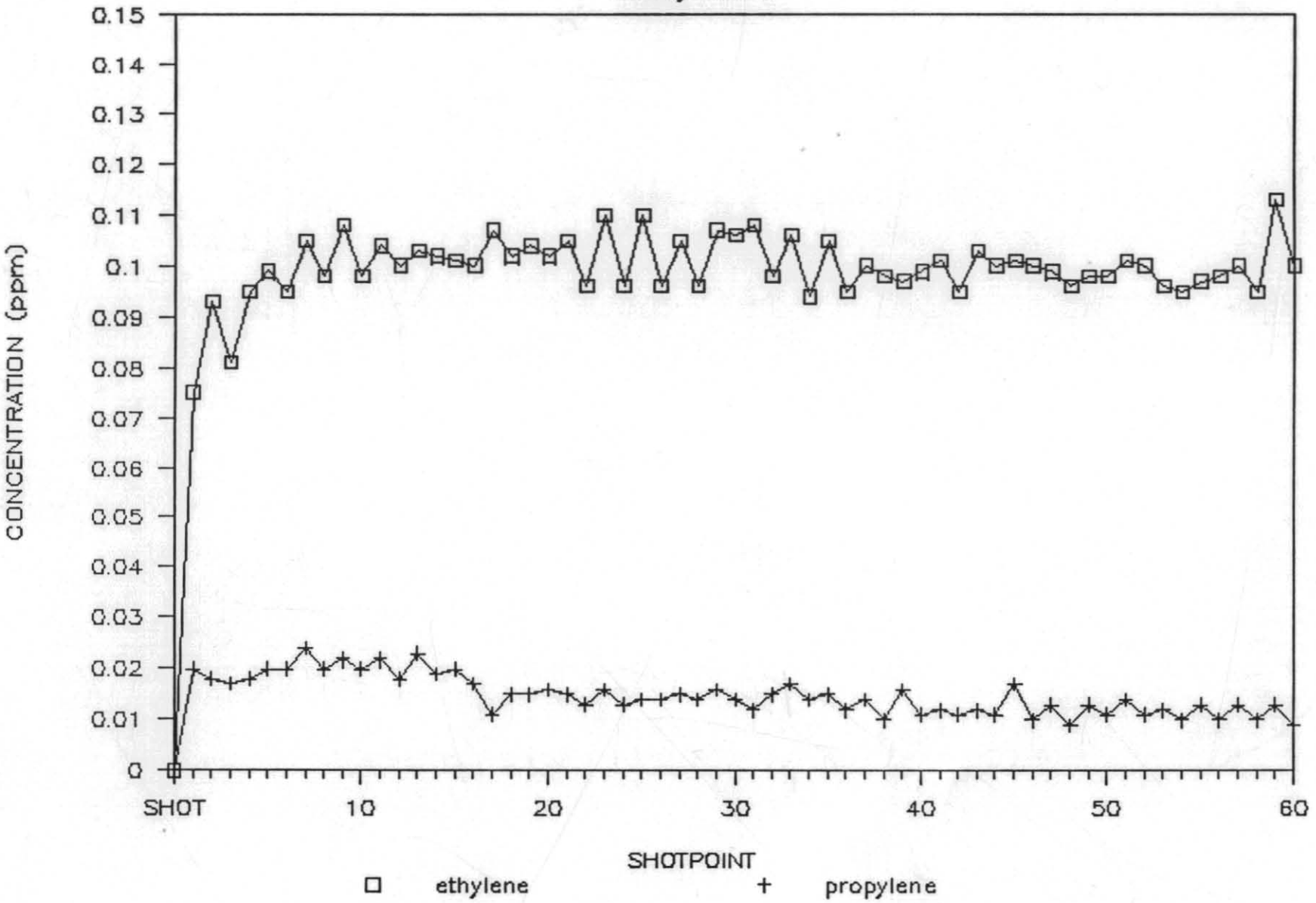
BASS BASIN

Survey Line 3



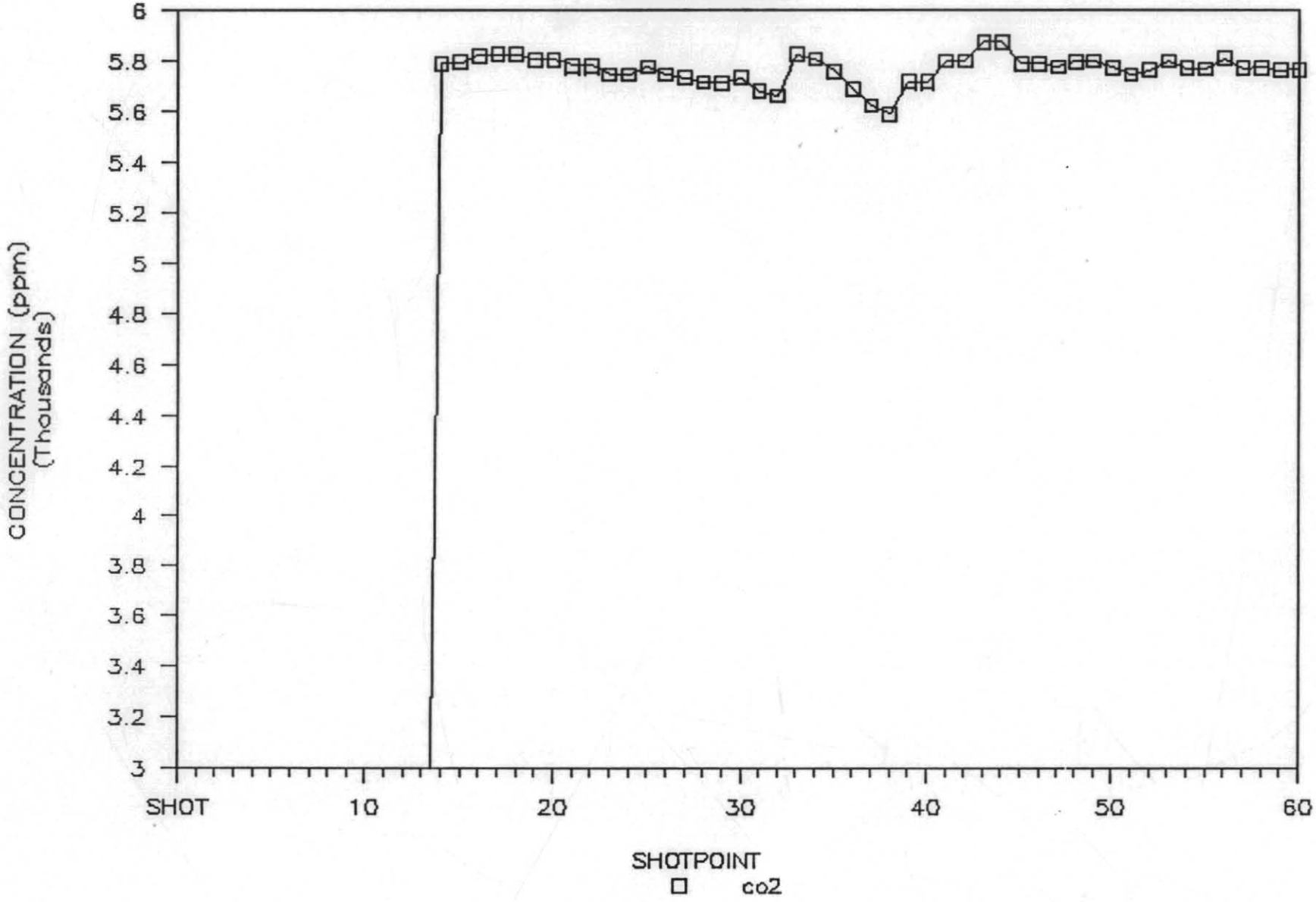
BASS BASIN

Survey Line 3



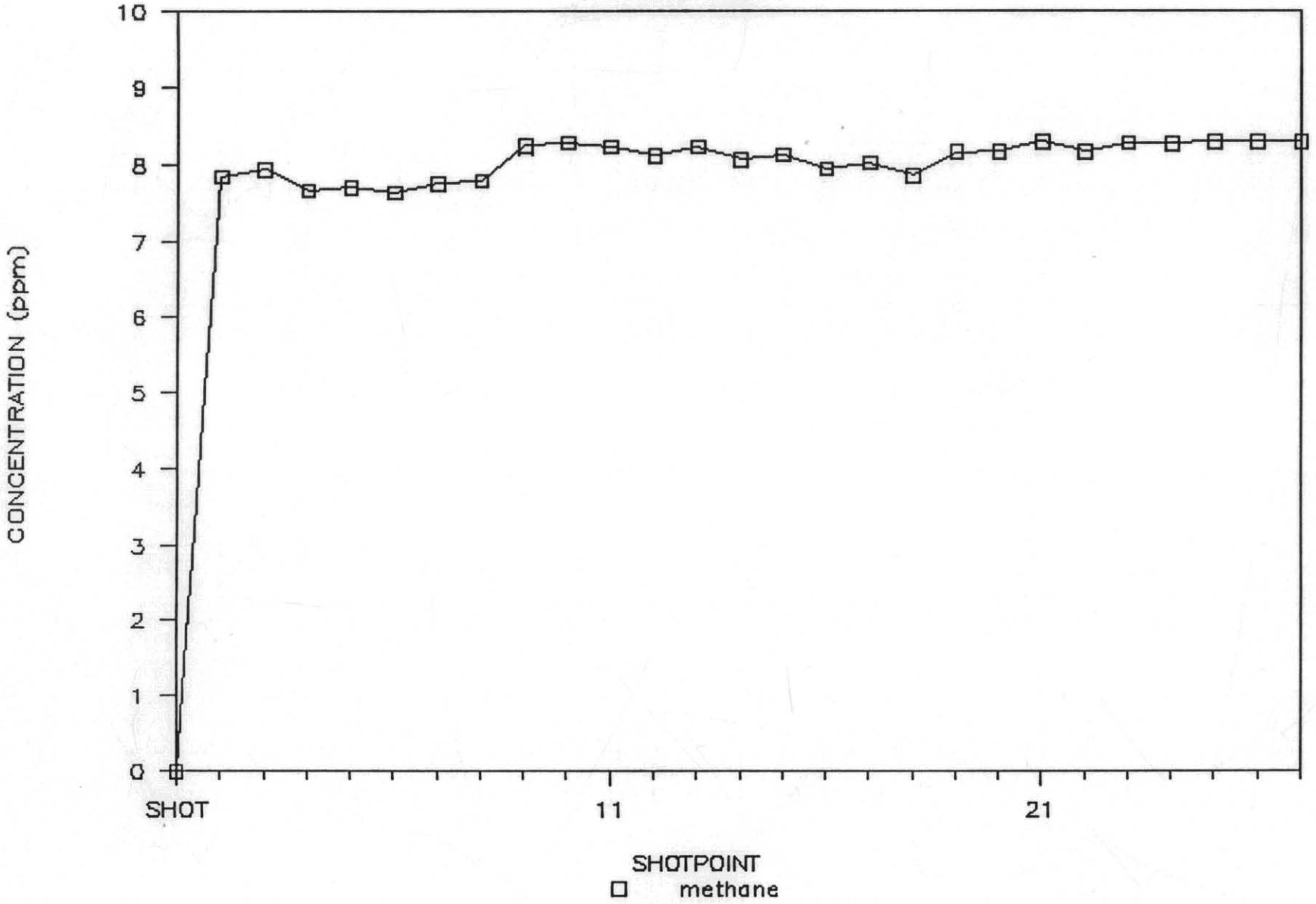
BASS BASIN

Survey Line 3



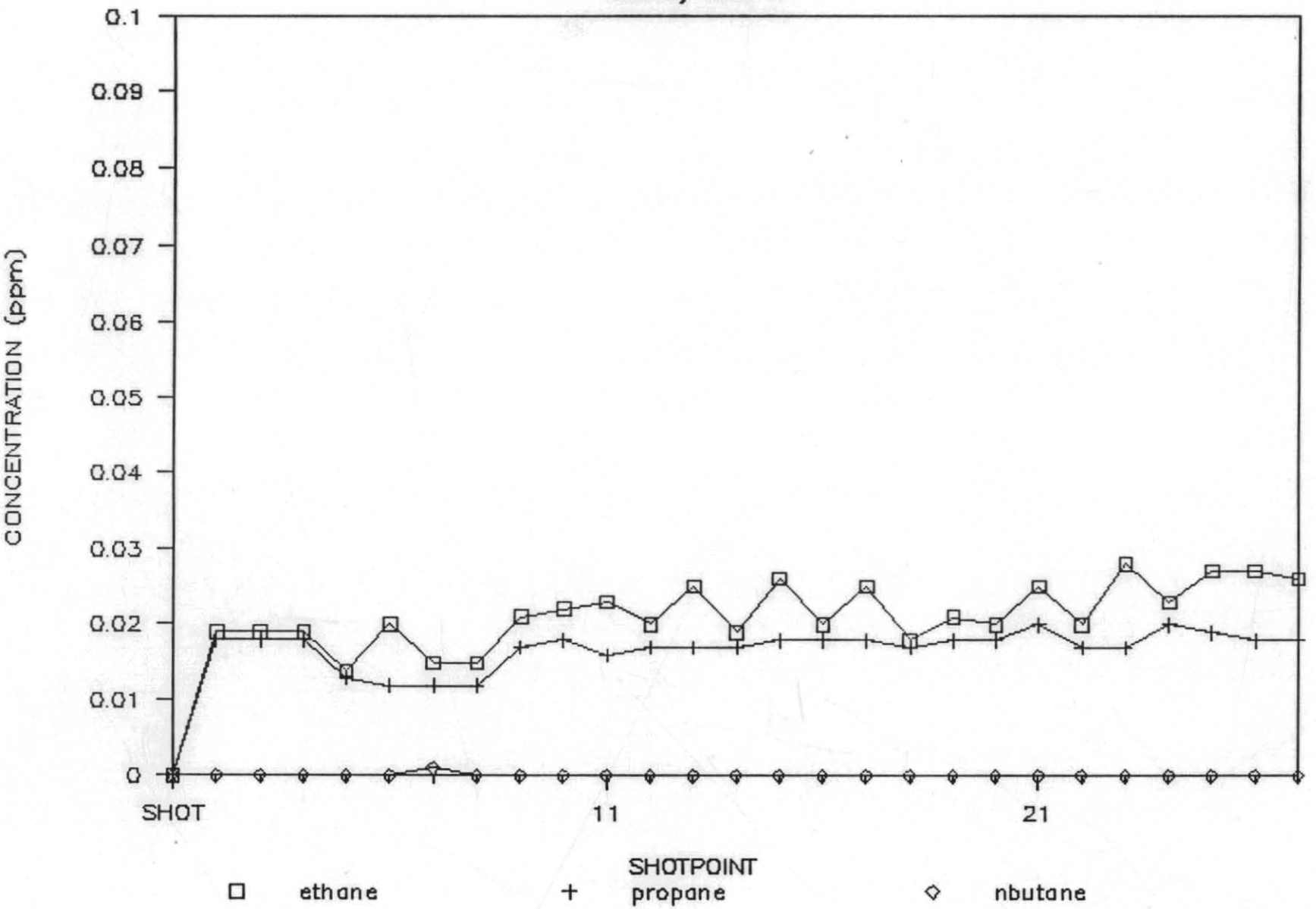
BASS BASIN

Survey Line 4



BASS BASIN

Survey Line 4



BASS BASIN

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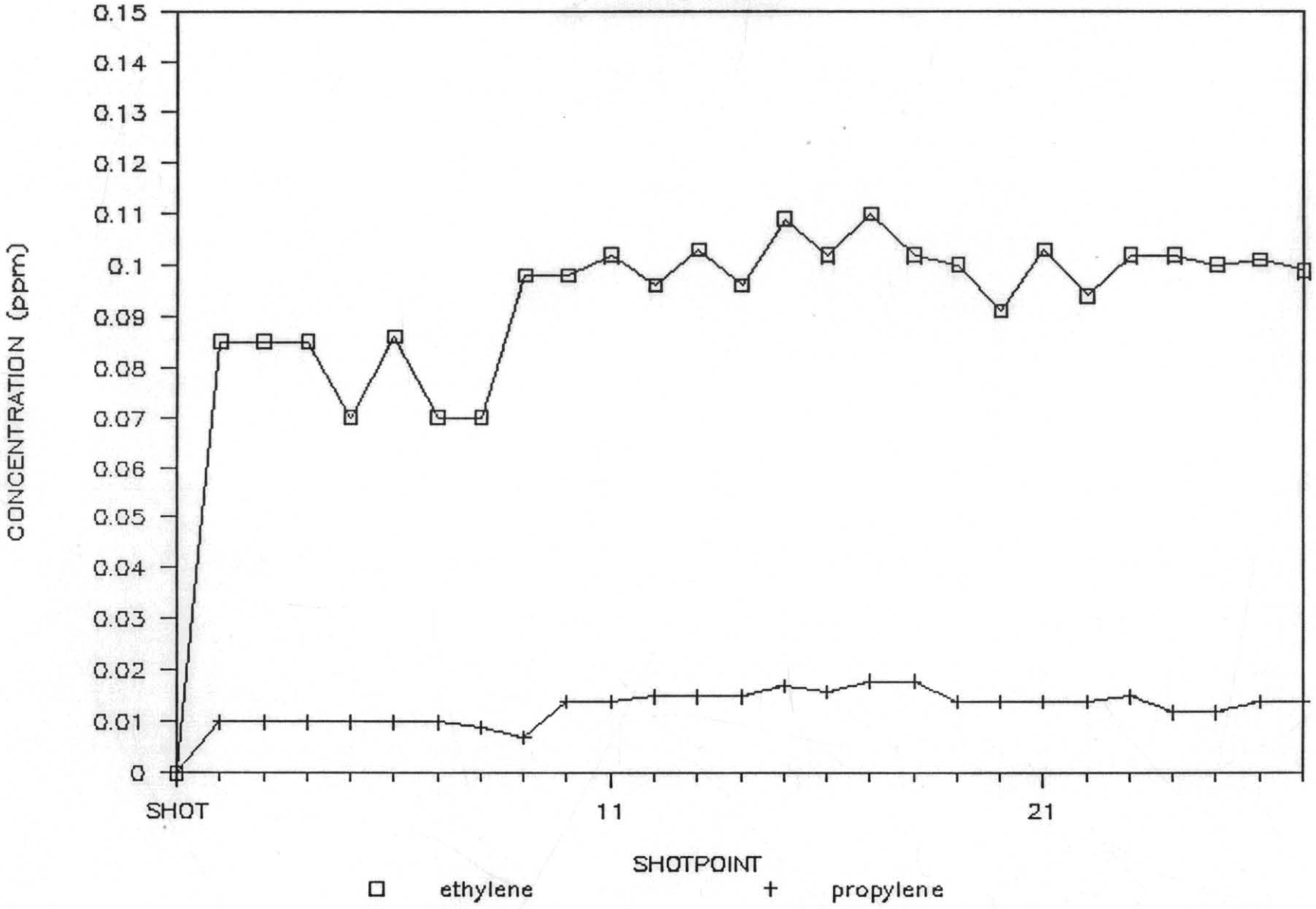

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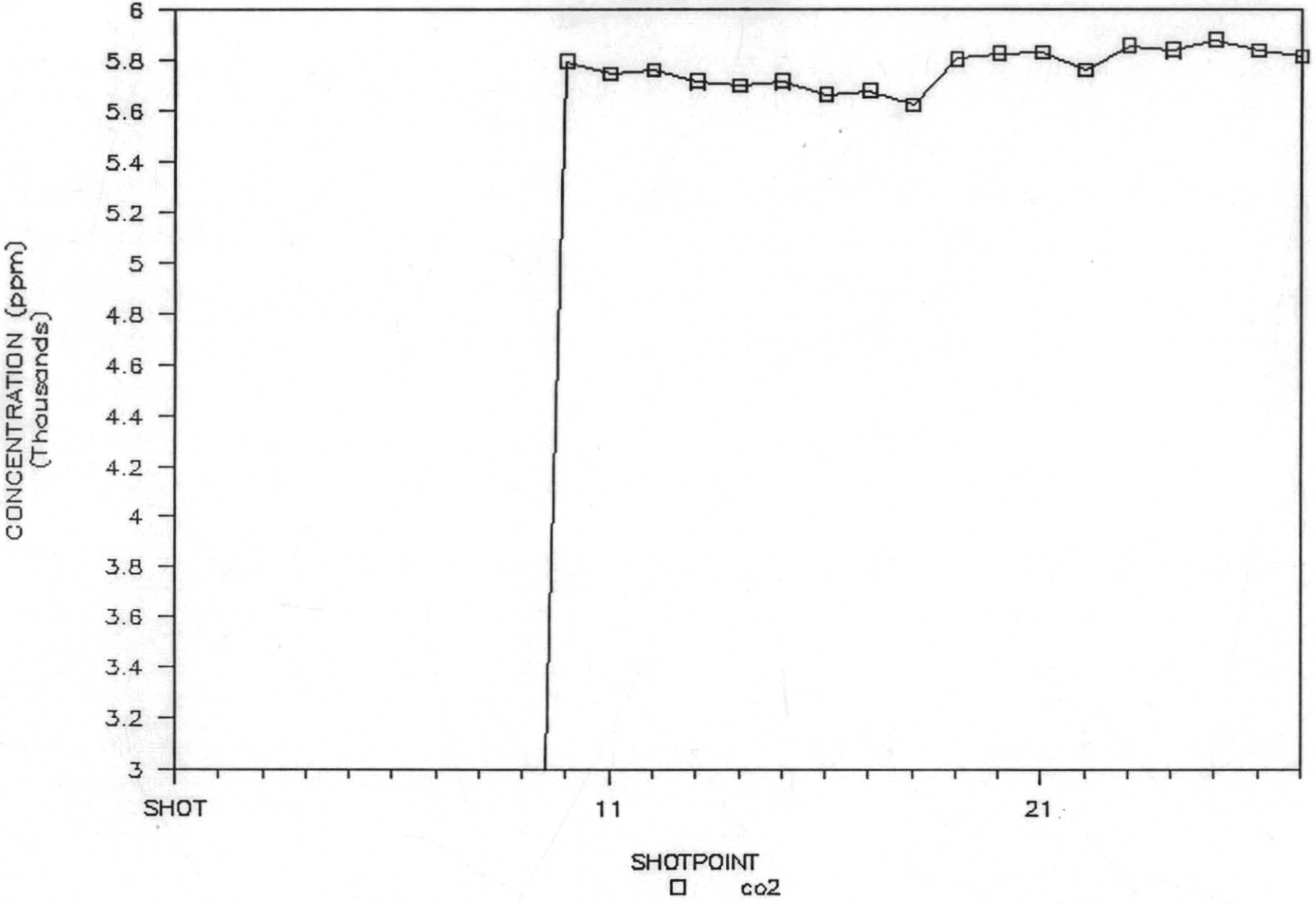

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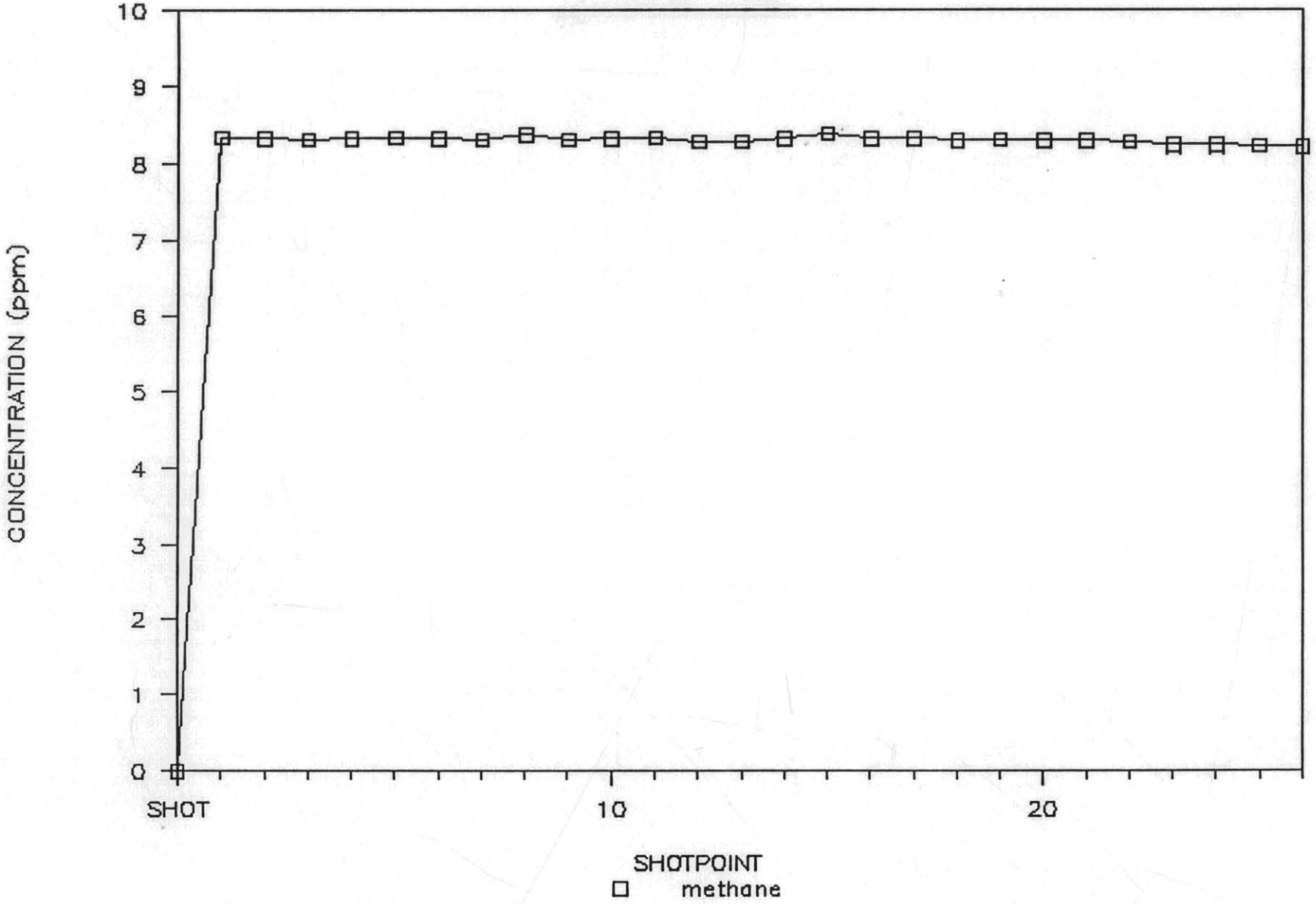

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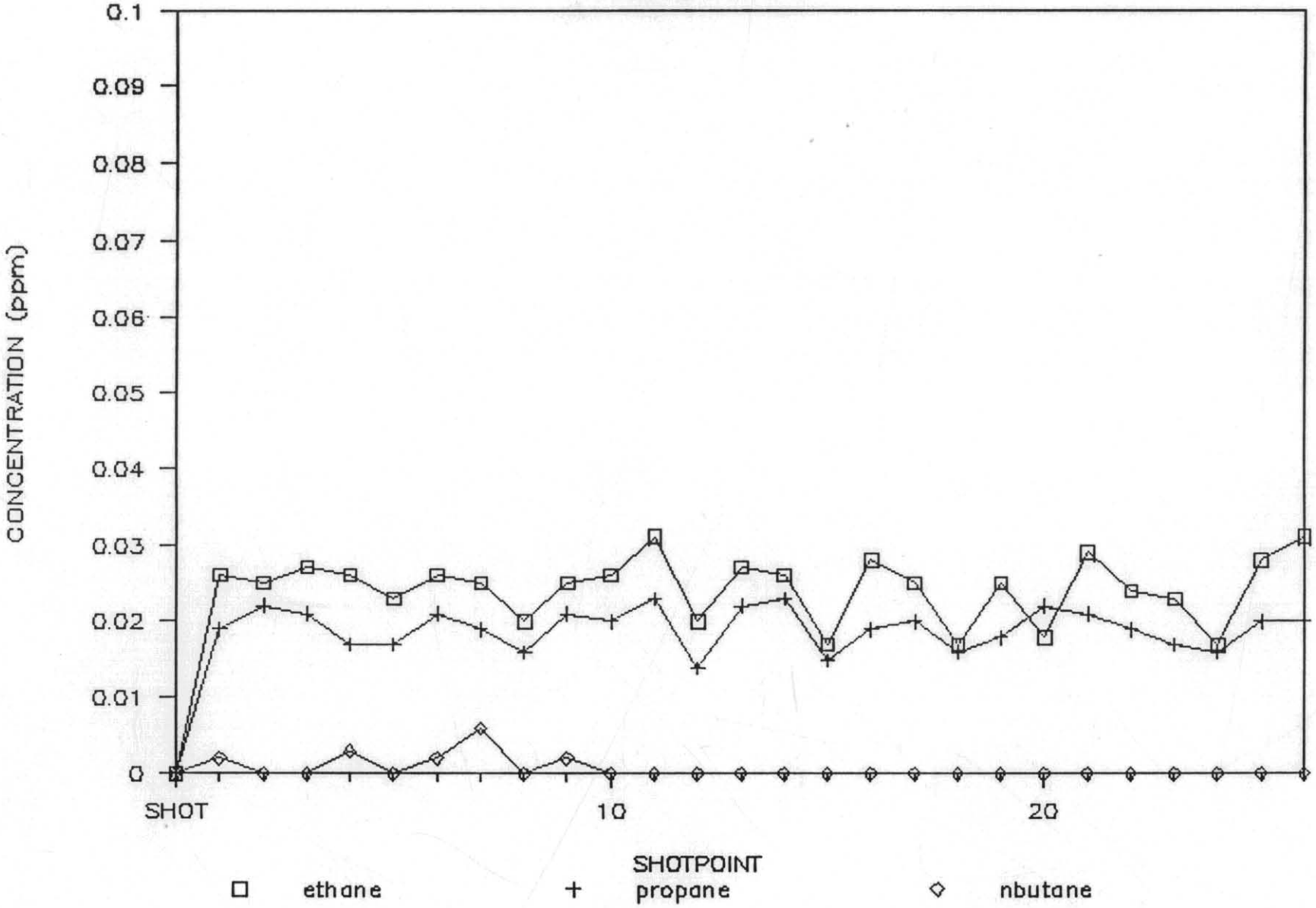

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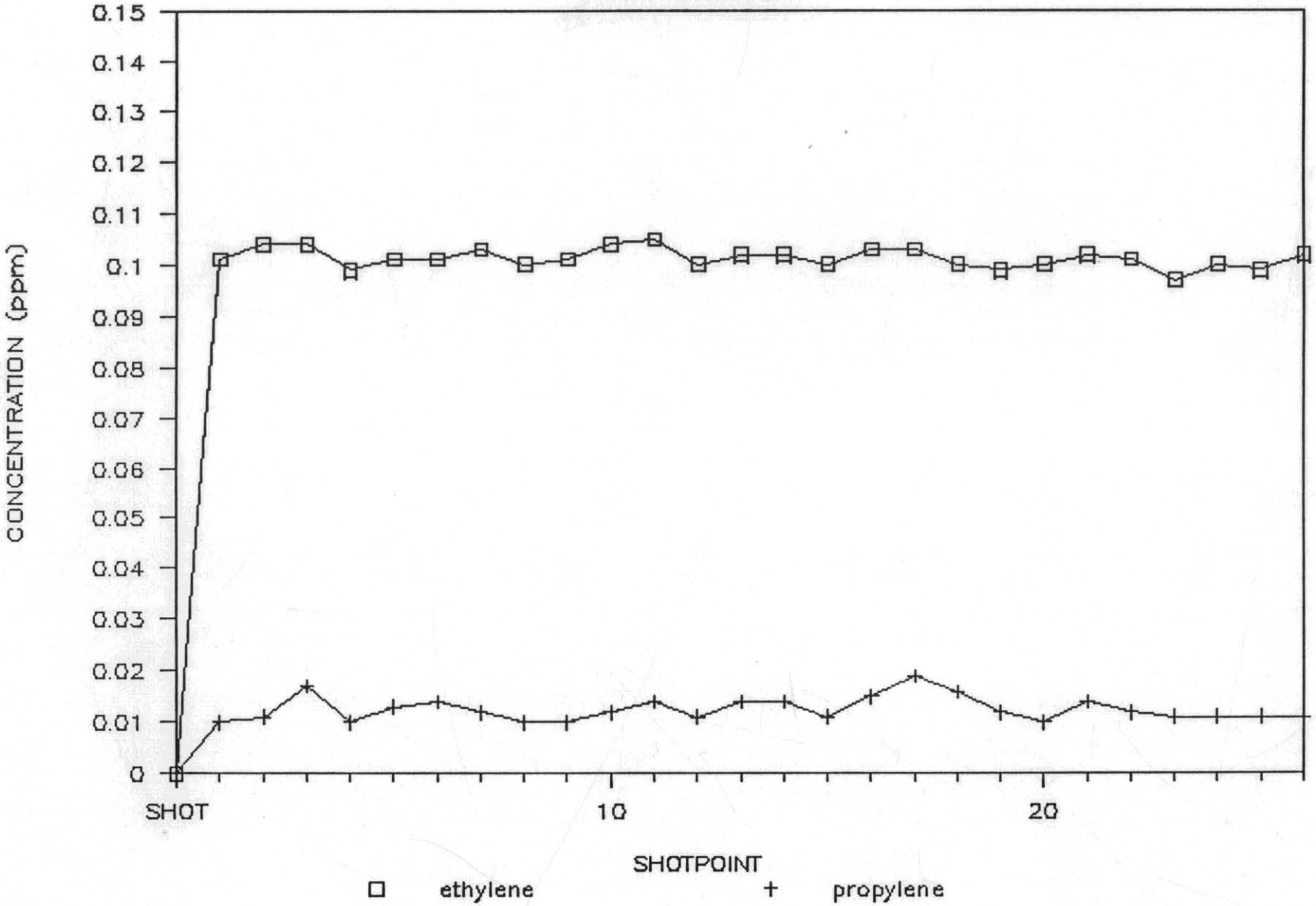

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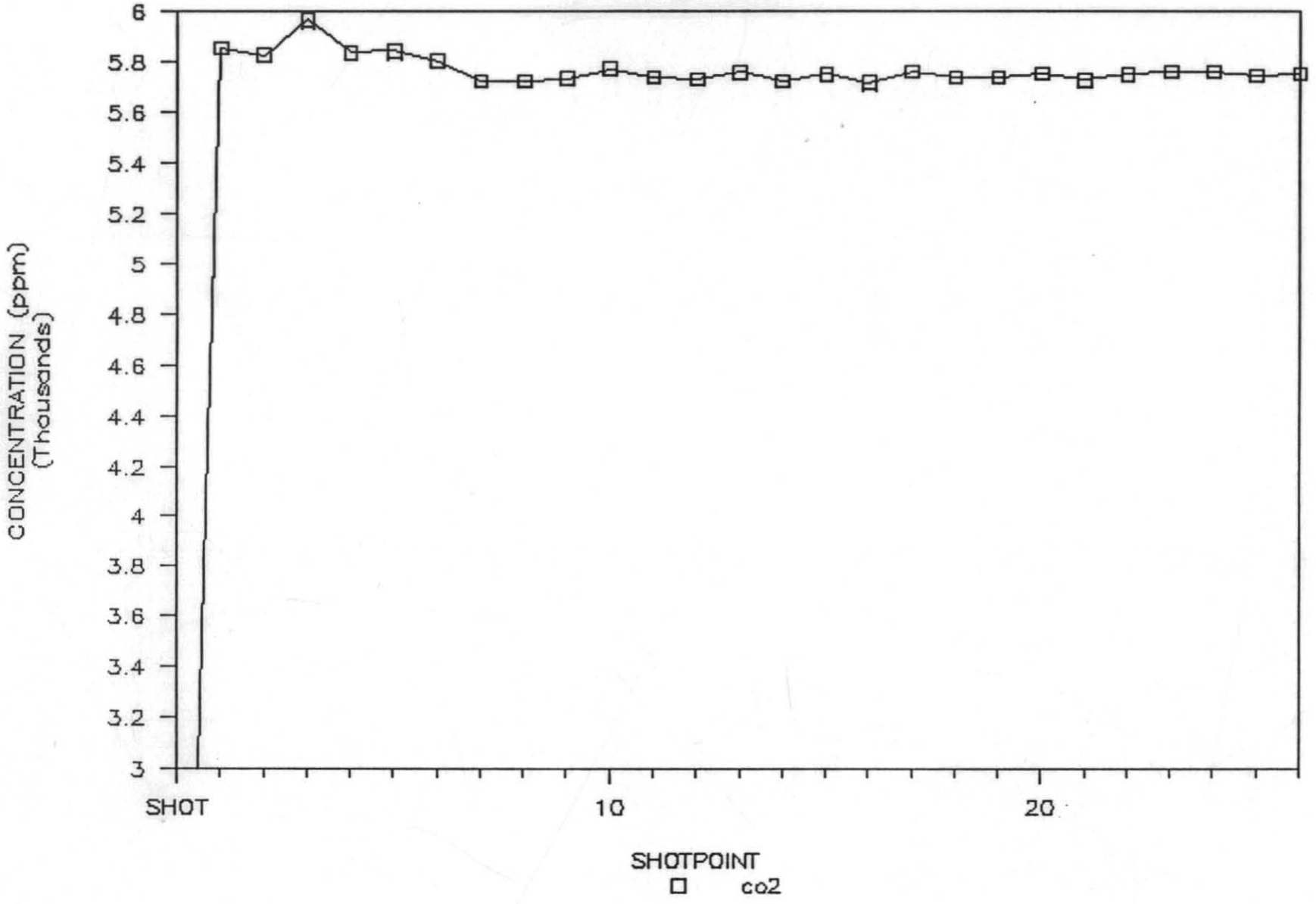

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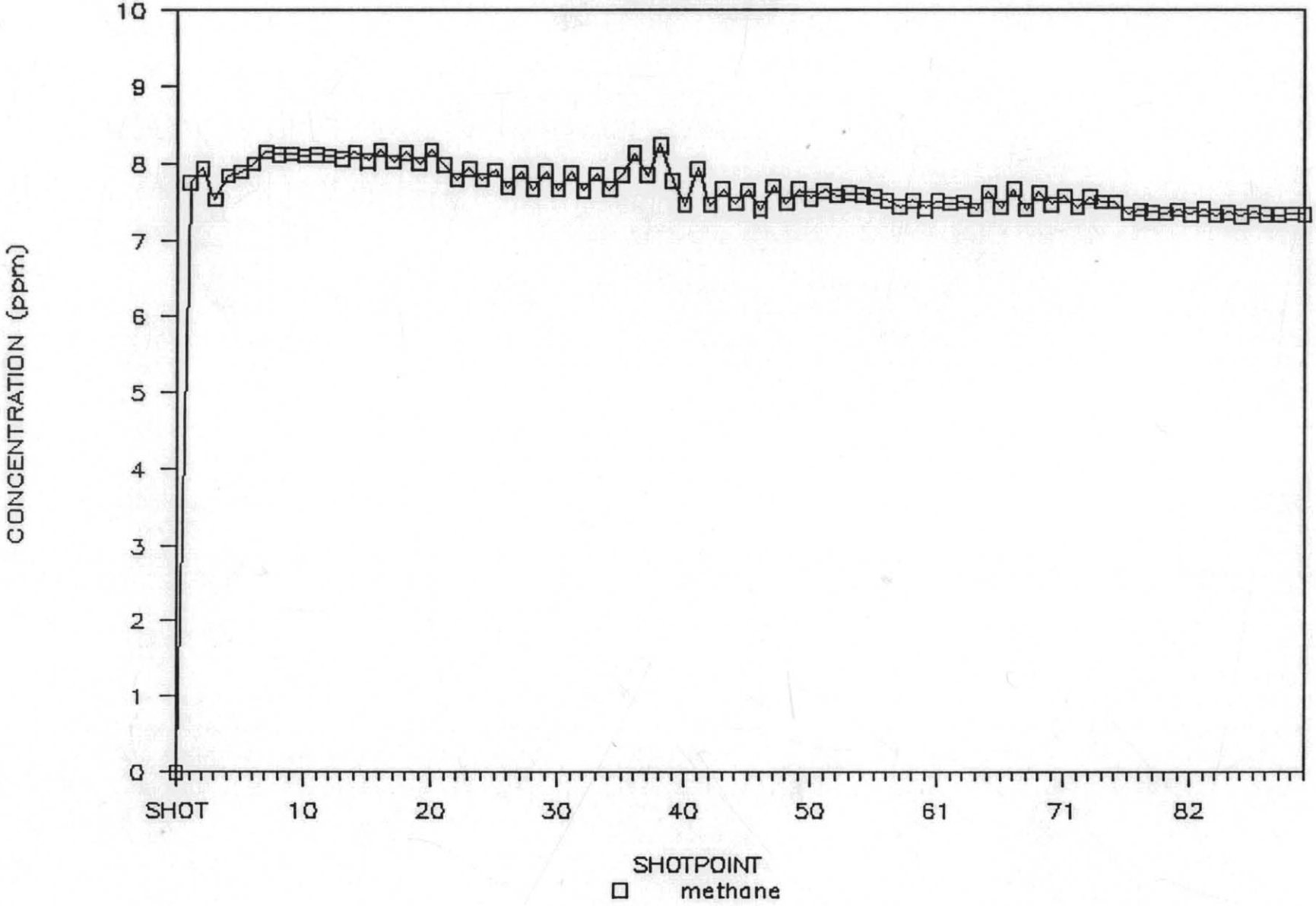

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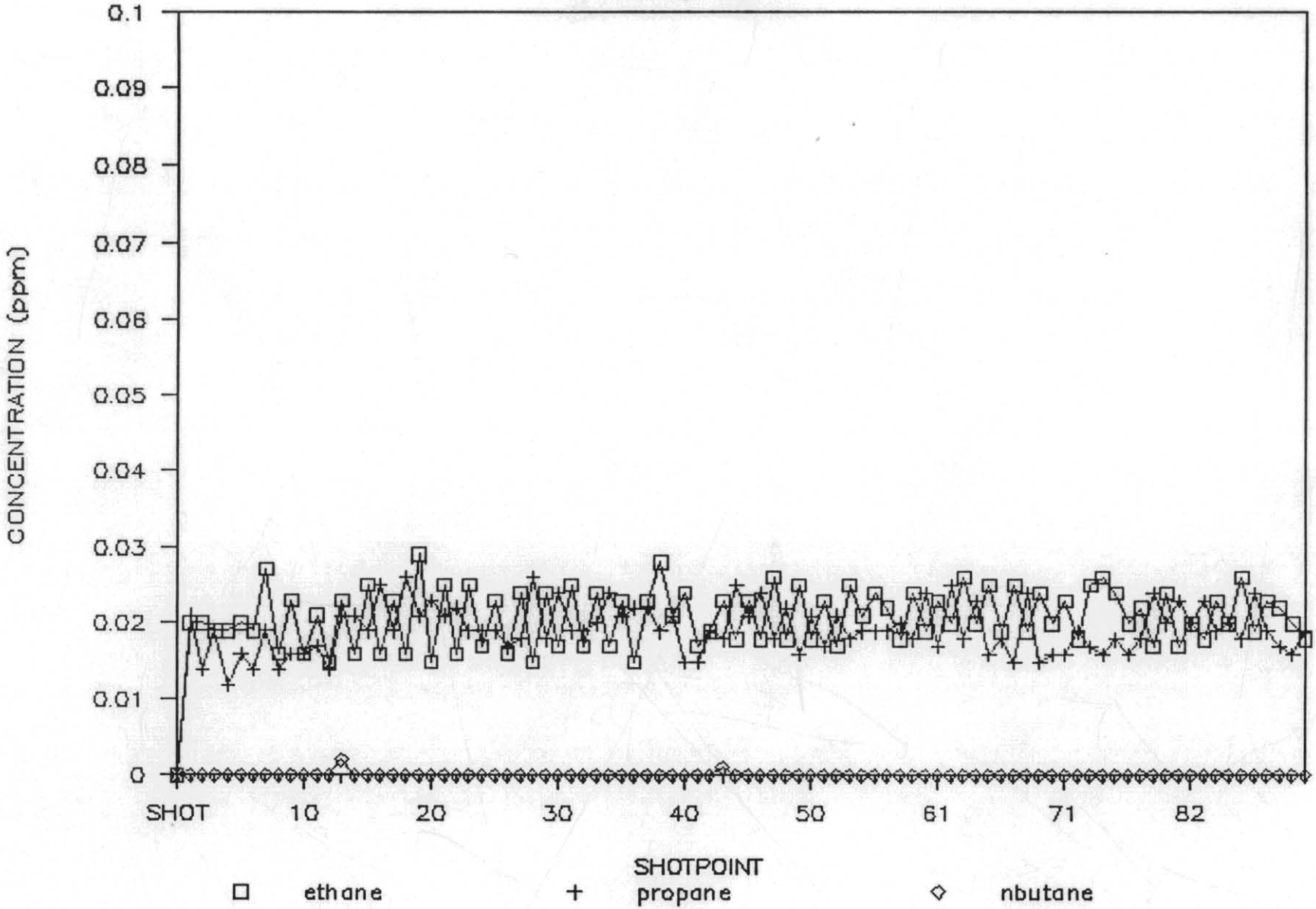

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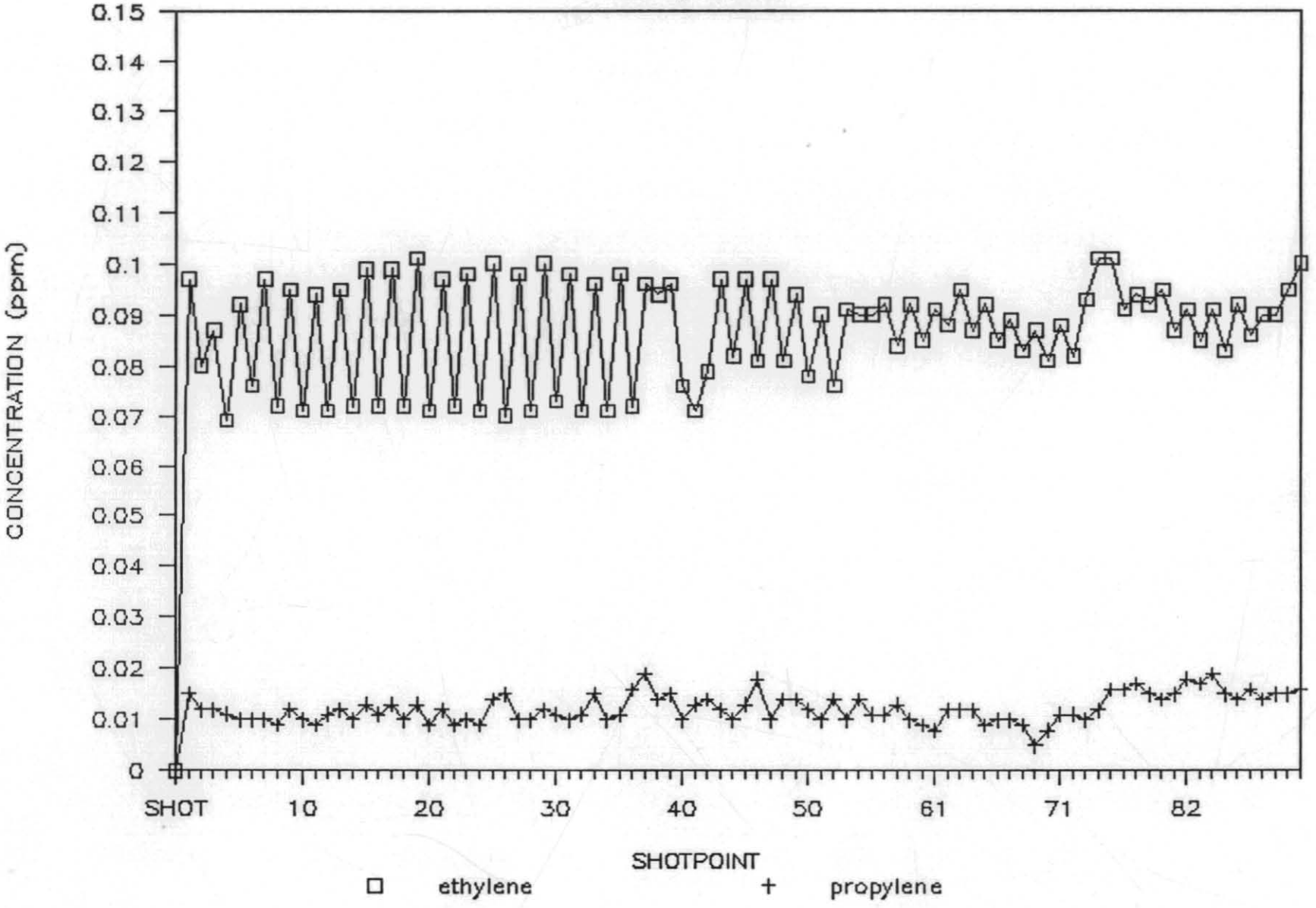

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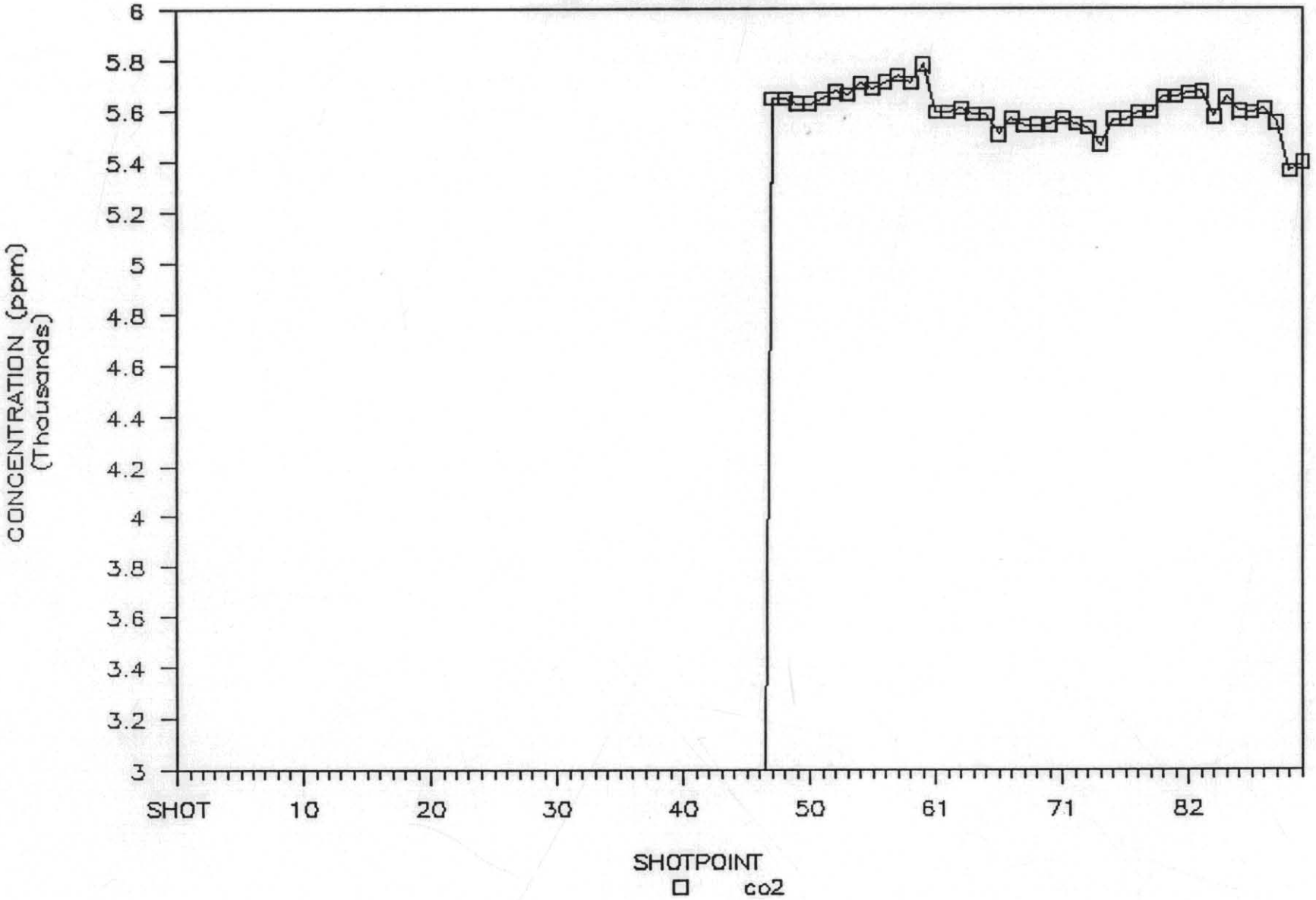

BASS BASIN

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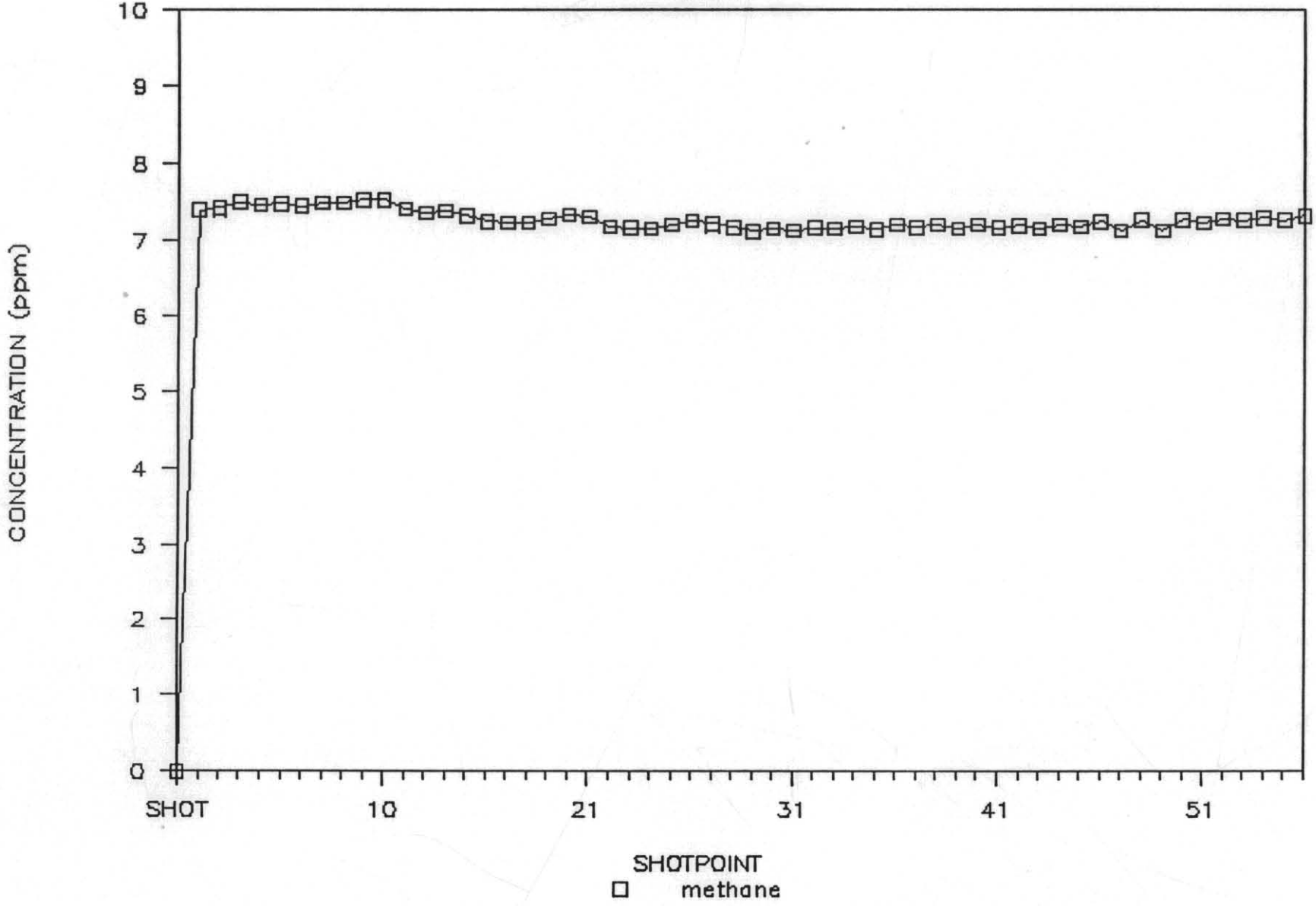

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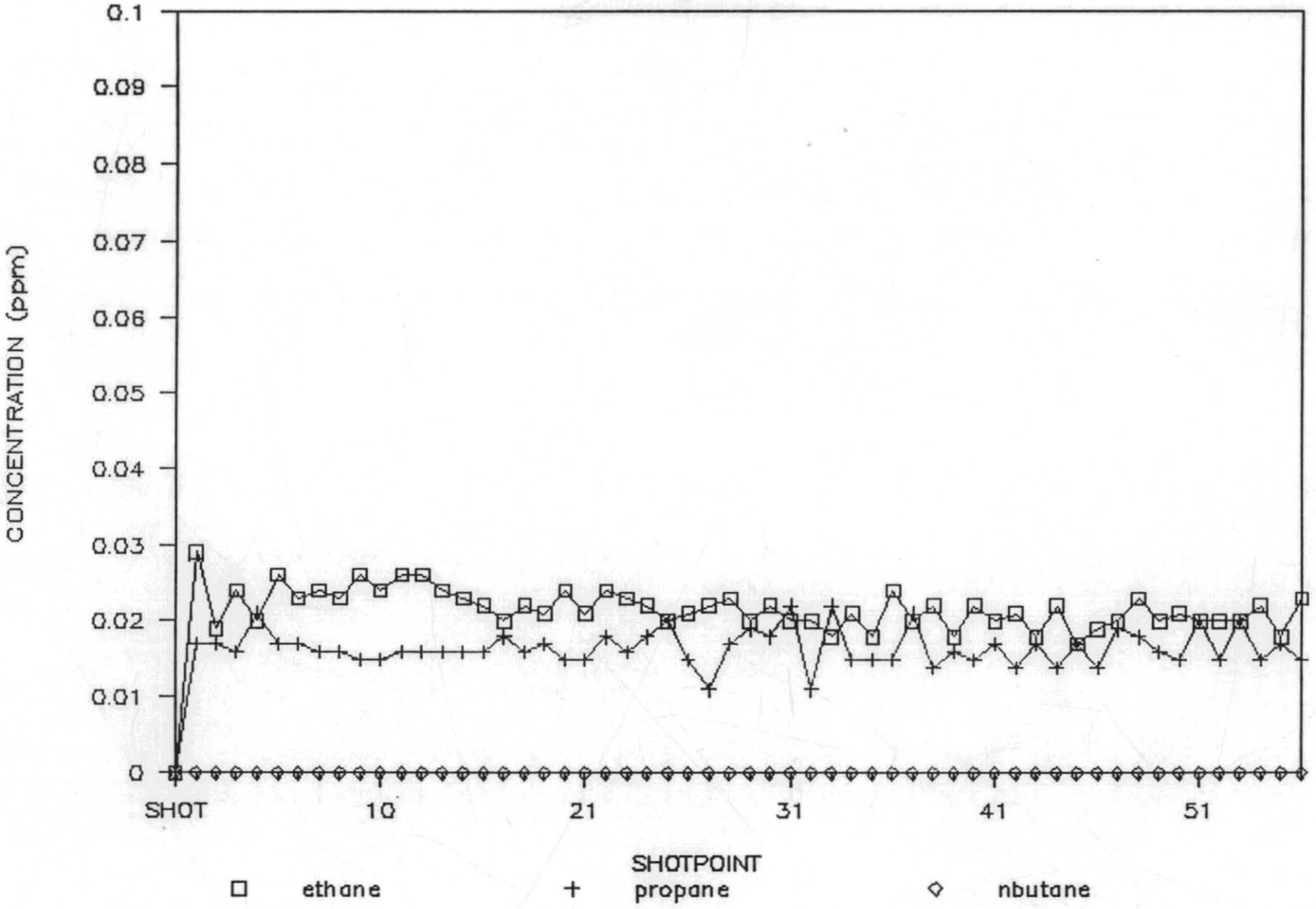

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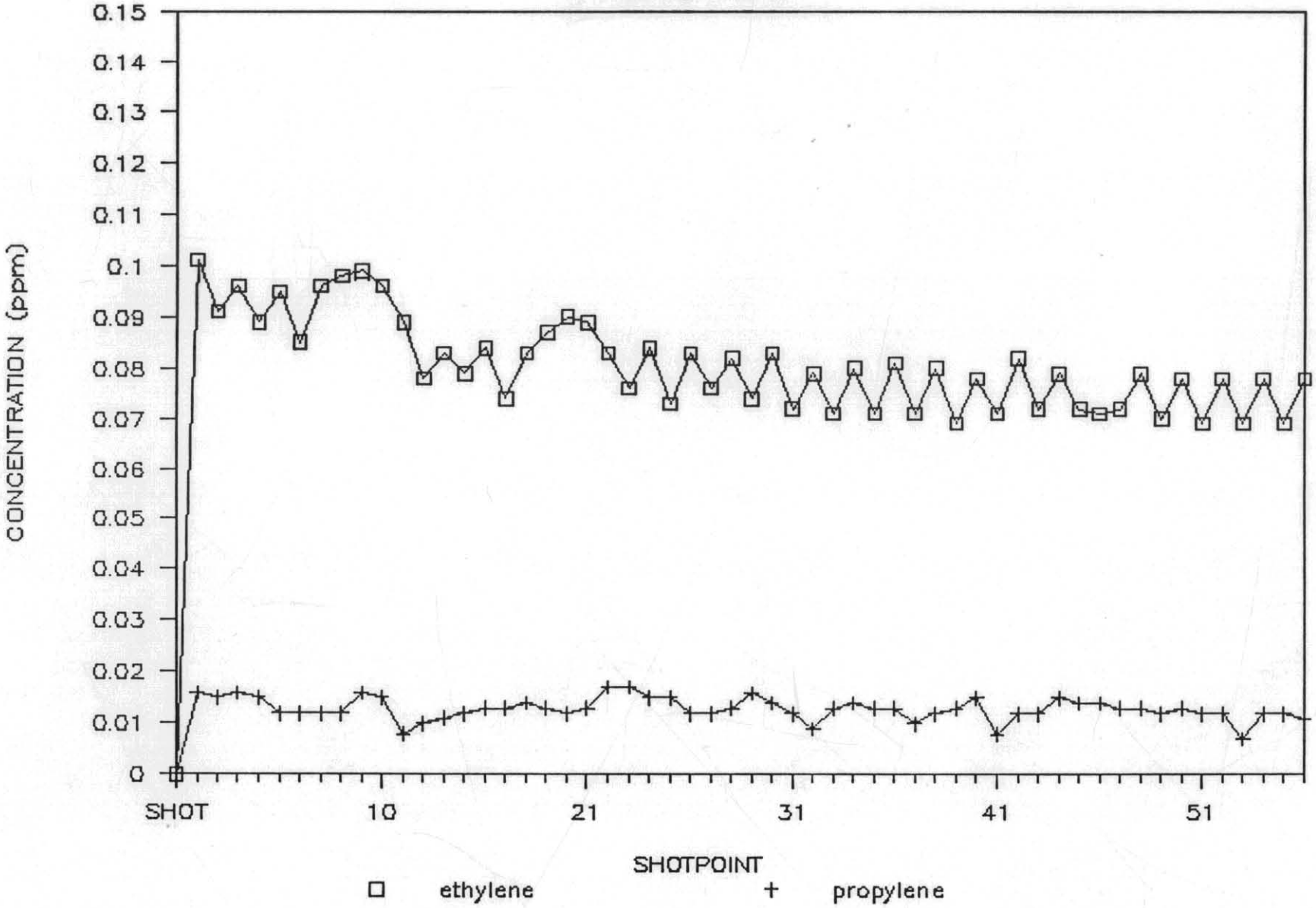

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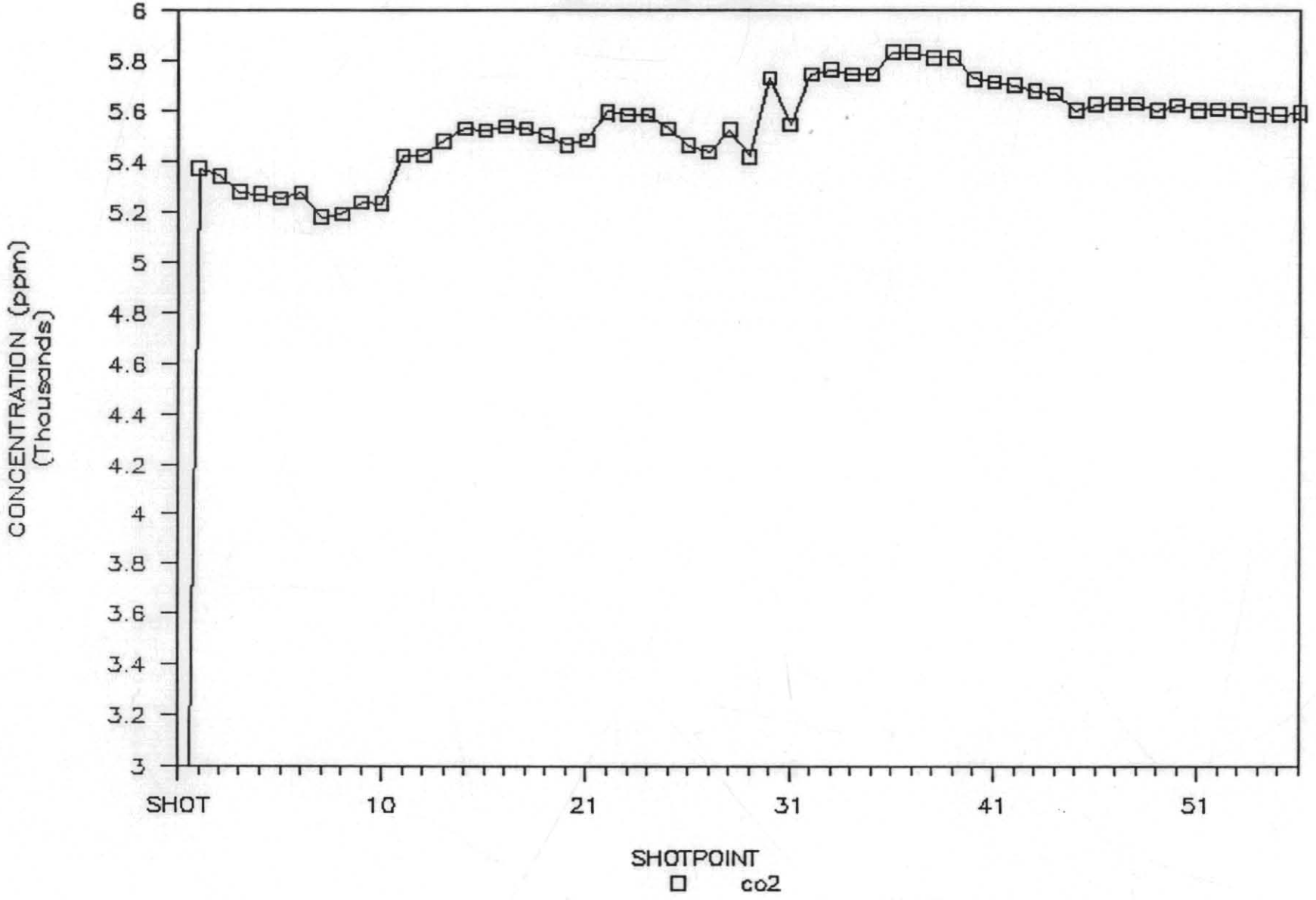

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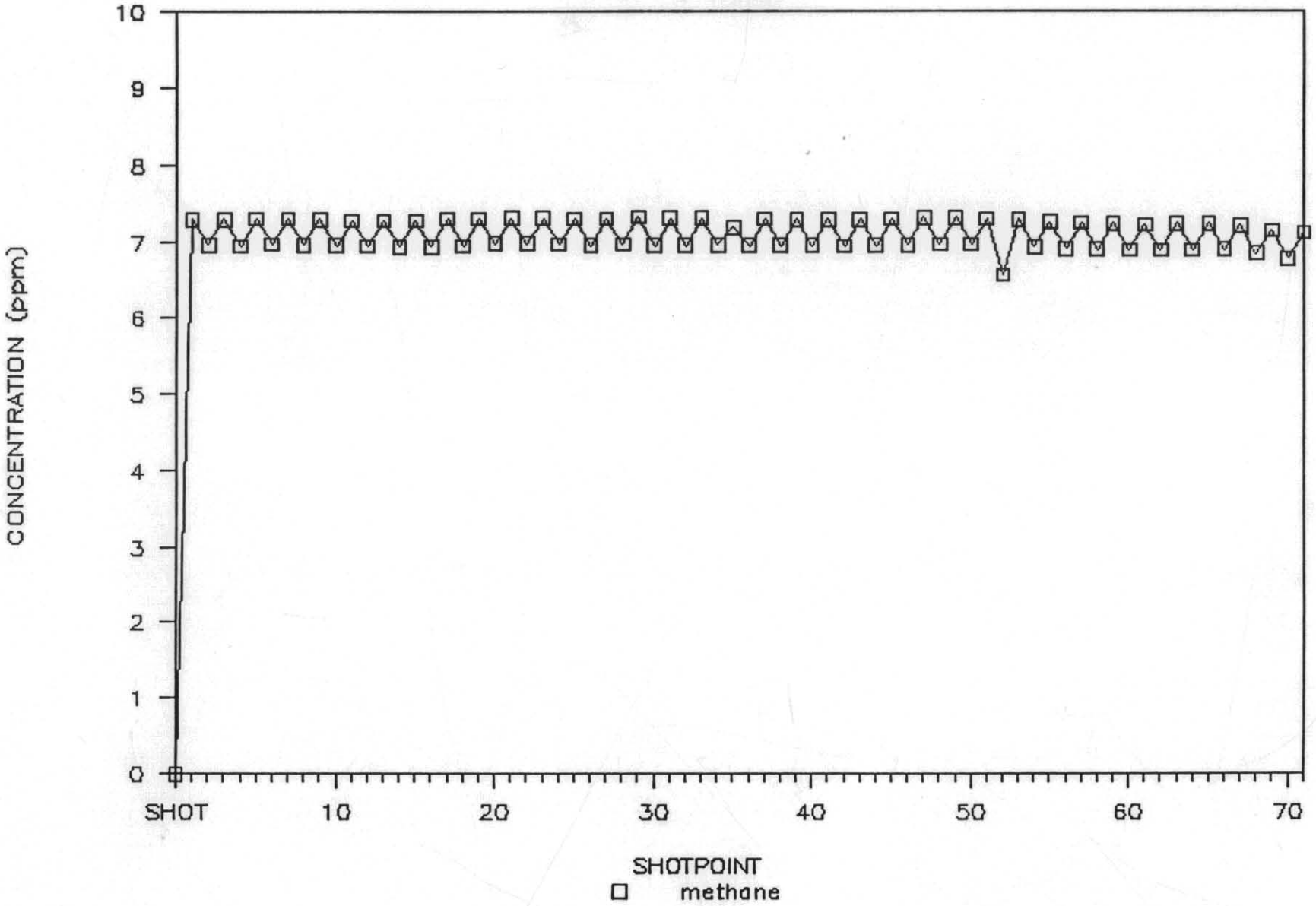

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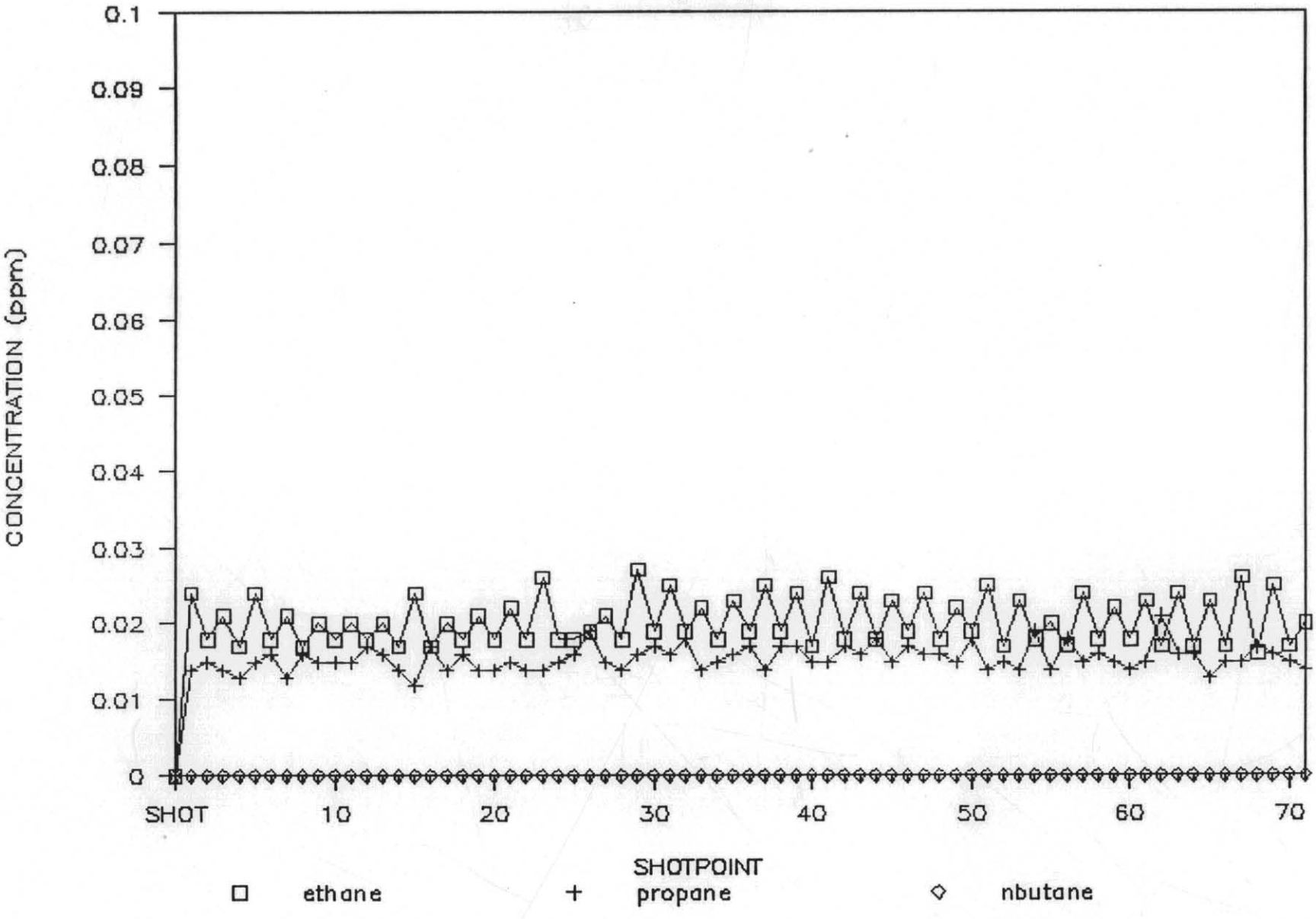

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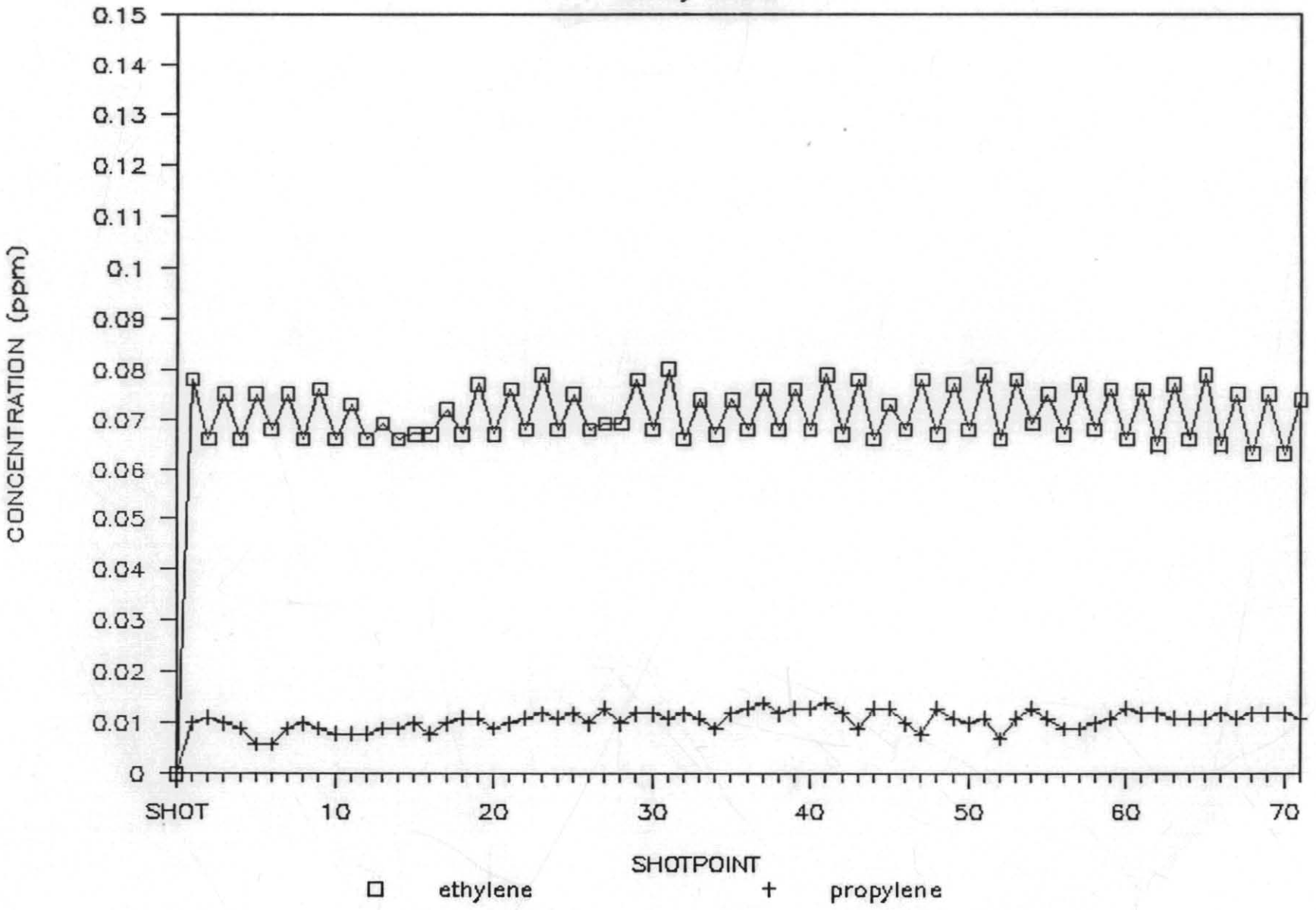

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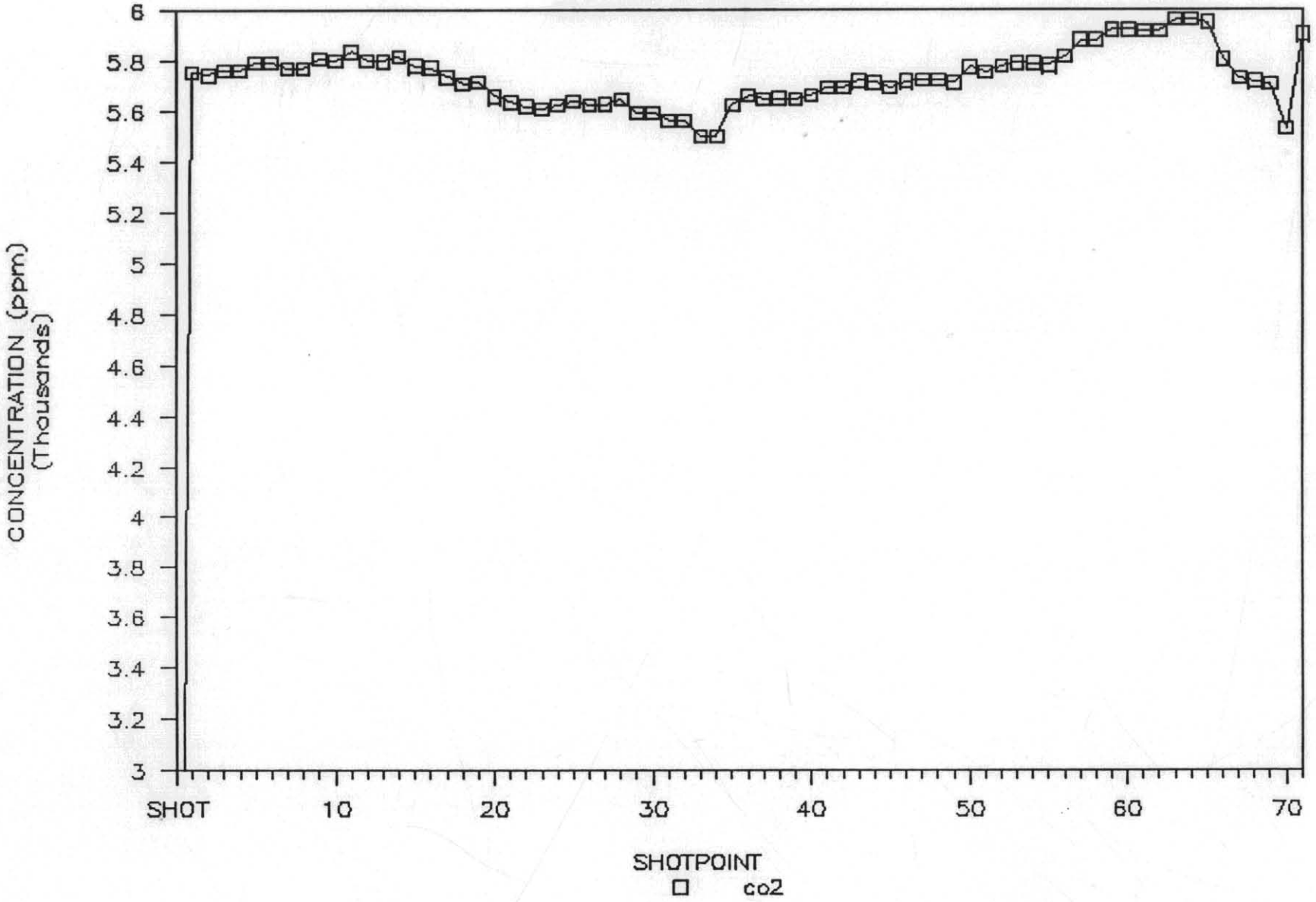

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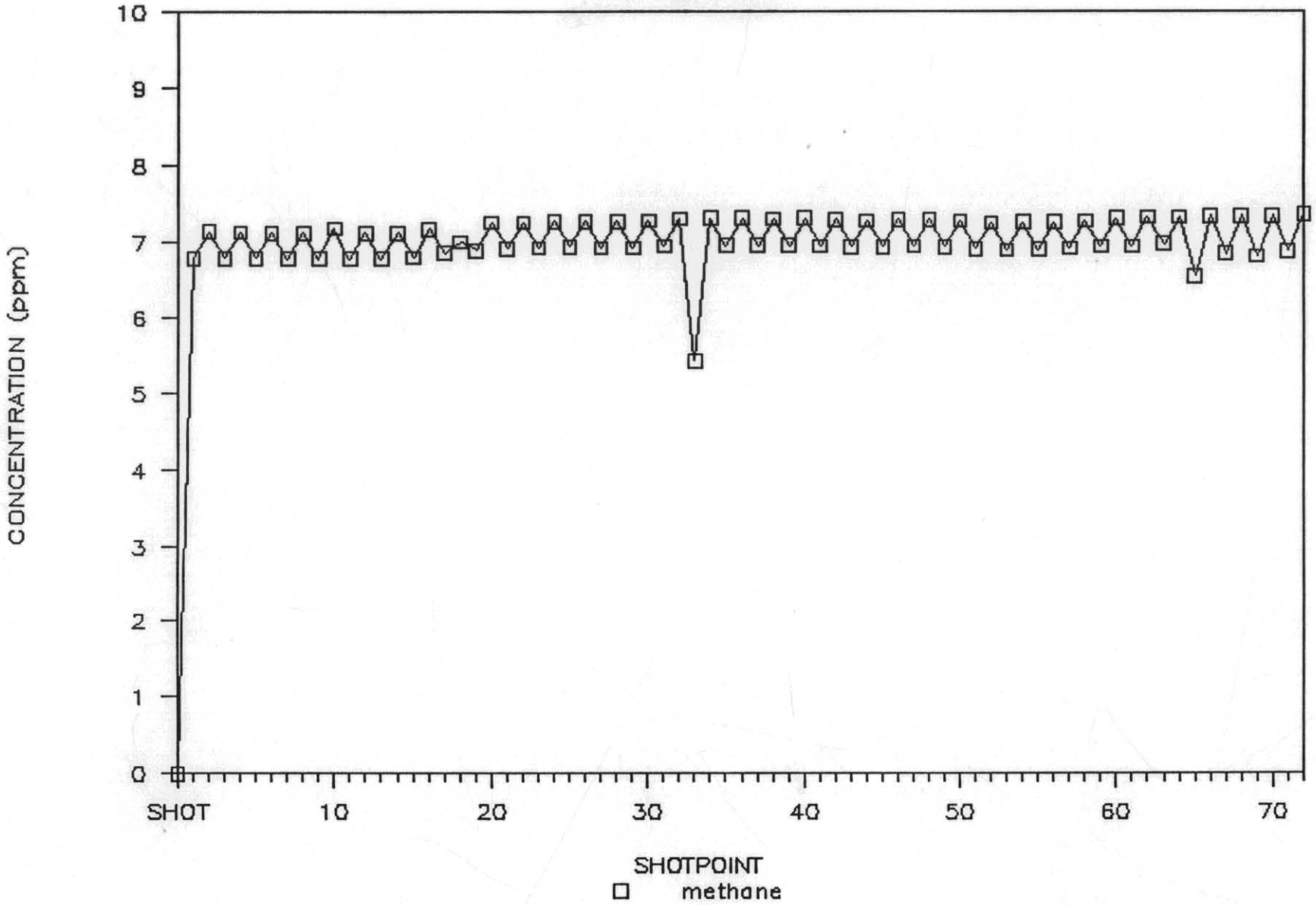

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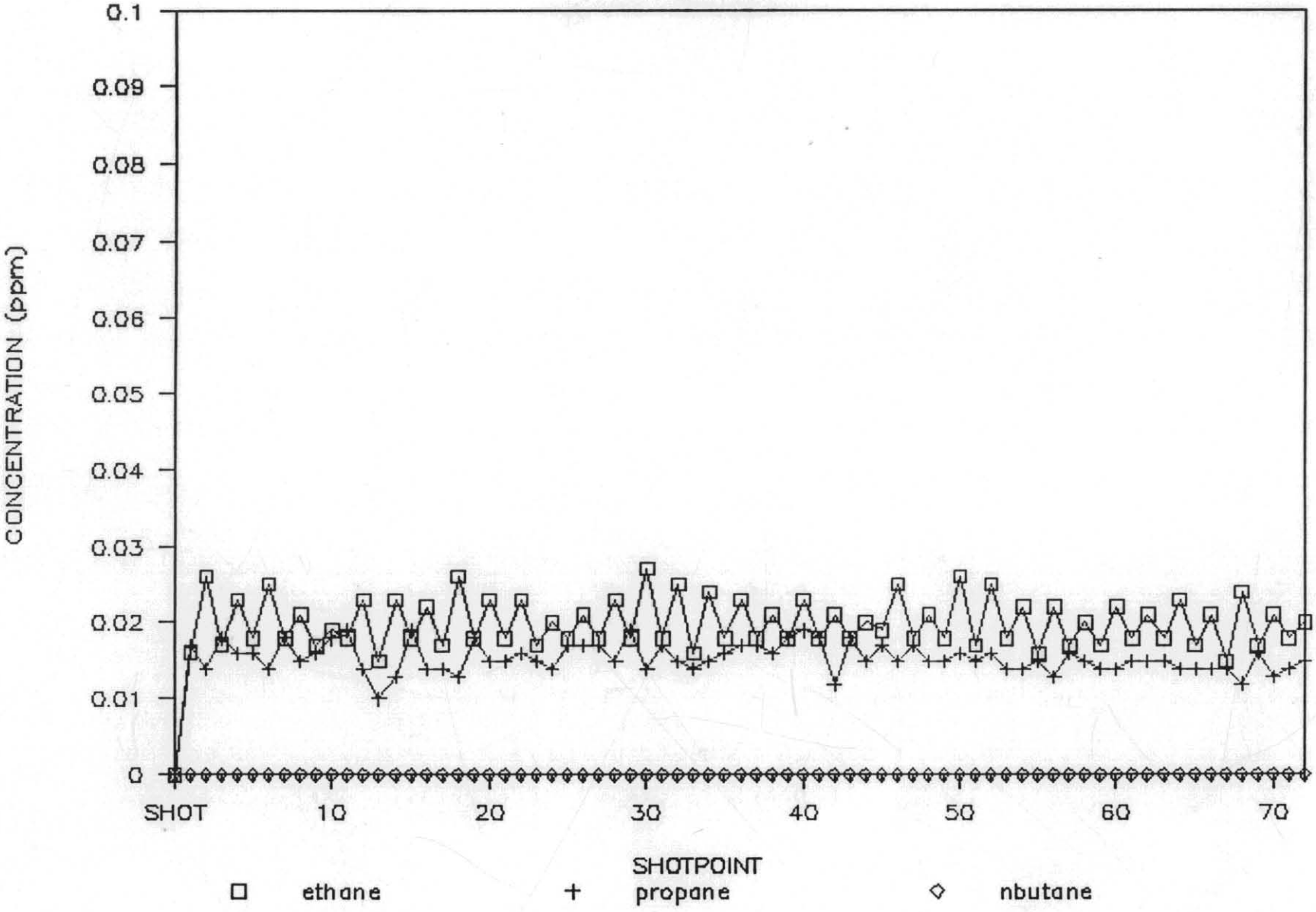

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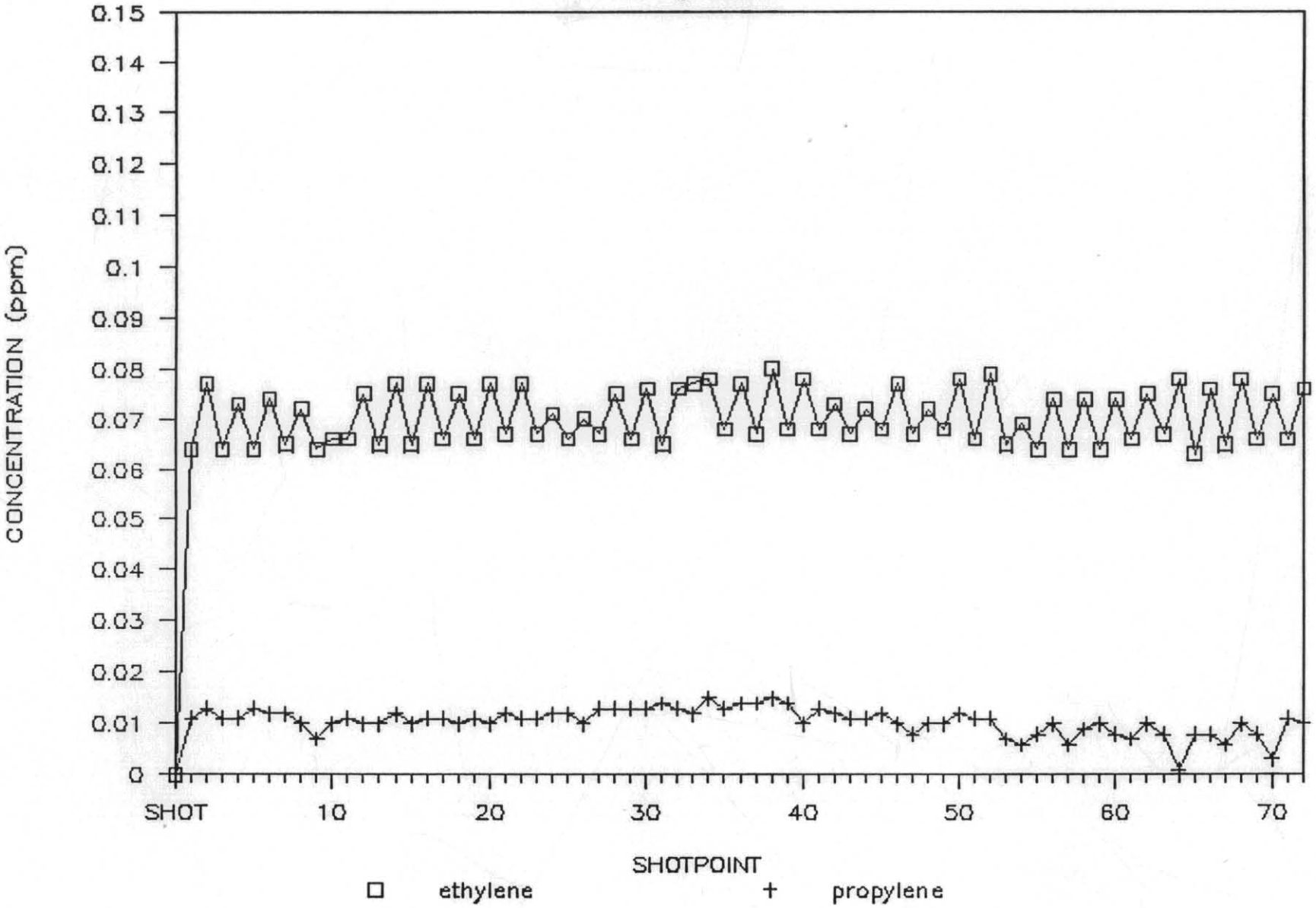

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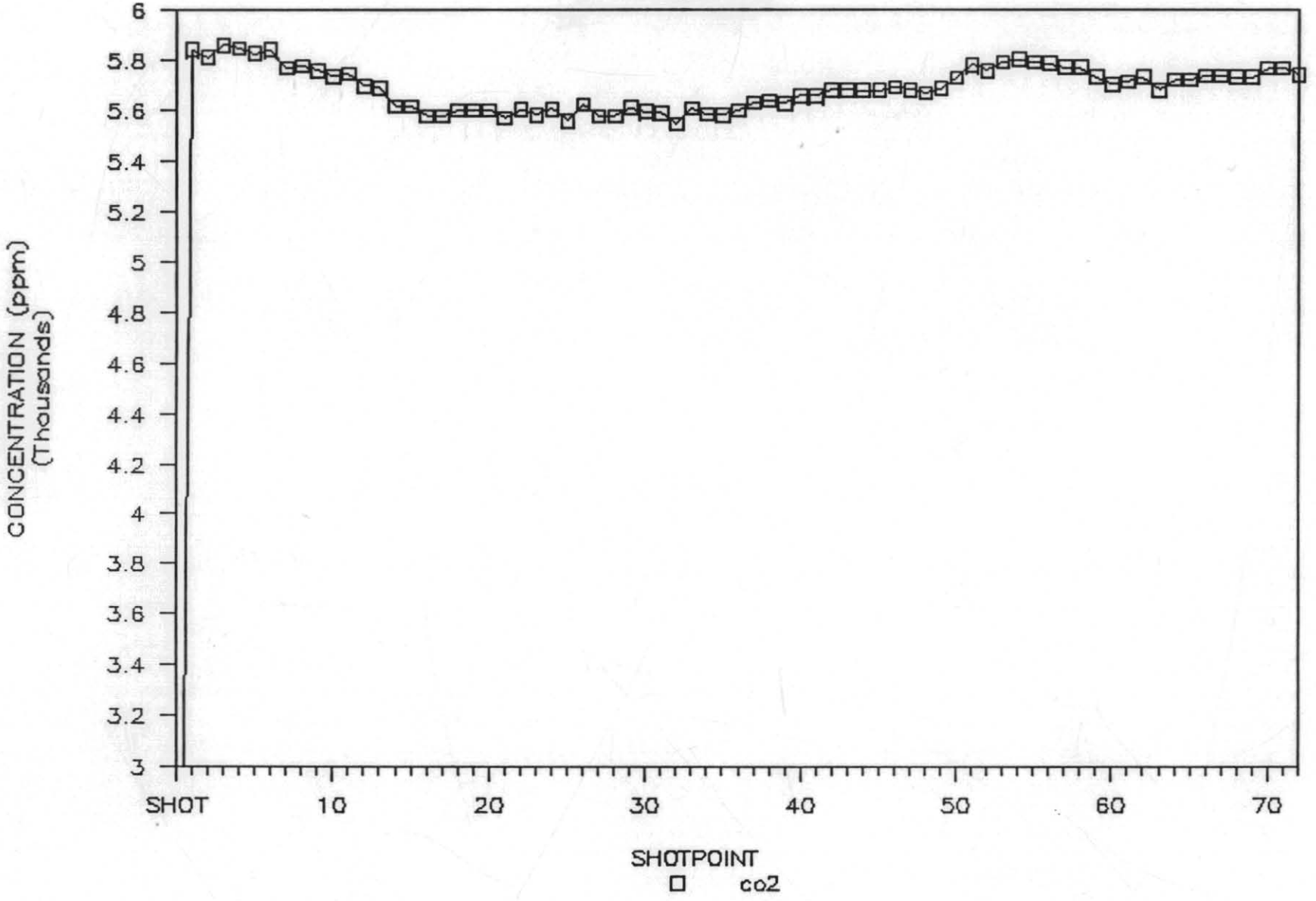

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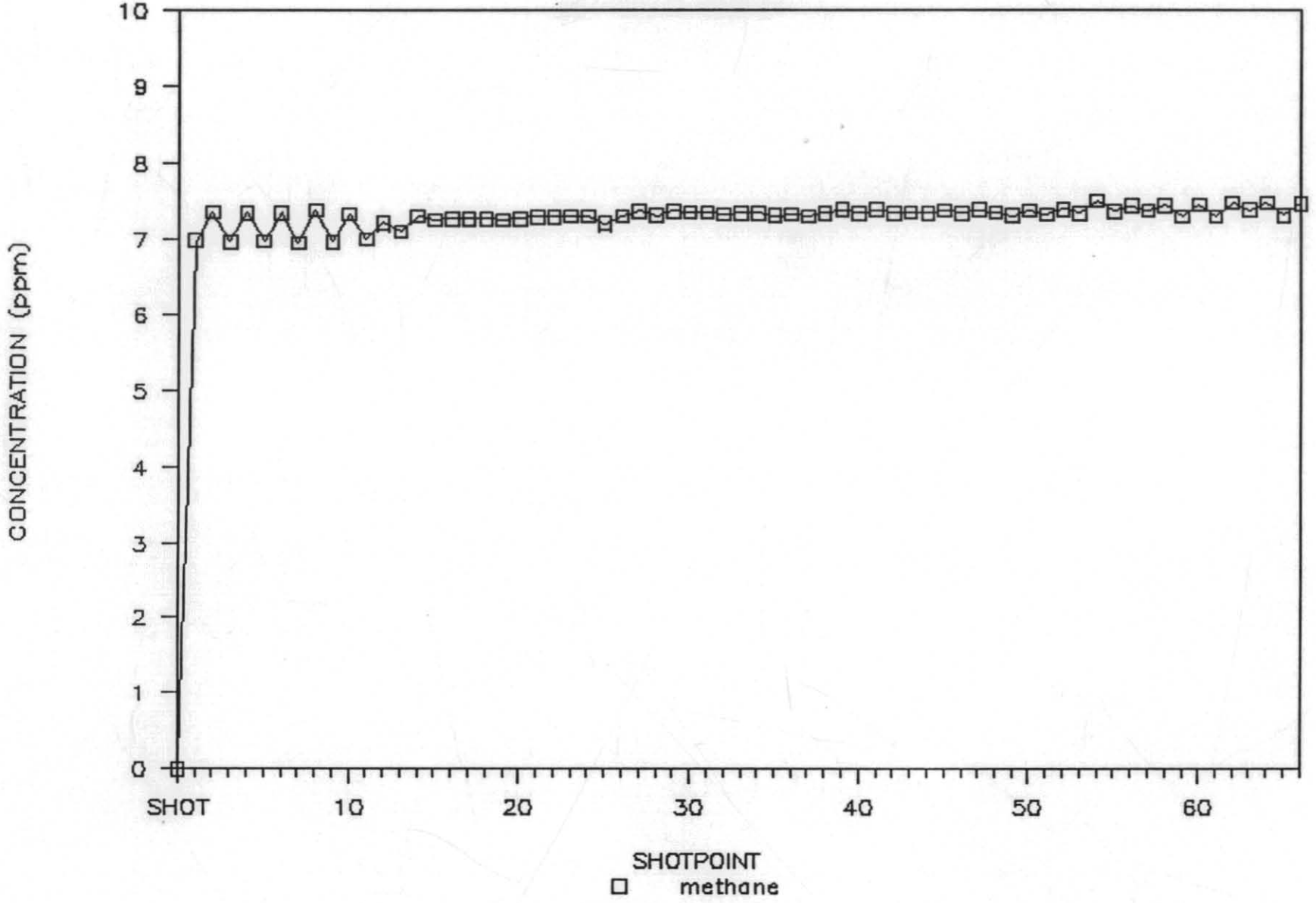

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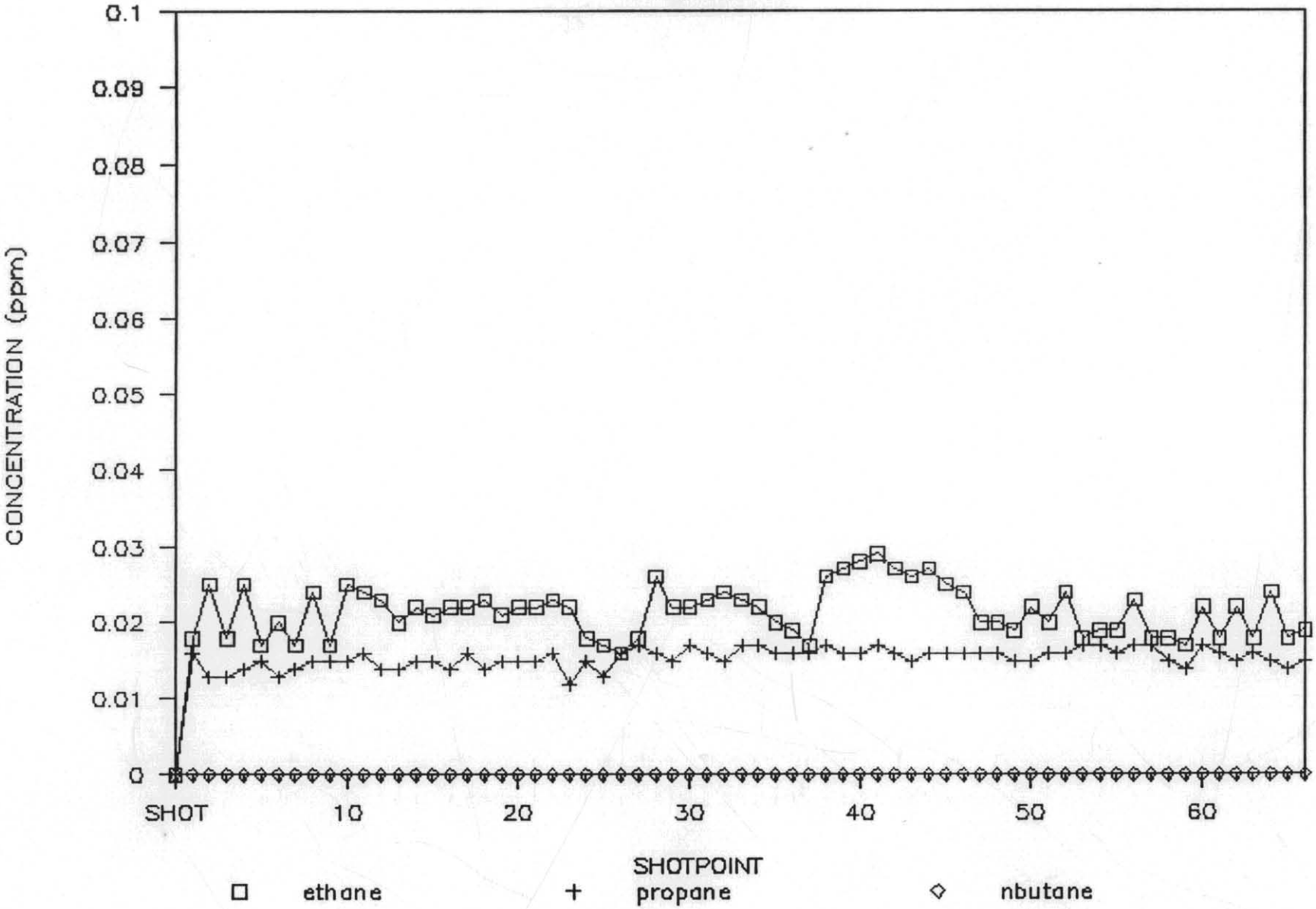

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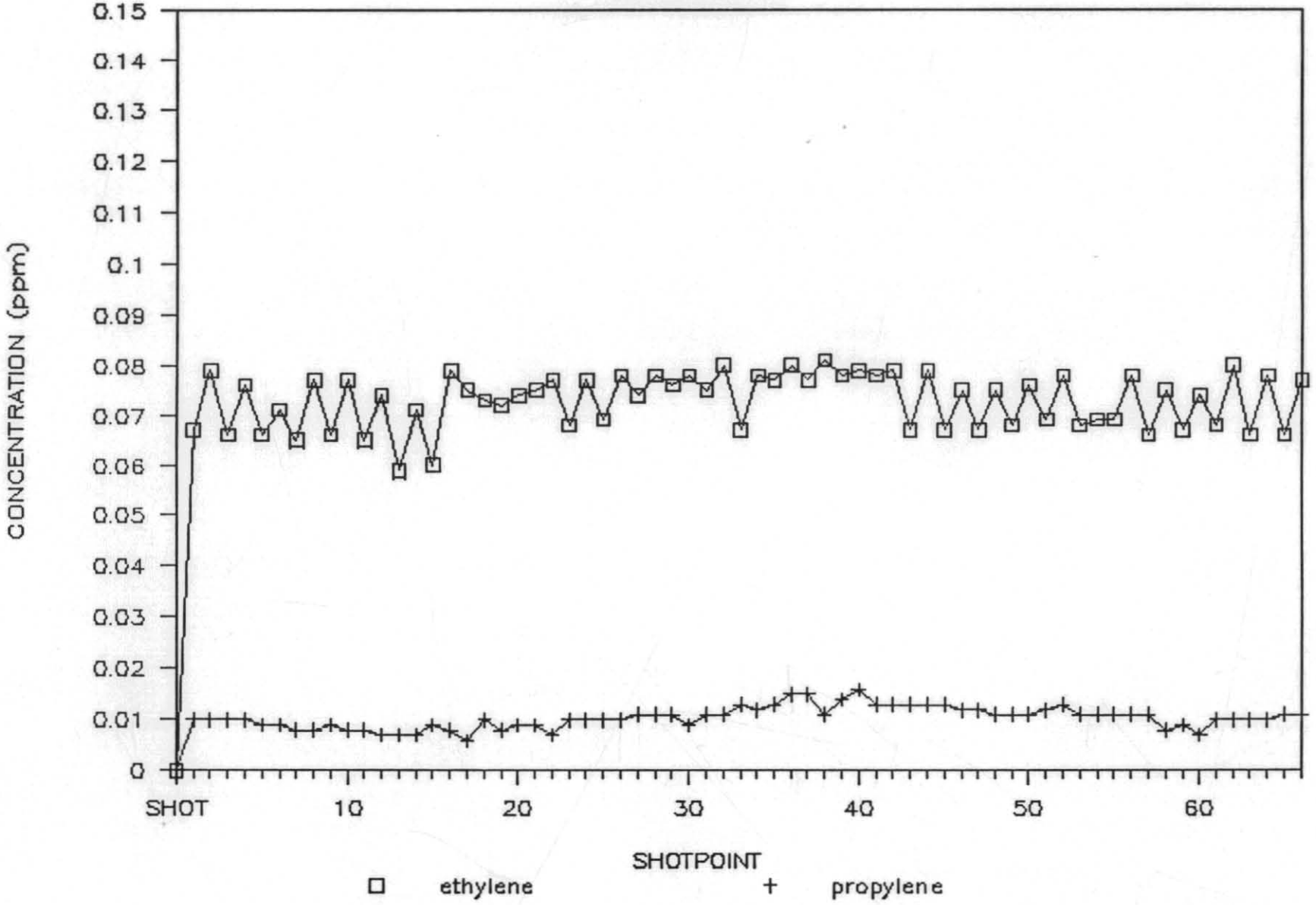

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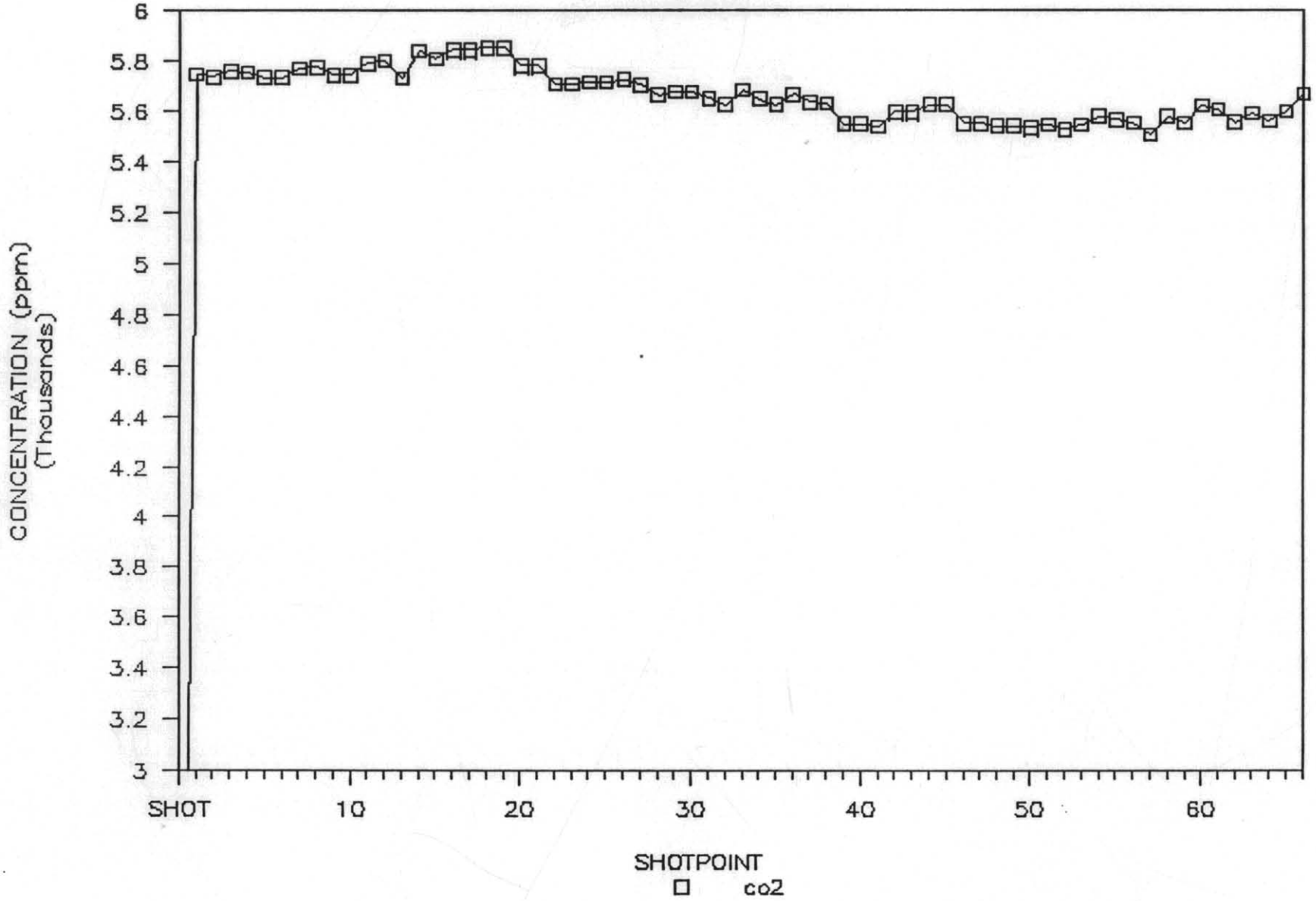

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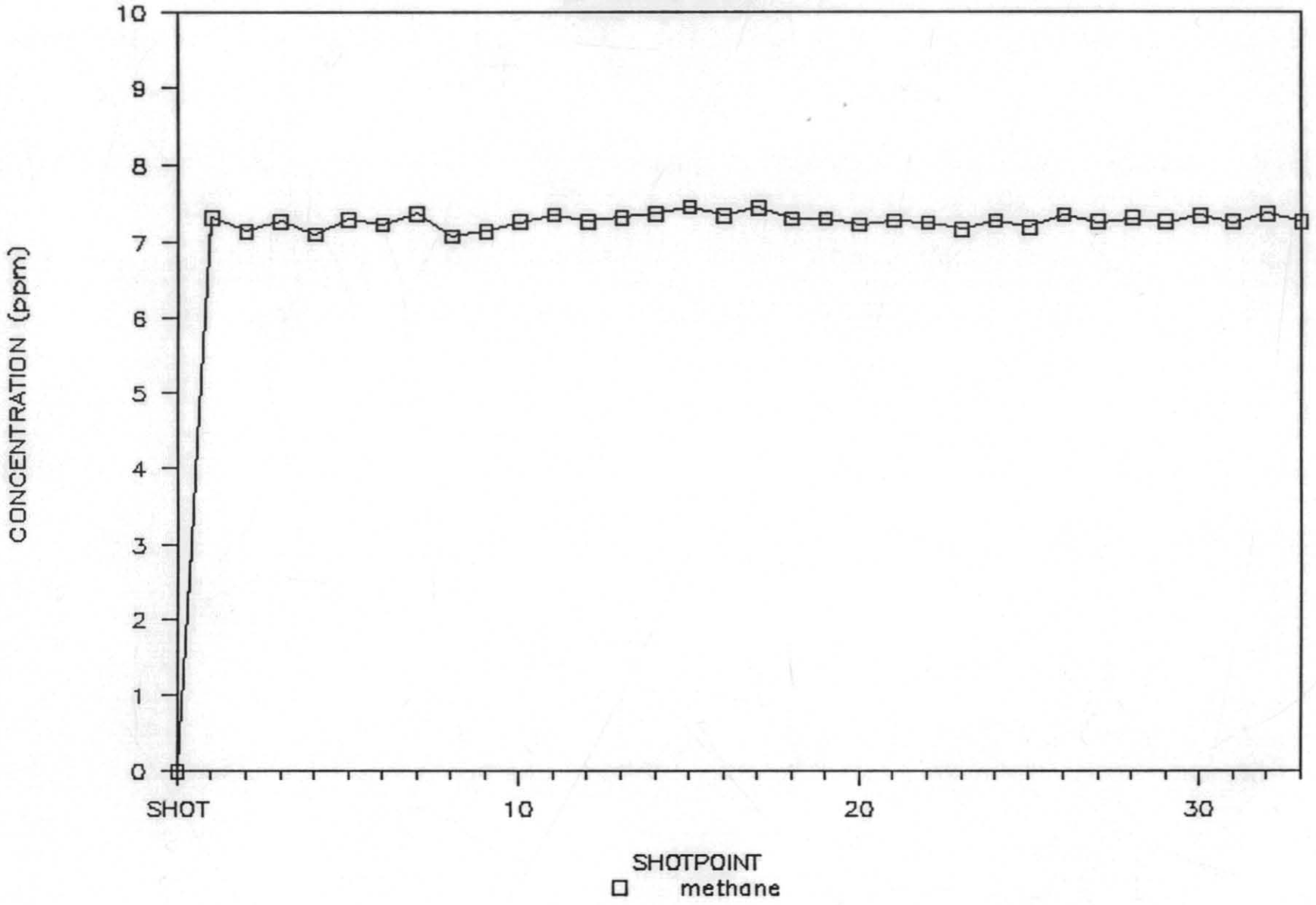

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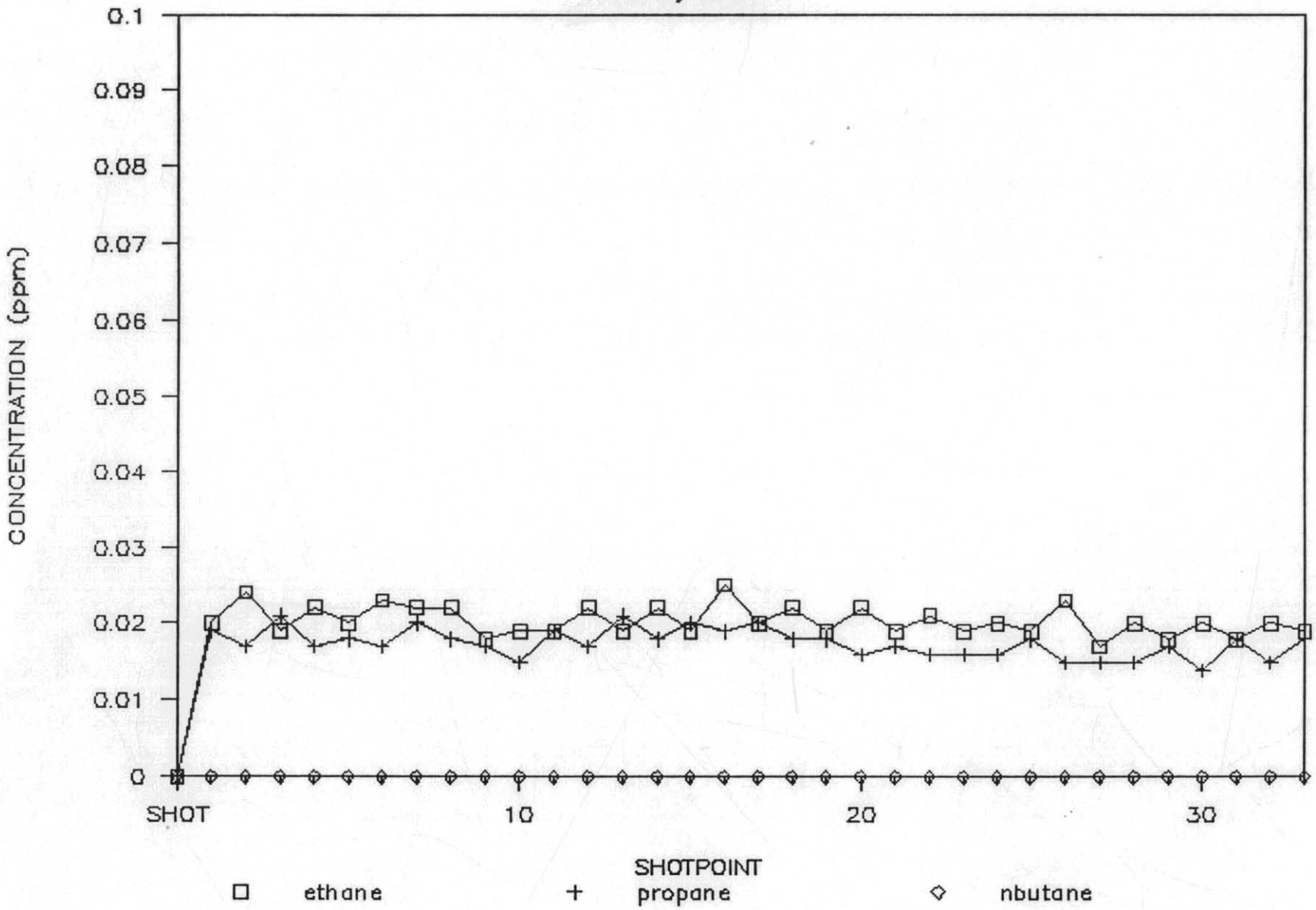

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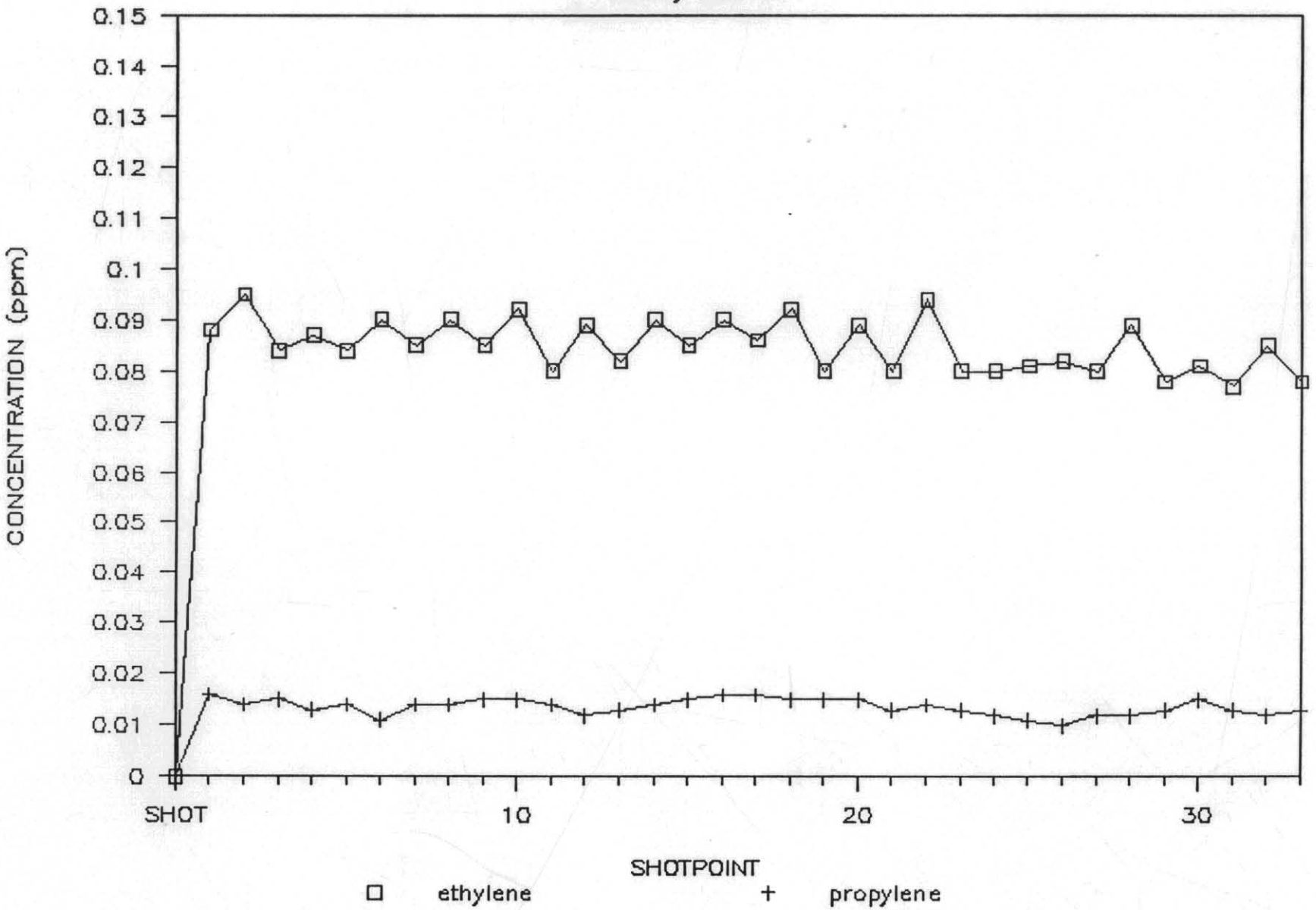

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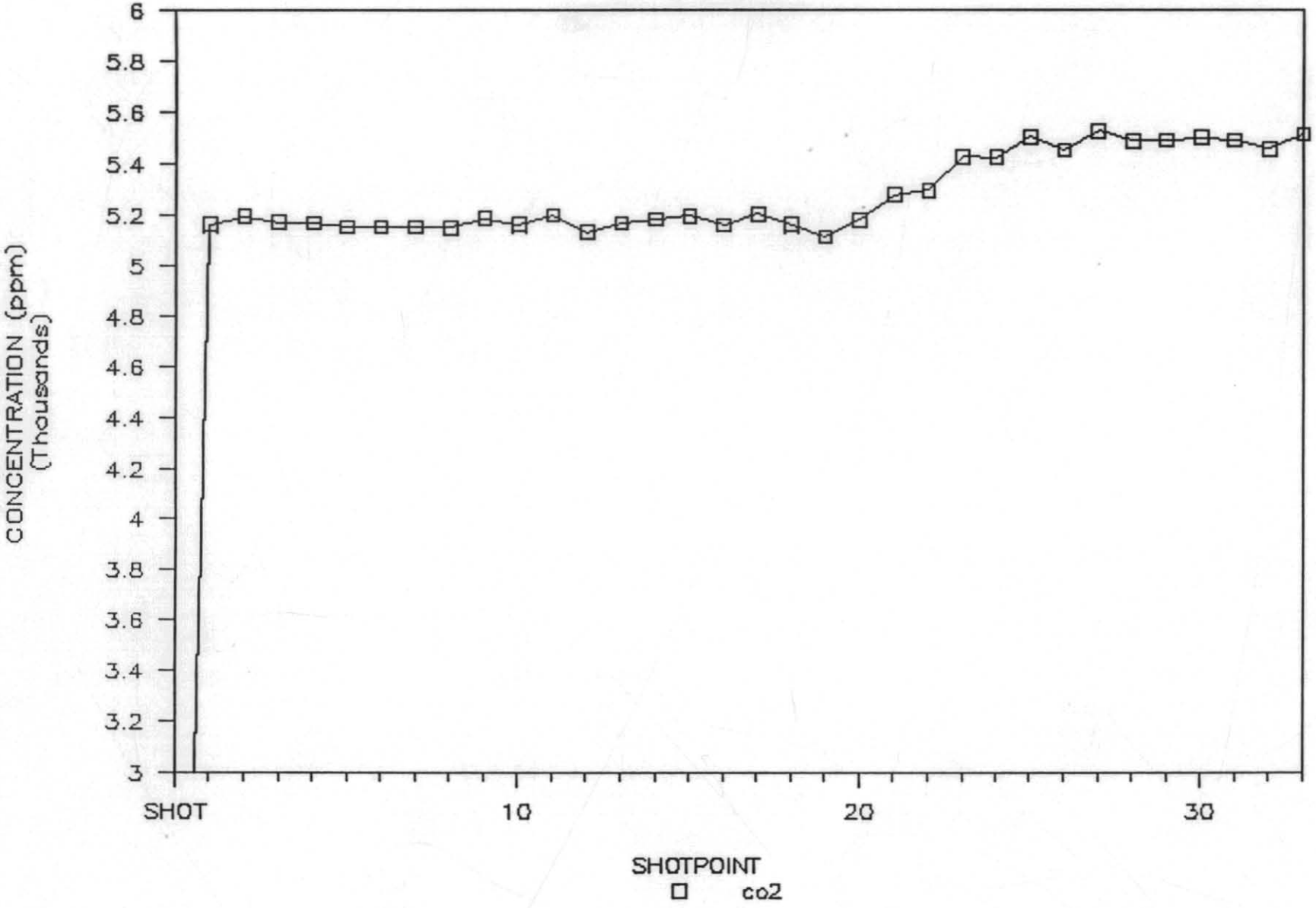

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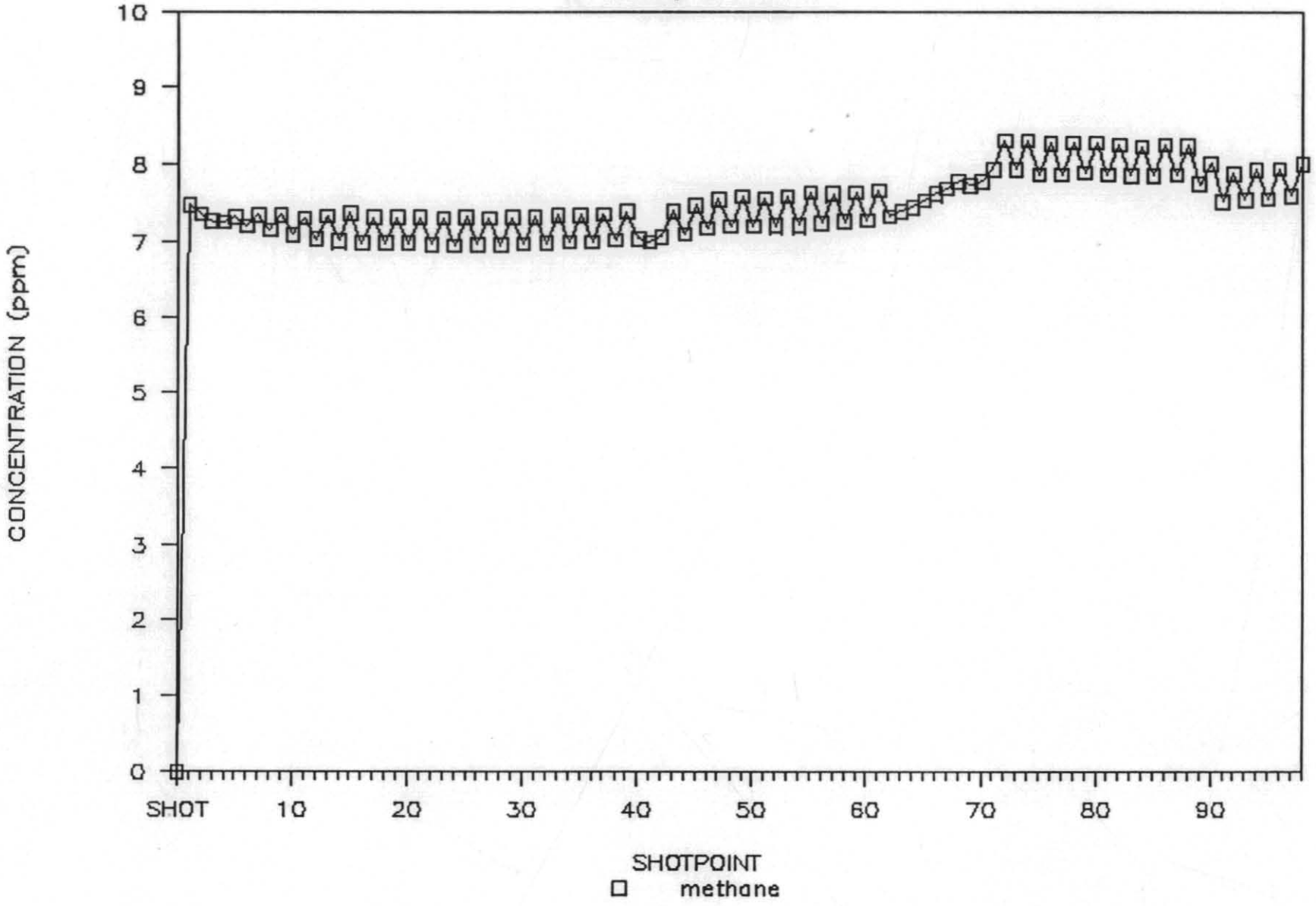

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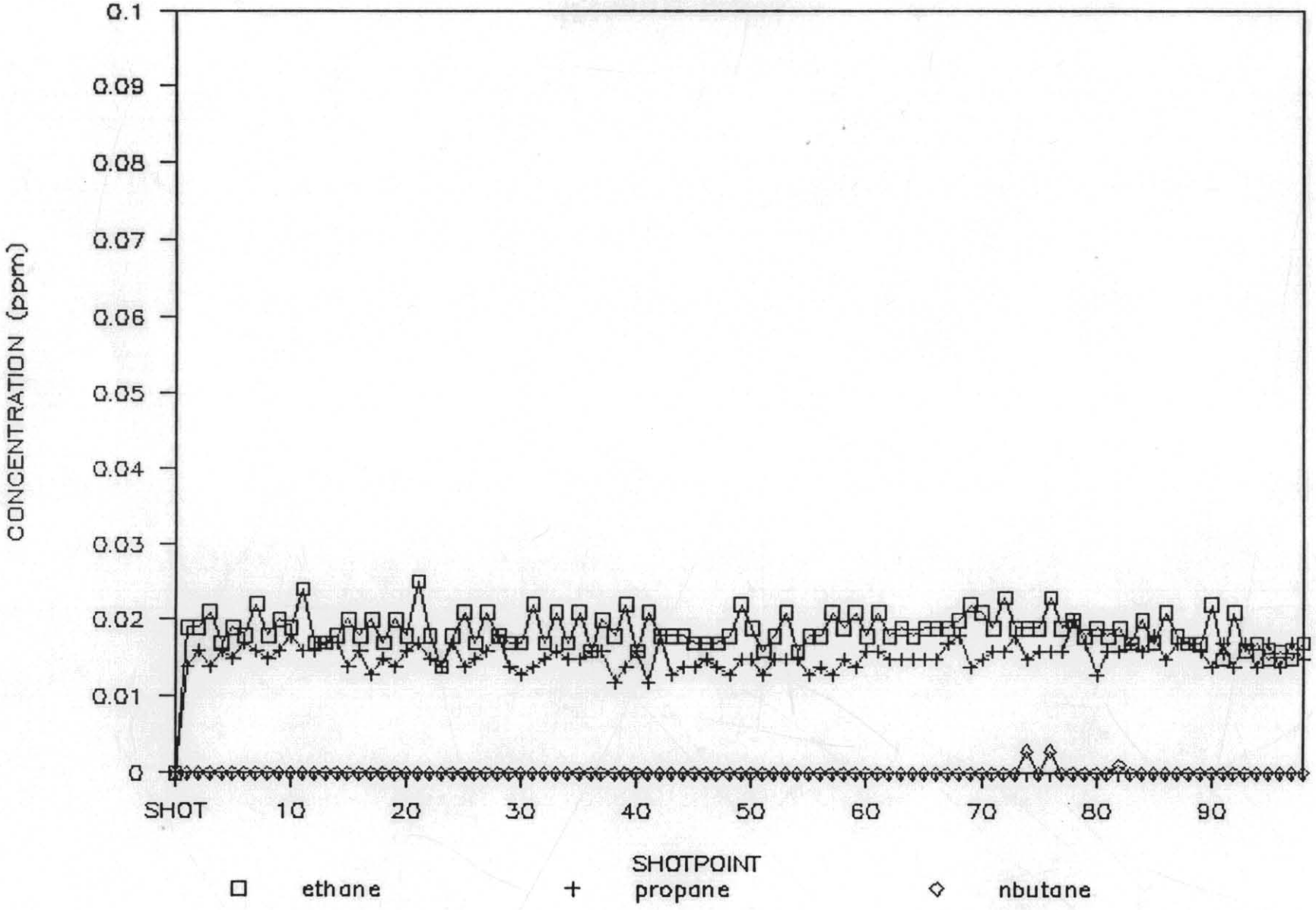

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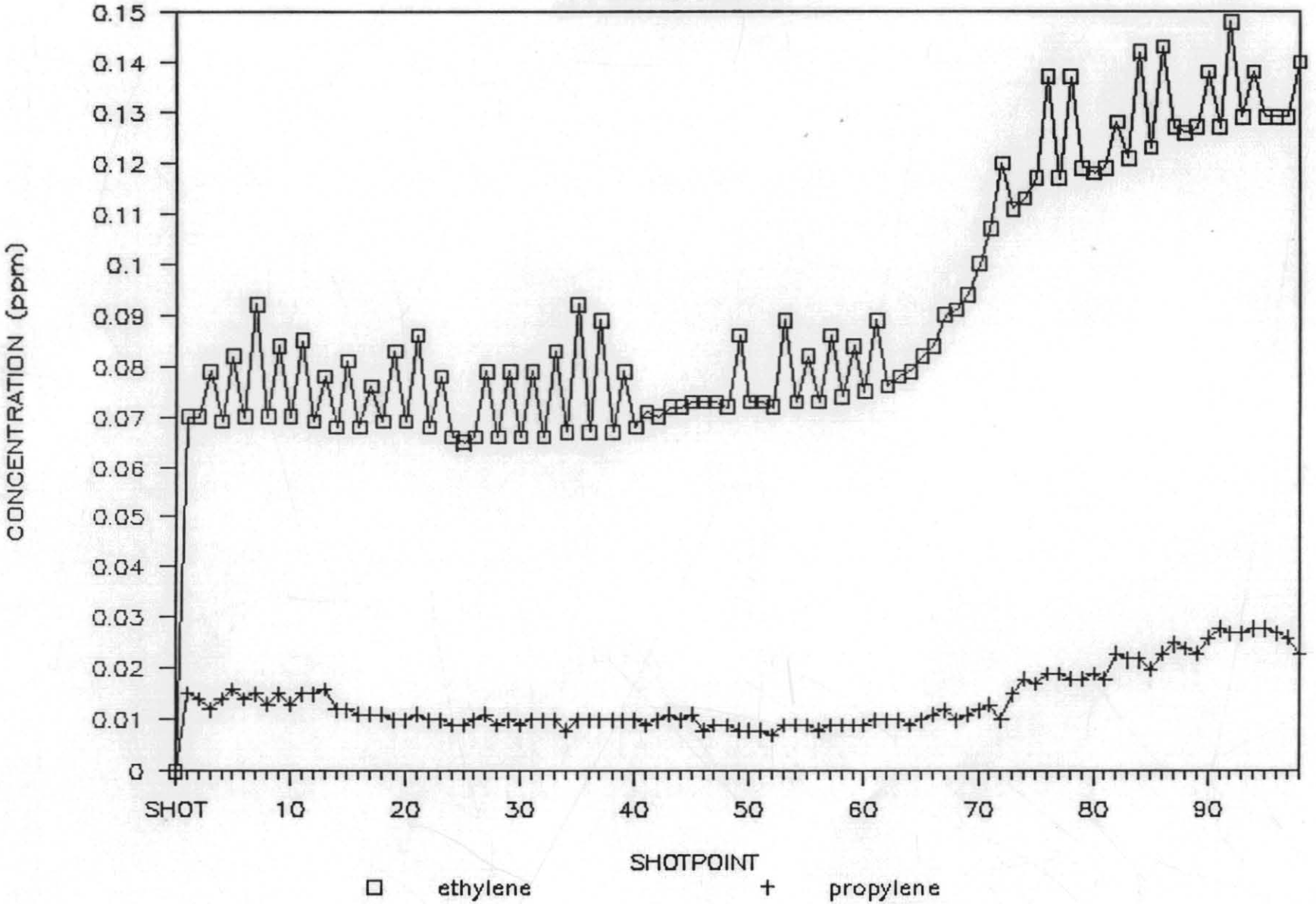

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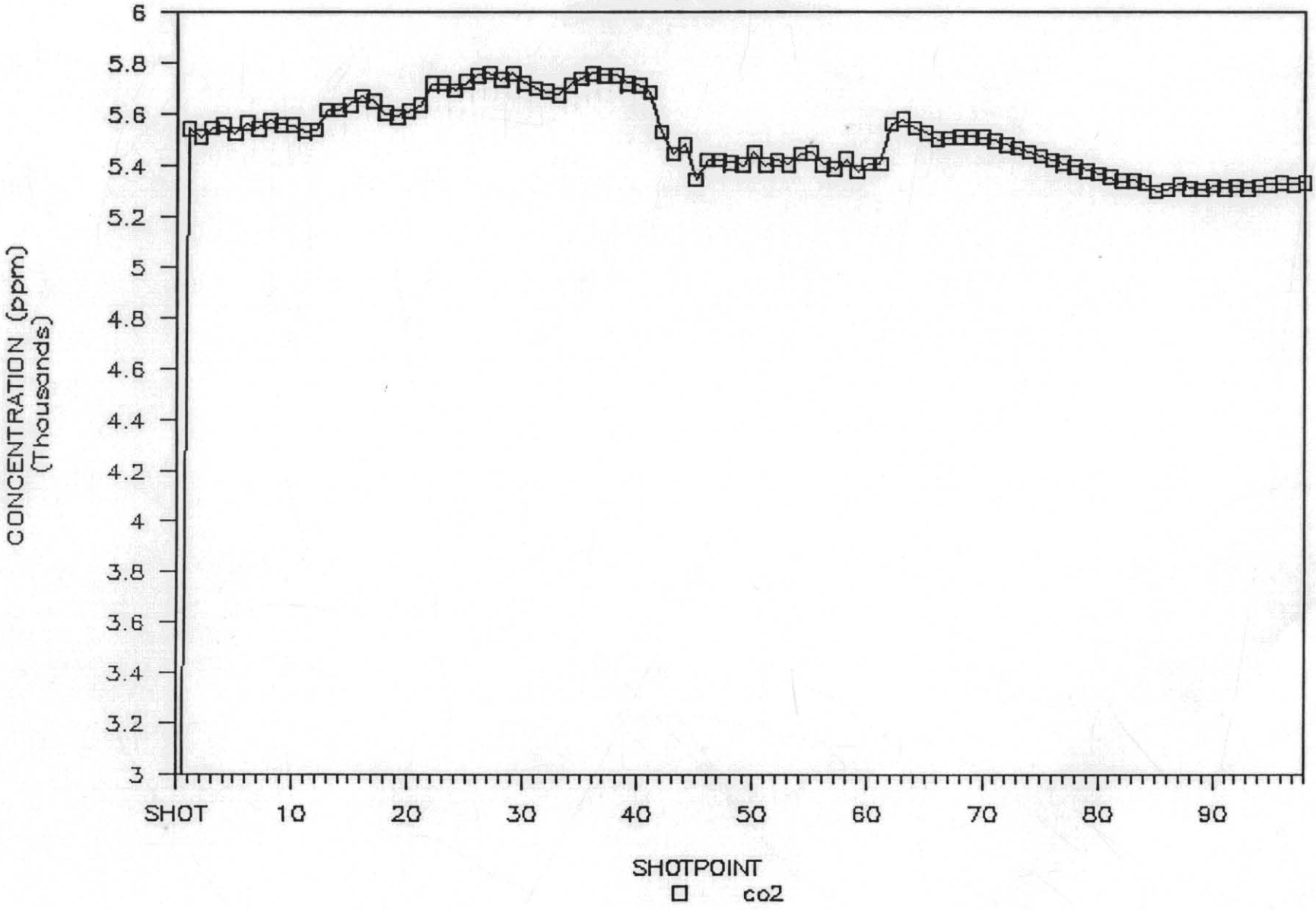

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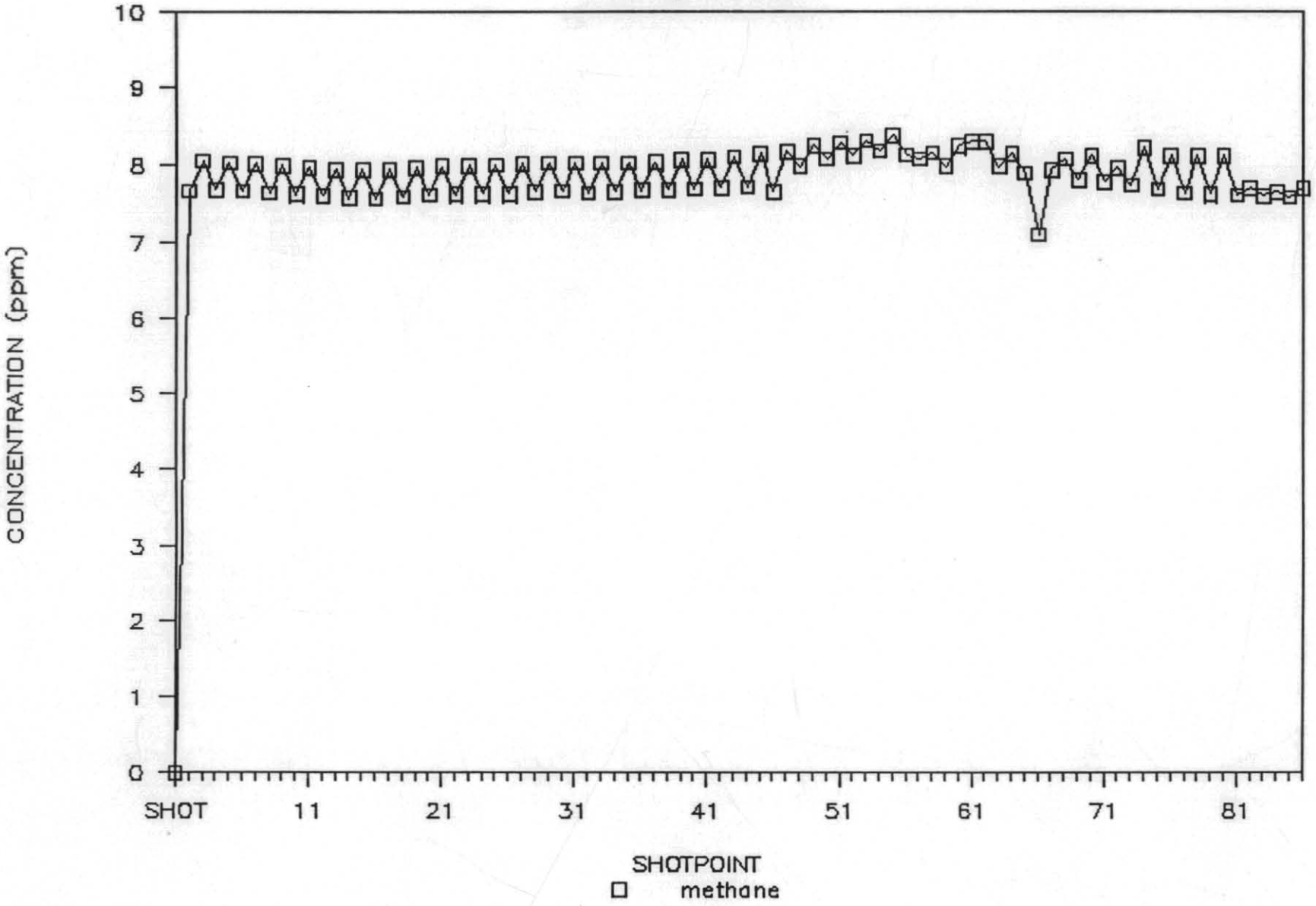

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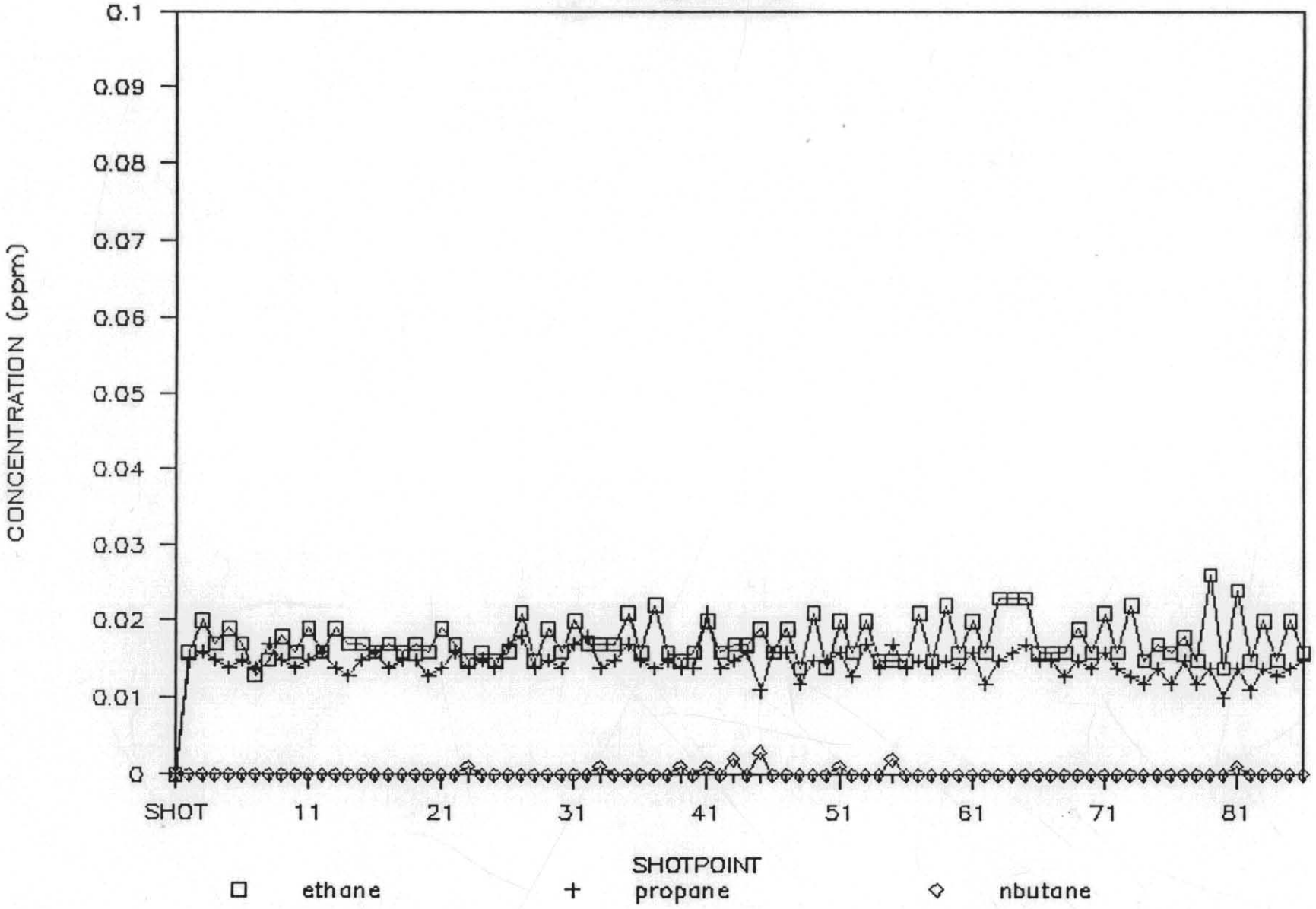

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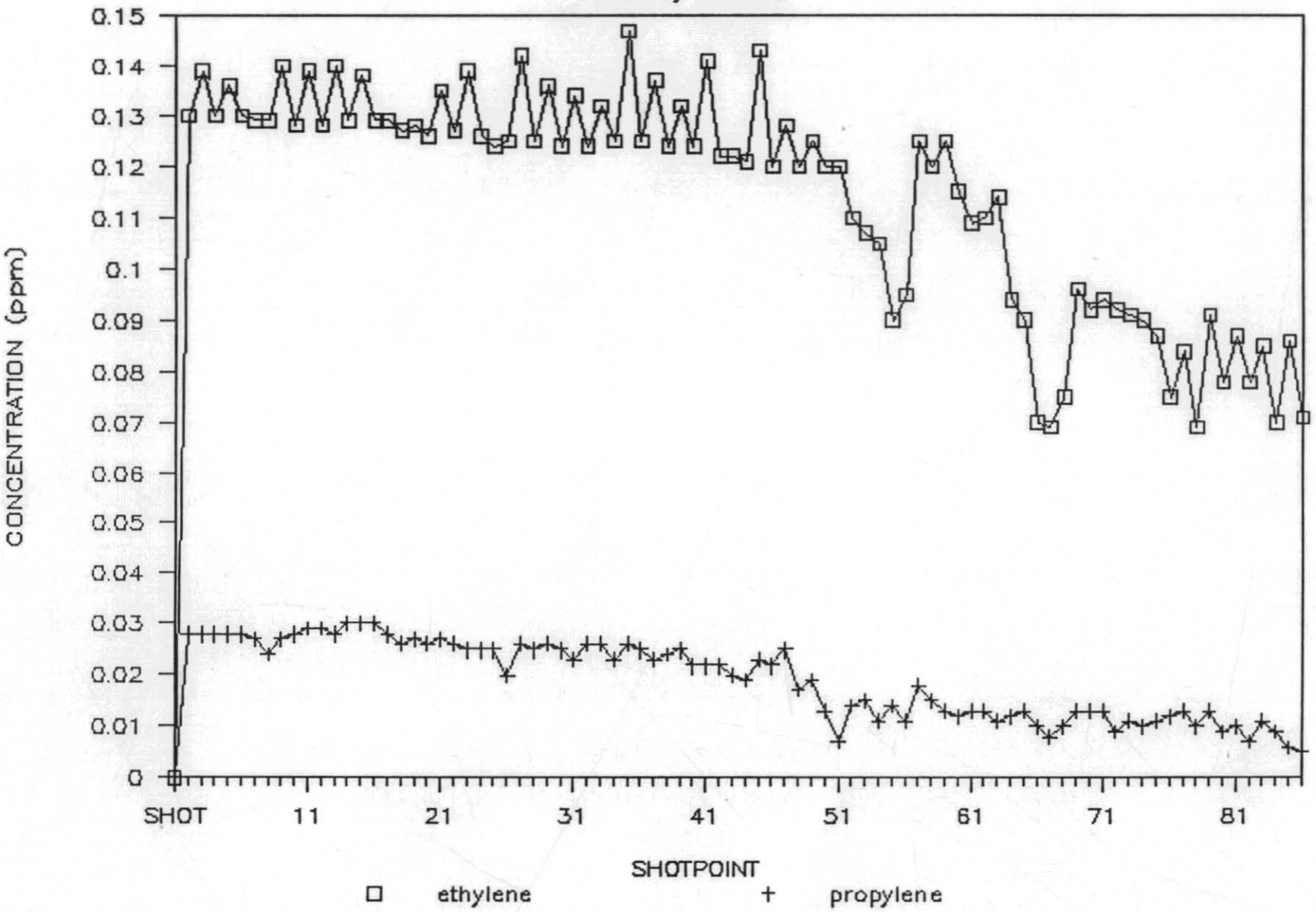

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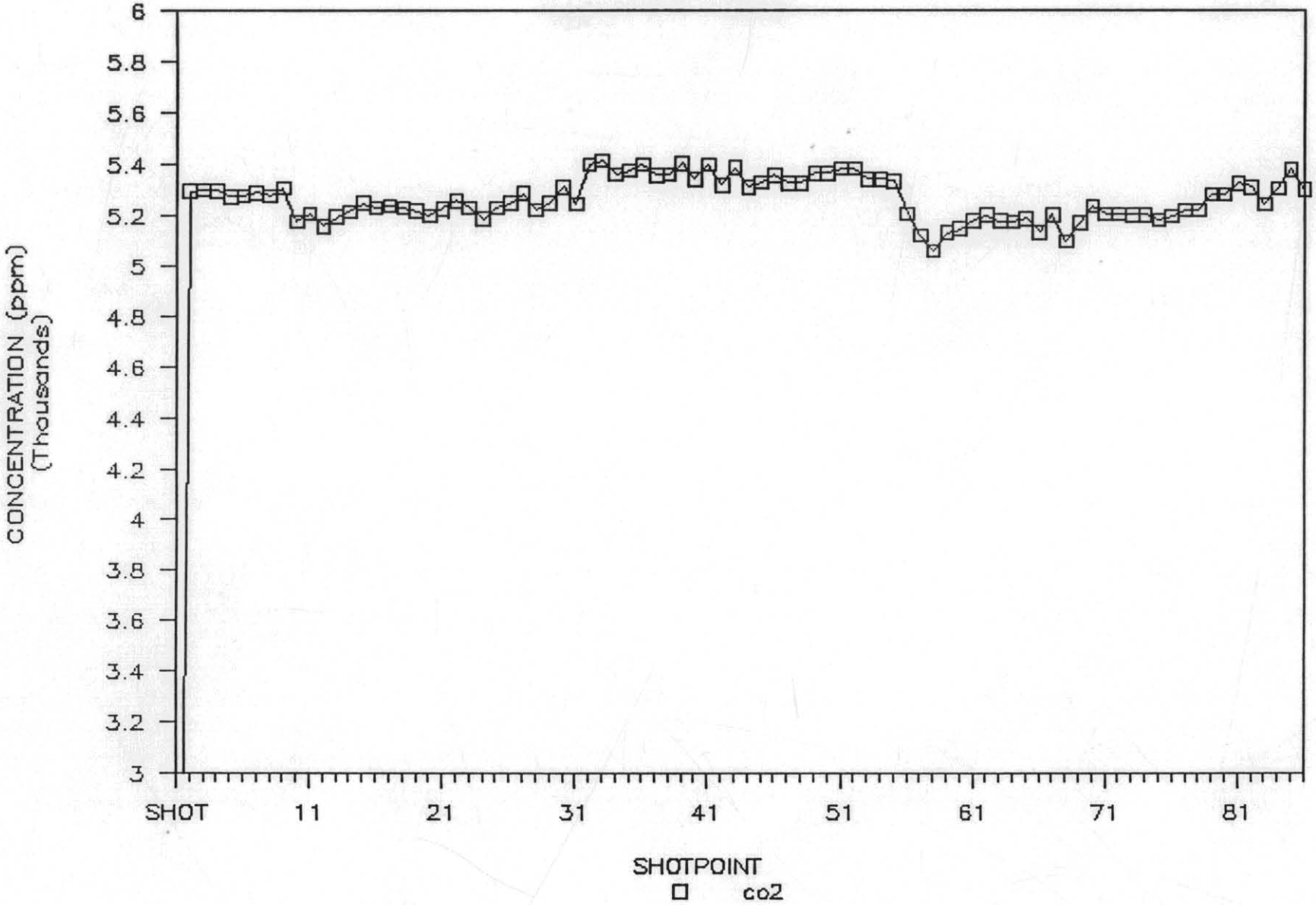

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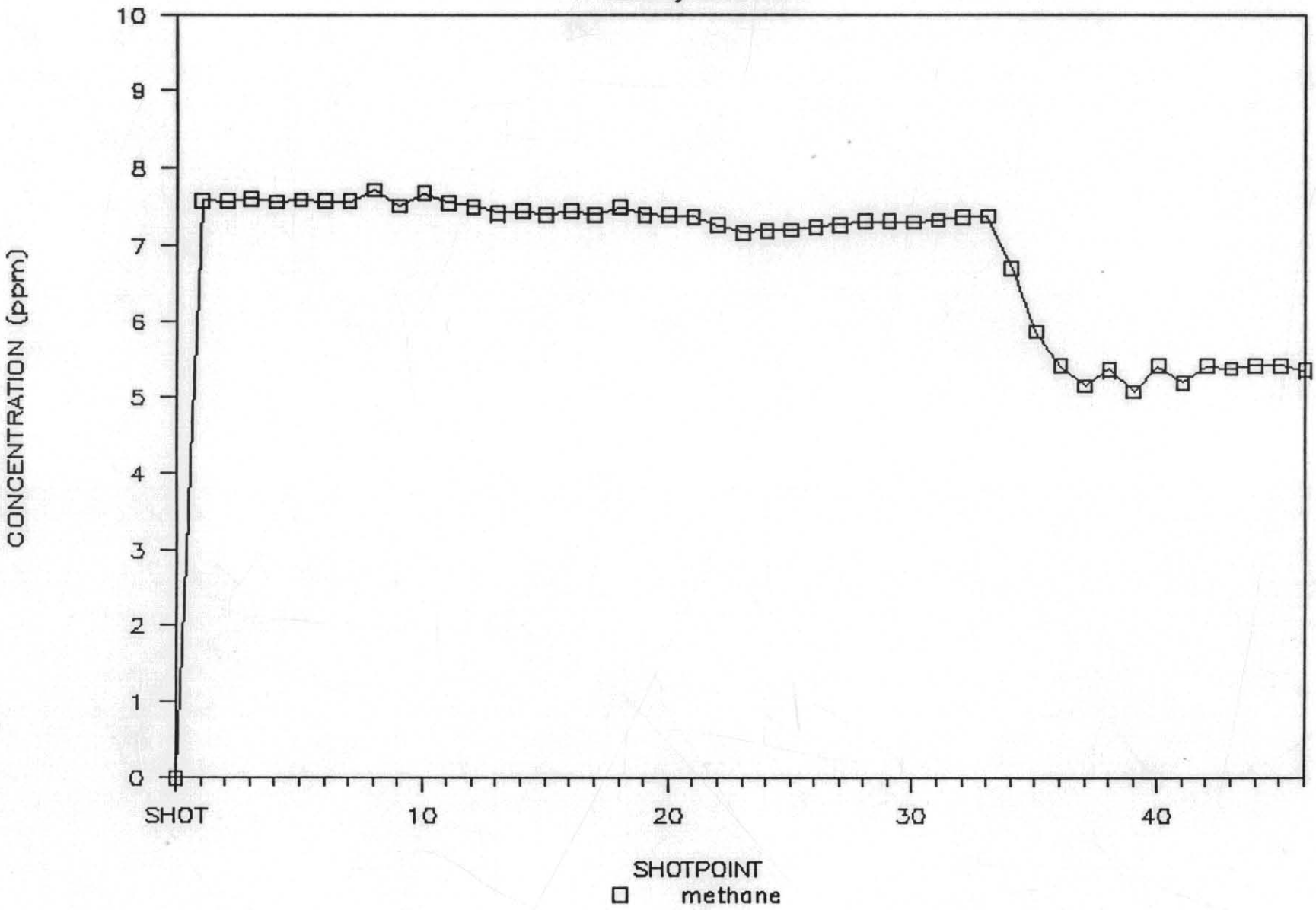

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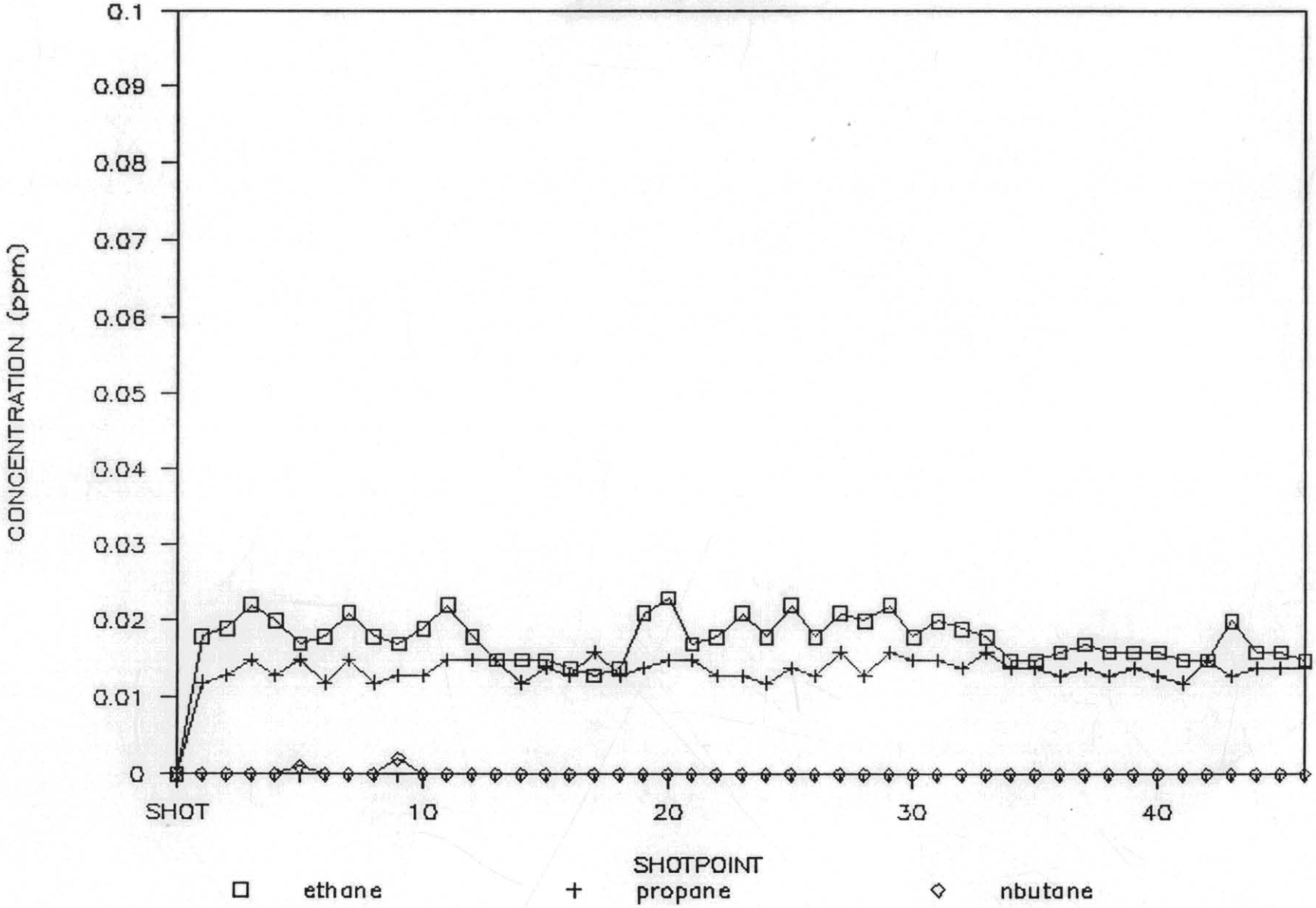

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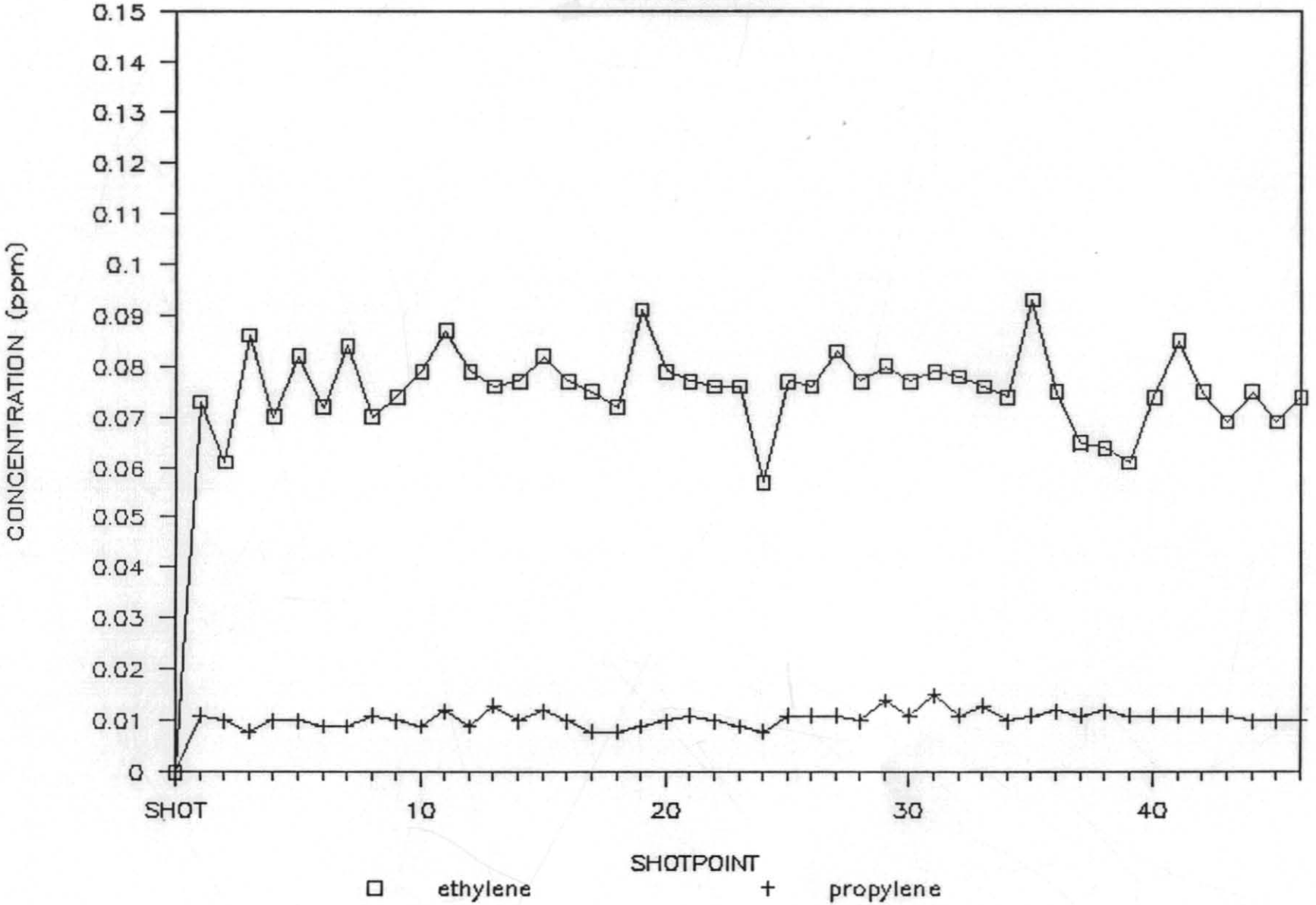

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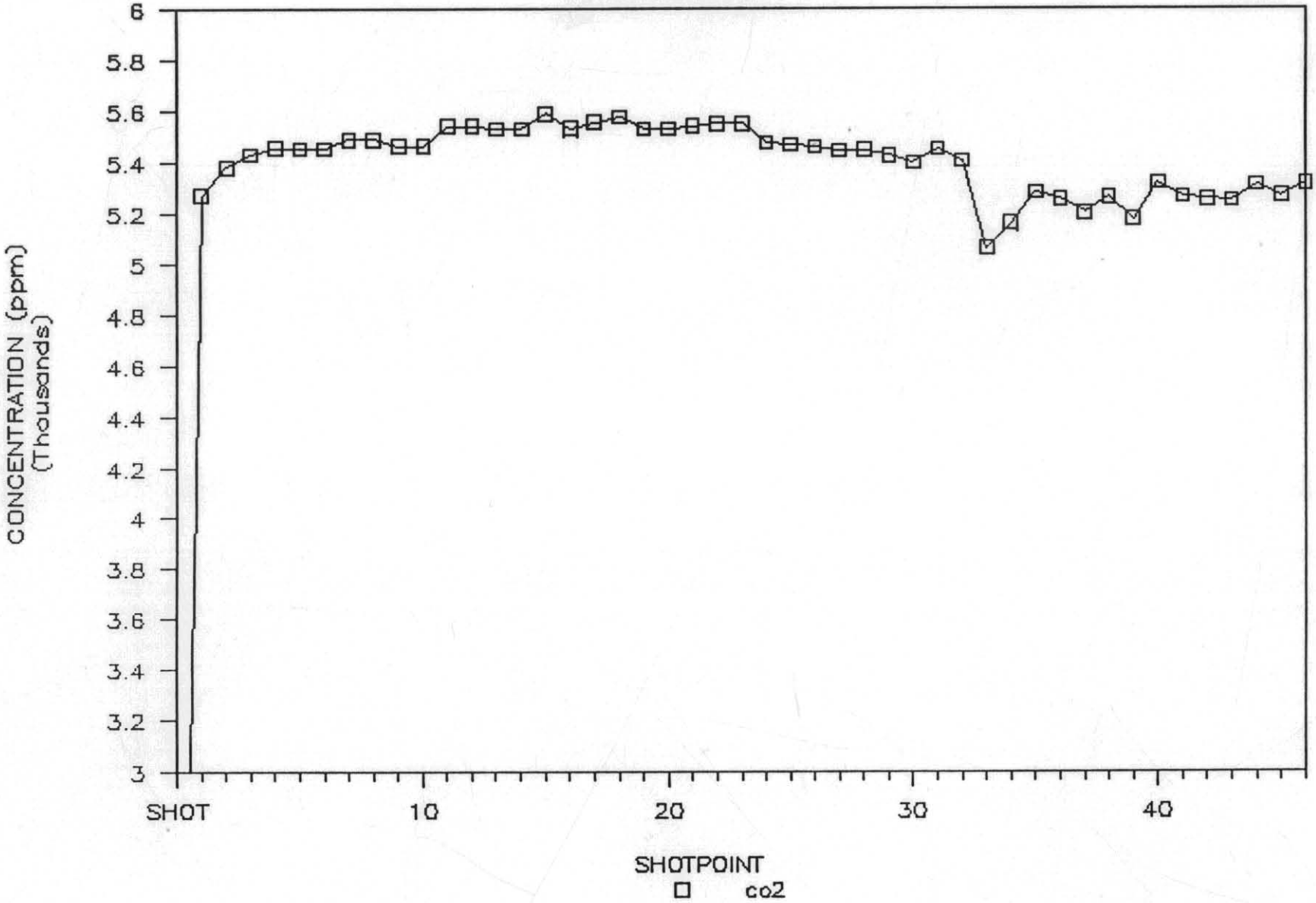

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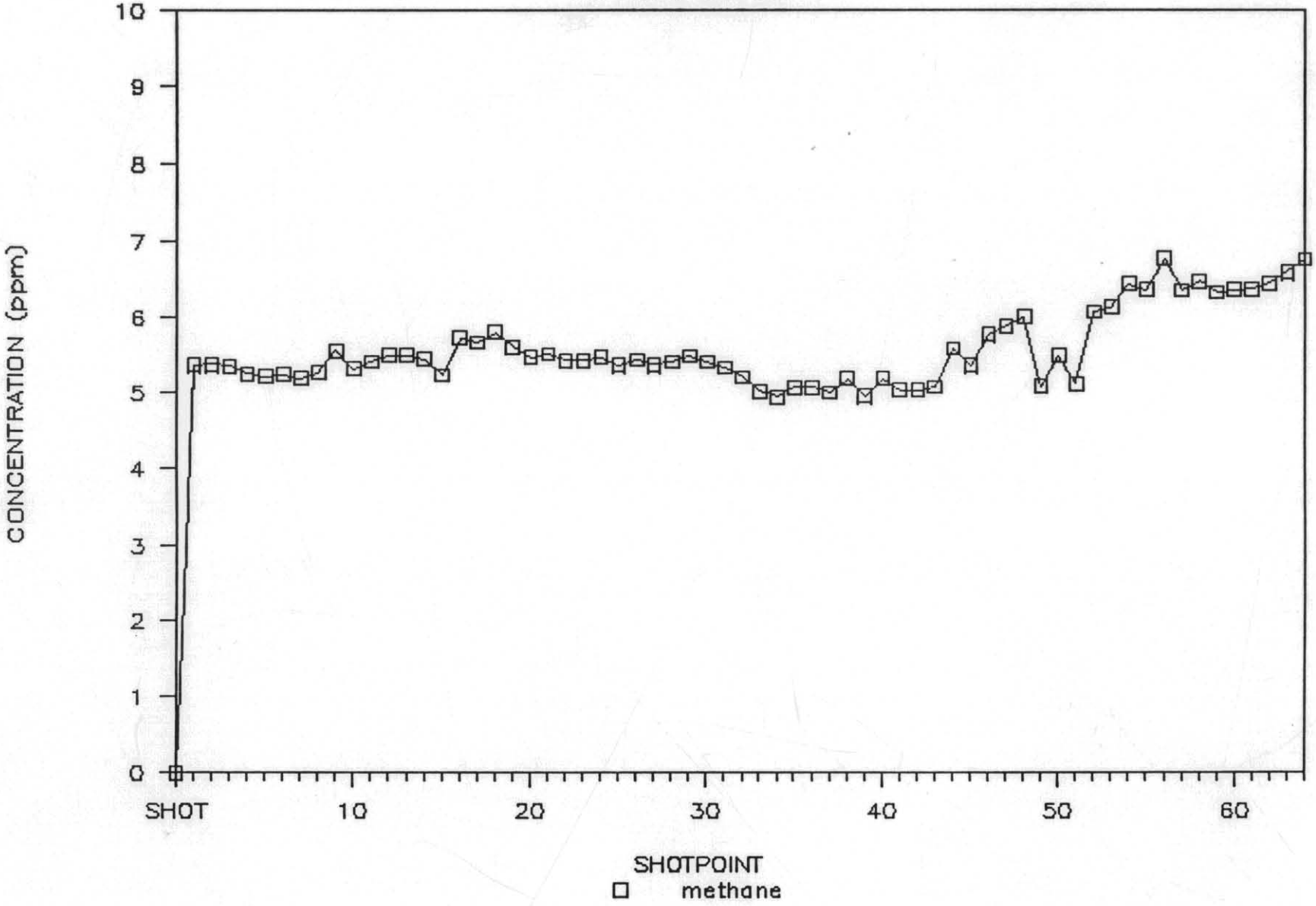

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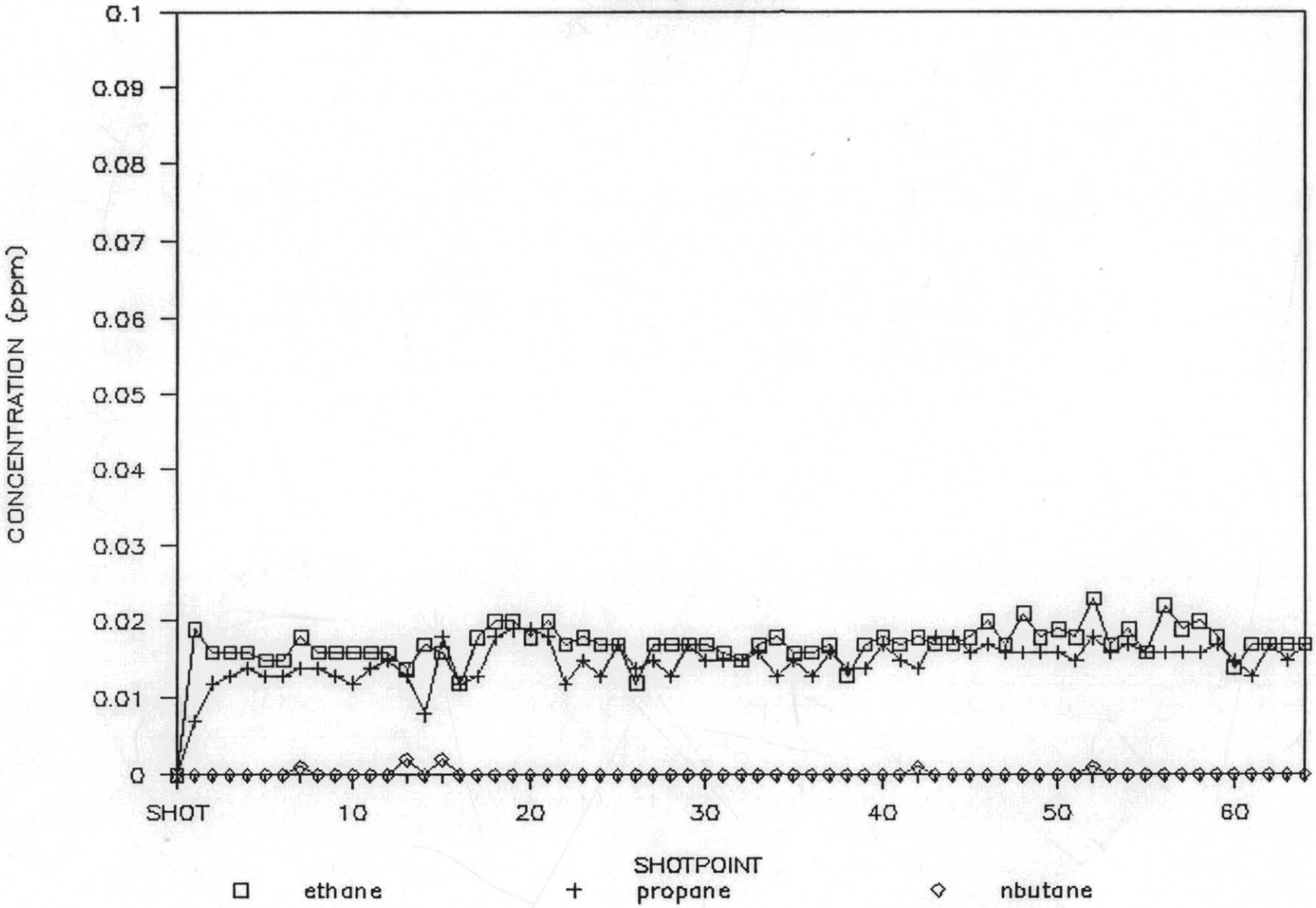

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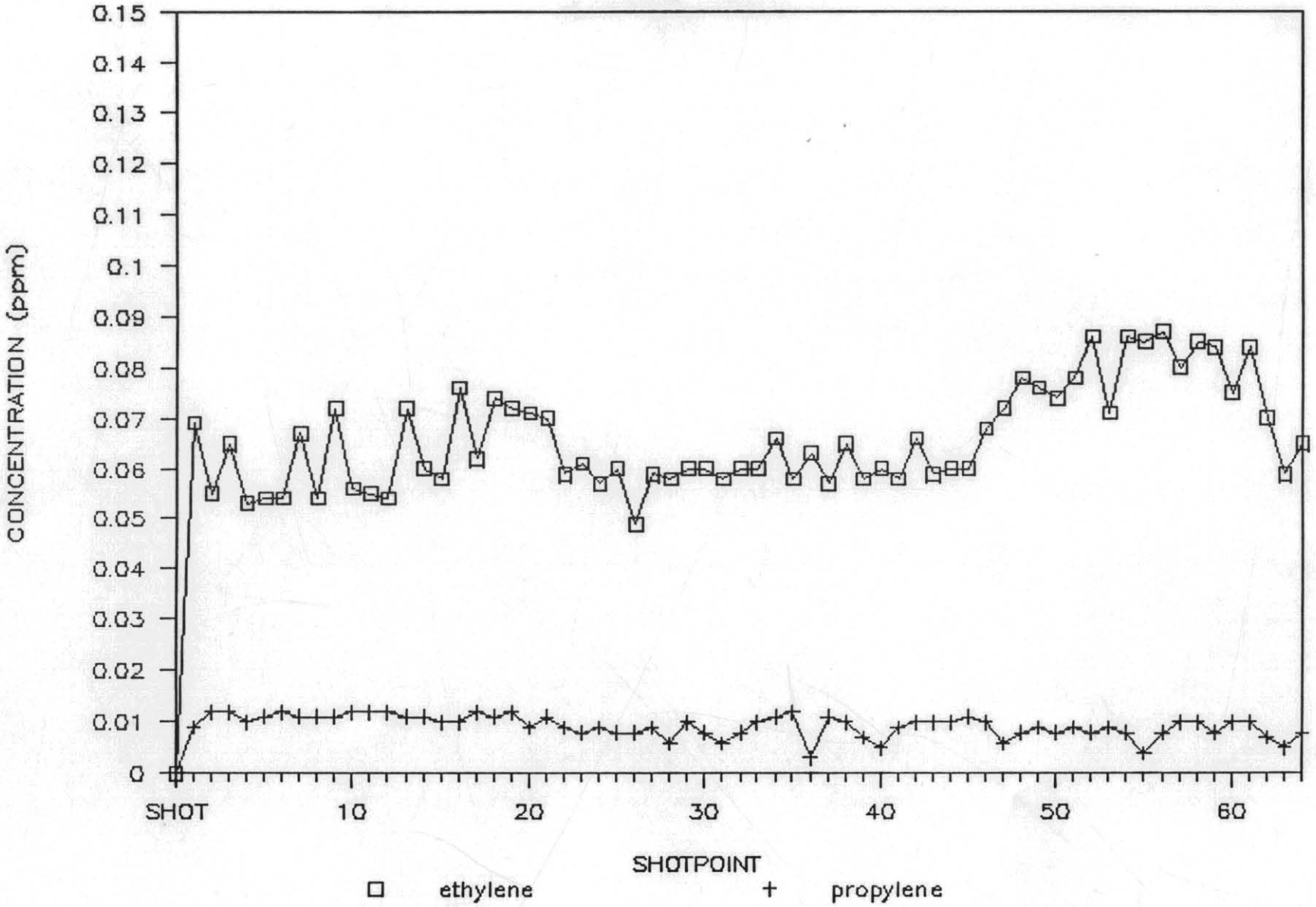

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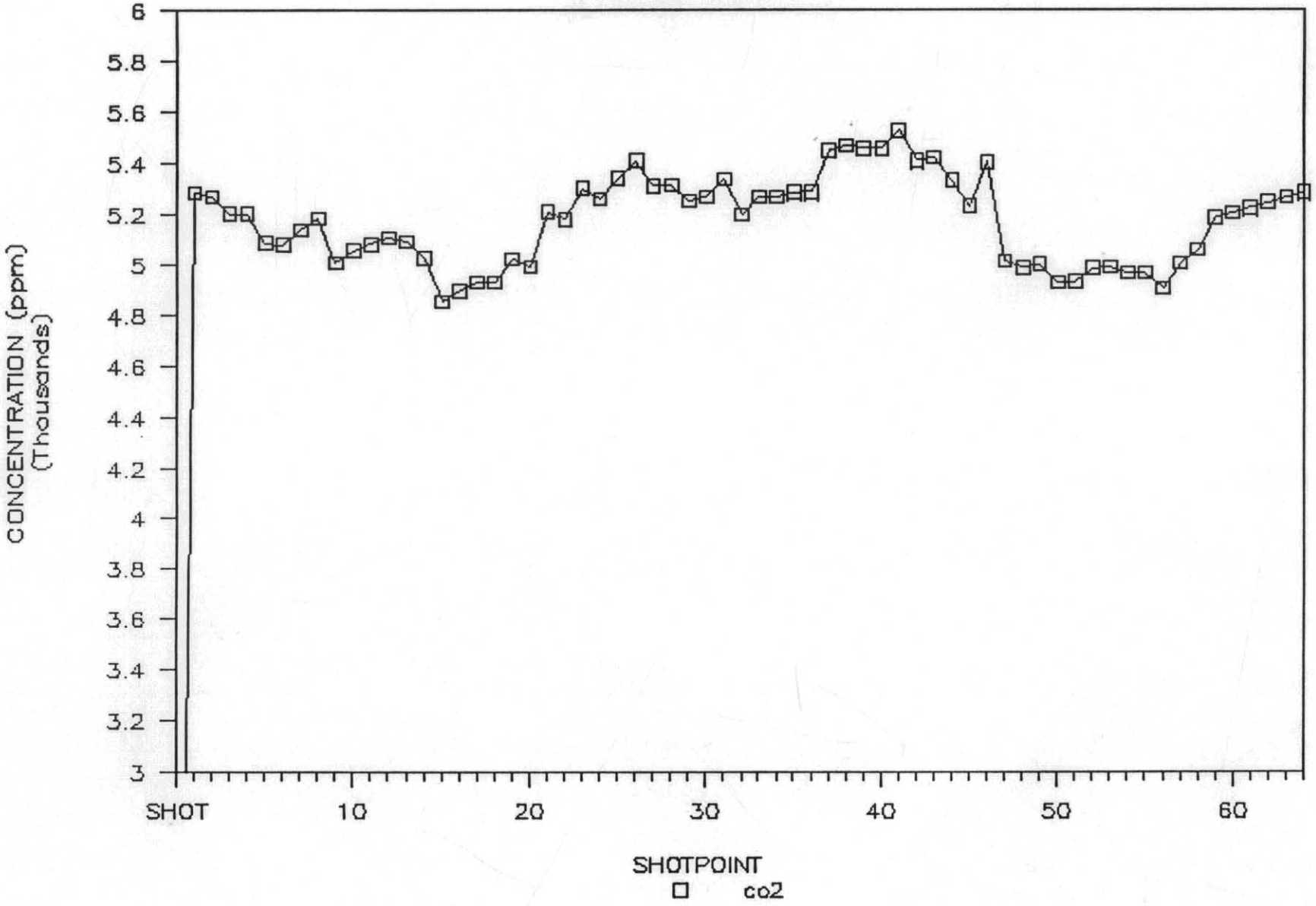

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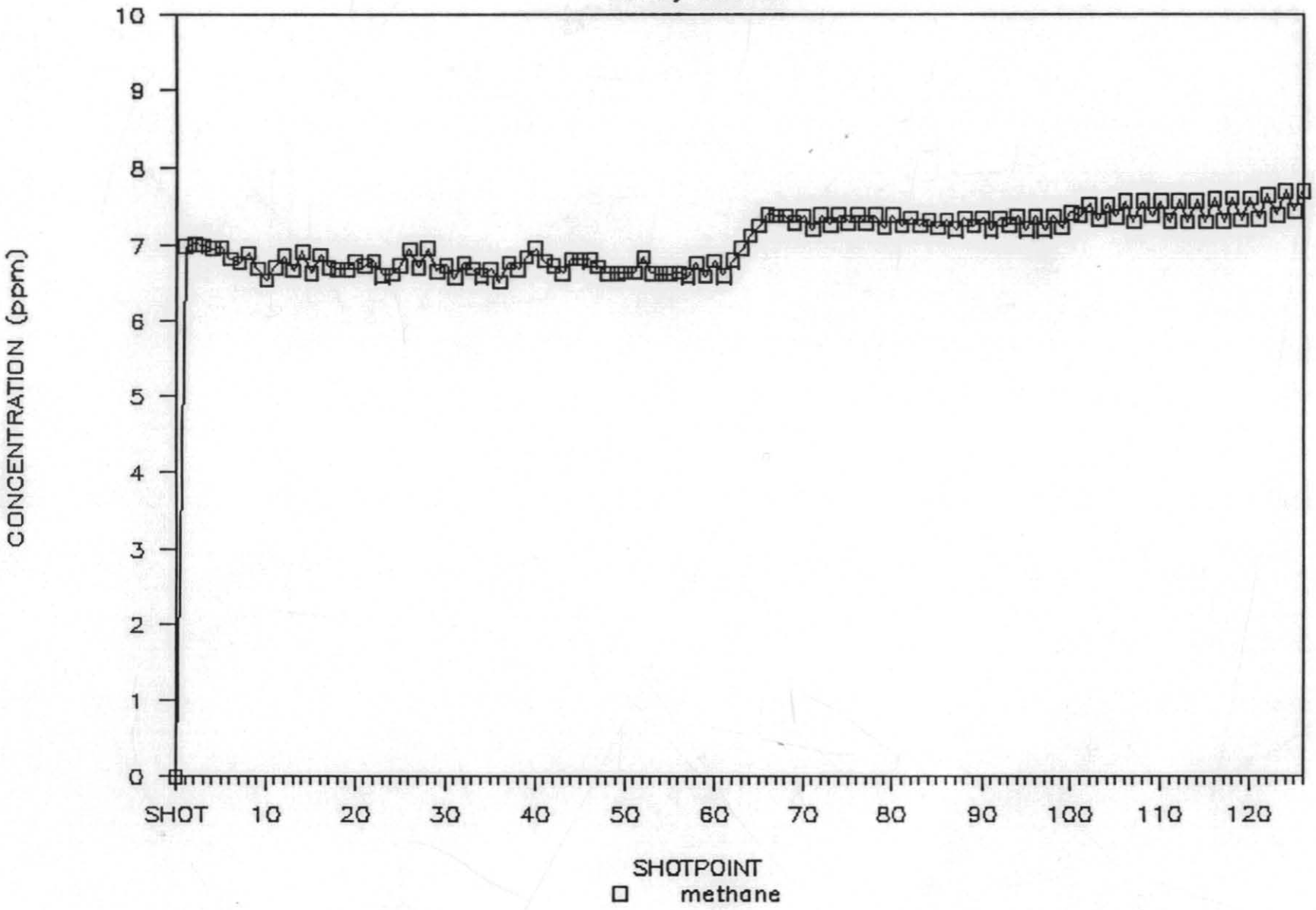

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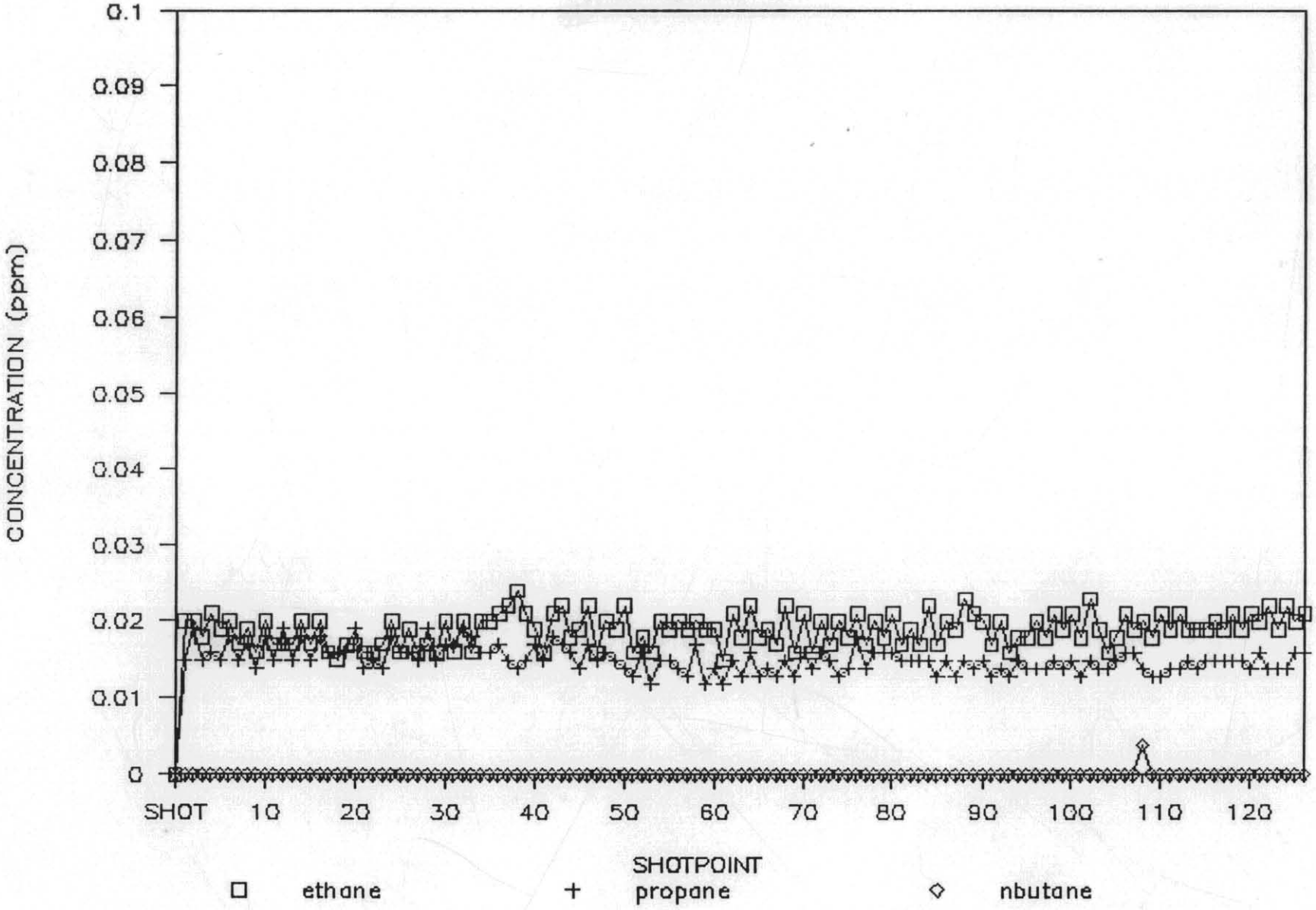

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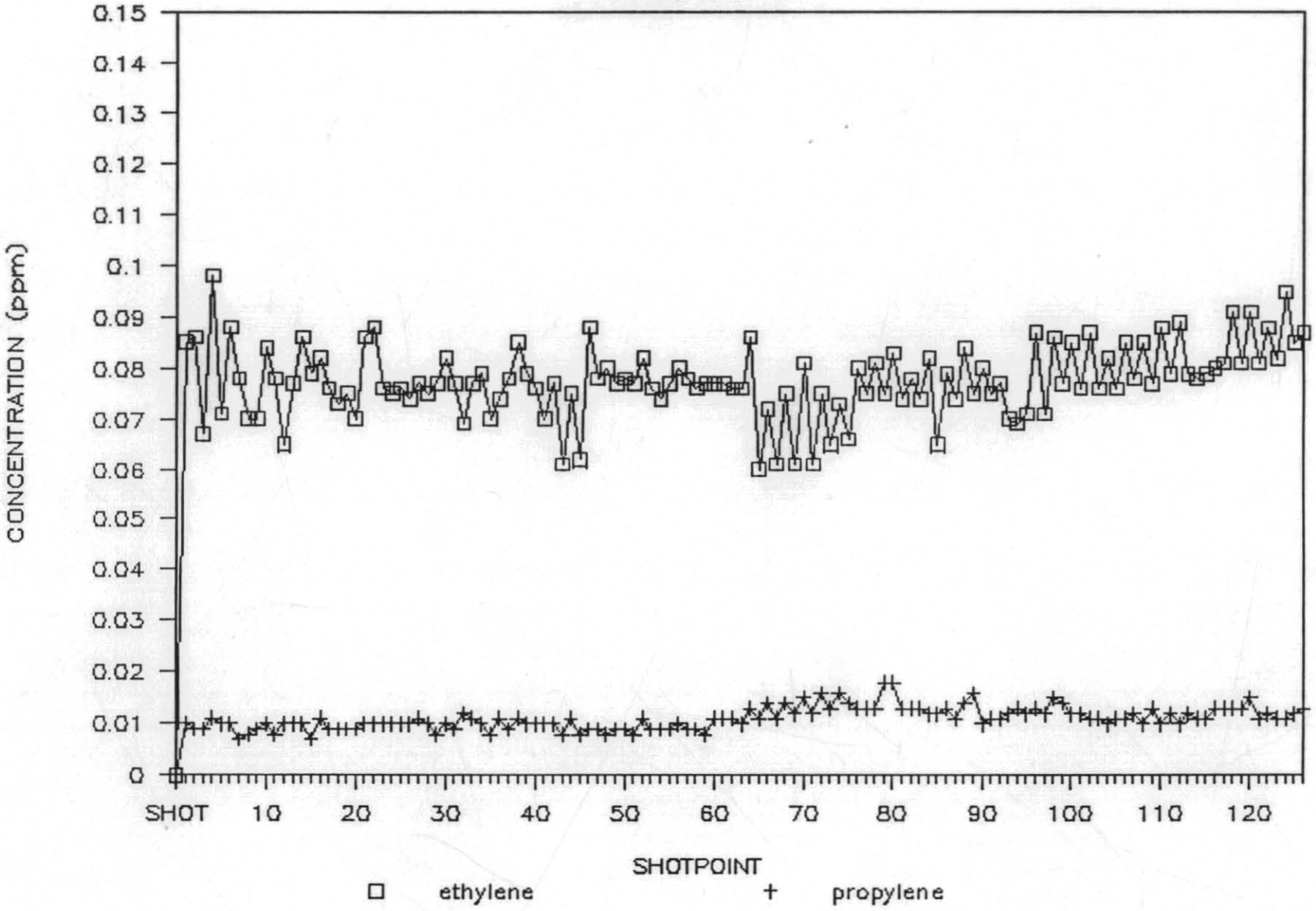

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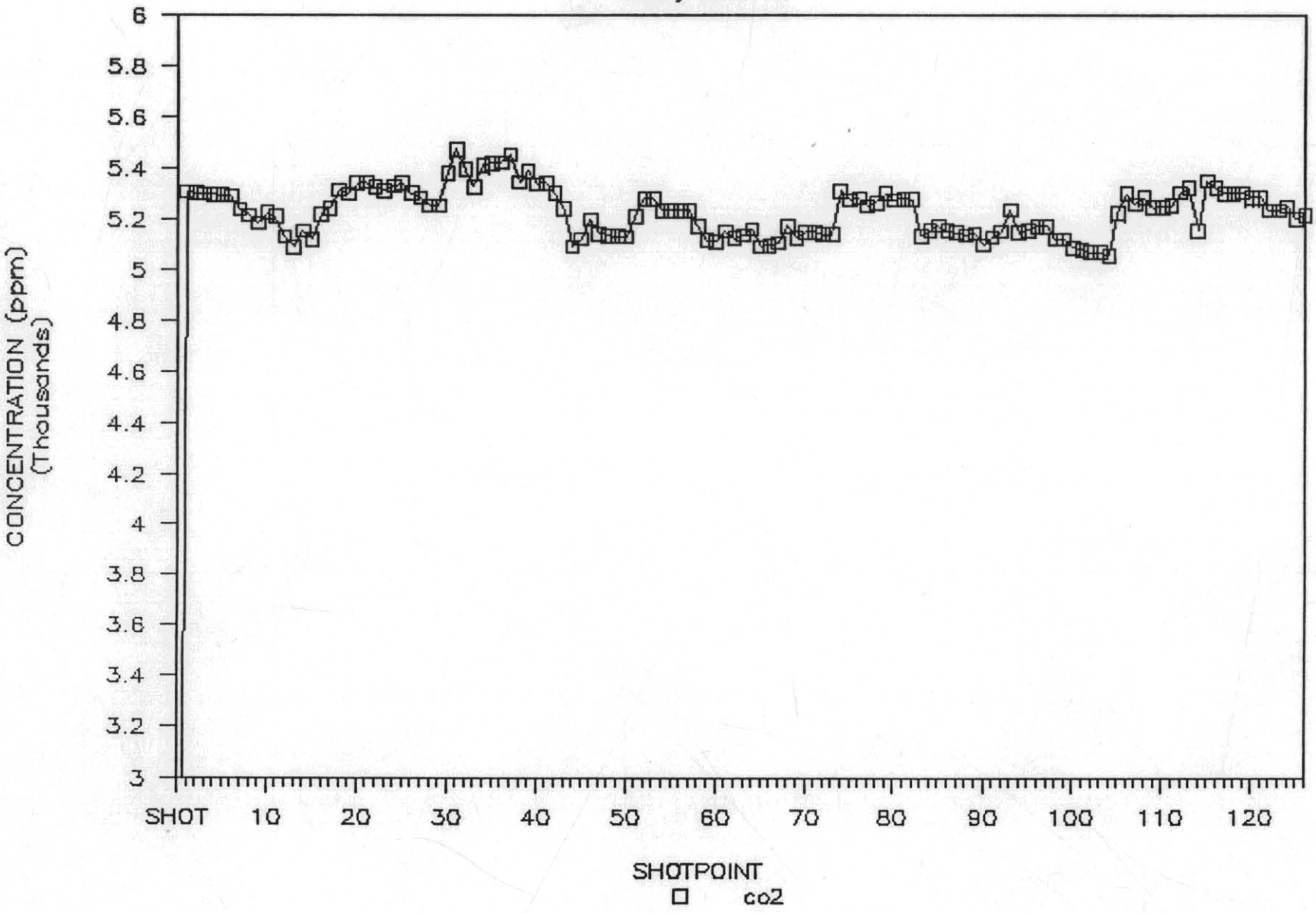

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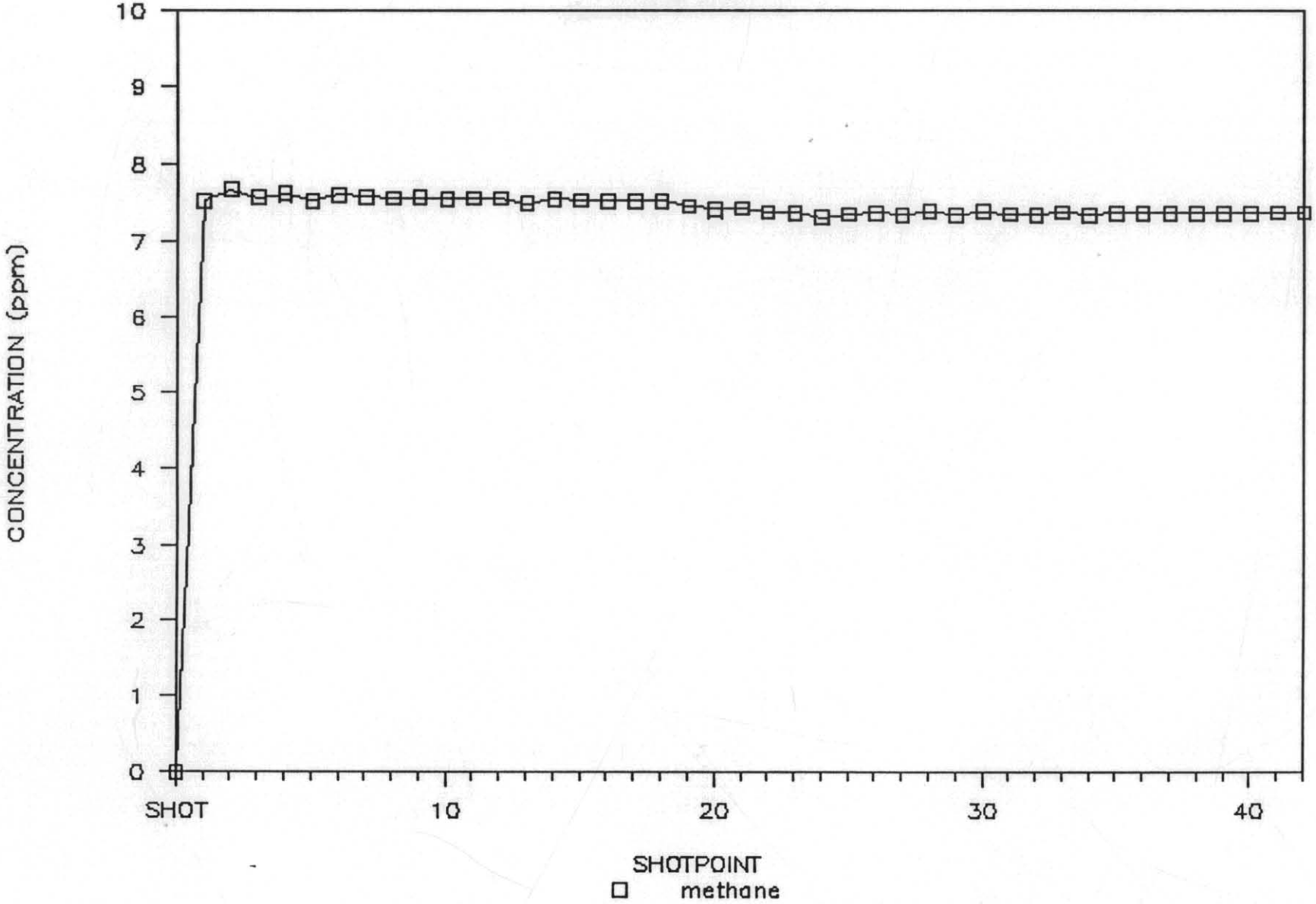

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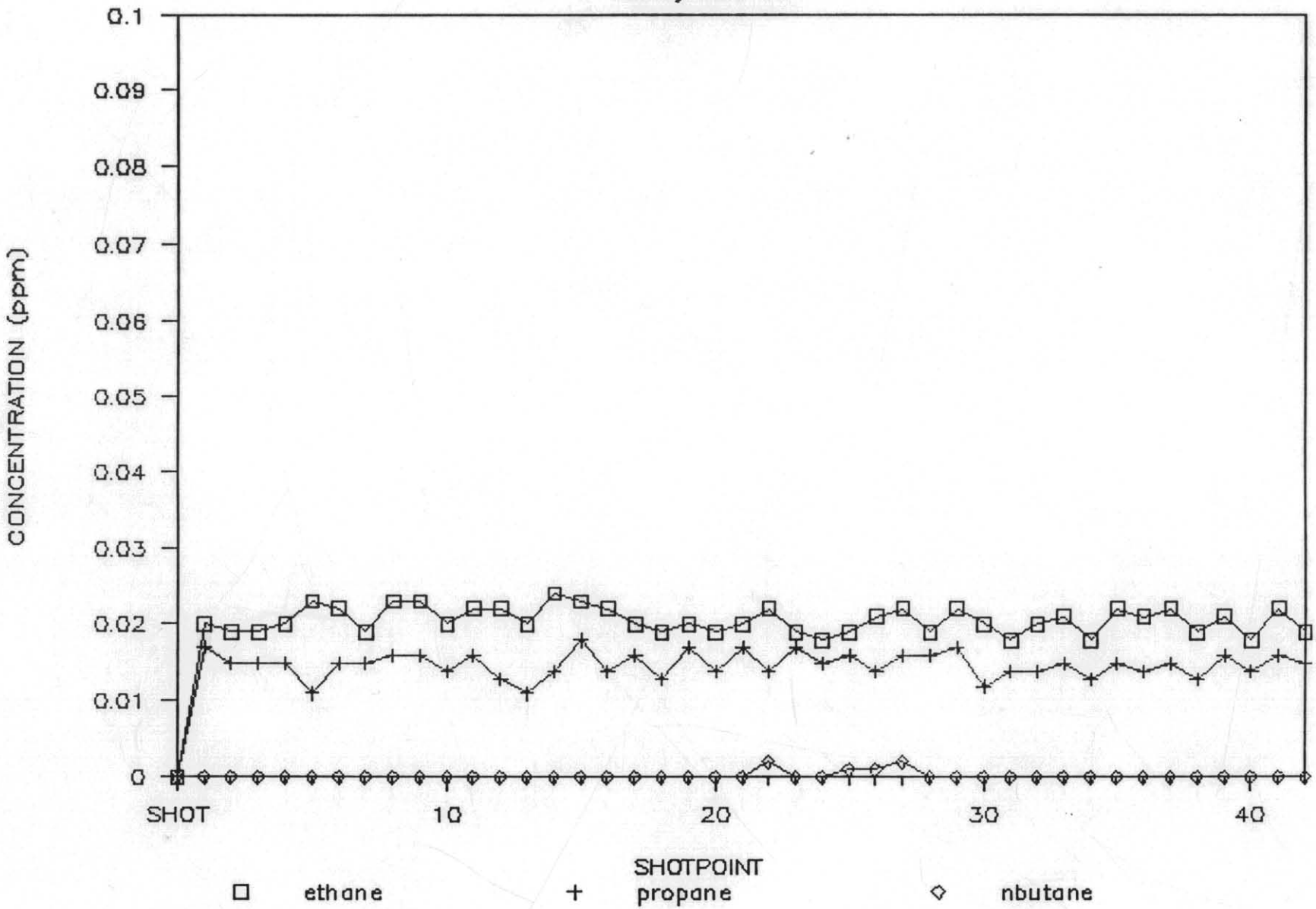

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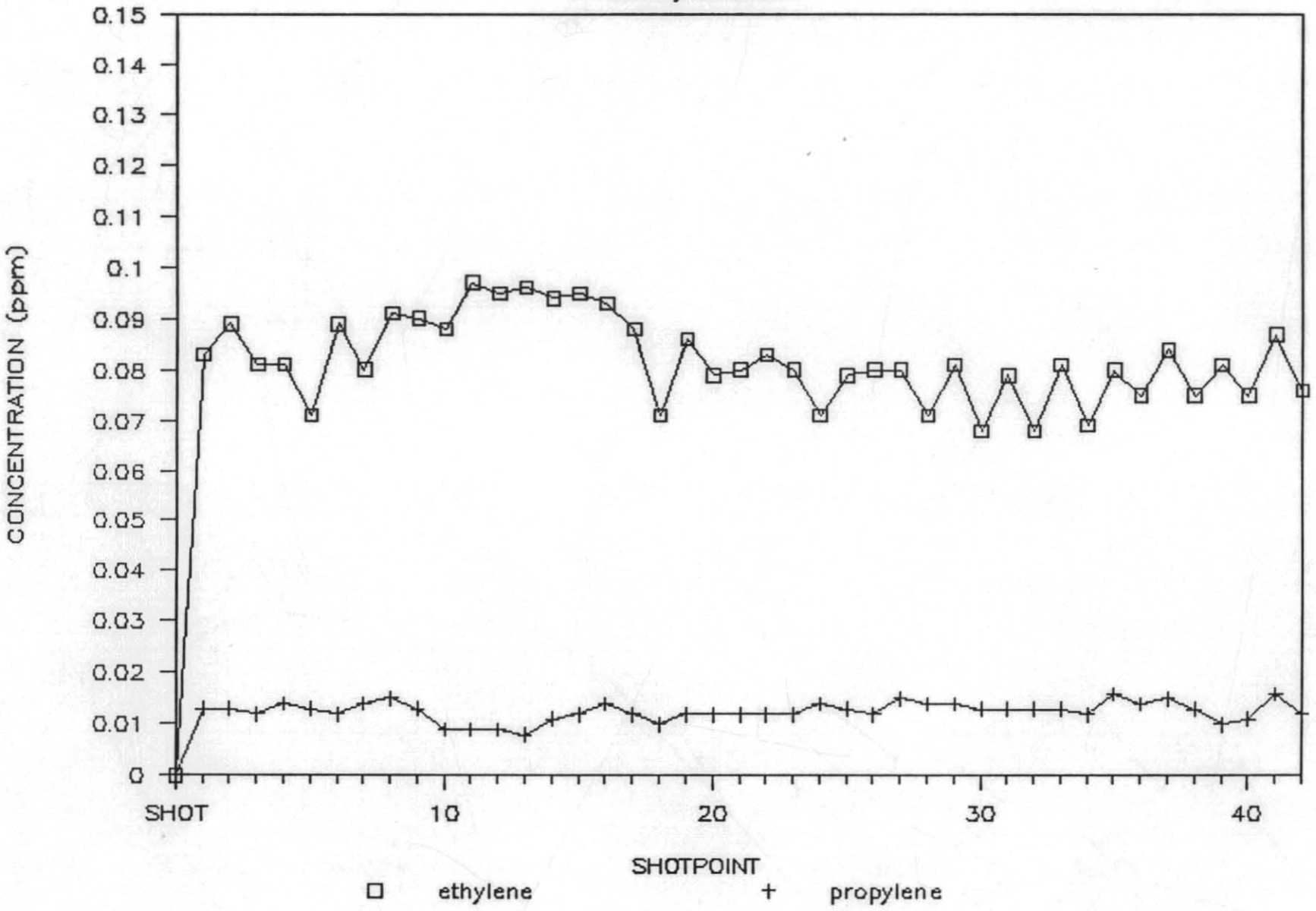

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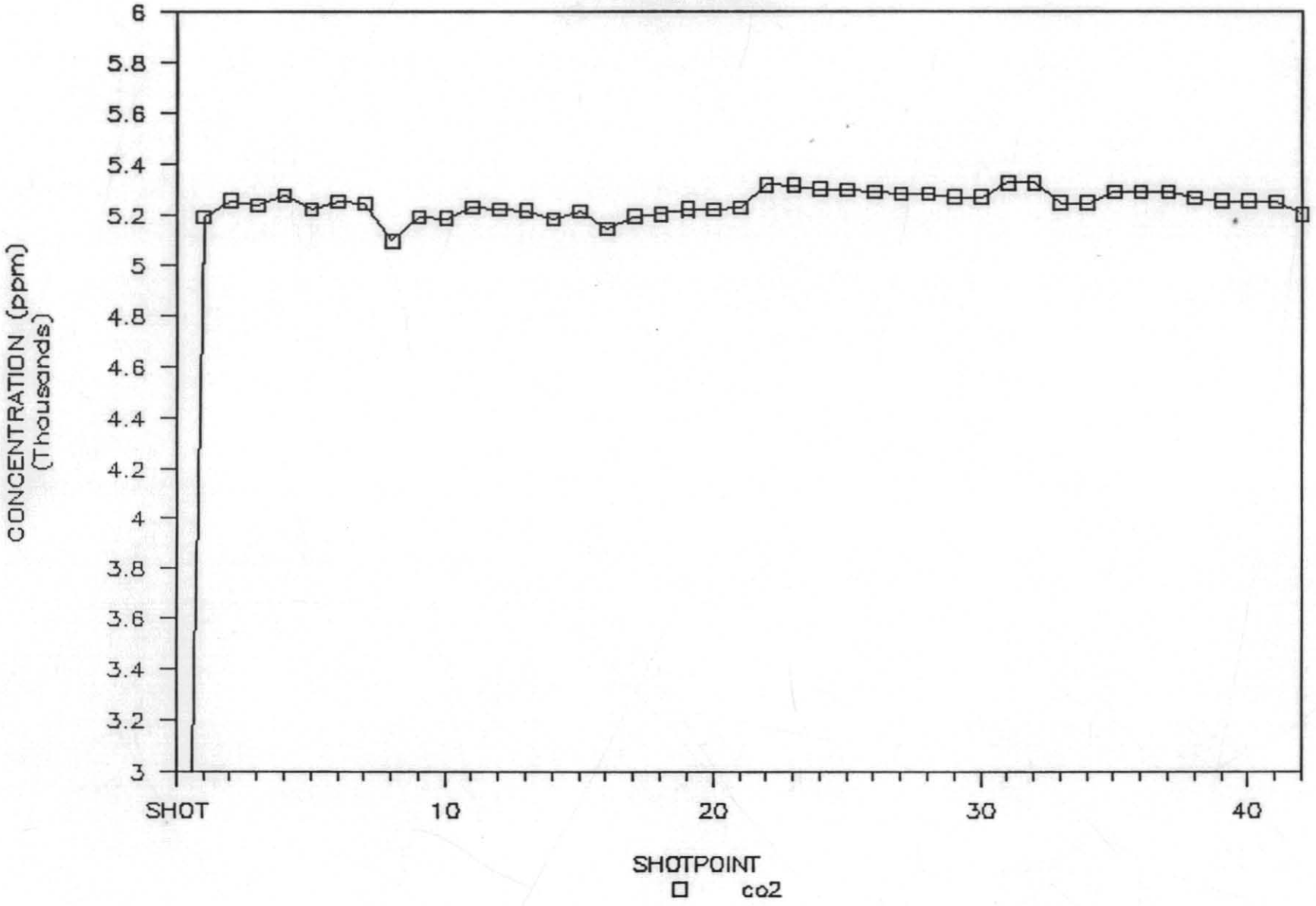

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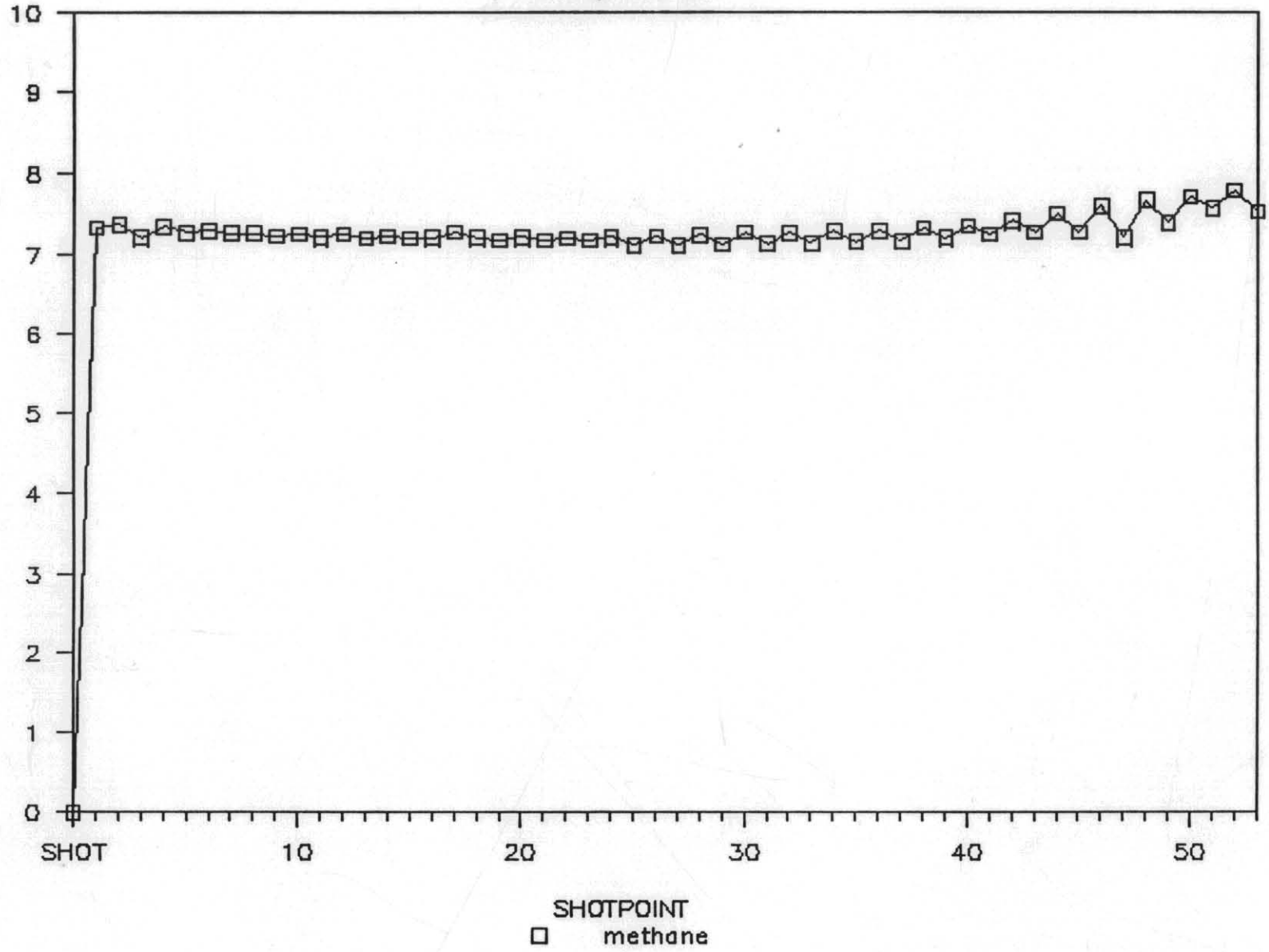

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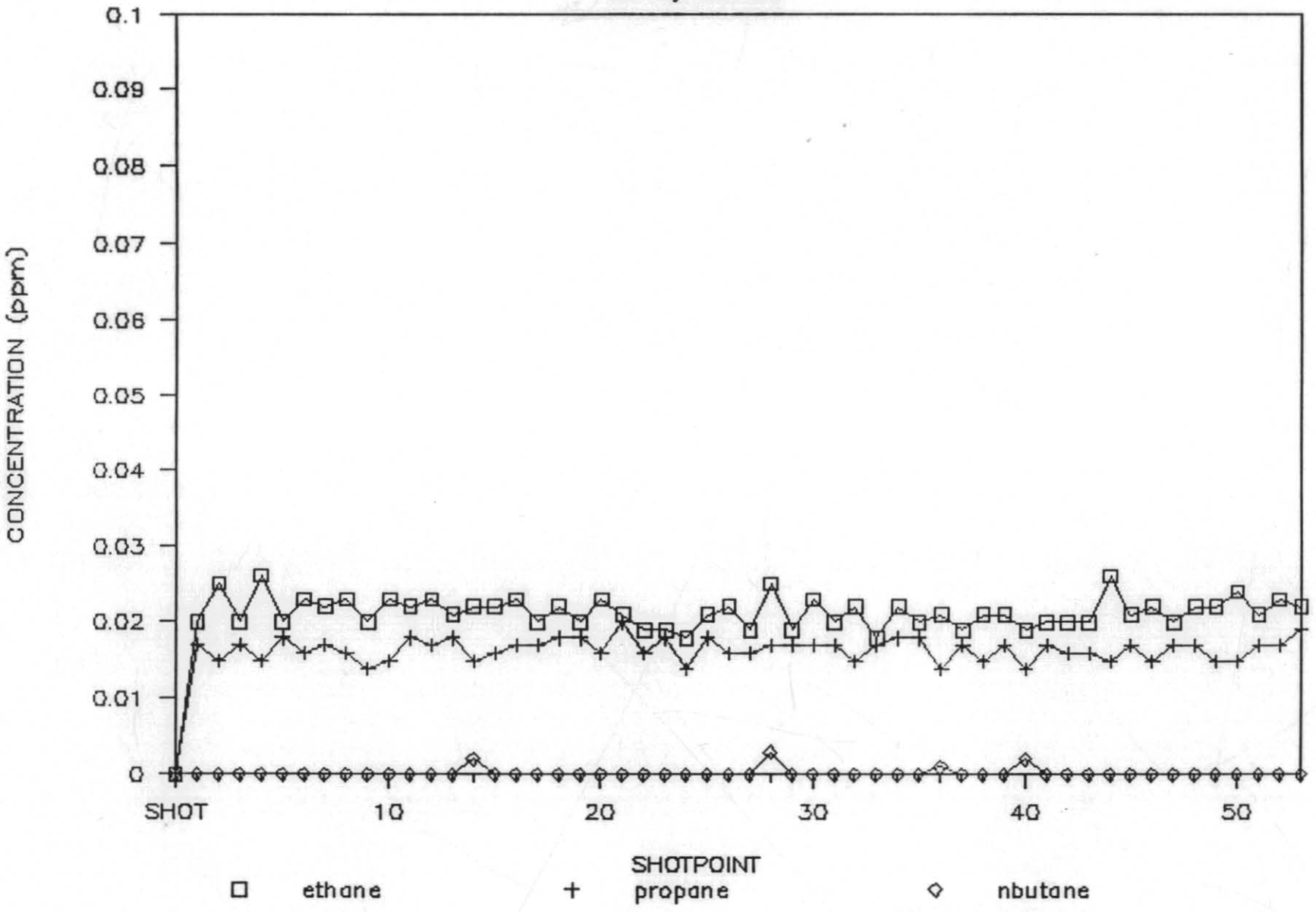

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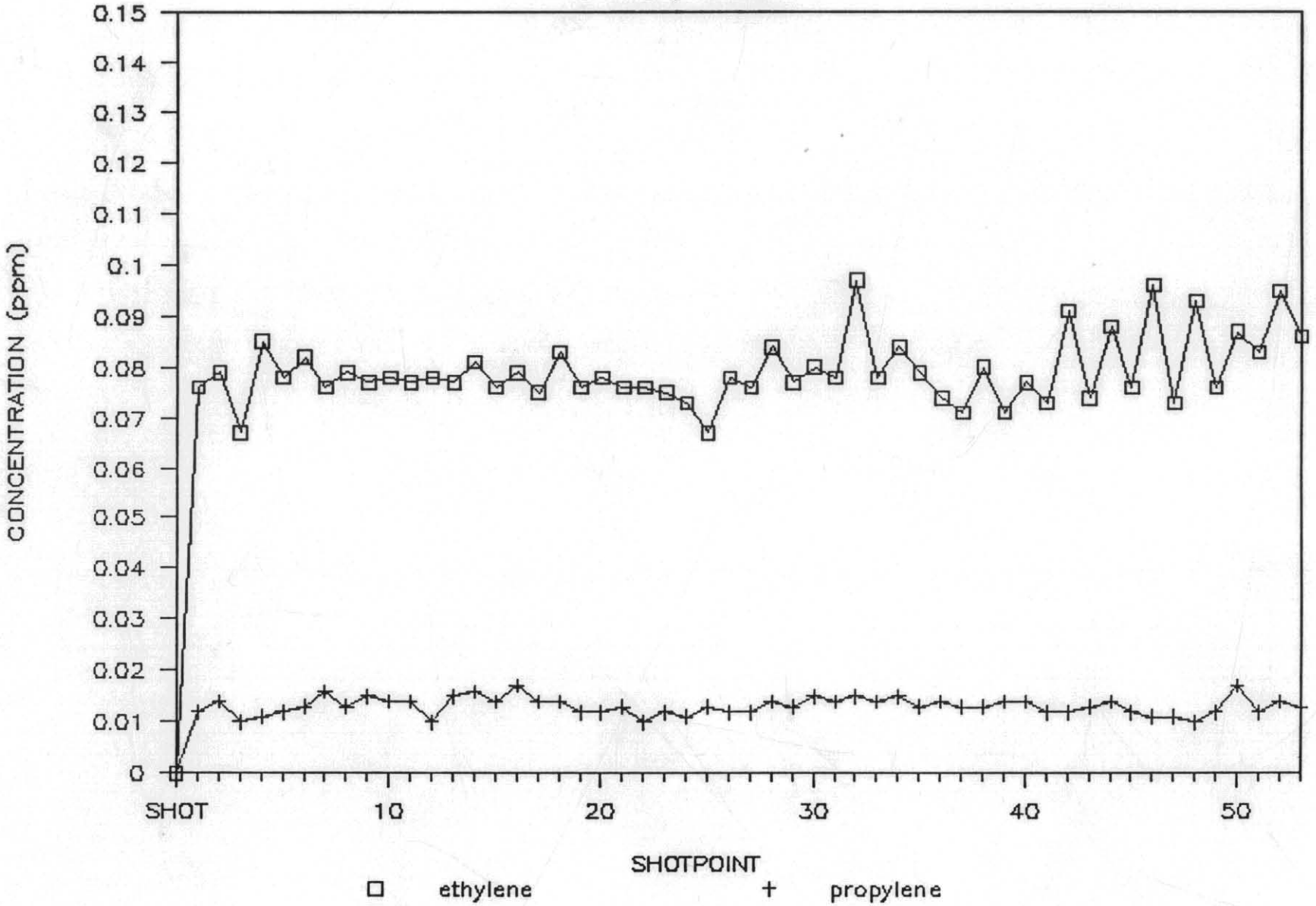
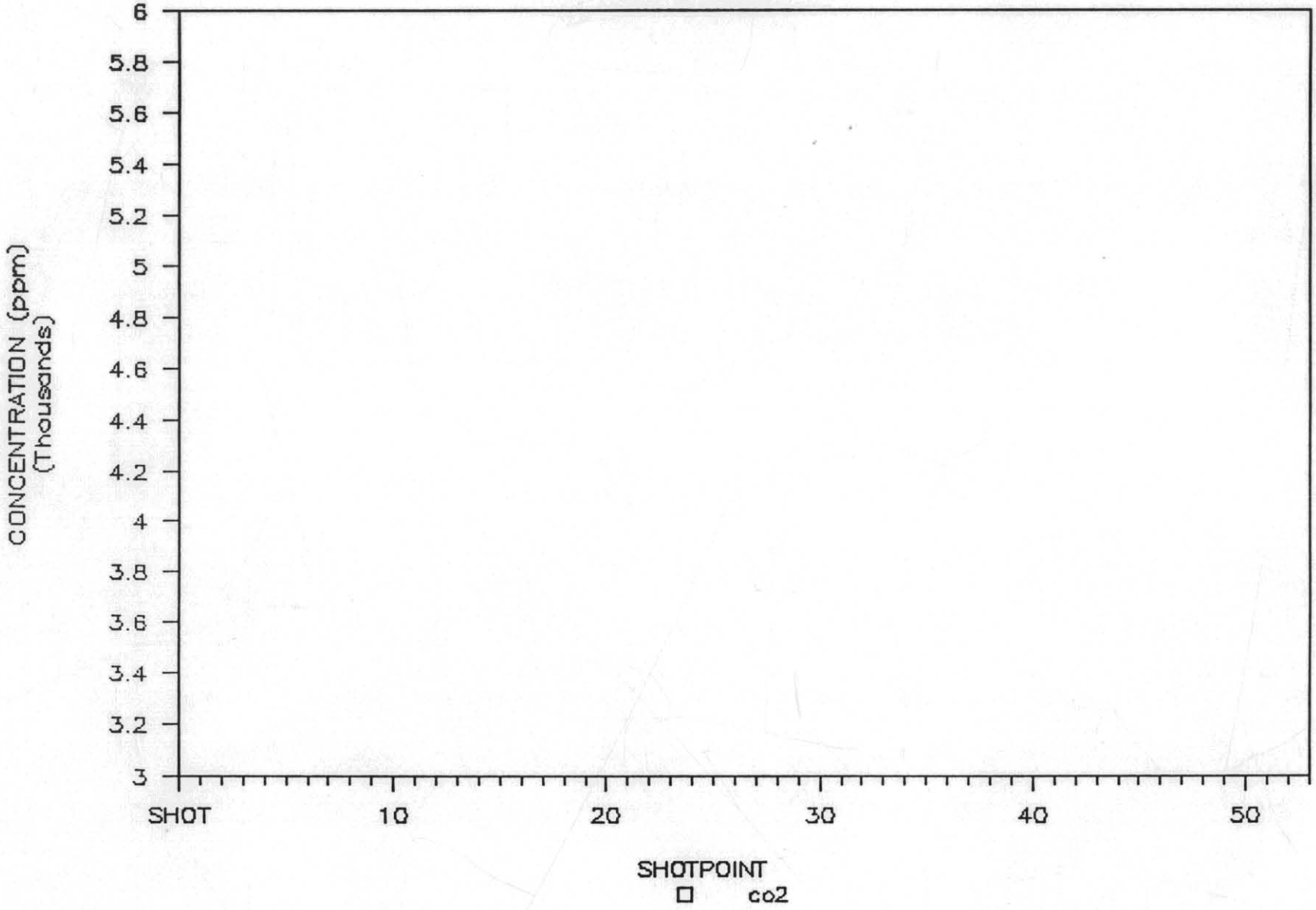


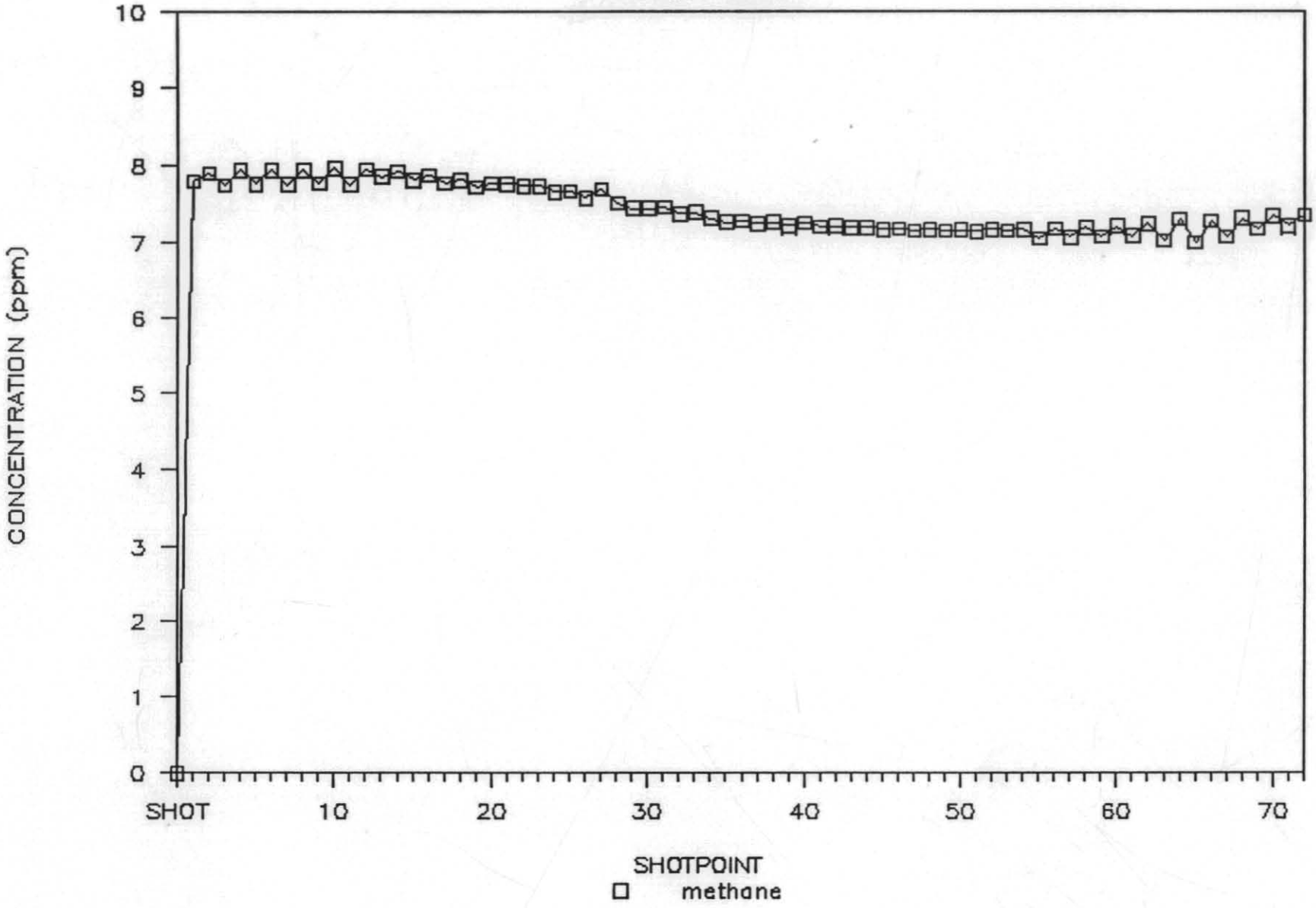
BASS BASIN

Survey Line 25



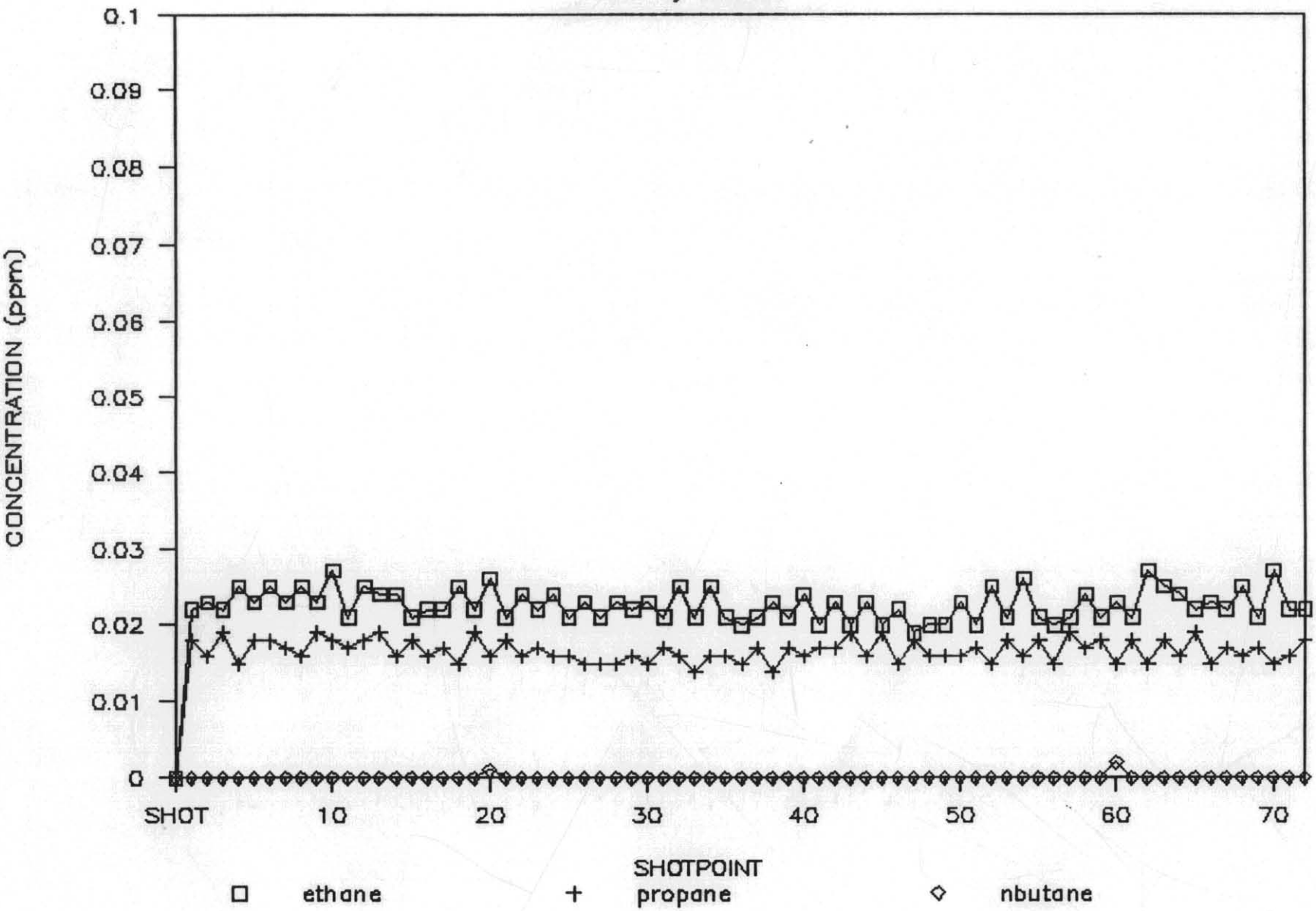
BASS BASIN

Survey Line 26



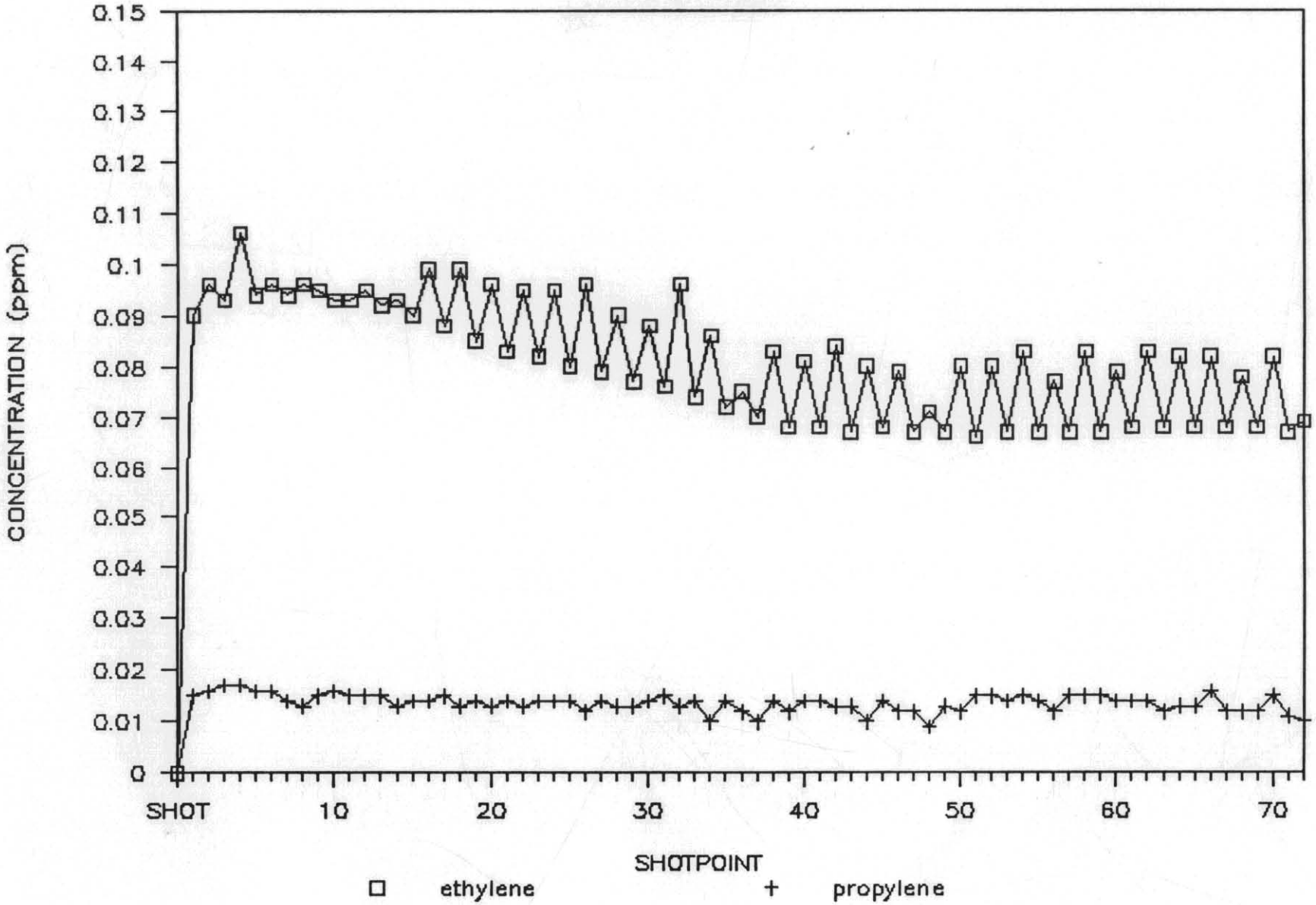
BASS BASIN

Survey Line 26



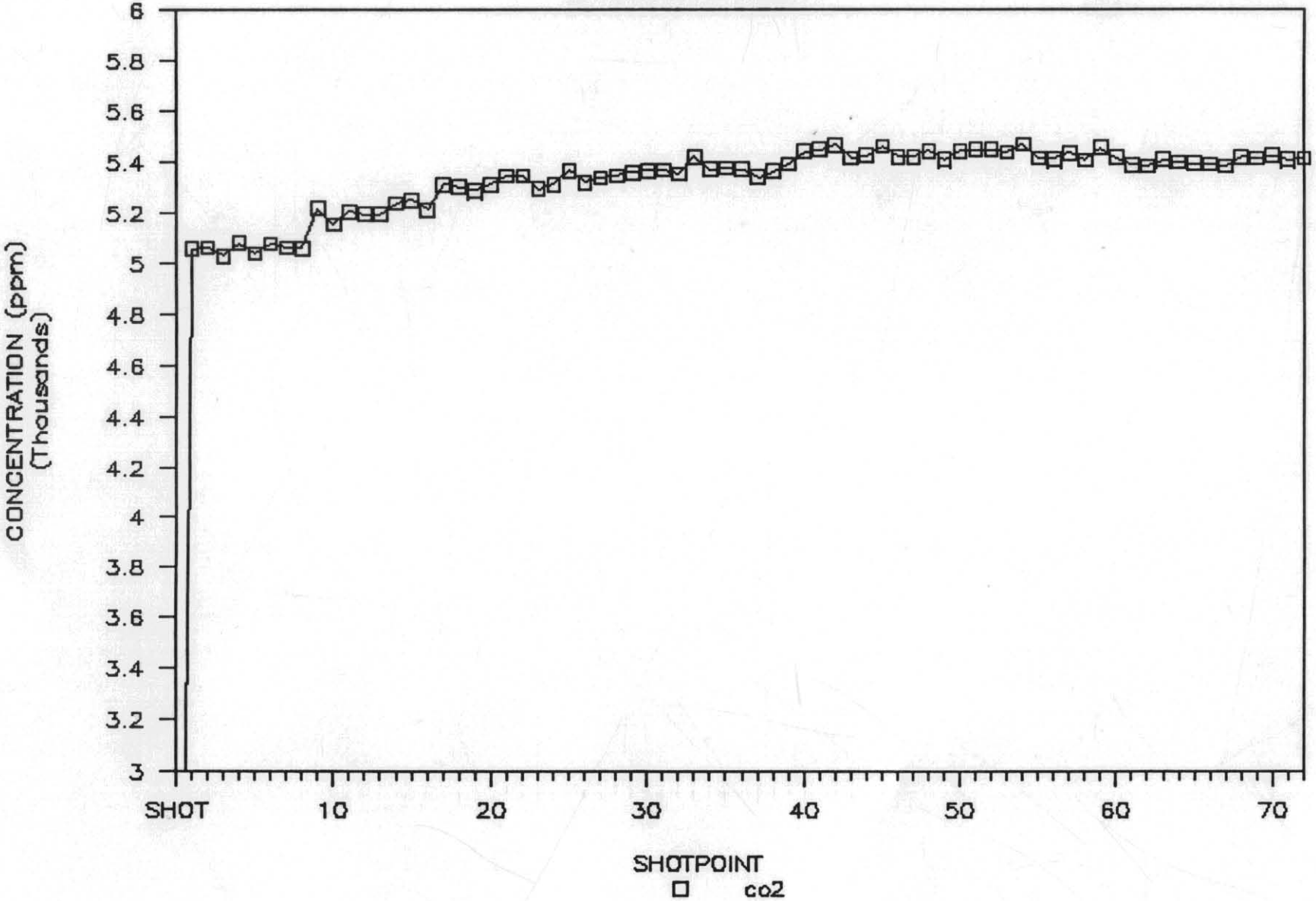
BASS BASIN

Survey Line 26



BASS BASIN

Survey Line 26



193129

SURVEY LOG SHEETS

193130

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SURVEY LOG SHEET

JOBNAME AMOCO BASS PAGE 1

Floppy Disk # AMOCOBASS 1

LHC1 Roll # 1 LHC2 Roll # 1 IHC Roll # 1
HHC Roll # 1 CO2 Roll # 1

DATE	TIME	LINE	SHPT	COMMENTS
2/3/89	1600	—	—	~~Testing~~ Underway to Survey area
2/4/89	0800	—	—	Fish over side for testing Calibrate CTD
	10:30	—	—	Fish on deck. Underway to start of first line working on A-frame
	1600			Fish over side. Pumping water to extractor
	1700			Begin analyzing seawater
	1845			Begin vertical profile to calibrate CTD and to test hydrocarbon distribution
	2000			Zero Nitrogen
	20:15			Cal Gas & recalibration

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SURVEY LOG SHEET

LINE: BASS1
1B.55 = last miles
3666 ⇒ FFFF

JOBNAME AMOCO BASS

PAGE 2

FN = SW203.*

Floppy Disk # AMOCOBASS 2

LHC1 Roll # 1 LHC2 Roll # 1 IHC Roll # 1+2 31.53(6)
HHC Roll # 1 CO2 Roll # 1+2

DATE	TIME	LINE	SHPT	FIRST SHT.	COMMENTS
2/3/87					
					Run to
					BASS1
					we will reshoot line
		SW2031			
2/3	2045		1	16	Survey finish past prior to line
	20:57		6	15	
	21:03		8	14	
			13		actual preplot start of line
	21:20		16	18	
	21:23		19	13	
	21:37		22	8	
	21:40		25	9	
	22:06		37	20	
	22:13		40	15	
	22:21		44	15	
	22:30		51	16	
	2300		61	18	
	1120		71	16	
	1142		82	16	
	1159		90	10	End of Line BASS1

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BASS 2 FFFF → EEEE
24 NM ≡ 44.7 km

JOBNAME AMOCO BASS PAGE 3

Floppy Disk # AMOCO BASS 1

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 1+2
HHC Roll # 1 CO2 Roll # 1+2

DATE	TIME	LINE	SHPT	COMMENTS
2/4/89	0023	2		
				Delayed BOL To Calib THC
2/4/89	0100	BASS 2	1	Fish Depth 48M Bottom 59M
	0127	BASS 2	16	FISH DEPTH 49 m
				BOTTOM 65 M
	0153		28	FISH DPTH 51 m, BOTTOM 62 m
	0230			DENYDRANT IS NOW $CaCO_3$.
				PREVIOUS HIGH THC ASP. FROM MOISTURE...
	0245		53	FISH DPTH 50 m BOTTOM 65 m
	0305		63	FISH DPTH 50 m BOTTOM 66 M
	0330		75	NEW DRIERITE. ($CaCO_3$ DID NOT HELP MUCH)
	0335		77	FISH DPTH 50 m. BOTTOM 67 M
	0400		86	NEW DRIERITE
	0445		102	FISH DPTH 49 m BOTTOM : 65 M
				FISH DPTH 49m BOTTOM : 67m
	0457	↓	107	EOL BASS 2

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LINE BASS 3
12 nm ≡ 22.4 km
CCEE → DDDD

JOBNAME AMOCOBASS

PAGE 4

Floppy Disk # AMOCOBASS 1

LHC1 Poll # 2 LHC2 Roll # 1 IHC Roll # 2
HHC Roll # 1 CO2 Roll # 1+2

DATE	TIME	LINE	SHPT	COMMENTS
2/4/89	0500	BASS 3	1	INCLUDES TURN. BOL
		1		FISHDPTH 35 m BOTTOM 67 m
	0515	1	7	NEW DIGICITE
	0516	1	8	"OFFICIAL BOL"
	0539	1	19	FISH DEPTH 49 m BOTTOM 63 m
	0612	1	35	FISH DEPTH 50 m BOTTOM 67 m
	0625	1	40	CHANGED DIGICITE
	0625	1	40	FISH DEPTH 50 m BOTTOM 68 m
	0717	1	EB	EOL BASS 3

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1 nm ≈ 1.7 km

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DDDD → CCCC

LINE BASS 4

6-8 NM = 12.7 km

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SURVEY LOG SHEET

JOBNAME AMOCO BASS PAGE 5

Floppy Disk # AMOCO BASS 1

LHC1 Roll # 2 LHC? Roll # 1 IHC Roll # 2

HHC Roll # 1 CO2 Roll # 2

DATE	TIME	LINE	SHPT		COMMENTS
2/4/89	0730			14	Checked Cal. & Meth (CHANGED DILUTE) on LHC 1 & 2 (CALGAS)
	0742	BASS 4	1		SEAWATER TURN - DILUTE RUN OUT
				13	FISHDEPTH 49 m BOTTOM 64 M
	0754	BASS 4	4		"OFFICIAL START"
	0759		6		CHECK SEATING ON DILUTE TUBE
	0830	4	18	12	FISH at 49M / Bott. @ 61M
2/4/89	0850	4	28		EOC

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LINE BASS 5
S.SWMC = 15.8 Km
CCCC → BBBB

SURVEY LOG SHEET

JOBNAME AMOCO BASS PAGE 6

Floppy Disk # AMOCO BASS 1

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 2
HHC Roll # 1 CO2 Roll # 2

DATE	TIME	LINE	SHPT	COMMENTS
4/2/89	08.50	BASS 5	1	BOL FISH 50 m BOTTOM 65 m
	"	"	"	Chngd Drierite
	0901	BASS 5	3	BUDDY STUCK ON BASS4 WILL NOT CHANGE.
	0936	BASS 5	14	TAKE OFF LHC1 TO CHECK TIME TABLE
	0940	BASS 5	14	LHC1 ON LINE AGAIN. NO MODIFIS
		BASS 5	15	O'S - CHANGED LINE TO LHC1 - CAN'T
				GET LOCK
			17	
	0950	BASS 5	17	FISH 50 m BOTTOM 67 m
	0954	BASS 5	18	LHC1 OFFLINE - PEAK LOOSING METHANE
	1001	BASS 5	20	LHC1 ONLINE (FIXED) S. LINE RETURN AT .220
	"	"	"	FISH 50 m BOTTOM 68 m
	1018	/	25	EOL BASS 5
				CALIBRATE LHC1

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Line Bass 6

21.5 NM ≡ 40.0 km

BBBB → AAAA *

JOBNAME AMOCO BASS PAGE —

Floppy Disk # AMOCO BASS 1

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 2

HHC Roll # 7 CO2 Roll # 2

DATE	TIME	LINE	SHPT	VERTICAL HT (M)	COMMENTS
2/21/90	1033	Bass 6	1		BOL
			1		FISHDEPTH 50 m BOTTOM 65 m
			6		FISHDEPTH 50 m BOTTOM 70 m
			6		GENERAL - 2 SMALL PEAKS RESPONDING
					INTO METHANE IN BOTH
					LHC1 AND LHC2 SPORADICALLY.
					→ VALUES OF B FOR METH ARE WRONG!
					FISHDEPTH 50 m BOTTOM 70 m
	1251	BASS 6	56		LHC1 OFFLINE TO CHECK METH PEAKS
	1248	BASS 6	56	12	
	1305	BASS 6	61	13	changed dessicant note drop in THC
	1310	"	67		Added 2nd dessicant in line to THC
	1319	"	71		THC/IHC off line for recalibration
		"			THC below value for methane
	1335	"	78	19	Recalibrated IHC/THC Back on line
	1352	"	86	14	Bottom Fish fluctuations
	1405	"	92		End of Line 6
					Directly into Line 7
			91		changed extractor dessicant #1
					/ S.P. 91 1404 hrs

46 24 43

146 15 72

26.86 km

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SURVEY LOG SHEET

LINE BASS 7
AAAA* → AAAA
LENGTH = 19.6 NMI = 36.5 km

JOBNAME AMOCO BASS

PAGE 8

Floppy Disk # AmocoBASS 2

LHC1 Roll # 1 LHC2 Roll # 1 IHC Roll # 2
HHC Roll # 1 CO2 Roll # 2

DATE	TIME	LINE	SHPT	fish ht (m)	COMMENTS
2/4/89	14:08	BASS 7	1	20	start of line
					All systems showing THC with sun down looking good
	14:23		8	20	
2/4	14:30		11	22	Lower FISH TO 51 meters
	14 43	7	16	15	
	15 10	27	27	17	
			30		Removed liners from extractor put separate liners on each machine
	15:48	46	46	17	
	16:21		62	15	
			67	10	
	16:45		74	8	
			75		Remove liners from THC
			79	8	
			81		Put liners back on THC
	17:02		83		End of LINE

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LINE BASS 8
AAAA → ZZZ

SURVEY LOG SHEET

JOBNAME AMOCOBASS

127 nm PAGE 9

21.6 km

Floppy Disk # AMOCOBASS2

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 2
HHC Roll # 1 CO2 Roll # 2

DATE	TIME	LINE	SHPT		COMMENTS
2/4	17:04	BASS 8	1	1 FIRST LAT	THC still questionable
					beginning of this line
					on turn before point AAAA
	17:19	BASS 8	8	10	Cross AAAA towards ZZZ
	17:27		12	6	
	17:43		19	12	Set white drierite trap on THC
	1810	8	32	10	All running / change Drierite ~~THC~~ 1
	1827	8	41	13	
	1877	8	50	11	
	1915	8	65	11	End of line 8 - continue to
					take data as this line
					comes around to line ~~8~~ 9
			67		Remove drierite trap from LHC
			70		Change drier on THC
	1927		71	15	EOL Bass 8

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SURVEY LOG SHEET

BASS 9
~~ZZZ~~ → XYY
Length = 14.38 NM
24.4 Km

JOBNAME AMOCO BASS

PAGE 10

Floppy Disk # AMOCOBASS 2

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 2
HHC Roll # 1 CO2 Roll # 2

DATE	TIME	LINE	SHPT		COMMENTS
2/4	19:28	BASS 9	1	FISH	Start at point ~~ZZZ~~
				DEPTH	All systems on except HHC
	19:34	9	3	13	
	2005	9	19	12	HHC paper jam
	2018	9	25	12	
	2033	9	37	12	CHANGE THC trap
	2051	9	41	12	
	2127	9	59	12	
	0939	9	65	12	End of preplot line #9 We will continue to sample until EOL #10
	0936		43		change THC. dessicant to CaCl
					Butane test on extractor should show in 66
	2149		69	5	2nd Butane test on extractor
	2155	9	72		End of Line #9 Butane tests Passed

End 40 28 46
145 46 27

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SURVEY LOG SHEET

BASS 10
YYY to XXX

JOBNAME Amoco Bass

PAGE 11

Floppy Disk # Amoco BASS 2

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 2
HHC Roll # 1 CO2 Roll # 2

14.58 km = 27.2 km

DATE	TIME	LINE	SHPT	Fish height	COMMENTS
4 Feb 89	0955	10	1	10	start of line
			3	9	all systems on except HHC
	~~2223~~ 2223	10	15	13	change desired THC
	2240	10	23	12	
	2304	~~10~~ 10	35	13	
	2312		37	10	Change THC down
	2315		40	10	Stop CHC 1 close
	2332	10	48	12	
	~~2345~~ 2345	10	56	13	
	1202	10	83	13	
		10			End of Line
					Calibration of GC's
2/5	0007	10	65	12	EOL
			66		End
	00:50				RUN CAL 2051
	01:05				RUN EN 2051

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BASS II

XXX → WWW
6.8 nm = 12.7 km

SURVEY LOG SHEET

JOBNAME AMOCO BASS

PAGE 12

Floppy Disk # AMOCOBASS 2

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 2
HHC Roll # 1 CO2 Roll # 2

DATE	TIME	LINE	SHPT	COMMENTS
FEB 5/89	01:26	BASS II	1	BOL. FISHDPTH 46 m BOTTOM 77 m
			15	FISHDPTH 116 m BOTTOM 71 m
			41	FISHDPTH 46 m BOTTOM 75 m
	02:33		33	EOL FISHDPTH 46 m BOTTOM 73 m
				HHC off for this line

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BASS 12, 12A

7 nm = 13 km

WWW * → WWW

SURVEY LOG SHEET

JOBNAME AMOCOBASS **PAGE** ~~BASS~~ 13

Floppy Disk # AMOCOBASS 2

LHC1 Roll # 2 **LHC2 Roll #** 1 **IHC Roll #** 2
HHC Roll # 1 **CO2 Roll #** 2

DATE	TIME	LINE	SHPT	COMMENTS
FEB 5/91	02:34	BASE 12	1 [illegible]	BOL. FISH 46 m BOTTOM 73 m
	03:09	"	18 [illegible]	FISH 46 m BOTTOM 71 m
	03:54	BASS 12	39-40	Changed THC Dehydrite
	04:17	↓	52 [illegible]	FISH 46 m BOTTOM 58 m
	04:20		54	FISH 46 m BOTTOM 61 m
	04:43		64	FISH 46 m BOTTOM 54 m
	04:54		67	FISH 46 m BOTTOM 54 m
	04:55	↓		INVERTER OUT ~~OUT~~
				LOST POWER TO CTD WHILE
				FISH BEING RAISED.
				RE-PLUGGED ALL INTO TRANSFORMERS
	05:00	BASS 12A	1	POWER BACK ON. CTD UP AGAIN
	05:17		4	FISH 35 m BOTTOM 51 m
	05:26	↓	0	FISH 35 m BOTTOM 48 m
	05:47		19	FISH 35 m BOTTOM 42 m
	05:52		21	FISH 35 m BOTTOM 41 m
	06:00		25	FISH 35 m BOTTOM 40 m
	0605		27	EOL BASS 12A
				IHC off this line

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SURVEY LOG SHEET

LINE = BASS 13
16 NM, NOT INCLUDING 3-mile TURN (WWW → VVV)
VVV → WWW*

JOBNAME AMOCO BASS

PAGE 14

Floppy Disk # AMOCOBASS2

TOTAL 32.3 KM

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 273
HHC Roll # 1 CO2 Roll # 2

DATE	TIME	LINE	SHPT		COMMENTS
FEB 5-/89	0607	BASS 13	1	5	BOL. FISH 35m BOTTOM 40m
					~~at~~ WOLD CTD CONDUCTIVITY OFF SOME
					SINCE INVERTER FAILURE
	0640	BASS 13	17		~~FISH~~ ~~OFF~~ BOL". END OF TURN.
	0740			5	FISH 35m BOTTOM 40m
	0740		47		CHANGED THC DESICCANT. NOT PINK YET.
					THC < METHANE NOW
				13	FISH 35m BOTTOM 48m
	0805		57	17	FISH 35m BOTTOM 56m
	0815		64		CH4 INCREASED PORT 4 FLOW SLIGHTLY
	0835		74	10	FISH 46m BOTTOM 56m
	0851		82		IHC OFFLINE TO CHANGE PAPER.
					INTEGRATOR DIED - WAIT TILL END
					OF LINE TO CALIBRATE FOR
					NEW CALIBRATION FILE.
	0900		87		EOL INC + THC OFFLINE
	0930				~~THC, IHC ON LINE~~
			45		~~FISH 50m BOTTOM 59m~~

HHC off this line

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SURVEY LOG SHEET

LINE = BASS 14
1111* - 1111
10.1 nm = 18.82 km

JOBNAME AMOCOBASS **PAGE** 15

Floppy Disk # AMOCOBASS 2

LHC1 Roll # 2 **LHC2 Roll #** 1 **IHC Roll #** 3
HHC Roll # 1 **CO2 Roll #** 2

DATE	TIME	LINE	SHPT		COMMENTS
FEB 5/89	0901	BASS 14	1		BOL THC + IHC ALL OFFLINE
					FOR EMERGENCY IHC CALI-
		↓			- BRATION (INTEGRATOR DIED).
	0919	BASS 14	10		THC, IHC ONLINE. NEW DENYDRITE.
	0934	BASS 14	16	15	FISH 49 m Bottom 64 m
					LOW METH VALUES ARE WRONG!
					INCREASED FLOW TIME TO INCREASE
					02 PEAK.
	0938		19		LHC1 OFFLINE TO EDIT CALIBRATION
					→ CHOOSE AT WINDOW FOR METH + O_2
	0947		20	W	LHC1 ON LINE
	1009		32	18	FISH 30 m Bottom 68 m
	1012		33		NEW DRIERITE
				17	FISH 50 m Bottom 67m
			45	16	FISH 50, Bottom 66
	1037	↓	45		EOL
					HHC off this line

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SURVEY LOG SHEET

BASS 15
uuu - TTT
12.7 nm = 24 Km

JOBNAME AMOCOBASS **PAGE** 16

Floppy Disk # AMOCOBASS 2

LHC1 Roll # 2 **LHC2 Roll #** 1 **IHC Roll #** 3
HHC Roll # 1 **CO2 Roll #** 2

DATE	TIME	LINE	SHPT	Fish HT	COMMENTS
FEB 5/89	10:39	BASS 15	1		Rec systems on except HHC
				7	FISH 50 m BOTTOM 67 m
	10 45		3	8	FISH 55 m BOTTOM 68 m
				12	FISH 55 m BOTTOM 67 m jumpy.
	11:17		13		FISH HT at 15 m
	11:26		19		NEW DRIERITE FOR IHC
	11:51		30		FISH HT 20 m
	12:16	15	43		12 m
	12:35	15	53		12 m End of Preplot line
					continue to sample
					until Line 16
			60		CO2 offline
	1300	15	64		End of extended turn

End 40 4.9
145 58.14

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SURVEY LOG SHEET

BASS 16
TTT → SSS
25.7 NM = 479 km

JOBNAME AMOCO BASS

PAGE 17

Floppy Disk # AMOCOBASS1

LHC1 Roll # 2 LHC2 Roll # 1 IHC Roll # 3
HHC Roll # 1 CO2 Roll # 2, 3

DATE	TIME	LINE	SHPT	Fish Ht.	COMMENTS
5 Feb 89	1301	16	1	13	Start of line CO_2 on line
					CO_2 recalibrated to 33 ppm for this line
	1309	BASS16	5	10	
	1332	16	16	18	
	1353	16	26	16	
	1405		32	15	Cell OK
			34	16	Change THC dessi
	1425	16	42	13	
	1452	16	55	15	CO_2 offline / Paper change roll 3
				58	Restore CO_2
	1509		63	16	Trap change THC
	1515		66	14	
	1540	16	79	11	
	1600	16	90	10	
			92		change THC dessicant
	1633	16	105	7	cable in
		16	115		change dessicant in THC
	1701	16	118	9	End of Prepot line
	1715				Date collection will start of line 17
	1715	16	126		End of line 16

B End

123.654
145 34.969

40 11.634
146 41.254

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SURVEY LOG SHEET

BASS 17
SSS → RRR

JOBNAME Amoco Bass **PAGE** 18

Floppy Disk # AMOCOBASS1

LHC1 Roll # 2,3 **LHC2 Roll #** 1 **IHC Roll #** 3
HHC Roll # 1 **CO2 Roll #** 3

DATE	TIME	LINE	SHPT	Fish Ft	COMMENTS
5 Feb 89	1715	17	1	8	start of line
	1724		4	10	LHC 1 printer down.
	1744	17	9	10	new LHC 1 roll
	1836	17	24	15	
	1847		27	17	
	1849		28		Change THC
			32	10	DROP FISH 1 WRAP
	1916		41	12	
			42		EOL at RRR

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SURVEY LOG SHEET

Line 25

11.711 NM = 20km

JOBNAME Amoco Bass **PAGE** 26

Floppy Disk # AMOCOBASS1 LLL* → LLL

LHC1 Roll # 4 **LHC2 Roll #** 2 **IHC Roll #** 3

HHC Roll # 2 **CO2 Roll #** 3

DATE	TIME	LINE	SHPT	Fish HT	COMMENTS
6 Feb 89	1211	25	1	15	Start of line THC off still
	1231	25	10	12	Change THC dessicant
	12 1253		21		Restore CO_2 - frozen
					Fish up
					THC + CO_2 hung up
	1325	25	36	15	
	1342		45	9	THC Back on line
			51	12	
	1400		54		EOL LINE BASS 25 at waypoint LLL
					Will not collect data along turn to waypoint KKK in order to bring system down to try to neutralize CO_2
					CO_2 back on line during turn towards BASS 26

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teg

SURVEY LOG SHEET

BASS26
KKK → JJJ

JOBNAME Amoco BASS

PAGE 27

Floppy Disk # AMOCO BASS2

30 Km

LHC1 Roll # 4 LHC2 Roll # 2 IHC Roll # 3
HHC Roll # 2 CO2 Roll # 3

DATE	TIME	LINE	SHPT	Fish ##	COMMENTS
2/6	14:06	BASS 26	1	11	Begin line on tern between line LLL 25 + 26 (warpts to KKK)
					all systems on except IHC
	14:16		6	12	
	1431	26	14	12	start preplot line 26
	1451	26	22	20	-
	1510	26	32	18	
	1530	26	42	20	
	15:50		52	14	
	1616	26	64	10	

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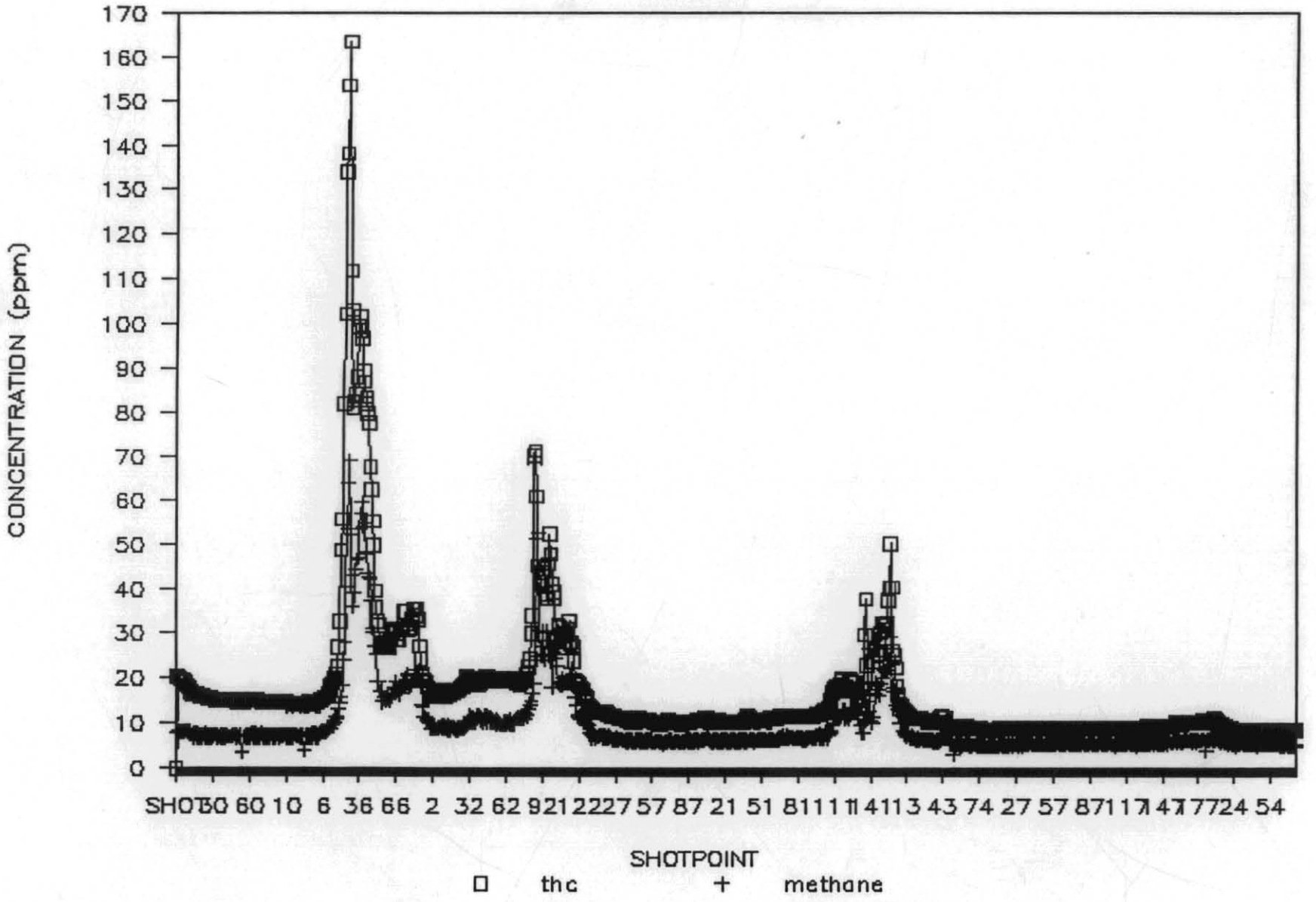
193150

GIPPSLAND DATA

GIPPSLAND BASIN

All Data



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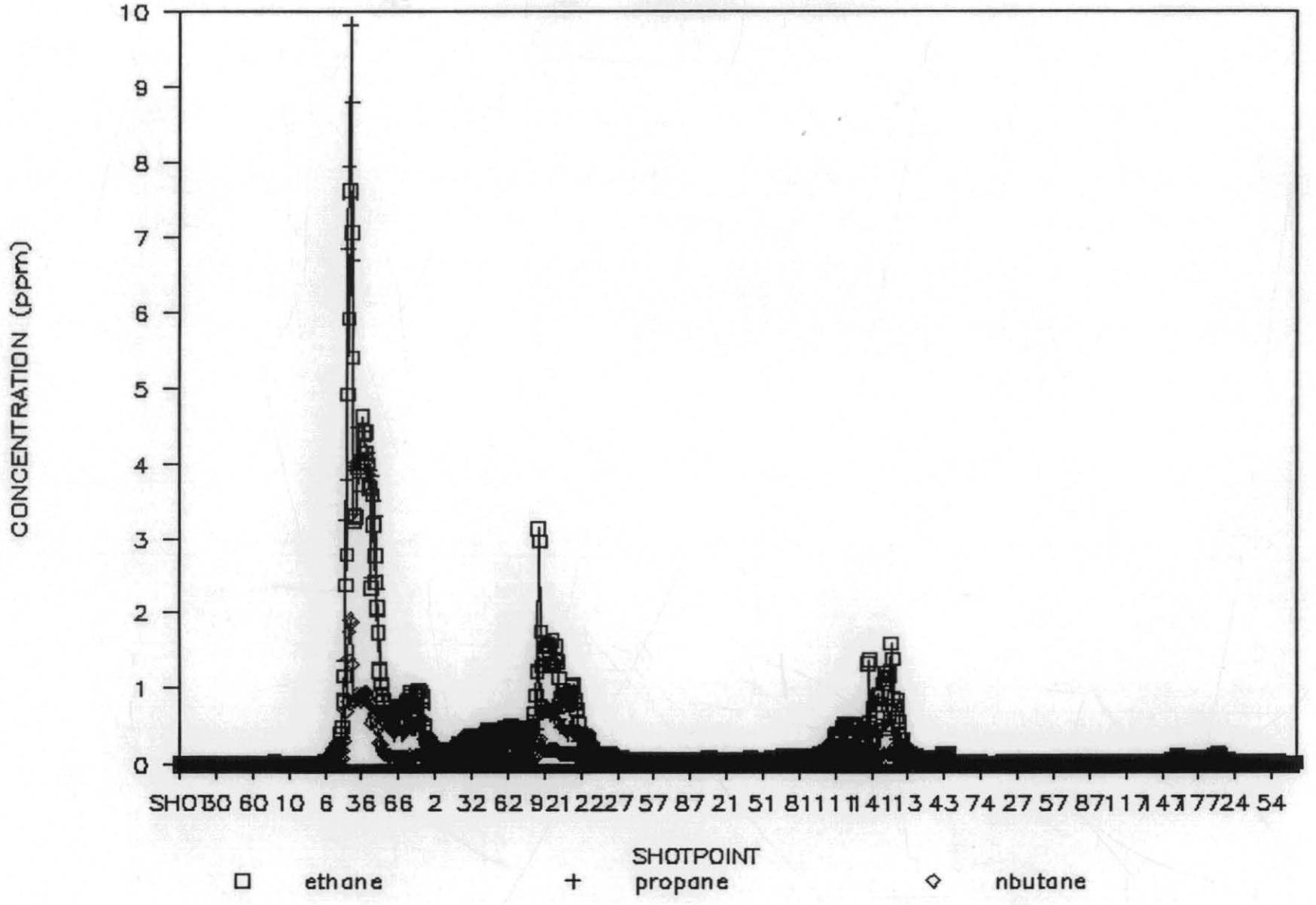

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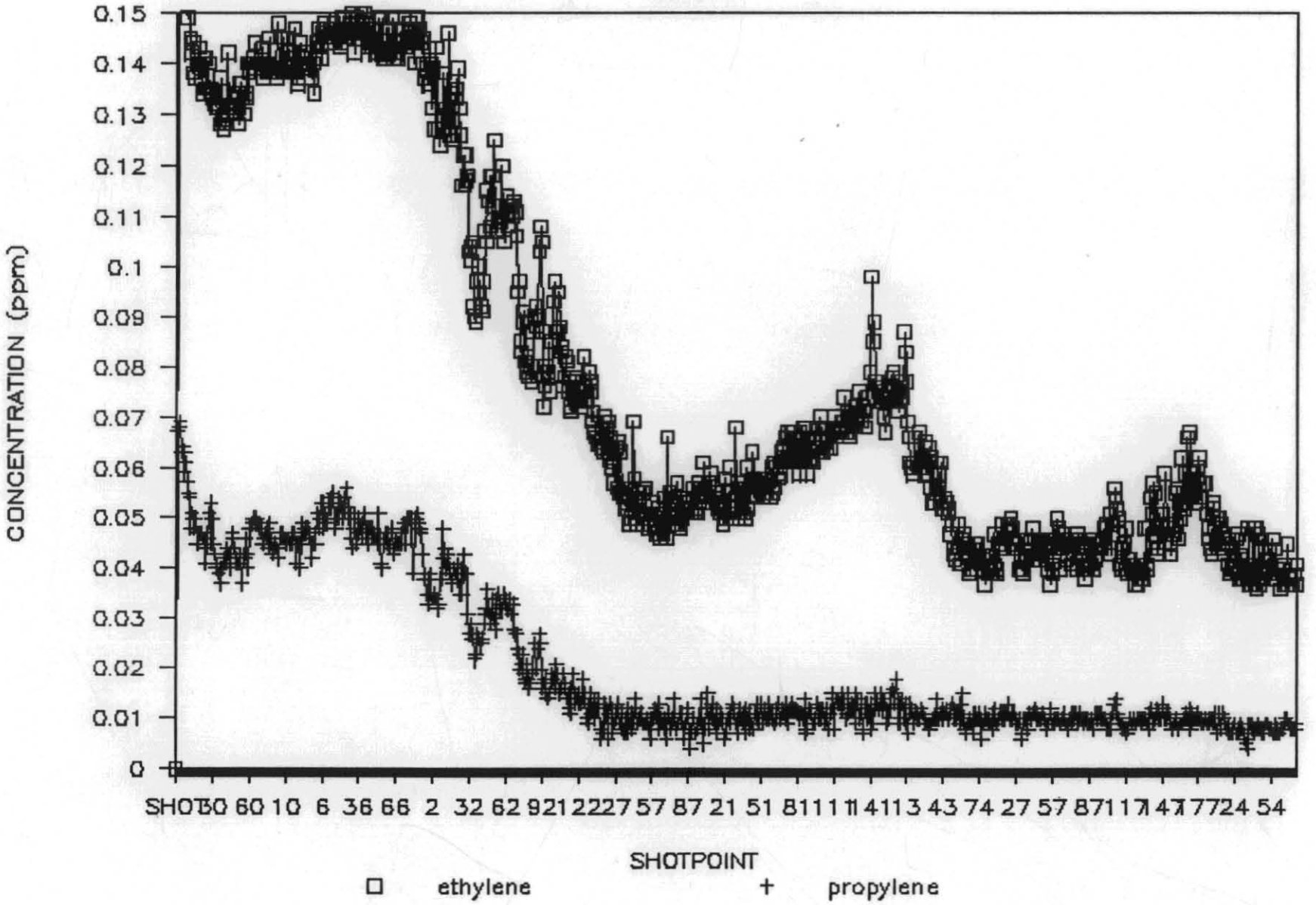

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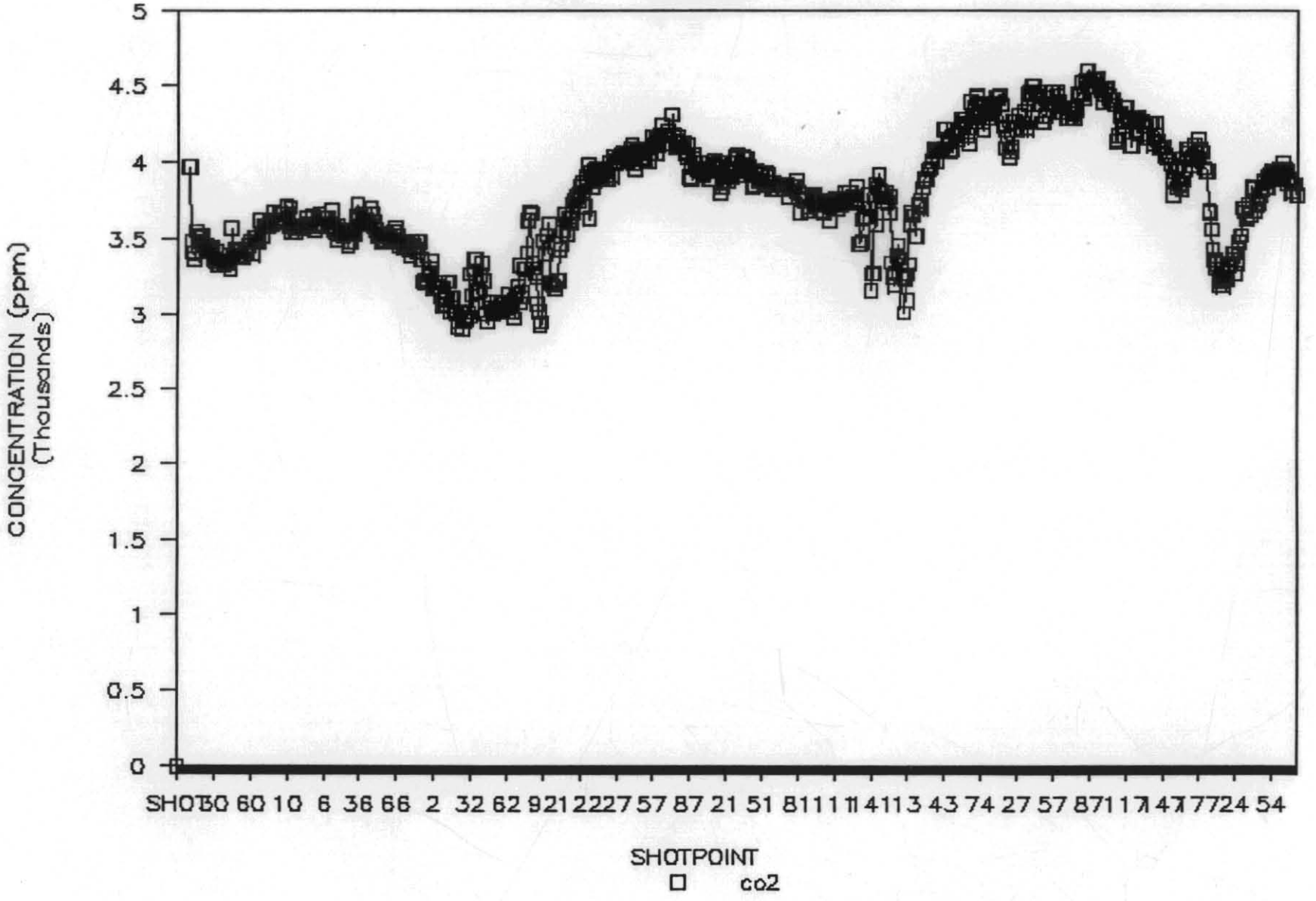
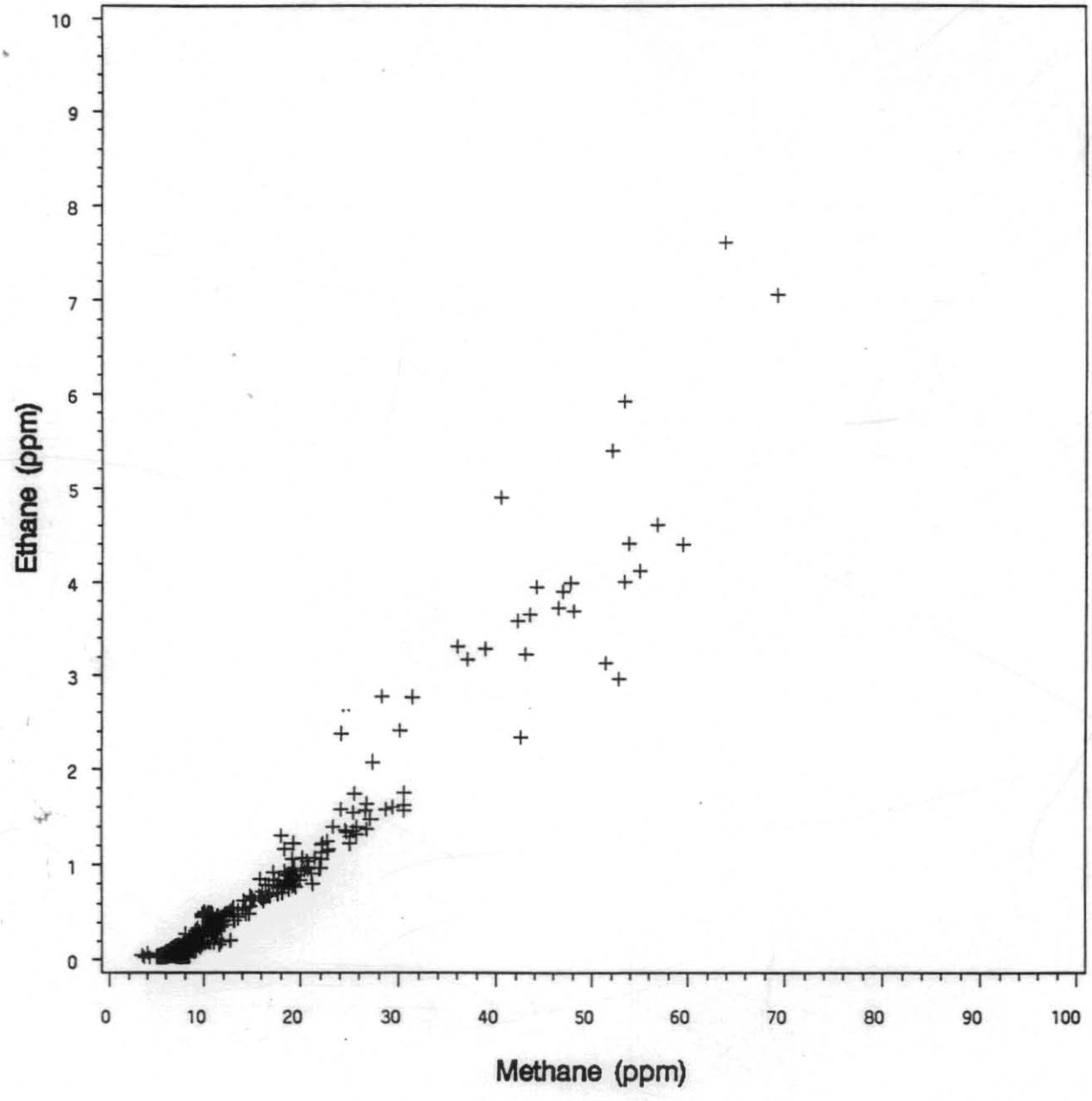
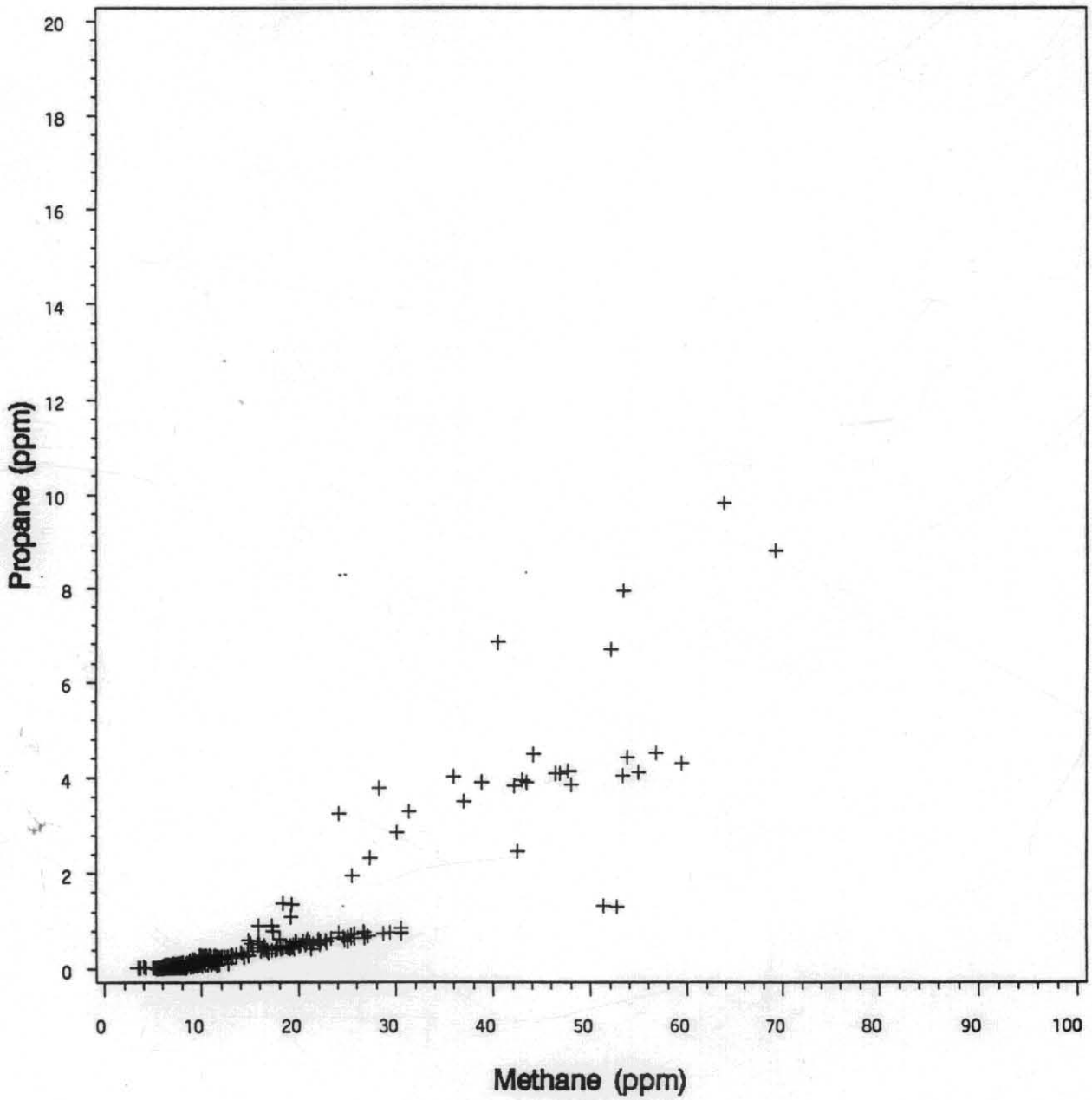


Gippsland Basin

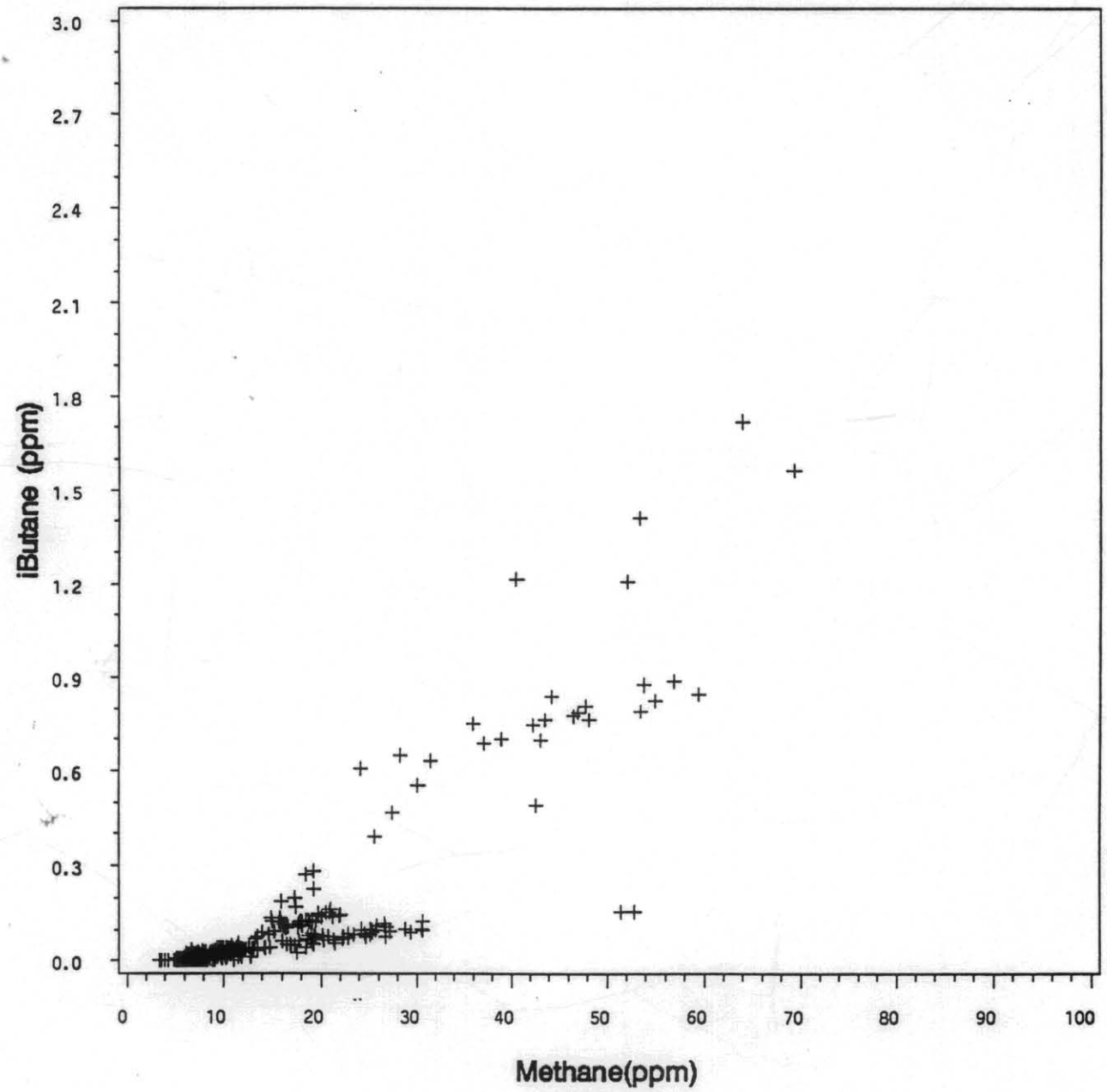


Gippsland Basin



193157

Gippsland Basin



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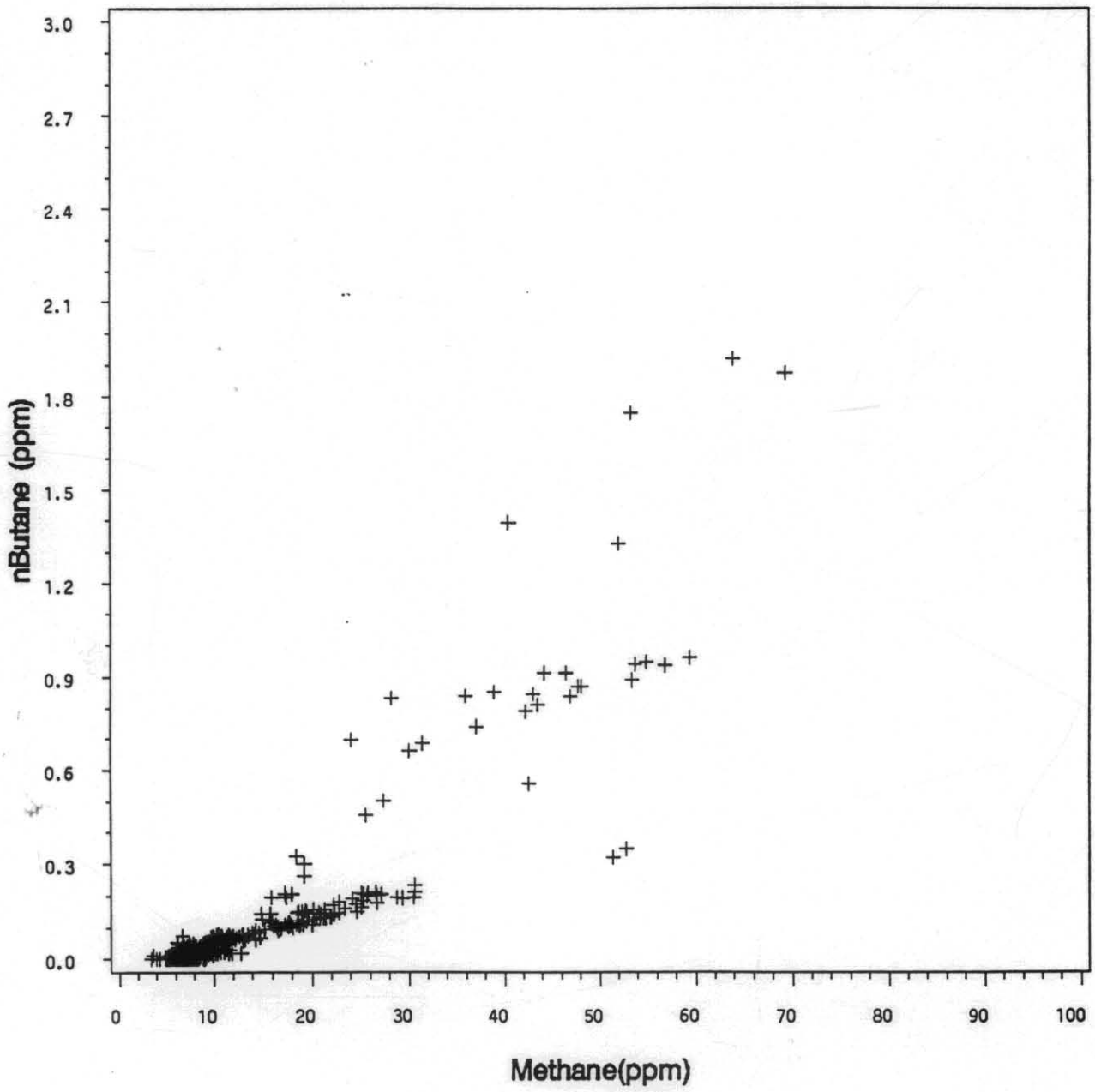
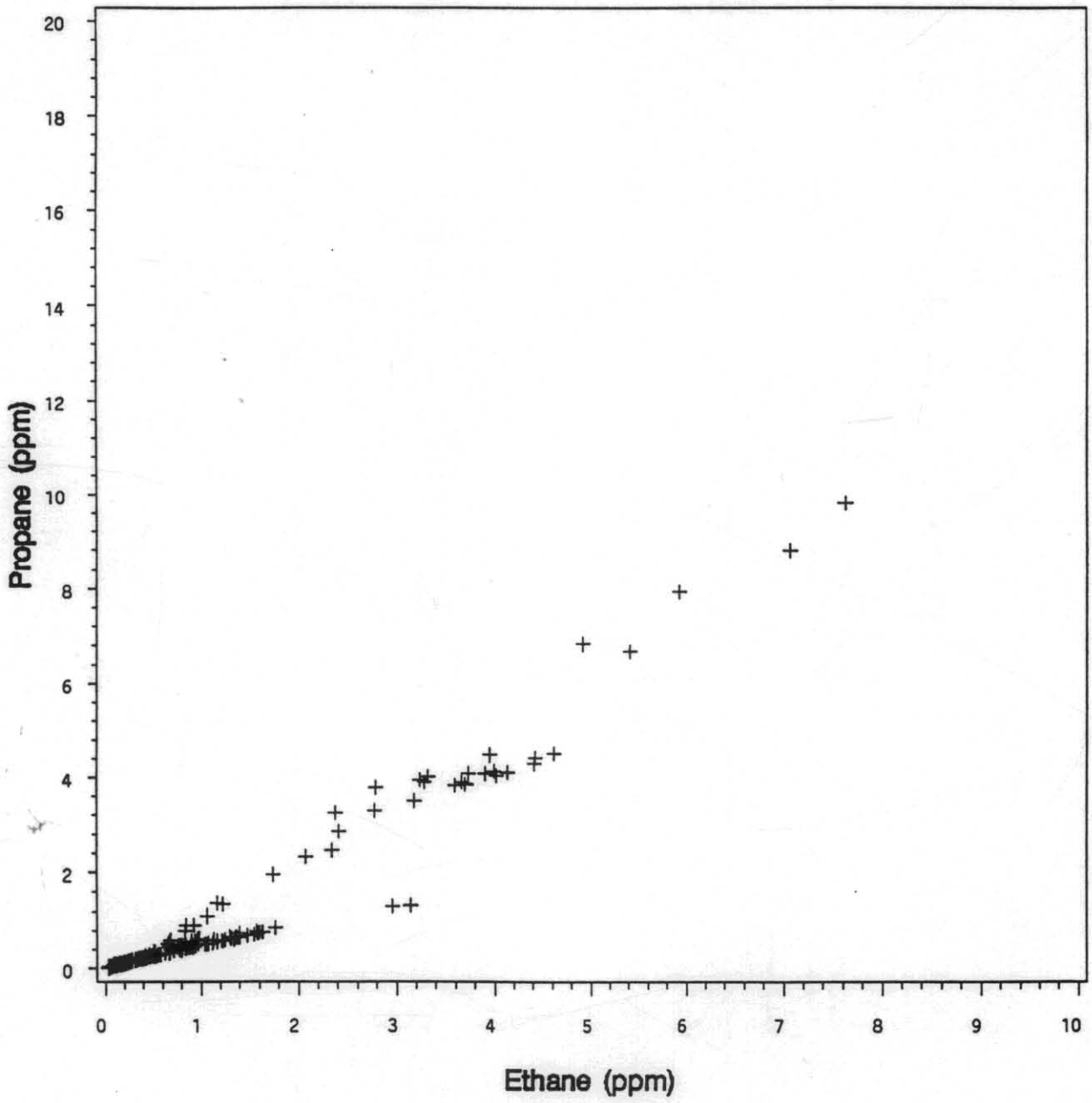
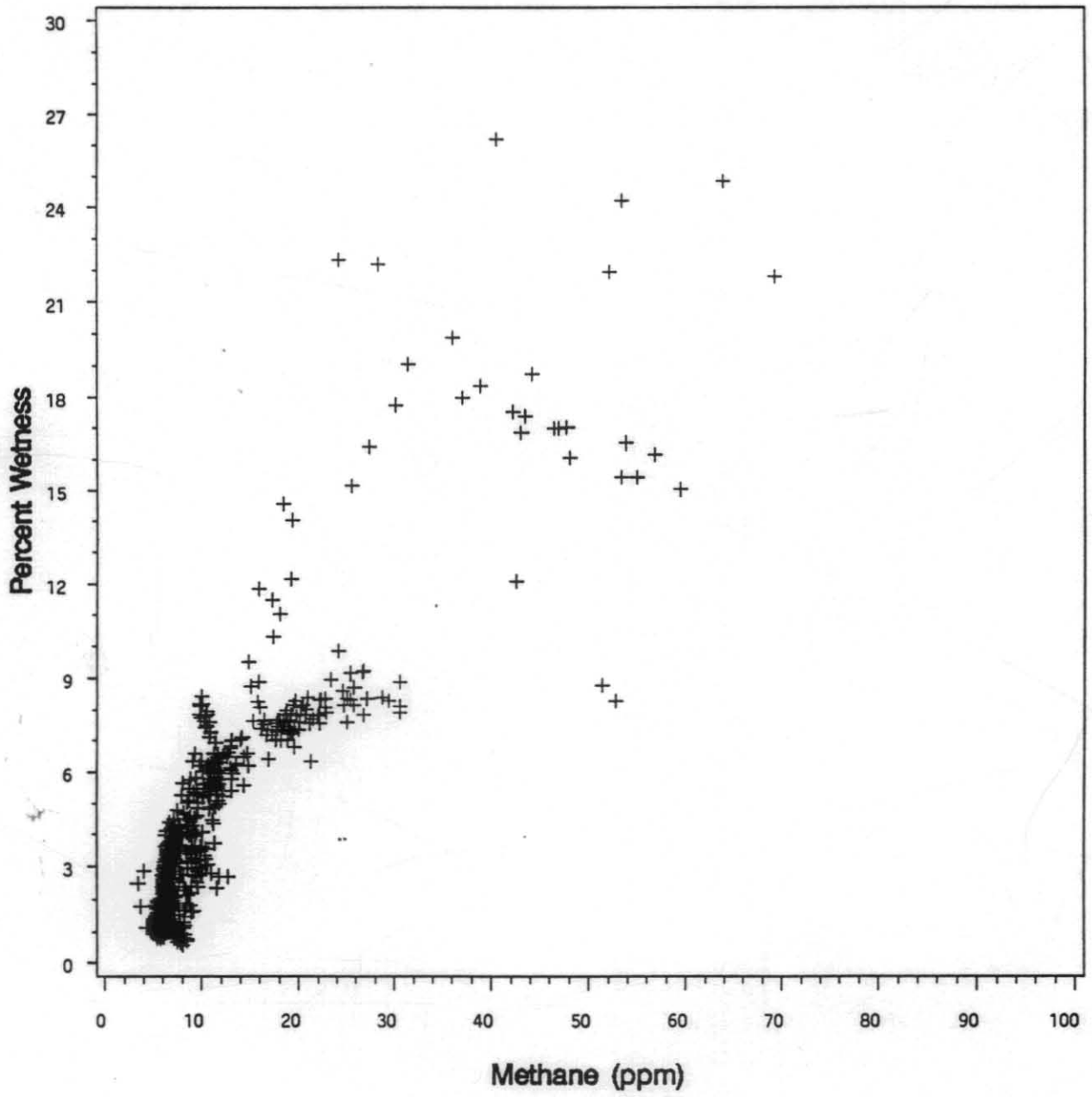


Gippsland Basin

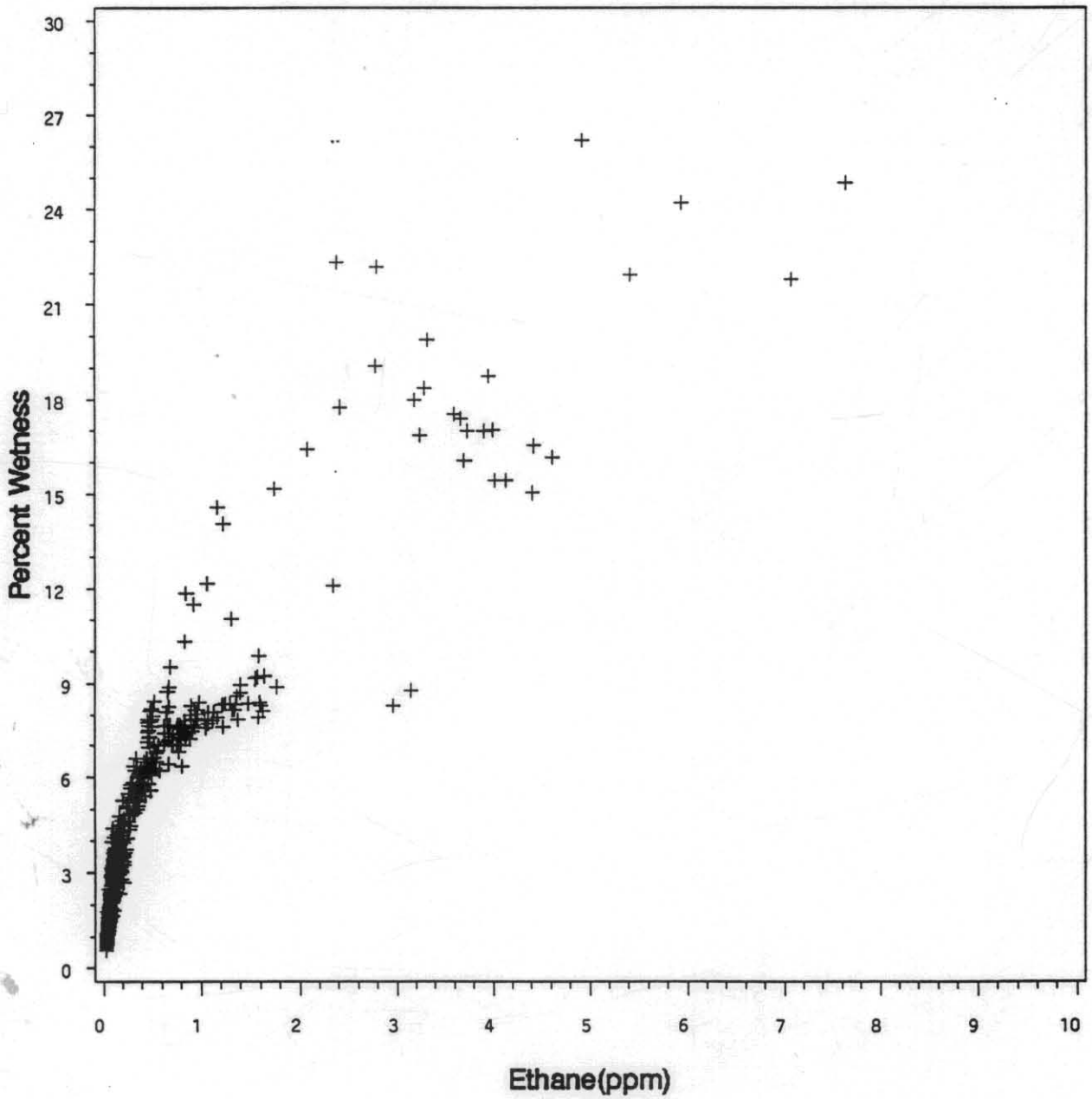


Gippsland Basin



193161

Gippsland Basin



193162

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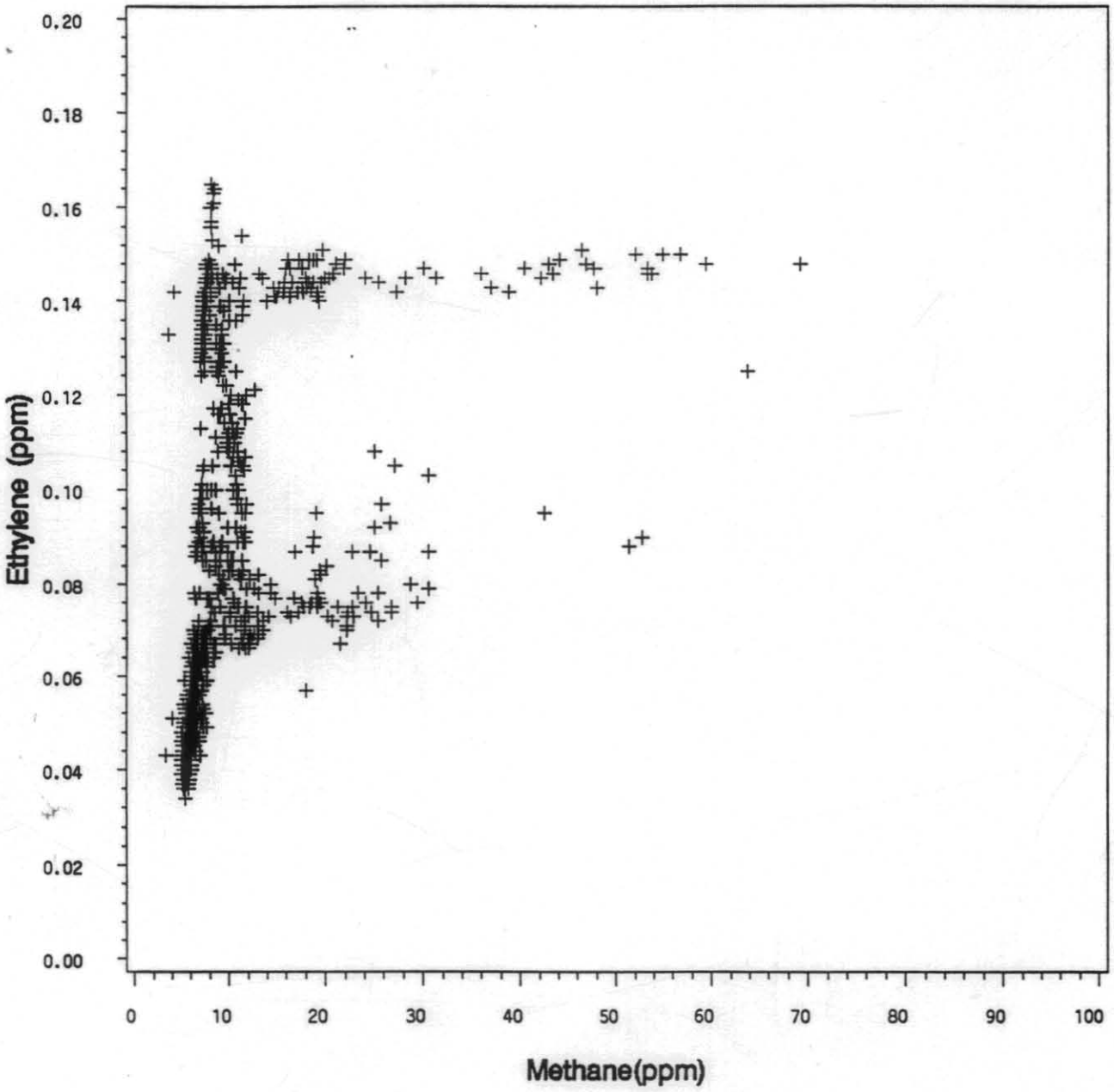
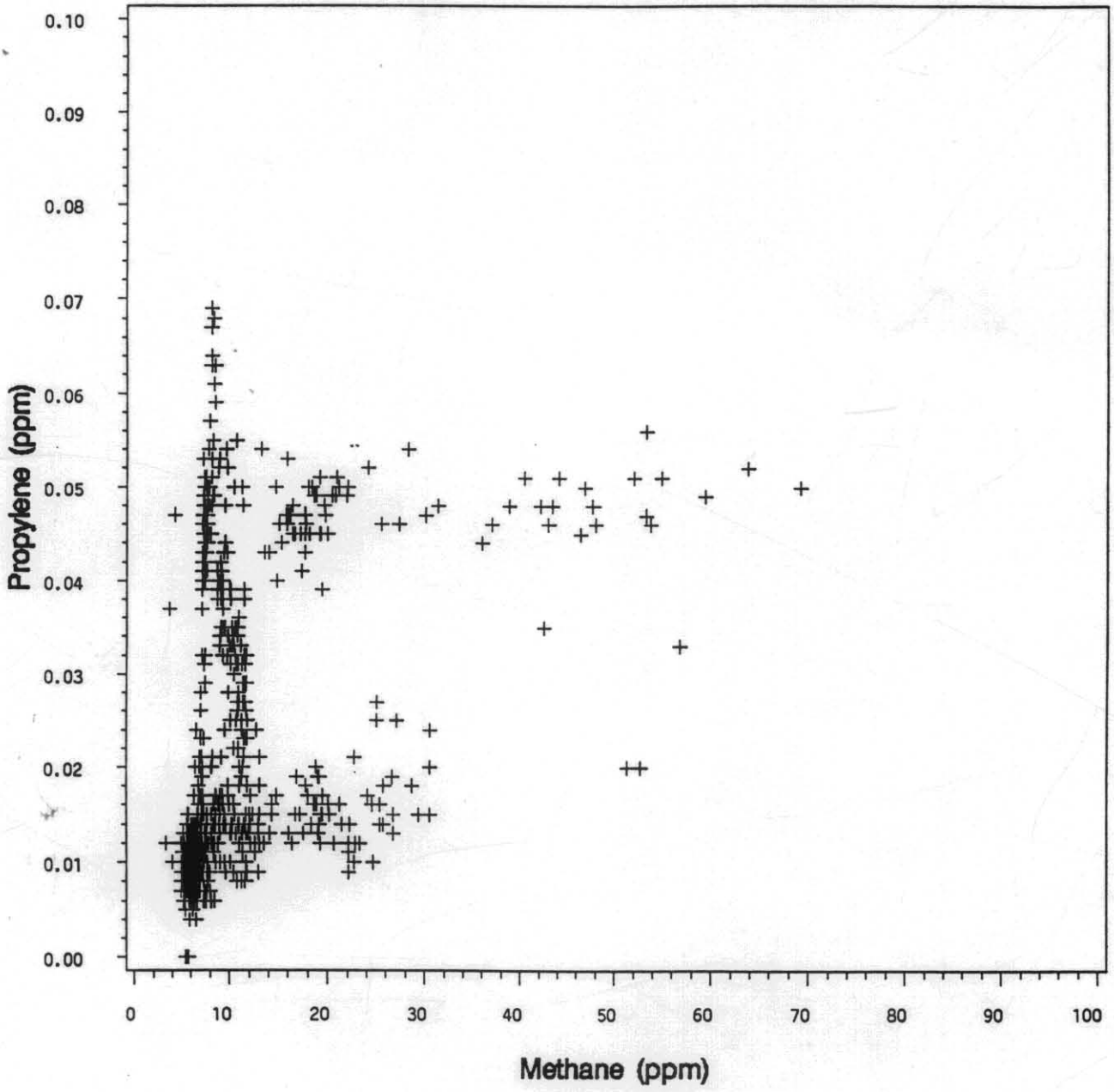


Gippsland Basin



193164

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