PANORAMA COAL PROJECT
GEOLOGICAL REPORT
1981

GULF CANADA RESOURCES INC.
COAL DIVISION

GR- Panorama 81(1)A

GULF CANADA RESOURCES INC.

PANORAMA COAL PROJECT GEOLOGICAL REPORT

1981

COAL LICENCE NUMBERS 5484 TO 5520 INCLUSIVE

AND 7037 TO 7042 INCLUSIVE

CASSIAR LAND DISTRICT

NTS MAP NO. 104 A

LATITUDES BETWEEN 56° 44' AND 56° 53' N

LONGITUDES BETWEEN 128° 24' and 128° 39' W

Author John Ihnis

GULF CANADA RESOURCES INC.

- and -

DAVID E. PEARSON, Ph.D. P.Eng.,
CONSULTING GEOLOGIST

NOVEMBER, 1981

SUBMITTED: JANUARY, 1982

DATE WORK DONE: MAY - NOVEMBER, 1981

STATEMENT OF QUALIFICATIONS

JOHN W. INNIS

This is to certify that I obtained a Bachelor of Science Degree in Geological Science at Queen's University in 1977, and a Master of Science Degree in Geology at the University of Western Ontario in 1980.

My geological experience has been through exploration and mapping programs in Newfoundland, Saskatchewan, and British Columbia, including two summers with the British Columbia Ministry of Energy, Mines and Petroleum Resources. I have been employed as a geologist in the Coal Division of Gulf Canada Resources Inc. since 1980.

PANORAMA PROJECT

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES IN TEXT

APPENDICES EXTERNAL TO TEXT

LIST OF MAPS INCLUDED IN APPENDIX IV

Scale 1:50 000	Geology — 7 maps here — (to break up this area @ 1:10,000)	
Scale 1:50 000	Cross-Section	A-A'
Scale 1:50 000	Cross-Section	P 2000
Scale 1:50 000	Cross-Section	P 3550
Scale 1:50 000	Cross-Section	P 4000
Scale 1:50 000	Cross-Section	P 6000
Scale 1:50 000	Cross-Section	P 8000
Scale 1:50 000	Cross-Section	P 9100
Scale 1:50 000	Cross-Section	P10000
Scale 1:50 000	Cross-Section	P12000
Scale 1:50 000	Cross-Section	P14000
Scale 1:50 000	Cross-Section	P16000
Scale 1:50 000	Cross-Section	P18000
Scale 1:50 000	Cross-Section	P20000

LIST OF MAPS INCLUDED IN APPENDIX VIII

Scale 1:10 000	Geology	Map A2
Scale 1:10 000	Geology	A3
Scale 1:10 000	Geology	B1
Scale 1:10 000	Geology	B2
Scale 1:10 000	Geology	B3
Scale 1:10 000	Geology	C1
Scale 1:10 000	Geology	C2
Scale 1:10 000	Geology	C3

Scale 1:10 000	Cross-Section	A-A'
Scale 1:10 000	Cross-Section	P 2000
Scale 1:10 000	Cross-Section	P 3550
Scale 1:10 000	Cross-Section	P 4000
Scale 1:10 000	Cross-Section	P 6000
Scale 1:10 000	Cross-Section	P 8000
Scale 1:10 000	Cross-Section	P 9100
Scale 1:10 000	Cross-Section	P10000
Scale 1:10 000	Cross-Section	P12000
Scale 1:10 000	Cross-Section	P14000
Scale 1:10 000	Cross-Section	P16000
Scale 1:10 000	Cross-Section	P18000
Scale 1:10 000	Cross-Section	P20000

1.0.0 SUMMARY

1.1.0 Location

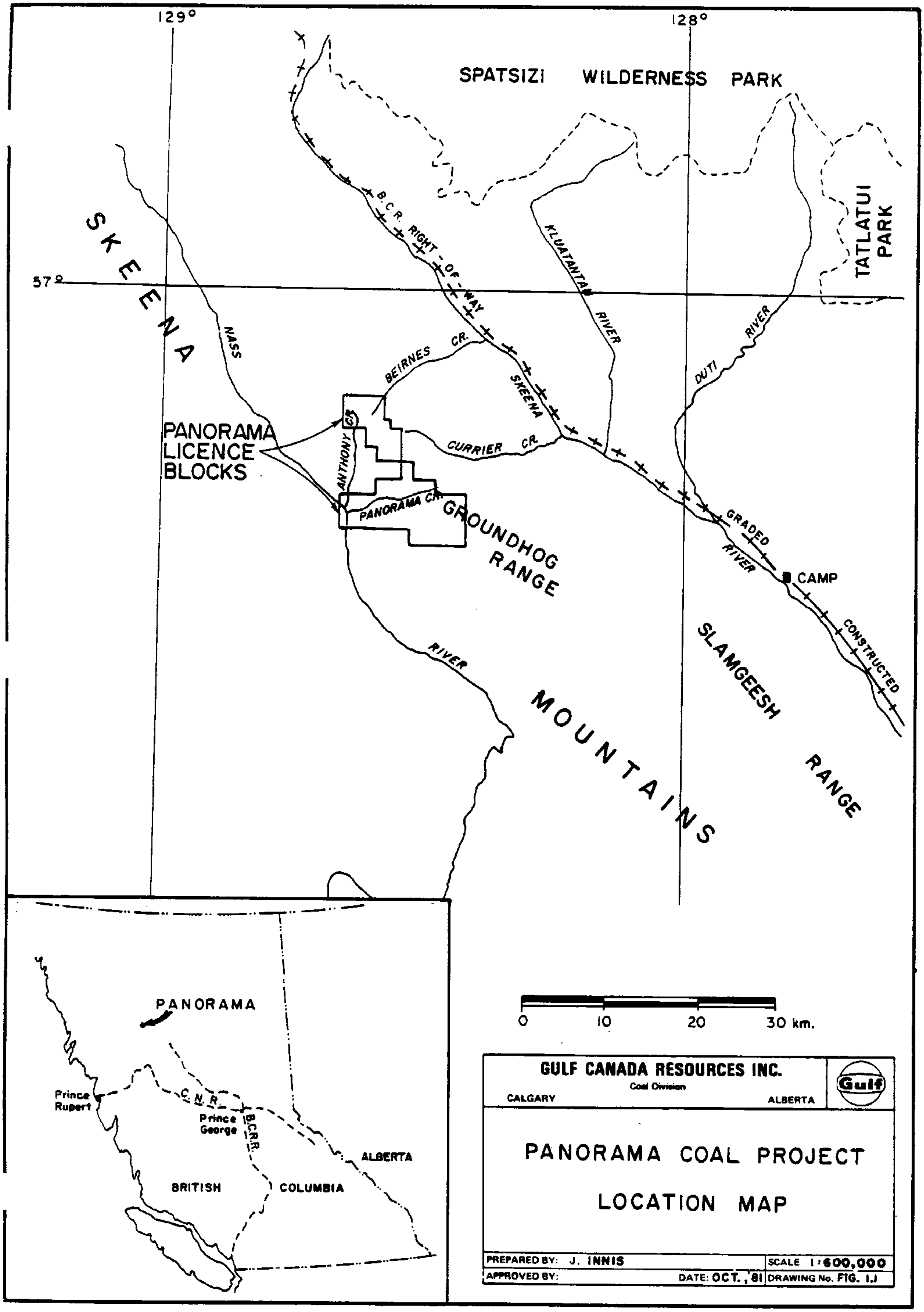
The Panorama Coal Licences are located in Northwestern British Columbia, approximately 234 air kilometres north of Smithers, British Columbia. The Licence Block lies within the Groundhog Range between the Skeena and Nass Rivers.

1.2.0 Access

The cleared right-of-way for the abandoned Prince George - Dease Lake British Columbia Railway is 15 kilometres northeast of the licences, and rail tracks are in place as far as the camp (shown in Figure 1.1), about 40 kilometres east of the licences. The sea port of Stewart is only 129 air kilometres to the southwest, but no access in this direction presently exists.

1.3.0 Licences

The property held comprises 43 licences with a total area of 12 061 hectares.


129°
128°
57°
SPATSIZI WILDERNESS PARK
TATLATUI PARK
SKEENA
NASS
B.C.R. RIGHT-OF-WAY
KLUATANTAN RIVER
DUTI RIVER
BEIRNES CR.
SKEENA
CURRIER CR.
ANTHONY CR.
PANORAMA CR.
PANORAMA LICENCE BLOCKS
GROUNDHOG RANGE
GRADED
RIVER
CAMP
CONSTRUCTED
RIVER
SLAMGEESH RANGE
MOUNTAINS
PANORAMA
Prince Rupert
C.N.R.
Prince George
B.C.R.R.
ALBERTA
BRITISH COLUMBIA
0 10 20 30 km.
GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf
PANORAMA COAL PROJECT
LOCATION MAP
PREPARED BY: J. INNIS
SCALE 1:600,000
APPROVED BY:
DATE: OCT., '81
DRAWING No. FIG. 1.1

1.4.0 Ownership

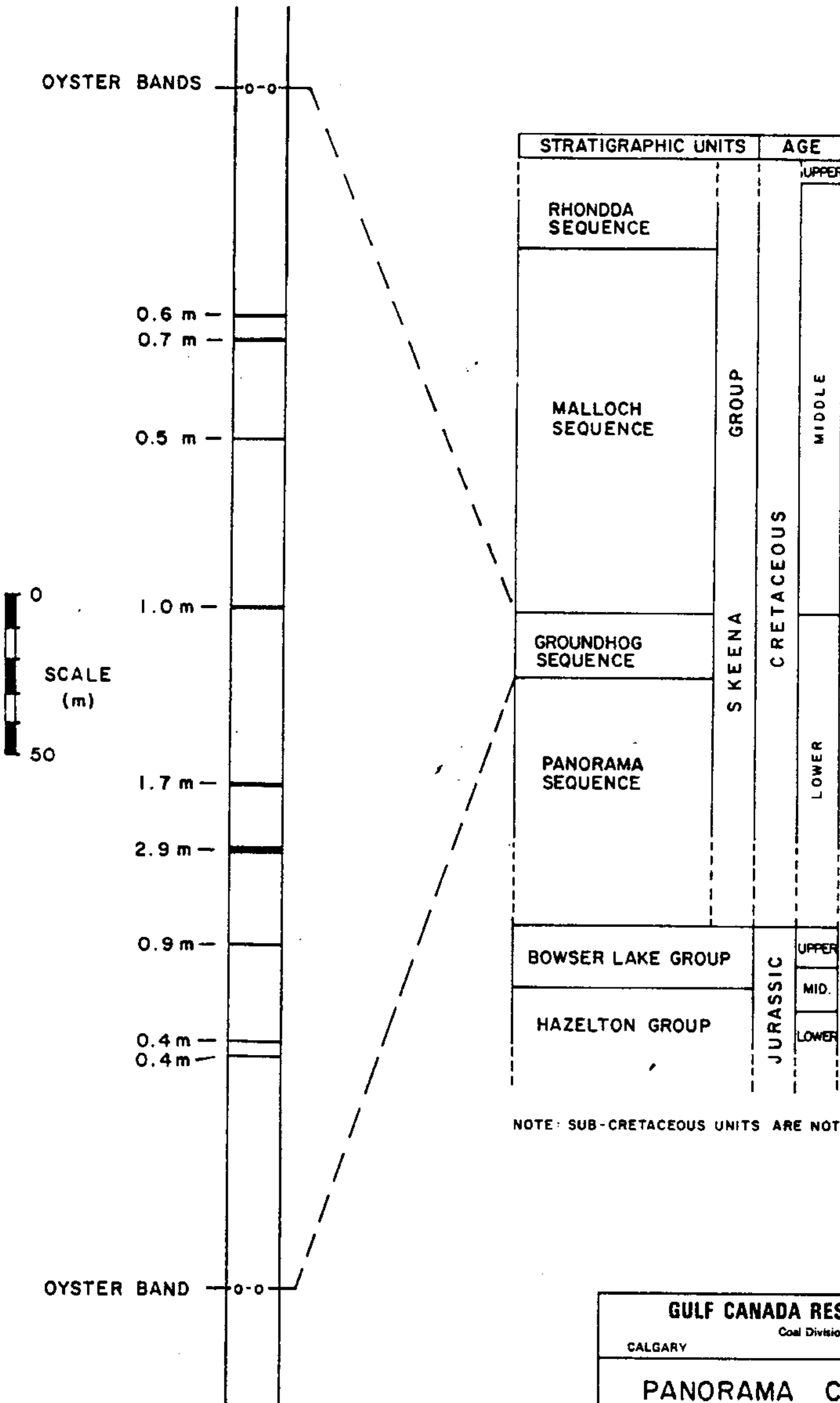
Gulf Canada Resources Inc. holds 100% interest in the Panorama licences.

1.5.0 Exploration

To date, investigation of the Panorama Licence Area has included helicopter-supported geological mapping of the entire area on a 1:10 000 scale in 1980 and 1981, hand trenching of all seams discovered in excess of 0.5 metres in thickness, and petrographic and quality analysis of coal samples from the trenches.

1.6.0 Geology

The Panorama Licences are underlain by lower to middle Cretaceous sedimentary rocks of the Skeena Group, which is subdivided into four stratigraphic sequences; the Panorama, the Groundhog, the Malloch, and the uppermost Rhondda. Major coal development is confined to the Groundhog sequence which is contained between prominent Oyster-bearing marine bands. Flexural-slip folding and thrusting in many localities thickens the coal-bearing sequence, and by repetition increases the number of coal seams. Late normal faults, however, restrict the distribution of the coal measures.



NOTE: SUB-CRETACEOUS UNITS ARE NOT DRAWN TO SCALE.

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PANORAMA COAL PROJECT

GENERALIZED STRATIGRAPHIC COLUMN

BY: J. INNIS DATE: OCT., 1981 FIG. 1.2

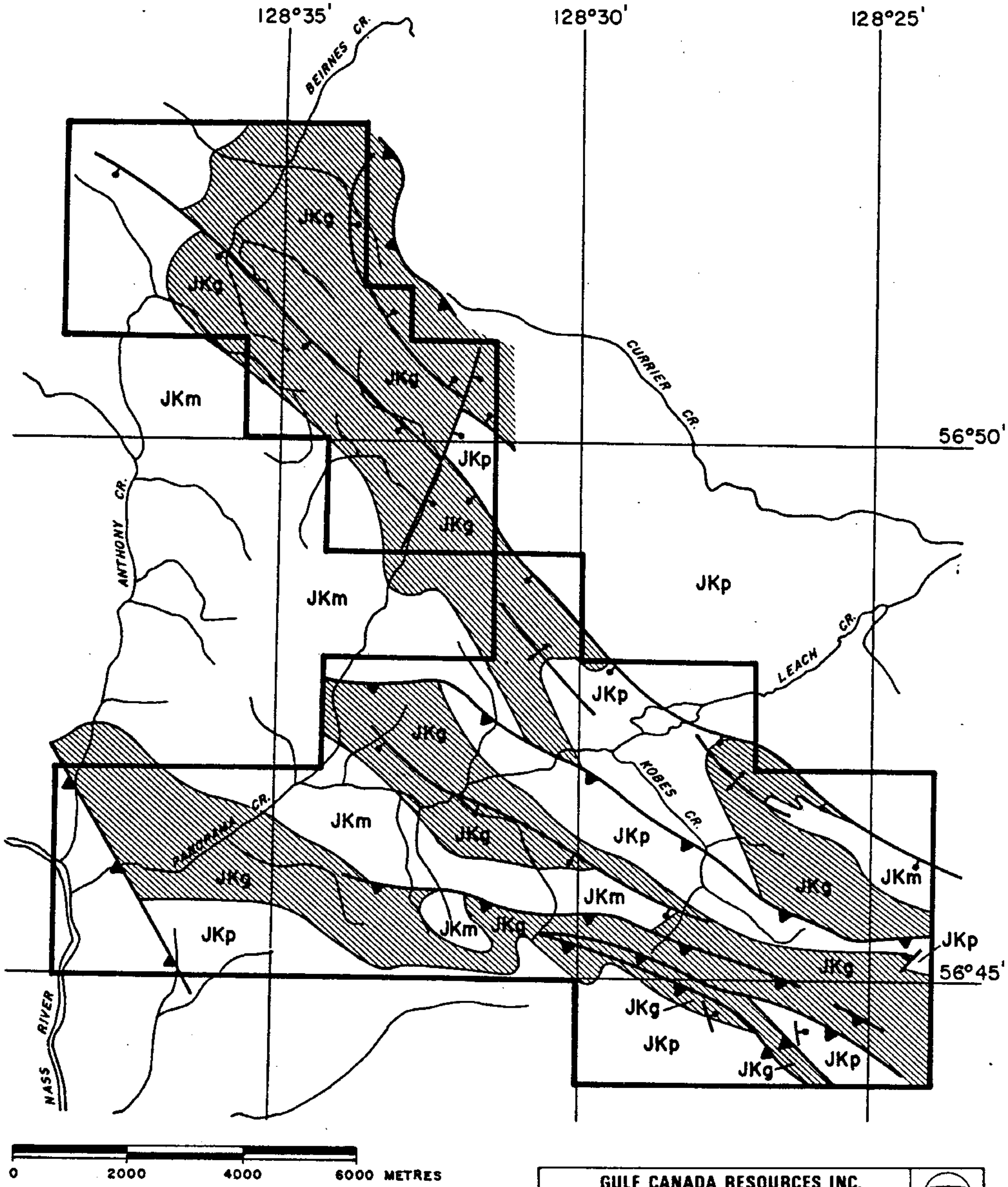
1.7.0 Resource Potential

The resource potential in the Panorama Licence Area is contained within the Groundhog sequence. Although nine coal seams with an aggregate thickness of 9.1 metres occur in the Groundhog sequence, structural thickening and erosion change total coal thickness in most locations.

The Inferred Resources of the area where the Groundhog sequence outcrops are estimated to be 240 million tonnes.

1.8.0 Coal Quality

The coal of the Panorama area is anthracite, as determined by vitrinite reflectance measurement on 138 individual coal samples. Because of oxidation, volatile matter yields of the coals are enhanced and calorific values are reduced, so their rank cannot be determined by means of proximate analysis of trench samples.



JKm MALLOCH SEQUENCE

JKg GROUNDHOG SEQUENCE
COAL BEARING SEQUENCE

JKp PANORAMA SEQUENCE

GEOLOGIC CONTACTS

FAULTS (NORMAL, THRUST)

FOLDS (SYNCLINE, ANTICLINE)

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PANORAMA COAL PROJECT

GEOLOGY MAP

PREPARED BY: S. BARRON SCALE: 1:100,000
DATE: OCT. 1981 FIG. 1.3

2.0.0 INTRODUCTION

2.1.0 Objectives

The objectives of the 1981 Panorama exploration program were:

a) to map precisely the distribution of stratigraphic units defined in the 1980 program;

b) to map all significant coal seams and to determine their relative stratigraphic position;

c) to define structural domains;

d) to trench seams for accurate resource appraisal;

e) to establish coal rank;

f) to delineate areas of potentially surface-mineable resources;

g) to establish the size of the resources in those areas; and,

h) to select sites for future drilling programs.

2.2.0 Location

The Panorama coal licences are located between the Nass and Skeena Rivers of northwestern British Columbia, within the Groundhog Ranges of the Skeena Mountains (Figure 2.1). The area is between 56°44' and 56°53' north latitude and 128°24' and 128°39' west longitude.

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LOCATION MAP

PANORAMA COAL PROJECT

PREPARED BY	J. INNIS		SCALE
APPROVED BY		DATE OCT./81	DRAWING No. FIG. 2.1

2.3.0 Coal Licences

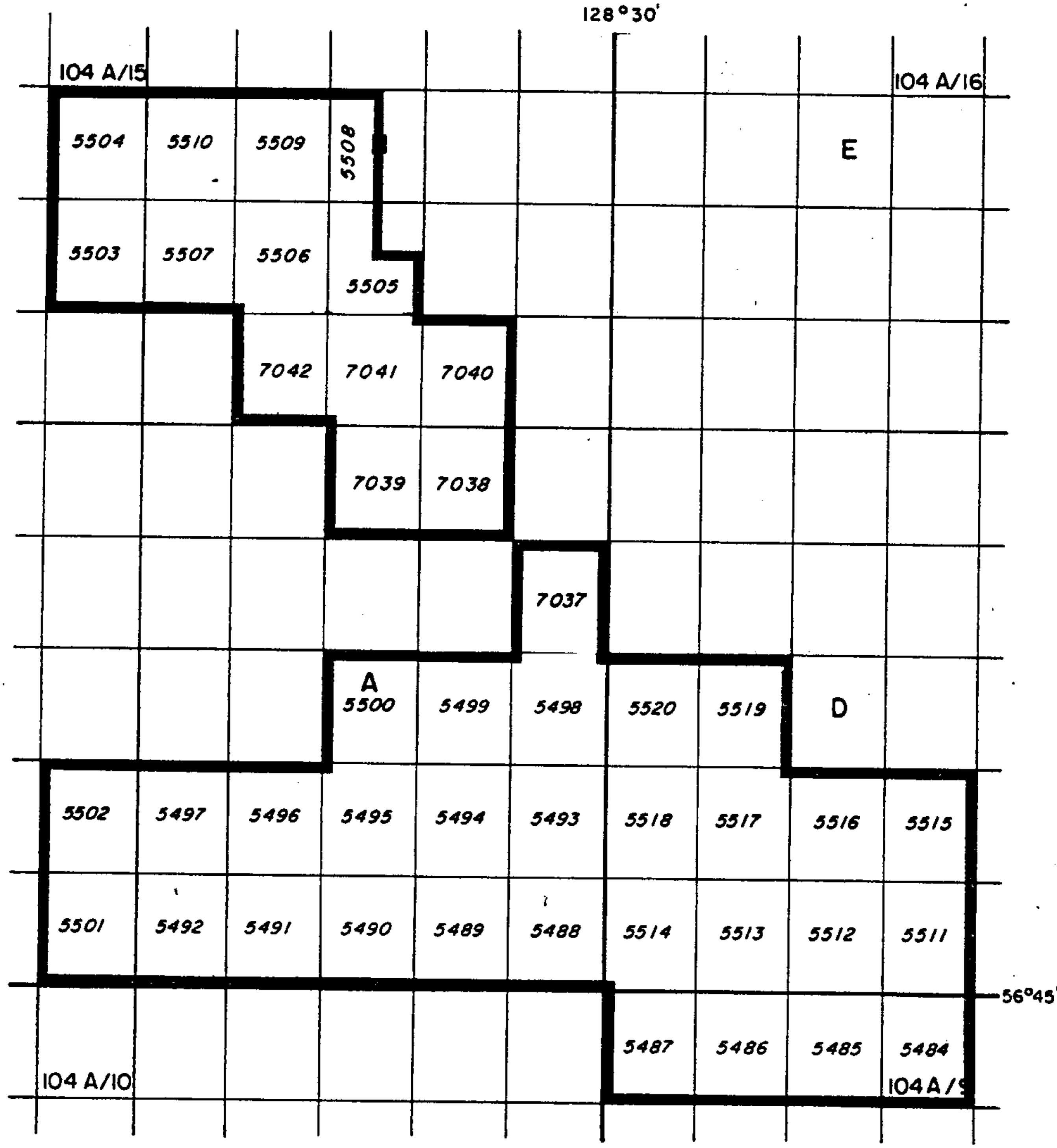
Forty-one whole licences and two partial licences comprise the Panorama licence block. The area contains 12 061 hectares. The distribution of these licences is shown in Figure 2.2, and a listing of them occurs as Appendix I. Licences 5482 to 5520 inclusive were acquired on November 5, 1979. A subsequent application for licences 7037 to 7042 inclusive was made on April 1, 1981.

2.4.0 Ownership

The Panorama coal licences are wholly owned by Gulf Canada Resources Inc.

2.5.0 Access

At present, there is no road access to the area of the Panorama coal licences. The cleared right-of-way for the abandoned British Columbia Railway between Prince George and Dease Lake lies 15 kilometres east of the Panorama licence block (Figure 2.3). Present railhead is 39 kilometres southeast of the licence block.



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PANORAMA COAL PROJECT
COAL LICENCE MAP

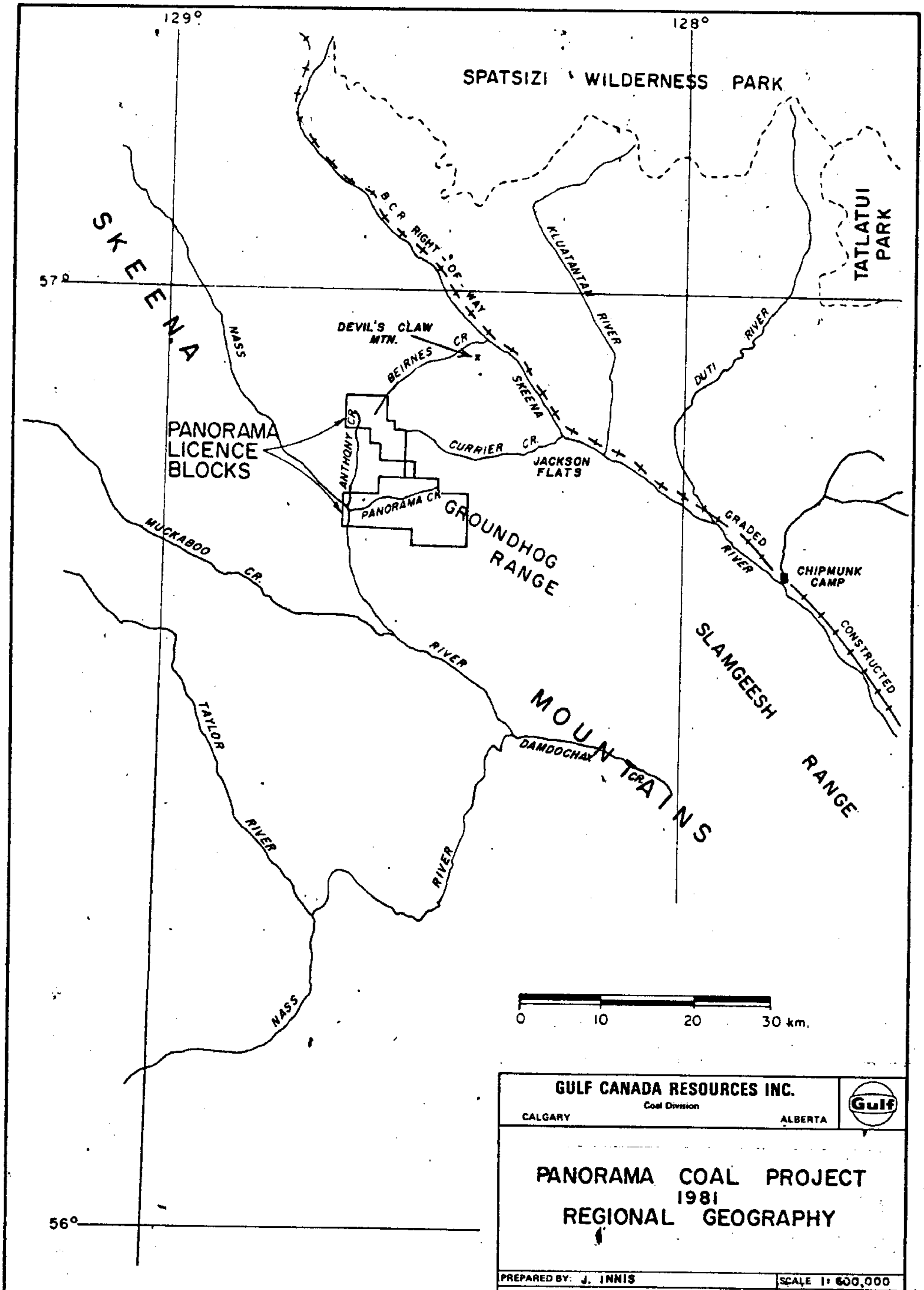
PREPARED BY: K.H. BABCOCK	SCALE 1 : 100,000
APPROVED BY: DATE: OCT./81	DRAWING No. 2.2

The coal licences are 129 air kilometres east of Stewart, B.C. (population 1,357), 249 kilometres northeast of Terrace (population 9,991), and 234 kilometres north of Smithers (population 3,864).

2.6.0 Biophysical Environment

The Panorama licences are located within the Skeena Mountains' physiographic region (Figure 2.3). Topography reflects the underlying structure somewhat, but is strongly influenced by the regional drainage pattern. The height of land in the middle of the property forms a drainage divide. Anthony Creek and Panorama Creek flow west from the licence block into the Nass River. Beirnes Creek in the north and Currier Creek in the east flow northeast into the Skeena River. The Nass and Skeena Rivers approximately parallel each other, flowing south and then west to the Pacific.

Elevations range from less than 700 metres at the Nass River in the southwest corner of the property, to over 2 000 metres on Cushing Ridge to the east.



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CALGARY ALBERTA

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PANORAMA COAL PROJECT
1981
REGIONAL GEOGRAPHY

PREPARED BY: J. INNIS	SCALE 1 : 600,000
APPROVED BY: DATE OCT./81	DRAWING No. FIG. 2.3

Many who have worked in the Panorama area have remarked on the abundance of precipitation that characterizes local weather patterns. Approximately half the yearly precipitation falls as snow. Most summers are reported as "exceptionally wet" (Buckham and Latour, 1950), with frequent days of precipitation. Daily temperatures range between 0°C and 30°C during the summer months.

The 1981 field season was a particularly dry and warm one. Of the eighty-six days spent in the field, only on twenty-five days did any precipitation fall; on many of the remaining days, temperatures exceeded 20°C.

The most abundant trees are the alpine species, including fir, white and black spruce, lodgepole pine, aspen, balsam, poplar and white birch. The timber line is approximately 1 350 metres above sea level with timber quite dense below 1 100 metres.

Game appeared plentiful with frequent sightings of moose, caribou, mountain goat and black bear. Grizzly bears were also observed on rare occasions. Grouse and ptarmigan are abundant as are Canada geese in the late summer. Steelhead and rainbow trout, cohoe salmon and dolly varden are reported in the upper Skeena and Kluatantan Rivers (Tompson, 1977).

3.0.0 EXPLORATION

3.1.0 Introduction

Thirty-seven of the Panorama coal licences were applied for in June, 1979. Subsequent to the 1980 field season, a further six licences were obtained.

3.2.0 Cartography

Government maps are available for the Panorama area on both the 1:50 000 and 1:250 000 scale. For the purpose of detailed mapping, this coverage was augmented by maps on a 1:10 000 scale with 10-metre contour intervals prepared from existing aerial photography by Hardy and Associates (1978) Ltd. (Appendix VII).

3.3.0 Field Camp

Field camp operations began June 17, 1981 at a site adjacent to the Chipmunk airstrip along the Skeena River. All initial supplies and equipment were flown from Smithers, British Columbia, as were weekly supplies. The camp consisted of five 16 x 14 foot tents, used for cooking, dining, recreation and office facilities; and ten smaller personnel tents. Power for the lights and freezer was supplied by a 3.5 kW gasoline generator. A propane heater provided hot water for the shower facilities and kitchen. Camp operations ceased on September 11, 1981, when much of the camp equipment was returned to Smithers for winter storage.

3.4.0 Geologic Mapping

The Panorama coal project utilized 7 crews, each consisting of a geologist and a geological assistant. The crews were air-supported by a Hughes 500D helicopter.

Two methods of mapping were employed. Extensive modified plane-table surveying of traverse lines assured accurate location of outcrop on 1:10 000 scale map cards. Occasional use was made of 1:10 000 scale orthophotos where limited vegetation cover allowed accurate identification of outcrop. All geological information was transferred from the map cards, orthophotos and field notes to 1:10 000 scale dylar maps in the field office. The results of the geological mapping program are summarized at a scale of 1:50 000 at the end of the text (Appendix IV). The same maps and cross-sections are provided at 1:10 000 scale in Appendix VIII. A map outlining each of the traverse locations is presented in Appendix V.

3.5.0 Trenching

A hand-trenching program was an integral part of the field mapping program. A two-man crew worked under the direction of geologists who had been responsible for mapping particular areas. The objective of trenching was to fully expose those coal seams that were thought to exceed a minimum thickness of 0.5 metres, but which were covered by overburden. The seam could then be accurately measured for resource appraisal.

The trenches were approximately 0.7 metres wide and cut to a minimum depth of 1 metre. A total of 54 were dug and logged on the Panorama licences in 1981. Several others were dug, but the actual coal thickness did not warrant logging.

The trench logs, illustrating a visual appraisal of the oxidized coal quality, are presented in Appendix II, and the trench location map is contained in Appendix VI. Trench locations are also plotted on the geology maps.

Quality analysis results from the 1981 program indicated that samples taken from trenches were highly oxidized. To augment the trenching program, a Winkie drill was used in an attempt to obtain fresh coal samples from seams exposed by trenching. Six holes were drilled for a total of 65.8 metres. The program met with limited success and was discontinued. The locations of the drill holes are shown on the Trench and Drill Hole location map, Appendix VI.

3.6.0 Reclamation

The area of environmental disturbance associated with the 1981 Panorama coal exploration program was minimal since all transportation was via helicopter or fixed-wing aircraft. Only minor disturbances were associated with the camp, trenching, and with drilling. Several hand trenches were left open for later viewing, while the remaining trenches were filled in. The camp utilized a pre-existing clearing, cleared by construction activities of the British Columbia Railway. The camp site was left in its original condition.

3.7.0 Project Management and Contractors

The 1981 coal exploration program was managed by B.P. Flynn (Supervisor, Regional Exploration) of Gulf Canada Resources Inc. Field operations were supervised by J.W. Innis of Gulf Canada Resources Inc., and geological supervision was provided by Dr. D.E. Pearson of David E. Pearson & Associates Ltd. The geological report was prepared by J.W. Innis and D.E. Pearson.

The following additional professional and technical personnel contributed to the Panorama Coal Project:

K. Babcock S. Barron	Geologists
R. Berg D. Bird R. Brezovski M. Desroches J. Greggs D. Matsushita E. More	Geological Assistants
V. Cobb	Helicopter Pilot/Engineer

The following also contributed to the project:

S. Lammle	Cook
G. Murray	Trencher
R. Bourdeau	Trencher
G. Barclay	First Aid Attendant

The following is a list of the service companies and suppliers used during the project:

SERVICES

Canadian Marconi Co.	Calgary
West Can Electronics Services Ltd.	Calgary
Minchuk Leasing Ltd.	Calgary
Smithers Air Service	Smithers
M.R. Rentals	Smithers
R.T. Exploration Services	Smithers
Aspen Motel and Restaurant	Smithers
Sandman Inn	Smithers
Alpine Helicopters Ltd.	Kelowna
Quasar Helicopters	Richmond
Highland Helicopters Ltd.	Smithers
Northern Mountain Helicopters	Prince George
Aviair Aviation	Kamloops
Kelowna Flightcraft Ltd.	Kelowna
Trans Provincial Airlines	Terrace
Columbia Airlines Ltd.	Prince George
David E. Pearson & Assoc. Ltd.	Victoria
Cyclone Engineering Sales Ltd.	Edmonton
Birtley Coal and Minerals Testing	Calgary
Canadian Freightways	Calgary
Nova Photo Centre Ltd.	Calgary

SUPPLIERS

Totem Distributors	Calgary
Ribtor's Mnfg. & Distr. Co. Ltd.	Calgary
Caldraft	Calgary
Carter Mapping (1979) Ltd.	Calgary
Photomovie Supply and Equip.	Calgary
Economy Bookbindery Co. Ltd.	Calgary
Sprung's Western Tent & Awning	Calgary
Alta. Tent & Awning	Calgary
Safety Supply Canada	Calgary
Petrocraft	Calgary
Neville Crosby	Vancouver
Premo Plastic Engineering	Victoria
The Plastic Shop	Victoria
Canadian Lab Supplies	Vancouver
Western Scientific Services	Richmond
Micro Metallurgical	Thornhill, Ont.
Smithers Hardware	Smithers
Tatlow Industries (1979) Ltd.	Smithers
Supervalu Stores	Smithers
Canadian Propane Gas & Oil	Smithers
Chevron Bulk Fuel	Smithers
Alfar Industrial Supplies Ltd.	Smithers
Alpine Wiring & Plumbing Services	Smithers
Trac and Trail Equipment Ltd.	Smithers
Apollo Automotive Parts	Smithers
Dieterich Post (Alta.) Ltd.	Edmonton
Guncraft Ltd.	Calgary

4.0.0 PREVIOUS WORK

4.1.0 Introduction

Prior to the 1980 field season, geological information on the Panorama area of the Groundhog Coalfield was limited to two industry reports and a reconnaissance report by the Geological Survey of Canada. The Geological Report of Gulf's 1980 Panorama Coal Project contained a synthesis of these reports and included a reinterpretation of the regional Groundhog stratigraphy. This is described in Section 5 of this report. A precis of these reports follows.

4.2.0 Regional Stratigraphy

The coal development which was the object of investigation of the Panorama coal exploration program is part of a Jurassic-Cretaceous depositional sequence in one of several successor basins in the Intermontane Belt of northwestern British Columbia (Eisbacher, 1974 [a]).

Volcanism dominated prior to the establishment of the successor basins, producing the Takla and Hazelton groups. Through the Upper Jurassic to Tertiary times, the marine strand line retreated to the southwest, coinciding with the deposition of the predominantly marine Bowser Lake Group, the marginally marine Skeena Group, and finally, the mostly continental Sustut Group (Figure 4.1).

The Panorama licence area is underlain solely by strata of the Skeena Group. These were deposited in an alluvial fan and coalswamp setting (Eisbacher, 1974 [a]) prograding over the older Bowser Lake marine deltaic complex. The resulting facies is typically laterally discontinuous, but with significant local coal deposits.

Malloch (1912), who named the Skeena (Series) Group, described in general terms the coal measures over much of the Groundhog coalfield, including the area of the Panorama licences. He also described some specific coal occurrences (1912, p. 93), but did not attempt a subdivision of the Skeena Group to aid in local correlation.

The first attempt at a correlatable subdivision of the Skeena was made by Black (1968), who described "Lower Conglomerate, Lower Shale, Upper Shale and Upper Conglomerate" sequences from a large area.

STRATIGRAPHY
TABLE OF FORMATIONS

AGE	SUBDIVISION OF AGE	GROUP	LITHOLOGY
TERTIARY	LOWER	SUSTUT	QUARTZ PEBBLE CONGLOMERATE, TO PEBBLY SANDSTONE, SANDSTONE SUB QUARTZOSE FELDSPATHIC, DARK GREY TO REDDISH MUDSTONE, THIN COAL SEAMS, SHALE, AND ASH FALL TUFFS IN UPPER PORTION OF UNIT.
CRETACEOUS	UPPER		
	MIDDLE	SKEENA	CHERT PEBBLE RICH; BROWN-GREY CONGLOMERATE, BLACK, BROWN, AND ORANGEY CLAYSTONE, SILICEOUS AND CLAYEY SANDSTONE, WITH SILTSTONE, CLAYSTONE AND COAL INTERBEDS. BASE OF UNIT DARK GREY TO BLACK TUFFS, TUFFACEOUS SANDSTONE AND CARBONACEOUS SHALE.
	LOWER		
JURASSIC	UPPER	BOWSER LAKE	FELDSPATHIC TO QUARTZOSE SANDSTONE, DARK GREY TO BLACK SHALE, SILTSTONE, GREYWACKE, CHERT PEBBLE CONGLOMERATE AND MINOR COAL SEAMS.
	MIDDLE		
	LOWER	HAZELTON	REDDISH, PURPLE, GREY AND GREEN PYROCLASTIC AND FLOW VOLCANICS, WITH CALC-ALKALINE CHEMICAL AFFINITIES, REDDISH SANDSTONE, SILTSTONE, MUDSTONE, MINOR CONGLOMERATE, AND LIMESTONE AND THEIR TUFFACEOUS EQUIVALENTS.
	UPPER	TAKLA	GREY–GREEN TO DARK GREEN FLOW AND PYROCLASTIC, BASALTIC AND ANDESITIC VOLCANIC ROCKS, PELITIC SEDIMENTARY ROCKS AND MINOR CARBONATE ROCKS.
	MIDDLE		

FIGURE 4.1

The Lower Conglomerate is composed of thick sandstone and conglomerate units with interbedded thinner sandstones, siltstones, and shales. The thicker sandstones are sometimes found to be quite dirty. The sequence, as a whole, fines and becomes more thinly-bedded upward with minor coal at the top and a gradational boundary with the overlying Lower Shales.

The Lower Shales unit comprises interbedded shale, sandstone, and coal units. The sandstones here are also quite dirty and, like those in the Lower Conglomerate, are non-marine. A few sandstones of marine character contain abundant bivalve shells. Black's (1968) mapped distribution of the coal-bearing Lower Shales was one of the main criteria employed in determining the number and location of licences in the initial application for the Panorama coal project.

A gradational boundary separates the Lower Shales from the Upper Shales. The Upper Shales unit contains predominantly sandstone, siltstone, and shale beds, but lacks the coal of the Lower Shales. The Upper Shales unit is also further distinguished by its content of thin beds of limy material and horizons containing excellently preserved plant fossils.

The Upper Conglomerate is made up of conglomerate beds 15 to 60 metres thick, interbedded with sandstone and shale. Some of the latter is carbonaceous, but no coal seams are reported.

Fossil evidence is interpreted by Black (1968) to indicate an age of Upper Jurassic for the Lower Conglomerate, Lower Shales, and most of the Upper Shales. The uppermost Upper Shales and the Upper Conglomerate are, therefore, Lower Cretaceous in age.

Tompson, Jenkins, and Roper (1970), described a four-fold subdivision of the Skeena Group from the area around Devil's Claw Mountain and the adjacent Skeena Valley between Jackson Flats and the confluence with Beirnes Creek (see Figure 2.3). This area is immediately north and east of the Panorama Licence block. Each subdivision was called a "lithosome" and named for the geographic location where it is best developed, for its predominant lithology, or for both.

The McEvoy Ridge lithosome is dominated by silty claystone with a relatively minor proportion of immature sandstone and very minor conglomerate. The sequence is evenly bedded with little cross-bedding and lateral and vertical gradational boundaries between lithologies. The sandstone beds usually have distinct bases and are friable to a degree that varies with the maturity of the sandstone.

The Coal-Bearing lithosome comprises coal, siltstone, and silty claystone with about 15 to 20 percent carbonaceous material, and very minor cross-bedded, medium-grained sandstone. A recessive weathering habit largely obscures the bedding character, but float is a characteristic brown-orange streaked with black.

The Lonesome Mountain lithosome comprises sandstone, conglomerate, and mudstone with thin discontinuous coals. Sandstones are fine to medium grained and may be interbedded with conglomerate. Burrows and marine bivalve fossils are found in some sandstones. The mudstones are brown in colour and 3 to 6 metres in thickness, with contained coals up to 1 metre in thickness.

The Devil's Claw Conglomerate lithosome is described by Tompson _et al_ (1970) as being a time stratigraphic equivalent of the Lonesome Mountain lithosome, lacking the extent of claystone and coal development of the Lonesome Mountain lithosome, and characterized by a much greater proportion of thick (60 metres) pebbly sandstones and conglomerates.

Thick claystone units do occur between the conglomerates and are carbonaceous, but the zones are not significantly coaly or continuous.

Mapping by Gulf geologists in 1980 showed that there was considerable discrepancy between the stratigraphy envisaged by Black (1968) and Tompson et al (1970), and what was actually observed in the field. A modified stratigraphy was established combining elements of both Black's and Tompson's stratigraphic units. These new stratigraphic units are (from oldest to youngest), Panorama Sequence, Groundhog Sequence, Malloch Sequence and Rhondda Sequence. A correlation between Black's (1968), Tompson et al's (1970), and Gulf's (1980) stratigraphies is shown in Figure 4.2. The stratigraphy as developed by Gulf (1980) was further refined in the 1981 program, as described in Section 5 of this report.

4.3.0 Regional Structure

Tompson, Jenkins and Roper (1970, p. 33) described and named a number of folds and faults north and east of the Panorama licence area that are of regional significance. Although some structure was described earlier by Malloch (1912), the general

COMPARED STRATIGRAPHIES

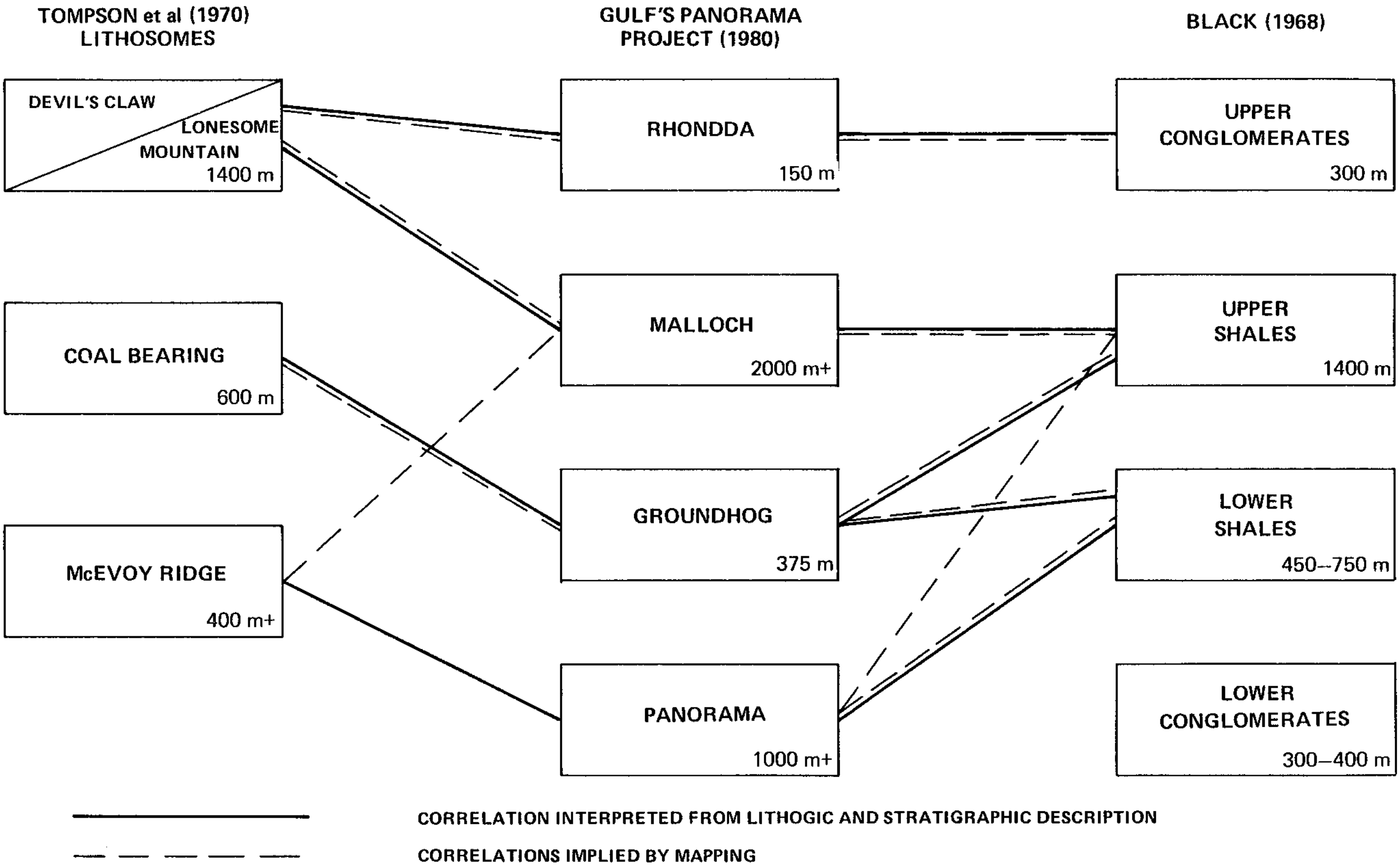


FIG. 4.2

nature of his descriptions together with the absence of specific details within the Panorama Licence area limit its usefulness.

A regional fault, referred to by Tompson et al as the "Groundhog Thrust Fault", is exposed along the west side of Skeena Valley northwestwards from Currier Creek. Folds beneath the fault surface, exposed in the vicinity of Mount Alec, caused these authors to interpret the structure as a thrust fault. The emplacement of McEvoy Ridge lithosome rocks over rocks of the coal-bearing lithosome offers further support for this interpretation.

Late tensional normal faults were also recognized by Tompson et al. One of these, the "Upper Currier Creek Normal Fault", transgresses the northeastern part of the Panorama Licences. The fault, which trends northwesterly, downthrows to the east.

A number of regional folds are described by Tompson et al, among which are the "Upper Currier Creek - Upper Beirnes Creek Folds". These folds are exposed in the northeast part of the Panorama Licences. They are described as "northwest-striking anticlines and synclines" that vary in fold style from tight to open.

5.0.0 GEOLOGY

5.1.0 Introduction

The Gulf Panorama Geological Report 1980 describes a stratigraphic succession, developed to resolve the discrepancies complicating previously suggested stratigraphies. The succession includes four units: the Panorama sequence, the Groundhog sequence (coal-bearing), the Malloch sequence and the Rhondda sequence in ascending order; however, only the lower three occur on the Panorama property. An objective of the 1981 program was to better define the character and boundaries of each of these sequences. This was accomplished by using more detailed observation of lithologies, actively tracing key fossil horizons, and quantitatively identifying coal seams using vitrinite reflectance.

The further objective of resolving the structural convolutions of the property was also greatly assisted through application of vitrinite reflectance measurements.

5.2.0 Stratigraphy

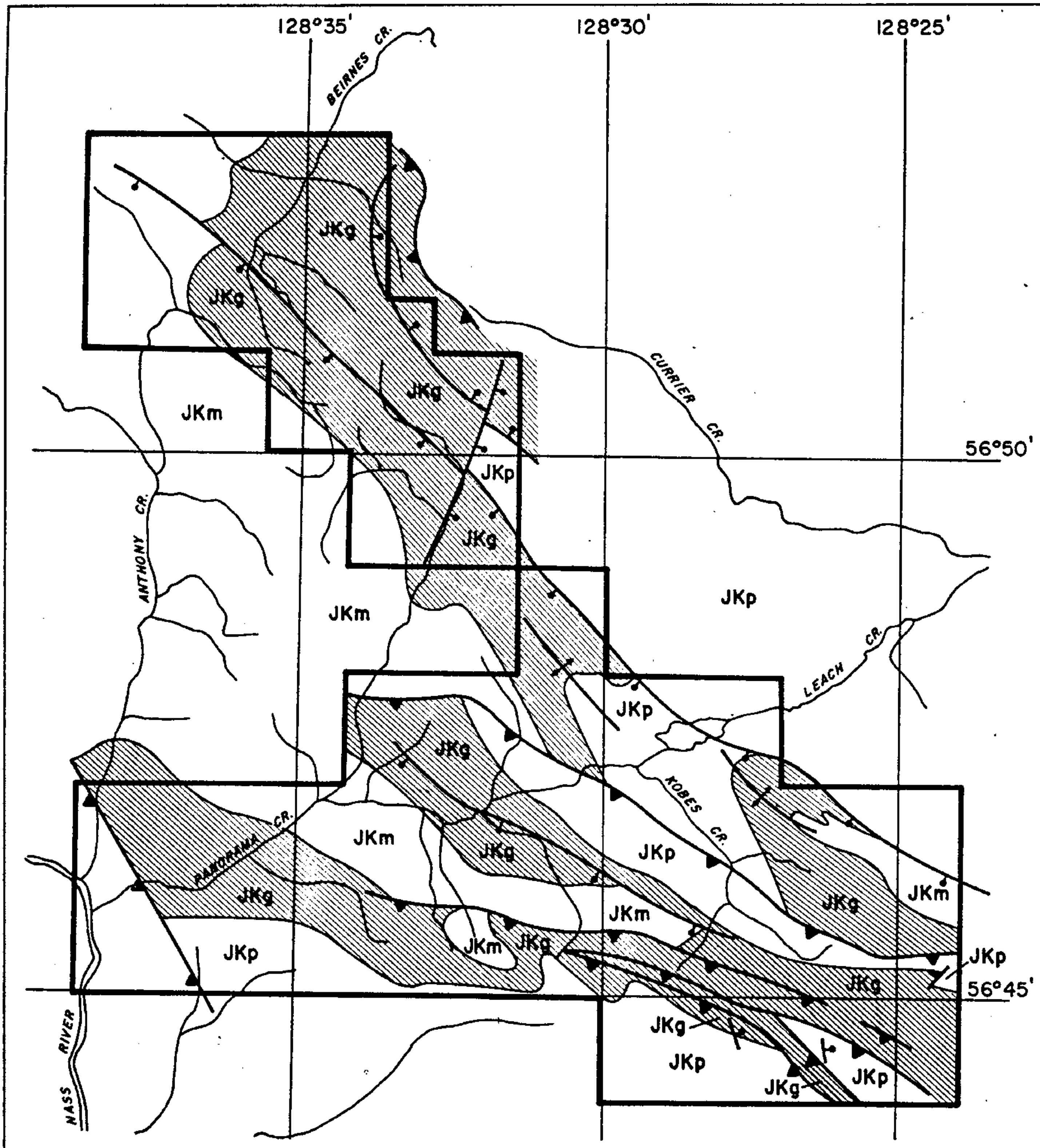
5.2.1 Panorama Sequence

The Panorama Sequence is the stratigraphically lowest mapped unit on the Panorama licences. The base of the sequence is not exposed, but the unit is at least 1 000 metres thick. The distribution of the unit is shown in Figure 5.1.

Lithologically, the unit consists of fine to medium-grained, medium to thick-bedded, grey sandstone gradationally associated with subordinate interbeds of recessive claystone to siltstone. Coal is rarely developed in these finer grained carbonaceous sediments. Primary sedimentary structures in the form of ripple marks and cross-bedding are not uncommon.

Fossil bivalves are preserved at a number of localities, and plant fossils are locally abundant.

The top of the Panorama sequence is marked, and generally recognized, by a succession of thick-bedded cliff-forming sandstones



0 2000 4000 6000 METRES

JKm MALLOCH SEQUENCE

JKg GROUNDHOG SEQUENCE
COAL BEARING SEQUENCE

JKp PANORAMA SEQUENCE

GEOLOGIC CONTACTS

FAULTS (NORMAL, THRUST)

FOLDS (SYNCLINE, ANTICLINE)

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PANORAMA COAL PROJECT
GEOLOGY MAP

PREPARED BY: S.BARRON
SCALE: 1:100,000
DATE: OCT. 1981
FIG. 5.1

as observed on the west end of Whistling Cairn Ridge, the west end of Grizzly Ridge, and northeast of Eldridge Ridge. A one metre thick, orange weathering, Oyster-bearing mudstone bed is found in some localities immediately above the sequence of sandstones. Although not always apparent, the Oyster- bearing bed is a useful stratigraphic marker in a generally non-distinctive sequence. The Oyster bed marks the top of the Panorama sequence on Grizzly Ridge, ASA 64 Ridge, Ptarmigan Ridge, Falcon Ridge, Cushing Ridge and Eldridge Ridge. However, it was not located on the west end of Whistling Cairn where a lithological transition indicates the top of the Panorama sequence.

Mean maximum vitrinite reflectance (Ro max) of coals of the Panorama Sequence is in the range of 3.5% to 4%.

5.2.2 Groundhog Sequence

The Groundhog Sequence, which is the principal coal-bearing member, conformably overlies the Panorama Member. The base of the Groundhog is most confidently recognized through the location of the oyster-bearing horizon at the top of the Panorama sequence. Twelve separate oyster bands were observed at a complete exposure of this marine interval. Fewer oyster bands are found in poorer exposures at other localities.

Primary distinction of the Groundhog sequence from the Panorama is made on a lithologic basis. The Groundhog sequence is predominantly finer grained than the Panorama sequence, with abundant, thinly-bedded dark argillites and siltstones. Sandstones are less massive and some are recessive. There is considerable vertical and, particularly, lateral gradation between lithologies.

The Groundhog sequence rocks weather a characteristic orangey colour, helping to distinguish them from the Panorama rocks below and the Malloch rocks above.

The scarcity of ripple marks and small-scale cross-bedding, relative to the Panorama sequence, suggest a lower-energy depositional environment for the Groundhog Sequence. The absence of primary sedimentary structures to indicate tops, sometimes makes structural interpretation difficult.

Fossils, however, are relatively abundant within the Groundhog sequence. Plant fragments appear in all lithologies and bivalves are locally abundant at a number of horizons. The latter were not found to be useful in correlation, suggesting localized lacustrine and fluvial rather than marine environments of deposition.

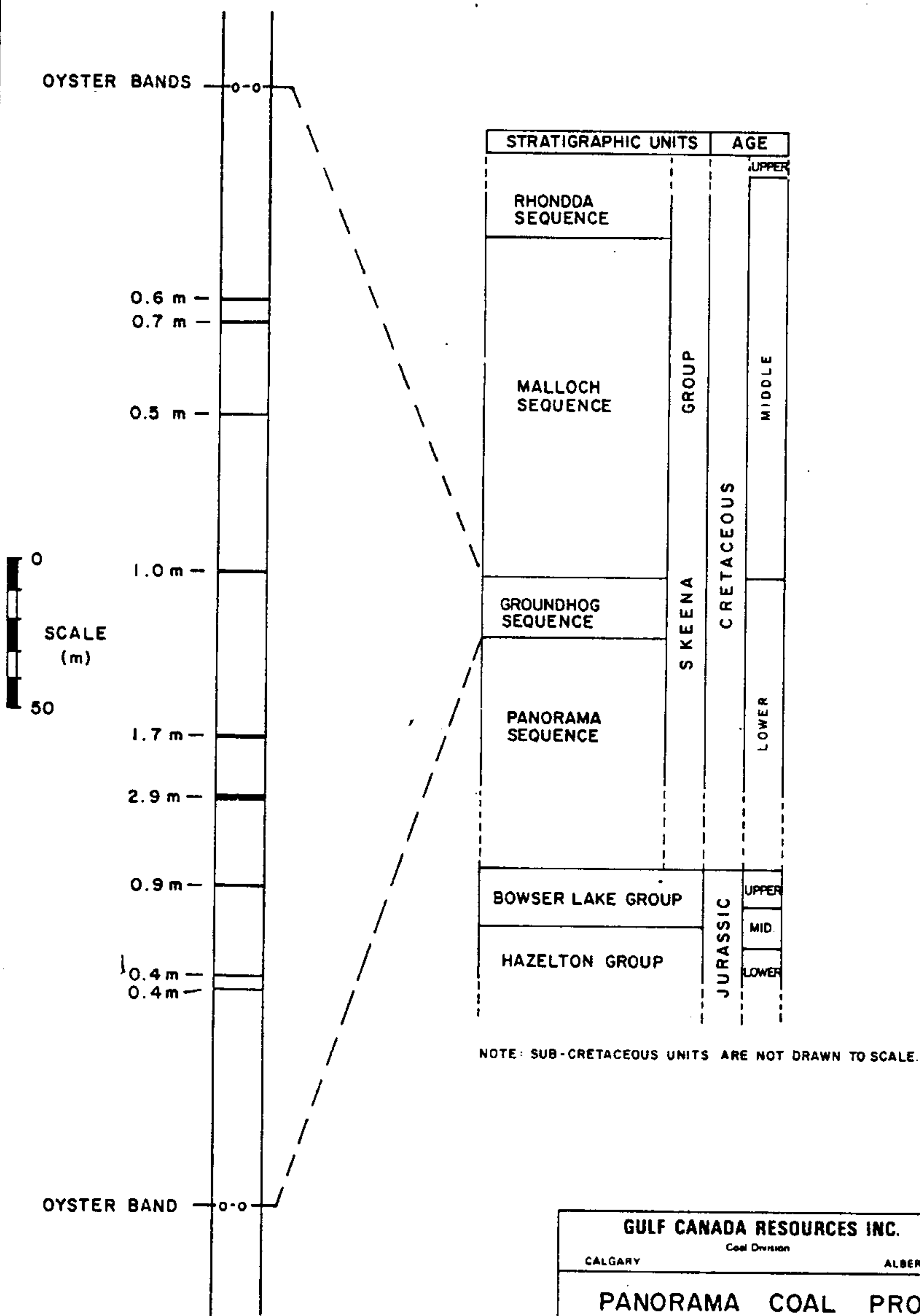
Where seen, the top of the Groundhog sequence is recognized by the reappearance of an Oyster-bearing marine band. This band is called the Upper Oyster band to distinguish it from the Lower Oyster band beneath the Groundhog. On Whistling Cairn Ridge, the Upper Oyster band is about 1.5 metres thick, but on Cushing Ridge at the top of the coal-bearing sequence, a marine interval includes no fewer than five distinct oyster beds with a combined thickness of 11.25 metres.

The range of values for mean maximum vitrinite reflectance ($\overline{Ro}$ max) of coals found within the Groundhog sequence varies and appears to be dependent on geographic location (structural position). Typically, coals within the Groundhog have a reflectance between 2.7% and 3.4%, though in the unusual structural terrain in the north of the property, coal within rocks lithologically resembling Groundhog have a reflectance of 4.1%.

Structural complications exist in each of the sections where the Groundhog sequence is exposed, so the true stratigraphic thickness can only be estimated from composite sections. On Ptarmigan Ridge, which appears to have a non-structurally thickened section, from the top of the Lower Oyster Bed to the base of the highest exposed coal is 440 metres. On Cushing Ridge, the thickness of the section from the estimated position of the Lower Oyster Bed (60 metres) beneath the stratigraphically lowest coal to the base of the Upper Oyster Bed is 320 metres, as shown in Figure 5.2.

5.2.3 Malloch Sequence

The Malloch is the stratigraphically highest sequence mapped on the Panorama Licences, conformably overlying the Groundhog sequence. The base of the Malloch is taken as



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GENERALIZED STRATIGRAPHIC COLUMN

FIGURE 5.2

the Upper Oyster band; the top of the sequence is not exposed, but at least 2 000 metres appears to be present. The distribution of the unit is shown in Figure 5.1.

Lithologically, the Malloch sequence is composed of interbedded sandstones, siltstones, and claystones with a predominance of the finer grained lithologies. From a distance, the Malloch sequence is a distinct, monotonous, dark-green unit, In hand sample, olive-green sandstones and dark brown siltstones are common. The unit is characterized by step-like topography caused by the resistant, often thickly-bedded, coarse sandstone and granular to pebbly conglomerates interbedded with recessive siltstone/claystone sequences.

Primary sedimentary structures are common in the Malloch; including large-scale cross-bedding, ripple marks and small-scale Bouma sequences.

Rare carbonaceous zones occasionally contain vitrain bands only centimetres wide. Reflectance values measured from thin coals a short distance above the Groundhog fall in the 2.3% to 2.4% range.

5.2.4 Rhondda Sequence

The thick, prominent conglomerates which overlie the Malloch sequence mentioned by both Black (1968) and Tompson (1970), do not occur within the Panorama licence area. The contact between these conglomerates, here included in a sequence named the Rhondda, and the Malloch sequence, can be found immediately to the northeast of the licence area on Devil's Claw Mountain. It is surprising that such a prominently weathering and resistant sequence as the Rhondda does not have a more extensive distribution. However, the factors controlling its erosion or non-deposition in the licence area are not known.

5.3.0 Coal Development

Figure 5.2 shows a section through the core of the Cushing Ridge anticline. Although the base of the sequence is not seen in the core of the fold, it is estimated to be 60 metres beneath the base of the lowest seam, based on a correlation with a stratigraphic section measured on the west end of Cushing Ridge. Nine distinct coal seams, with a combined thickness of 9.1 metres, are exposed in this section. Seven of these seams are thicker than 0.5 metres and these were trenched in either the 1980 Program or the 1981 Program.

Figure 5.2 shows that coal is developed throughout the Groundhog sequence with, in this example, the thicker coals developed in the middle part of the succession.

Structural disturbance is so common, however, that only rarely is the complete stratigraphic section preserved; more commonly seen are structurally thickened sections where one or more thrust faults accompanied by folds cause stratigraphic repetition. On ASA 64 Ridge (P 6000) for example, the apparently greater thickness of coal (9.5 metres), is caused by structural repetition of portions of the stratigraphy. At the north end of the ridge however, only 3.06 metres of coal were observed in 440 metres of apparently undisturbed Groundhog. Elsewhere, on East Grizzly Ridge in a structurally repeated section that contains ten distinct seams, the total coal development is 8.44 metres.

The conclusion is reached, therefore, that coal development is variable. In non-structurally thickened sequences, percentage of coal in total Groundhog stratigraphy varies from 0.7 to 2.8%. This either increases or decreases depending on the local structural setting.

5.4.0 Structure

The structure of the Panorama licence area is typical of constrictional tectonic regimes, with overturned flexural folds and thrust faults being very common. Later tensional normal faulting is also evident in the area (Figure 5.3).

5.4.1 Synthesis of Structural Geology

Figure 5.1 is a map showing the principal structural features of the Panorama licences.

South and east of Panorama Creek, coal-bearing Groundhog sequence reoccurs at three separate structural levels.

On Cushing Ridge, an overturned syncline with a thin development of Malloch sequence in

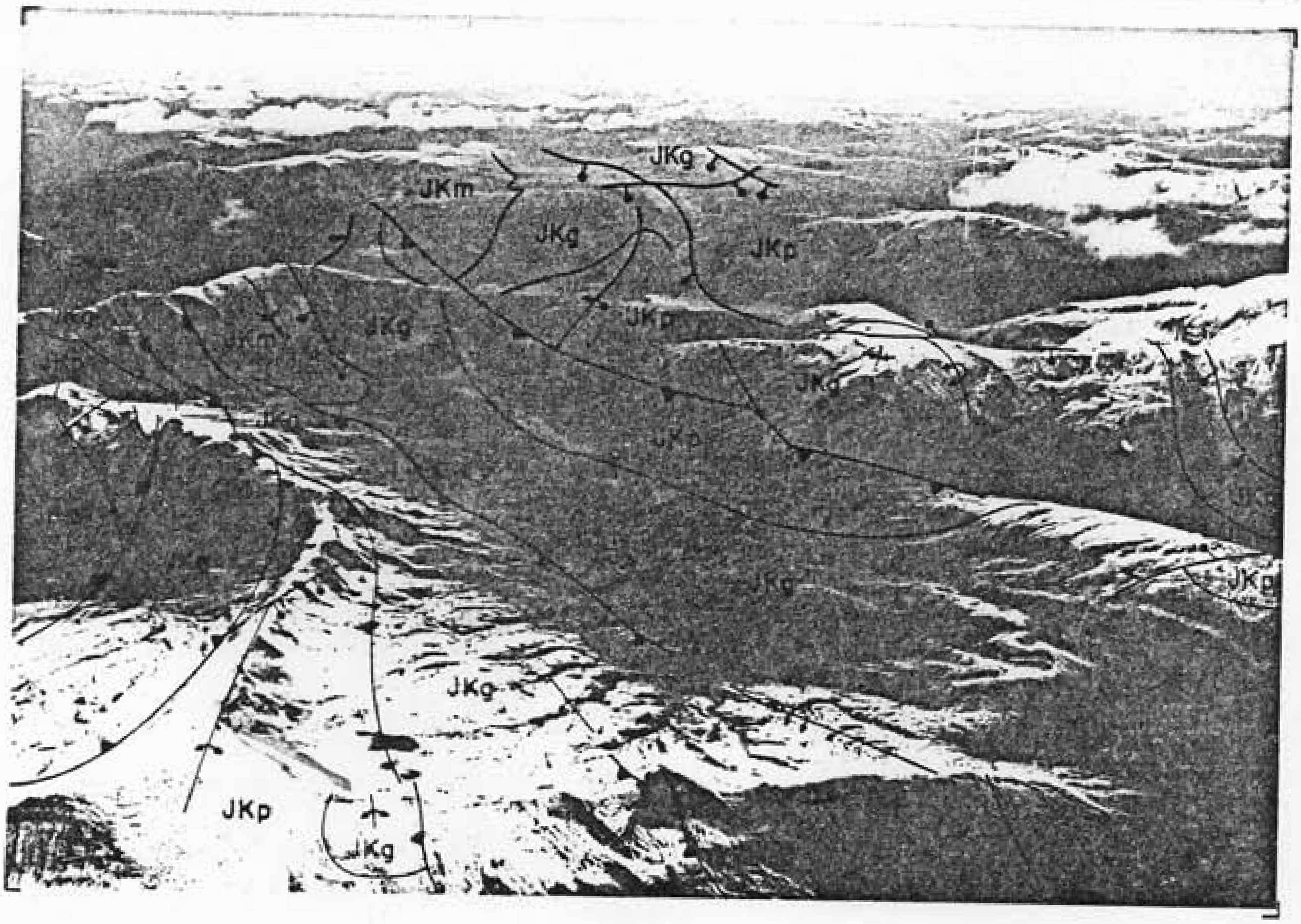


Figure 5.3 View of Panorama Licence Area Looking Northwest

its core, and flanked on the south side by an upright anticline in Groundhog sequence rocks, occurs as the lowest structural level.

This coal-bearing fold-couple is overthrust from the south by a coal-bearing stratigraphic package that occupies the second structural level and rides on the Kobes Ck. Thrust, the trace of which follows Kobes Creek. The Malloch sequence on this second structural level occupies the core of a broad WNW-trending syncline, the north limb of which is downfaulted against the Groundhog on ASA 64 Ridge and in Panorama Creek. The west limb of this syncline is exposed along the Whistling Cairn Ridge. An extension of the Kobes Ck. Thrust trends west along the north side of Panorama Ck. Here, the thrust carries quite severely contorted Panorama, Groundhog and Malloch sediments (visible in Panorama Ck.) over gently folded Malloch rocks that support the broad ridge north of Panorama Ck.

The third structural level, which rides the Grizzly thrust plate, is itself imbricated by a series of lesser thrusts. It comprises Groundhog and Panorama sequence rocks and overlies Malloch sequence rocks on the south end of ASA 64 Ridge and Groundhog sequence rocks on Grizzly Ridge.

A northwest-trending normal fault, which downthrows to the southwest, provides a northern boundary to the coal-bearing sequence of Cushing Ridge, where the Groundhog sequence is juxtaposed with Panorama sequence rocks. Along the northwest part of this fault, Groundhog rocks are downfaulted against Groundhog. In the northeast of the licences, a vertical normal fault becomes a decollement surface towards the east.

5.4.2 Details of Structural Geology

5.4.2.1 Cushing Ridge

A structurally-thickened sequence of coal measures occurs on Cushing Ridge where an overturned anticline is flanked on the north side by a tight symmetric syncline and on the south side by an open asymmetric syncline. All the folds have essentially horizontal axes. The effect of these folds is to steepen dips and repeat the coal-bearing stratigraphy (Section P 3550).

5.4.2.2 East Grizzly Ridge

Coal-bearing Groundhog sequence rocks on East Grizzly Ridge ride on the Kobes Ck. thrust, and structurally are above the Cushing Ridge folds. At the south end of the structure, an asymmetric anticline is thrust over an asymmetric syncline that is in turn thrust over coal measures along the north part of the ridge. The result is to stack at least ten seams of coal into a steeply dipping, 600 metre section (Section A-A').

5.4.2.3 Grizzly Ridge

Grizzly Ridge Thrust, together with splays of the sole thrust, dominate the structure of this ridge. Grizzly Ridge comprises a steeply north-dipping homoclinal sequence of coal-bearing Groundhog Member rocks, repeated on two subsidiary faults. The result is that nine coal seams, in a 600 metre section, are thrust over coal-bearing rocks that strike west of East Grizzly Ridge (Section P 3550).

5.4.2.4. ASA 64 - Ptarmigan Ridge

At the north end of this ridge, a southerly dipping homoclinal sequence of about 440 metres of coal measures is truncated against the Ptarmigan Ridge normal fault. The coal measures at this end of the ridge are thought to be contiguous with those of East Grizzly Ridge, described above.

At the south end of the ridge, coal measures riding on the Grizzly Ridge Thrust are in contact with Malloch sequence strata. A splay of the main thrust repeats the stratigraphy (Section P 6000).

5.4.2.5 Whistling Cairn Ridge

A homoclinal, northerly dipping sequence comprising Panorama, Groundhog and Malloch sequence rocks is located on Whistling Cairn Ridge. This stratigraphic package is continuous with that underlying the Grizzly Ridge Thrust on ASA 64 - Ptarmigan Ridge. The coal measures here form the southern limb of a gentle, open, northwest-trending syncline. Unfortunately, the coals exposed on Whistling Cairn Ridge, though numerous, are also relatively thin.

5.4.2.6 North Panorama Creek

The northwest-trending, normal-faulted synclinal parcel of rocks, described above, is exposed in Panorama Creek. At higher elevations on the north side of the creek, however, an entirely different structural situation prevails. There, a southeast-trending sequence of folded, coal-bearing Groundhog is overlain on the west side by Malloch sequence rocks. The junction between these two structural regimes coincides with a break in slope that marks the position of the western extension of the Kobes Ck. Thrust.

5.4.2.7 Eldridge Ridge

In the northernmost part of the area, south of Beirnes Creek, the coal-bearing Groundhog is folded in a tight overturned anticline. This deformed sequence appears to have been thrusted towards the southwest over gently folded Lower Groundhog rocks and then subjected to remobilization to the east on the Eldrige Ridge Normal Fault. This fault is vertical where found on Eldrige Ridge, but it shallows rapidly to the east and becomes a decollement surface. The net effect of this structureal deformation is to compress thirteen coal seams, with a combined thickness of 14.5 m, into a 1.5 km section.

6.0.0 RESOURCE POTENTIAL

6.1.0 Introduction

The 1980 Geological Report on the Panorama property includes a section on Resource Potential, with tonnages computed for two presumed continuous seams shown on generalized cross-sections. These two seams were labelled the Currier and the Leach. Six other seams, considered to be laterally impersistent, were omitted from the resource estimate. Thus, the estimated quantity of coal was based on broad knowledge of the geological character of the region and the assumed continuity of the two seams. These are therefore Speculative Resources, and comprise 322.5 million tonnes.

6.2.0 Inferred Resources

More detailed work on the Panorama Licences during the 1981 program, enabled the construction of more accurate cross-sections for many areas. These, together with the trenching program which allowed measurement of numerous previously covered seams, permitted a resource estimate with an improved level of confidence. Correlation of individual seams between cross-sections is still not possible however, and continuity of seams in most instances is still assumed. The quantity estimate shown in Table 6-1 is therefore of Inferred Resources, and follows the criteria of the National Resource Classification (Energy, Mines & Resources Canada, Report ER 79-9, 1979).

The magnitude of the Inferred Resource was calculated by dividing the property into a number of subareas and determining the contained resource within each. The formula applied is as follows:

Total thickness of coal (observed or projected) x length of coal trace as interpreted in cross-section x interpreted or observed extent of seams between cross-section x specific gravity.

Without benefit of drilled seam intersections, the figure for total coal thickness in resource estimates is strongly subject to variation as a function of the exposure available. In areas of better exposure, more seams will be observed than in predominantly covered areas. For the purposes of these calculations, a conservatively rounded sum of the thicknesses of all observed seams over 0.5 m was used for total coal thickness in areas of good exposure. Over areas of cover known to be underlain by the Groundhog sequence, a coal thickness of 2.0 m was used as a bare minimum expected resource.

The length of each seam trace was approximated by constructing a line (called the "Coal Zone Median Line") to define the middle of the package of seams under consideration. Measurement of this line provides a reasonable average length for the several seams involved. Structural complexities depicted in the cross-sections, required that a separate median line be drawn for each structural block containing coal. These are numbered on each cross-section and resources are calculated separately. Seam traces at depths in excess of 300 m beneath surface were not included in the resource.

As the cross-sections were spaced at 2 km intervals, the influence of the quantity of coal projected within any particular cross-section was usually extended for 1 km on either side of it. This is true except in cases where the attitude of seams dictates that their extent would be more limited, or where faulting cuts off the resource package short of the 1 km mark. In these cases, a reduced figure would be applied.

Specific gravity in all cases was 1.7 S.G. This is a conservative fugure considering the general density of coals found in the Groundhog coalfield.

The total in-situ Inferred Resource, calculated as described above, is 240 million tonnes (see Table 6.1).

TABLE 6-1 PANORAMA INFERRED RESOURCES

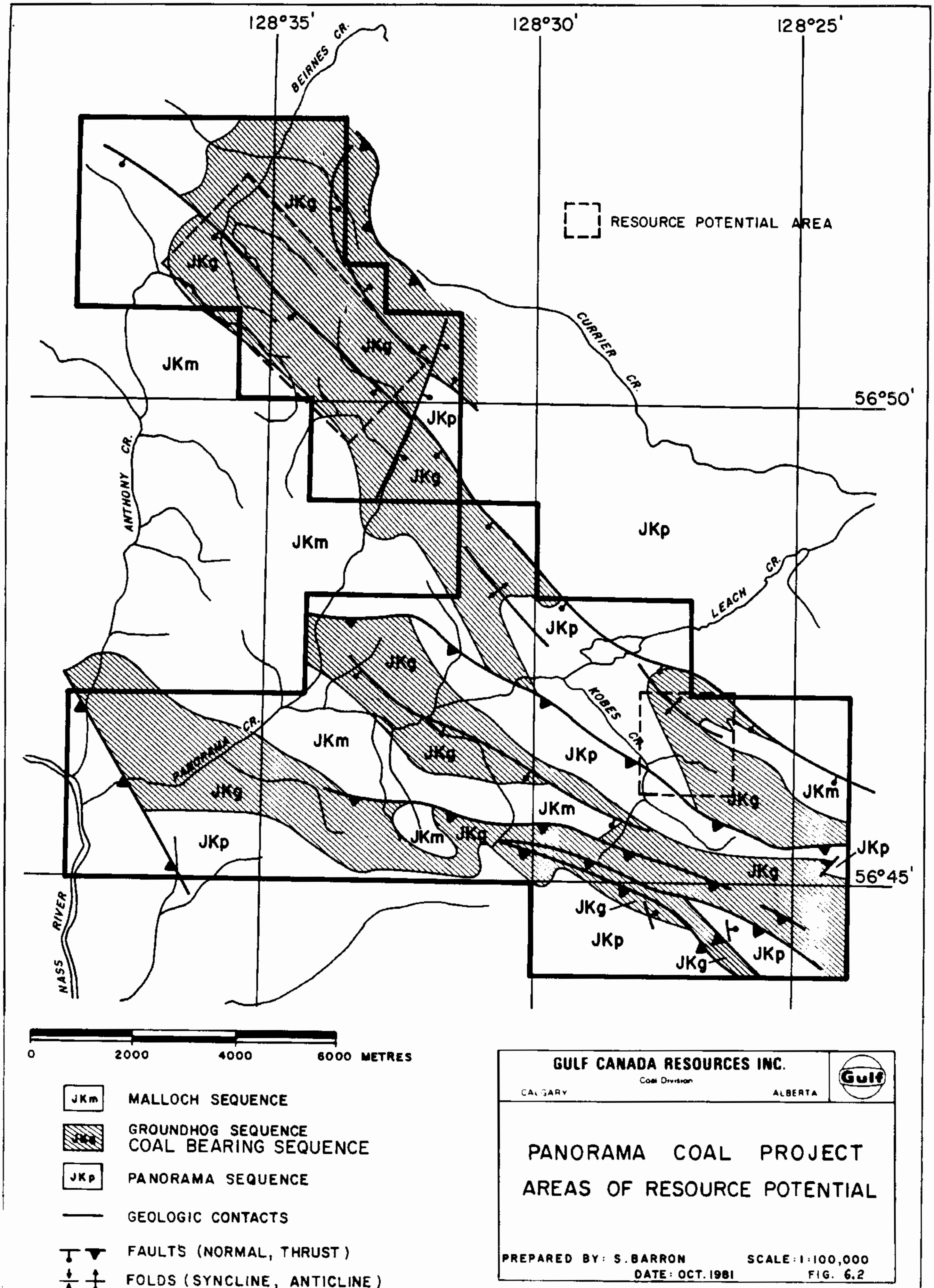
SECTION	SUB-AREA	TOTAL COAL THICKNESS (m)	SEAM SECTION LENGTH (km)	EXTRAPOLATED DISTANCE FROM SECTION LINE (km)	SPECIAL GRAVITY	INFERRED RESOURCES (MILLIONS OF METRIC TONNES)
P 2000	1	7.50	1.60	2.50	1.7	51.0
	2	3.75	0.50	1.50	1.7	4.8
P 4000	1	5.00	1.10	2.00	1.7	18.7
	2	3.25	1.10	2.00	1.7	12.2
	3	3.75	0.80	2.00	1.7	10.2
P 6000	1	5.00	0.50	1.00	1.7	4.2
	2	3.50	0.25	1.50	1.7	2.2
	3	3.00	0.40	2.00	1.7	4.1
	4	2.00	0.35	2.00	1.7	2.4
P 8000	1	2.00	1.10	1.30	1.7	4.9
	2	2.00	0.60	1.50	1.7	3.1
	3	3.00	0.60	1.50	1.7	4.6
	4	2.00	0.70	0.80	1.7	1.9
P 9100	1	2.00	0.50	1.50	1.7	
	2		0.35	1.00	1.7	
	3	0.75	1.00	1.00		
P 10 000	1	2.00	0.70	2.00	1.7	4.8
	2	2.50	0.60	1.50	1.7	3.8
	3	3.00	0.90	1.50	1.7	6.9
	4	2.00	1.10	0.50	1.7	1.9
P 12 000	1	2.00	1.30	2.00	1.7	8.8
	2	4.50	0.80	2.00	1.7	12.2
	3	2.00	1.50	2.00	1.7	10.2
P 14 000	1	2.00	0.75	1.50	1.7	3.8
	2	2.00	1.50	2.00	1.7	10.2
	3	2.00	1.00	2.00	1.7	6.8
	4	2.00	1.40	2.00	1.7	9.5
P 16 000	1	2.00	0.60	2.00	1.7	4.1
	2	2.00	0.80	2.00	1.7	5.4
	3	5.00	0.50	2.00	1.7	8.5
	4	5.25	0.70	2.00	1.7	12.5
	5	3.25	0.70	2.00	1.7	7.7
P 18 000	1	2.00	0.50	2.00	1.7	3.4
	2	2.00	0.60	1.50	1.7	3.0
	3	2.00	0.80	1.20	1.7	3.3
	4	2.00	0.60	1.20	1.7	2.4
P 20 000	1	2.00	1.40	1.40	1.7	6.6
						242.7

6.3.0 Specific Areas of Potential

Aside from the resource figure determined for the property as a whole, an additional resource of unknown size may be present in two specific areas of perhaps better potential than the average for the property. These areas are the west end of Cushing Ridge and the broad open valley that straddles Cushing Ridge Normal Fault, south of Beirnes Creek (Figure 6.2).

On Cushing Ridge, 9 metres of coal are found in 9 seams in a succession striking northwestward towards Panorama Lake. Unfortunately, outcrop is virtually absent toward the northwest and so appraisal of coal thickness can only be achieved by drilling. Should good intersections be obtained, the area may share the surface mineable potential of the well-exposed part of Cushing Ridge.

The northern area of the property, in the vicinity of Beirnes Creek, is dissected by the Cushing Ridge Normal Fault. East of this fault, a few thin seams were located on a dip slope, but exposure is not good and other coal seams may well have been missed during regional mapping. A drill program here would test the potential for another surface mineable deposit. West of the fault, tight folds are observed in resistant sandstones and recessive coal seams may be covered. This area should also be tested by drilling.



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PANORAMA COAL PROJECT
AREAS OF RESOURCE POTENTIAL

PREPARED BY: S.BARRON SCALE: 1:100,000
DATE: OCT. 1981 FIG. 6.2

7.0.0 COAL QUALITY

7.1.0 Introduction

The 1980 Geological Report on the Panorama Coal Project contains a section describing coal quality. Forty-two trench samples were subjected to float/sink tests, proximate analysis and classification by rank based on standard A.S.T.M. procedures. The coals were thought to be of semi-anthracite to low volatile bituminous rank, with one sample representing a medium volatile bituminous coal. Subsequent petrographic analysis revealed that all of the coals were anthracite.

The discrepancy is thought to be due to the effects of oxidation on volatile matter yield and calorific value. Volatile matter yield, corrected for moisture and mineral matter, is used as the criterion to assign rank, but it is liable to marked increase upon coal oxidation. Conversely, calorific value (on a dry basis) is reduced upon oxidation and can, in fact, be used to show level of oxidation. With the knowledge of the effects of oxidation on the results of proximate analysis, these results and petrographic measurements can be used jointly to establish rank (quality) of Panorama coals.

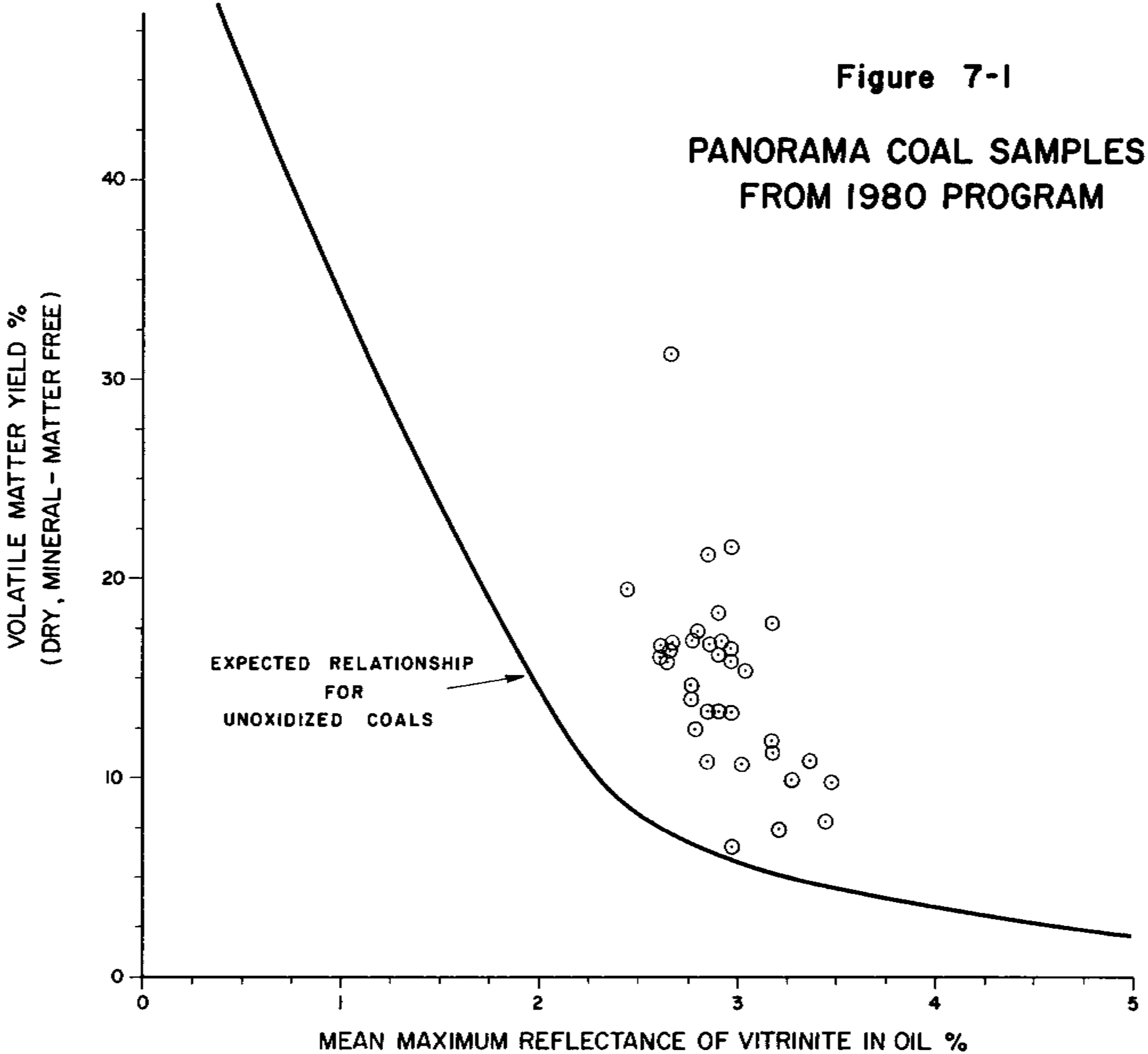
7.2.0 Rank of Coals

Figure 7.1 shows a plot of volatile matter yield (corrected to a dry, mineral-matter free basis) versus the mean maximum reflectance of vitrinite in oil (Ro max) for Panorama coals from the 1980 program. The solid line in the diagram is the relationship between these two parameters obtained from fresh coals sampled worldwide (Stach, 1975). It is apparent from the diagram that for Panorama coals, either the volatile yield is too high for the reflectance value, or the reflectance value is too high for the volatile yield. Whereas there are a number of reasons why volatile yield is enhanced in oxidized coals (and the occurrence is relatively common), examples of coals with raised reflectances relative to volatile matter yield are unknown.

The occurrence of SO_4-, OH- and CO_2- bearing minerals, formed in response to oxidation, and often contained on cleat surfaces, is common among weathered coals. And whereas correction for the CO_2 contained in syngenetic carbonate mineral matter will correctly restore the volatile yield among fresh coals to a normal value shown in Figure 7.1, similar corrections among oxidized samples still leave the coal with anomalously high volatile yields.

Figure 7-1

PANORAMA COAL SAMPLES FROM 1980 PROGRAM

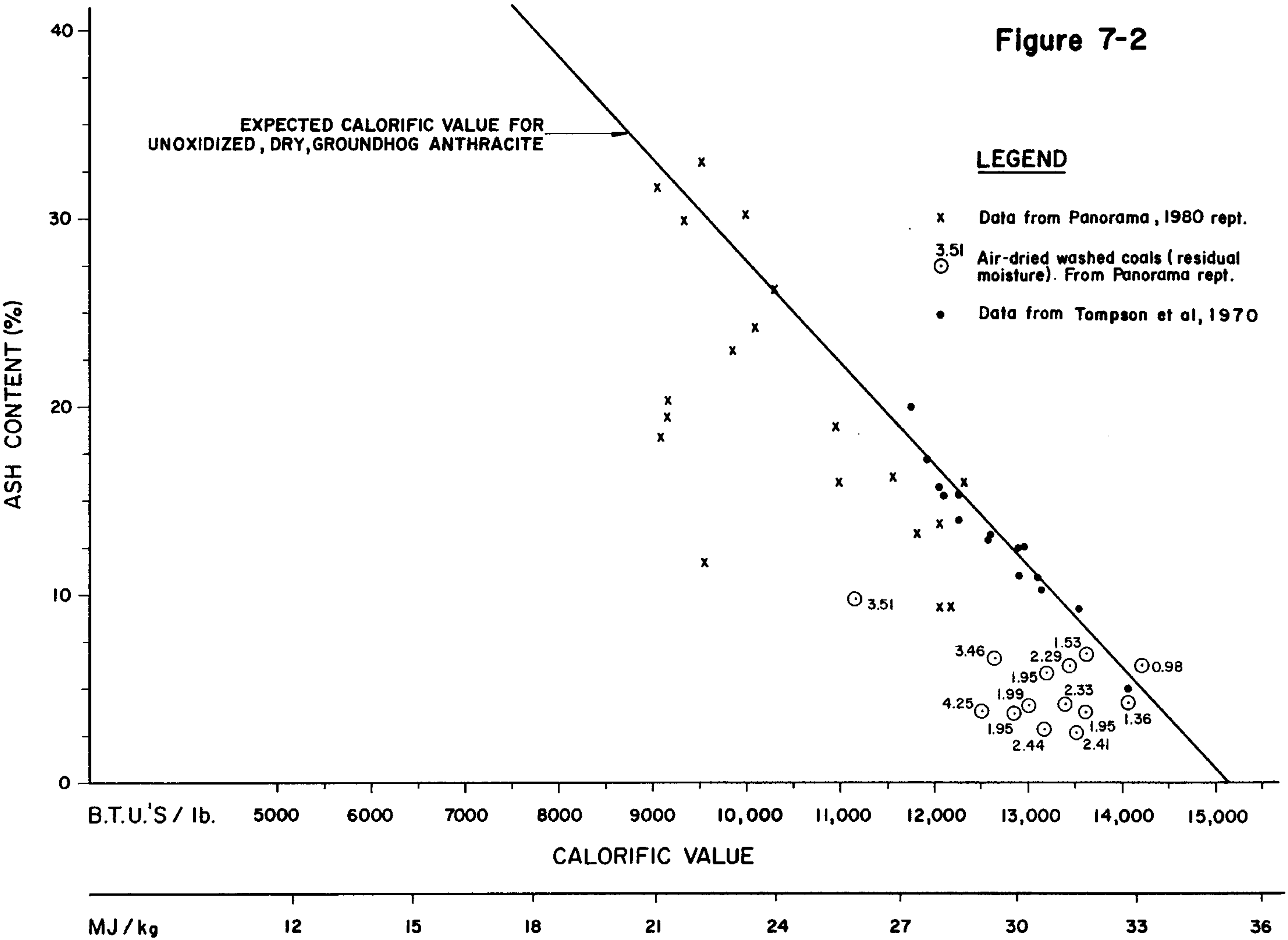


Further evidence of the fact that samples of Panorama coals taken to date are oxidized, is provided by Figure 7.2 which plots calorific value versus ash content for unoxidized Groundhog anthracites (Tompson, 1970, Appendix). Since the plot is on a dry basis, the relationship is linear. Departure from this line is therefore caused by reduction in calorific value, a function of oxidation. The Panorama 1980 Coals, with few exceptions, fall away from the line in a scattered fashion. The effect of the residual moisture remaining in an air-dried coal can also be seen in Figure 7.2.

It is concluded, therefore, that the coals collected in the 1980 Program were oxidized, calorific values were reduced and volatile yields were enhanced. Accordingly, these parameters cannot be used to establish rank (quality).

Reliance has therefore been placed on reflectance data, which consistently has indicated that the coals are of anthracite rank.

Figure 7-2



EXPECTED CALORIFIC VALUE FOR UNOXIDIZED, DRY, GROUNDHOG ANTHRACITE
LEGEND
x Data from Panorama, 1980 rept.
3.51 Air-dried washed coals (residual moisture). From Panorama rept.
• Data from Tompson et al, 1970
ASH CONTENT (%)
0
10
20
30
40
3.51
3.46
1.53
2.29
1.95
0.98
2.33
1.99
4.25
1.95
1.95
1.36
2.44
2.41
B.T.U.'S / lb.
5000
6000
7000
8000
9000
10,000
11,000
12,000
13,000
14,000
15,000
CALORIFIC VALUE
MJ / kg
12
15
18
21
24
27
30
33
36

Not surprisingly, the fresh drill-core coals from the Skeena Valley (Tompson 1970, Appendix) show lower volatile yields and higher calorific values than the Panorama 1980 samples. Although this could be caused by other factors, the level of oxidation may be significant.

In an attempt to obtain fresh core samples from trenched seams, a Winkie drilling program was undertaken. Although the core recovery was very poor, of three samples analyzed, two were relatively unoxidized on the basis of their volatile yields (Figure 7.1).

7.3.0 Estimated Quality of Coals

Although no fresh coal samples have yet been obtained from the Panorama Coal Licences, fresh samples from elsewhere in the Groundhog Coalfield, and the Winkie drill-core are sufficient to allow estimates of coal quality.

The following ranges for fresh coal is expected on the licences:

Raw Ash	8 - 32%
Volatile Matter (dmmf)	4 - 7%
Calorific Value (d.b.) (at ash values shown above)	13650 - 9200 Btu/lb. 31.7 - 21.4 MJ/kg.
Sulphur	0.47%
Ro Max.	3.4 - 2.7%

8.0.0 RECOMMENDATIONS

The following recommendations are made regarding the Panorama licences:

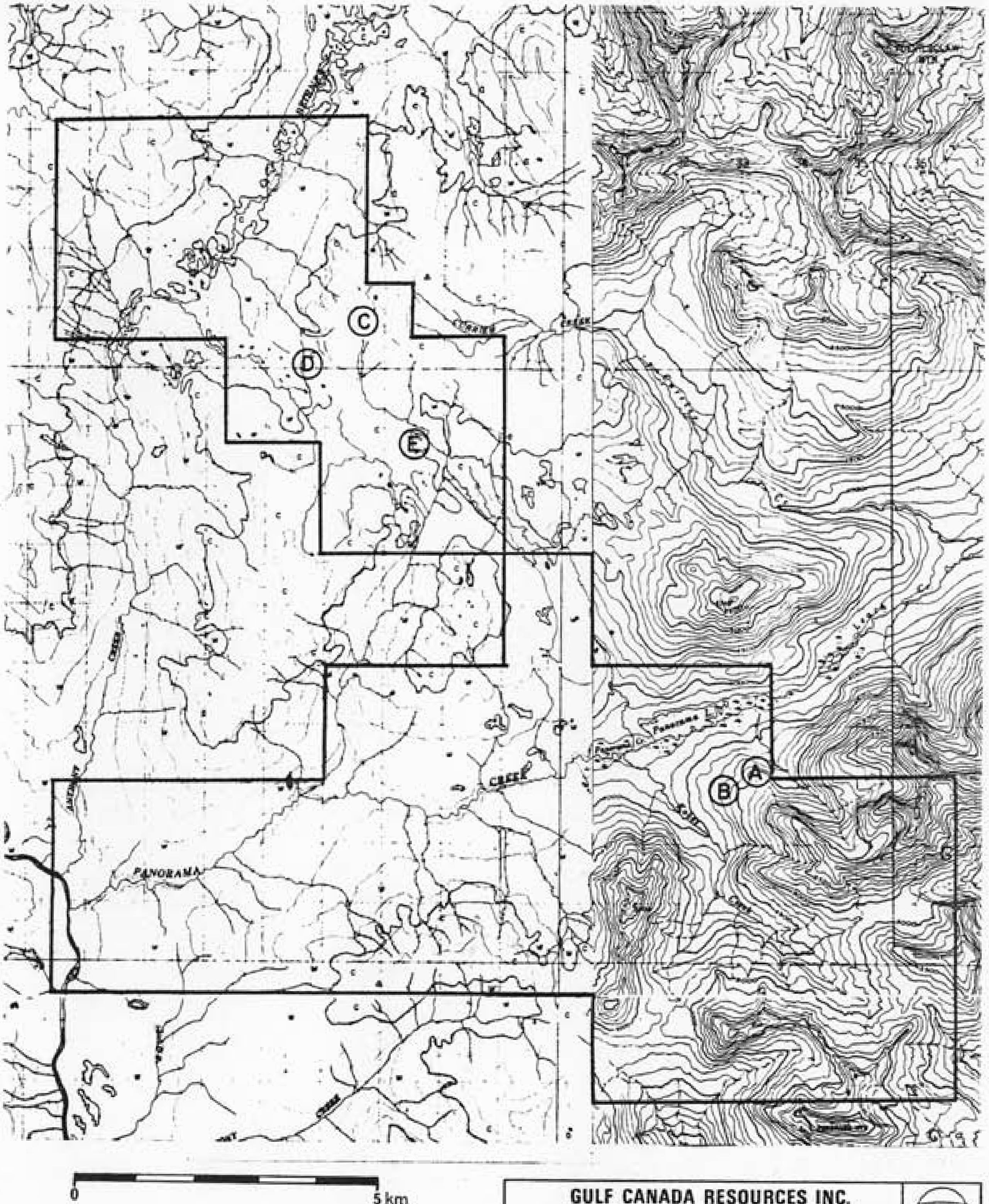
1. To establish indicated resources, a drilling program should be instituted to test:

    a) the continuity of coal seams along the western end of Cushing Ridge;

    b) the presence, thickness and extent of potential coals in the area south of Beirnes Creek.

    The recommended drilling sites are as indicated on Figure 8.1.

2. On the basis of the current geological interpretation of the Panorama licence block, it is recommended that four licences be dropped, as they cover non-coal-bearing sequences. Licences 5487 and 5501 are underlain by Panorama sequence rocks. Licences 5503 and 5504 are underlain by the Malloch sequence (Figure 8.2).



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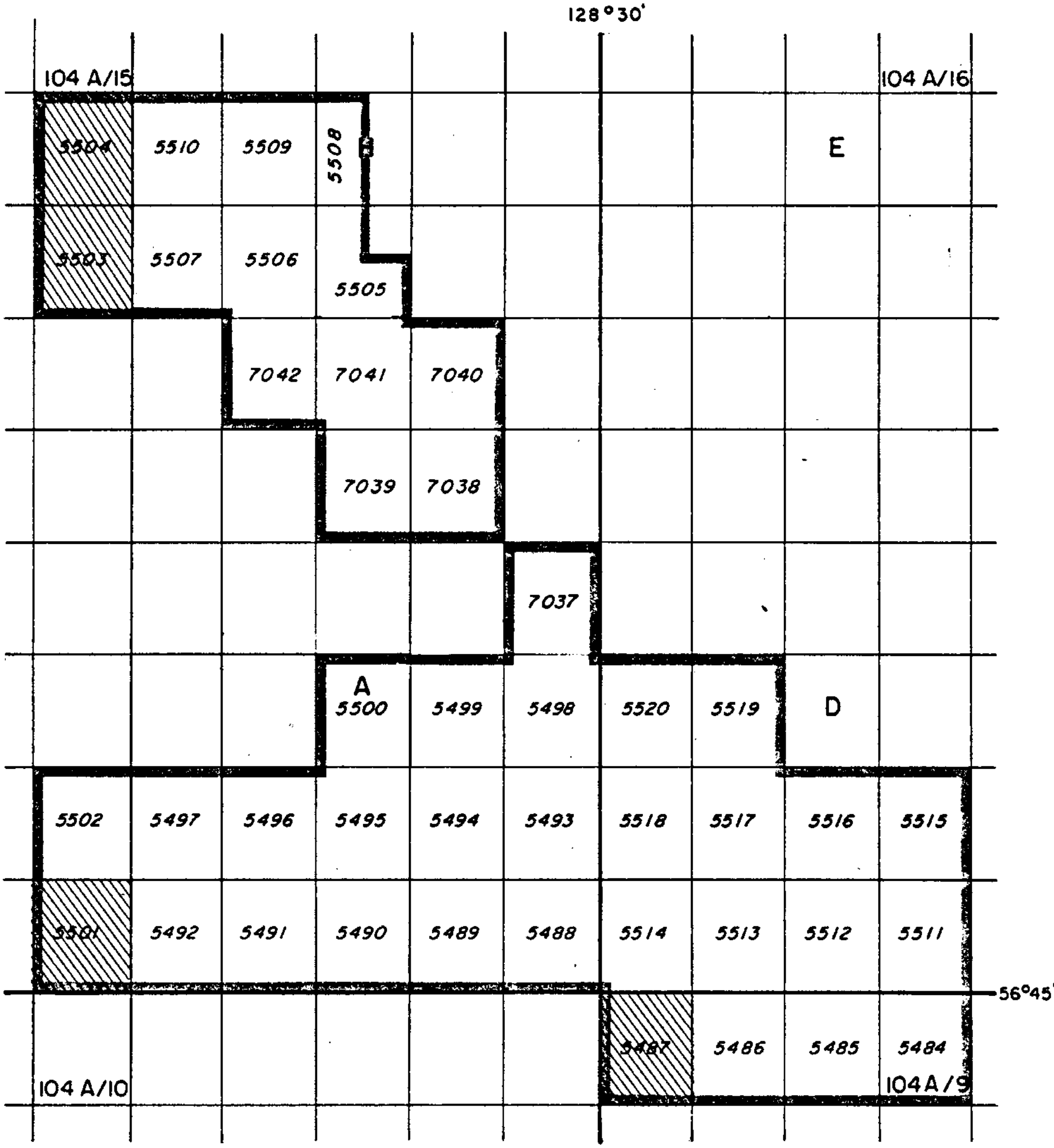
PANORAMA COAL PROJECT
RECOMMENDED DRILLING SITES

PREPARED BY: J. INNIS	SCALE 1:100,000
APPROVED BY: DATE: DEC. 1980	DRAWING No. FIG. 8.1



LICENCES TO BE SURRENDERED

GULF CANADA RESOURCES INC. Coal Division CALGARY ALBERTA	Gulf

PANORAMA COAL PROJECT
LICENCE REVISIONS

PREPARED BY: J. INNIS	SCALE 1:100,000
APPROVED BY: DATE: NOV./81	DRAWING No. 8.2

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APPENDIX I

PANORAMA COAL PROJECT 1981

LICENCE DESCRIPTION

Licence No.	Date Issued	Hectares	Land Description: Series	Block	Units
5484	November 5/79	284	104-A-9	L	83,84,93,94
5485	"	"	"	"	85,86,95,96
5486	"	"	"	"	87,88,97,98
5487	"	"	"	"	89,90,99,100
5488	"	"	104-A-15	A	1, 2,11,12
5489	"	"	"	"	3, 4,13,14
5490	"	"	"	"	5, 6,15,16
5491	"	"	"	"	7, 8,17,18
5492	"	"	"	"	9,10,19,20
5493	"	"	"	"	21,22,31,32
5494	"	"	"	"	23,24,33,34
5495	"	"	"	"	25,26,35,36
5496	"	"	"	"	27,28,37,38
5497	"	"	"	"	29,30,39,40
5498	"	"	"	"	41,42,51,52
5499	"	"	"	"	43,44,53,54
5500	"	"	"	"	45,46,55,56
5501	"	"	104-A-15	B	1, 2,11,12
5502	"	"	"	"	21,22,31,32
5511	"	"	104-A-16	D	3, 4,13,14
5512	"	"	"	"	5, 6,15,16
5513	"	"	"	"	7, 8,17,18
5514	"	"	"	"	9,10,19,20
5515	"	"	"	"	23,24,33,34
5516	"	"	"	"	25,26,35,36
5517	"	"	"	"	27,28,37,38
5518	"	"	"	"	29,30,39,40
5519	"	"	"	"	47,48,57,58
5520	"	"	"	"	49,50,59,60
5503	"	"	104-A-15	G	21,22,31,32
5504	"	283	"	"	41,42,51,52
5505	"	245	104-A-15	H	25,26,35,36 PTN
5506	"	284	"	"	27,28,37,38
5507	"	"	"	"	29,30,39,40
5508	"	175	"	"	45,46,55,56 PTN
5509	"	283	"	"	47,48,57,58
5510	"	"	"	"	49,50,59,60

PANORAMA COAL PROJECT 1981

LICENCE DESCRIPTION

Licence No.	Date Issued	Hectares	Land Description Series	Block	Units
7037	April 1/81	284	104-A-15	A	61,62,71,72
7038	"	"	"	"	83,84,93,94
7039	"	"	"	"	85,86,95,96
7040	"	"	"	H	3, 4,13,14
7041	"	"	"	"	5, 6,15,16
7042	"	"	"	"	7, 8,17,18
TOTAL		12,061			

APPENDIX II

	ROCK	COAL
2.04		0.60
		0.95
	0.30	
		0.19
TOTAL	0.30	1.74

ATTITUDE OF ROOF = 140/67°S

ATTITUDE OF FLOOR = 144/ 59°S

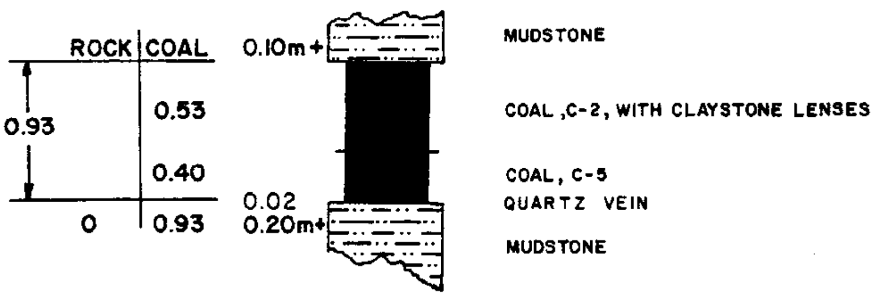
GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 001

DRAWN BY:	DATE: 20·10·81	SCALE 1 : 50	
PREPARED B... J. INNIS		DRAWING No.	
APPROVED BY:	DATE:		



ATTITUDE OF ROOF = 090/80°N
ATTITUDE OF FLOOR = 070/65°N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

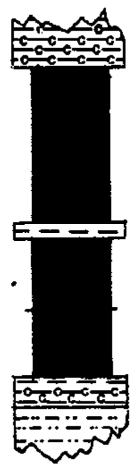
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 002

DRAWN BY:		DATE: 20·10·81	SCALE 1:50
PREPARED BY	J. INNIS		DRAWING No.
APPROVED BY		DATE:	

	ROCK	COAL
		1.03
2.01	0.08	
		0.48
		0.42
TOTAL	0.08	1.93



ATTITUDE OF ROOF = N /A

ATTITUDE OF FLOOR = 080/65° N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

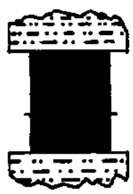
PANORAMA COAL PROJECT

TRENCH LOG

TRC-81-003

DRAWN BY:	DATE: 20.10.81	SCALE 1:50	
PREPARED BY: J. INNIS		DRAWING No.	
APPROVED BY:	DATE		

	ROCK	COAL
0.69		0.45
		0.24
TOTAL	0	0.69



ATTITUDE OF ROOF = 125/57° S.W.

ATTITUDE OF FLOOR = 114/56° S.W.

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

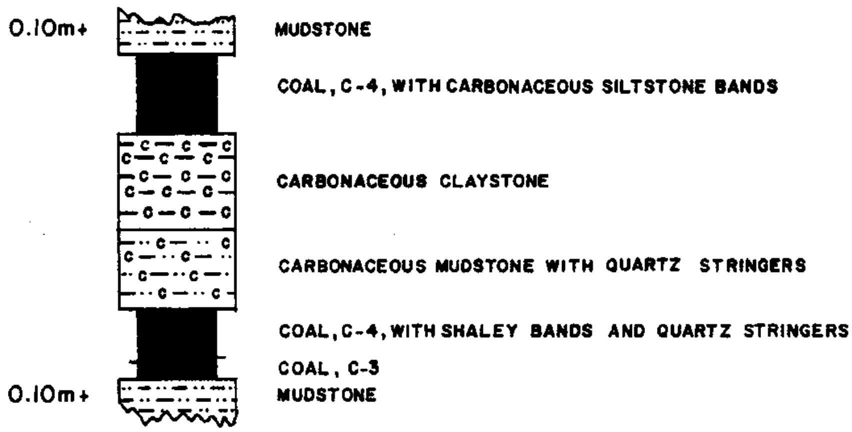
PANORAMA COAL PROJECT

TRENCH LOG

TRC - 81 - 004

DRAWN BY: DATE: 20.10.81 SCALE 1 : 50
PREPARED BY: J. INNIS DRAWING No.
APPROVED BY: DATE:

	ROCK	COAL
		0.53
	0.64	
2.16		
	0.53	
		0.34
		0.12
TOTAL	1.17	0.99



ATTITUDE OF ROOF = 114/75° S.W.

ATTITUDE OF FLOOR = 132/54° S. W.

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

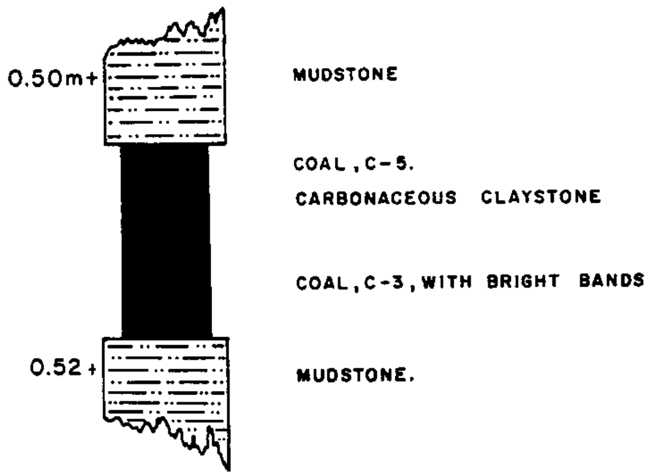
PANORAMA COAL PROJECT

TRENCH LOG

TRC-81-005

DRAWN BY	DATE 20.10.81	SCALE 1:50	
PREPARED BY J. INNIS		DRAWING No.	
APPROVED BY	DATE		

	ROCK	COAL
		.042
1.21	0.015	
		.077
TOTAL	0.015	1.19



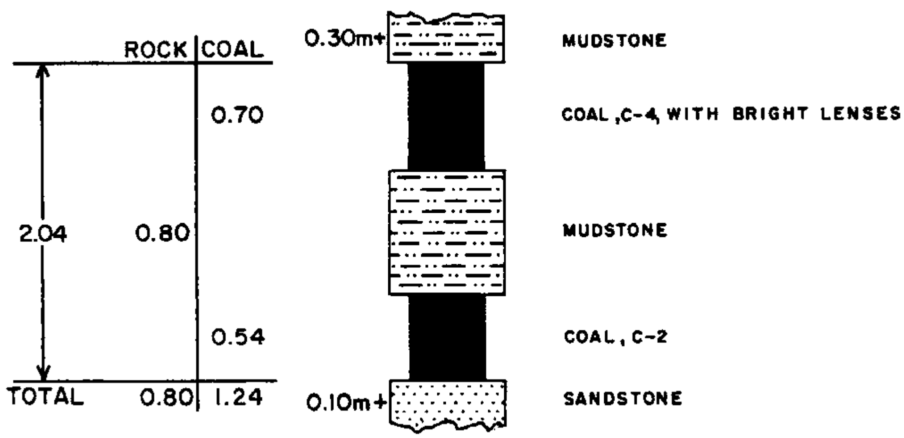
ATTITUDE OF ROOF = 115/54° SW
ATTITUDE OF FLOOR = 130/42° SW

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT
TRENCH LOG
TRC – 81 – 006

DRAWN BY		DATE: 20·10·81	SCALE 1:50
PREPARED BY	J. INNIS		DRAWING No.
APPROVED BY		DATE:	



ATTITUDE OF ROOF = 109/50°S

ATTITUDE OF FLOOR = 114/56°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

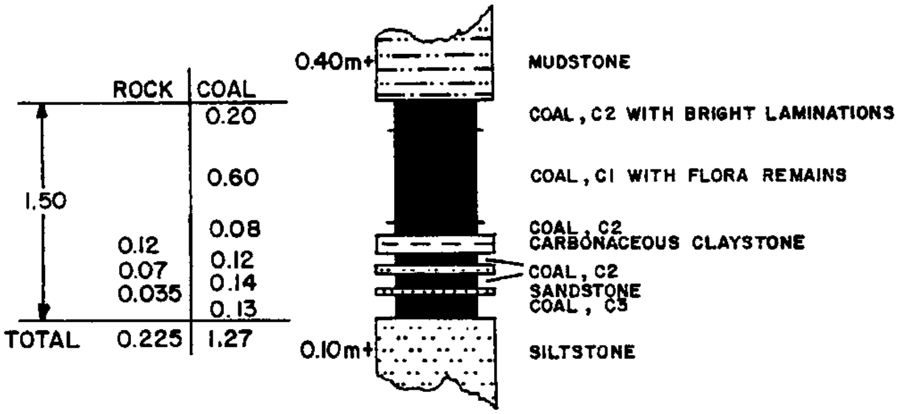
Gulf

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 007

DRAWN BY		DATE 20-10-81	SCALE 1:50
PREPARED BY	J. INNIS		DRAWING No.
APPROVED BY		DATE	



ATTITUDE OF ROOF = 119/51° NE

ATTITUDE OF FLOOR = 016/85° W

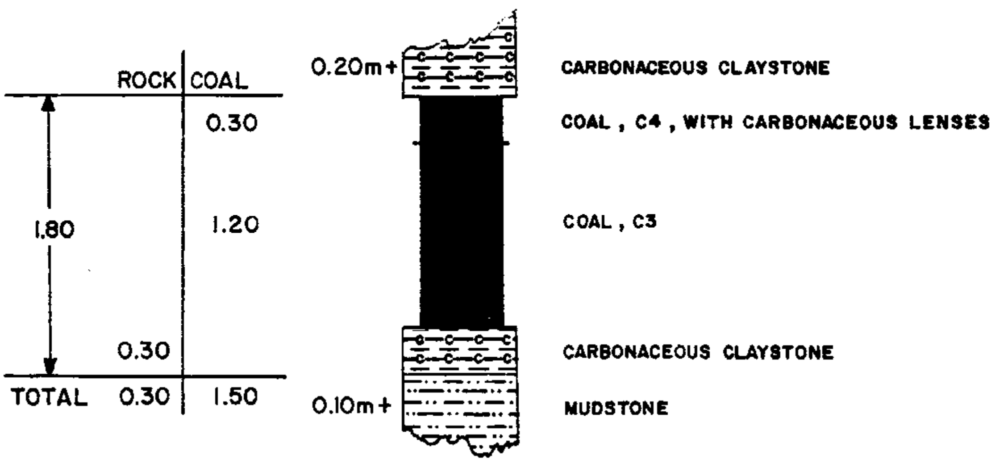
GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 008

DRAWN BY: DATE: 20-10-81 SCALE: 1 : 50
PREPARED BY: J. INNIS DRAWING No.
APPROVED BY DATE



ATTITUDE OF ROOF = N/A

ATTITUDE OF FLOOR = 100/46°N

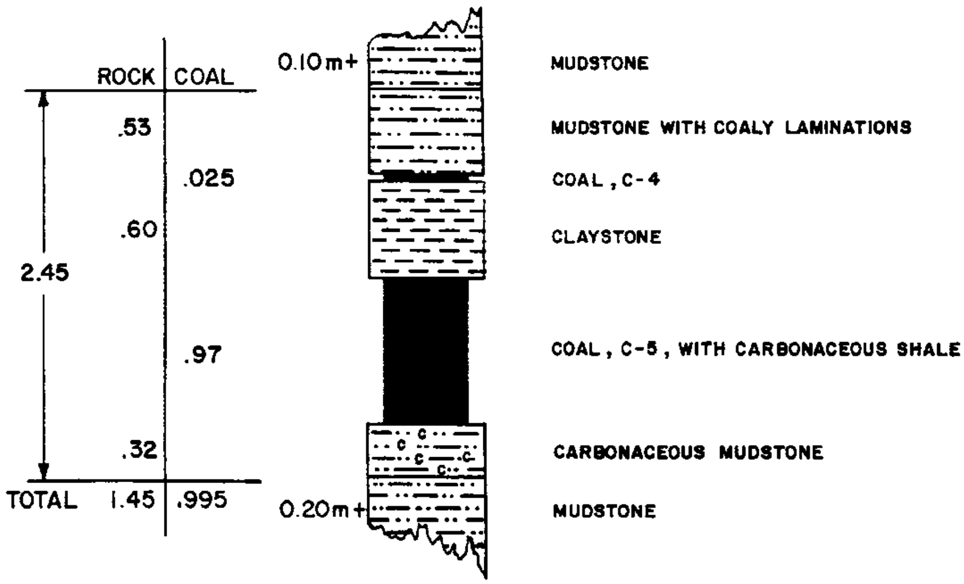
GULF CANADA RESOURCES INC.

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 009

DRAWN BY		DATE 20·10·81	SCALE 1:50
PREPARED BY	J. INNIS		DRAWING No
APPROVED BY		DATE	



ATTITUDE OF ROOF = 159/59°E

ATTITUDE OF FLOOR = 150/62°E

GULF CANADA RESOURCES INC.

CALGARY

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 010

DRAWN BY | DATE 20-10-81 | SCALE 1:50

PREPARED BY: J. INNIS | DRAWING No.

APPROVED BY | DATE

	ROCK	COAL
2.90		2.90
TOTAL	0	2.90

0.10m+ CARBONACEOUS MUDSTONE

COAL, C-3

0.20m+ CLAYSTONE

ATTITUDE OF ROOF = 099/70°N
ATTITUDE OF FLOOR = 096/82°N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

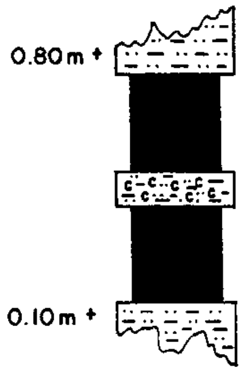
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 011

DRAWN BY:	DATE: 20·10·81	SCALE 1:50
PREPARED BY: J. INNIS		DRAWING No.
APPROVED BY:	DATE:	

	ROCK	COAL
1.36		.61
	.19	
		.30
		.26
TOTAL	.19	1.17



MUDSTONE WITH CARBONACEOUS LAMINATIONS

COAL, C-3

CARBONACEOUS CLAYSTONE

COAL, C-2, WITH BRIGHT BANDS

COAL, C-3

ATTITUDE OF ROOF = 119/72°S

ATTITUDE OF FLOOR = 115/57°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

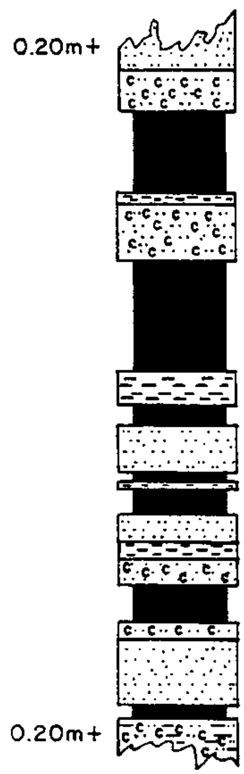
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 012

DRAWN BY DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No.
APPROVED BY DATE

	ROCK	COAL
	.24	
		.30
		.24
	.08	
	.35	
		.76
4.15		
	.20	
	.31	.11
	.04	.09
		.16
	.19	
	.08	
	.19	
		.21
	.11	
	.41	
		.08
TOTAL	2.20	1.95



CARBONACEOUS SILTSTONE WITH FLORA FOSSILS
COAL, C-5, WITH BRIGHTER LENSES
COAL, C-3
CLAYSTONE
CARBONACEOUS SILTSTONE
COAL, C-4
COAL, C-4
COAL, C-5
COAL, C-5
SILTSTONE WITH COALY LAMINATIONS
CLAYSTONE
CARBONACEOUS SILTSTONE
COAL, C-4
CARBONACEOUS SILTSTONE
SILTSTONE WITH BRIGHT COAL BANDS
COAL, C-5
CARBONACEOUS MUDSTONE

ATTITUDE OF ROOF = 110/70°S
ATTITUDE OF FLOOR = 102/69°S

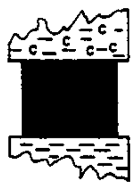
GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

PANORAMA COAL PROJECT
TRENCH LOG
TRC – 81 – 013

DRAWN BY DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No
APPROVED BY DATE

	ROCK	COAL
0.57		0.15
		0.10
		0.13
		0.19
TOTAL	0	0.57

0.20m+



0.20m+

CARBONACEOUS CLAYSTONE
COAL, C-4
COAL, C-2
COAL, C-4, WITH BRIGHT BANDS
COAL, C-4
CLAYSTONE

ATTITUDE OF ROOF = 90/60°N
ATTITUDE OF FLOOR = 110/55°N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

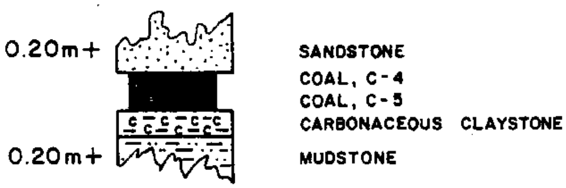
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 014

DRAWN BY
DATE 20·10·81 SCALE 1:50
PREPARED BY J. INNIS
DRAWING NO.
APPROVED BY
DATE

	ROCK	COAL
0.38		0.16
	0.16	0.06
TOTAL	0.16	0.22



ATTITUDE OF ROOF = 100/70°S

ATTITUDE OF FLOOR = 95/60°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

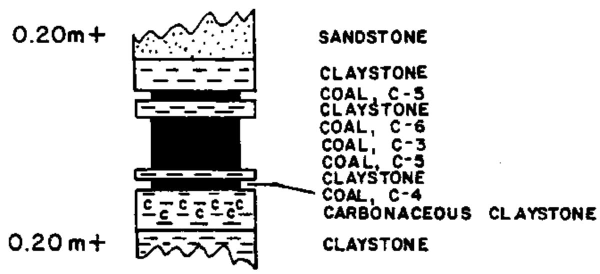
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 015

DRAWN BY		DATE 20·10·81	SCALE 1:50
PREPARED BY	J. INNIS		DRAWING No.
APPROVED BY		DATE	

	ROCK	COAL
1.06	0.18	
		0.02
	0.10	
		0.02
		0.26
		0.08
	0.04	
		0.09
	0.27	
TOTAL	0.59	0.47



ATTITUDE OF ROOF = 100/65°S

ATTITUDE OF FLOOR = 100/65°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

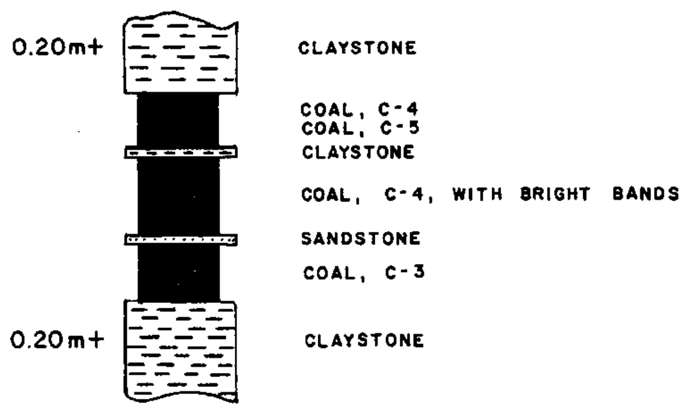
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 016

DRAWN BY | DATE 20-10-81 | SCALE 1: 50
PREPARED BY J. INNIS | DRAWING No.
APPROVED BY | DATE

	ROCK	COAL
		0.30
	0.04	0.10
1.29		
	0.03	0.50
		0.32
TOTAL	0.07	1.22



ATTITUDE OF ROOF = 110/85°S
ATTITUDE OF FLOOR = 110/85°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

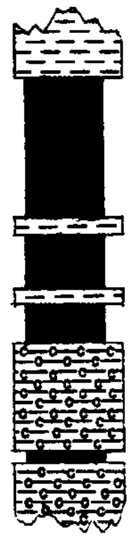
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 017

DRAWN BY
DATE 20·10·81 SCALE 1:50
PREPARED BY J. INNIS
DRAWING No
APPROVED BY
DATE

	ROCK	COAL
		0.20
		0.70
	0.12	
2.50		0.35
	0.10	
		0.21
	0.72	
		0.10
TOTAL	0.94	1.56



ATTITUDE OF ROOF = 110/90°

ATTITUDE OF FLOOR = 110/90°

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

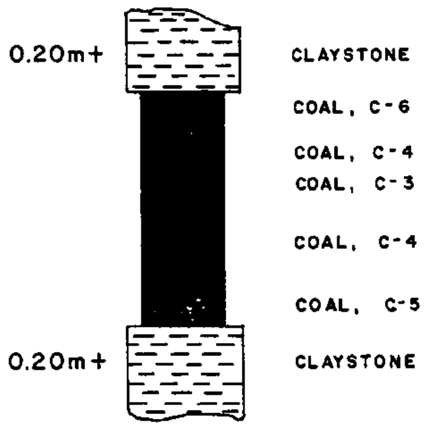
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 018

DRAWN BY		DATE 20-10-81	SCALE 1:50
PREPARED BY	J. INNIS		DRAWING No.
APPROVED BY		DATE	

	ROCK	COAL
		0.12
		0.46
		0.02
1.48	0.06	0.03
		0.55
		0.24
TOTAL	0.06	1.42



ATTITUDE OF ROOF = 110/90°S
ATTITUDE OF FLOOR = 110/90°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

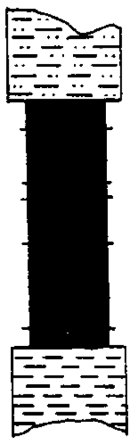
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 019

DRAWN BY
PREPARED BY J. INNIS
APPROVED BY
DATE 20-10-81 SCALE 1:50
DRAWING NO.
DATE

	ROCK	COAL
		0.18
		0.36
		0.14
1.58		0.25
		0.55
		0.10
TOTAL	0	1.58



ATTITUDE OF ROOF = 90/75° N

ATTITUDE OF FLOOR = 90/75° N

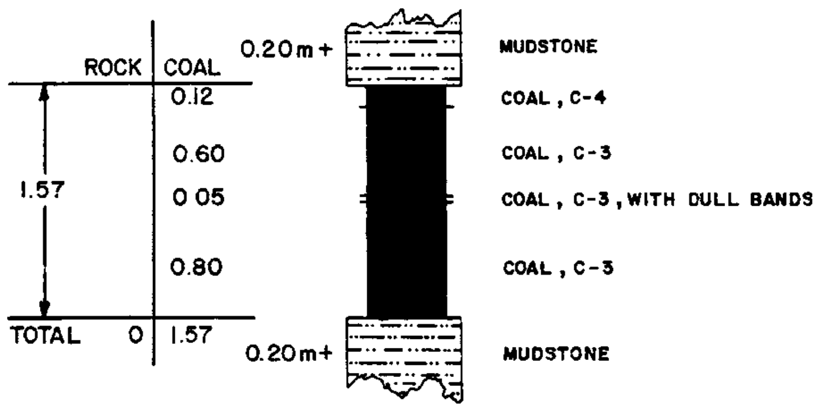
GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 020

DRAWN BY | DATE 20-10-81 | SCALE 1:50
PREPARED BY J. INNIS | DRAWING No
APPROVED BY | DATE



ATTITUDE OF ROOF = 125/35°S
ATTITUDE OF FLOOR = 125/35°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 021

DRAWN BY
DATE 20-10-81
SCALE 1: 50
PREPARED BY J. INNIS
DRAWING No
APPROVED BY
DATE

113

Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources

APPLICATION TO EXTEND TERM OF LICENCE

I, COURTERELLE, P. (Name) agent for Gulf Canada Resources Inc (Name)

67 CROMWELL AVENUE, CALGARY, ALBERTA T2L 0M6 (Address)

401 - 9th Avenue, S.W., PO Box 130, CALGARY, ALBERTA T2P 2H7 (Address)

Valid FMC No. 244895

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 5484-5486, 5488-5500, 5502, 5505-5520

for a further period of one year.

2. Property name PANORAMA COAL LICENCES

3. I am allowing the following Coal Licence(s) No(s). to forfeit 5501, 5503, 5504, 5487

4. I have performed, or caused to be performed, during the period May 25, 1981 to November 5, 19 81, work to the value of at least $ 440,257

on the location of coal licence(s) as follows:

CATEGORY OF WORK

	Licence(s) No(s).	Apportioned Cost
Geological mapping		329,419
Surveys: Geophysical		
Geochemical		
Other		
Road construction		
Surface work		26,800
Underground work		
Drilling		21,670
Logging, sampling, and testing		22,610
Reclamation		
Other work (specify)		
Off-property costs		39,758

5. I wish to apply $ 440,257 of this value of work on Coal Licence(s) No(s). as per attached

6. I wish to pay cash in lieu of work in the amount of $ NIL on Coal Licence(s) No(s).

7. The work performed on the location(s) is detailed in the attached report entitled PANORAMA COAL PROJECT GEOLOGICAL REPORT 1981

January 22, 1982 (Date)

[signature] (Signature)

[signature] (Position)

(FORMS AND REPORT TO BE SUBMITTED IN DUPLICATE)

CATEGORY OF WORK

GEOLOGICAL MAPPING — Yes ☒ No ☐

	Area (Hectares)	Scale	Duration
Reconnaissance	10,926	110,000	85 days
Detail: Surface	N/A		
Underground			

*Other (specify) ....

Total Cost $ 329,419

GEOPHYSICAL/GEOCHEMICAL SURVEYS — Yes ☐ No ☒

Method ....
Grid ....
Topographic ....
*Other (specify) ....

Total Cost $ --

ROAD CONSTRUCTION — Yes ☐ No ☒

Length .... Width ....
On Licence(s) No(s). ....
Access to ....

Total Cost $ --

SURFACE WORK — Yes ☒ No ☐

	Length	Width	Depth	Cost
Trenching	80m	0.5m	1 - 1.5 m	26,800
Seam Tracing				
Crosscutting				
*Other (specify)				

Total Cost $ 26,800

UNDERGROUND WORK — Yes ☐ No ☒

	No. of Adits	Maximum Length	No. of Holes	Total Metres	Cost
Test Adits			--		
*Other workings					

Total Cost $ --

DRILLING — Yes ☒ No ☐

		Hole Size	No. of Holes	Total Metres	Cost
Core:	Diamond	IAX	6	66	21,670
	Wireline				
Rotary:	Conventional				
	Reverse circulation				
*Other (specify)					

Contractor DRILCOR SALES LTD. (supplied rental equipment)
Where is the core stored? ....

Total Cost $ 21,670

LOGGING, SAMPLING AND TESTING — Yes ☒ No ☐

Lithology: Drill samples ☐ Core samples ☐ Bulk samples ☐
Logs: Gamma-neutron ☐ Density ☐
*Other (specify) ....
Testing: Proximate analysis ☒ FSI ☒ Washability ☐
Carbonization ☐ Petrographic ☐ Plasticity ☐
*Other (specify) .... $ 22,610

OTHER WORK (specify details)

Cost

Total Cost	$ 22,610
On-property costs	400,499
Off-property costs	39,758
Total Expenditures	$ 440,257

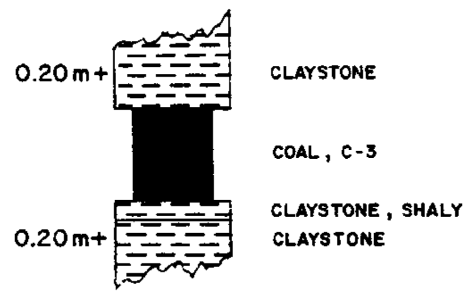
January 1982
(Date)

(Signature)

Administration Analyst
(Position)

*A full explanation of other work is to be included.

	ROCK	COAL
0.71		0.60
	0.11	
TOTAL	0.11	0.60



ATTITUDE OF ROOF = 090/85°S

ATTITUDE OF FLOOR = 090/85°S

GULF CANADA RESOURCES INC

PANORAMA COAL PROJECT

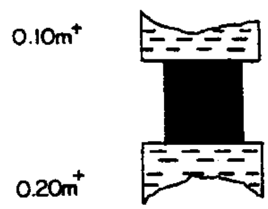
TRENCH LOG

TRC – 81 – 022

DATE 20-10-81 SCALE 1 : 50

PREPARED BY J. INNIS

	ROCK	COAL
0.51		0.08
		0.19
		0.24
TOTAL	0	0.51



COAL , C - 5 .
COAL , C - 3 .
COAL , C - 5 .

ATTITUDE OF ROOF = 090/90°
ATTITUDE OF FLOOR = 090/90°

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

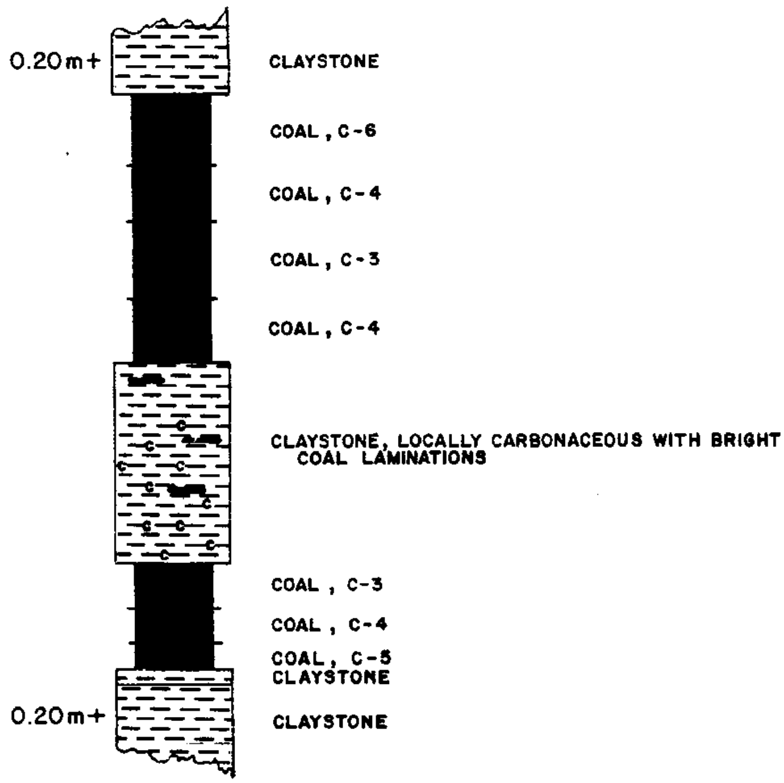
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 023

DRAWN BY: DATE: 20-10-81 SCALE 1: 50
PREPARED BY: J. INNIS DRAWING No.
APPROVED BY: DATE:

	ROCK	COAL
		0.47
		0.33
		0.50
		0.40
3.73	1.27	
		0.27
		0.22
	0.11	0.16
TOTAL	1.38	2.35



ATTITUDE OF ROOF = 085/45°S

ATTITUDE OF FLOOR = 100/85°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

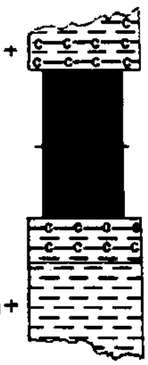
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 024

DRAWN BY
PREPARED BY J. INNIS
APPROVED BY
DATE 20-10-81 SCALE 1:50
DRAWING No.
DATE

	ROCK	COAL
0.96		0.50
		0.46
TOTAL	0	0.96



ATTITUDE OF ROOF = 100/70°N

ATTITUDE OF FLOOR = 100/70°N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

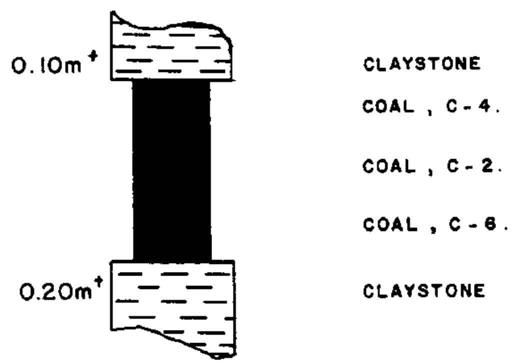
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 025

DRAWN BY
DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS
DRAWING No
APPROVED BY
DATE

	ROCK	COAL
1.24		0.35
		0.32
		0.57
TOTAL	0	1.24



ATTITUDE OF ROOF = 140/60°S

ATTITUDE OF FLOOR = 140/60°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

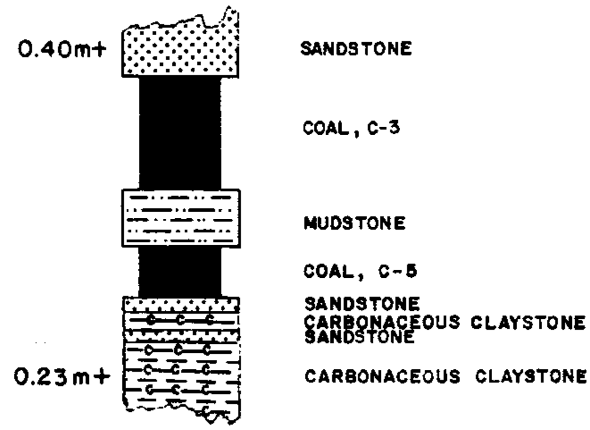
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 026

DRAWN BY: DATE 20-10-81 SCALE 1:50
PREPARED BY: J. INNIS DRAWING No.
APPROVED BY: DATE:

	ROCK	COAL
		.74
1.61	.34	
		.21
	.11	
	.09	
	.12	
TOTAL	.66	.95

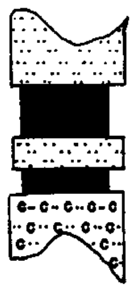


ATTITUDE OF ROOF = 084/57°E

ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC. Coal Division CALGARY ALBERTA	Gulf
PANORAMA COAL PROJECT	
TRENCH LOG	
TRC – 81 – 027	
DRAWN BY: DATE 20-10-81	SCALE 1: 50
PREPARED BY J. INNIS	DRAWING No.
APPROVED BY DATE:	

	ROCK	COAL
		0.36
0.68	0.20	
		0.12
TOTAL	0.20	0.48



ATTITUDE OF ROOF = 058/004°S

ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

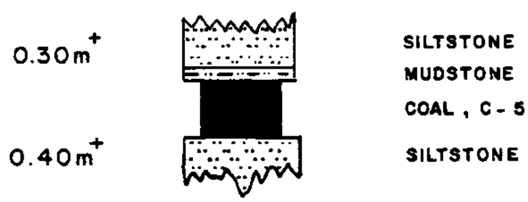
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 028

DRAWN BY: DATE 20-10-81 SCALE 1:50
PREPARED BY: J. INNIS DRAWING No.
APPROVED BY: DATE.

	ROCK	COAL
0.48	0.08	0.4
TOTAL	0.08	0.4



ATTITUDE OF ROOF = 121/47°NE

ATTITUDE OF FLOOR = 119/10°NE

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

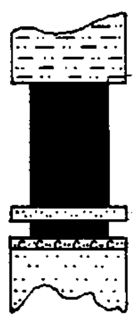
TRENCH LOG

TRC – 81 – 029

DRAWN BY:	DATE: 20-10-81	SCALE 1: 50
PREPARED BY: J. INNIS		DRAWING No
APPROVED BY:	DATE:	

	ROCK	COAL
		0.15
1.01		0.7
	0.05	
		0.11
TOTAL	0.05	0.96

0.30 m+



MUDSTONE

COAL , C - 5 .

COAL , C - 5 .

SILTSTONE

COAL , C - 6 .

CARBONACEOUS SILTSTONE

SILTSTONE

0.20 m+

ATTITUDE OF ROOF = 124/54° E

ATTITUDE OF FLOOR= 140/43°E

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

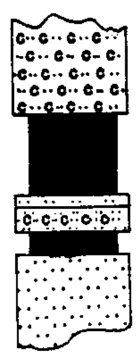
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 030

DRAWN BY: DATE: 20-10-81 SCALE: 1:50
PREPARED BY: J. INNIS DRAWING No.
APPROVED BY: DATE:

	ROCK	COAL
0.94		.55
	.06	
	.15	
		.18
TOTAL	.21	.73

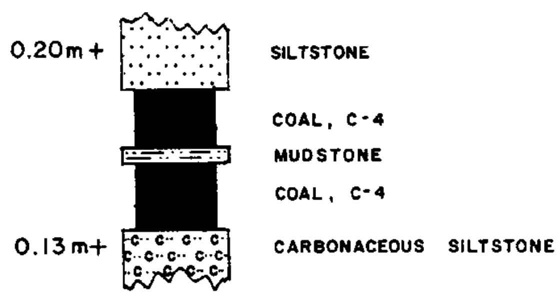


ATTITUDE OF ROOF = N/A

ATTITUDE OF FLOOR = 67/12°N

GULF CANADA RESOURCES INC. Coal Division CALGARY ALBERTA	Gulf
PANORAMA COAL PROJECT	
TRENCH LOG	
TRC – 81 – 031	
DRAWN BY: DATE: 20-10-81 SCALE 1: 50	
PREPARED BY J. INNIS DRAWING No.	
APPROVED BY DATE:	

	ROCK	COAL
		.38
0.87	.08	
		.41
TOTAL	.08	.79



ATTITUDE OF ROOF = 092/27°W
ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 032

DRAWN BY: DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No
APPROVED BY: DATE:

	ROCK	COAL
		.15
		.04
0.50	.03	.07
	.13	
	.08	
TOTAL	0.24	.26

0.10+

0.10+

CLAYSTONE -
COAL, C-5
COAL, C-3
QUARTZ
COAL, C-5
MUDSTONE
CARBONACEOUS MUDSTONE
SILTSTONE

ATTITUDE OF ROOF = 070/28°S
ATTITUDE OF FLOOR = 031/12°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

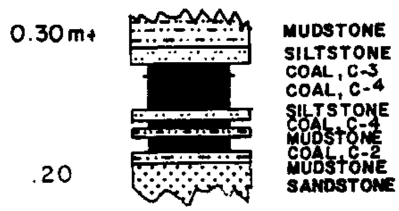
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 033

DRAWN BY:	DATE: 20-10-81	SCALE 1:50
PREPARED BY: J. INNIS		DRAWING No.
APPROVED BY:	DATE:	

	ROCK	COAL
	.10	0.07
0.64	0.10	0.23
	0.03	0.05
		0.06
TOTAL	0.23	0.41



ATTITUDE OF ROOF = 140/30°N

ATTITUDE OF FLOOR = 141 /34°N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

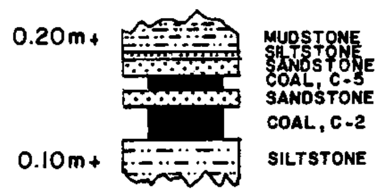
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 034

DRAWN BY: DATE: 20-10-81 SCALE 1:50
PREPARED BY: J. INNIS DRAWING No.
APPROVED BY: DATE:

	ROCK	COAL
0.53	0.04 0.12 0.09	0.07 0.21
TOTAL	0.25	0.28



ATTITUDE OF ROOF = 162/40°SW

ATTITUDE OF FLOOR = 005/25°SW

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

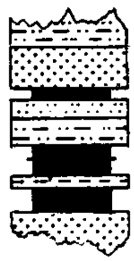
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 035

DRAWN BY: DATE 20-10-81 SCALE 1:50
PREPARED BY: J. INNIS DRAWING No.
APPROVED BY: DATE:

	ROCK	COAL
	0.23	0.05
1.02	0.31	
		0.07
	0.07	0.13
		0.16
TOTAL	0.61	0.41



ATTITUDE OF ROOF = N/A

ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

PANORAMA COAL PROJECT

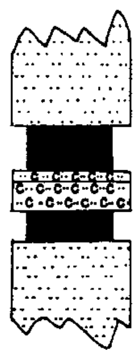
TRENCH LOG

TRC – 81 – 036

DRAWN BY:		DATE: 20-10-81	SCALE 1:50
PREPARED BY	J. INNIS		DRAWING No.
APPROVED BY		DATE:	

	ROCK	COAL
0.70		0.28
	0.07	
	0.16	
		0.19
TOTAL	0.23	0.47

0.40m+



0.50m+

SILTSTONE

COAL, C-4.

CARBONACEOUS SILTSTONE

CARB. SILTSTONE WITH BRIGHT COAL LENSES

COAL, C-5.

SILTSTONE

ATTITUDE OF ROOF = 112/48°W

ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

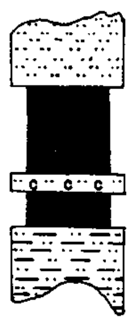
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 037

DRAWN BY | DATE 20-10-81 | SCALE 1:50
PREPARED BY J. INNIS | DRAWING No.
APPROVED BY | DATE

	ROCK	COAL
		0.56
0.80	0.10	
		0.24
TOTAL	0.10	0.70



ATTITUDE OF ROOF = 131 /25°S
ATTITUDE OF FLOOR = 120/ 29 °S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

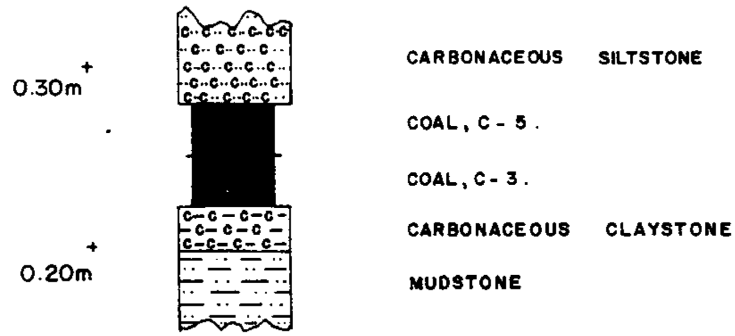
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 038

DRAWN BY DATE 20-10-81 SCALE 1: 50
PREPARED BY J. INNIS DRAWING NO.
APPROVED BY DATE

	ROCK	COAL
		0.37
0.97		0.29
	0.31	
TOTAL	0.31	0.66



ATTITUDE OF ROOF = 073/25°SW
ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

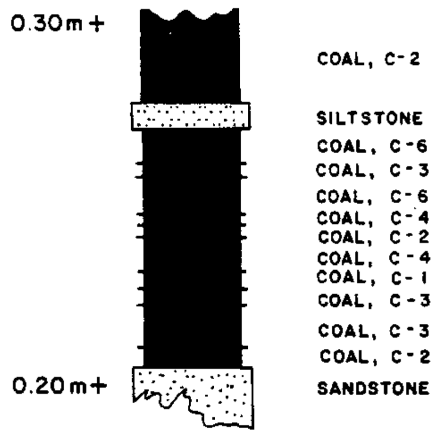
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 039

DRAWN BY DATE 20-10-81 SCALE 1: 50
PREPARED BY J. INNIS DRAWING No.
APPROVED BY DATE

	ROCK	COAL
		.30+
	.18	
		.21
		.07
		.20
1.55		.07
		.06
		.24
		.06
		.14
		.26
		.16
TOTAL	.18	1.37+



ATTITUDE OF ROOF = 021/14°SW

ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

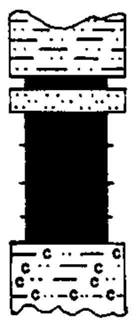
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 040

DRAWN BY DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No.
APPROVED BY DATE

	ROCK	COAL
1.00	0.15	0.06
		0.21
		0.24
		0.16
		0.18
TOTAL	0.15	0.85



ATTITUDE OF ROOF = 173/19°S

ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

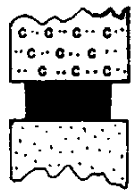
TRENCH LOG

TRC – 81 – 041

DRAWN BY: DATE 20-10-81 SCALE 1:50
PREPARED BY: J. INNIS DRAWING NO.
APPROVED BY: DATE

	ROCK	COAL
0.22		0.22
TOTAL		0.22

0.20m^{+}



0.10m^{+}

CARBONACEOUS SILTSTONE

COAL, C - 3.

SANDSTONE

ATTITUDE OF ROOF = 179/10°SW

ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

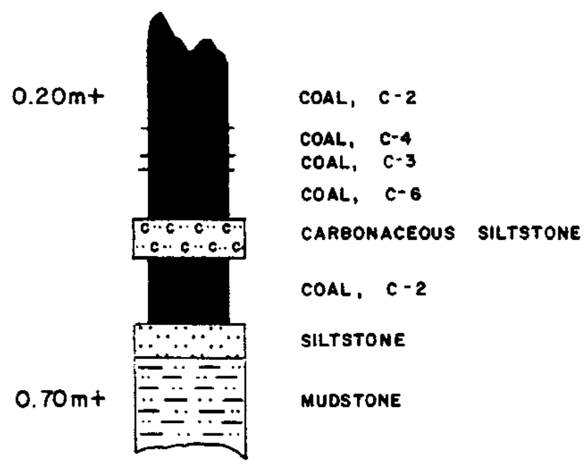
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 042

DRAWN BY DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No.
APPROVED BY DATE

	ROCK	COAL
1.46		.20+
		.20
		.10
		.30
	.25	
		.41
TOTAL	.25	1.21+



ATTITUDE OF ROOF = N/A

ATTITUDE OF FLOOR = N/A

ADJACENT OUTCROP = 275/18°N

GULF CANADA RESOURCES INC
Coal Division
CALGARY ALBERTA

Gulf

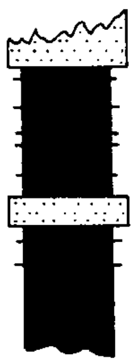
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 043

DRAWN BY | DATE 20-10-81 | SCALE 1:50
PREPARED BY J. INNIS | DRAWING No
APPROVED BY | DATE

	ROCK	COAL
		.11
		.17
		.17
		.08
1.42		.13
	.16	.16
		.11
		.12
		.21 +
TOTAL	.16	1.26+



ATTITUDE OF ROOF = (N END) 122/73°N

ATTITUDE OF FLOOR = N/A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

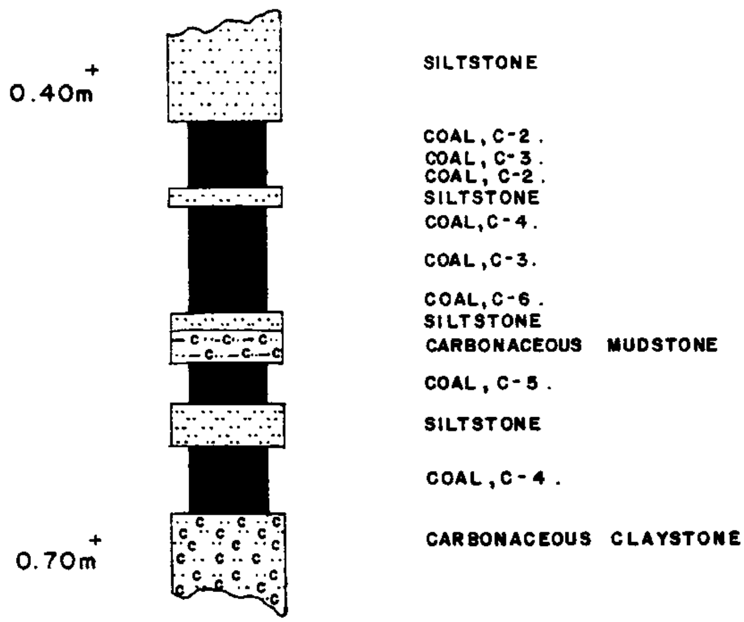
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 044

DRAWN BY DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No
APPROVED BY DATE

	ROCK	COAL
2.31		0.23
		0.05
		0.11
	0.07	
		0.20
		0.30
		0.13
	0.10	
	0.16	
		0.26
	0.29	
		0.41
TOTAL	0.62	1.69



ATTITUDE OF ROOF = N/A

ATTITUDE OF FLOOR = N/A

INTERMEDIATE ATTITUDE = 131/47°

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

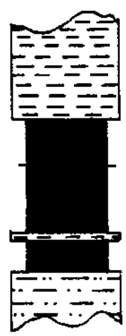
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 045

DRAWN BY	DATE 20-10-81	SCALE 1:50
PREPARED BY J. INNIS		DRAWING No.
APPROVED BY	DATE	

	ROCK	COAL
		0.27
1.01		0.48
	0.03	
		0.23
TOTAL	0.03	0.98



0.30m+	CLAYSTONE
0.015	
	COAL, C-3, WITH BRIGHT BANDS
	COAL, C-5
	CLAYSTONE
	COAL, C-3
0.30m+	MUDSTONE

ATTITUDE OF ROOF = 120/47°S

ATTITUDE OF FLOOR = 132/50°N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

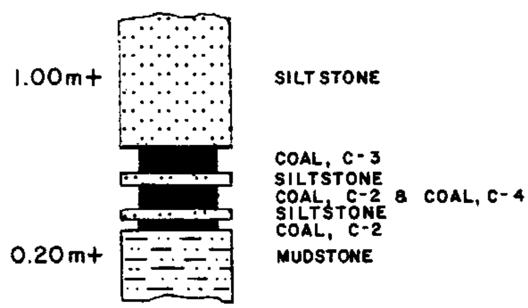
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 046

DRAWN BY: DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No.
APPROVED BY DATE

	ROCK	COAL
.50	.07	.17
	.07	.09
		.07
		.03
TOTAL	.14	.36



ATTITUDE OF ROOF = N/A INDISTINCT BEDDING HERE

ATTITUDE OF FLOOR = 130/34°N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

PANORAMA COAL PROJECT

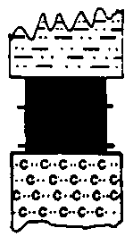
TRENCH LOG

TRC – 81 – 047

DRAWN BY
DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS
DRAWING No.
APPROVED BY DATE

	ROCK	COAL
.47	0.0	.20 .24 .03
TOTAL	0.0	.47

0.25m + MUDSTONE



COAL, C-3

COAL, C-2

COAL, C-3

0.20m + CARBONACEOUS SILTSTONE

ATTITUDE OF ROOF = 115/8°S

ATTITUDE OF FLOOR = 115/8°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 048

DRAWN BY DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No
APPROVED BY DATE

	ROCK	COAL
		0.12
1.16		0.44
		0.50
		0.10
TOTAL	0.0	1.16

0.60m+

0.05m+

COAL, C-2.
COAL, C-2, WITH BRIGHT COAL BANDS.
COAL, C-3, WITH BRIGHT COAL LAMINATIONS.
COAL, C-3.
MUDSTONE

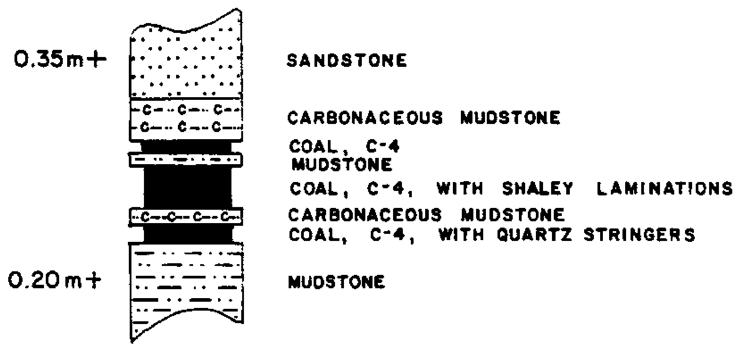
ATTITUDE OF ROOF = 106/24°S
ATTITUDE OF FLOOR = 112/29°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

PANORAMA COAL PROJECT
TRENCH LOG
TRC – 81 – 049

DRAWN BY DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No.
APPROVED BY DATE

	ROCK	COAL
	.28	
		.07
0.94	.08	
		.28
	.11	
		.12
TOTAL	.47	.47



ATTITUDE OF ROOF = 082/29°S

ATTITUDE OF FLOOR = 070/35°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

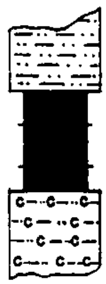
TRENCH LOG

TRC – 81 – 050

DRAWN BY DATE 20-10-81 SCALE 1: 50
PREPARED BY J. INNIS DRAWING No
APPROVED BY DATE

	ROCK	COAL
		.25
0.65	0.0	.28
		.12
TOTAL	0.0	.65

0.60m+



0.70m+

MUDSTONE

COAL, C-3

COAL, C-2

COAL, C-5, WITH SHALEY AND BRIGHT COAL HORIZONS

CARBONACEOUS MUDSTONE

ATTITUDE OF ROOF = 085/21°S

ATTITUDE OF FLOOR = 080/4°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

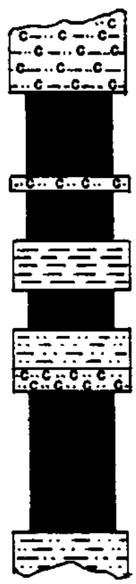
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 051

DRAWN BY DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS DRAWING No.
APPROVED BY DATE

	Rock	Coal	Lithology
+ 0.50 m			CARBONACEOUS MUDSTONE
		0.04	COAL, C-5.
		0.48	COAL, C-3.
	0.09		CARBONACEOUS SILTSTONE
		0.32	COAL, C-4.
	0.31		CLAYSTONE
		0.03	COAL, C-6.
		0.13	COAL, C-5.
		0.05	COAL, C-4.
	0.21		MUDSTONE
	0.16		CARBONACEOUS CLAYSTONE
		0.26	COAL, C-6.
		0.44	COAL, C-4, WITH BRIGHT LENSES
		0.06	COAL, C-4.
		0.08	COAL, C-6.
TOTAL (2.56)	0.77	1.89	
+ 0.40 m			MUDSTONE



ATTITUDE OF ROOF = N/A

ATTITUDE OF FLOOR = N/A

INTERMEDIATE ATTITUDE = 095/43°N

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

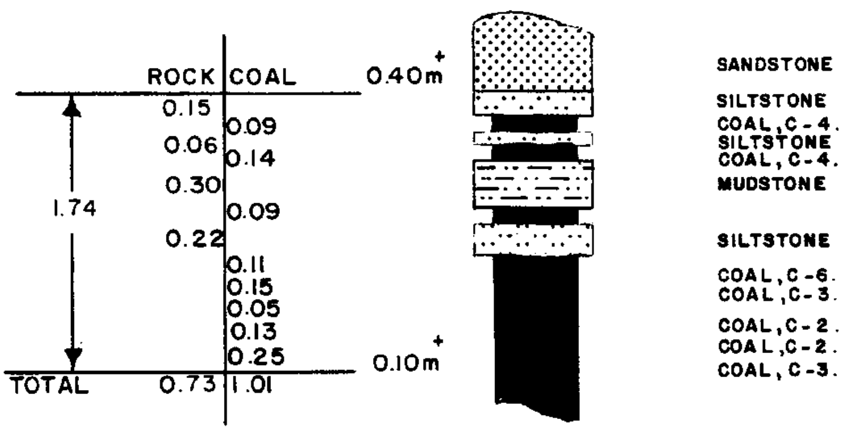
Gulf

PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 052

DRAWN BY
DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS
DRAWING No.
APPROVED BY
DATE



ATTITUDE OF ROOF = 149/45°S

ATTITUDE OF FLOOR = 145/54°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

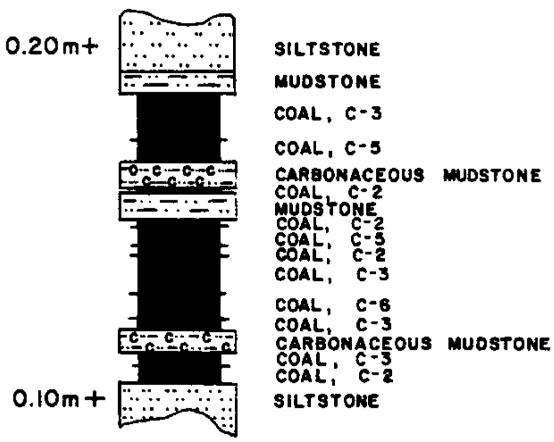
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 053

DRAWN BY
DATE 20-10-81 SCALE 1:50
PREPARED BY J. INNIS
DRAWING NO.
APPROVED BY
DATE

	ROCK	COAL
	0.15	.25
		.17
		.02
	.15	
		.02
1.91	.17	
		.02
		.14
		.04
		.25
	.11	.12
		.09
		.11
		.10
TOTAL	0.58	1.33



ATTITUDE OF ROOF = 128/84°S

ATTITUDE OF FLOOR = 135/69°S

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

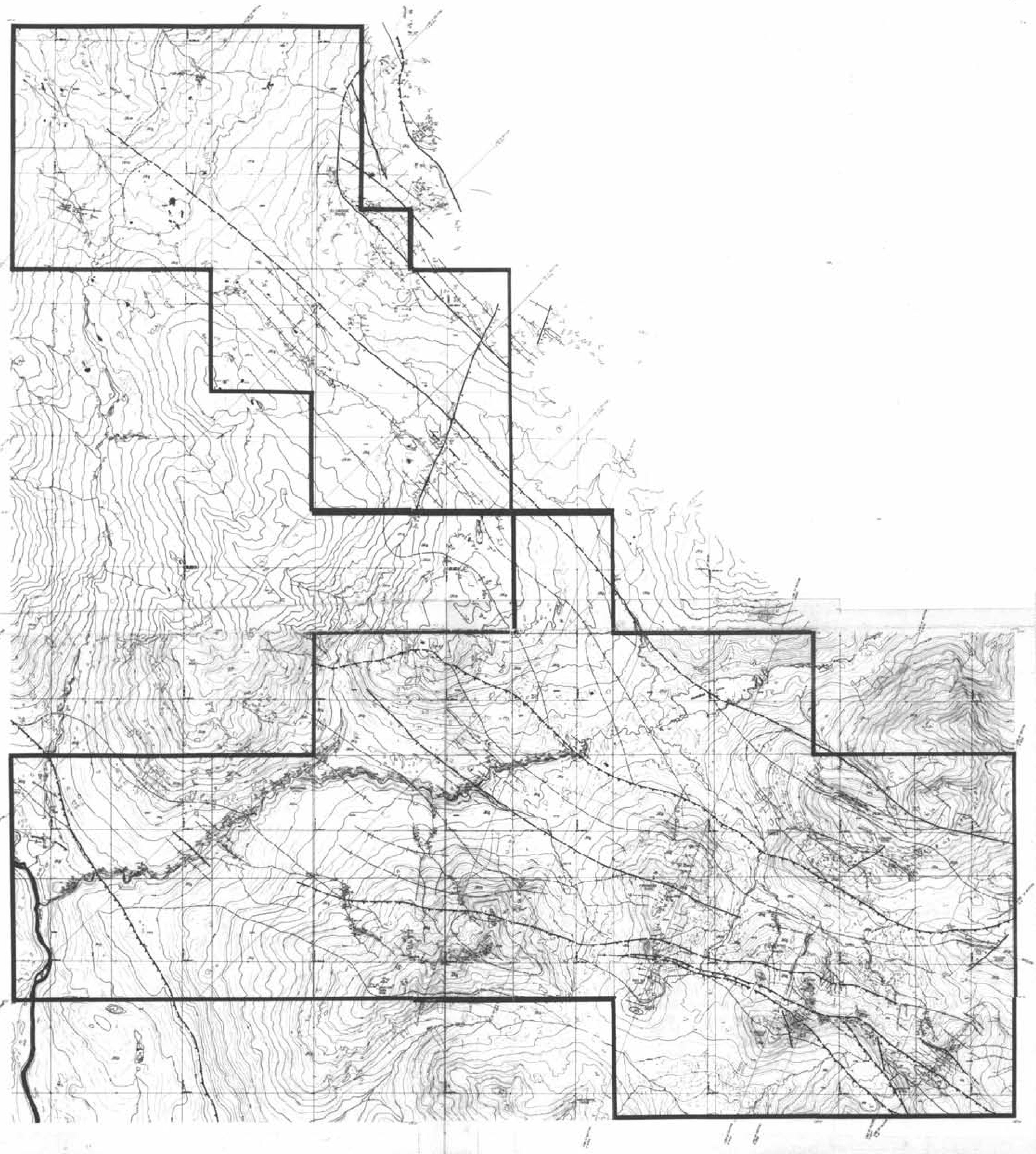
PANORAMA COAL PROJECT

TRENCH LOG

TRC – 81 – 054

DRAWN BY
DATE 20-10-81 SCALE 1: 50
PREPARED BY J. INNIS
DRAWING No.
APPROVED BY
DATE

APPENDIX IV



0 — 5km

LEGEND

MALLOCH MEMBER

JKm — mountainous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

GROUNDHOG MEMBER

JKg — interbedded thin, fine-grained sandstone, siltstone, claystone and coal with rare cross-beds and ripple mark and abundant bivalve and plant fossils, contained between two marine intervals marked by oyster-bearing sandstone beds

PANORAMA MEMBER

JKp — interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

GEOLOGICAL STRUCTURE

GEOLOGICAL CONTACT (DEFINED, APPROXIMATE, INFERRED)
ANTICLINE (DEFINED, APPROXIMATE, INFERRED)
SYNCLINE (DEFINED, APPROXIMATE, INFERRED)
ANTICLINE OVERTURNED
SYNCLINE OVERTURNED
THRUST FAULT (DEFINED, APPROXIMATE, INFERRED)
NORMAL FAULT (DEFINED, APPROXIMATE, HACHURES ON DOWN THROWN SIDE)

STRIKE & DIP OF BEDS
APPROXIMATE STRIKE & DIP OF BEDS
VERTICAL BEDDING
HORIZONTAL BEDDING
STRIKE & DIP OF OVERTURNED BED

KEY

CONGLOMERATE
SANDSTONE
SILTSTONE
CLAYSTONE
MUDSTONE
CARBONACEOUS CLAYSTONE
LICENCE BOUNDARY
COAL SEAM TRACE
TRENCH LOCATION
PELECYPOD BAND

113

GR-Panorama 81(2*)A *(1)

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

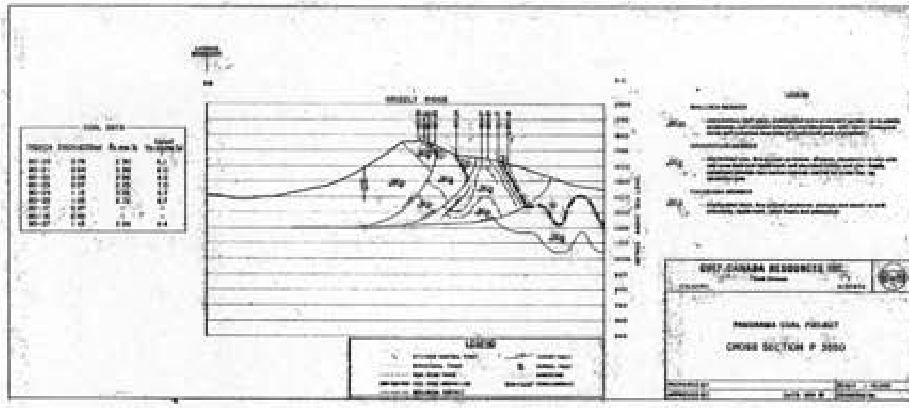
PANORAMA COAL PROJECT 1981

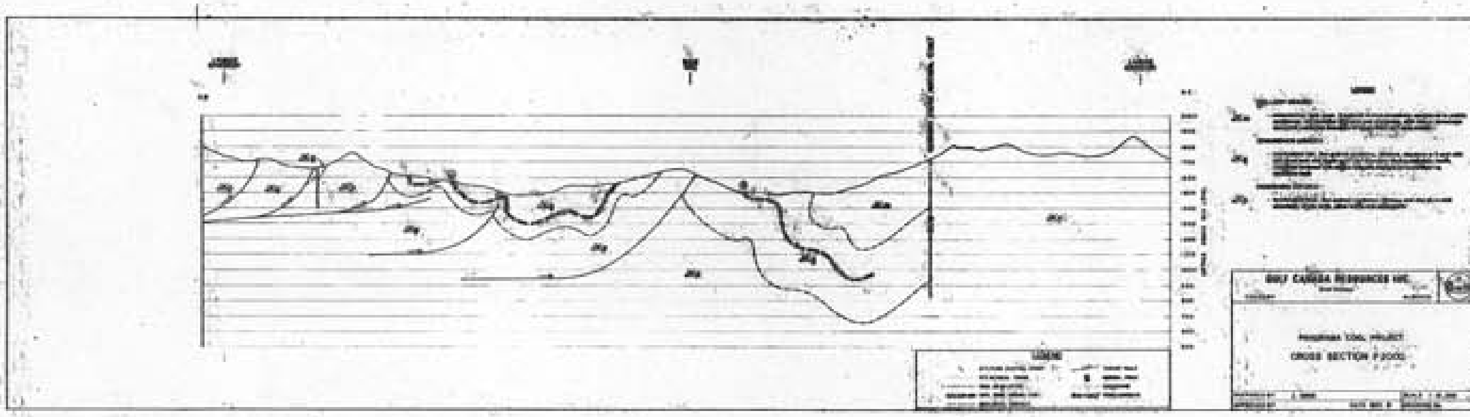
GEOLOGY

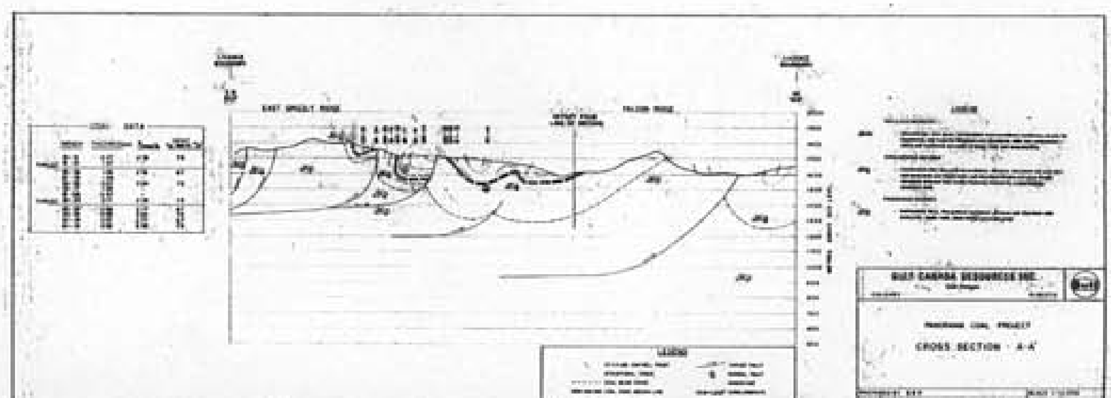
104 A/9,10,15,16

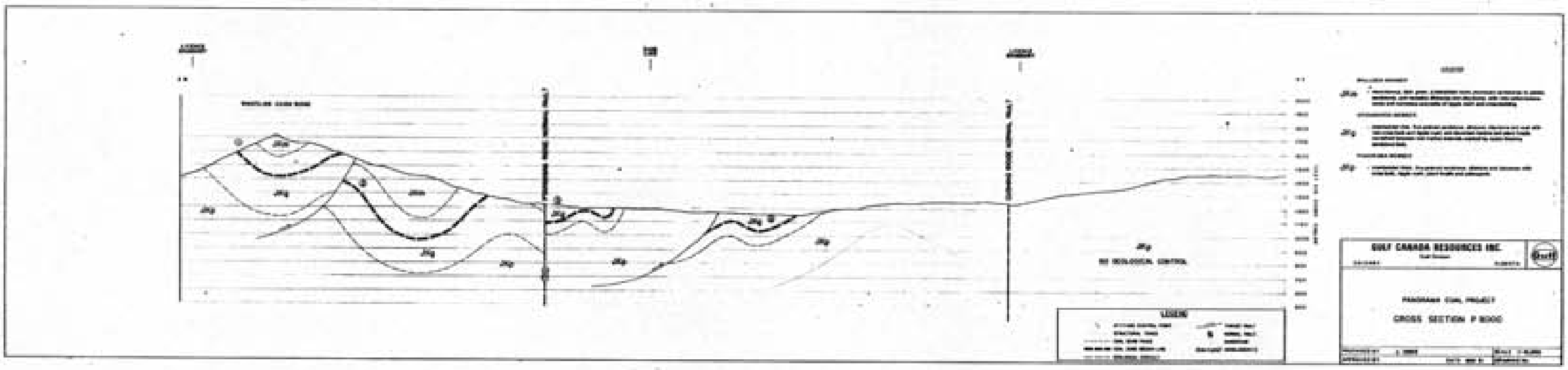
PREPARED BY: D.E.P.	SCALE 1:50,000
APPROVED BY: J. INNIS DATE: OCT., 1981	DRAWING No.

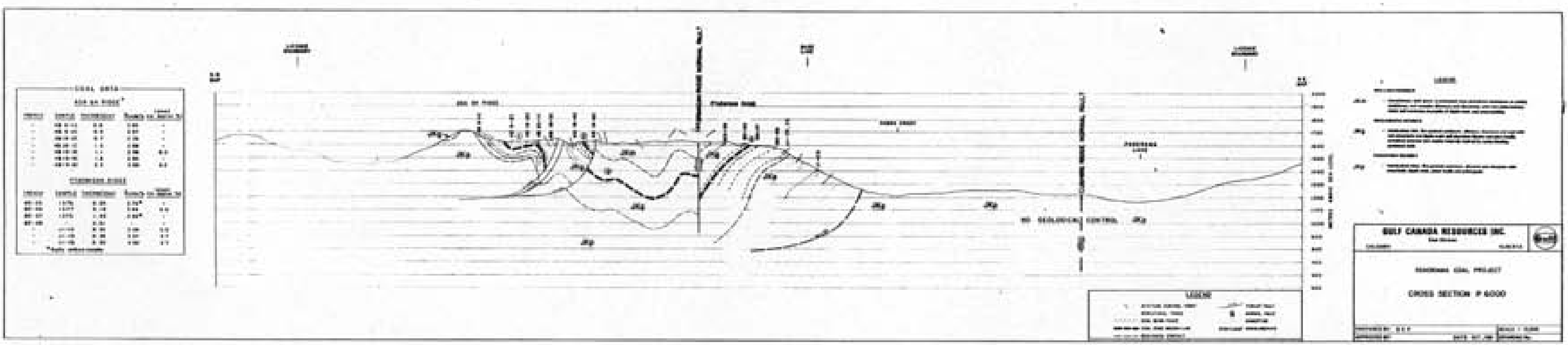
NO APPENDIX # NO NTS, UTM
NO NORTH

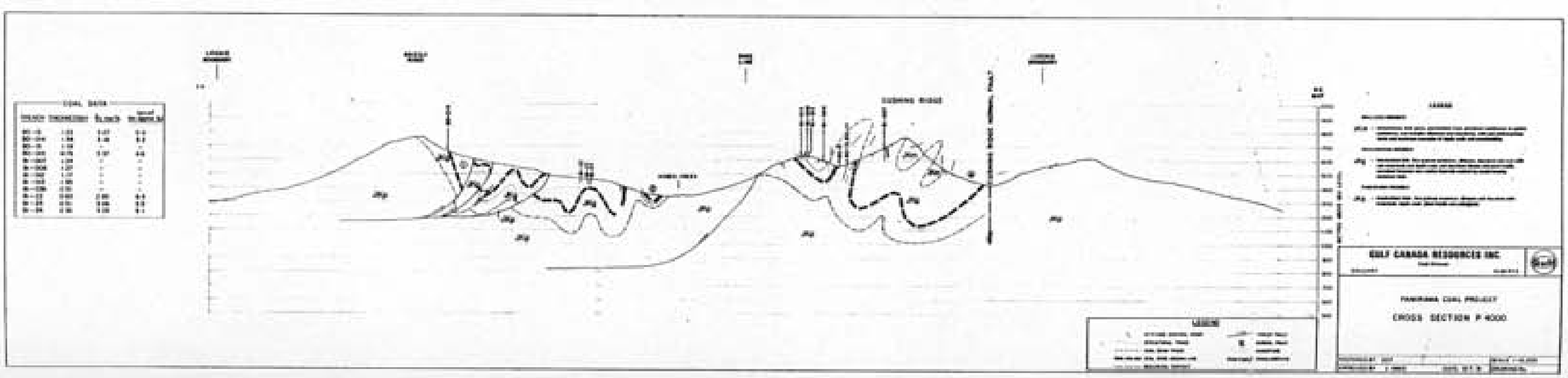

GRIZZLY RIDGE
COAL DATA
LEGEND
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION P 3000

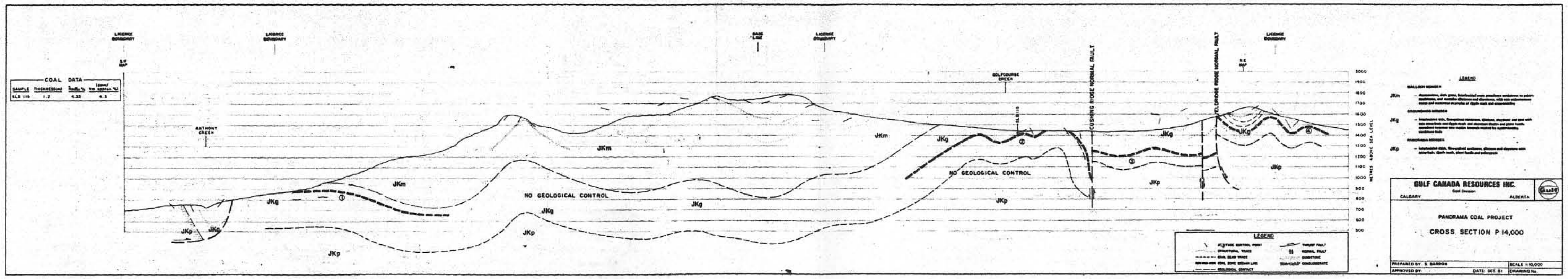

LEGEND
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION P2000

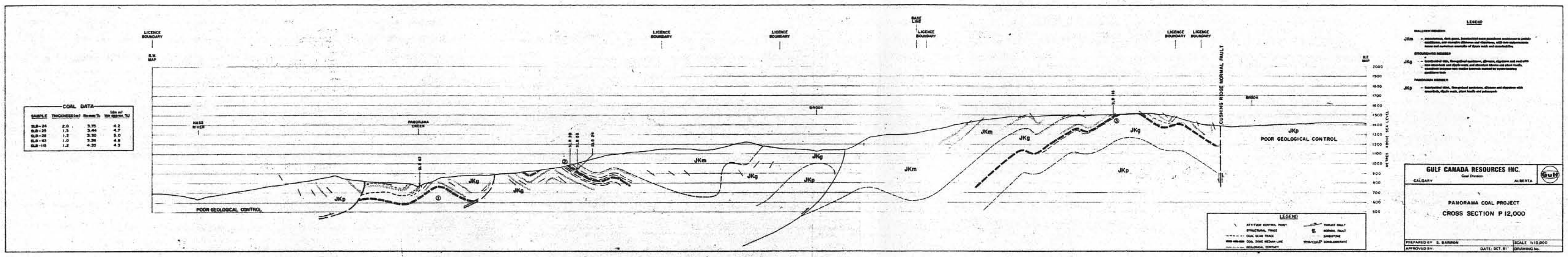

EAST GRIZZLY RIDGE
FALCON RIDGE
COAL DATA
LEGEND
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION - A-A'

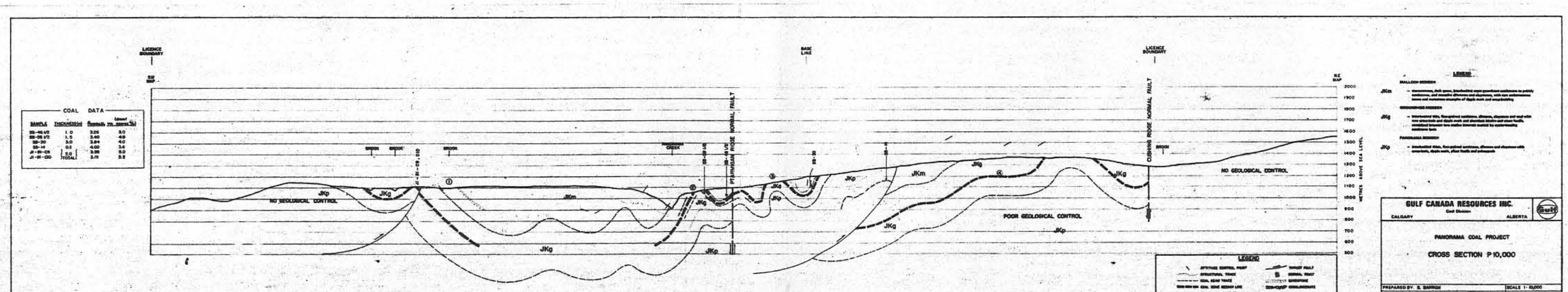

NO GEOLOGICAL CONTROL
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION P 8000

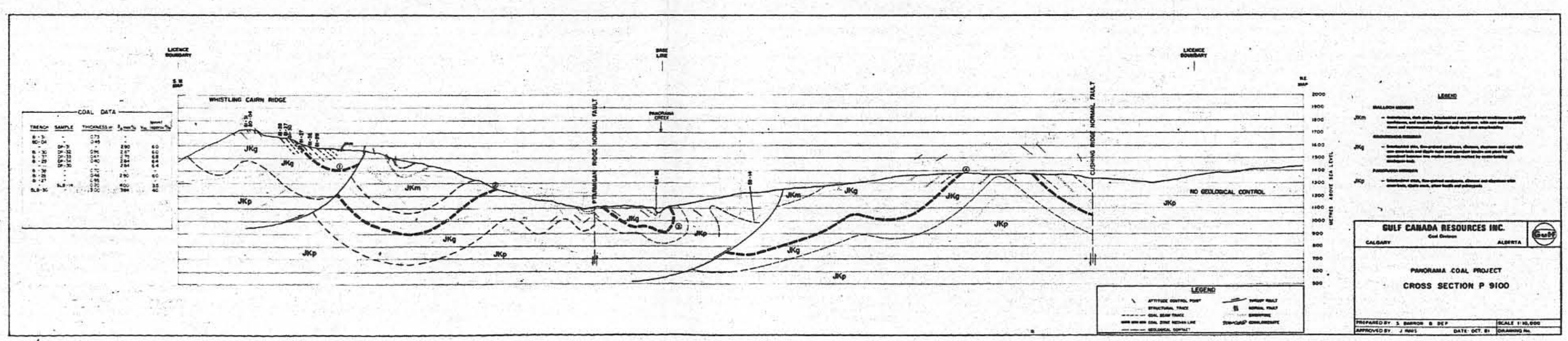

COAL DATA
NO GEOLOGICAL CONTROL
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION P 6000

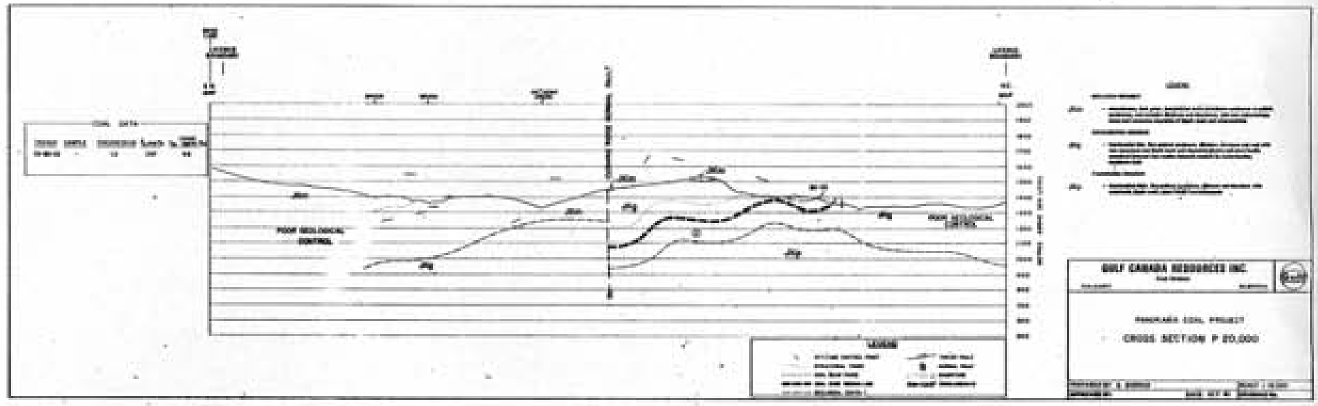

COAL DATA
CUSHING RIDGE
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION P 4000

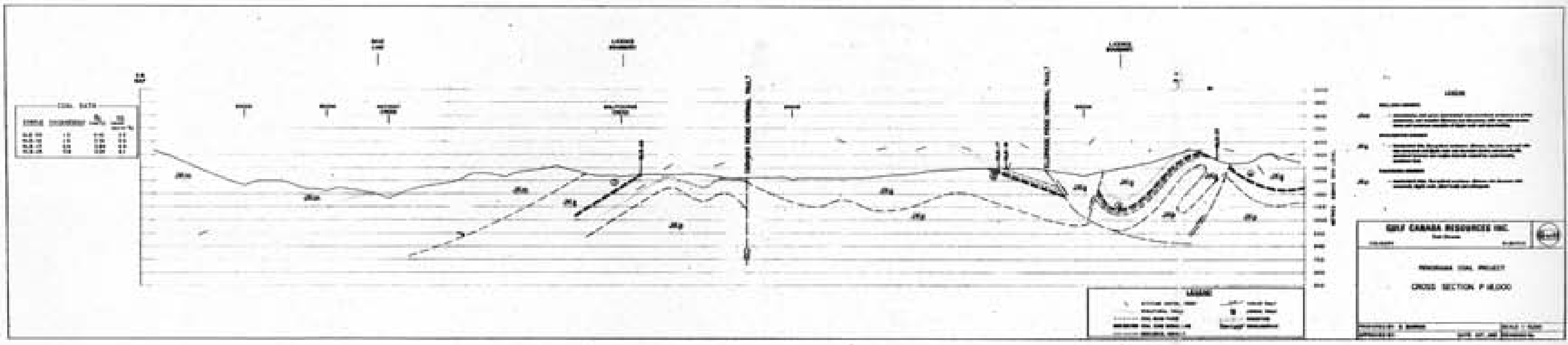

COAL DATA
LICENCE BOUNDARY
NO GEOLOGICAL CONTROL
JKm
JKg
JKp
METRES ABOVE SEA LEVEL
LEGEND
GULF CANADA RESOURCES INC.
Coal Division
CALGARY
ALBERTA
PANORAMA COAL PROJECT
CROSS SECTION P 14,000
PREPARED BY S. BARRON
SCALE 1:10,000
APPROVED BY
DATE: OCT. 81
DRAWING No.

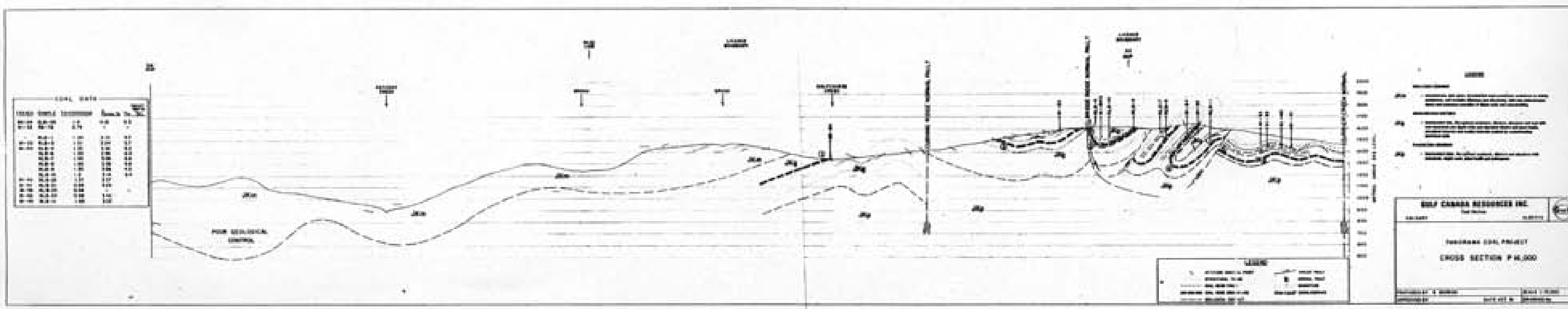

COAL DATA
LICENCE BOUNDARY
BASE LINE
POOR GEOLOGICAL CONTROL
JKm
JKg
JKp
LEGEND
GULF CANADA RESOURCES INC.
CALGARY
ALBERTA
PANORAMA COAL PROJECT
CROSS SECTION P 12,000


COAL DATA
LICENCE BOUNDARY
NO GEOLOGICAL CONTROL
POOR GEOLOGICAL CONTROL
JKm
JKg
JKp
LEGEND
GULF CANADA RESOURCES INC.
CALGARY
ALBERTA
PANORAMA COAL PROJECT
CROSS SECTION P 10,000

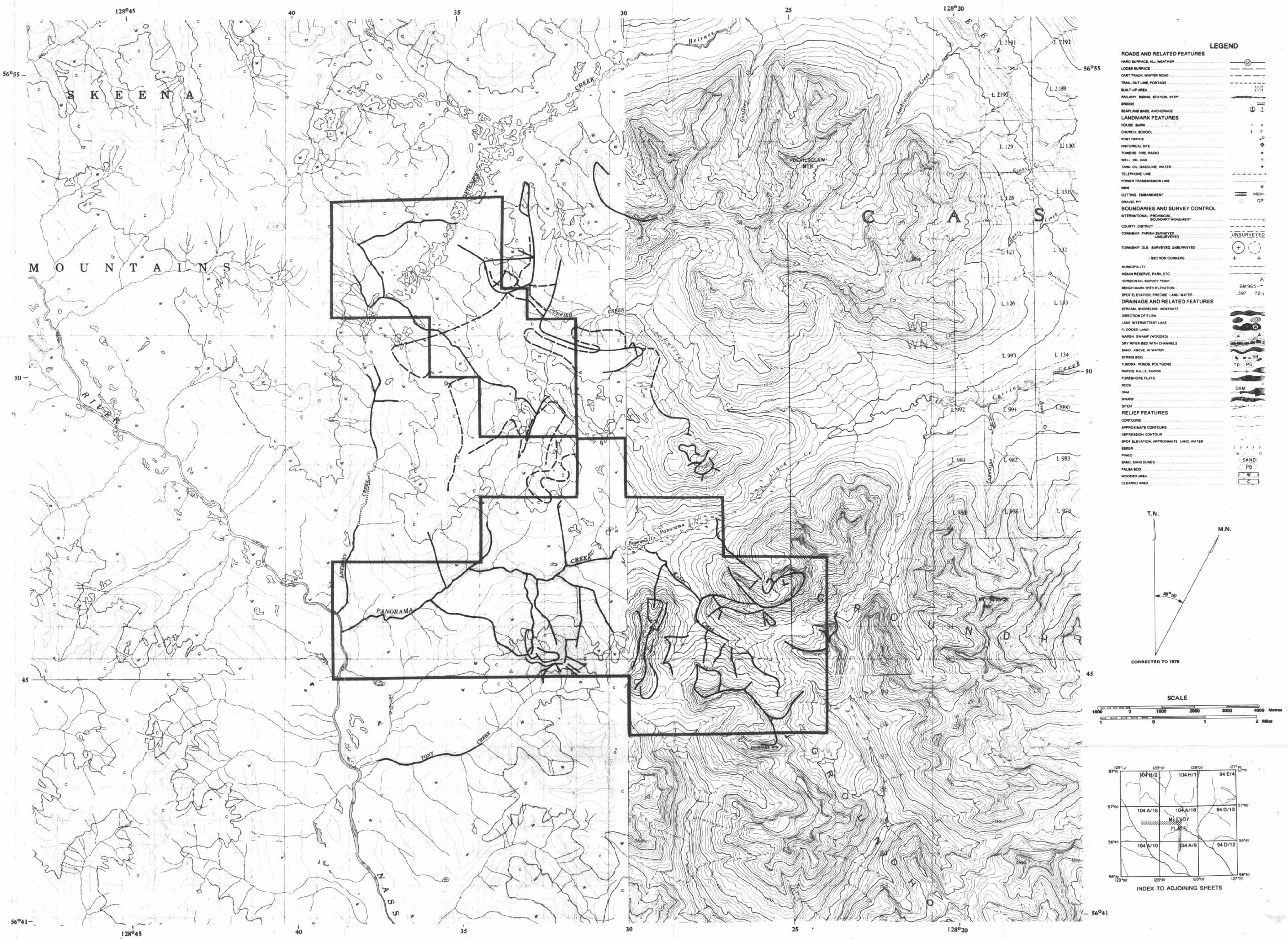

COAL DATA
LICENCE BOUNDARY
WHISTLING CAIRN RIDGE
NO GEOLOGICAL CONTROL
JKm
JKg
JKp
LEGEND
GULF CANADA RESOURCES INC.
CALGARY
ALBERTA
PANORAMA COAL PROJECT
CROSS SECTION P 9100


COAL DATA
POOR GEOLOGICAL CONTROL
POOR GEOLOGICAL CONTROL
LEGEND
LEGEND
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION P 20,000


COAL DATA
LEGEND
LEGEND
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION P 18,000


COAL DATA
POOR GEOLOGICAL CONTROL
LEGEND
LEGEND
GULF CANADA RESOURCES INC.
PANORAMA COAL PROJECT
CROSS SECTION P 16,000

APPENDIX V



Published 1950.
Compiled by the Topographical Survey in 1949 from photographs taken in 1948 by the Royal Canadian Air Force.

Converted from 1:63,360 to 1:50,000 without revision, by the Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa, in 1971.

Copies may be obtained from the Map Distribution Office, Department of Energy, Mines and Resources, Ottawa.

—— PLANE TABLED
— — — WALKED

GR-Panorama 81(2)A (1*)

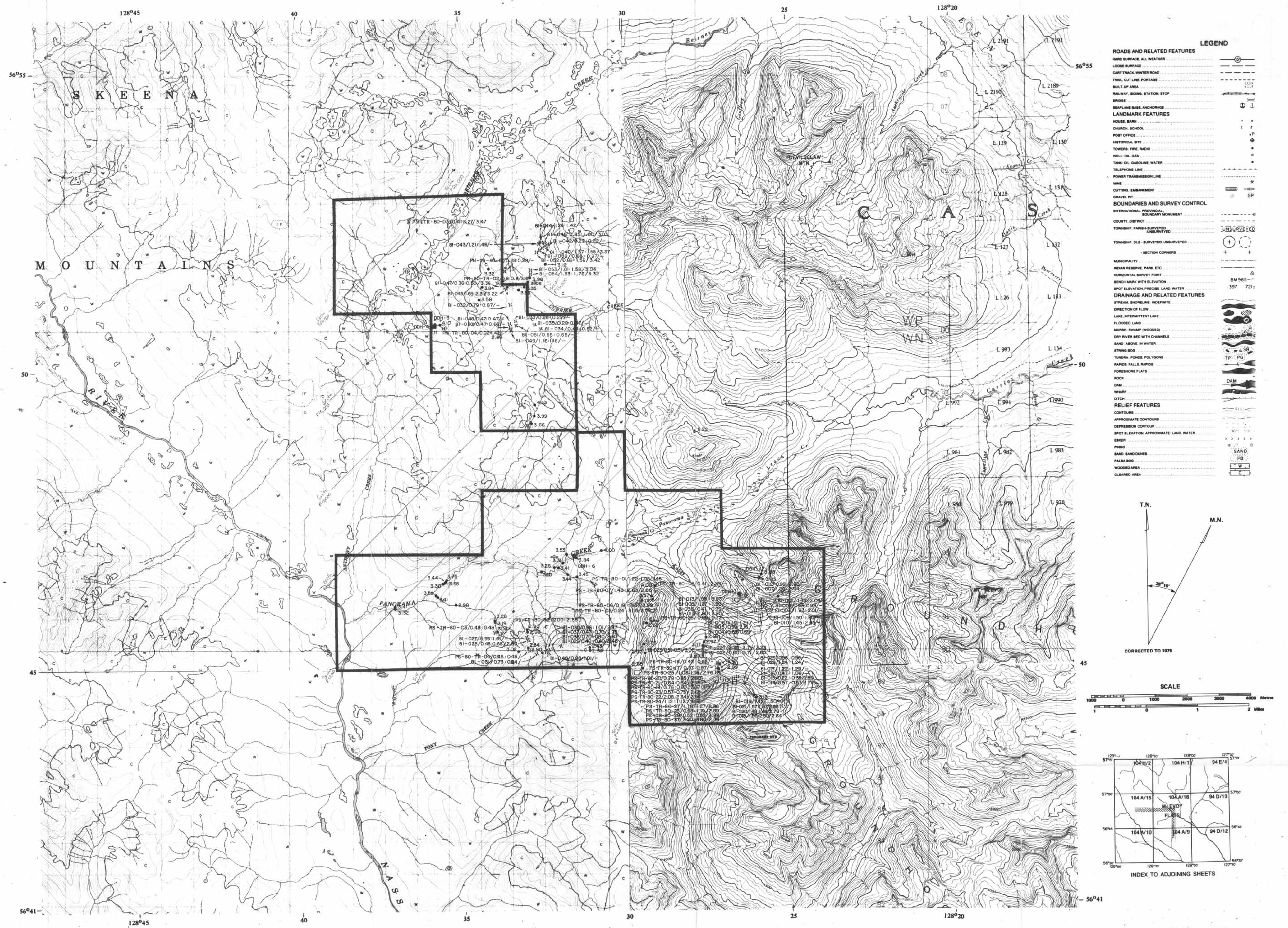
113

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

PANORAMA COAL PROJECT 1981
TRAVERSE LOCATIONS

DRAWN BY:	DATE: OCT. 1981	SCALE 1:50,000
PREPARED BY: K.H.B.		DRAWING No.
APPROVED BY:	DATE:	APPENDIX 5

APPENDIX VI



Published 1950.
Compiled by the Topographical Survey in 1949 from photographs taken in 1948 by the Royal Canadian Air Force.
Converted from 1:63,360 to 1:50,000 without revision, by the Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa, in 1971.
Copies may be obtained from the Map Distribution Office, Department of Energy, Mines and Resources, Ottawa.

TRENCH LOCATION — TRENCH TRC-81-030 — COAL (m) — COAL & ROCK (m) — $\bar{R}o$ (max)

81-030/0.96 : 1.01/2.87

• - $\bar{R}o$ (max)

✧ - DRILLHOLE

GR-Panorama 8(12*)A *(1)

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

113

PANORAMA COAL PROJECT 1981
TRENCH DATA, SAMPLE REFLECTANCE & DRILLHOLE LOCATIONS

DRAWN BY:	DATE: OCT. 1981	SCALE 1 : 50,000
PREPARED BY: S.L.B.		DRAWING No. APPENDIX 6
APPROVED BY:	DATE:	

APPENDIX VII

PN 2[illegible]

HARDY ASSOCIATES (1978) LTD.

CONSULTING ENGINEERING & PROFESSIONAL SERVICES

File No.

December 21, 1979

CALGARY OFFICE (MAIN)
219 - 18th STREET S.E.
CALGARY, ALBERTA
T2E 6J5
TELEPHONE: (403) 272-8761
TELEX NO.: 03-826717

Gulf Resources Canada Inc.
401 Ninth Avenue S.W.
Calgary, Alberta
T2P 3C5

Attention: Mr. Brian Flynn

Dear Sir:

Re: Reconnaissance Type Photogrammetric Mapping of the Sustut and Panorama Project Areas

In reference to our meeting in your office with yourself and Mr. G.D. Childs, we are pleased to submit the following proposal to satisfy your photogrammetric mapping requirements on the above two project areas.

To obtain the 1:10 000 approximate scale reconnaissance type photogrammetric mapping with a 10 metre form line interval, we propose the following procedures:

1) We will obtain from the Federal Government photography and diapositives covering the Sustut Project at the approximate scale of 1:72 000; and we will obtain from the British Columbia Government the set of contact prints and diapositives for the Panorama Project at the approximate scale of 1:63 000.

2) For control in the above mapping, we shall utilize existing data, i.e. Government monuments and locations providing they are photo identifiable, and survey control from existing NTS maps.

3) Prior to mapping, we will carry out aerial triangulation and numerical adjustment for both project areas.

4) Mapping will be carried out on our first and second order stereo plotter instruments and we will submit to you, as an end product, pencil manuscripts showing the approximate position of UTM grids and all necessary details as specified for this type of reconnaissance mapping by the CAAS.

Production of this type of reconnaissance mapping is very economical and may be accomplished within a short period of time. However, the mapping will only be as accurate as existing data and their photo identifiability. In other words, the relative elevation between form lines will be good but absolute elevation differences for the whole property, plus the scale, will not be exact or as reliable as if special survey had been carried out for the project. The map, therefore, is only a reconnaissance type map which can only be used as a tool during the field geology, but cannot be used for detailed evaluation or engineering feasibility studies, etc.

The entire Sustut area will be mapped photogrammetrically, as aforementioned, and the maps will be produced on irregular sheet sizes on reproducible cronoflex sheets. However, the Panorama area which is outlined and marked number 10 on the 1:250 000 map sheets will be mapped photogrammetrically and the area between the two blocks will be mapped by enlarging the existing 1:50 000 map sheets to the 1:10 000 scale and hand interpolate 50 metre form lines and trace all other details. For both areas, the extent of the maps and mapping area is shown on the Appendix maps.

We estimate that producing both maps could take as long as 3 1/2 to 4 months of which 2 months would be spent obtaining necessary data, material, and carrying out aerial triangulation and numerical adjustments. It is our understanding that no photo reproduction, enlargements or reductions will be carried out by our organization, but that this will be taken care of by your company in accordance with our specifications.

It is also our understanding that you may require ortho photos for both the above properties. For the ortho photos, we suggest we utilize the diapositives produced by us and controlled for the mapping. The ortho photos should be produced at the approximate scale of 1:20 000 (end product would not be good at the 1:10 000 approximate scale because of the 7 X enlargement) on the individual model basis. All photo reproduction in connection with the ortho photos should be carried out by your organization. To relate the ortho photos to the line map, we suggest the following procedures:

1) Obtain the original ortho photo negatives and Gulf will enlarge them to 1:20 000.

2) Reduce manuscripts of the line map to 1:20 000 (some of the lines such as intermediate contours may not reproduce very well because the original is only pencil).

3) By fitting ortho photo negatives by their control points on the line map, the grids should be transferred onto the negatives.

4) From the above negatives, screen cronoflex positives on photographic paper prints should be produced as an end product.

5) If you should require a composite and ortho photos to be made from the line map, we strongly recommend that the line map should be redrafted for better reproduction purposes prior to the production of the composite map.

We also discussed the possibility of transferring the geological interpretation onto the line map using a photogrammetric method. It is quite possible and we suggest, some test models should be done as soon as the field work is completed. We feel that photo geological interpretation could be extended during the plotting phase of the above, if needed, on the geological overlay.

FEE SCHEDULE:

1. To provide aerial triangulation and numerical adjustment to cover both project areas and to produce the above reconnaissance photogrammetric mapping at the approximate scale of 1:10 000 with 10 metre form line intervals as shown on the appendix maps:

   OUR ESTIMATED FEE: $26,000.

   The above fee will include the manual interpretation of the enlarged 1:50 000 map to cover the area between two blocks No. 10 on the Panorama Project, the end product on manuscripts on the reproducible cronoflex sheets as discussed in the attached proposal.

2. To provide ortho photo negatives from existing photograph at the same scale as the photography, our fee will be $120 per model, (please note that all photo reproductions will be done by Gulf Canada Resources Inc.

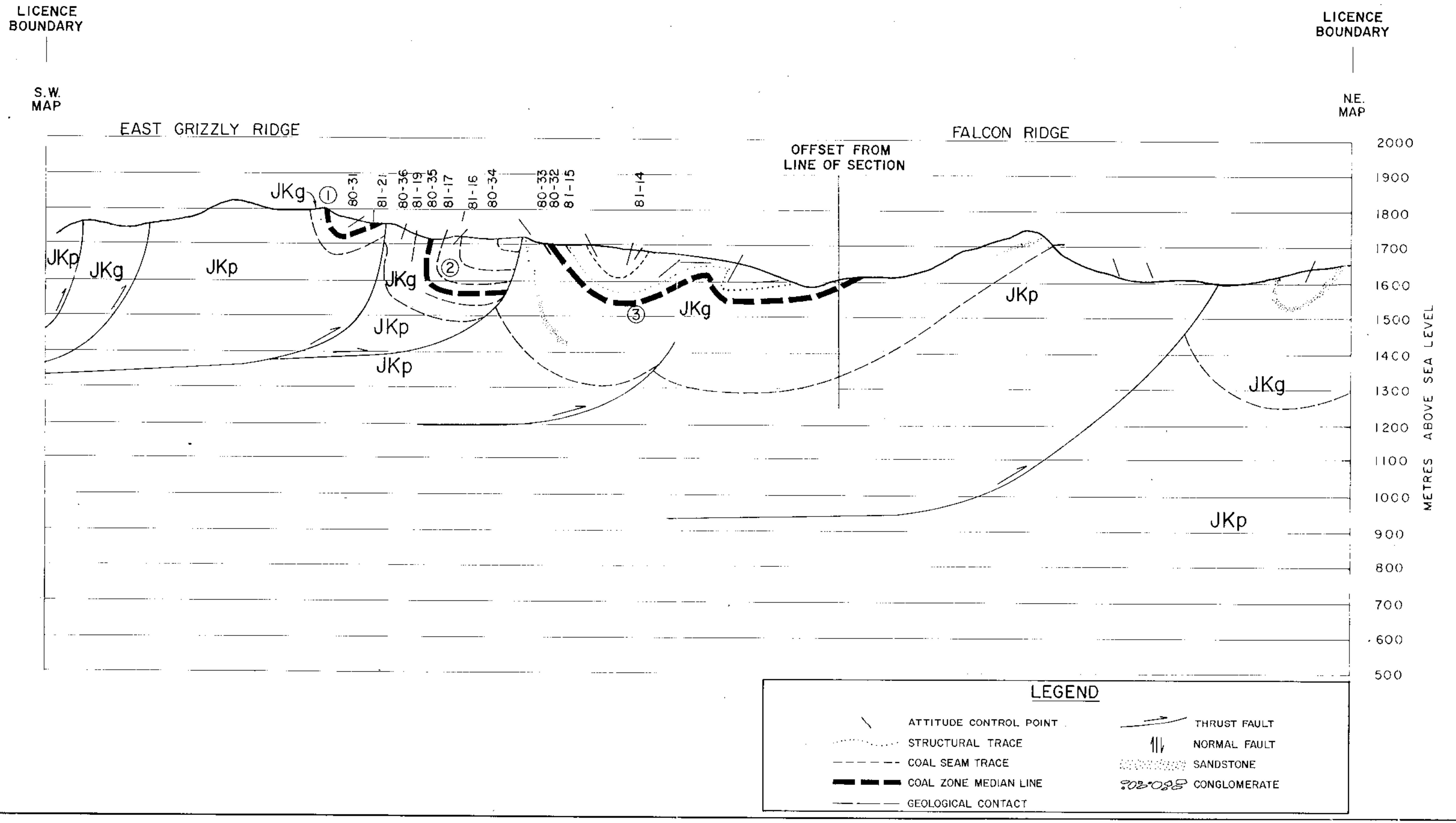
We thank you for the opportunity of submitting the above proposal and cost estimate. We look forward to hearing from you in the near future.

Yours truly,

HARDY ASSOCIATES (1978) LTD.

J. Kende, C.C.
Director, Mapping Section

JK:bc



COAL DATA

	TRENCH	THICKNESS(m)	$\bar{R}_{o max}$%	V_m (dmmf approx %)
	80-31	0.47	2.59	7.5
THRUST	81-21	1.57	–	
	80-36	1.05	2.76	6.7
	81-19	1.44	–	
	80-35	0.23	2.64	7.2
	80-17	1.29	–	
	81-016	0.47	–	
THRUST	80-34	0.71	2.59	7.5
	80-33	0.66	2.77	6.7
	80-32	0.55	2.63	7.2
	81-14	0.57	2.77	6.7
	81-15	0.22	2.59	7.5

SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS

LEGEND

MALLOCH MEMBER

JKm — monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

GROUNDHOG MEMBER

JKg — interbedded thin, fine-grained sandstone, siltstone, claystone and coal with rare cross-beds and ripple mark and abundant bivalve and plant fossils, contained between two marine intervals marked by oyster-bearing sandstone beds

PANORAMA MEMBER

JKp — interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

113 GR-Panorama 81(2)A *1

GULF CANADA RESOURCES INC.

Coal Division

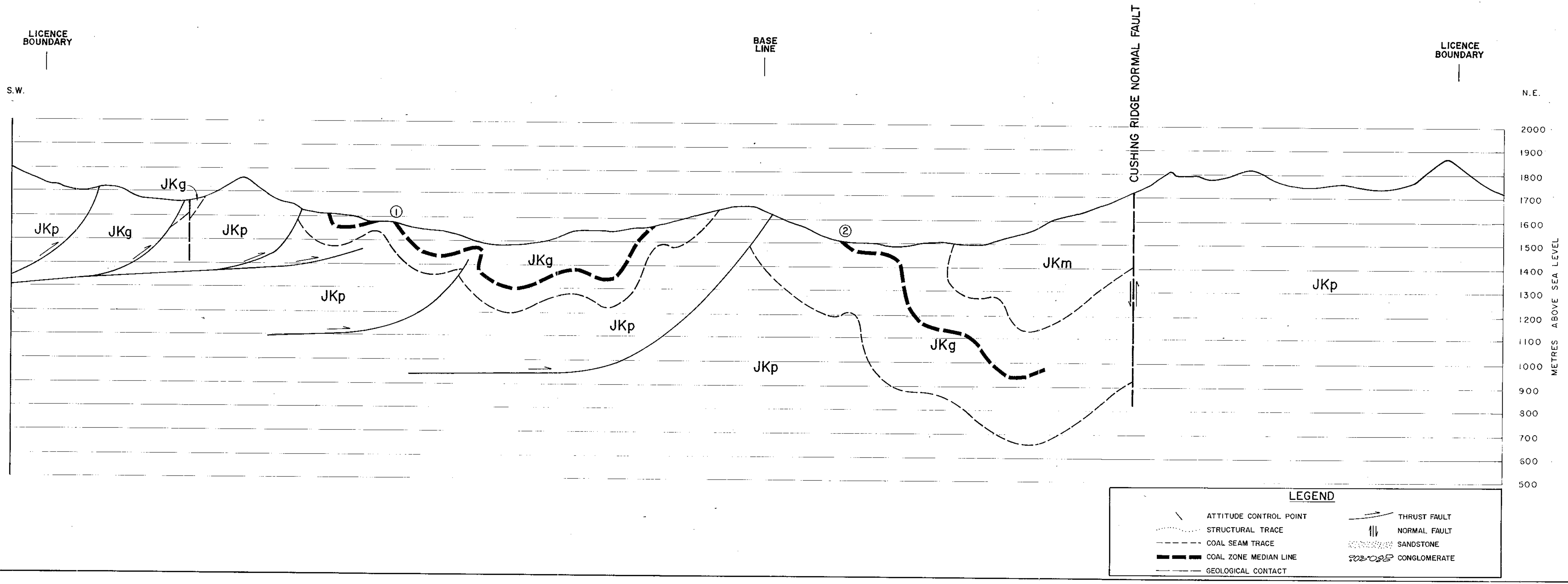
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

CROSS SECTION - A-A'

PREPARED BY: D.E.P.	SCALE 1:10,000
APPROVED BY: DATE: OCT. 81	DRAWING No.



SCALE: 1:10,000

LEGEND

MALLOCH MEMBER

JKm — monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

GROUNDHOG MEMBER

JKg — interbedded thin, fine-grained sandstone, siltstone, claystone and coal with rare cross-beds and ripple mark and abundant bivalve and plant fossils, contained between two marine intervals marked by oyster-bearing sandstone beds

PANORAMA MEMBER

JKp — interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

113 GR-Panorama 91(2)A *1

GULF CANADA RESOURCES INC.

Coal Division

CALGARY ALBERTA

Gulf

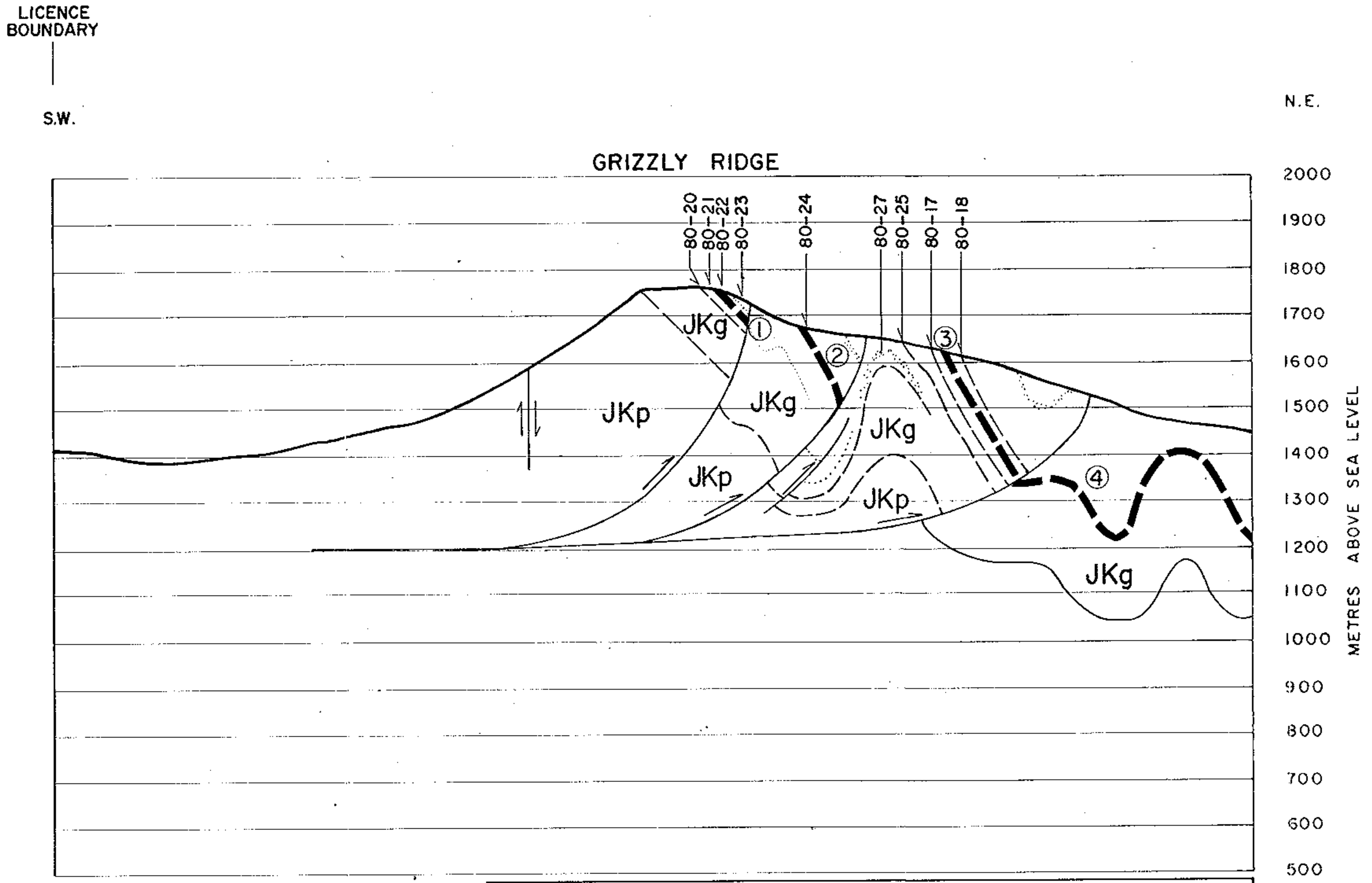
PANORAMA COAL PROJECT

CROSS SECTION P2000

PREPARED BY: J. INNIS		SCALE 1:10,000
APPROVED BY:	DATE: NOV. 81	DRAWING No.

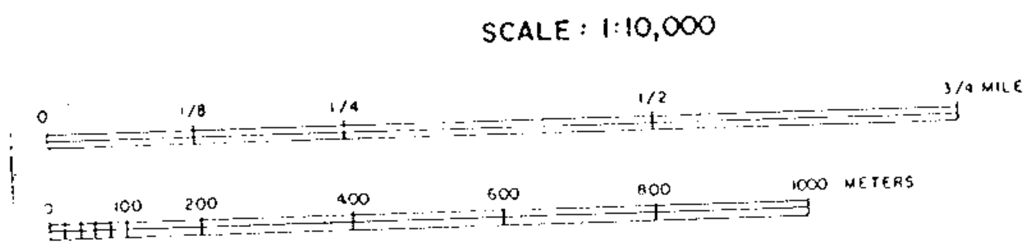
COAL DATA

TRENCH	THICKNESS(m)	R̄o max %	(dmmf Vm approx.%)
80-20	0.78	2.90	6.1
80-21	0.64	2.96	6.0
80-22	2.08	2.96	6.0
80-23	0.57	2.65	7.0
80-24	1.12	3.02	5.7
80-25	1.05	2.76	6.7
80-17	0.97	–	–
80-18	0.42	–	–
80-27	1.18	2.86	6.4



LEGEND

ATTITUDE CONTROL POINT	THRUST FAULT
STRUCTURAL TRACE	NORMAL FAULT
COAL SEAM TRACE	SANDSTONE
COAL ZONE MEDIAN LINE	CONGLOMERATE
GEOLOGICAL CONTACT	



LEGEND

MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

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PANORAMA MEMBER

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113

GR-Panorama 81(2)A *1

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

PANORAMA COAL PROJECT

CROSS SECTION P 3550

PREPARED BY:		SCALE 1:10,000
APPROVED BY:	DATE: NOV.81	DRAWING No.

COAL DATA

TRENCH	THICKNESS(m)	$\bar{R}o$ max%	(dmmf Vm approx.%)
80-13	1.22	3.27	5.0
80-014	1.34	3.18	5.2
80-15	1.19	–	–
80-019	0.76	3.37	4.6
81-007	1.24	–	–
81-008	1.27	–	–
81-012	1.17	–	–
81-013	1.95	–	–
81-036	0.51	–	–
81-22	0.60	2.85	6.4
81-23	0.51	3.06	5.5
81-24	2.35	3.23	5.1

SCALE : 1:10,000

LEGEND

MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

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PANORAMA MEMBER

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LEGEND

- ATTITUDE CONTROL POINT
- STRUCTURAL TRACE
- COAL SEAM TRACE
- COAL ZONE MEDIAN LINE
- GEOLOGICAL CONTACT
- THRUST FAULT
- NORMAL FAULT
- SANDSTONE
- CONGLOMERATE

113 GR-Panorama 81-(2)A *1

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

CROSS SECTION P 4000

PREPARED BY: DEP	SCALE 1:10,000
APPROVED BY: J. INNIS DATE: OCT. 81	DRAWING No.

COAL DATA

ASA 64 RIDGE*

TRENCH	SAMPLE	THICKNESS(m)	$\bar{R}$omax%	Vm (dmmf approx. %)
–	KB 9-1C	2.0	2.65	–
–	KB 9-2C	0.9	2.97	–
–	KB 19-2C	0.7	2.26	–
–	KB 20-1C	1.0	2.88	–
–	KB 19-3C	1.1	2.98	6.0
–	KB 19-4C	1.6	2.85	–
–	KB 19-6C	2.3	2.89	6.2

PTARMIGAN RIDGE

TRENCH	SAMPLE	THICKNESS(m)	$\bar{R}$omax%	Vm (dmmf approx. %)
80-05	1376	0.24	2.76*	–
80-06	1377	0.18	2.99	6.0
80-07	1375	1.43	2.66*	–
80-08	–	0.51	–	–
–	J1-C4	0.35	3.06	5.5
–	J1-C5	0.35	3.37	4.7
–	J1-C6	0.30	4.00	3.7

* highly oxidized samples

LEGEND

ATTITUDE CONTROL POINT		THRUST FAULT	
STRUCTURAL TRACE		NORMAL FAULT	
COAL SEAM TRACE		SANDSTONE	
COAL ZONE MEDIAN LINE		CONGLOMERATE	
GEOLOGICAL CONTACT			

SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS

LEGEND

MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

GROUNDHOG MEMBER

JKg – interbedded thin, fine-grained sandstone, siltstone, claystone and coal with rare cross-beds and ripple mark and abundant bivalve and plant fossils, contained between two marine intervals marked by oyster-bearing sandstone beds

PANORAMA MEMBER

JKp – interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

113 GR-Panorama 81(a)*A *1

GULF CANADA RESOURCES INC.

Coal Division

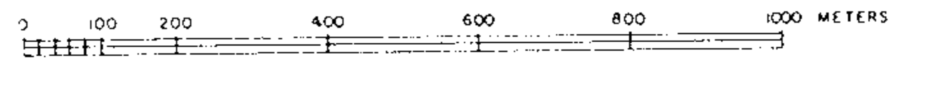
CALGARY ALBERTA

PANORAMA COAL PROJECT

CROSS SECTION P 6000

PREPARED BY: D.E.P.	SCALE 1: 10,000
APPROVED BY: DATE: OCT., 1981	DRAWING No.

SCALE : 1:10,000



MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

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PANORAMA MEMBER

JKp – interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

113 GR-Panorama 81(3)A

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

CROSS SECTION P 8000

PREPARED BY: J. INNIS		SCALE 1:10,000
APPROVED BY:	DATE: NOV. 81	DRAWING No.

COAL DATA

TRENCH	SAMPLE	THICKNESS (m)	$\bar{R}_o$ max %	V_m (dmmf approx. %)
81 - 31	-	0.73	-	
80 - 04	-	0.45	-	
-	DP-31	-	2.90	6.0
81 - 30	DP-32	0.96	2.87	6.0
81 - 37	DP-33	0.47	2.75	6.8
81 - 29	DP-34	0.40	2.84	6.4
-	DP-30	-	2.84	6.4
81 - 38	-	0.70	-	-
81 - 28	-	0.48	2.90	6.0
81 - 27	-	0.95	-	-
-	SLB-14	0.20	4.00	3.5
SLB-30	-	3.00	3.84	4.0

LEGEND

ATTITUDE CONTROL POINT
STRUCTURAL TRACE
COAL SEAM TRACE
COAL ZONE MEDIAN LINE
GEOLOGICAL CONTACT
THRUST FAULT
NORMAL FAULT
SANDSTONE
CONGLOMERATE

SCALE : 1:10,000

LEGEND

MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

GROUNDHOG MEMBER

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PANORAMA MEMBER

JKp – Interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

113

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

CROSS SECTION P 9100

PREPARED BY: S. BARRON & DEP		SCALE 1:10,000
APPROVED BY: J. INNIS	DATE: OCT. 81	DRAWING No.

COAL DATA

SAMPLE	THICKNESS (m)	Romax %	(dmmf Vm approx %)
SB-46 1/2	1.0	3.26	5.0
SB-58 1/2	1.5	3.40	4.9
SB-30	3.0	3.84	4.0
SB-14	0.2	4.00	3.6
J1-81-C9	2.0 TOTAL	3.28	5.0
J1-81-C10		3.19	5.2

LEGEND

- ATTITUDE CONTROL POINT
- STRUCTURAL TRACE
- COAL SEAM TRACE
- COAL ZONE MEDIAN LINE
- GEOLOGICAL CONTACT
- THRUST FAULT
- NORMAL FAULT
- SANDSTONE
- CONGLOMERATE

SCALE 1:10,000

LEGEND

MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

GROUNDHOG MEMBER

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PANORAMA MEMBER

JKp – interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

113 GR-Panorama 81(2)A *1

GULF CANADA RESOURCES INC.

Coal Division

CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT

CROSS SECTION P 10,000

PREPARED BY: S. BARRON	SCALE 1:10,000
APPROVED BY: DATE: OCT., 1981	DRAWING No.

COAL DATA

SAMPLE	THICKNESS (m)	Ro max %	(dm mf Vm approx. %)
SLB - 24	2.0	3.75	4.2
SLB - 25	1.5	3.44	4.7
SLB - 28	1.2	3.30	5.0
SLB - 63	1.0	3.36	4.9
SLB - 115	1.2	4.33	4.3

LEGEND

ATTITUDE CONTROL POINT
STRUCTURAL TRACE
COAL SEAM TRACE
COAL ZONE MEDIAN LINE
GEOLOGICAL CONTACT
THRUST FAULT
NORMAL FAULT
SANDSTONE
CONGLOMERATE

LEGEND

MALLOCH MEMBER

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PANORAMA MEMBER

JKp – interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

SCALE : 1:10,000

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA
Gulf

PANORAMA COAL PROJECT

CROSS SECTION P 12,000

PREPARED BY: S. BARRON		SCALE 1:10,000
APPROVED BY:	DATE: OCT. 81	DRAWING No.

COAL DATA			
SAMPLE	THICKNESS(m)	$\bar{R}o_{max}$%	(dmmf Vm approx.%)
SLB 115	1.2	4.33	4.3

LEGEND

╲	ATTITUDE CONTROL POINT		THRUST FAULT
....	STRUCTURAL TRACE		NORMAL FAULT
– – – –	COAL SEAM TRACE		SANDSTONE
▬ ▬ ▬	COAL ZONE MEDIAN LINE		CONGLOMERATE
—— ——	GEOLOGICAL CONTACT		

SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS

LEGEND

MALLOCH MEMBER

JKm — monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

GROUNDHOG MEMBER

JKg — interbedded thin, fine-grained sandstone, siltstone, claystone and coal with rare cross-beds and ripple mark and abundant bivalve and plant fossils, contained between two marine intervals marked by oyster-bearing sandstone beds

PANORAMA MEMBER

JKp — interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

113 GR-Panorama 81(2)A *1

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

PANORAMA COAL PROJECT

CROSS SECTION P 14,000

PREPARED BY: S. BARRON	SCALE 1:10,000
APPROVED BY: DATE: OCT. 81	DRAWING No.

SCALE 1:10,000

COAL DATA

TRENCH	SAMPLE	THICKNESS(m)	$\bar{R}_{omax}$ %	V_m (dmmf approx %)
80-04	SLB-20	1.4	4.10	3.5
81-32	RB-78	0.79	–	–
–	RLB-1	1.00	3.12	5.5
81-53	RLB-3	1.01	3.04	5.7
81-54	RLB-4	1.33	3.32	5.2
	RLB-6	1.00	2.96	6.0
	RLB-7	1.00	3.06	5.6
	RLB-8	1.50	3.35	4.9
	RLB-9	1.30	3.58	4.5
	RLB-10	1.0	3.14	5.4
81-40	RLB-22	1.37	3.37	
81-41	RLB-21	0.85	3.03	
81-39	RLB-23	0.66	–	–
81-52	RLB-24	0.89	3.42	
81-45	RLB-11	1.69	3.22	

LEGEND

ATTITUDE CONTROL POINT
STRUCTURAL TRACE
COAL SEAM TRACE
COAL ZONE MEDIAN LINE
GEOLOGICAL CONTACT
THRUST FAULT
NORMAL FAULT
SANDSTONE
CONGLOMERATE

LEGEND

MALLOCH MEMBER

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GROUNDHOG MEMBER

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PANORAMA MEMBER

JKp – interbedded thick, fine-grained sandstone, siltstone and claystone with cross-beds, ripple mark, plant fossils and pelecypods

113

GR-Panorama 81(2)A *1

GULF CANADA RESOURCES INC.

Coal Division

CALGARY ALBERTA

PANORAMA COAL PROJECT

CROSS SECTION P 16,000

PREPARED BY: S. BARRON	SCALE 1:10,000
APPROVED BY: DATE: OCT. 81	DRAWING No.

COAL DATA

SAMPLE	THICKNESS(m)	$\bar{R}o$ (max %)	Vm (dmmf approx.%)
SLB-20	1.5	4.10	3.5
RLB-16	1.0	3.32	5.0
RLB-17	0.8	3.84	4.0
RLB-25	0.8	3.24	5.1

LEGEND

ATTITUDE CONTROL POINT	THRUST FAULT
STRUCTURAL TRACE	NORMAL FAULT
COAL SEAM TRACE	SANDSTONE
COAL ZONE MEDIAN LINE	CONGLOMERATE
GEOLOGICAL CONTACT	

SCALE 1:10,000

LEGEND

MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

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PANORAMA MEMBER

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113

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

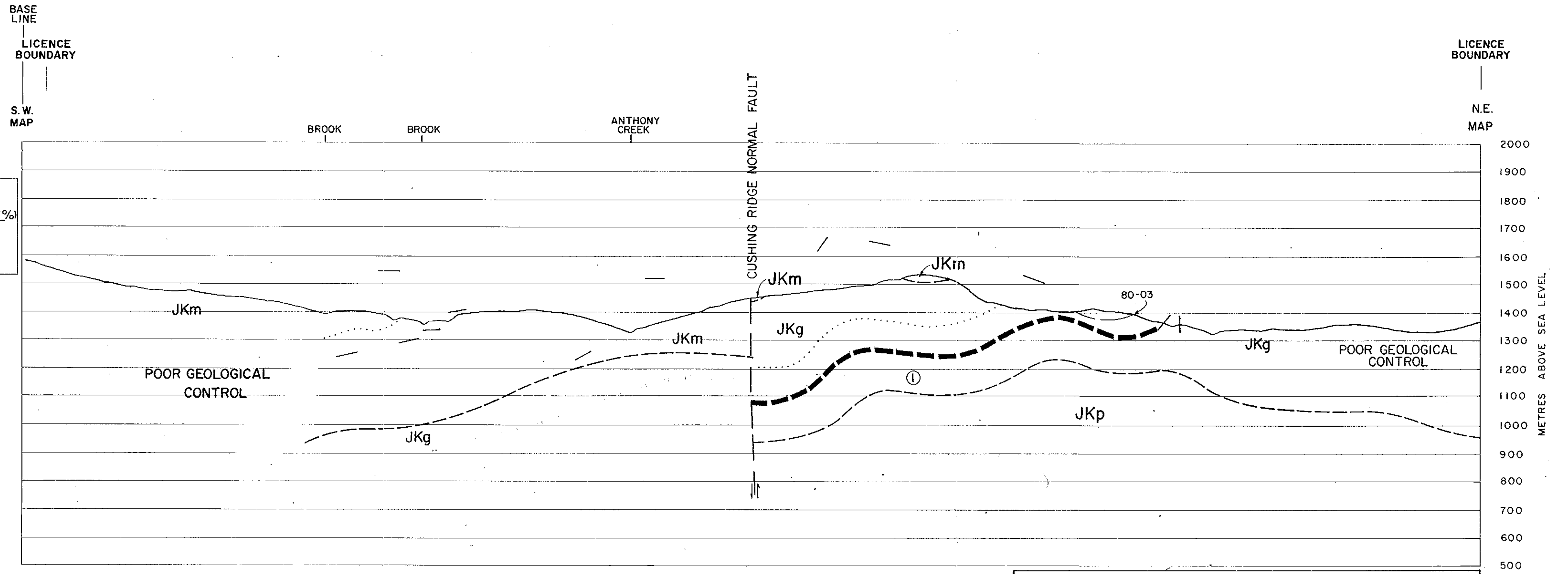
PANORAMA COAL PROJECT

CROSS SECTION P 18,000

PREPARED BY: S. BARRON	SCALE 1:10,000
APPROVED BY: DATE: OCT., 1981	DRAWING No.

COAL DATA

TRENCH	SAMPLE	THICKNESS (m)	$\bar{R}_0$ max%	V_m (dmmf approx %)
TR-80-03	-	1.3	3.47	4.6



SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS

LEGEND

MALLOCH MEMBER

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PANORAMA MEMBER

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LEGEND

- ATTITUDE CONTROL POINT
- STRUCTURAL TRACE
- COAL SEAM TRACE
- COAL ZONE MEDIAN LINE
- GEOLOGICAL CONTACT
- THRUST FAULT
- NORMAL FAULT
- SANDSTONE
- CONGLOMERATE

113

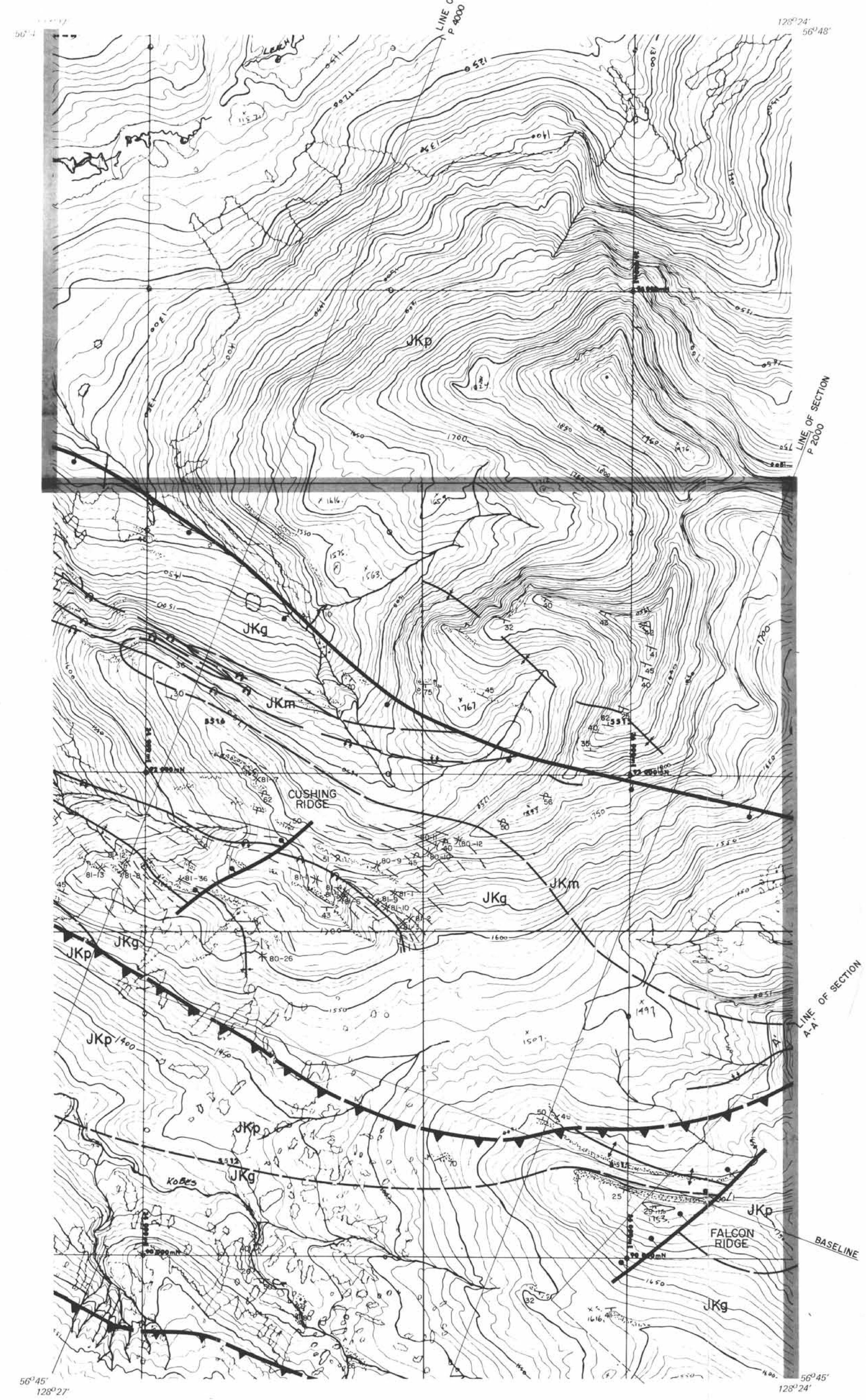
SQ-Panorama 81(6)A #1

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

PANORAMA COAL PROJECT

CROSS SECTION P 20,000

PREPARED BY: S. BARRON		SCALE 1:10,000
APPROVED BY:	DATE: OCT. 81	DRAWING No.



LEGEND

RIVER	
STREAM	
LAKE	
SAND	
TREE LINE	
FORM LINES	
DEPRESSION FORM LINE	
SPOT HEIGHT	× 1012
MAIN ROAD	
SECONDARY ROAD	
TRACK	
TRAIL	
CUT LINE	
RAILROAD	
BUILDING	
COAL LICENCE	5857

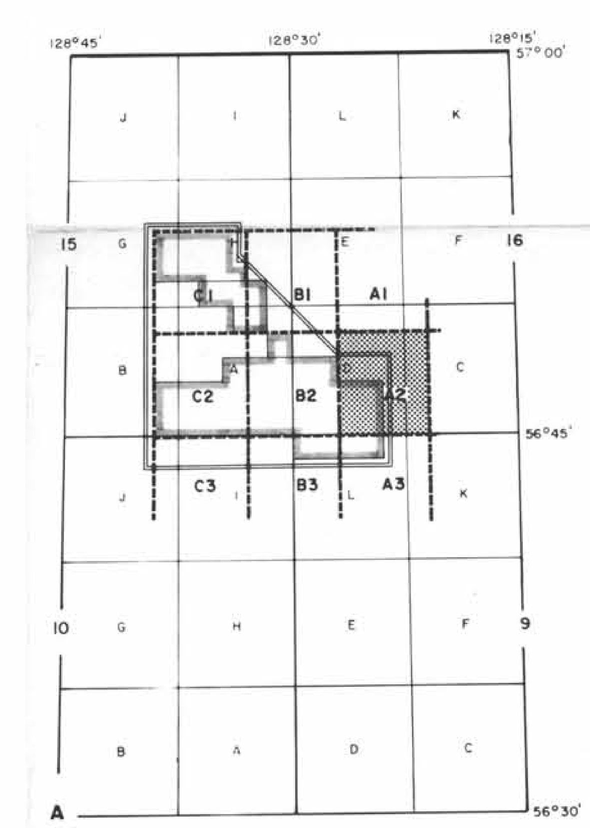
FORM LINE INTERVAL 10 METRES

SURVEY NOTE
SURVEY CONTROL TAKEN FROM EXISTING PHOTO IDENTIFIABLE GOVERNMENT SURVEY MONUMENTS AND N.T.S. MAPS. MAPPING IS BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID AND GEODETIC DATUM.

SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

100 200 400 600 800 1000 METERS



PANORAMA AREA

INDEX MAP

LEGEND

MALLOCH MEMBER

JKm — monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

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GEOLOGICAL STRUCTURE

GEOLOGICAL CONTACT	(DEFINED, APPROXIMATE, INFERRED)
ANTICLINE:	(DEFINED, APPROXIMATE, INFERRED)
SYNCLINE:	(DEFINED, APPROXIMATE, INFERRED)
ANTICLINE:	OVERTURNED
SYNCLINE:	OVERTURNED
THRUST FAULT:	(DEFINED, APPROXIMATE, INFERRED)
NORMAL FAULT:	(DEFINED, APPROXIMATE, HACHURES ON DOWN THROWN SIDE)

20 STRIKE & DIP OF BEDS
20 APPROXIMATE STRIKE & DIP OF BEDS
VERTICAL BEDDING
HORIZONTAL BEDDING
20 STRIKE & DIP OF OVERTURNED BED

KEY

- CONGLOMERATE
- SANDSTONE
- SILTSTONE
- CLAYSTONE
- MUDSTONE
- CARBONACEOUS CLAYSTONE
- LICENCE BOUNDARY
- COAL SEAM TRACE
- TRENCH LOCATION
- PELECYPOD BAND

113

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

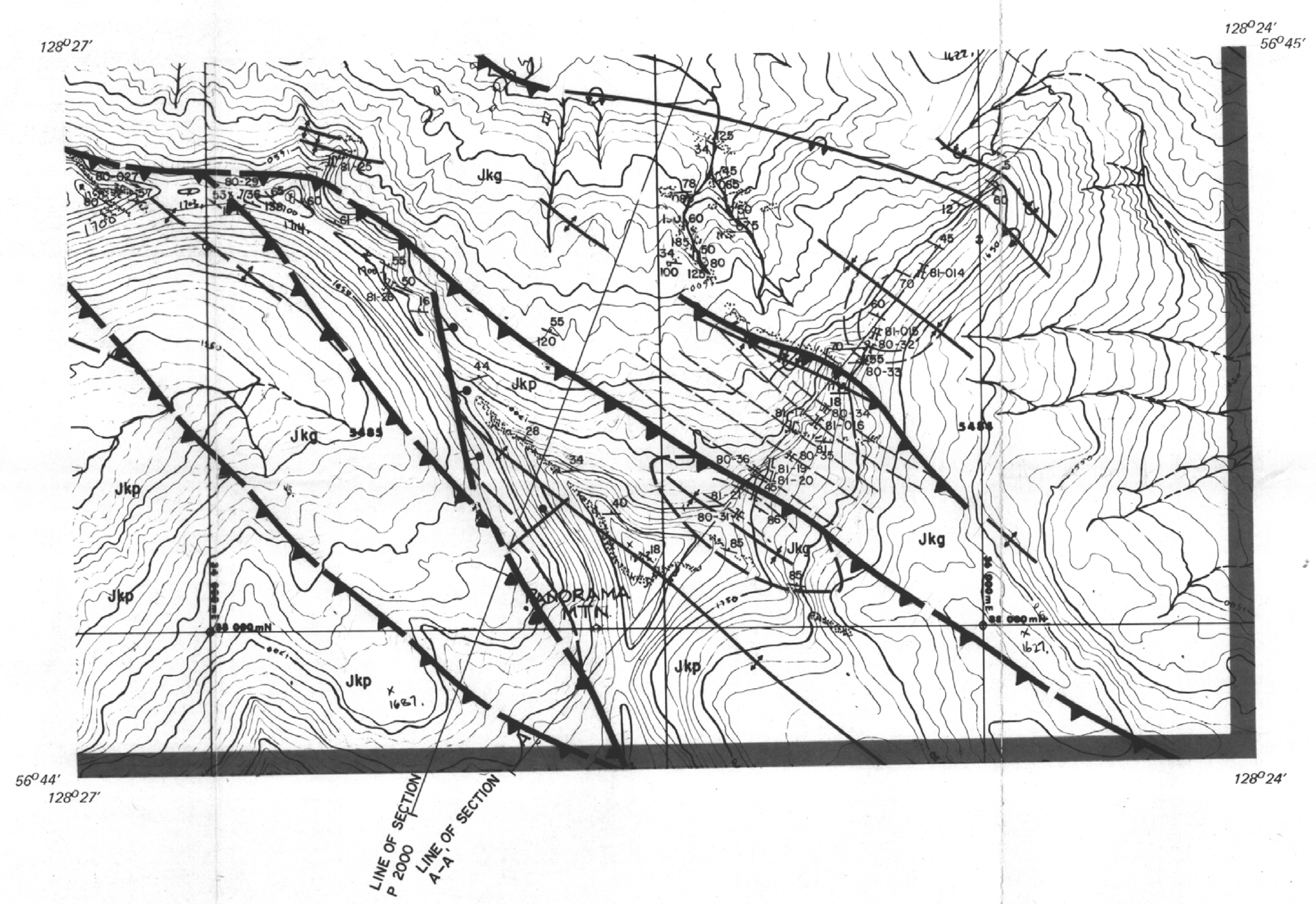
PANORAMA COAL PROJECT 1981

GEOLOGY

MAP A2

PREPARED BY: D. E.P.	SCALE 1:10,000
APPROVED BY: J. INNIS DATE: OCT., 1981	DRAWING No.

GR-Panorama 81(2)#A #1



N

LEGEND

RIVER	
STREAM	
LAKE	
SAND	
TREE LINE	
FORM LINES	1000 / 1050
DEPRESSION FORM LINE	
SPOT HEIGHT	× 1012
MAIN ROAD	
SECONDARY ROAD	
TRACK	
TRAIL	
CUT LINE	
RAILROAD	
BUILDING	
COAL LICENCE	5857

FORM LINE INTERVAL 10 METRES

SURVEY NOTE
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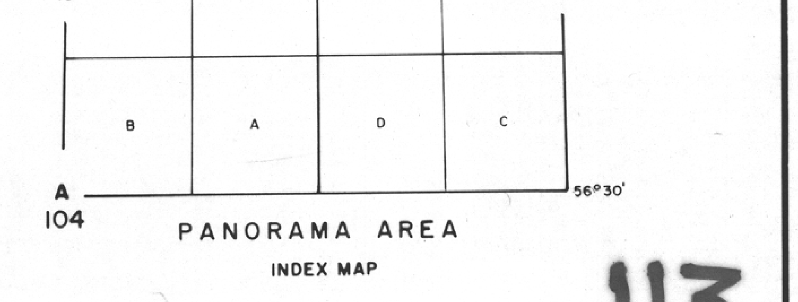
SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS



PANORAMA AREA
INDEX MAP

113

LEGEND

MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

GROUNDHOG MEMBER

JKg – interbedded thin, fine-grained sandstone, siltstone, claystone and coal with rare cross-beds and ripple mark and abundant bivalve and plant fossils, contained between two marine intervals marked by oyster-bearing sandstone beds

PANORAMA MEMBER

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GEOLOGICAL CONTACT (DEFINED, APPROXIMATE, INFERRED)
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20 STRIKE & DIP OF BEDS
20 APPROXIMATE STRIKE & DIP OF BEDS
VERTICAL BEDDING
HORIZONTAL BEDDING
20 STRIKE & DIP OF OVERTURNED BED

KEY

CONGLOMERATE
SANDSTONE
SILTSTONE
CLAYSTONE
MUDSTONE
CARBONACEOUS CLAYSTONE
LICENCE BOUNDARY
COAL SEAM TRACE
TRENCH LOCATION
PELECYPOD BAND

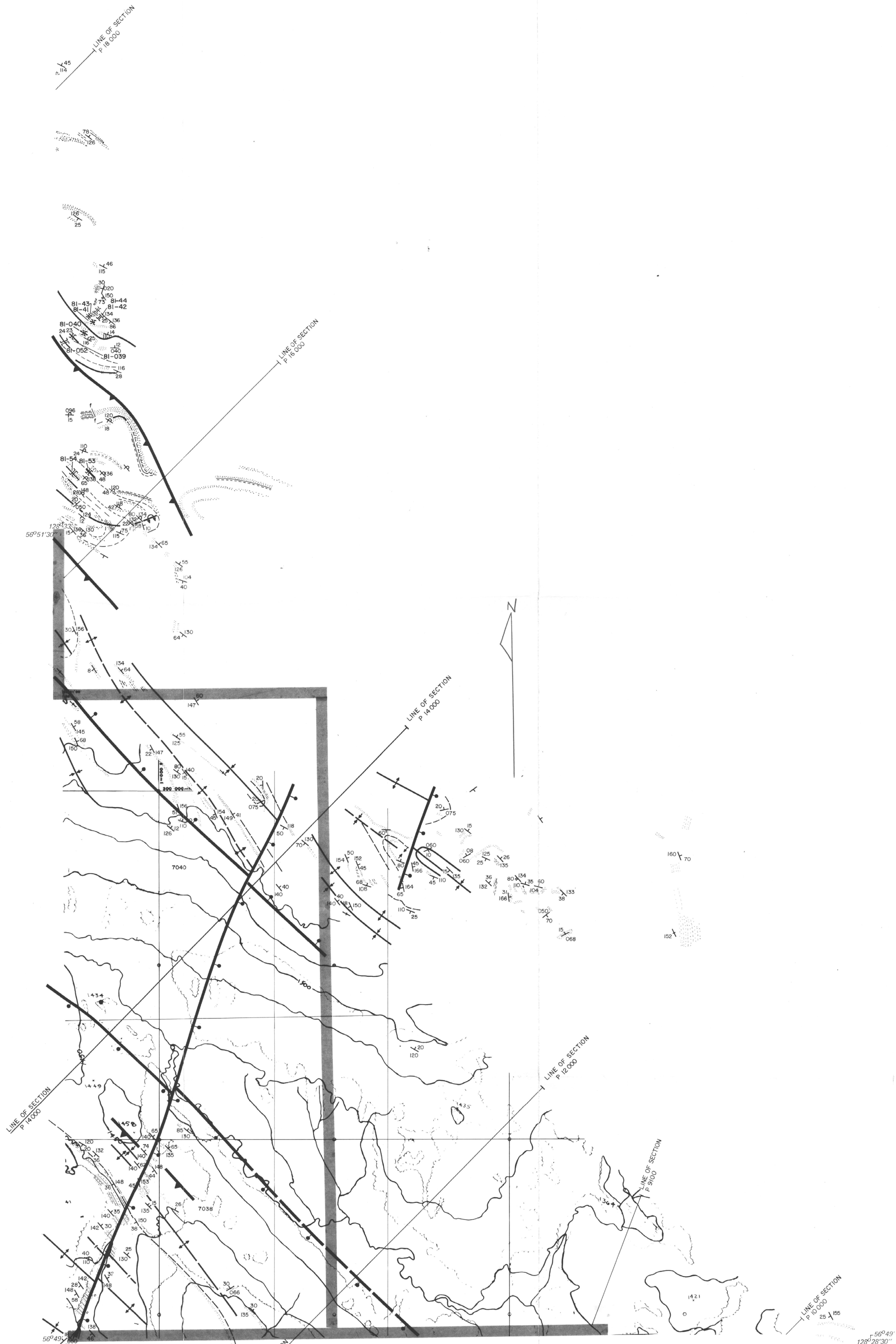
GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

Gulf

PANORAMA COAL PROJECT 1981
GEOLOGY
MAP A3

PREPARED BY: D. E.P.		SCALE 1: 10,000
APPROVED BY: J. INNIS	DATE: OCT., 1981	DRAWING No.

GIR- Panorama 81(7)A #1



LEGEND

RIVER
STREAM
LAKE
SAND
TREE LINE
FORM LINES
DEPRESSION FORM LINE
SPOT HEIGHT × 1012
MAIN ROAD
SECONDARY ROAD
TRACK
TRAIL
CUT LINE
RAILROAD
BUILDING
COAL LICENCE 5857

FORM LINE INTERVAL 10 METRES

SURVEY NOTE
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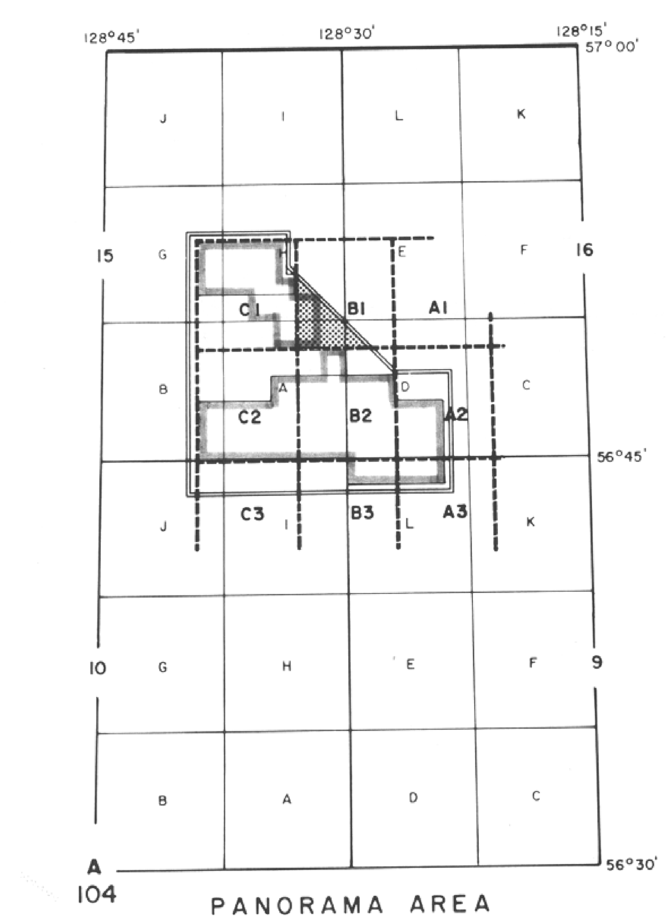
SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS



PANORAMA AREA

INDEX MAP

113

LEGEND

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20 APPROXIMATE STRIKE & DIP OF BEDS
VERTICAL BEDDING
HORIZONTAL BEDDING
20 STRIKE & DIP OF OVERTURNED BED

KEY

CONGLOMERATE
SANDSTONE
SILTSTONE
CLAYSTONE
MUDSTONE
CARBONACEOUS CLAYSTONE
LICENCE BOUNDARY
COAL SEAM TRACE
TRENCH LOCATION
PELECYPOD BAND

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

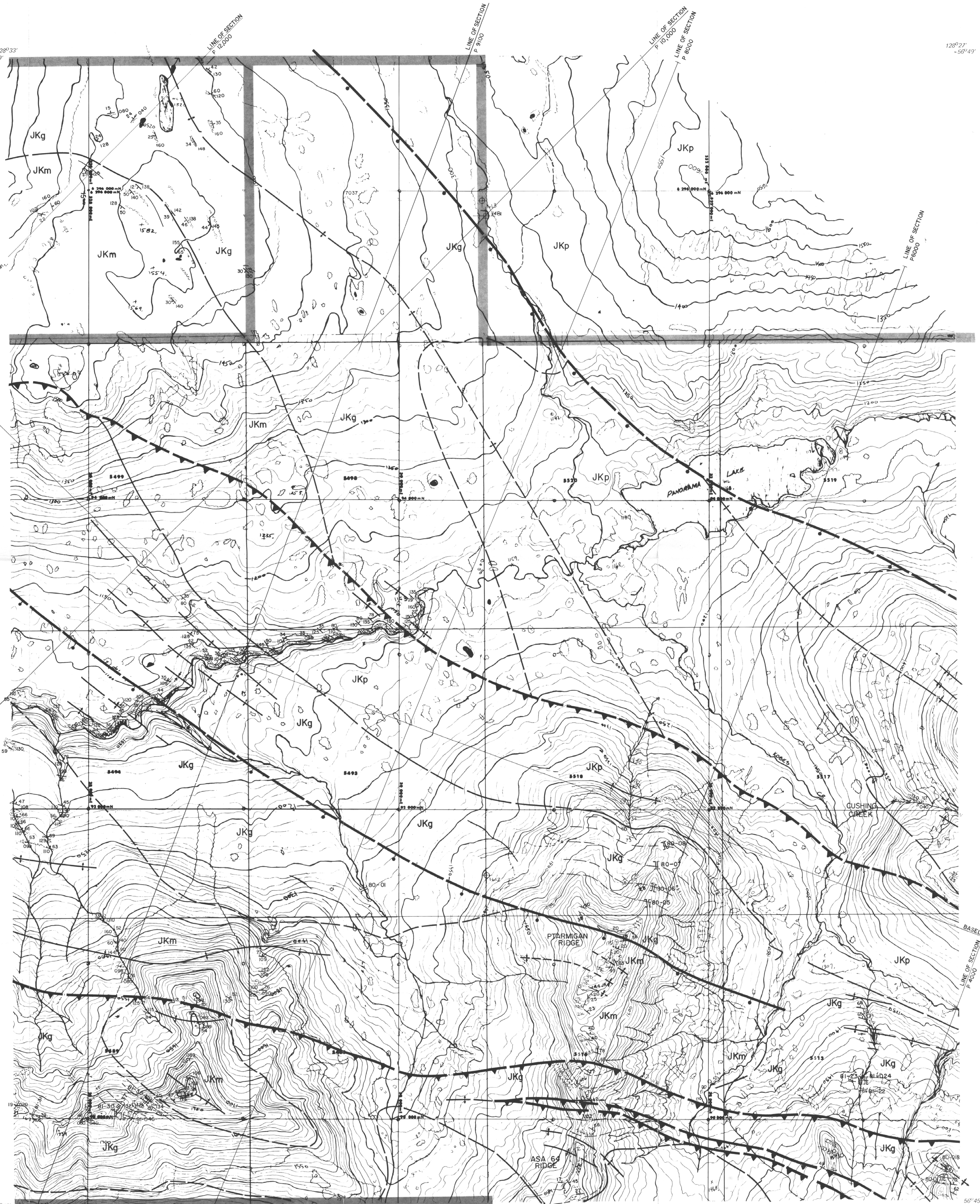
PANORAMA COAL PROJECT 1981

GEOLOGY

MAP B1

PREPARED BY: D.E.P.	SCALE 1 : 10,000
APPROVED BY: J. INNIS DATE: OCT., 1981	DRAWING No.

GR - Panorama 81(2)A #1



LEGEND

RIVER
STREAM
LAKE
SAND
TREE LINE
FORM LINES
DEPRESSION FORM LINE
SPOT HEIGHT × 1012
MAIN ROAD
SECONDARY ROAD
TRACK
TRAIL
CUT LINE
RAILROAD
BUILDING
COAL LICENCE 5857

FORM LINE INTERVAL 10 METRES

SURVEY NOTE
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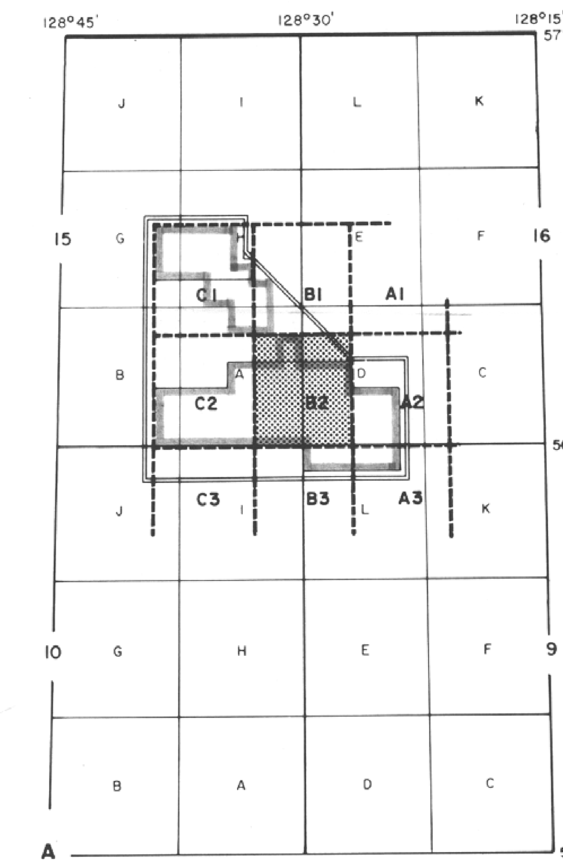
SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS



PANORAMA AREA

INDEX MAP

113

LEGEND

MALLOCH MEMBER

JKm – monotonous, dark green, interbedded more prominent sandstones to pebbly sandstones, and recessive siltstones and claystones, with rare carbonaceous zones and numerous examples of ripple mark and cross-bedding

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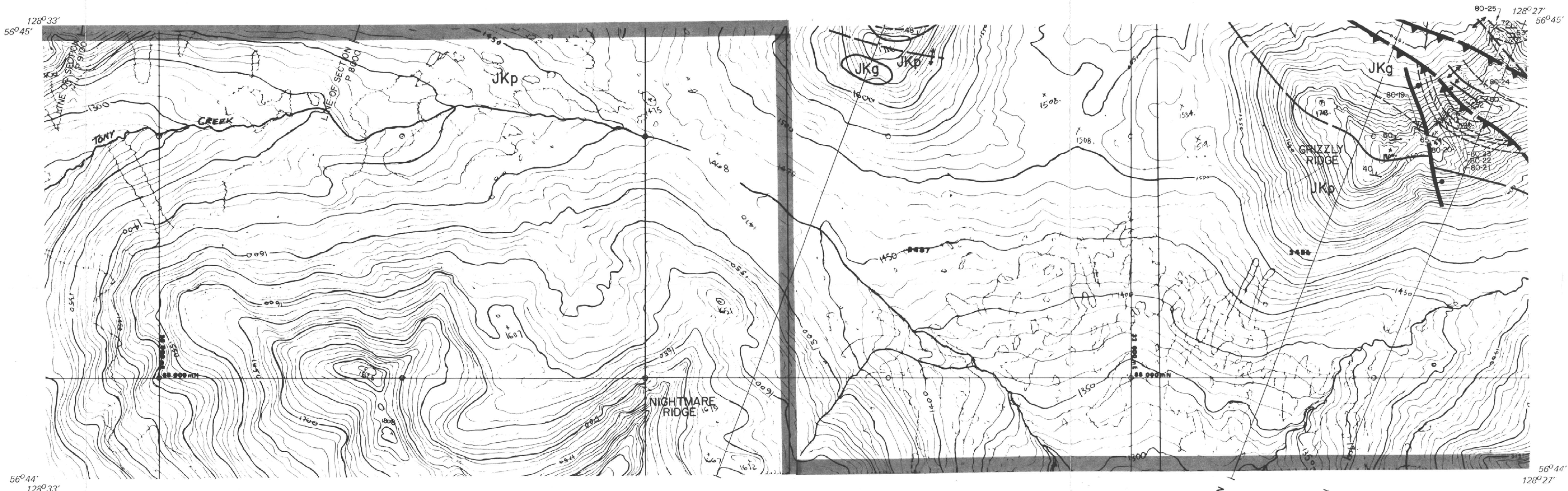
20 APPROXIMATE STRIKE & DIP OF BEDS
VERTICAL BEDDING
HORIZONTAL BEDDING
20 STRIKE & DIP OF OVERTURNED BED

KEY

CONGLOMERATE
SANDSTONE
SILTSTONE
CLAYSTONE
MUDSTONE
CARBONACEOUS CLAYSTONE
LICENCE BOUNDARY
COAL SEAM TRACE
TRENCH LOCATION
PELECYPOD BAND

GULF CANADA RESOURCES INC. Coal Division CALGARY ALBERTA	Gulf
PANORAMA COAL PROJECT 1981 GEOLOGY MAP B2	
PREPARED BY: D.E.P.	SCALE 1 : 10,000
APPROVED BY: J. INNIS DATE: OCT., 1981	DRAWING No.

GR-Panorama 81(2)A #1



LEGEND

RIVER	
STREAM	
LAKE	
SAND	
TREE LINE	
FORM LINES	1000 / 1050
DEPRESSION FORM LINE	
SPOT HEIGHT	× 1012
MAIN ROAD	
SECONDARY ROAD	
TRACK	
TRAIL	
CUT LINE	
RAILROAD	
BUILDING	
COAL LICENCE	5857

FORM LINE INTERVAL 10 METRES

SURVEY NOTE
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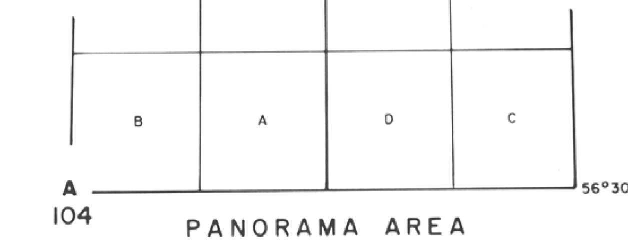
SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE
0 100 200 400 600 800 1000 METERS



PANORAMA AREA
INDEX MAP

113

LEGEND

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20 APPROXIMATE STRIKE & DIP OF BEDS
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HORIZONTAL BEDDING
20 STRIKE & DIP OF OVERTURNED BED

KEY

SANDSTONE
SILTSTONE
CLAYSTONE
MUDSTONE
CARBONACEOUS CLAYSTONE
LICENCE BOUNDARY
COAL SEAM TRACE
TRENCH LOCATION
PELECYPOD BAND

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

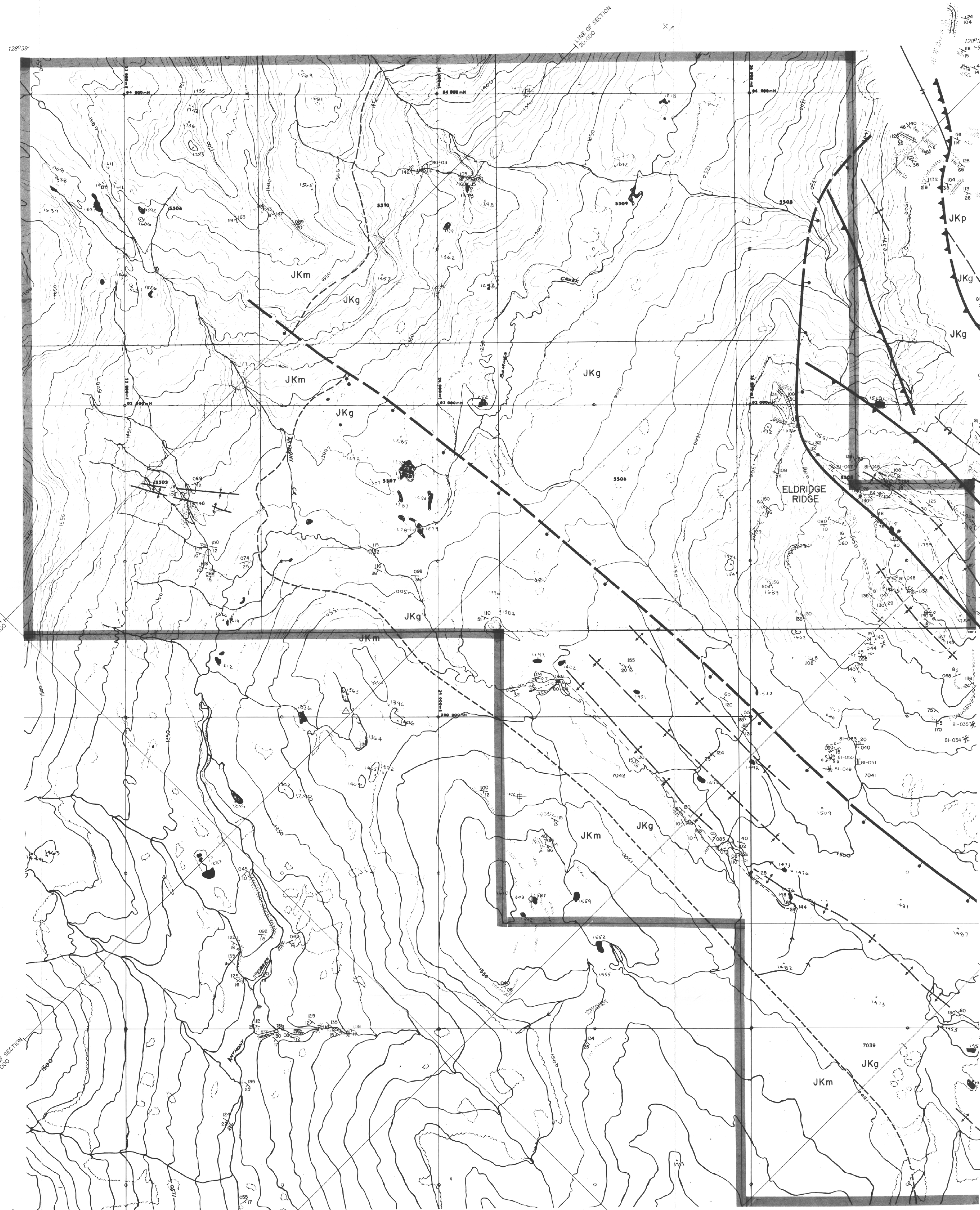
PANORAMA COAL PROJECT 1981

GEOLOGY

MAP B3

PREPARED BY: D.E.P	SCALE 1: 10,000
APPROVED BY: J. INNIS DATE: OCT., 1981	DRAWING No.

GR-Panorama 81(2)A #1



LEGEND

RIVER
STREAM
LAKE
SAND
TREE LINE
FORM LINES
DEPRESSION FORM LINE
SPOT HEIGHT × 1012
MAIN ROAD
SECONDARY ROAD
TRACK
TRAIL
CUT LINE
RAILROAD
BUILDING
COAL LICENCE 5857

FORM LINE INTERVAL 10 METRES

SURVEY NOTE
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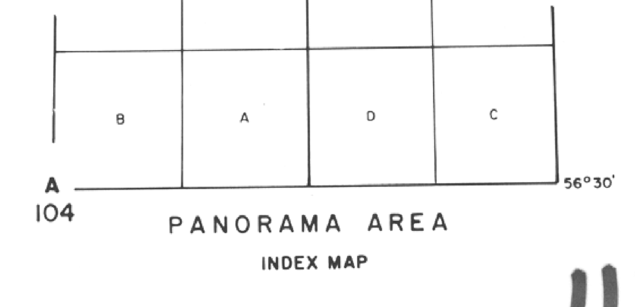
SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS



PANORAMA AREA

INDEX MAP

113

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SILTSTONE
CLAYSTONE
MUDSTONE
CARBONACEOUS CLAYSTONE
LICENCE BOUNDARY
COAL SEAM TRACE
TRENCH LOCATION
PELECYPOD BAND

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

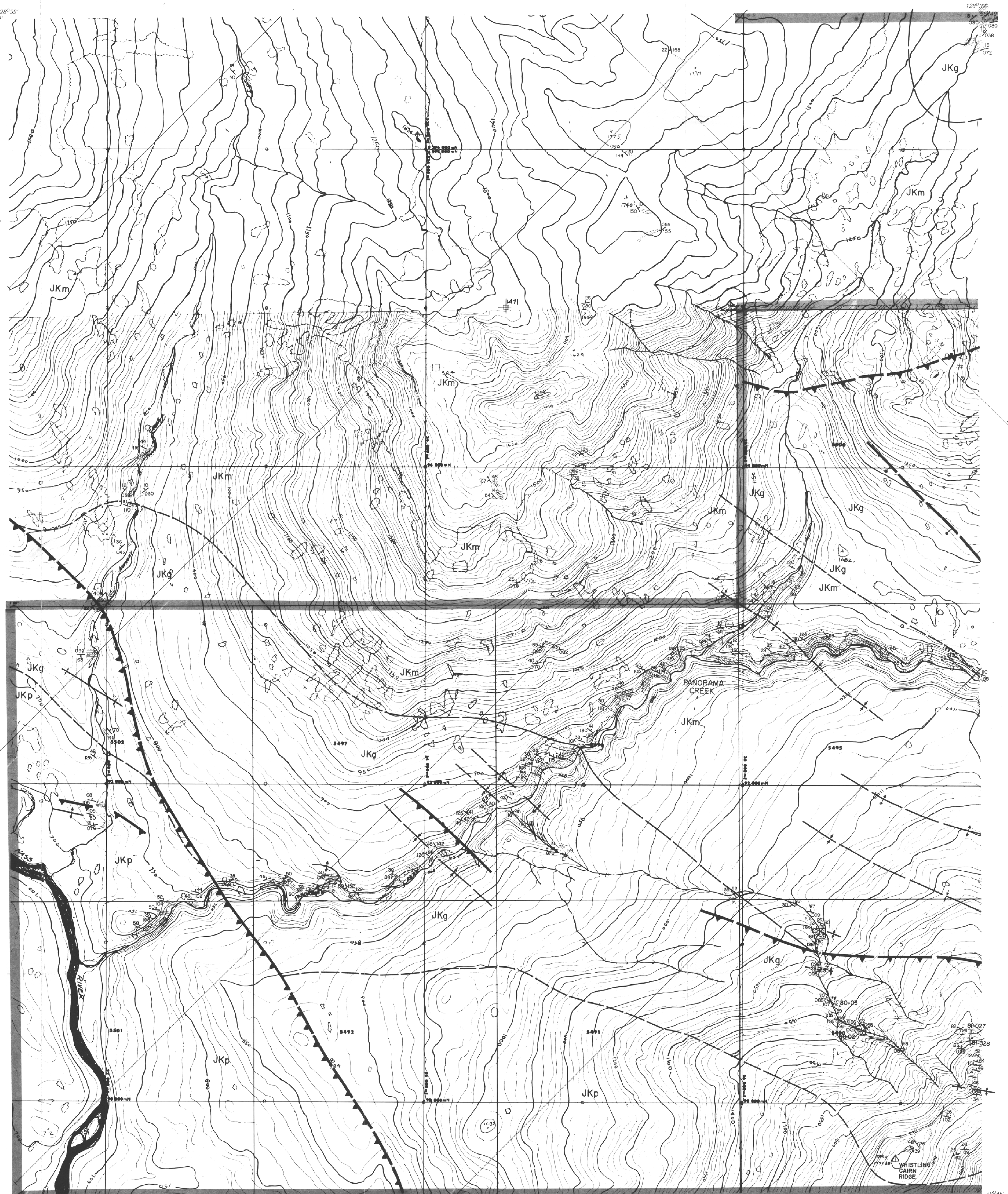
PANORAMA COAL PROJECT 1981

GEOLOGY

MAP C1

PREPARED BY: D.E.P.	SCALE 1:10,000
APPROVED BY: J. INNIS DATE: OCT., 1981	DRAWING No.

GR-Panorama 81(2)*A *1



LEGEND

RIVER
STREAM
LAKE
SAND
TREE LINE
FORM LINES
DEPRESSION FORM LINE
SPOT HEIGHT × 1012
MAIN ROAD
SECONDARY ROAD
TRACK
TRAIL
CUT LINE
RAILROAD
BUILDING
COAL LICENCE 5857

FORM LINE INTERVAL 10 METRES

SURVEY NOTE
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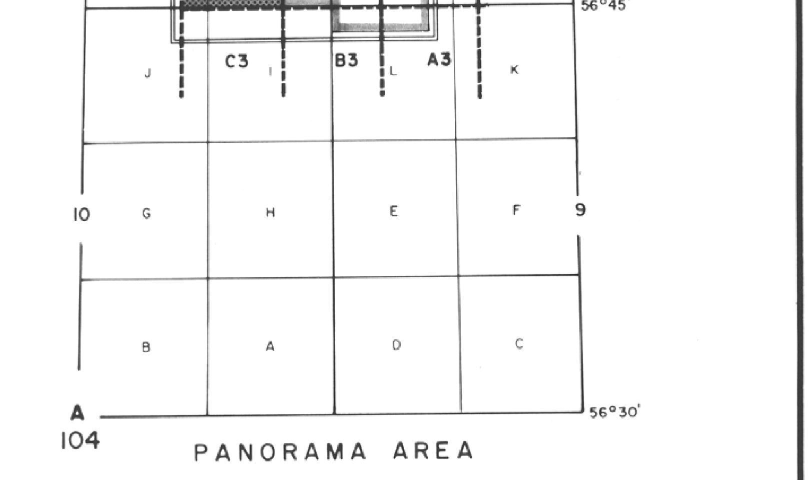
SCALE : 1:10,000

0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS



PANORAMA AREA
INDEX MAP

113

LEGEND

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MUDSTONE
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LICENCE BOUNDARY
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TRENCH LOCATION
PELECYPOD BAND

GULF CANADA RESOURCES INC.
Coal Division
Gulf
CALGARY ALBERTA

PANORAMA COAL PROJECT 1981
GEOLOGY
MAP C2

PREPARED BY: D.E.P.	SCALE 1:10,000
APPROVED BY: J. INNIS DATE: OCT., 1981	DRAWING No.

GR-Panorama 81(2)#A #1

LEGEND

RIVER
STREAM
LAKE
SAND
TREE LINE
FORM LINES 1000 1050
DEPRESSION FORM LINE
SPOT HEIGHT × 1012
MAIN ROAD
SECONDARY ROAD
TRACK
TRAIL
CUT LINE
RAILROAD
BUILDING
COAL LICENCE 5857

FORM LINE INTERVAL 10 METRES

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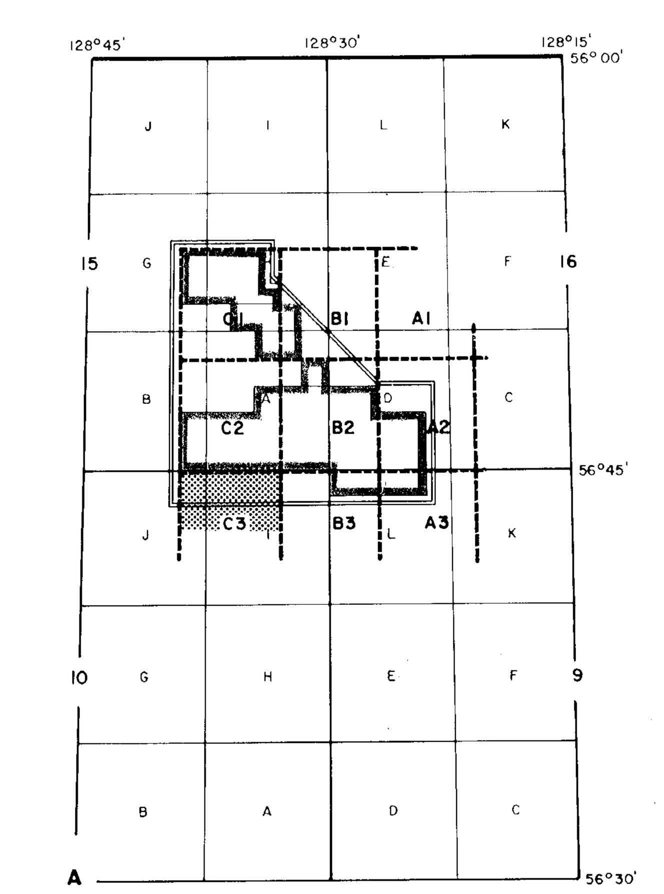
0 1/8 1/4 1/2 3/4 MILE

0 100 200 400 600 800 1000 METERS



PANORAMA AREA

INDEX MAP

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20 APPROXIMATE STRIKE & DIP OF BEDS
VERTICAL BEDDING
HORIZONTAL BEDDING
20 STRIKE & DIP OF OVERTURNED BED

CONGLOMERATE
SANDSTONE
SILTSTONE
CLAYSTONE
MUDSTONE
CARBONACEOUS CLAYSTONE
LICENCE BOUNDARY
COAL SEAM TRACE
TRENCH LOCATION
PELECYPOD BAND

113

GULF CANADA RESOURCES INC.
Coal Division
CALGARY ALBERTA

PANORAMA COAL PROJECT 1981
GEOLOGY
MAP C3

PREPARED BY: D.E.P.		SCALE 1:10,000
APPROVED BY: J. INNIS	DATE: OCT. 1981	DRAWING No.

GR-Panorama 81(2)A *1

GR-Panorama 81(#)A +(1)

APPENDIX IX

Detailed Vitrinite Reflectance Data

138 Samples from

Panorama Area

113

Analysis by:

David E. Pearson and Assoc. Ltd.
804 Leota Place
Victoria, B.C.
V8Y 1H2

APPENDIX III

VITRINITE REFLECTANCE SAMPLES

Samples From 1980 Program

Trench #	Sample #	$\overline{Ro}$ Max.(%)	Standard Deviation(%)
PN-TR-80-02	1365	3.16	0.10
03	1363	3.47	0.12
04	1391	2.99	0.10
PS-TR-80-01	1368	3.45	0.12
02	1367	2.85	0.10
05	1376	2.76	0.18
06	1377	2.99	0.08
07	1375	2.66	0.15
09	1309	2.92	0.13
10	1310	2.45	0.14
11	1311	2.85	0.13
12	1315	2.77	0.11
13	1314	3.27	0.10
14	1312	3.18	0.10
16	1313	3.21	0.09
19	1353	3.37	0.10
20	1351	2.90	0.08
21	1352	2.96	0.12
22	1354	2.96	0.08
23	1355	2.65	0.10
24	1356	3.02	0.17
25	1357	2.76	0.10
27	1360	2.86	0.15
28	1361	2.89	0.12
29	1362	2.89	0.11
31	1370	2.59	0.07
32	1371	2.63	0.07
33	1372	2.77	0.10
34	1373	2.59	0.09
35	1374	2.64	0.09
36	1378	2.76	0.11
37	1369	2.79	0.11
38	1304	3.04	0.15

VITRINITE REFLECTANCE SAMPLES

Samples From 1981 Program

Sample #	$\overline{Ro}$ Max.(%)	Standard Deviation(%)
DP-81- 4	3.07	0.08
5	3.07	0.05
6	3.85	0.11
8	3.89	0.10
12	3.12	0.14
23	2.98	0.07
24	3.02	0.13
25	2.97	0.08
29	3.02	0.07
30	2.84	0.07
31	2.90	0.07
32	2.87	0.08
33	2.75	0.05
34	2.84	0.07
35	2.97	0.07
36	2.80	0.05
44	3.48	0.05
45	3.11	0.12
46	3.11	0.07
47	3.17	0.05
52	2.75	0.17
55	3.16	0.05
66	3.22	0.06
67	3.26	0.05
JI-81-C1	2.35	0.12
C2	2.43	0.11
C3	2.39	0.16
C4	3.06	0.15
C5	3.37	0.13
C6	4.00	0.08
C7	3.19	0.09
C8	3.04	0.10
C9	3.28	0.10
C10	3.19	0.10
C11	3.50	0.07
C14	4.20	0.11

Sample #	$\overline{Ro}$ Max.(%)	Standard Deviation(%)
KB-81-1-1C	2.68	0.08
9-1C	2.65	0.14
9-2C	2.97	0.05
9-4C	2.76	0.09
10-1C	3.13	0.06
10-2C	3.21	0.08
10-5C	3.11	0.05
13-1C	2.50	0.11
13-2C	3.20	0.10
13-3C	2.99	0.07
14-1C	3.27	0.05
14-2C	2.85	0.10
14-3C	3.06	0.07
14-4C	3.23	0.07
14-5C	3.17	0.09
14-6C	2.99	0.07
17-1C	2.90	0.08
17-2C	2.97	0.07
19-2C	2.26	0.11
19-3C	2.98	0.06
19-4C	2.85	0.10
19-6C	2.89	0.07
20-1C	2.88	0.05
RB-81- 6	3.45	0.07
7	3.44	0.10
8	3.41	0.07
10	2.90	0.05
11	2.76	0.08
12	2.98	0.07
13	3.41	0.06
15	3.59	0.06
16	3.23	0.06
17	5.22	0.07

VITRINITE REFLECTANCE SAMPLES

Samples From 1981 Program
(Page 2)

Sample #	$\overline{Ro}$ Max. (%)	Standard Deviation (%)
RLB-81- 1	3.12	0.09
3	3.04	0.09
4	3.32	0.07
6	2.96	0.09
7	3.06	0.09
8	3.35	0.07
9	3.58	0.06
10	3.14	0.08
11	3.22	0.08
14	3.36	0.09
16	3.32	0.08
17	3.84	0.08
18	3.58	0.07
21	3.03	0.10
22	3.37	0.06
24	3.42	0.07
25	3.24	0.05
SLB-81-8-1/8	3.53	0.09
14	4.00	0.08
16-1/4	4.11	0.08
20	4.10	0.10
22-1/2	3.99	0.06
24	3.75	0.06
25	3.44	0.08
26-1/3	3.66	0.14
28	3.30	0.10
30	3.84	0.09
41	3.31	0.08
46-1/2	3.26	0.04
58-1/2	3.40	0.10
59	3.25	0.05
Seam 2 63	3.41	0.12
Seam 3 63	3.32	0.08
115	4.33	0.13

Report

on

thirty-three coal samples

from the

Panorama Area.

June 1981.

David E. Pearson & Associates Ltd.,
Consulting Coal Geologists and Petrographers,
804 Leota Place,
Victoria,
British Columbia.

INTRODUCTION

Thirty three coal samples, representative of samples collected during the 1980 field season, were received at the laboratory on May 22,1981. The samples were in crushed form and ready for pelletising. The objective of the study was to see if coal reflectance could shed light on the quality of the coals found in the Panorama area, and help in the elucidation of the stratigraphy and structure of the area. One sample was to be studied to show the format and kind of study that this laboratory is capable of performing.

SAMPLE PREPARATION

The coals were placed in 25mm. plastic METSERV moulds together with a quantity of casting resin to which had already been added MEK peroxide hardener. The pellets were allowed to solidify and were subsequently ground and polished on BEUHLER equipment.

MEASURING PROCEDURE

The pellets were placed on plates for attachment to the microscope stage. A LEITZ Orthoplan microscope -photometer interfaced to a HEWLETT-PACKARD 85 Series computer with HP-7225 plotter was used in the determinations. The microscope was standardised, and 50 maximum reflectance measurements on the maceral vitrinite were made. The computer then determined the mean maximum reflectance of the readings together with the standard deviation, and drew the histogram contained in the appendix. The readings were grouped by the computer into "half-V steps", (units of 0.05% reflectance). The blue line in these histograms represents the computer-derived normal distribution curve for the determined values, and is an indication of the central tendency of that sample.

RESULTS

The results of the reflectance analysis are shown in Table 1, and the results of the maceral analysis on sample #1369, from trench PS-TR-80-37 on the Grizzly Mountain section, are shown in Table 2.

All of the coals examined have levels of organic maturity that indicates them to be ANTHRACITES.
The lowest reflectance value is 2.45%, from a highly oxidised coal; the highest reflectance is 3.51%. Corresponding volatile-matter yields would be 9% and 5% respectively. Higher volatile yields would suggest the addition of carbonates or hydroxyl-bearing minerals to the oxidised coal.

Coals near the base of the stratigraphic sequence have reflectance values of about 3.4%; those towards the top of the succession have values of about 2.6%, giving a stratigraphic rank gradient of about 0.25% R_o / 100 metres.

The following geological observations are worthy of note:-
FIGURE 1

Coals at the west end of Cushing Ridge dip south and have R_o 's of 3.2%. At the east end of the Ridge, coals also dip south, but have R_o's of 2.9%-2.7%. Thus, the succession appears to be inverted, or overturned, as high rank coals overlie lower rank coals.

FIGURE 2

A post-coalification thrust separates two coal-bearing sequences on Grizzly Mountain. Trenches 19-23 are overthrust by a plate containing trenches 24-37. On East Ridge (my name), it appears trenches 30&31 are similarly overthrust.

FIGURE 3

On Ptarmigan Ridge, a possibly complete succession of coal measures is exposed. Coal in trench 5 was very oxidised and probably has a "real" value of reflectance of about 3.2%.

Trench #	Sample #	$R_o max$	Standard deviation
		%	%
PN-TR-80-02	1365	3.16	0.10
03	1363	3.47	0.12
04	1391	2.99	0.10
PS-TR-80-01	1368	3.45	0.12
02	1367	2.85	0.10
05	1376	2.76	0.18
06	1377	2.99	0.08
07	1375	2.66	0.15
09	1309	2.92	0.13
10	1310	2.45	0.14
11	1311	2.85	0.13
12	1315	2.77	0.11
13	1314	3.27	0.10
14	1312	3.18	0.10
16	1313	3.21	0.09
19	1353	3.37	0.10
20	1351	2.90	0.08
21	1352	2.96	0.12
22	1354	2.96	0.08
23	1355	2.65	0.10
24	1356	3.02	0.17
25	1357	2.76	0.10
27	1360	2.86	0.15
28	1361	2.89	0.12
29	1362	2.89	0.11
31	1370	2.59	0.07
32	1371	2.63	0.07
33	1372	2.77	0.10
34	1373	2.59	0.09
35	1374	2.64	0.09
36	1378	2.76	0.11
37	1369	2.79	0.11
38	1304	3.04	0.15

TABLE 1.

Results of reflectance analysis.

<u>Identification</u>	
Laboratory Number.............	1369
Description....................	PS-TR-80-37
<u>Distribution of Vitrinite Types</u>	
V-24.......................%	
V-25.......................%	
V-26.......................%	26
V-27.......................%	28
V-28.......................%	28
V-29.......................%	14
V-30.......................%	4
V-31.......................%	
<u>"Reactive" Components</u> (all components are inert in anthracites).	
Total Vitrinite.............%	83.6
Reactive semi-fusinite......%	-
Exinite.....................%	-
Total.......................%	83.6
<u>Inert Components</u>	
Inert semi-fusinite.........%	5.1
Macrinite...................%	1.1
Fusinite....................%	0.3
Mineral Matter..............%	9.9
Total.......................%	16.4
<u>Petrographic Indices</u>	
Mean Maximum Reflectance....%	2.79
Balance Index...............%	-
Strength Index..............%	-
Stability Index.............%	-

<u>TABLE 2.</u>

FIGURE 1.

Geological sketch map of Cushing Ridge.

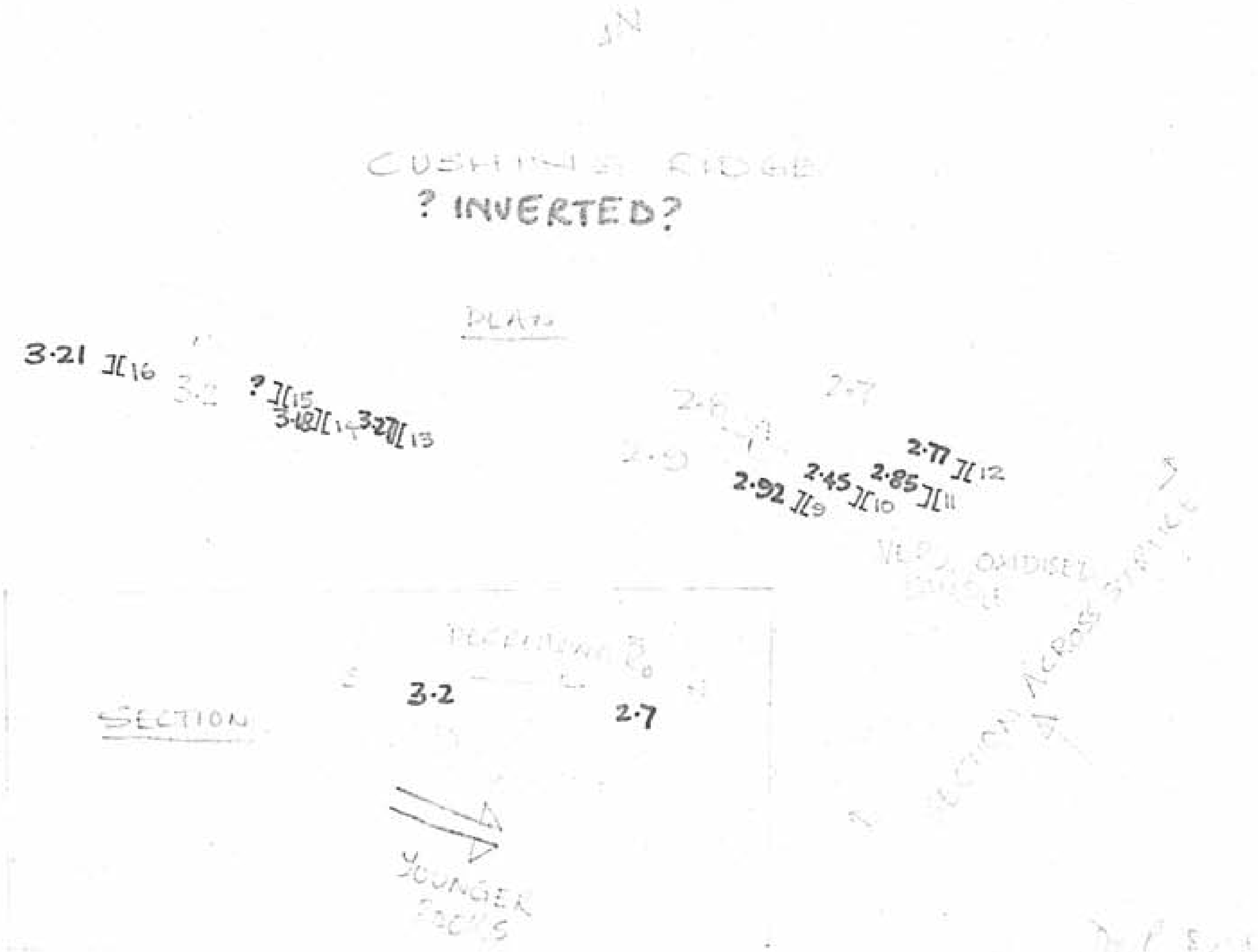


FIGURE 2.

Geological sketch map of Grizzly Mountain.

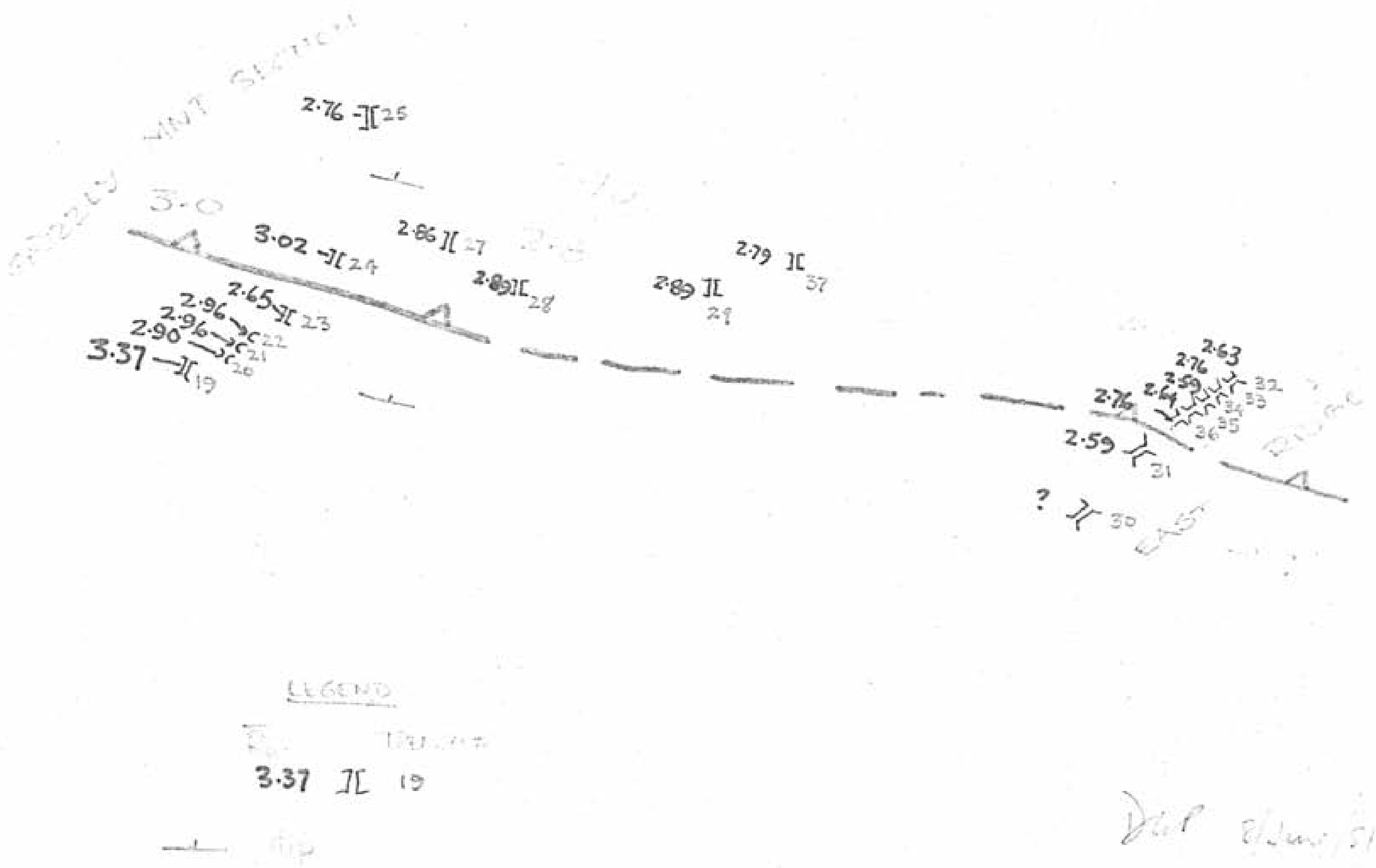
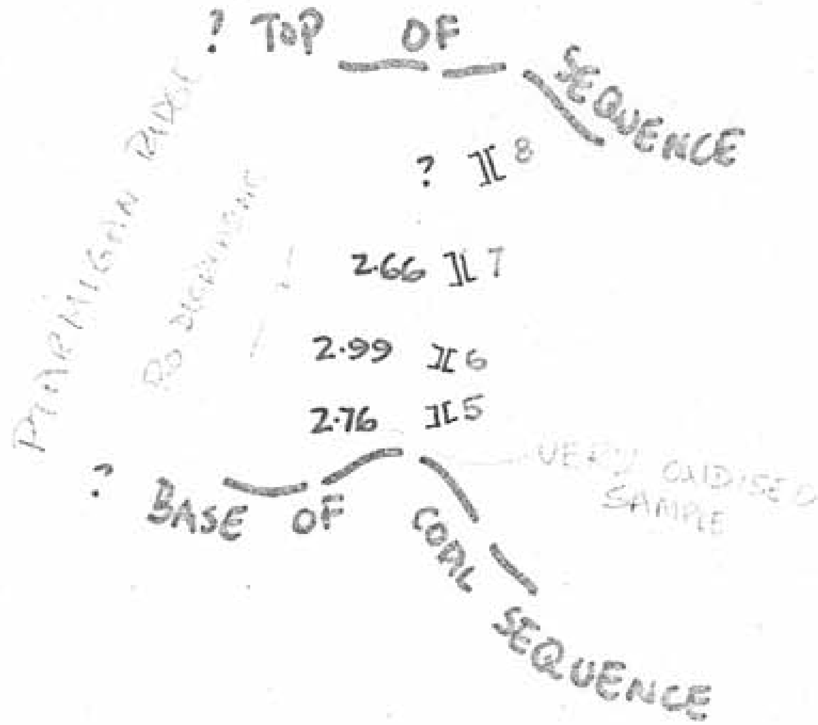
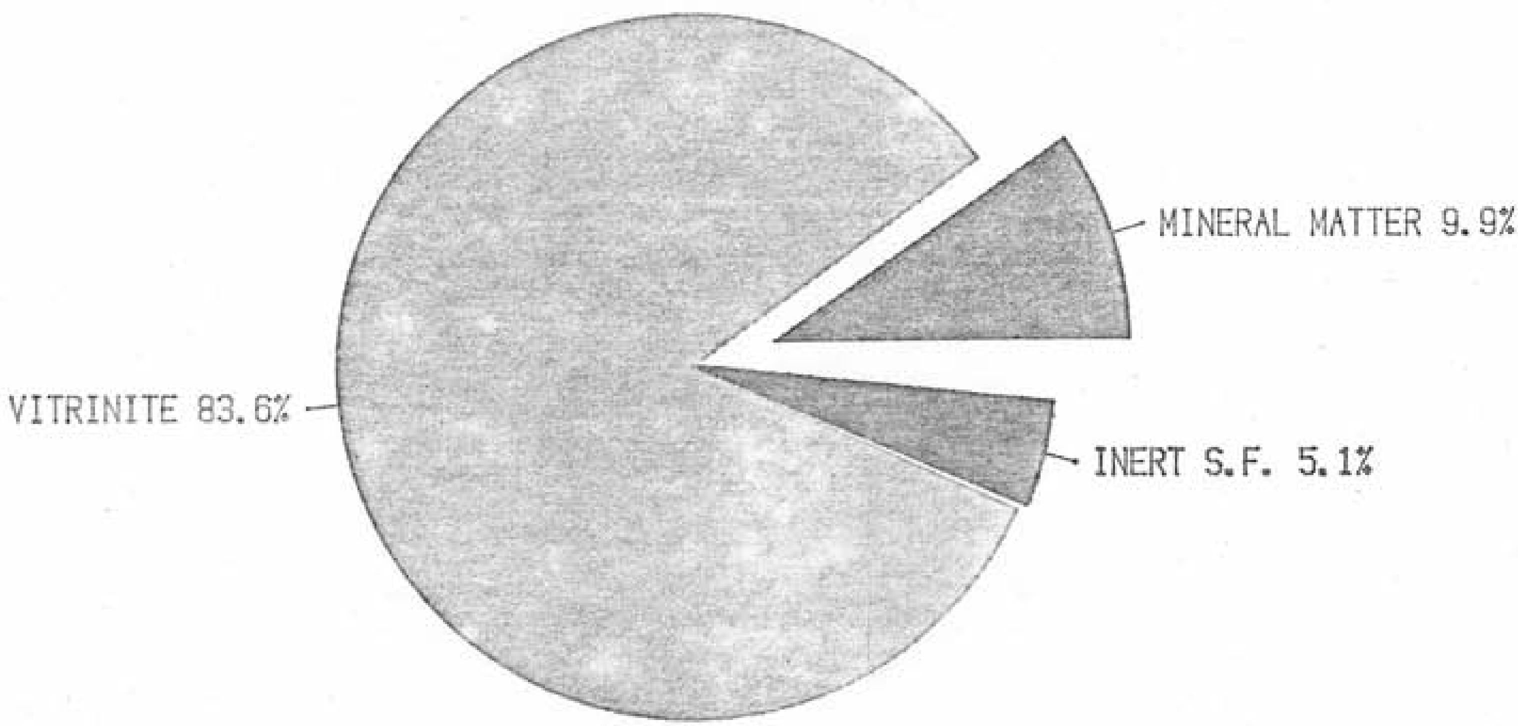


FIGURE 3.
Geological sketch map of Ptarmigan Ridge.



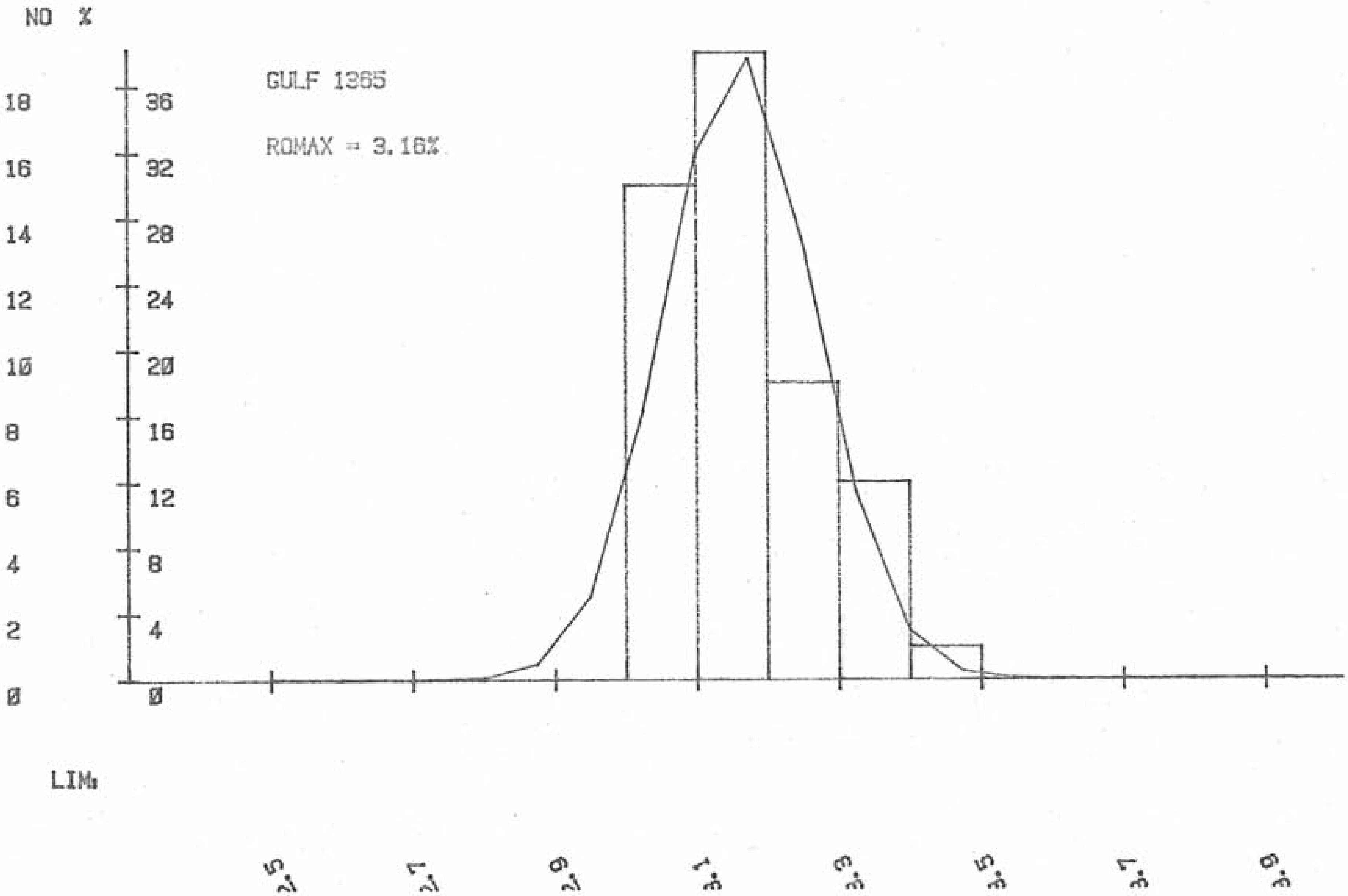
MACERAL DISTRIBUTION

PANORAMA-1369 TRENCH PS-TR-8Ø-37



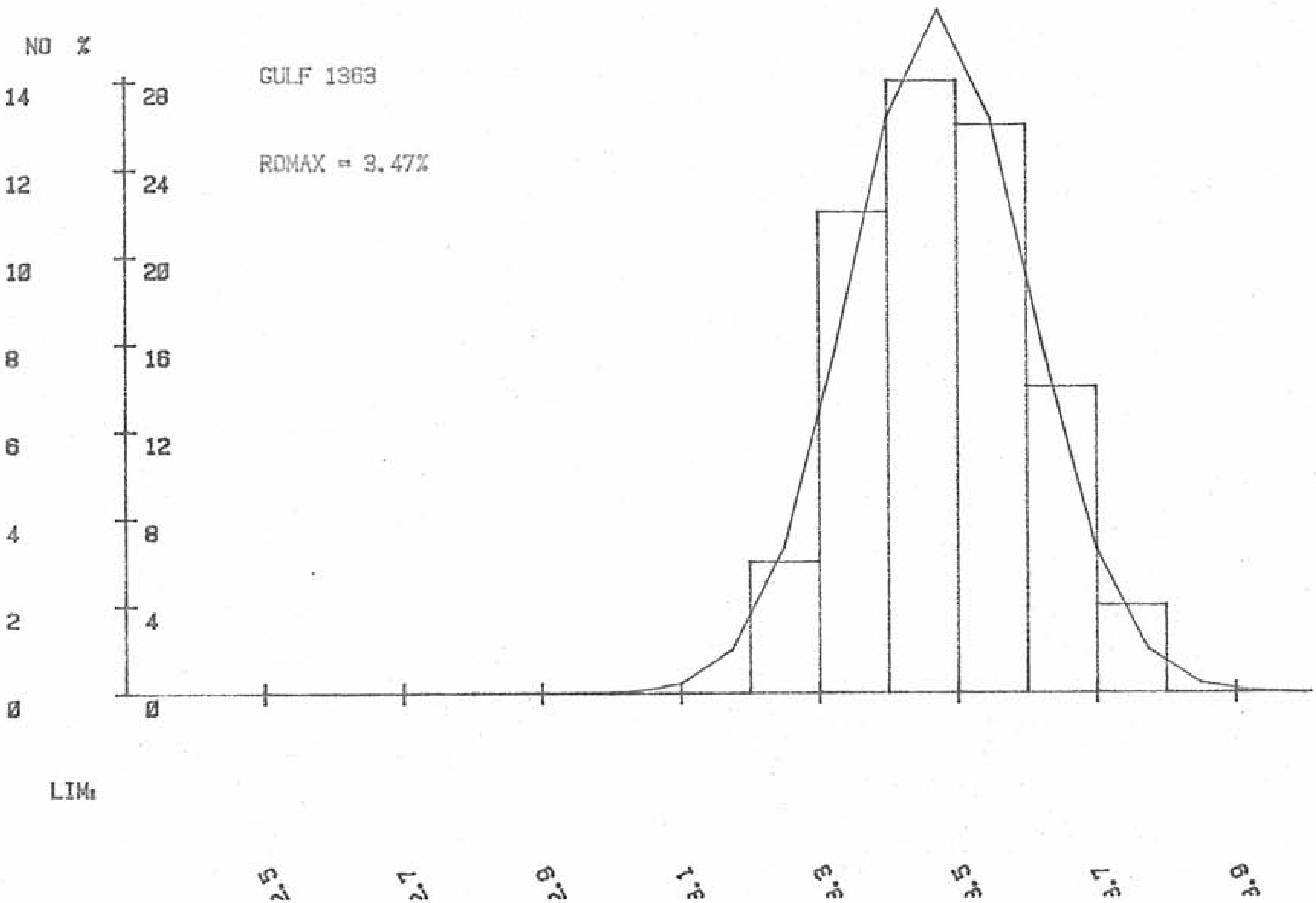
GLF65

I	X(I)	X(I+1)
1	3.2500	3.1000
3	3.1300	3.0600
5	3.1500	3.2900
7	3.0700	3.1700
9	3.0100	3.1900
11	3.1000	3.1400
13	3.2200	3.0600
15	3.0900	3.1600
17	3.1300	3.0700
19	3.0600	3.4400
21	3.0900	3.1500
23	3.0200	3.1800
25	3.0300	3.3000
27	3.1100	3.2300
29	3.2200	3.0000
31	3.3100	3.2700
33	3.0500	3.0800
35	3.0300	3.3100
37	3.3800	3.1000
39	3.0600	3.1500
41	3.2700	3.1500
43	3.3700	3.2400
45	3.3300	3.1200
47	3.1800	3.2100
49	3.1100	3.1500


NO %
GULF 1365
ROMAX = 3.16%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIMs
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

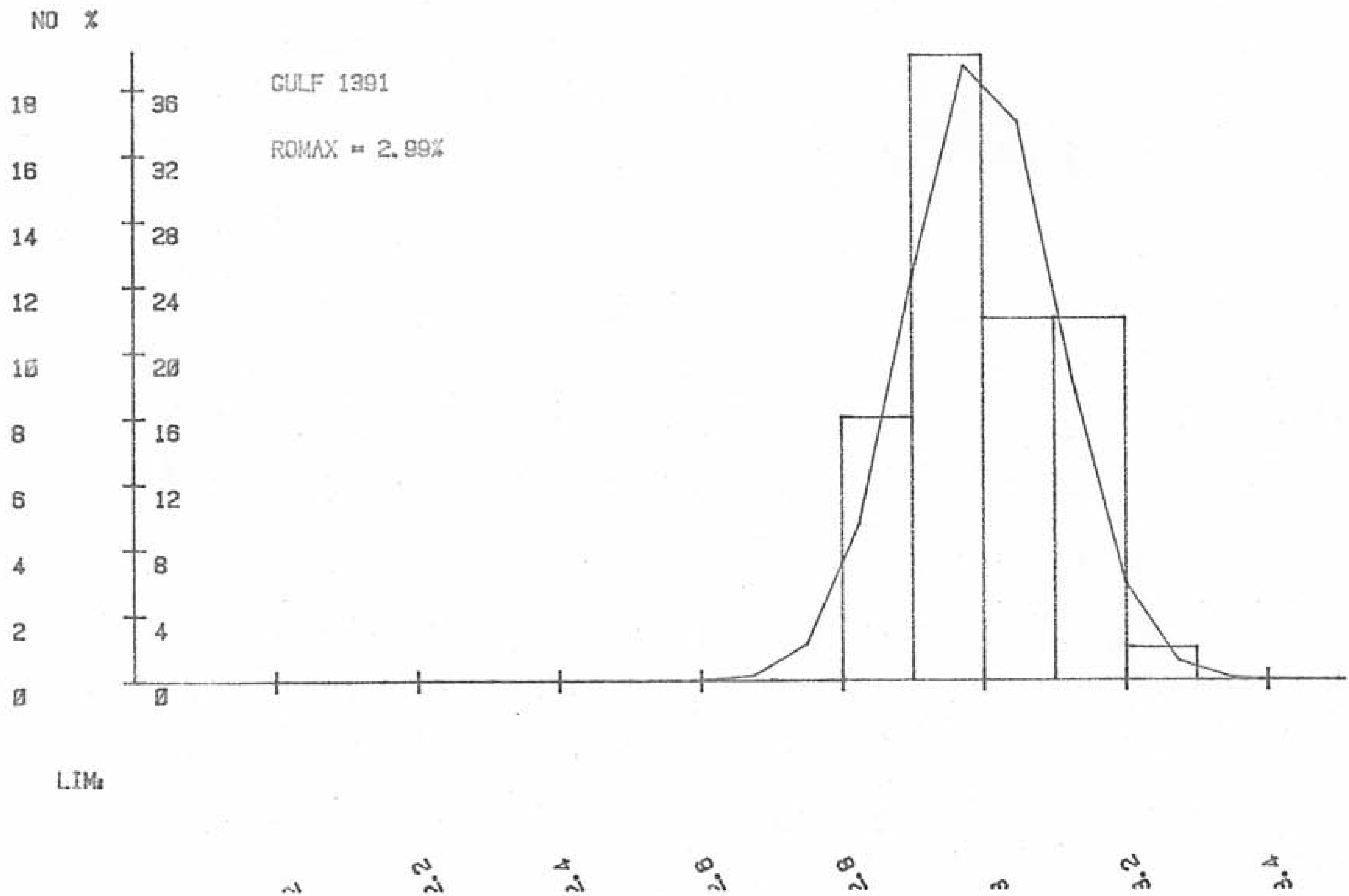
GLF63

I	X(I)	X(I+1)
1	3.7600	3.6200
3	3.4100	3.5200
5	3.5900	3.3800
7	3.5700	3.4300
9	3.4100	3.3800
11	3.5500	3.6100
13	3.5100	3.4100
15	3.3900	3.3200
17	3.6200	3.6600
19	3.5700	3.6900
21	3.3300	3.4900
23	3.4800	3.6600
25	3.3800	3.5400
27	3.5400	3.5200
29	3.4000	3.4000
31	3.3300	3.4700
33	3.4100	3.4200
35	3.5400	3.4200
37	3.2900	3.5900
39	3.4800	3.3400
41	3.6300	3.2600
43	3.5000	3.2300
45	3.5900	3.3200
47	3.4600	3.3000
49	3.3100	3.7200


NO %
GULF 1363
ROMAX = 3.47%
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

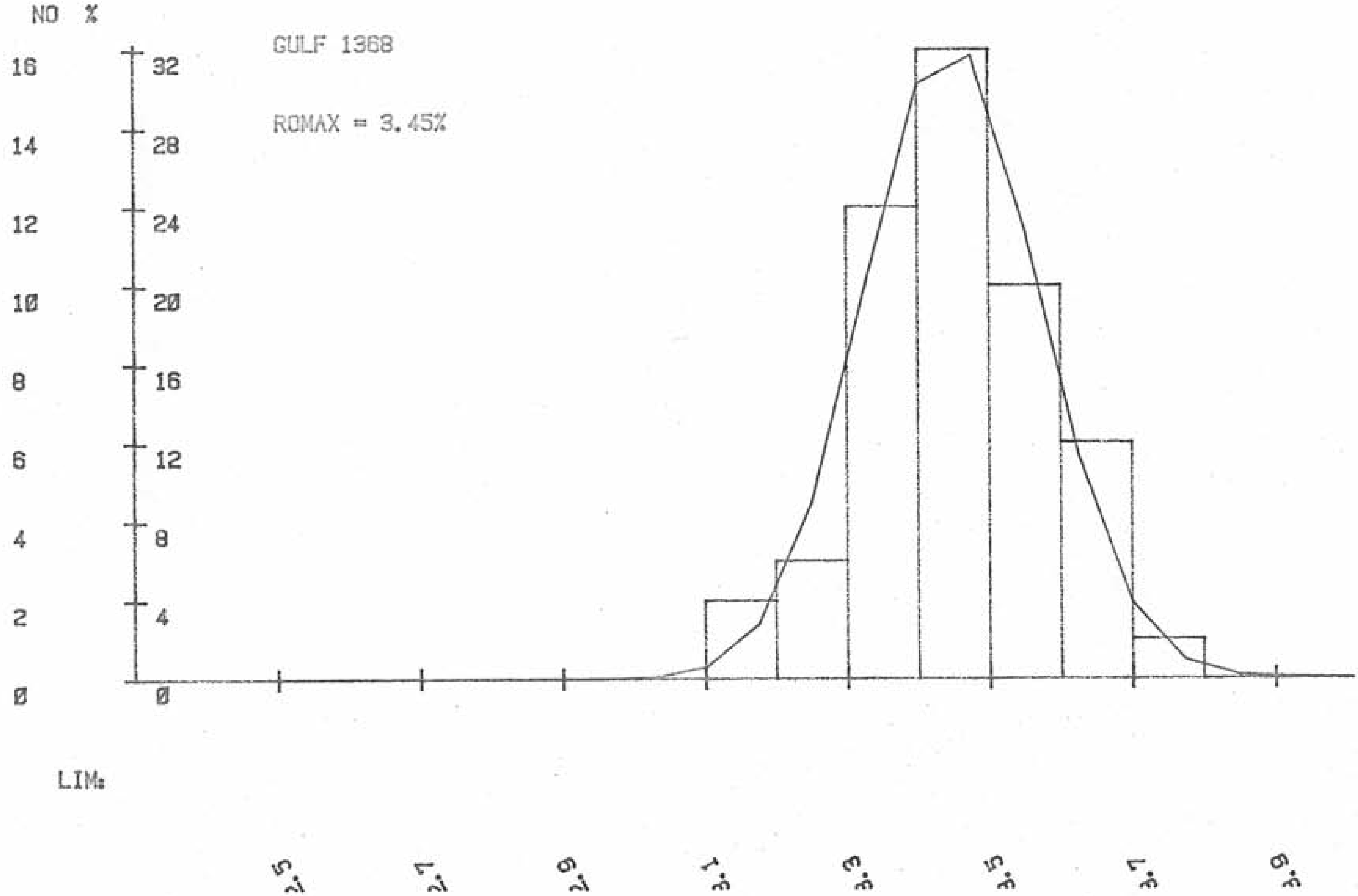
GLF91

I	X(I)	X(I+1)
1	2.8700	2.8600
3	2.8500	3.1000
5	3.0000	3.0300
7	2.9200	2.8300
9	3.1500	2.9500
11	3.1700	2.9000
13	2.8300	3.0200
15	2.8200	3.1600
17	3.0400	2.9700
19	2.9900	2.9900
21	3.0900	3.1200
23	3.0000	2.9100
25	3.1300	2.9900
27	2.9700	3.0400
29	3.1200	3.0500
31	3.1400	3.0000
33	2.9200	3.1500
35	3.1200	2.9500
37	2.9900	2.9300
39	3.2300	2.9200
41	2.9900	2.8600
43	2.9600	3.0000
45	2.8600	2.9200
47	3.1500	2.9800
49	3.0500	2.9500


NO %
GULF 1391
ROMAX = 2.99%
18
16
14
12
10
8
6
4
2
0
36
32
28
24
20
16
12
8
4
0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLF68
1

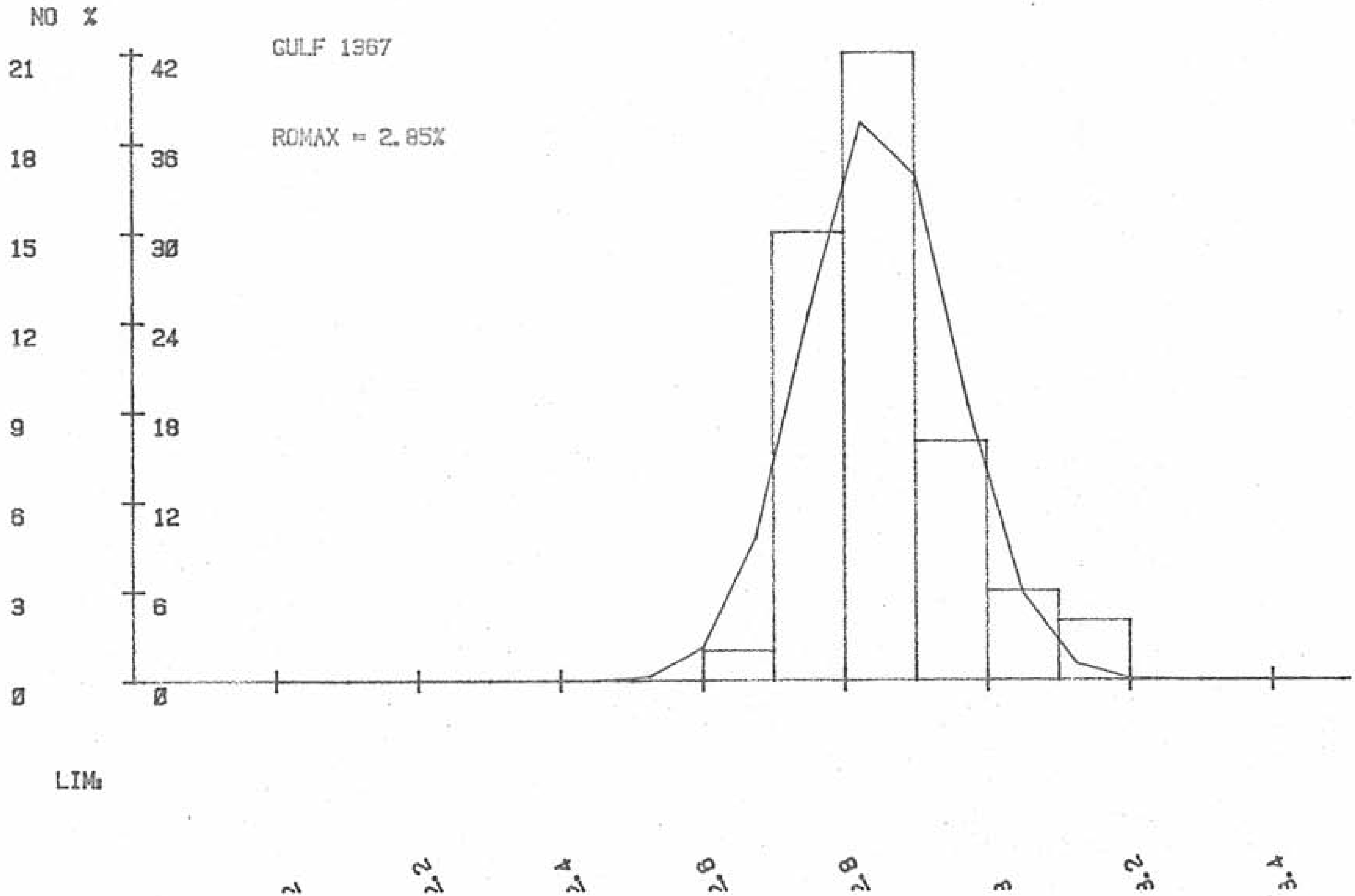
	X(I)	X(I+1)
1	3.3900	3.4800
3	3.3400	3.5700
5	3.6100	3.1900
7	3.5400	3.6400
9	3.4800	3.3800
11	3.4700	3.2700
13	3.5000	3.4000
15	3.3000	3.3100
17	3.2400	3.3300
19	3.4300	3.5400
21	3.5100	3.6100
23	3.4700	3.5700
25	3.3500	3.1600
27	3.6300	3.5500
29	3.5700	3.4400
31	3.4500	3.3400
33	3.3400	3.4600
35	3.3600	3.6000
37	3.5100	3.4400
39	3.3600	3.5400
41	3.3800	3.4400
43	3.4500	3.4400
45	3.6300	3.4200
47	3.4300	3.2700
49	3.7200	3.4800



NO %
GULF 1368
ROMAX = 3.45%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

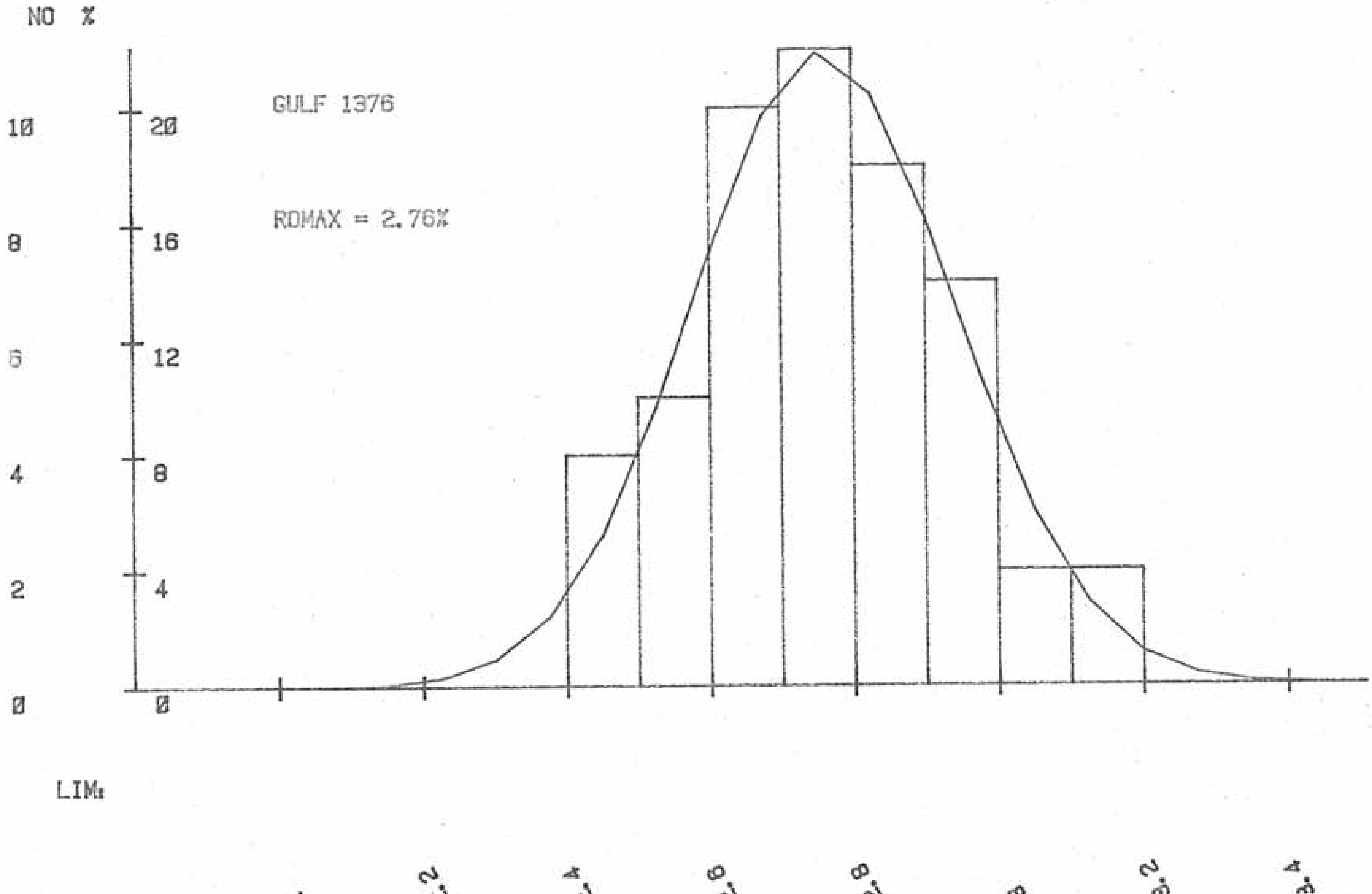
GLF67

I	X(I)	X(I+1)
1	2.8300	2.8300
3	2.7000	2.8200
5	2.8300	2.9100
7	2.9400	2.8600
9	2.8200	2.6700
11	2.7500	2.8100
13	2.7000	2.8000
15	2.7300	2.7700
17	2.7300	3.0200
19	3.0600	2.8400
21	2.7800	2.8400
23	3.1500	2.7800
25	2.9400	2.9800
27	2.7200	2.8900
29	2.8900	3.1100
31	2.7200	2.8700
33	2.9500	2.7600
35	2.8400	2.9100
37	2.8500	2.8700
39	2.7600	2.7600
41	2.7900	2.9000
43	2.8300	2.8300
45	3.0200	2.7800
47	2.9200	2.8900
49	2.8200	2.8500


NO %
GULF 1367
ROMAX = 2.85%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM.
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLP76

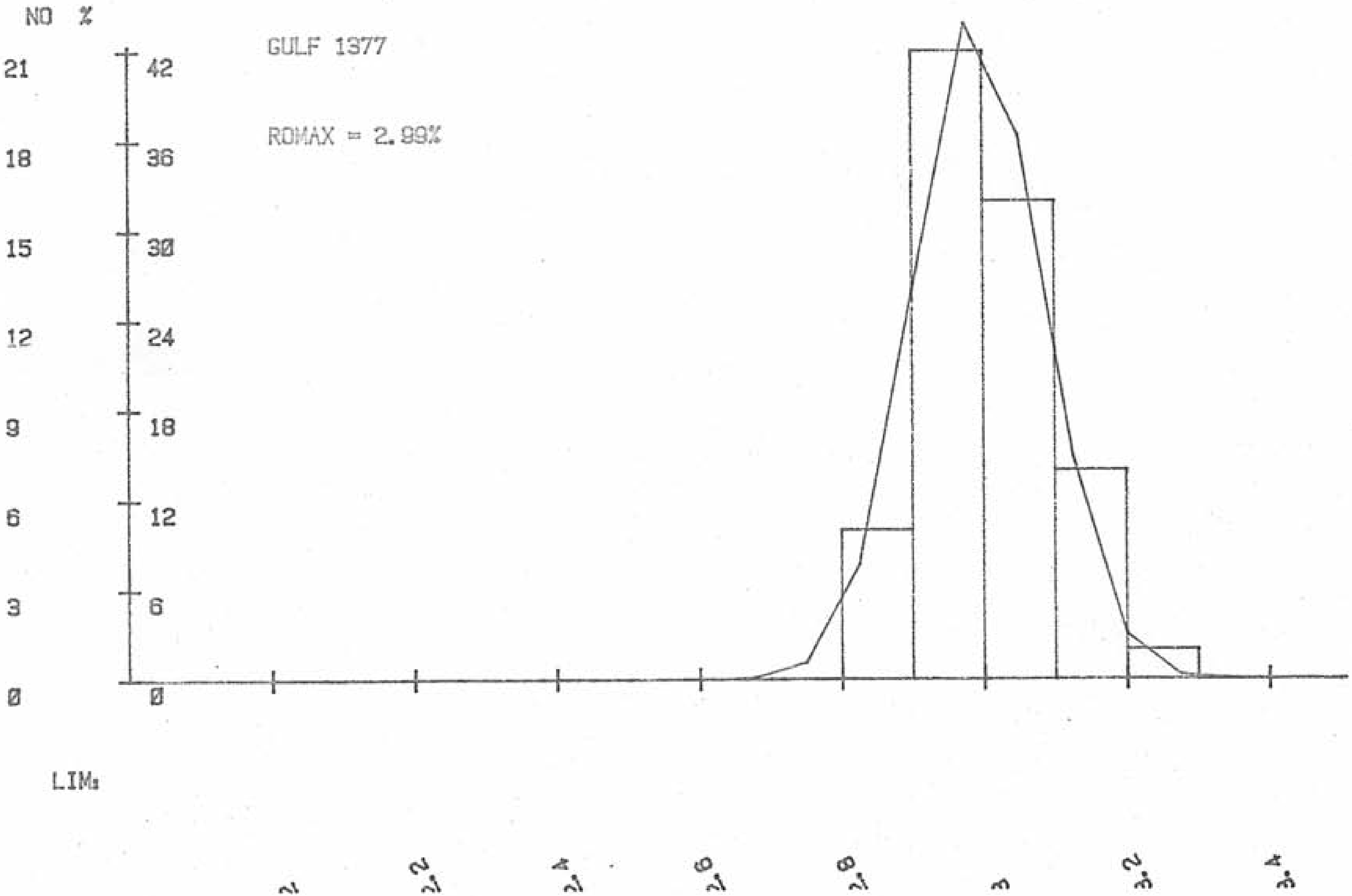
I	X(I)	X(I+1)
1	2.6300	3.1900
3	2.8200	2.9400
5	3.0800	3.1500
7	2.6000	2.7200
9	2.6800	2.9500
11	2.7400	2.8800
13	2.6000	2.7700
15	2.7600	2.6800
17	2.8000	2.4200
19	2.8500	2.7300
21	2.7300	2.8100
23	2.5300	2.9400
25	2.7500	2.6800
27	2.4700	2.4500
29	2.7800	2.9100
31	2.4700	2.8100
33	2.8600	2.5800
35	2.9700	3.0900
37	2.8800	2.6300
39	2.6900	2.5100
41	2.7200	2.7500
43	2.5600	2.5600
45	2.6600	2.8300
47	2.9600	2.7600
49	2.9800	2.6000



NO %
GULF 1376
RDMAX = 2.76%
10
8
6
4
2
0
20
16
12
8
4
0
LIM:
2.2
2.4
2.6
2.8
3
3.2
3.4

GLF770

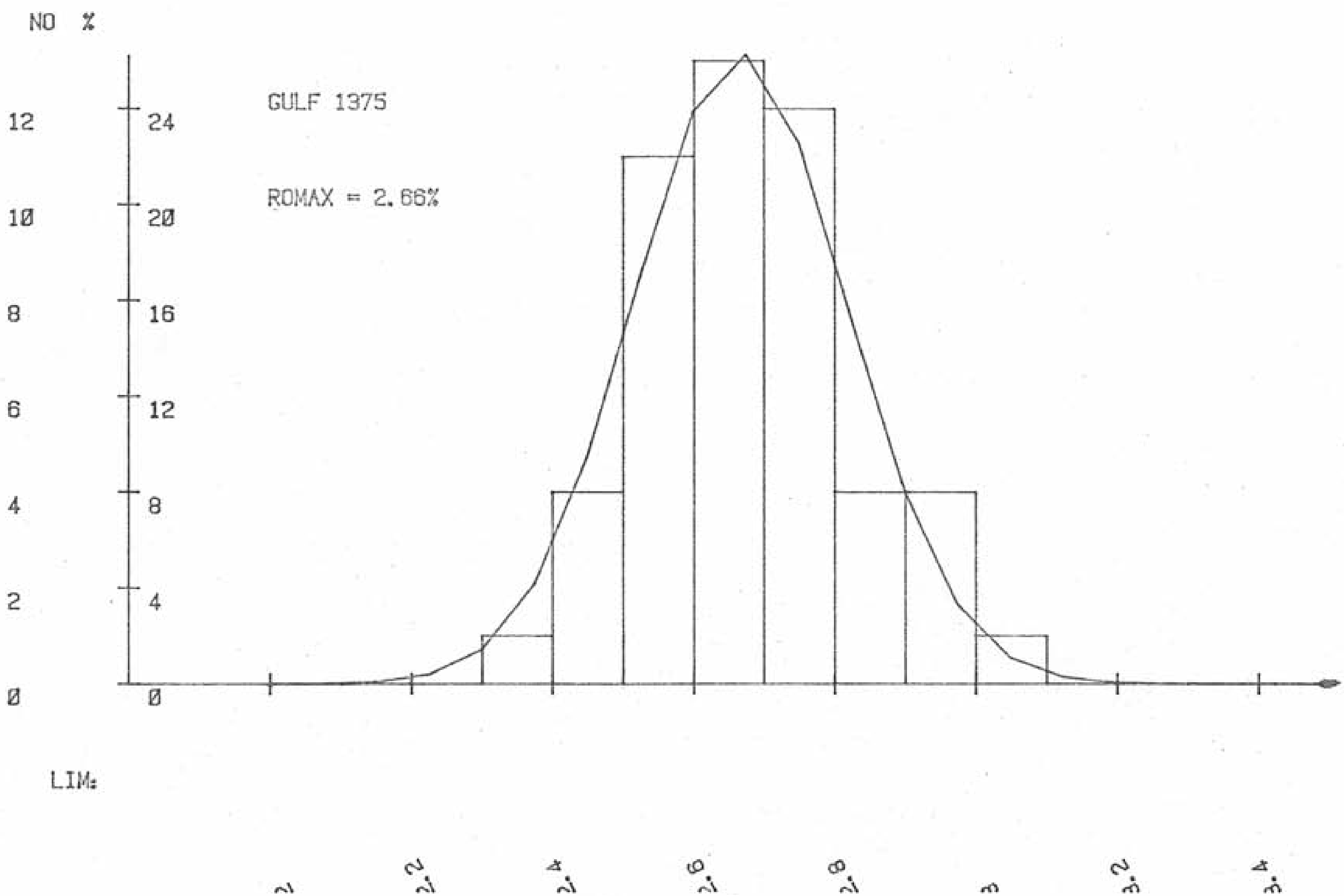
I	X(1)	X(I+1)
1	3.1000	3.0200
3	2.9500	2.9000
5	3.0600	2.8500
7	2.9200	3.0500
9	2.8000	3.1000
11	3.0800	3.0300
13	2.8800	2.8900
15	3.0700	3.1400
17	2.9400	3.1200
19	3.0800	2.9200
21	3.0100	2.9600
23	2.9100	2.9400
25	2.9400	2.9200
27	2.9500	3.0900
29	2.9100	2.9900
31	3.0000	3.2000
33	2.9400	3.0700
35	3.1200	3.0200
37	2.9300	3.1900
39	2.9500	3.0000
41	2.9200	2.8900
43	3.0200	2.9600
45	3.1000	3.0200
47	2.9400	3.0000
49	2.9200	2.9200



NO %
GULF 1377
ROMAX = 2.99%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.
2.2
2.4
2.6
2.8
3
3.2
3.4

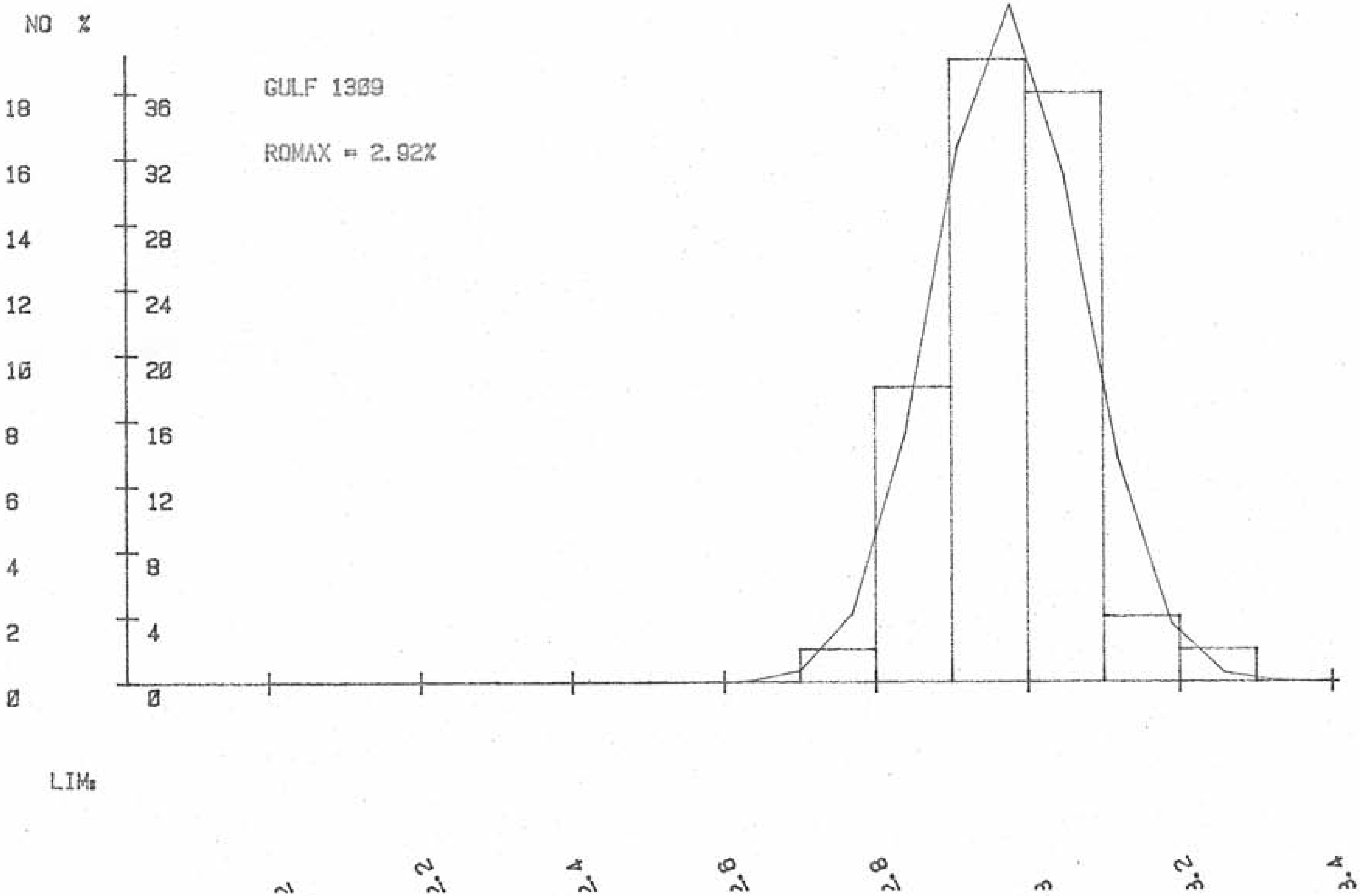
GLF75

I	X(I)	X(I+1)
1	3.0000	2.6000
3	2.8300	2.3000
5	2.9300	2.5500
7	2.7300	2.7400
9	2.7500	2.6400
11	2.7100	2.6500
13	2.5500	2.5500
15	2.8800	2.7400
17	2.6100	2.5000
19	2.6400	2.6000
21	2.9600	2.9000
23	2.8900	2.6500
25	2.8500	2.6700
27	2.7000	2.6500
29	2.4800	2.4500
31	2.6200	2.5900
33	2.6900	2.7200
35	2.7000	2.4200
37	2.7000	2.4700
39	2.7500	2.7200
41	2.5300	2.5300
43	2.9600	2.5800
45	2.6500	2.6000
47	2.5200	2.7000
49	2.5900	2.5200


NO %
GULF 1375
ROMAX = 2.66%
12
10
8
6
4
2
Ø
24
20
16
12
8
4
Ø
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLF09B

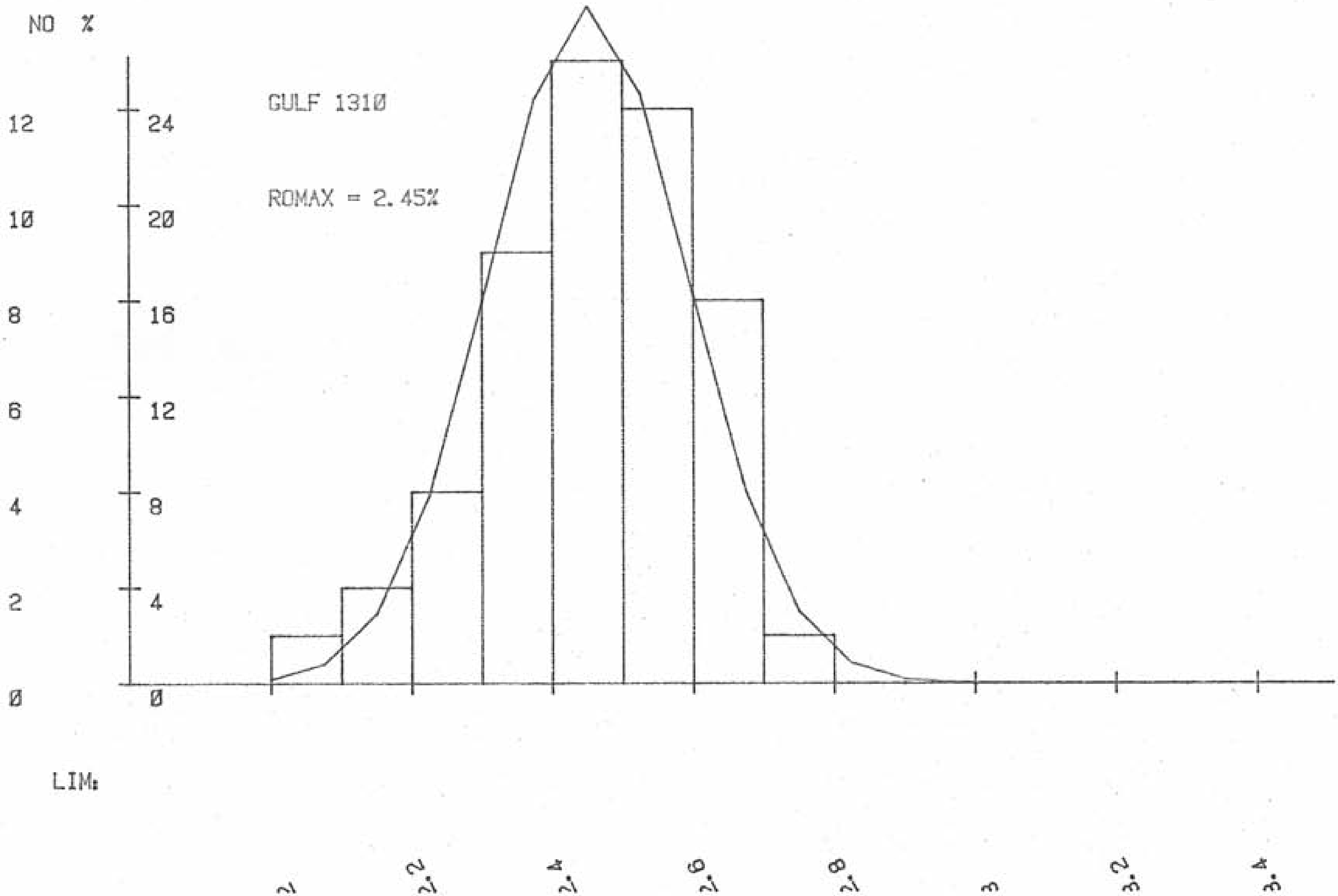
I	X(I)	X(I+1)
1	2.9000	2.8800
3	2.9100	3.0500
5	3.0400	3.0400
7	2.9800	2.9600
9	2.9700	3.0100
11	2.8000	3.0800
13	2.8500	3.2300
15	3.1600	3.0200
17	2.9600	3.0100
19	3.0200	2.9800
21	3.0600	2.8500
23	2.9700	2.8600
25	2.9400	2.9900
27	3.0200	2.9100
29	2.980[illegible]	2.9100
31	2.91[illegible]	2.9600
33	2.8800	3.0900
35	3.0300	2.9200
37	2.7400	2.9800
39	2.880[illegible]	2.8300
41	2.8400	3.0600
43	3.0100	3.0900
45	3.0800	3.0400
47	3.1400	2.9400
49	3.0700	2.9900



NO
%
GULF 13Ø9
ROMAX = 2.92%
18
16
14
12
1Ø
8
6
4
2
Ø
36
32
28
24
2Ø
16
12
8
4
Ø
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLFIO

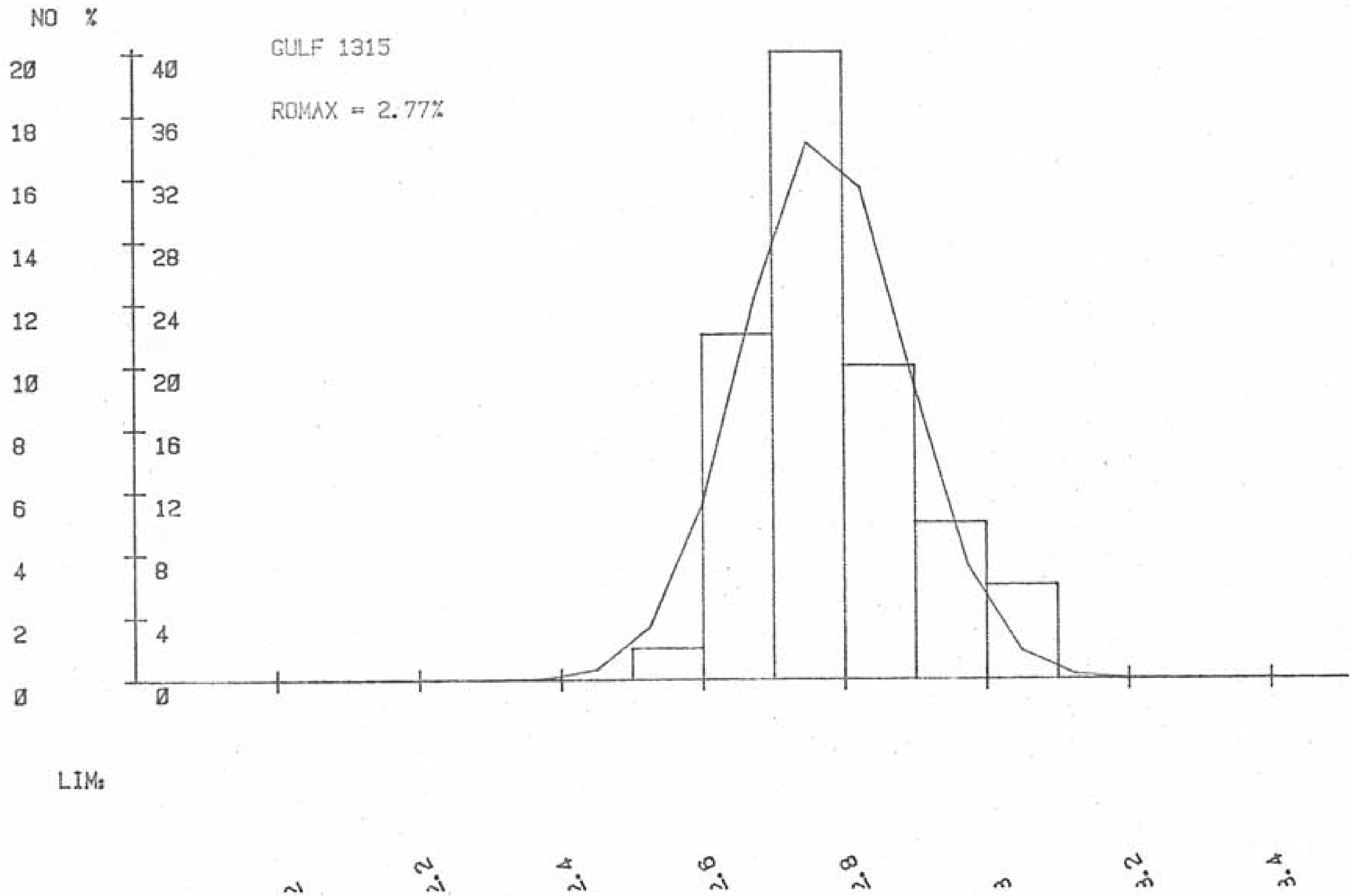
I	X(I)	X(I+1)
1	2.0900	2.1600
3	2.4900	2.4900
5	2.4900	2.5600
7	2.3800	2.5100
9	2.4900	2.6300
11	2.3700	2.6100
13	2.4600	2.4800
15	2.7000	2.3400
17	2.3900	2.4300
19	2.2300	2.2900
21	2.3000	2.3600
23	2.5200	2.4400
25	2.5300	2.4000
27	2.6400	2.3000
29	2.3100	2.5000
31	2.1800	2.5500
33	2.4000	2.6300
35	2.3300	2.5700
37	2.5300	2.2500
39	2.5400	2.6700
41	2.5100	2.5100
43	2.4600	2.6600
45	2.5000	2.4400
47	2.6100	2.2500
49	2.6000	2.4800



NO %
GULF 1310
ROMAX = 2.45%
12
10
8
6
4
2
0
24
20
16
12
8
4
0
LIM:
2.2
2.4
2.6
2.8
3
3.2
3.4

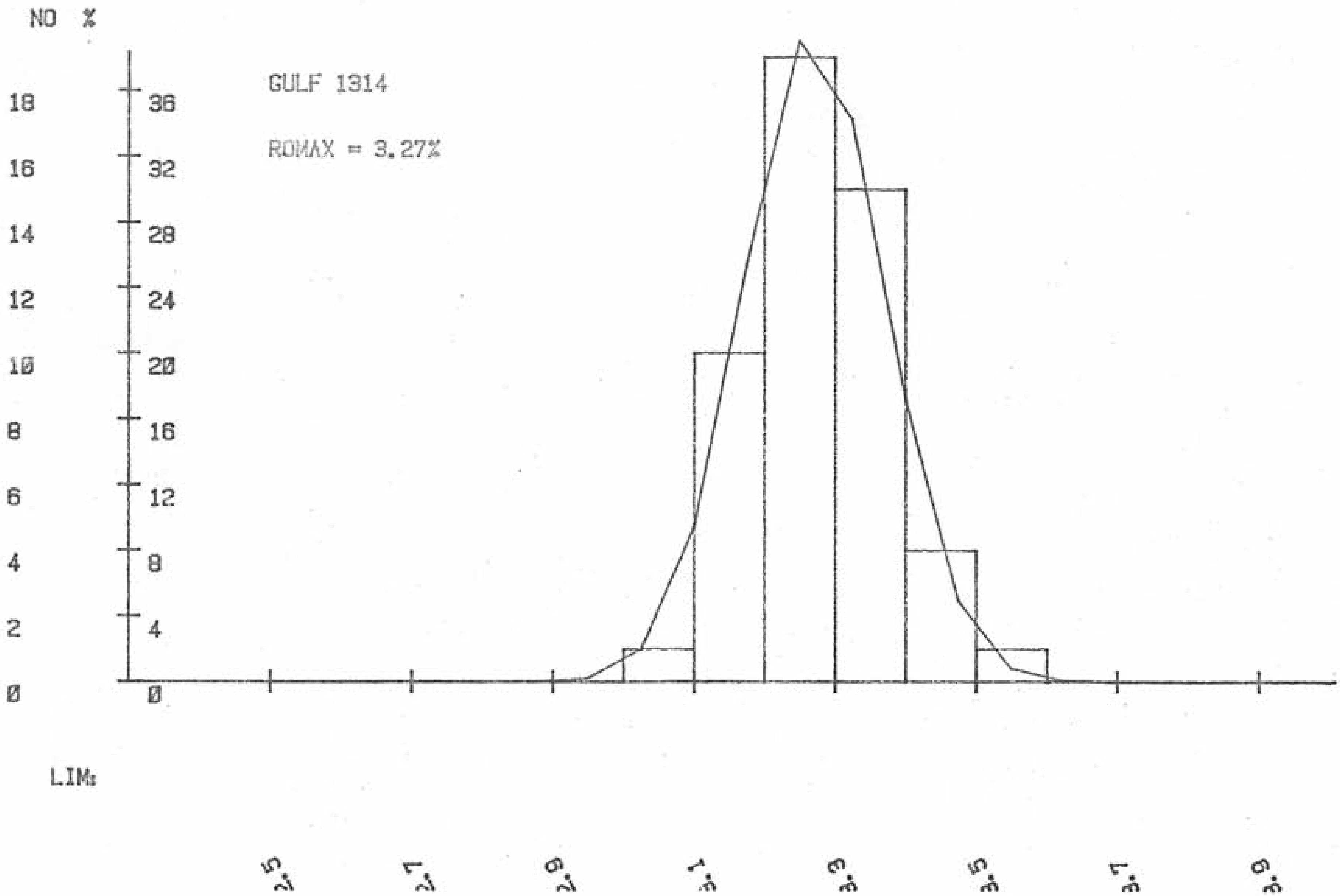
GLF11

I	X(I)	X(I+1)
1	2.7000	2.3600
3	2.8900	3.0400
5	2.9600	2.9000
7	2.8500	2.7900
9	2.8300	3.0100
11	3.0000	2.7400
13	2.6000	2.8600
15	2.6800	2.9700
17	2.8800	2.8200
19	3.0200	2.6800
21	2.7200	2.9200
23	2.7500	3.0400
25	2.9600	2.8200
27	2.9000	2.9400
29	2.8200	2.9700
31	2.7000	2.9800
33	2.8800	2.8200
35	2.9200	3.0500
37	2.9600	2.8600
39	2.7400	2.9800
41	2.6400	2.8600
43	2.7200	2.8600
45	2.9400	2.9500
47	2.3300	2.8100
49	2.8700	2.9500


NO %
GULF 1315
ROMAX = 2.77%
20 40
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

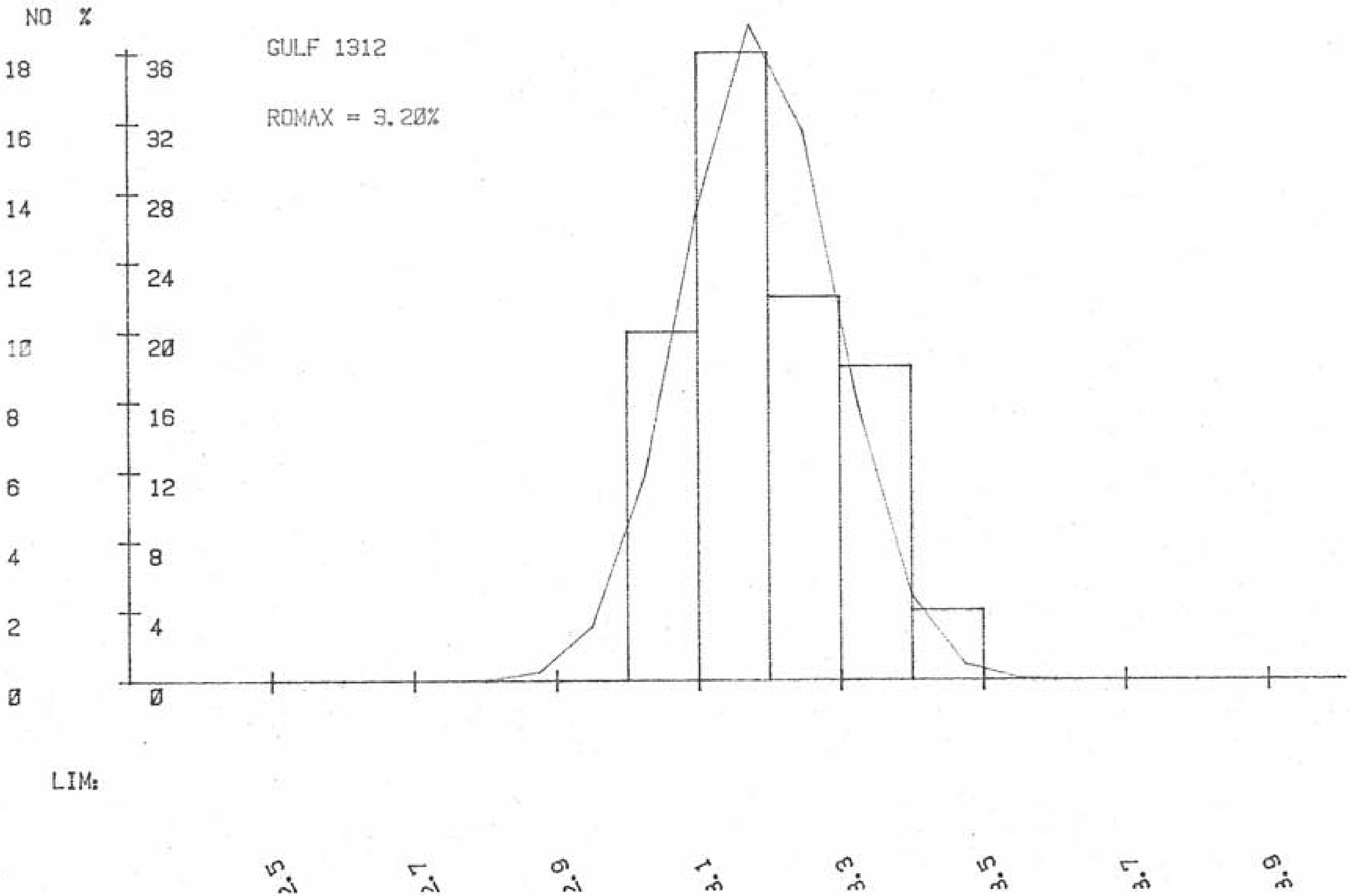
GLF14

I	X(I)	X(I+1)
1	3.2500	3.3500
3	3.0800	3.2100
5	3.3400	3.2100
7	3.3100	3.2800
9	3.2000	3.2900
11	3.3000	3.4600
13	3.2400	3.5500
15	3.3600	3.4400
17	3.2100	3.3300
19	3.2600	3.3200
21	3.2100	3.2000
23	3.2600	3.3100
25	3.3900	3.2700
27	3.1300	3.1400
29	3.1100	3.3200
31	3.1500	3.1600
33	3.1400	3.2900
35	3.3400	3.3500
37	3.3000	3.2800
39	3.3900	3.3300
41	3.4300	3.1700
43	3.2100	3.4500
45	3.1700	3.3000
47	3.1700	3.3200
49	3.1700	3.2600


NO %
GULF 1314
ROMAX = 3.27%
18
16
14
12
10
8
6
4
2
0
36
32
28
24
20
16
12
8
4
0
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

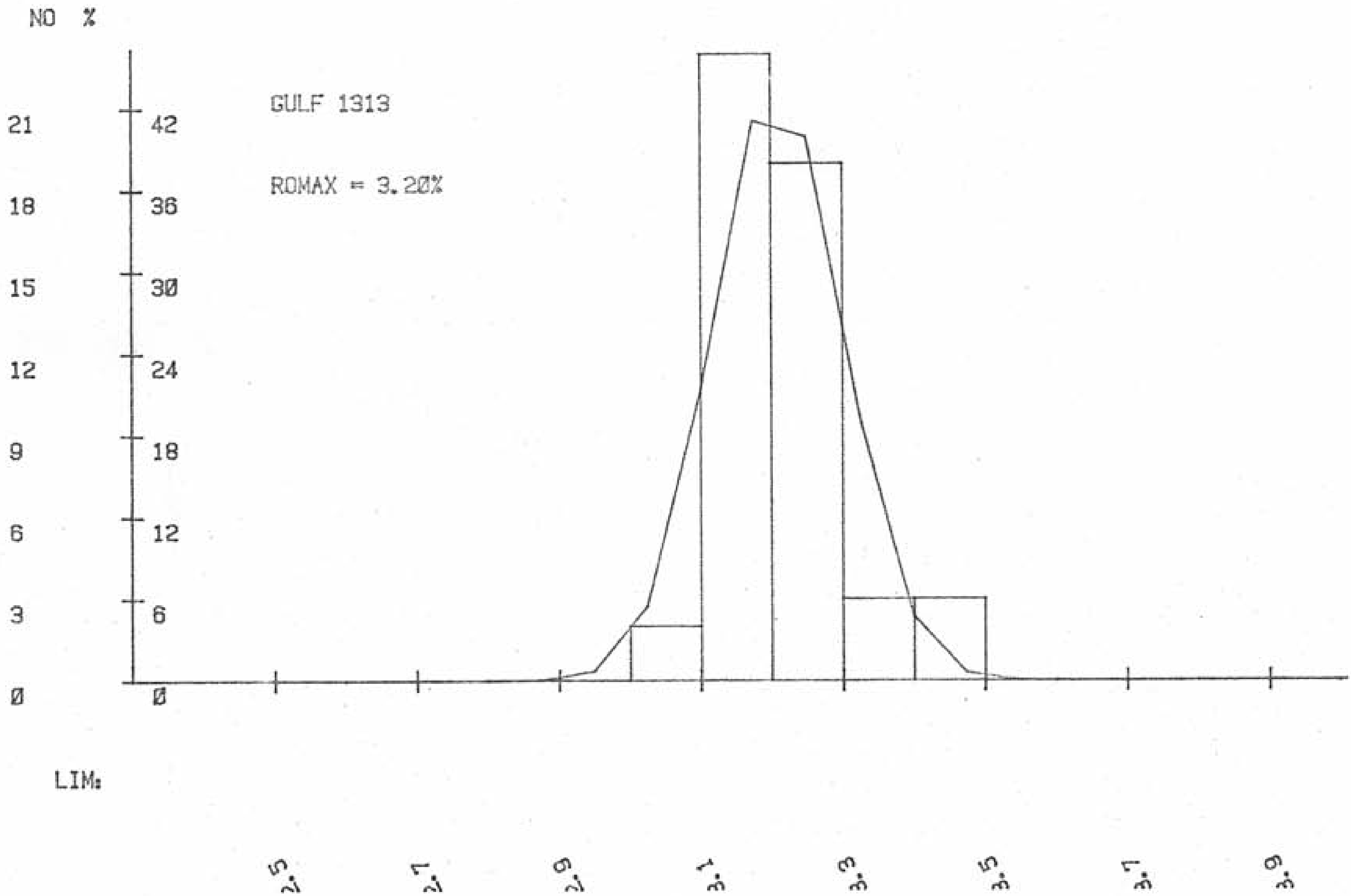
DATA12

I	X(I)	X(I+1)
1	3.2500	[illegible]
3	3.1000	3.0600
5	3.1500	3.0500
7	3.1800	3.0600
9	3.2100	3.2100
11	3.1500	3.4100
13	3.3200	3.0500
15	3.1200	3.2000
17	3.2100	3.1400
19	3.3200	3.1100
21	3.1700	3.4100
23	3.3600	3.2400
25	3.1000	3.2800
27	3.3500	3.2200
29	3.3100	3.2000
31	3.0300	3.2000
33	3.1100	3.1100
35	3.1200	3.2100
37	3.0900	3.1600
39	3.0700	3.3900
41	3.1000	3.1700
43	3.0500	3.2000
45	3.1700	3.1400
47	3.0600	3.0400
49	3.2600	3.1500


NO %
GULF 1312
ROMAX = 3.20%
18
16
14
12
10
8
6
4
2
0
36
32
28
24
20
16
12
8
4
0
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

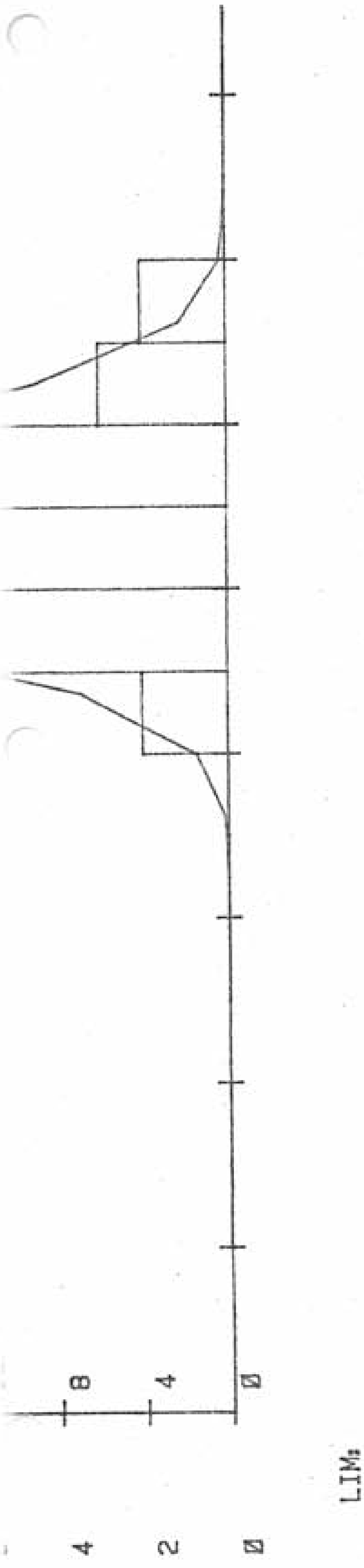
GLF12

I	X(I)	X(I+1)
1	3.1700	3.2600
3	3.1900	3.0800
5	3.2400	3.2000
7	3.3000	3.1600
9	3.1700	3.2900
11	3.2300	3.2400
13	3.2500	3.2700
15	3.4600	3.0500
17	3.1900	3.1900
19	3.2500	3.2700
21	3.3900	3.1200
23	3.1100	3.1300
25	3.1000	3.2100
27	3.2100	3.2800
29	3.1300	3.2100
31	3.1200	3.1700
33	3.1800	3.1700
35	3.2100	3.1500
37	3.2300	3.1600
39	3.4300	3.2500
41	3.1000	3.2400
43	3.4500	3.1500
45	3.3200	3.1700
47	3.1500	3.1300
49	3.2400	3.1400


NO %
GULF 1313
ROMAX = 3.20%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

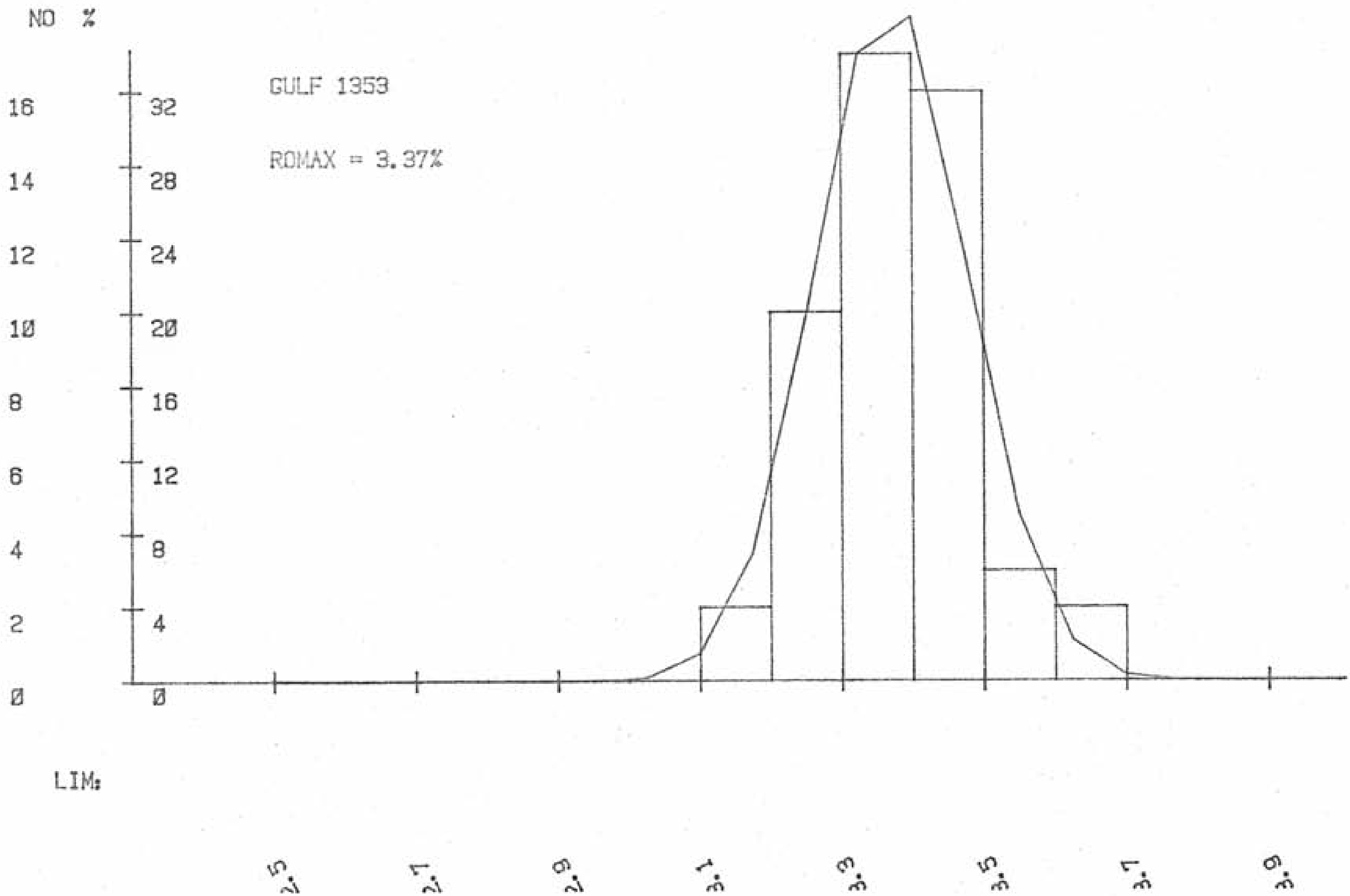
GLF5C

I	X(I)	X(I+1)
1	3.2800	3.2800
3	3.4300	3.2000
5	3.3600	3.2400
7	3.1800	3.2300
9	3.3500	3.2200
11	3.1800	3.2500
13	3.4100	3.4300
15	3.3000	3.3700
17	3.2300	3.2200
19	3.3700	3.4100
21	3.2200	3.4000
23	3.6100	3.3500
25	3.4600	3.4400
27	3.3200	3.4800
29	3.5700	3.4300
31	3.3900	3.3800
33	3.3400	3.4500
35	3.4000	3.6500
37	3.3400	3.4200
39	3.3500	3.5100
41	3.3000	3.3900
43	3.3800	3.4300
45	3.3700	3.4800
47	3.4100	3.4100
49	[illegible]	3.3300



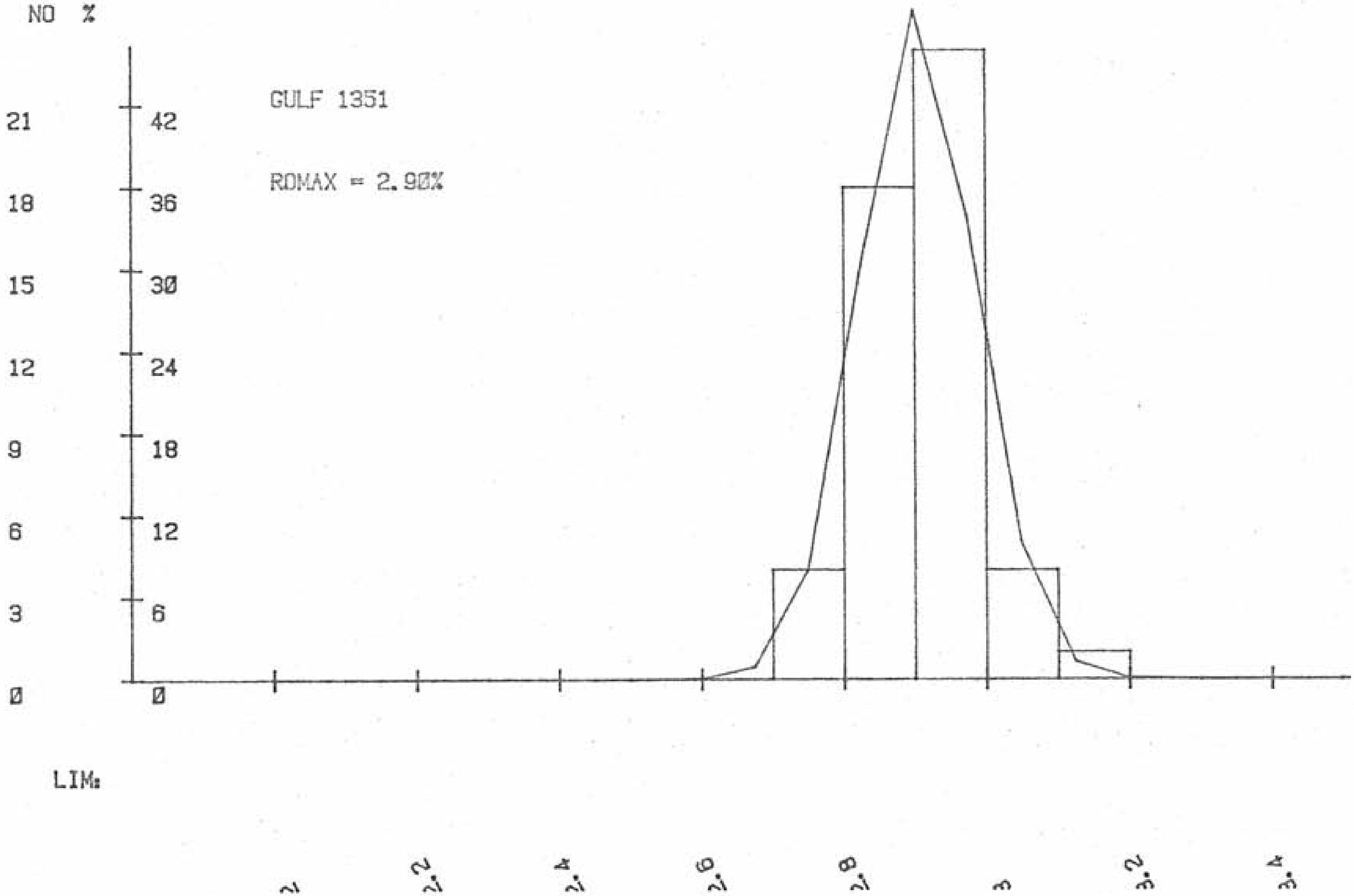
GLF52

	X(1)	X(
1	3.2800	
[illegible]	3.4300	
[illegible]	3.3600	
[illegible]	3.1800	
[illegible]	3.3500	
11	3.1800	
13	3.[illegible]100	
15	3.3000	
[illegible]	3.2800	
[illegible]	3.3700	
[illegible]	3.2200	
[illegible]	3.6100	
[illegible]	3.4600	
[illegible]	3.3200	
[illegible]	3.5700	
[illegible]	3.3900	
[illegible]	3.[illegible]400	
[illegible]	3.4000	
[illegible]	3.[illegible]400	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	


NO %
GULF 1353
ROMAX = 3.37%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

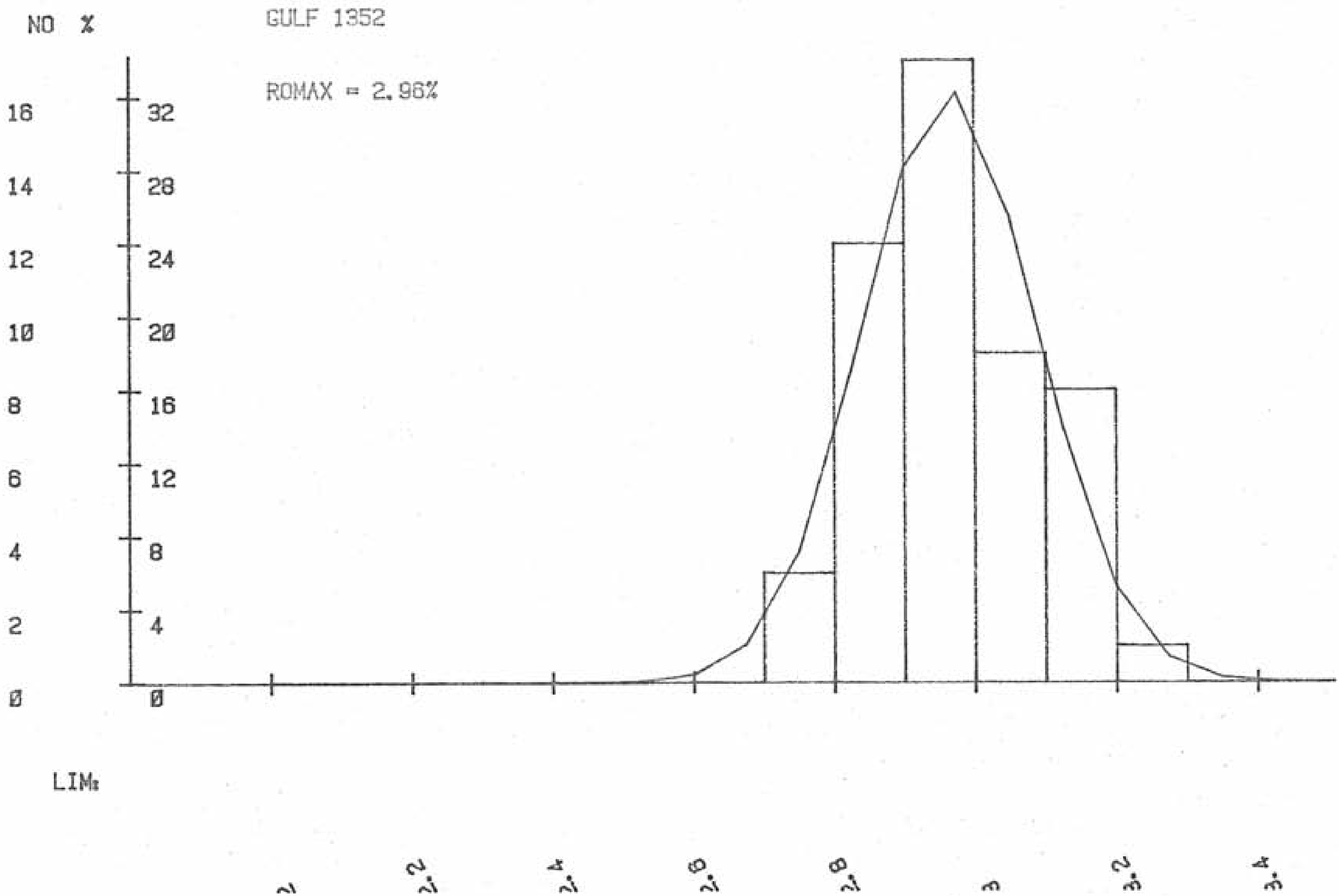
GLF[illegible]

I	X(I)	X(I+1)
1	3.0700	2.9600
3	2.7900	3.0100
5	3.1700	2.8500
7	2.9300	2.7300
9	2.9300	2.9500
11	2.9100	2.8800
13	2.9400	2.8000
15	2.9700	2.8300
17	2.9600	2.8400
19	2.8200	3.0200
21	2.[illegible]500	2.9000
23	2.9[illegible]00	2.9500
25	2.9400	2.8800
27	2.9500	2.9400
29	2.9800	2.9500
31	2.9800	2.7900
33	2.7800	2.9300
35	2.9000	2.9800
37	2.8500	2.9700
39	2.9400	2.8500
41	2.[illegible]900	2.8500
43	[illegible]	2.9800
45	[illegible]	3.0200
47	[illegible]	2.8300
49	[illegible]	2.8500


NO %
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
GULF 1351
RDMAX = 2.90%
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLF52B

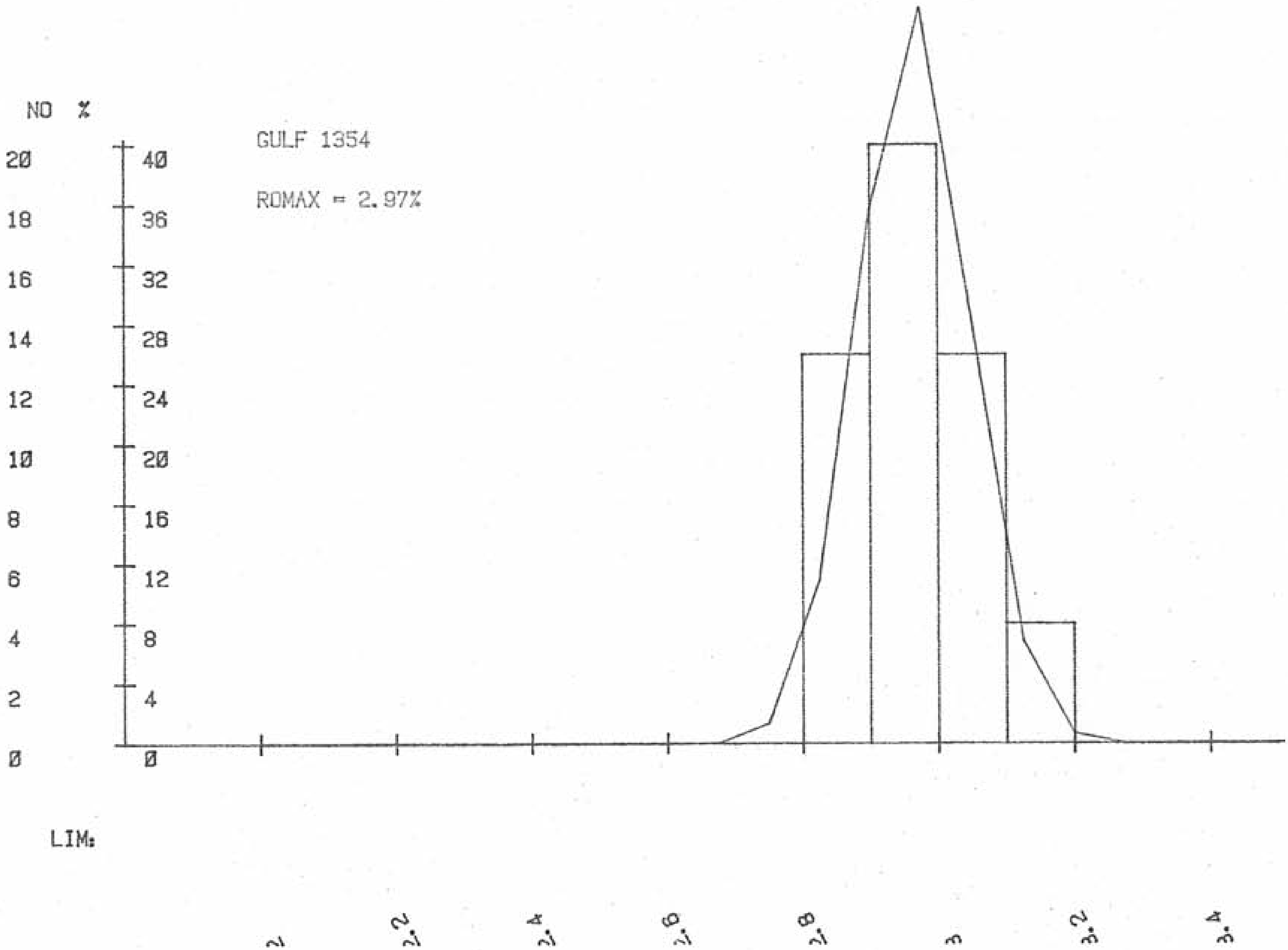
I	X(I)	X(I+1)
1	2.9700	2.9500
3	3.0600	2.8800
5	3.0600	2.9100
7	3.1400	3.1100
9	3.1000	2.8100
11	2.9400	2.7700
13	2.7700	2.9100
15	2.8200	2.8100
17	2.9900	3.0200
19	3.1600	2.8400
21	2.8000	3.0900
23	2.9800	2.9700
25	3.0400	3.1800
27	3.0100	3.2100
29	2.7000	3.0300
31	2.9600	2.8200
33	3.1200	2.9000
35	3.0500	2.8900
37	2.9700	2.9400
39	2.9600	3.0700
41	2.8900	2.9500
43	3.1700	3.1900
45	2.9100	2.8500
47	2.9800	2.8900
49	2.8200	2.9200



NO %
GULF 1352
ROMAX = 2.96%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLF54

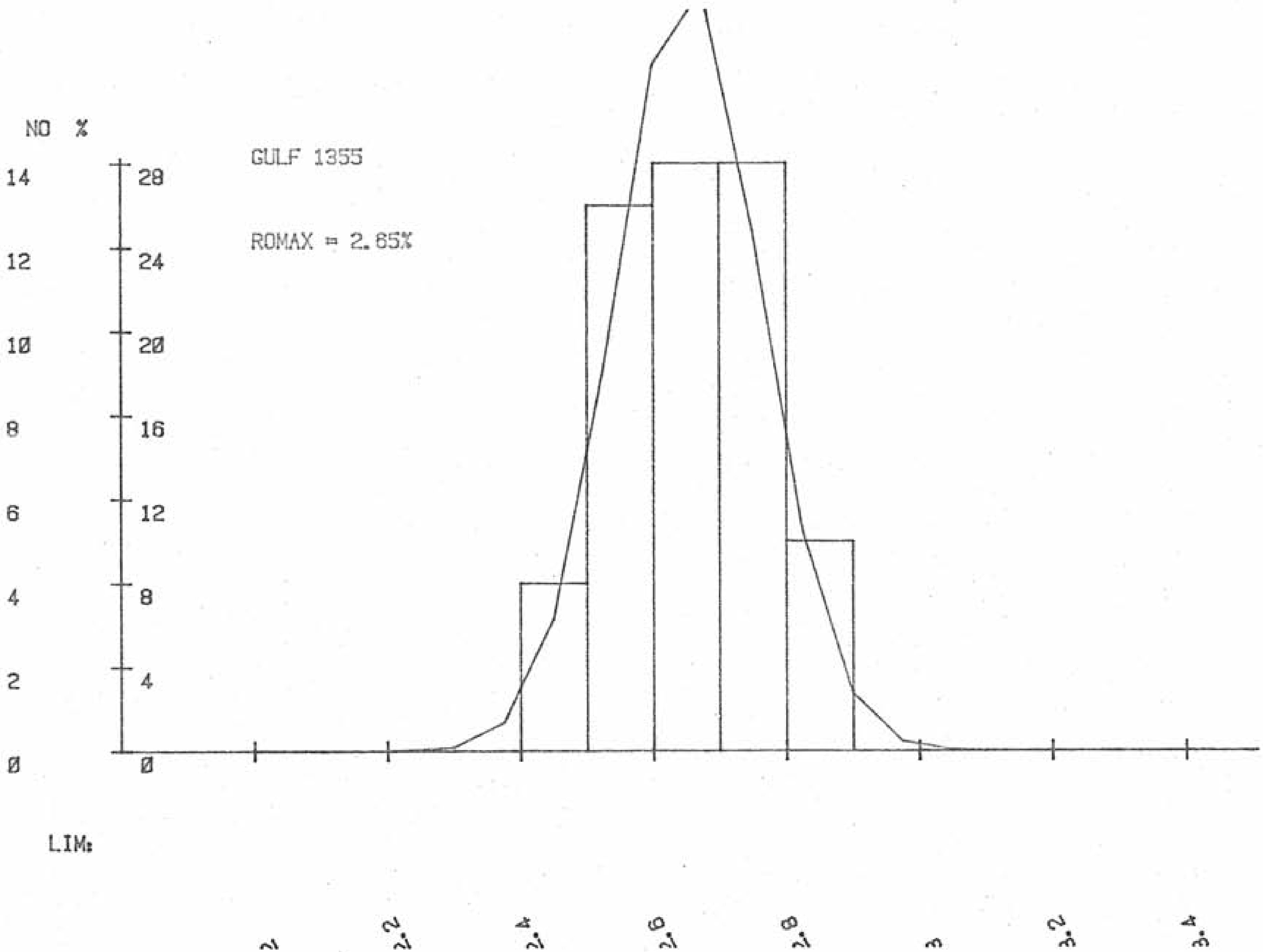
I	X(I)	X(I+1)
1	3.0300	3.1000
3	2.8800	2.9600
5	2.9700	2.9700
7	2.9900	2.9200
9	2.8200	3.1200
11	3.0200	2.9000
13	2.9900	2.9400
15	2.8800	2.8900
17	2.8300	3.0000
19	3.0500	2.9900
21	2.9500	2.8600
23	3.0900	3.0200
25	2.8500	3.0600
27	3.1000	3.0500
29	2.9400	2.9000
31	2.8800	2.8600
33	3.0200	3.0700
35	2.8400	2.8700
37	2.9500	2.9300
39	2.8900	2.9500
41	3.0300	3.0400
43	2.9700	3.1200
45	2.8900	2.9900
47	2.9300	2.9200
49	3.0200	2.9500



NO %
GULF 1354
ROMAX = 2.97%
20 40
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLF55

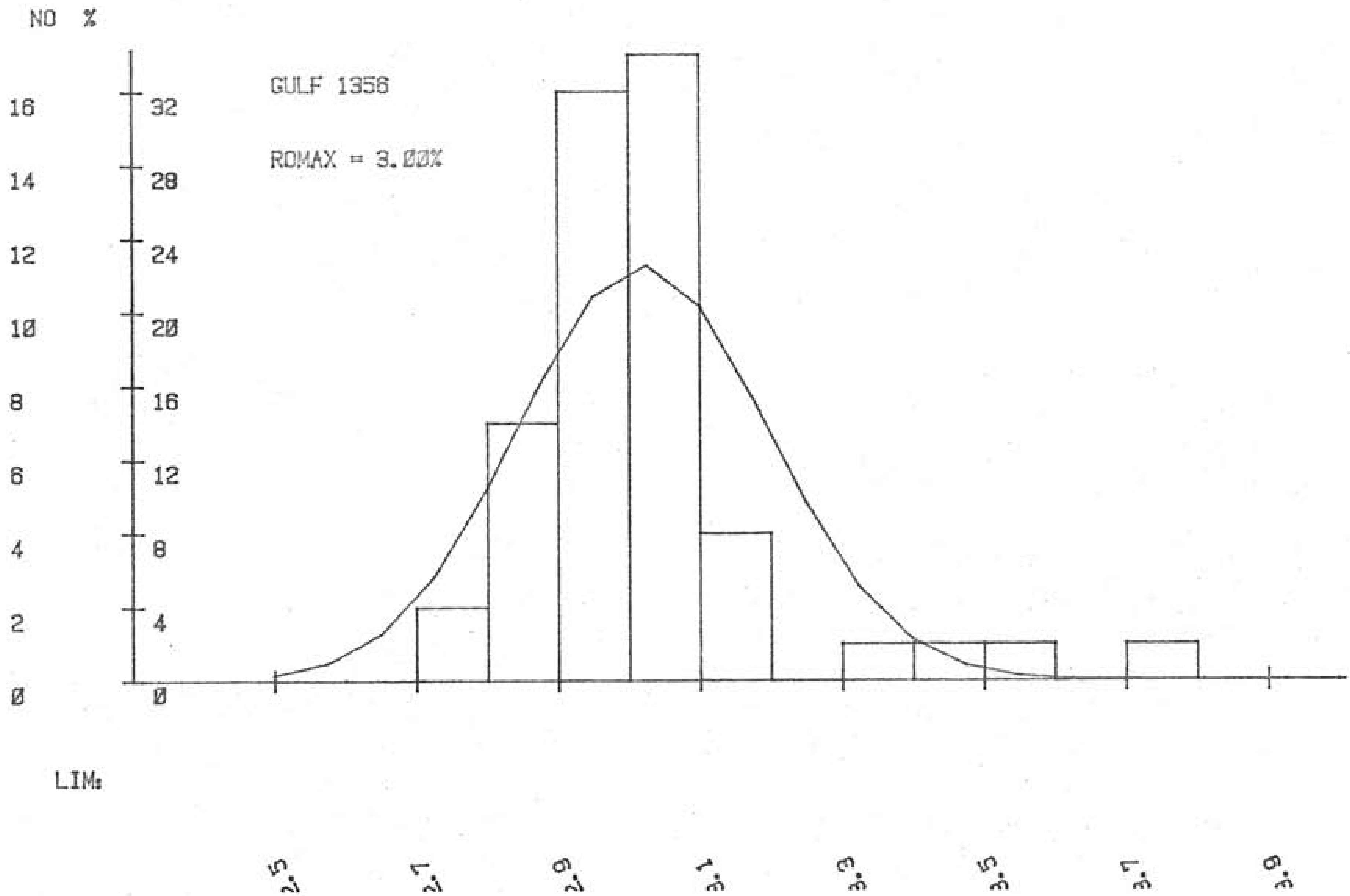
I	X(I)	X(I+1)
1	2.7800	2.7200
3	2.8400	2.7200
5	2.6500	2.6400
7	2.5200	2.7100
9	2.8000	2.8500
11	2.6000	2.5900
13	2.4800	2.5300
15	2.4500	2.7200
17	2.5700	2.6000
19	2.5800	2.5900
21	2.6900	2.5000
23	2.5600	2.4500
25	2.4800	2.5500
27	2.7500	2.7400
29	2.6400	2.8400
31	2.6500	2.7500
33	2.6800	2.7100
35	2.5800	2.5100
37	2.6600	2.7800
39	2.7900	2.5800
41	2.6500	2.6100
43	2.6500	2.8500
45	2.7800	2.5900
47	2.7200	2.6400
49	2.6500	2.7000



NO %
GULF 1355
ROMAX = 2.65%
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

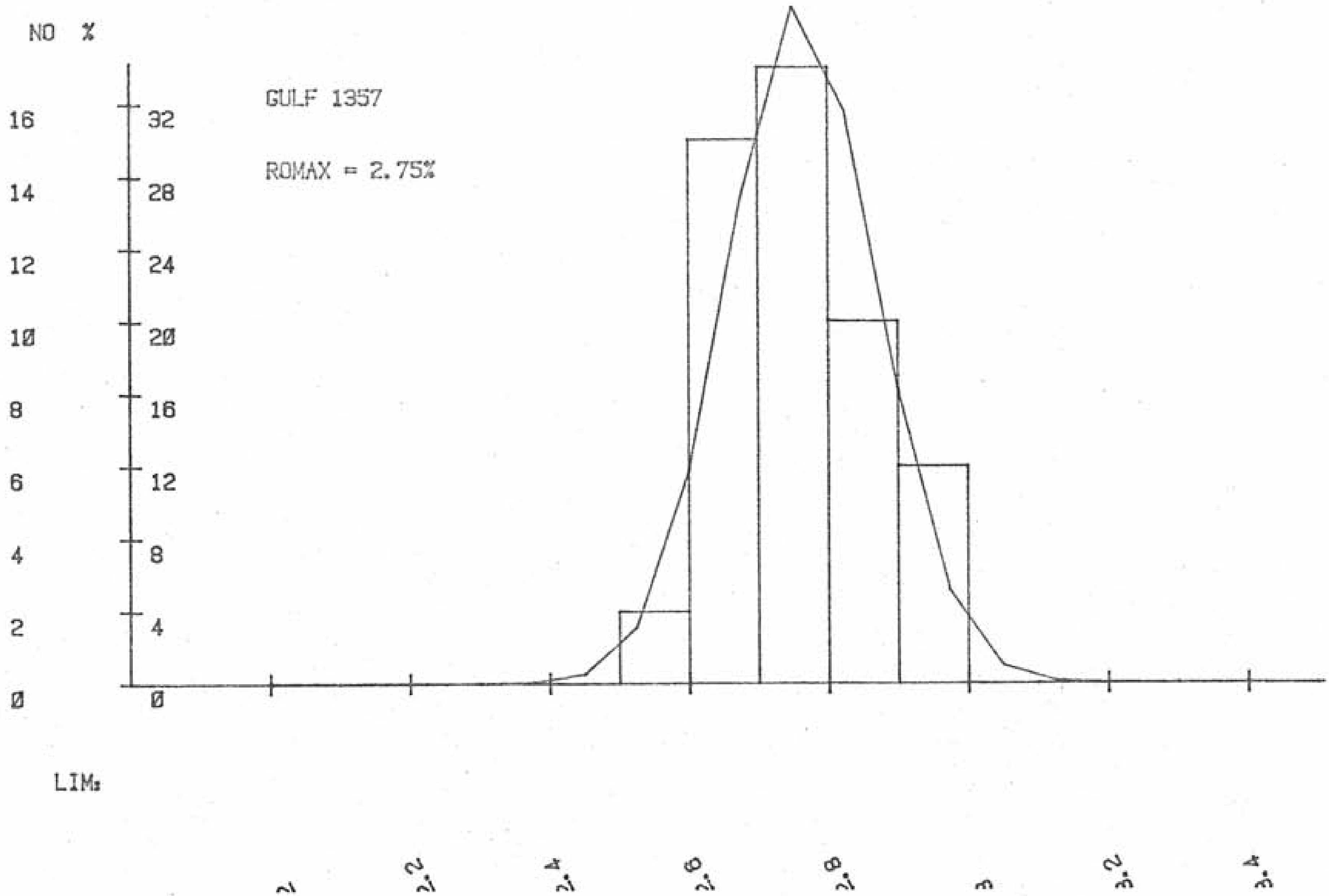
GLFSC

I	X(I)	X(I+1)
1	3.0000	2.8400
3	2.8200	3.0900
5	2.7700	2.8600
7	3.0000	2.8900
9	3.1100	3.0400
11	2.9500	2.9300
13	3.7500	3.0800
15	3.4500	3.0300
17	2.8400	3.0900
19	2.9900	2.9200
21	3.0100	3.1200
23	2.8900	2.7300
25	3.0400	2.9500
27	2.9100	3.0300
29	2.9300	3.0100
31	3.1100	3.0700
33	2.9600	2.9900
35	2.8900	3.0900
37	2.9000	2.9900
39	3.1300	2.9100
41	2.9800	2.9100
43	2.9900	3.0400
45	3.3200	3.0200
47	3.5000	2.9600
49	3.0900	3.0500


NO %
GULF 1356
ROMAX = 3.00%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

GLFST

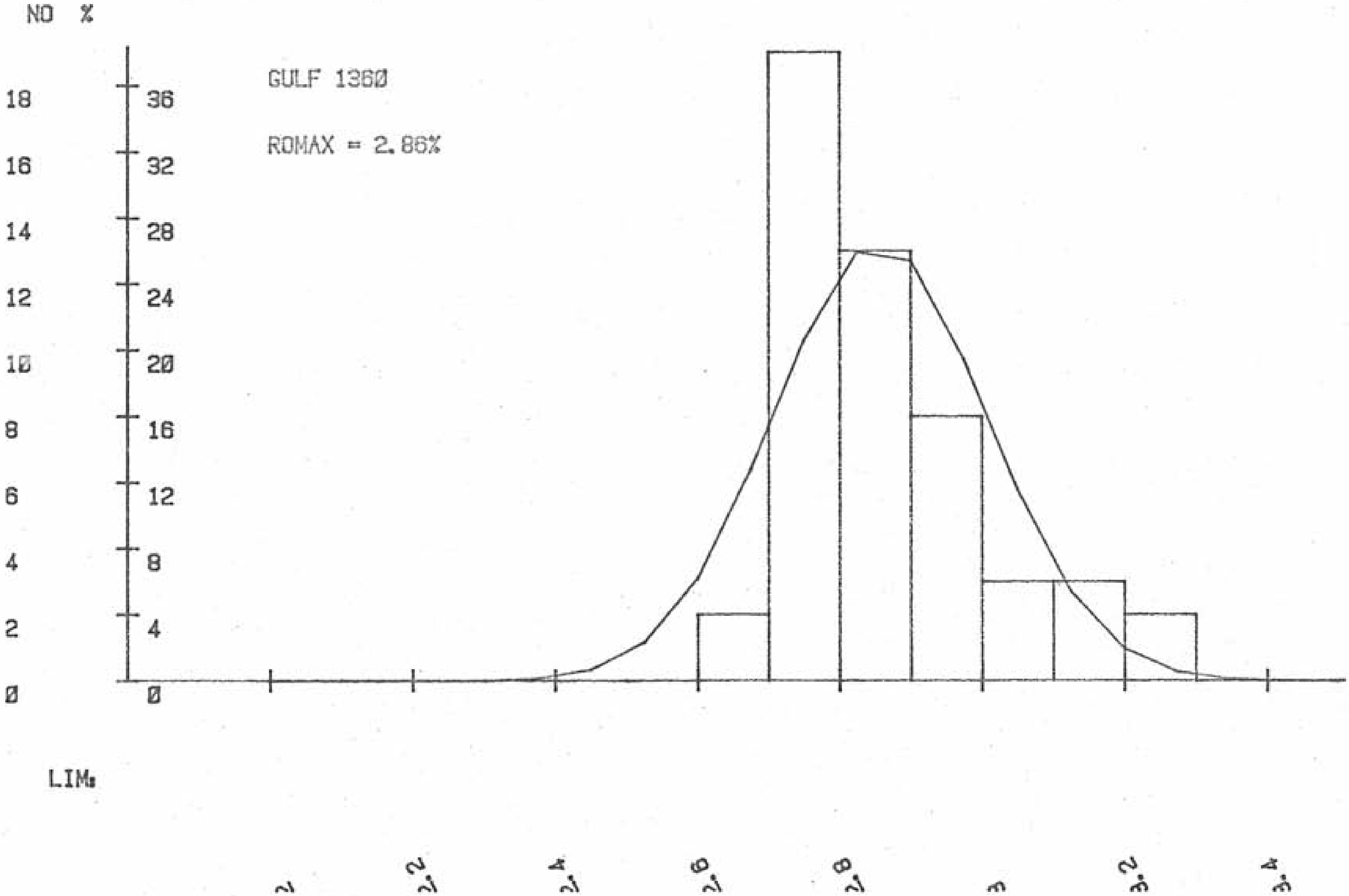
I	X(I)	X(I+1)
1	2.6900	2.5900
3	2.6300	2.8800
5	2.9700	2.7900
7	2.9200	2.8700
9	2.6300	2.8800
11	2.7400	2.5500
13	2.6800	2.8800
15	2.7700	2.6400
17	2.8700	2.6400
19	2.7000	2.6900
21	2.3200	2.7200
23	2.8800	2.7000
25	2.9800	2.9500
27	2.9200	2.7900
29	2.7300	2.7700
31	2.8800	2.6700
33	2.6700	2.6300
35	2.8600	2.8500
37	2.7600	2.6800
39	2.6800	2.7500
41	2.9000	2.7000
43	2.7900	2.7500
45	2.6900	2.6700
47	2.7700	2.7500
49	2.7300	2.6700



NO %
GULF 1357
ROMAX = 2.75%
16
14
12
10
8
6
4
2
0
32
28
24
20
16
12
8
4
0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

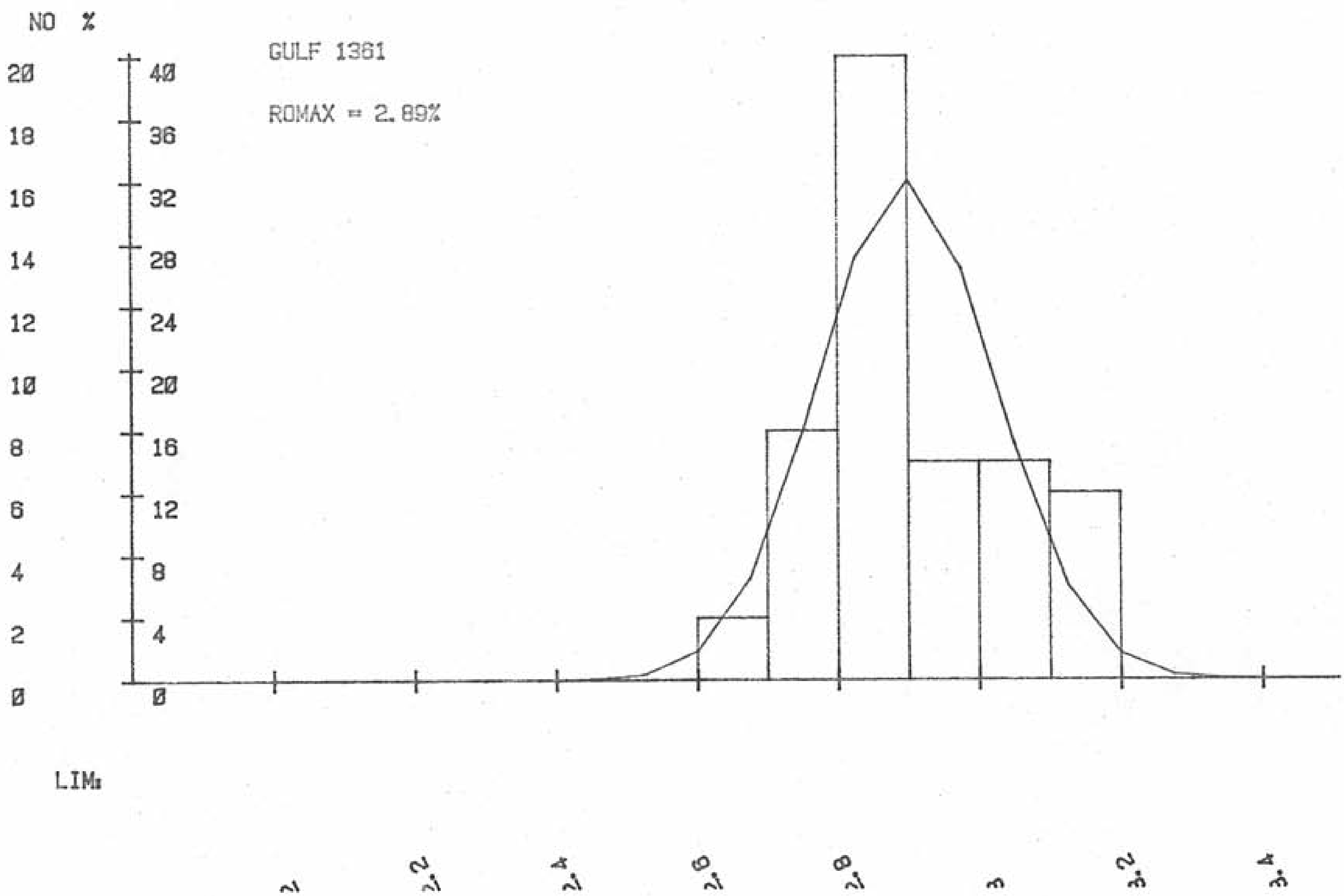
GLF60

I	X(I)	X(I+1)
1	2.9800	2.8400
3	3.2300	2.7100
5	2.7200	2.7900
7	2.9100	2.7000
9	2.7300	3.1300
11	2.7000	2.7400
13	2.7400	3.1400
15	2.7200	2.8200
17	2.8800	2.9500
19	2.6300	2.7100
21	2.7100	2.8500
23	3.0100	2.9800
25	2.7700	3.0200
27	2.7400	2.8800
29	2.8100	2.7600
31	3.1900	2.8100
33	2.8500	2.8000
35	2.9300	2.6600
37	2.8900	2.9300
39	2.9900	2.7100
41	3.2600	3.0600
43	2.9100	2.7900
45	2.9100	2.7500
47	2.9300	2.7500
49	2.8200	2.7900


NO %
GULF 1360
ROMAX = 2.86%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

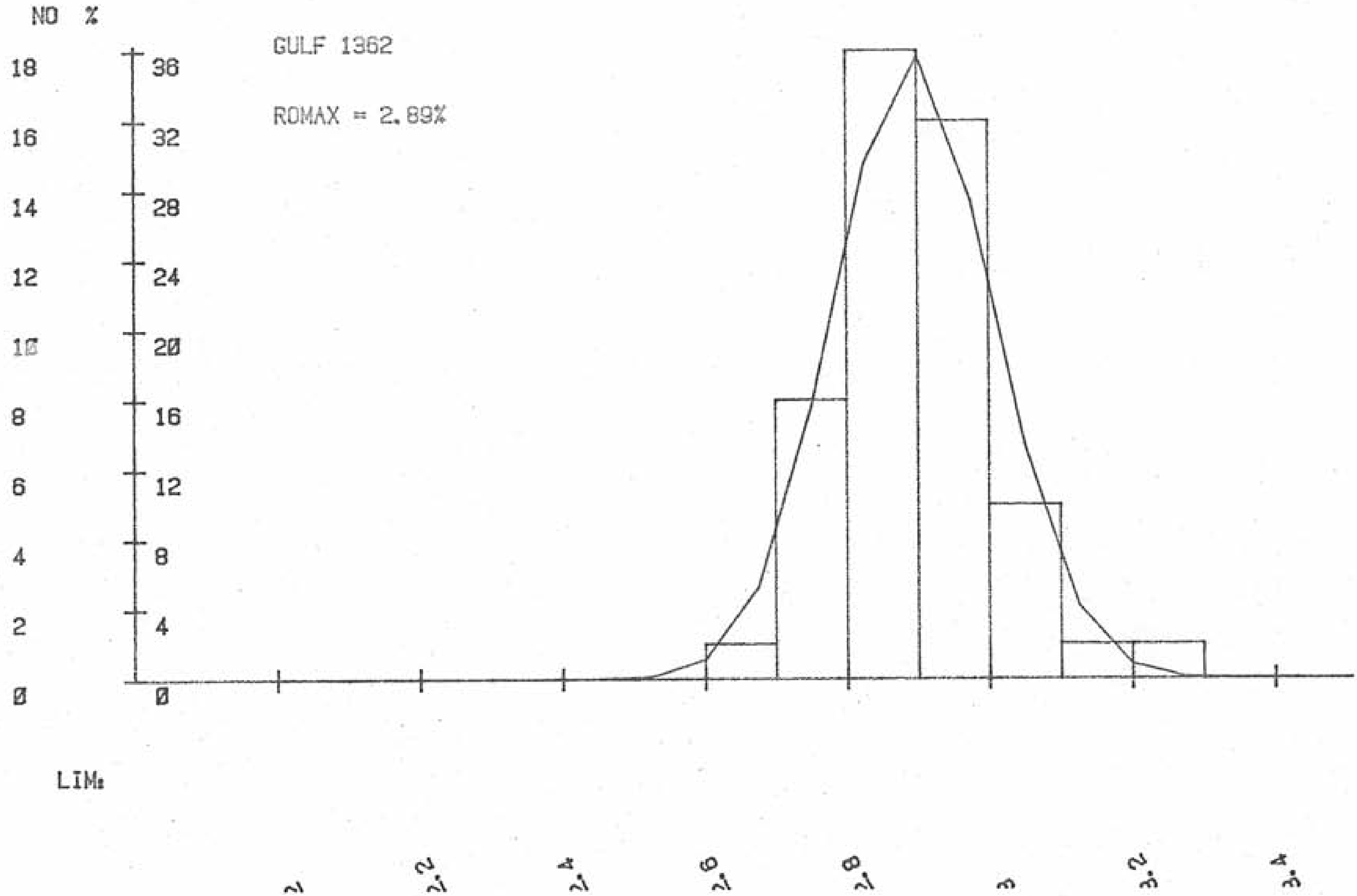
[illegible]

I	X(I)	X(I+1)
1	2.8200	2.8900
3	2.7300	2.8100
5	2.9500	2.6900
7	2.8500	2.8000
9	2.8600	2.8000
11	2.8900	2.8900
13	2.7800	2.7900
15	2.7600	2.7900
17	2.9200	2.9600
19	2.8800	2.9100
21	2.8500	2.9300
23	3.0600	3.1100
[illegible]	3.0300	3.0200
[illegible]	3.1100	3.1400
[illegible]	3.0100	3.1400
31	2.7700	2.8900
33	3.1000	2.9300
[illegible]	3.0700	3.0100
[illegible]	2.7800	2.8200
[illegible]	3.1200	2.8100
41	2.8200	2.9600
[illegible]	2.[illegible]	2.7100
[illegible]	2.9400	2.[illegible]
[illegible]	3.0300	2.8700
[illegible]	2.8100	2.[illegible]



NO %
GULF 1361
ROMAX = 2.89%
20 40
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

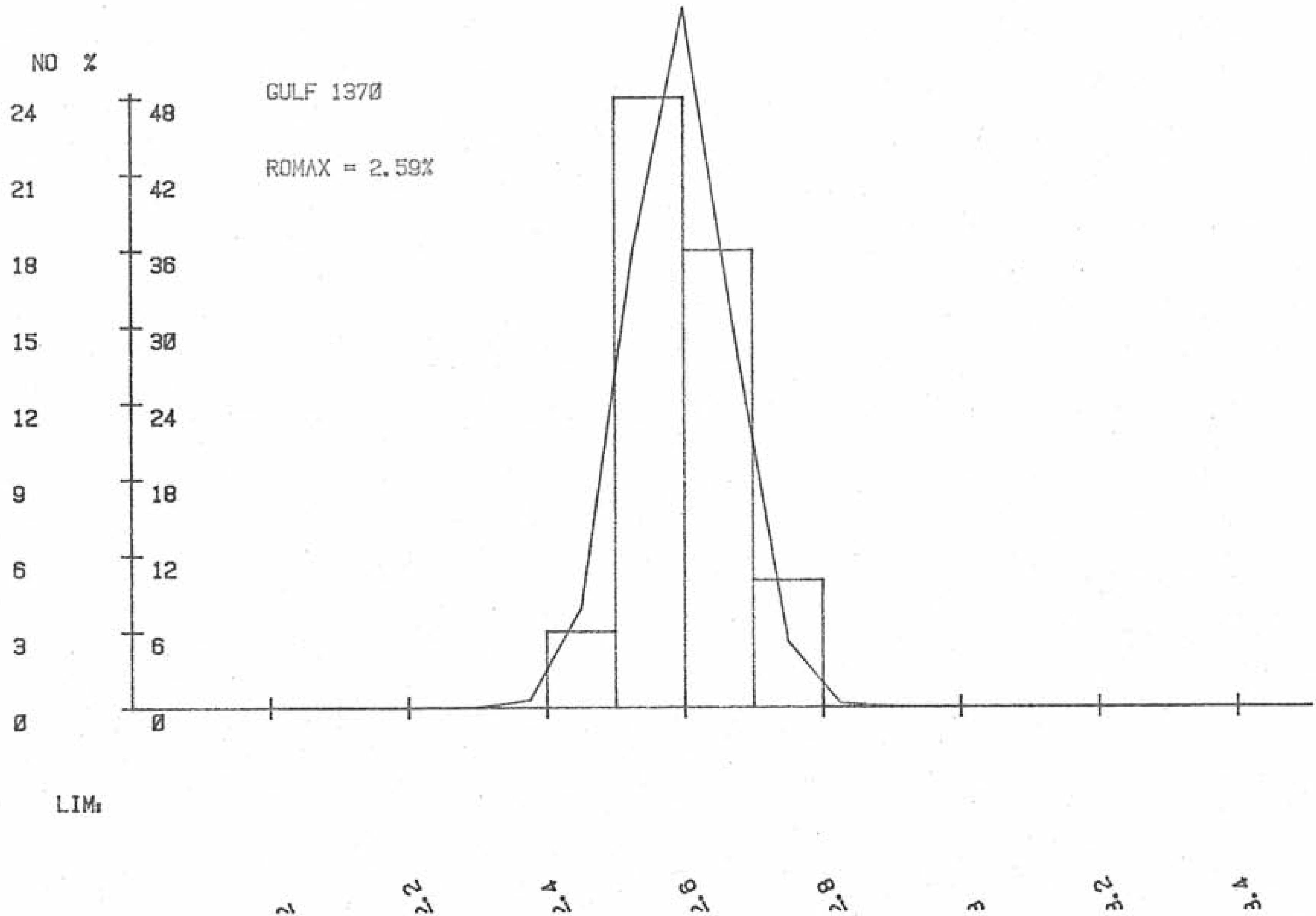
I	X(I)	X(I+1)
1	2.9800	2.9800
3	2.8200	2.9800
5	2.7200	2.8400
7	2.8300	2.8400
9	3.0500	3.0300
11	2.8300	2.8600
13	2.9300	2.9800
15	2.9500	2.7600
17	2.8100	3.2300
19	2.8700	2.7900
21	2.8200	3.0500
23	2.9500	2.9800
25	2.7800	2.6400
27	2.7300	2.8300
29	3.0000	2.7700
[illegible]	2.9500	2.8400
[illegible]	2.8200	2.8900
[illegible]	2.9000	2.9100
[illegible]	2.9300	2.9700
[illegible]	2.9400	3.1700
[illegible]	2.9900	2.9100
43	2.7900	2.8400
45	3.0000	2.8800
47	2.7700	2.9800
49	2.8700	2.8300



NO %
GULF 1362
ROMAX = 2.89%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

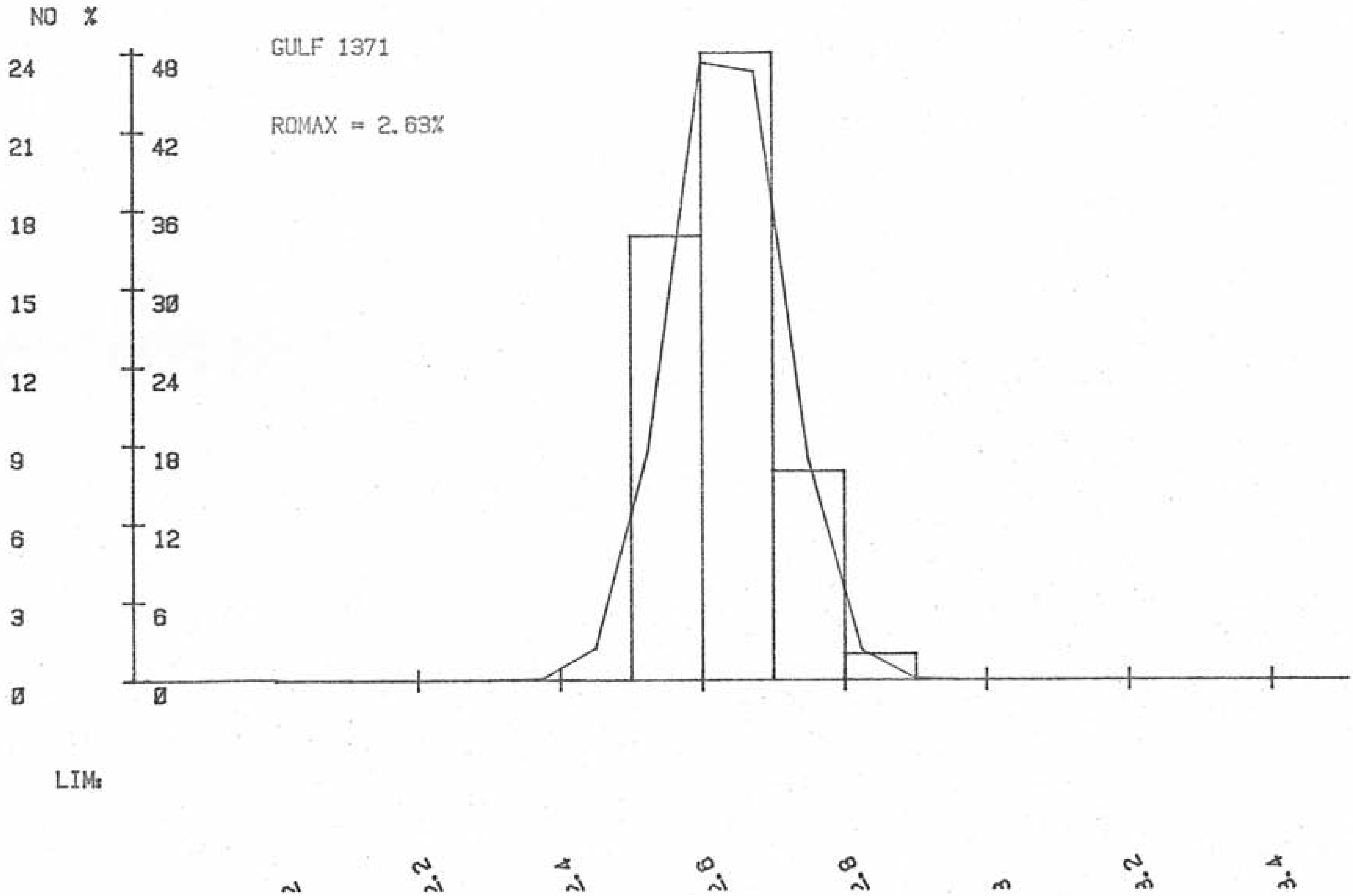
GLF70

I	X(I)	X(I+1)
1	2.5200	2.5600
3	2.6300	2.6300
5	2.6400	2.6000
7	2.6200	2.6600
9	2.6000	2.4900
11	2.6100	2.5000
13	2.6100	2.6700
15	2.6400	2.7500
17	2.5500	2.7200
19	2.5800	2.5200
21	2.5500	2.6000
23	2.7000	2.5300
25	2.5800	2.5900
27	2.6600	2.6300
29	2.7100	2.5900
31	2.4600	2.5600
33	2.5500	2.6900
35	2.6500	2.5100
37	2.5400	2.4500
39	2.5900	2.5000
41	2.5000	2.5500
43	2.5800	2.5400
45	2.5600	2.7600
47	2.5200	2.5900
49	2.5400	2.5200


NO %
GULF 1370
ROMAX = 2.59%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

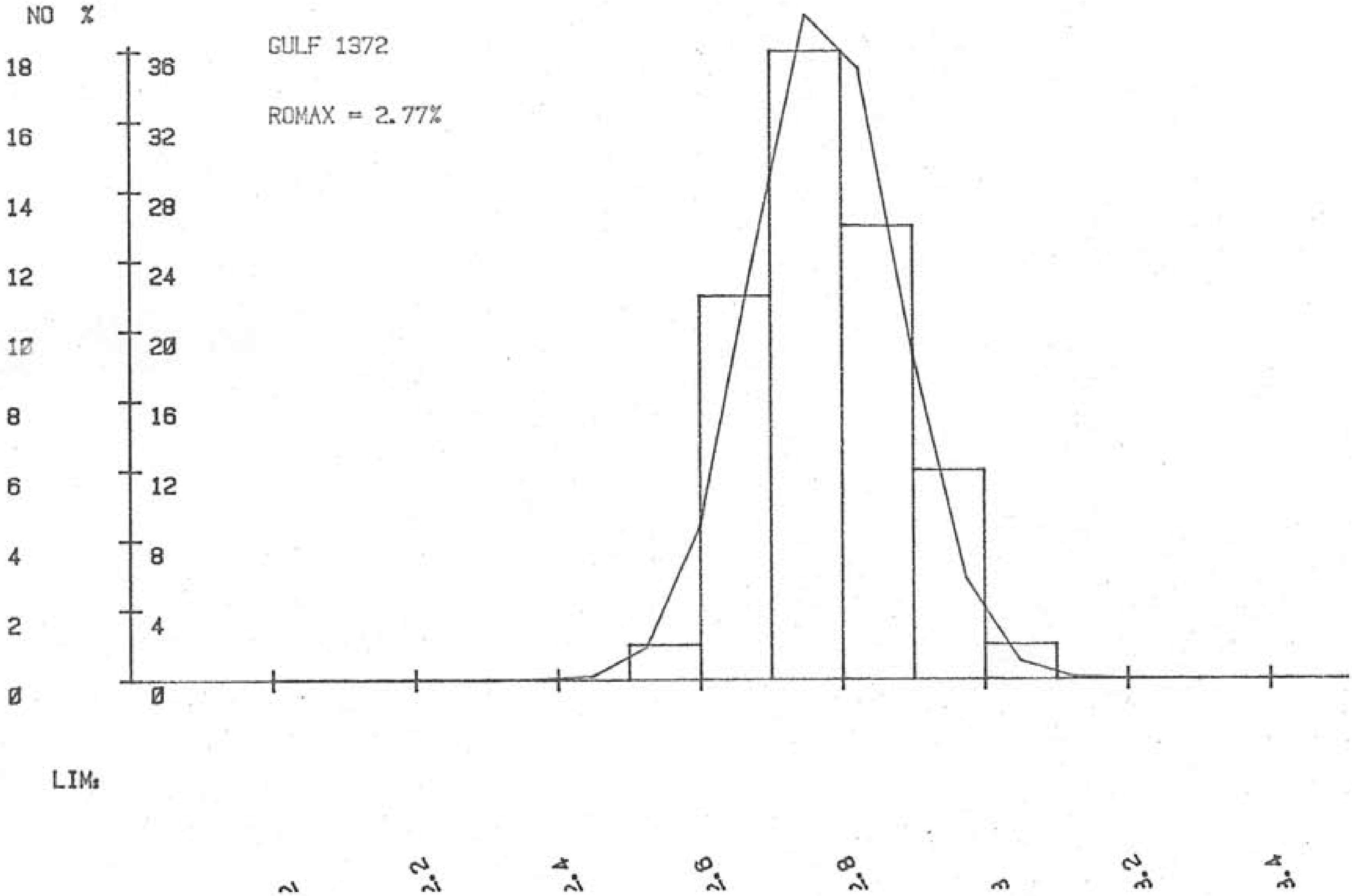
[illegible]

I	X(I)	X(I+1)
1	2.6900	2.6800
3	2.3000	2.5600
5	2.5700	2.5500
7	2.6400	2.5400
9	2.6600	2.6000
11	2.5800	2.6500
13	2.5500	2.6800
15	2.6700	2.6000
17	2.5300	2.5900
19	2.5700	2.5800
21	2.6000	2.6200
23	2.6200	2.6100
25	2.7400	2.7100
27	2.7700	2.5700
29	2.6900	2.6000
31	2.6900	2.5700
33	2.7300	2.6700
35	2.7800	2.6900
37	2.7800	2.5700
39	2.5800	2.3900
41	2.5600	[illegible]
43	2.5700	2.6000
45	2.6600	2.6500
47	[illegible]	2.6600
49	[illegible]	[illegible]


NO %
GULF 1371
ROMAX = 2.63%
24 21 18 15 12 9 6 3 Ø
48 42 36 30 24 18 12 6 Ø
LIM:
2 2.2 2.4 2.6 2.8 3 3.2 3.4

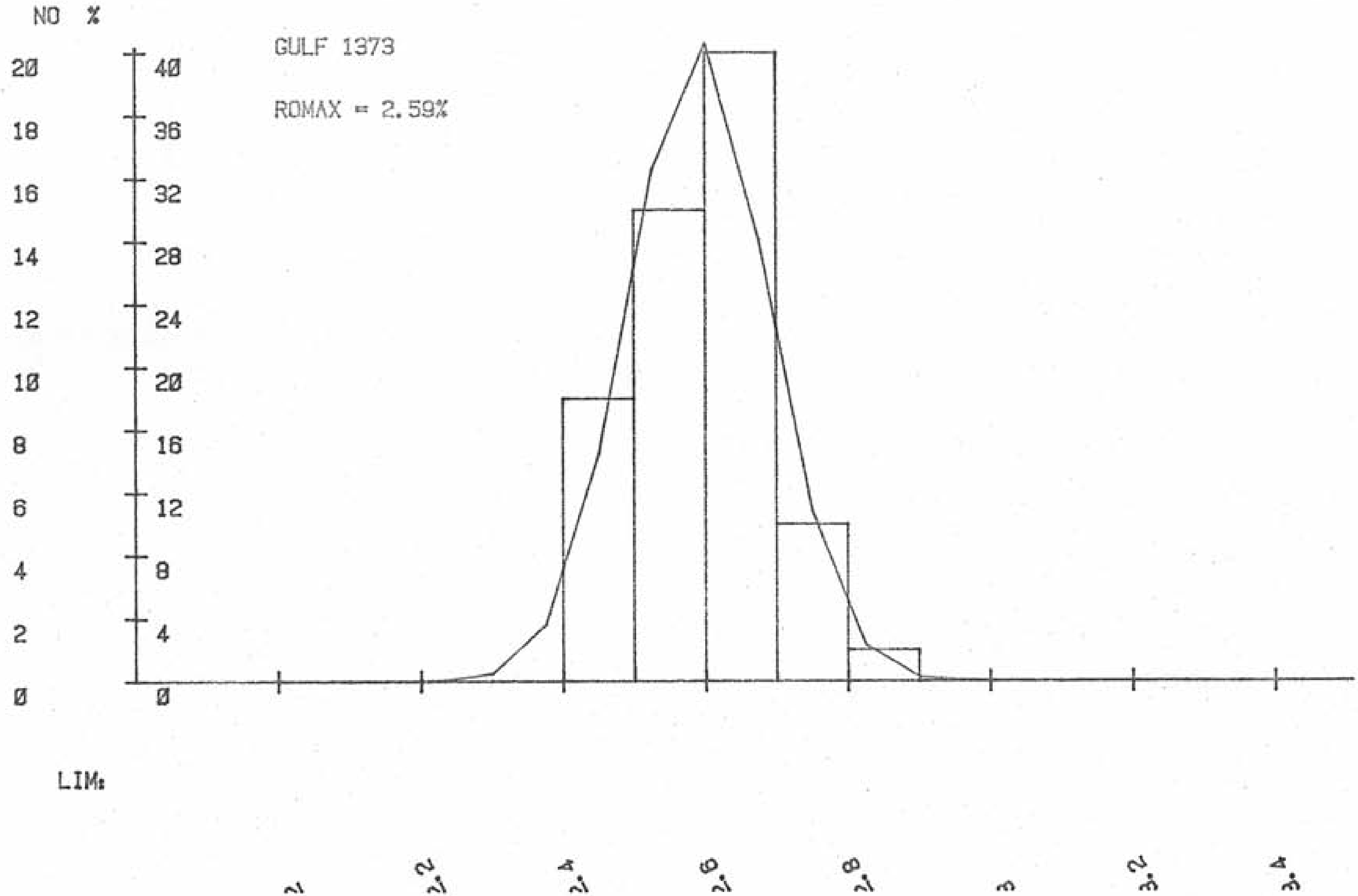
GLF72

I	X(I)	X(I+1)
1	2.8500	2.5900
3	2.6600	2.7700
5	2.9300	2.8300
7	2.6100	2.8500
9	2.7500	2.7300
11	2.6700	2.9100
13	2.0200	2.9600
15	2.7900	2.7500
17	2.7600	2.7200
19	2.7200	2.7400
21	2.7400	2.7100
23	2.6700	2.8100
25	2.8700	2.8400
27	2.8700	2.6900
29	2.6900	2.7300
31	2.7100	2.9100
33	2.7000	2.8500
35	2.9900	2.7400
37	2.6600	2.8500
39	2.6800	2.8100
41	2.8900	2.8400
43	2.9100	2.9000
45	2.7300	2.7600
47	2.[illegible]600	3.0100
[illegible]	[illegible]	[illegible].6700


NO %
GULF 1372
ROMAX = 2.77%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

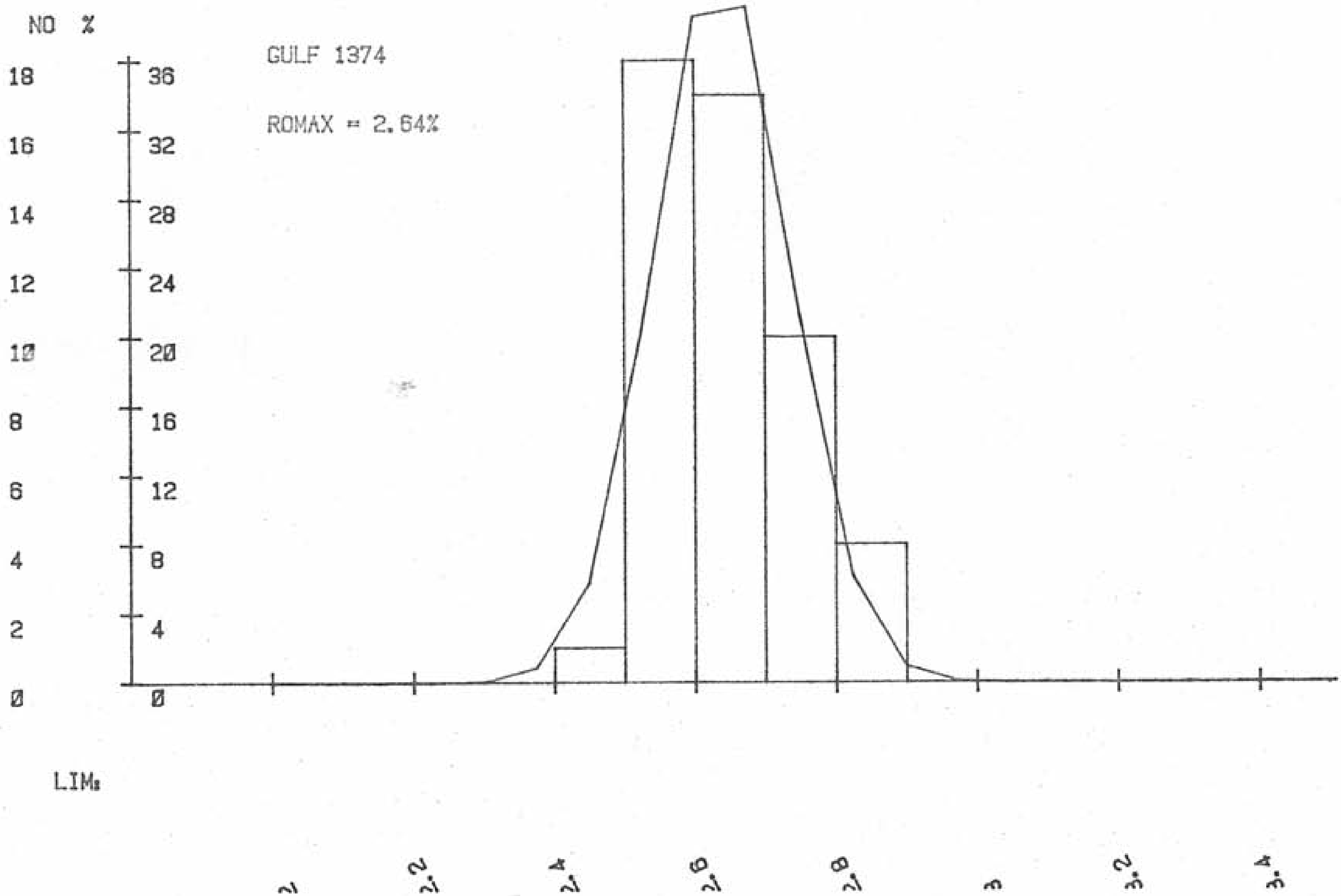
GLF73

I	X(I)	X(I+1)
1	2.4200	2.4200
3	2.4400	2.4100
5	2.6000	2.6300
7	[illegible]	2.5500
9	[illegible]	2.5000
11	[illegible]	2.4600
13	[illegible]	2.6400
15	2.6700	2.4600
17	2.4800	2.5100
19	2.4400	2.4500
21	2.6100	2.6200
23	2.5200	2.5700
25	2.5800	2.7500
27	2.6500	[illegible]
29	2.6900	[illegible]
31	2.6900	2.5200
[illegible]	2.6200	2.4500
[illegible]	[illegible]	2.5700
[illegible]	[illegible]	2.5500
[illegible]	2.7100	2.5400
[illegible]	2.6000	2.5000
[illegible]	2.6000	2.5500
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	2.6100
[illegible]	[illegible]	[illegible]


NO %
GULF 1373
ROMAX = 2.59%
20 18 16 14 12 10 8 6 4 2 0
40 36 32 28 24 20 16 12 8 4 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

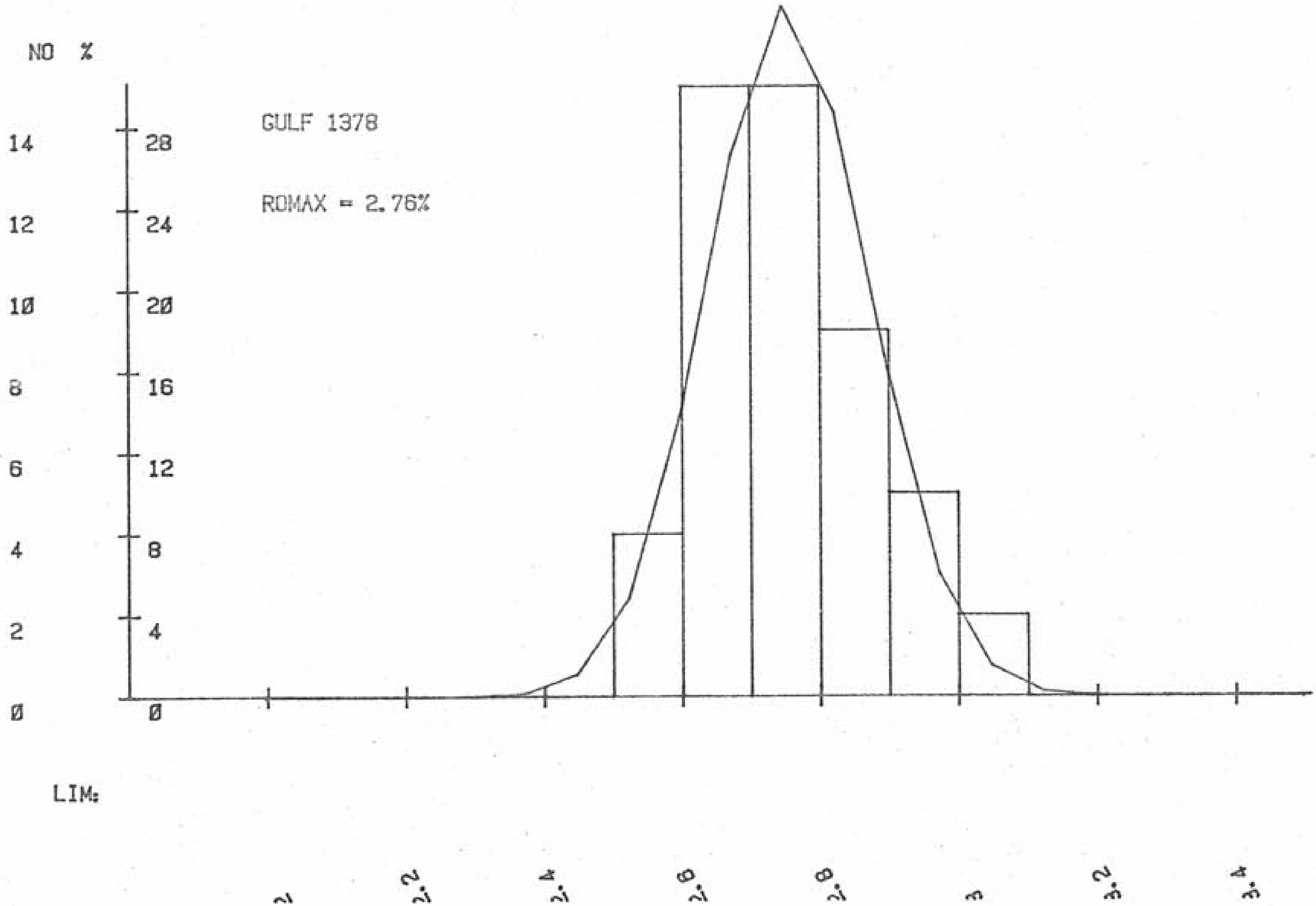
GLF74

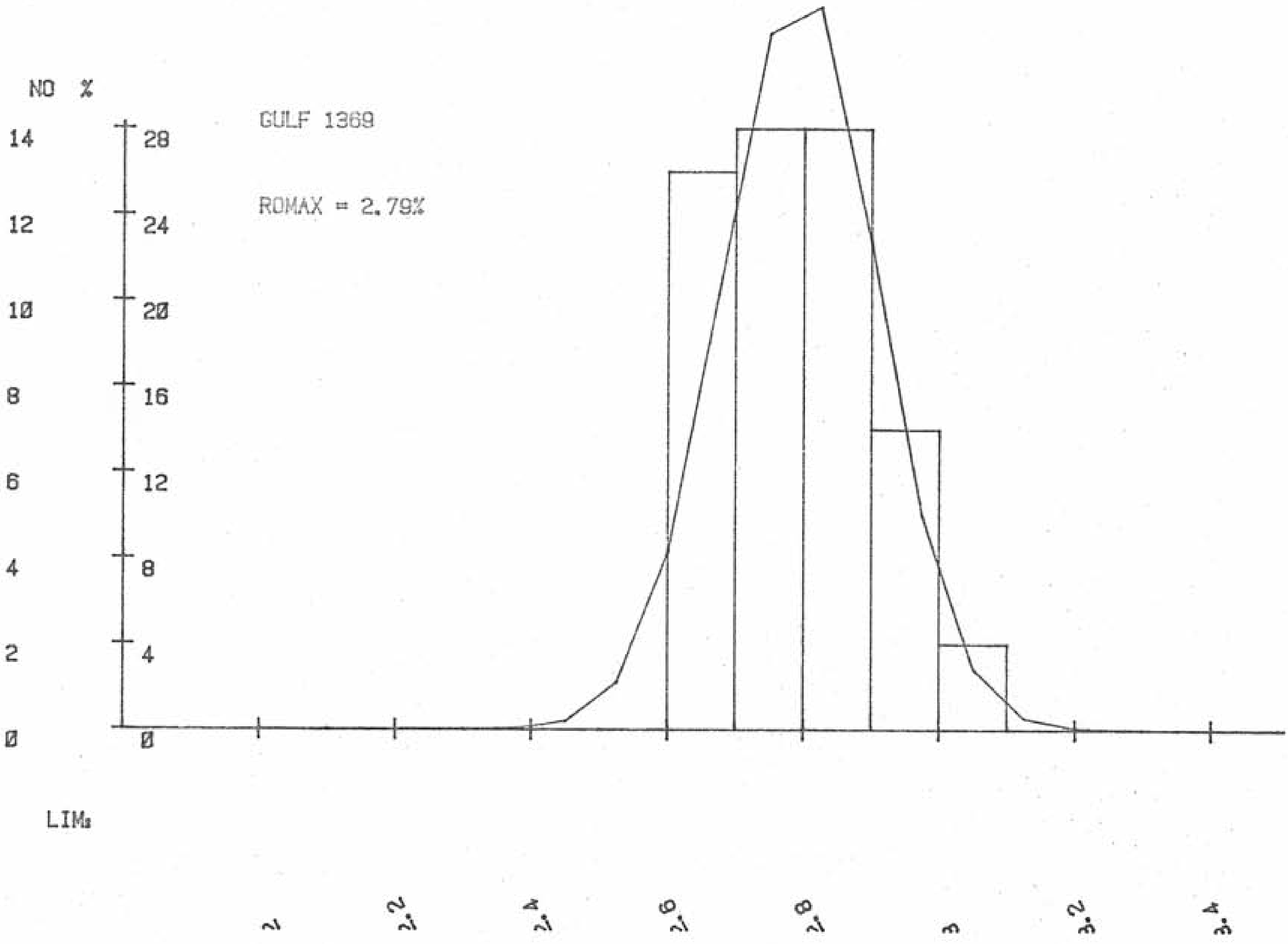
I	X ID	XCINIT
1	2.6500	2.5500
3	2.5700	2.4200
5	2.5500	2.6000
7	2.6600	2.6100
9	2.7200	2.5500
11	2.5700	2.5800
13	2.5700	2.8100
15	[illegible]	2.7300
17	2.5500	2.5600
19	2.5200	2.5200
21	2.5500	2.5600
23	2.6900	2.7600
25	2.8000	2.7000
27	2.6900	2.6800
29	2.7300	2.6700
31	2.8600	2.5100
33	2.7000	2.6900
35	2.5900	2.5800
37	2.6400	[illegible]
39	2.5900	2.6200
41	2.8800	2.6000
43	2.6000	2.5300
45	2.6300	2.5500
47	2.5400	2.7200
49	2.6500	2.7200


NO %
GULF 1374
ROMAX = 2.64%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLF7E

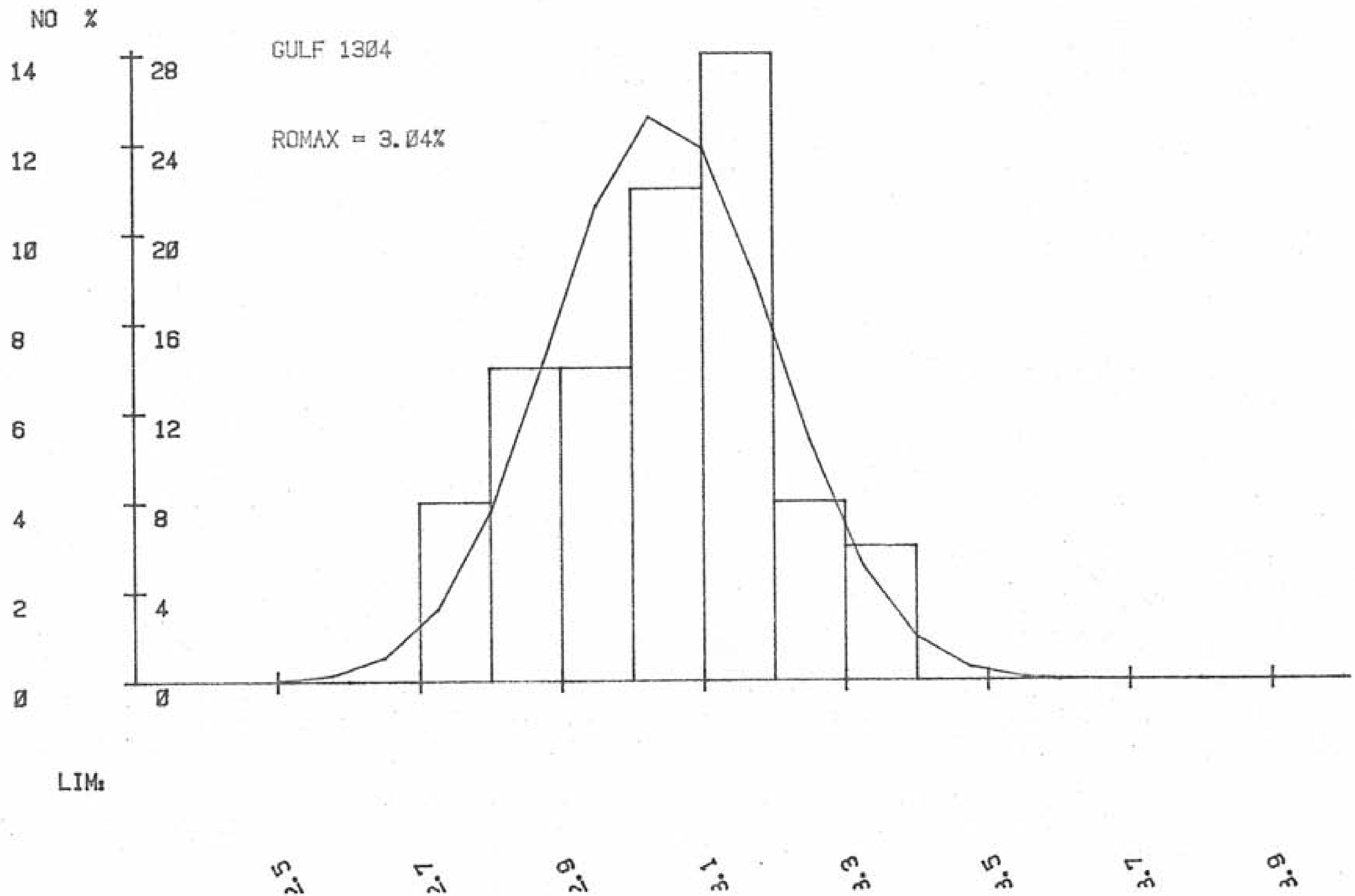
I	X(I)	X(I+1)
1	2.8200	2.8900
3	2.8900	2.7500
5	3.0500	2.7700
7	2.6300	2.8400
9	2.9200	2.8500
11	2.7500	2.7600
13	2.9100	2.9000
15	2.6600	2.5800
17	2.5700	2.6600
19	2.7500	2.6800
21	2.8200	2.9900
23	2.6500	2.6900
25	2.8200	2.7300
27	2.7300	3.0300
[illegible]	2.5300	[illegible]
[illegible]	2.9000	2.6800
[illegible]	2.7800	[illegible]
35	2.7500	[illegible]
[illegible]	2.7700	2.6600
39	2.2700	2.6500
41	2.6500	2.6600
43	2.6400	2.6900
45	2.6900	2.7200
47	2.5600	2.7700
[illegible]	2.7300	2.5600


NO %
GULF 1378
ROMAX = 2.76%
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4


NO %
GULF 1369
ROMAX = 2.79%
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4

GLF#4

I	X(I)	X(I+1)
1	3.0700	3.1400
3	2.7300	2.8500
5	3.3300	2.8100
7	2.9700	3.1100
9	3.0700	3.0500
11	2.8700	2.9300
13	2.9900	3.1600
15	3.0200	3.1900
17	2.8900	2.8900
19	2.9600	3.1500
21	3.0900	3.1600
23	2.9800	3.0300
25	2.8300	3.0100
27	3.0200	3.1600
29	3.1400	2.7700
31	3.1200	3.1000
33	3.1300	3.1000
35	3.0900	3.1900
37	3.2300	3.0400
39	2.7300	3.1200
41	2.7900	[illegible].5400
43	3.3900	3.2300
45	3.2000	2.8100
47	2.8600	2.9700
49	3.2300	3.0600


NO %
GULF 13Ø4
ROMAX = 3.Ø4%
14 28
12 24
1Ø 2Ø
8 16
6 12
4 8
2 4
Ø Ø
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9

Report
on
forty-five coal samples
from the
Panorama Area.

August 1981

David E. Pearson & Associates Ltd.,
Consulting Coal Geologists and Petrographers,
804 Leota Place,
Victoria,
British Columbia

INTRODUCTION

Forty-five coal samples collected during detailed work on the Panorama licences during the early part of the 1981 field season were received at the coal laboratory on July 16, 1981. The samples had been previously pelletised at the Chipmunk base camp, and were ready for grinding and polishing.

MEASURING PROCEDURE

The pellets were placed on plates for attachment to the microscope stage. A LEITZ Orthoplan microscope-photometer interfaced to a HEWLETT-PACKARD 85 Series computer with HP-7225 plotter was used in the determinations. The microscope was standardised and 50 maximum reflectance measurements on the maceral vitrinite were made. The computer then determined the mean maximum reflectance of the readings together with the standard deviation, and drew the histogram contained in the appendix. The readings were grouped by the computer into "half-V steps" (units of 0.05% reflectance). The blue line in these histograms represents the computer-derived normal distribution curve for the determined values, and is an indication of the central tendency of that sample.

RESULTS

The results of the reflectance analysis are shown in Table 1; the statistical treatment of the data together with histograms are contained in the appendix.

All of the coals examined have levels of organic maturity that indicate them to be ANTHRACITES.

The lowest reflectance among the suite of coals is 2.43%; the highest is 4.00%. Corresponding volatile-matter yields would be 9% and 4% respectively.

TABLE 1

RESULTS

Sample	Romax	Standard Deviation
JI-81-C1	2.35	0.12
C2	2.43	0.11
C3	2.39	0.16
C4	3.06	0.15
C5	3.37	0.13
C6	4.00	0.08
C7	3.19	0.09
C8	3.04	0.10
C9	3.28	0.10
C10	3.19	0.10
KB-81-1-1C	2.68	0.08
9-2C	2.97	0.05
9-4C	2.76	0.09
10-1C	3.13	0.06
10-2C	3.21	0.08
10-5C	3.11	0.05
RB-81- 6	3.45	0.07
- 7	3.44	0.10
- 8	3.41	0.07
SLB-81-24	3.75	0.06
-25	3.44	0.08
-26	3.38	0.10
-28	3.30	0.10
-30	3.84	0.09
-41	3.31	0.08
-46½	3.26	0.04
-58½	3.40	0.10
-63 seam 2	3.41	0.12
-63 seam 3	3.32	0.08

Sample	Romax	Standard Deviation
DP-81- 4	3.07	0.08
6	3.85	0.11
8	3.89	0.10
12	3.12	0.14
23	2.98	0.07
24	3.02	0.13
25	2.97	0.08
27		
29	3.02	0.07
30	2.84	0.07
31	2.90	0.07
32	2.87	0.08
33	2.75	0.05
34	2.84	0.07
35	2.97	0.07
36	2.80	0.05

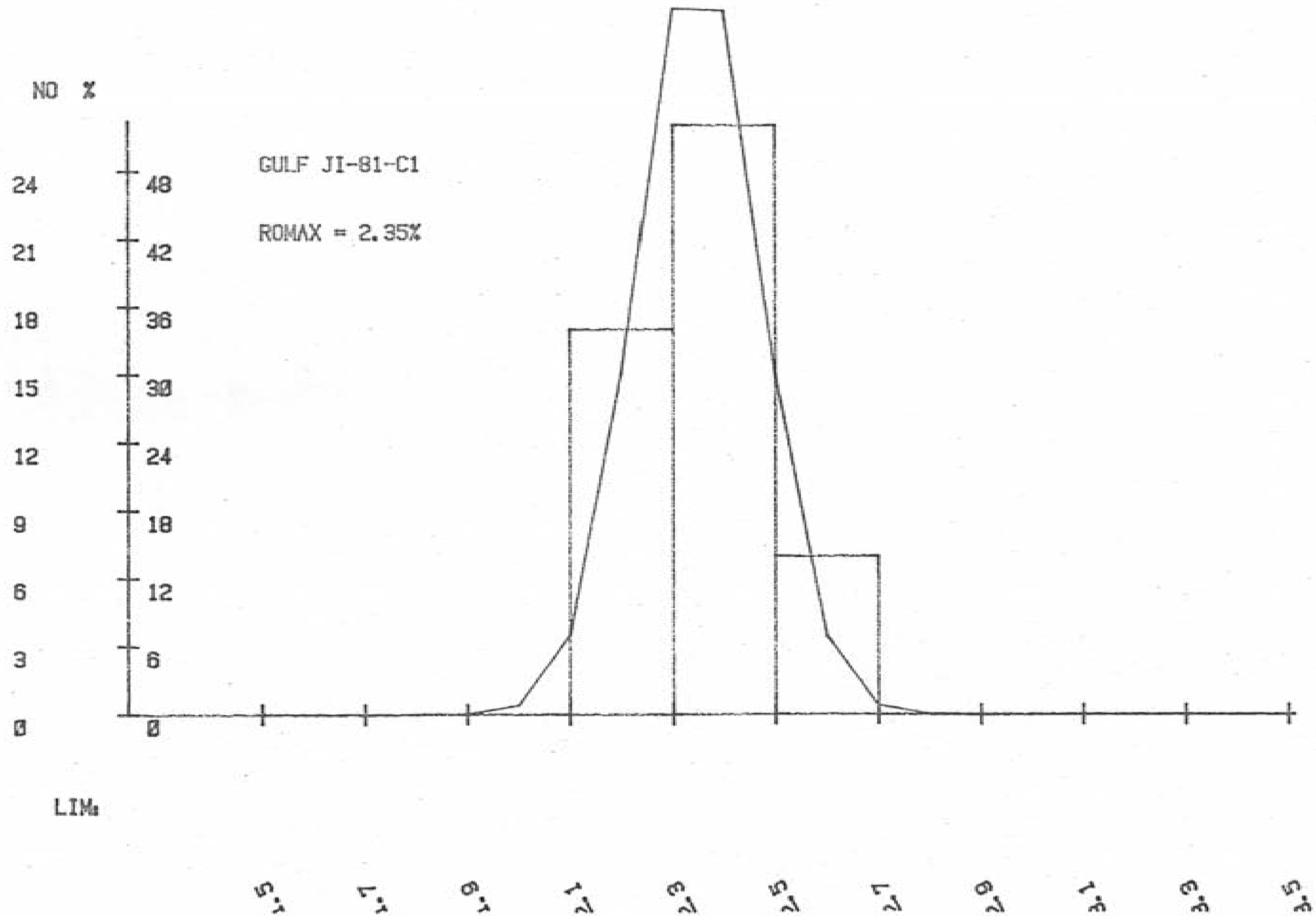
APPENDIX.

JI-81-C1

I	X(I)	X(I+1)
1	2.5700	2.4800
3	2.5500	2.5100
5	2.3200	2.3500
7	2.3800	2.5100
9	2.3600	2.2800
11	2.1400	2.2500
13	2.2100	2.1900
15	2.4900	2.5000
17	2.4600	2.3200
19	2.1600	2.4400
21	2.1700	2.2100
23	2.3400	2.3600
25	2.5100	2.3500
27	2.4300	2.5600
29	2.3300	2.2200
31	2.2300	2.1900
33	2.1800	2.2900
35	2.1700	[illegible]
37	2.4200	2.4200
39	2.4100	2.2700
41	2.3300	2.3700
43	2.3000	2.2800
45	2.2600	2.4500
47	2.4200	2.2700
49	2.2200	[illegible]

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 2.3496
COEF OF VARIATION = 4.99%
VARIANCE = .0137
STANDARD DEVIATION = .1172
SKEWNESS = .0152
KURTOSIS = 2.0499

95.00% C.I. FOR MEAN
(2.3163, 2.3829)
ONE-TAIL T(49 , .025)=
2.01[illegible] 50016


NO %
GULF JI-81-C1
ROMAX = 2.35%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM.
1.5
1.7
1.9
2.1
2.3
2.5
2.7
2.9
3.1
3.3
3.5

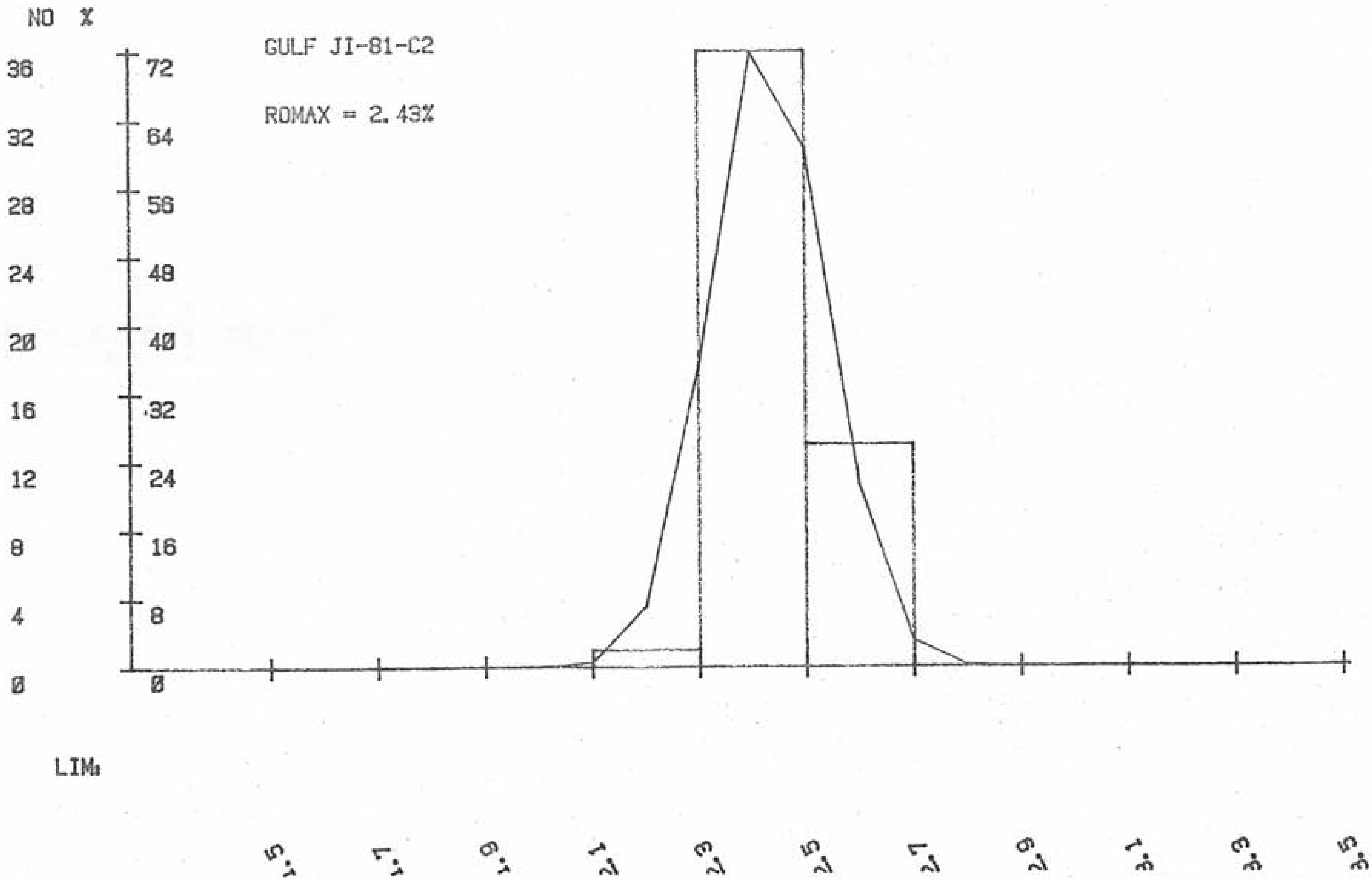
JI-81-C2

I	X(I)	X(I+1)
1	[illegible]	2.6400
[illegible]	[illegible]	2.3700
[illegible]	2.3400	2.3500
[illegible]	2.3300	2.4000
[illegible]	2.5200	2.5600
[illegible]	2.3200	2.3200
[illegible]	2.4000	[illegible]
[illegible]	2.3700	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	2.3100	[illegible]
[illegible]	2.4300	[illegible]
[illegible]	2.6100	[illegible]
[illegible]	2.3800	[illegible]
[illegible]	2.4300	[illegible]
[illegible]	2.5500	[illegible]
[illegible]	2.4900	[illegible]
[illegible]	2.3000	[illegible]
[illegible]	2.6500	[illegible]
[illegible]	[illegible]	2.3500
[illegible]	[illegible]	[illegible]
[illegible]	2.3500	[illegible]
45	[illegible]	[illegible]
[illegible]	2.4300	[illegible]
47	2.3000	[illegible]
49	2.3700	[illegible]

BASIC STAT[illegible]
[illegible]

N = 50
STD ERROR OF THE MEAN= .02[illegible]
MEAN = 2.4310
COEF OF VARIATION = 4.[illegible]
VARIANCE = .0113
STANDARD DEVIATION = .1065
SKEWNESS = .5064
KURTOSIS = 2.0606

95.00% C.I. FOR MEAN:
(2.4007 , 2.4613)
ONE-TAIL T(49 , .025)=
2.0100[illegible]50016

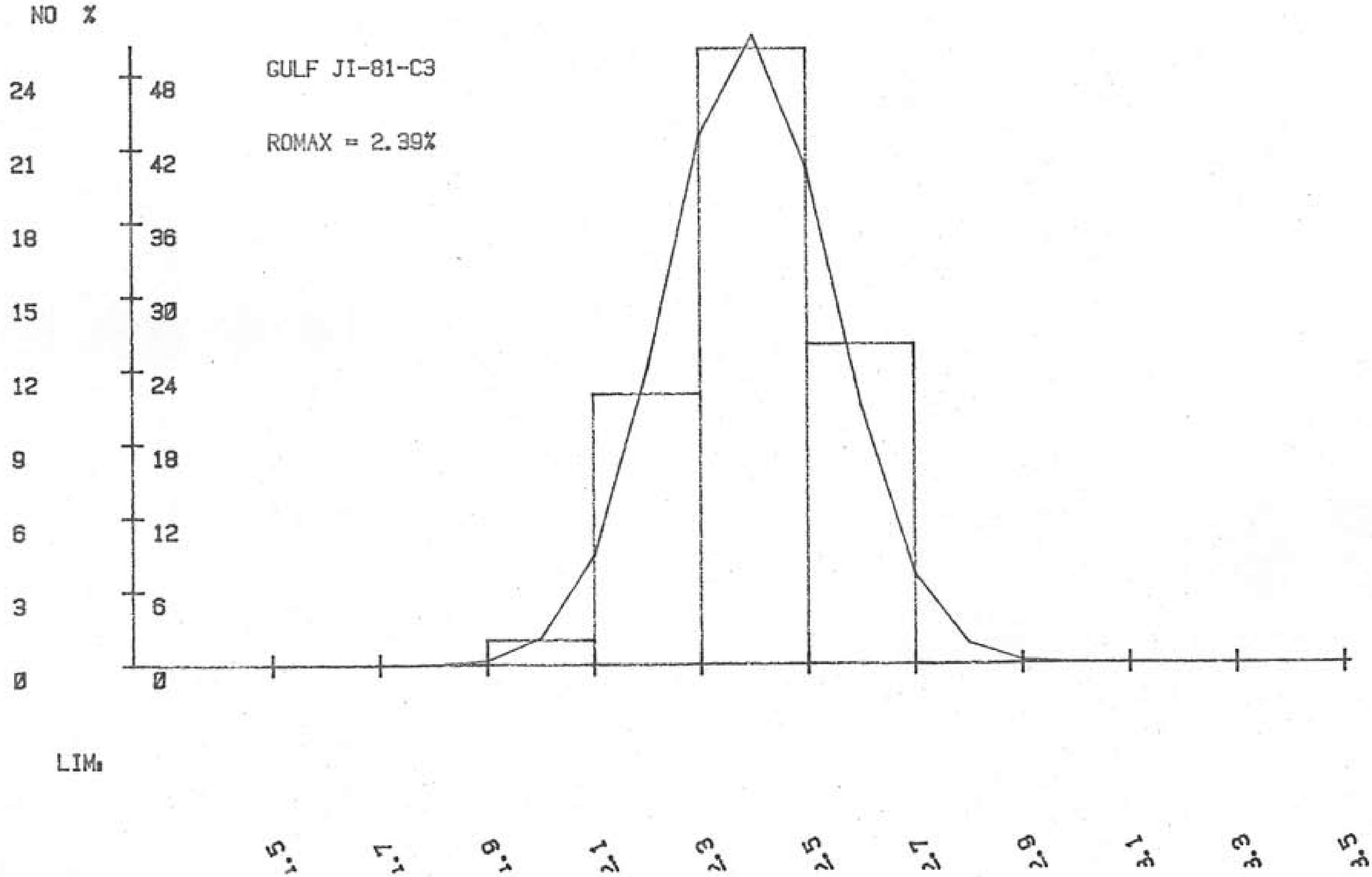

NO %
GULF JI-81-C2
ROMAX = 2.43%
36
32
28
24
20
16
12
8
4
0
72
64
56
48
40
32
24
16
8
0
LIM:
1.5
1.7
1.9
2.1
2.3
2.5
2.7
2.9
3.1
3.3
3.5

JI-81-C3

I	X(I)	X(I+1)
1	2.6700	2.5500
[illegible]	2.5700	[illegible].5700
[illegible]	2.5200	2.4900
[illegible]	2.3600	2.[illegible]
[illegible]	2.3500	2.[illegible]
[illegible]	[illegible]	2.3400
[illegible]	[illegible].3400	[illegible].2500
[illegible]	[illegible]	[illegible].2200
[illegible]	[illegible].3500	[illegible]
[illegible]	2.[illegible]	[illegible]
[illegible]	2.2900	2.[illegible]
[illegible]	2.4500	2.4500
[illegible]	2.3800	[illegible]
[illegible]	2.[illegible]200	2.[illegible]
[illegible]	2.1100	[illegible].1500
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible].[illegible]100
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	2.1200	[illegible]
[illegible]	2.6600	2.[illegible]
[illegible]	2.3600	[illegible]
[illegible]	2.2500	[illegible]
[illegible]	2.[illegible]500	[illegible].4200

BASIC [illegible]TICS
[illegible]**********************
N = 30
STD ERROR OF THE MEAN = [illegible]
MEAN = 2.3920
COEF OF VARIATION = 6.[illegible]%
VARIANCE = .0243
STANDARD DEVIATION = .15[illegible]0
SKEWNESS = [illegible]
KURTOSIS = [illegible]

95.00% C.I. FOR MEAN:
(2.3477 , 2.43[illegible]3)
ONE-TAIL [illegible]
2.0.80345001[illegible]



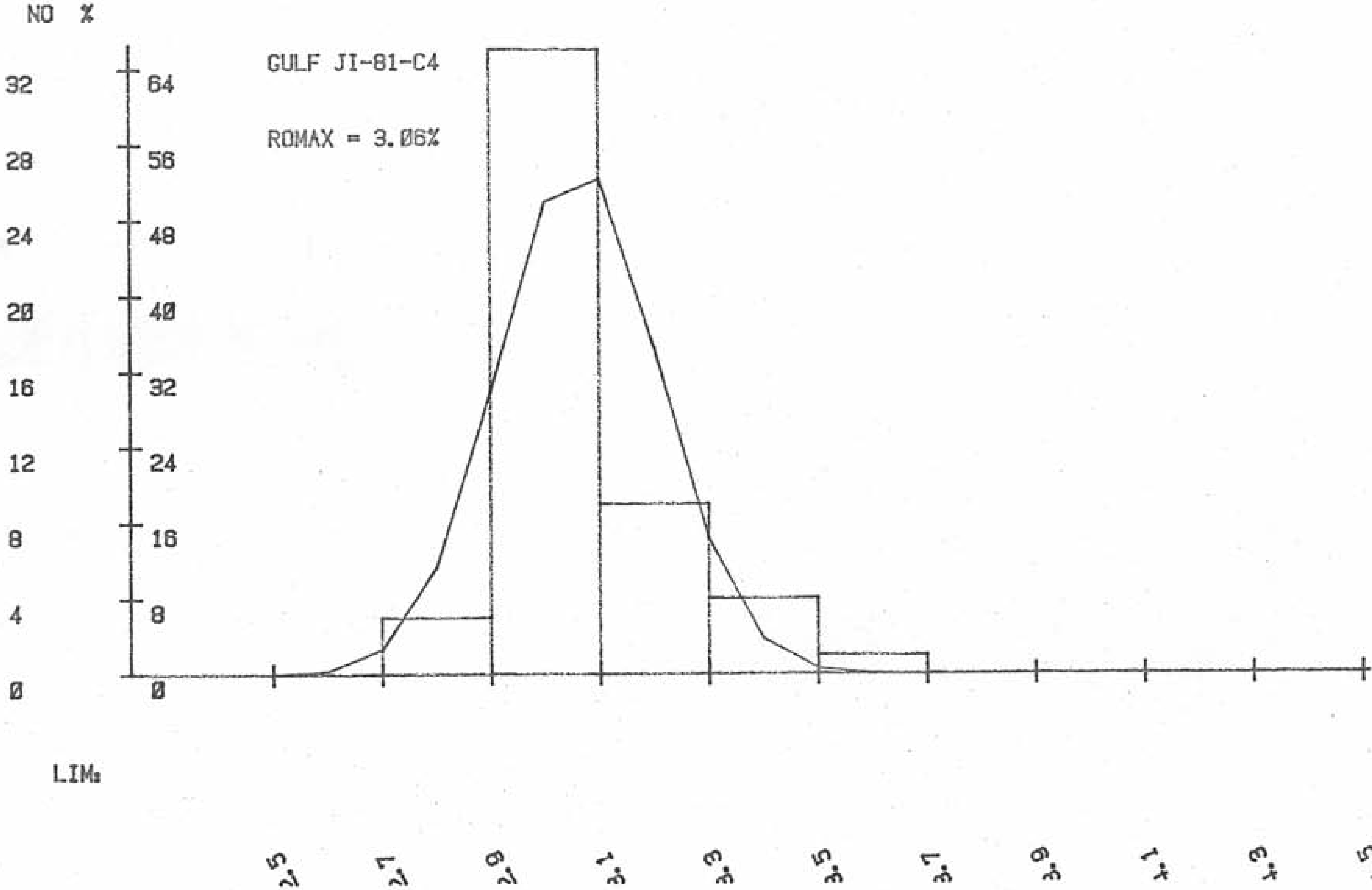
NO %
GULF JI-81-C3
ROMAX = 2.39%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
1.5
1.7
1.9
2.1
2.3
2.5
2.7
2.9
3.1
3.3
3.5

JI-81-C4.

I	X(I)	X(I+1)
1	3.1200	3.1600
3	3.2500	3.1500
5	3.3600	3.5300
7	3.3600	3.0600
[illegible]	2.9600	[illegible]
11	[illegible]	[illegible]
1[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]
[illegible]	[illegible]	3.2500
[illegible]	2.[illegible]	2.9900
21	[illegible]	[illegible]
2[illegible]	2.8900	3.0200
25	2.9800	2.9900
2[illegible]	2.9400	3.2300
29	2.9600	3.0200
31	3.0000	2.9300
33	3.1500	2.9100
35	3.3700	3.0700
37	3.1900	[illegible]
39	3.0000	[illegible]
41	[illegible]	2.9600
43	2.9700	2.940[illegible]
45	3.0600	3.[illegible]
47	3.0200	3.[illegible]
49	3.0700	3.1[illegible]

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= 0.[illegible]
MEAN = 3.0[illegible]2
COEF OF VARIATION = 4.[illegible]%
VARIANCE = .0216
STANDARD DEVIATION = .1470
SKEWNESS = [illegible].2505
KURTOSIS = [illegible].0556

95.0[illegible] [illegible] FOR MEAN
3.[illegible] 3.1[illegible]
ONE-TAIL [illegible] 49 [illegible] .025 [illegible]
[illegible]

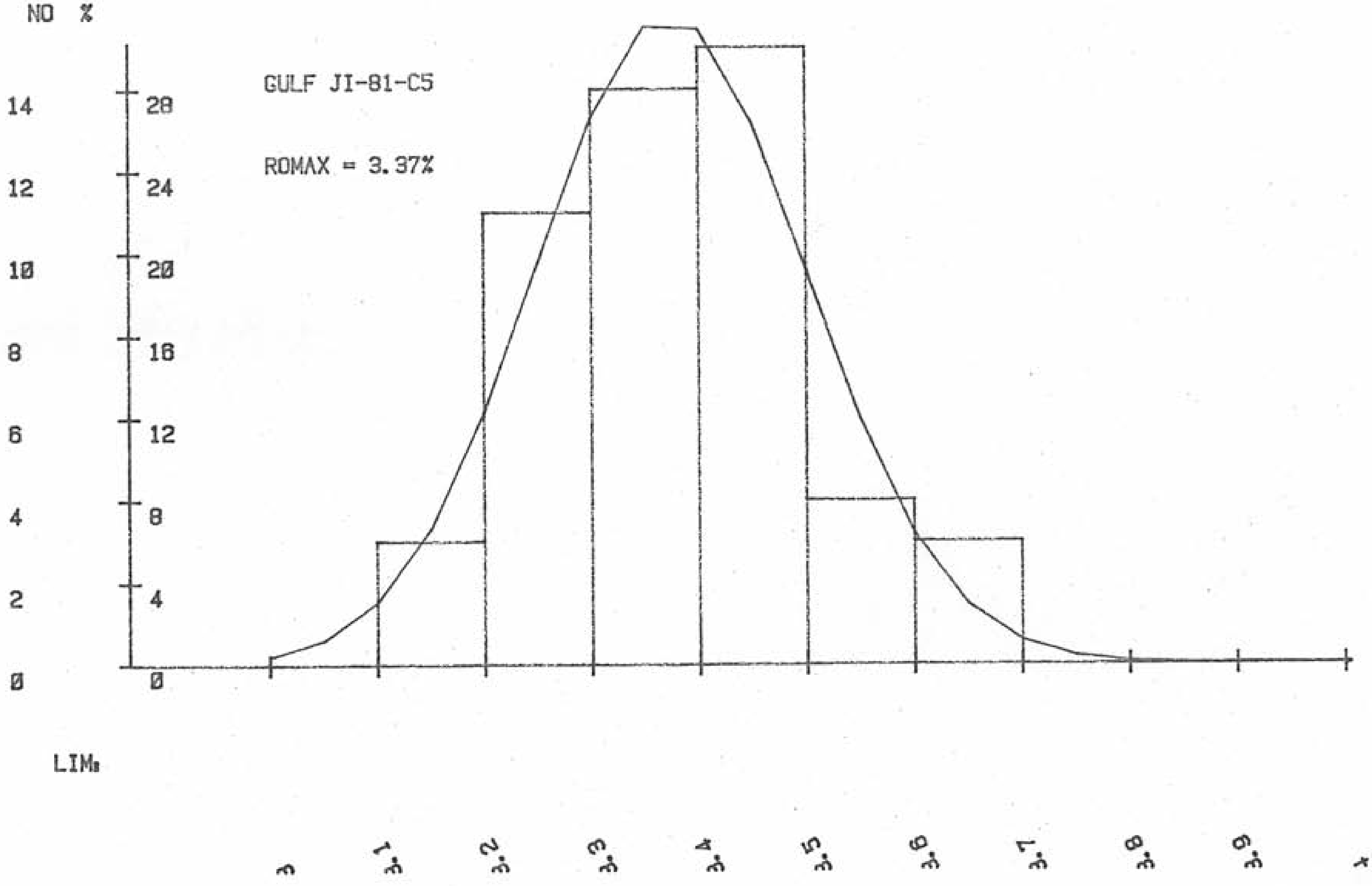

NO %
GULF JI-81-C4
ROMAX = 3.06%
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.5
2.7
2.9
3.1
3.3
3.5
3.7
3.9
4.1
4.3
4.5

JI- 81 - C5.

1	3.4900	[illegible]
[illegible]	3.2600	[illegible]
[illegible]	3.2400	3.3200
[illegible]	3.4700	3.2300
[illegible]	3.2500	3.5600
[illegible]	3.2600	[illegible]
[illegible]	3.2700	[illegible]
[illegible]	3.5400	[illegible]
[illegible]	3.4500	3.4000
[illegible]	3.4600	3.3600
[illegible]	3.5700	3.5400
[illegible]	3.4200	3.4700
[illegible]	3.4000	3.3400
[illegible]	3.5000	3.44[illegible]
[illegible]	3.2[illegible]	3.2600
[illegible]	3.6200	3.4900
[illegible]	3.1700	[illegible]
[illegible]	3.3000	[illegible]
[illegible]	3.4200	
[illegible]	3.3000	
[illegible]	3.3900	
[illegible]	3.3500	[illegible]
[illegible]	3.2900	[illegible]
[illegible]	3.1600	[illegible]
[illegible]	3.1500	[illegible]

[illegible] STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02[illegible]
MEAN = 3.3738
COEF OF VARIATION = 3.7[illegible]
VARIANCE = .0160
STANDARD DEVIATION = .1265
SKEWNESS = .2491
KURTOSIS = 2.4718

[illegible] C.I. FOR MEAN
(3.3379, 3.4098)
ONE-TAIL T(49, .025)=
[illegible] 1.863 [illegible]



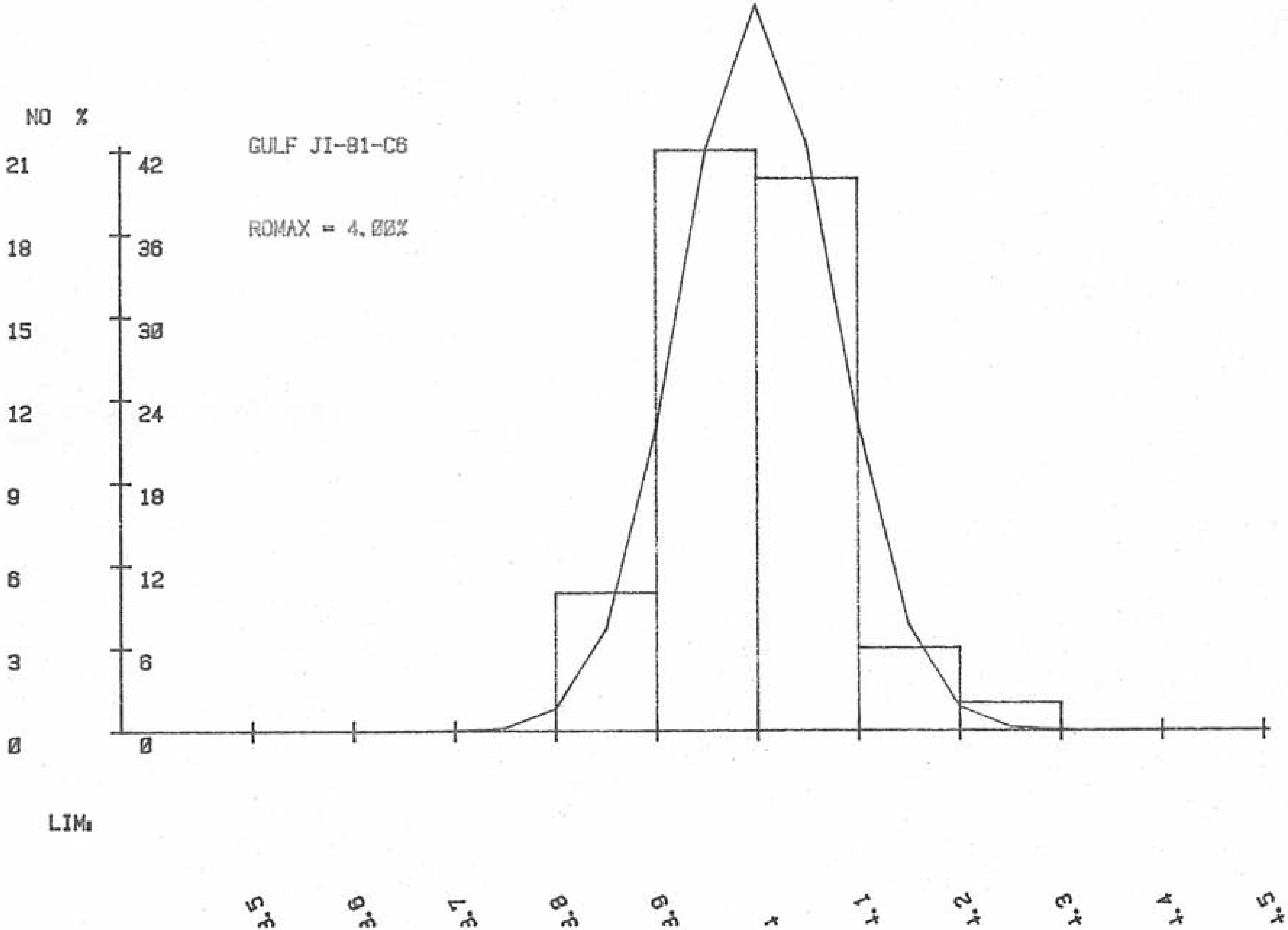
NO %
GULF JI-81-C5
ROMAX = 3.37%
14
12
10
8
6
4
2
0
28
24
20
16
12
8
4
0
LIM.
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9

JI-81-C6.

I	X(I)	X(I+1)
1	3.9900	3.9600
3	3.8700	4.0200
5	3.9900	4.0000
7	3.9800	4.1300
9	3.8900	3.8300
11	4.0200	3.9100
13	3.8300	3.9400
15	3.8900	3.9600
17	3.9900	4.0500
19	4.0400	3.8900
21	3.9600	3.9500
23	3.9900	4.0500
25	3.9600	3.9900
27	3.9200	4.0600
29	4.0800	3.9700
31	4.0200	4.0600
33	4.1700	3.9900
35	4.0100	3.9300
37	4.2200	4.0000
39	4.0300	4.0300
41	4.0200	4.0000
43	4.0500	4.1700
45	4.0600	4.0300
47	3.9500	3.9800
49	4.0300	3.9900

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 4.0002
COEF OF VARIATION = 1.90%
VARIANCE = .0058
STANDARD DEVIATION = .0760
SKEWNESS = .4897
KURTOSIS = 3.8692

95.00% C.I. FOR MEAN:
(3.9792, 4.0224)
ONE-TAIL t(49 , .025)=
2.01003450016



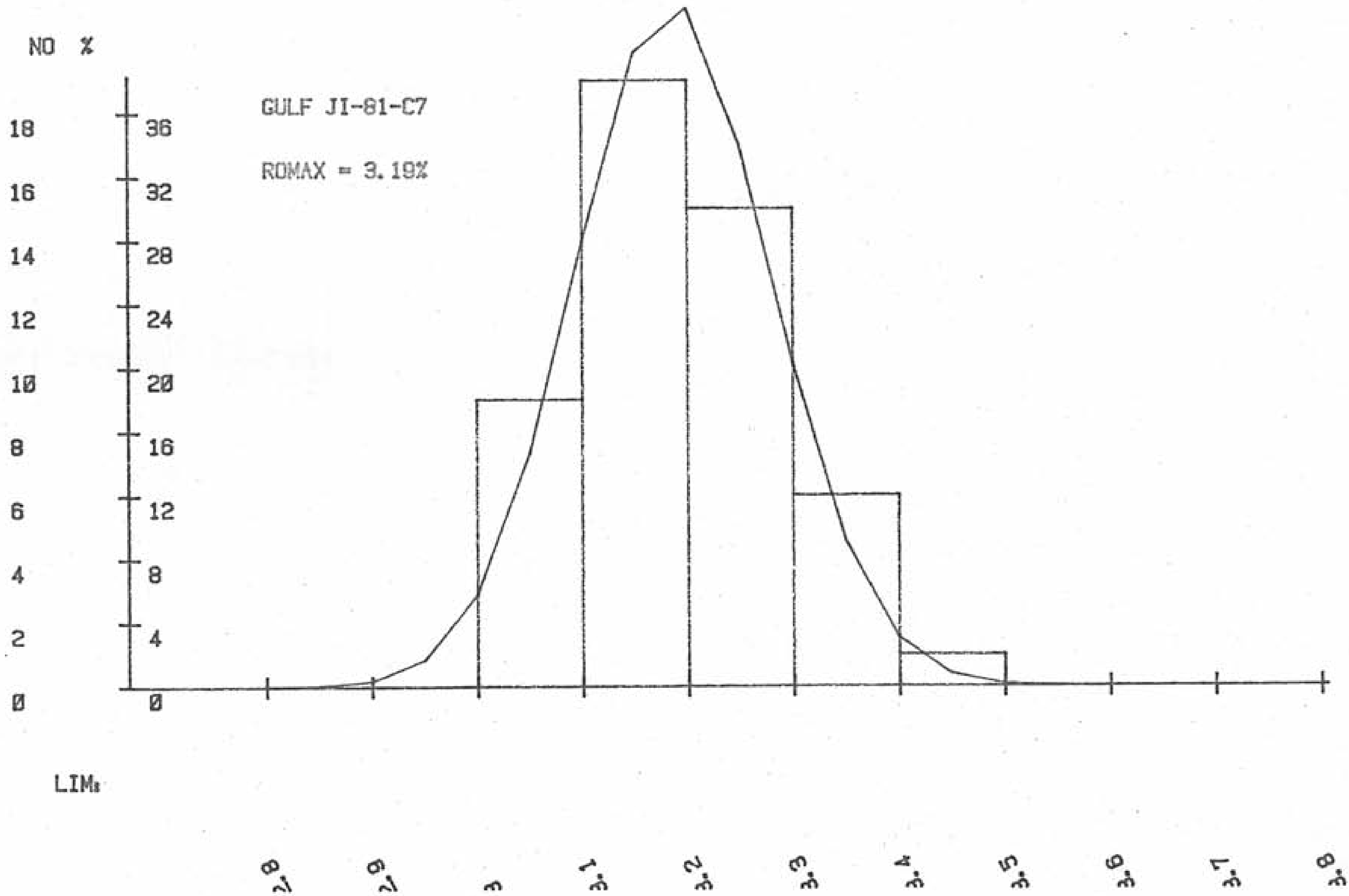
NO %
21 42
18 36
15 30
12 24
9 18
6 12
3 6
Ø Ø
GULF JI-81-C6
ROMAX = 4.ØØ%
LIM:
3.5
3.6
3.7
3.8
3.9
4
4.1
4.2
4.3
4.4
4.5

JI - 81 - C7

I	X(I)	X(I+1)
1	3.2300	3.2700
3	3.2600	3.2500
5	3.3000	3.3100
7	3.1900	3.3000
9	3.1300	3.3000
11	3.2600	3.0400
13	3.2000	3.2500
15	3.1500	3.1200
17	3.2700	3.0300
19	3.1600	3.0900
21	3.0600	3.1300
23	3.1400	3.2200
25	3.0900	3.1400
27	3.3000	3.1000
29	3.3200	3.1600
31	3.0600	3.2900
33	3.0100	3.1800
35	3.1200	3.1800
37	3.1400	3.2900
39	3.0200	3.1100
41	3.4200	3.2500
43	3.2400	3.0500
45	3.1600	3.1300
47	3.1700	3.1500
49	3.2400	3.2600

[illegible]ASIC STATISTICS
****
[illegible] = 50
ST[illegible] ERROR OF THE MEAN= .01
[illegible]EAN = 3.1864
COEF OF VARIATION = 2.92%
VARIANCE = .0086
STANDARD DEVIATION = .0929
[illegible]KEWNESS = .0335
[illegible]RTOSIS = 2.4005

95.00% C.I. FOR MEAN:
(3.1600, 3.2128)
ONE-TAIL t(49 , .025)=
[illegible].01003450016

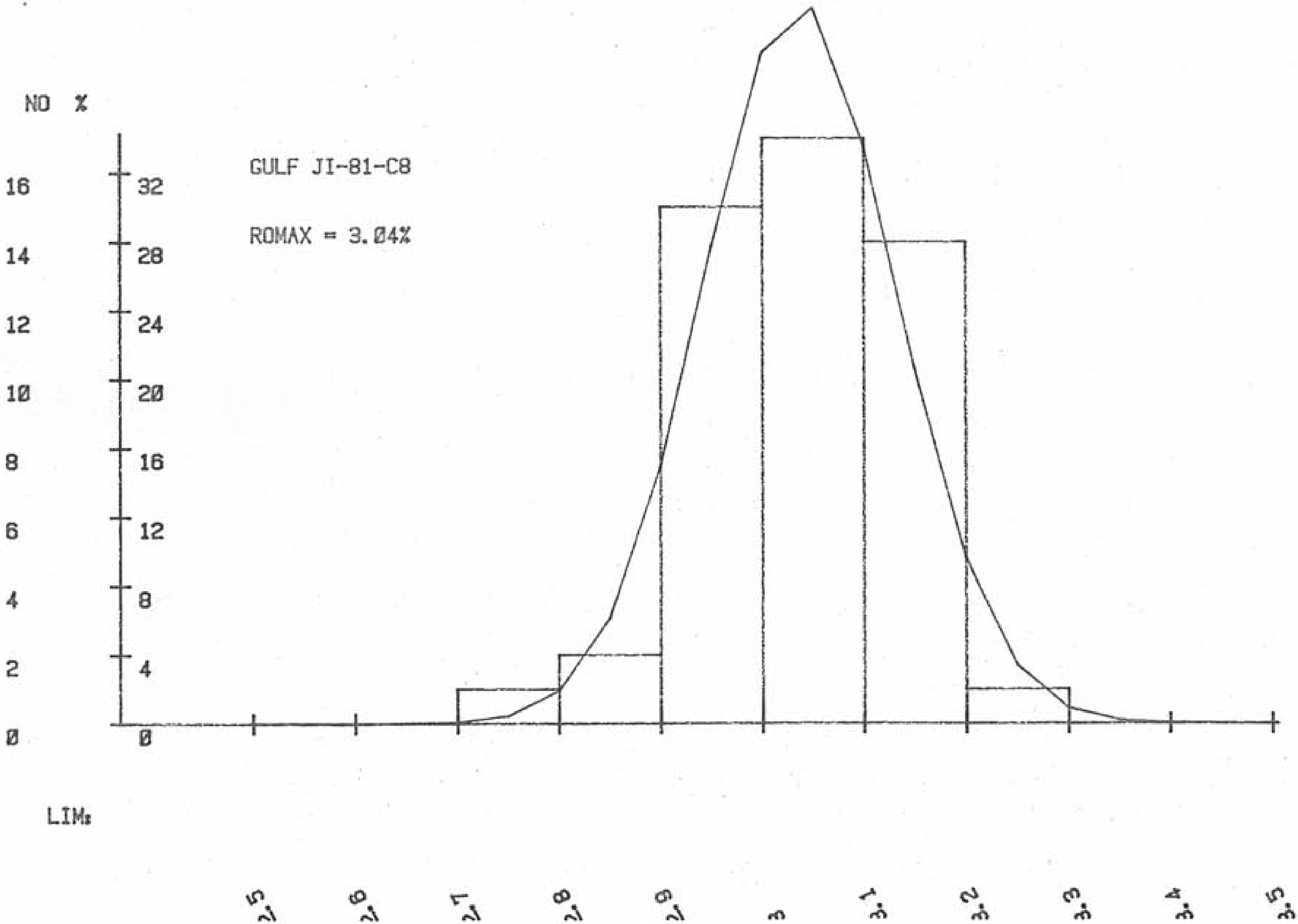

NO %
GULF JI-81-C7
ROMAX = 3.18%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

JI-81-C8.

	X(I)	X(I+1)
1	2.7800	2.8700
3	2.9900	3.1200
5	2.9600	2.8600
7	2.9400	3.0500
9	3.1900	3.0400
11	3.1000	3.0800
13	2.9700	3.0200
15	3.1000	3.1700
17	3.0600	3.1100
19	3.1300	3.0000
21	3.0100	3.0000
23	3.1900	3.0500
25	3.0500	[illegible].0200
27	2.9400	[illegible].9500
29	3.0400	[illegible].9900
31	3.2400	2.9500
33	3.0000	3.0700
35	3.0600	2.9800
37	2.9300	2.9700
39	3.1900	3.1300
41	2.9500	2.9700
43	2.9400	2.9500
45	3.1100	3.1700
47	3.1200	3.0100
49	3.0700	3.1200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.0366
COEF OF VARIATION = 3.13%
VARIANCE = .0091
STANDARD DEVIATION = .0952
SKEWNESS = -.1680
KURTOSIS = 2.8700

95.00% C.I. FOR MEAN
(3.0095, 3.0637)
ONE-TAIL T(49 , .025)=
2.01003458016

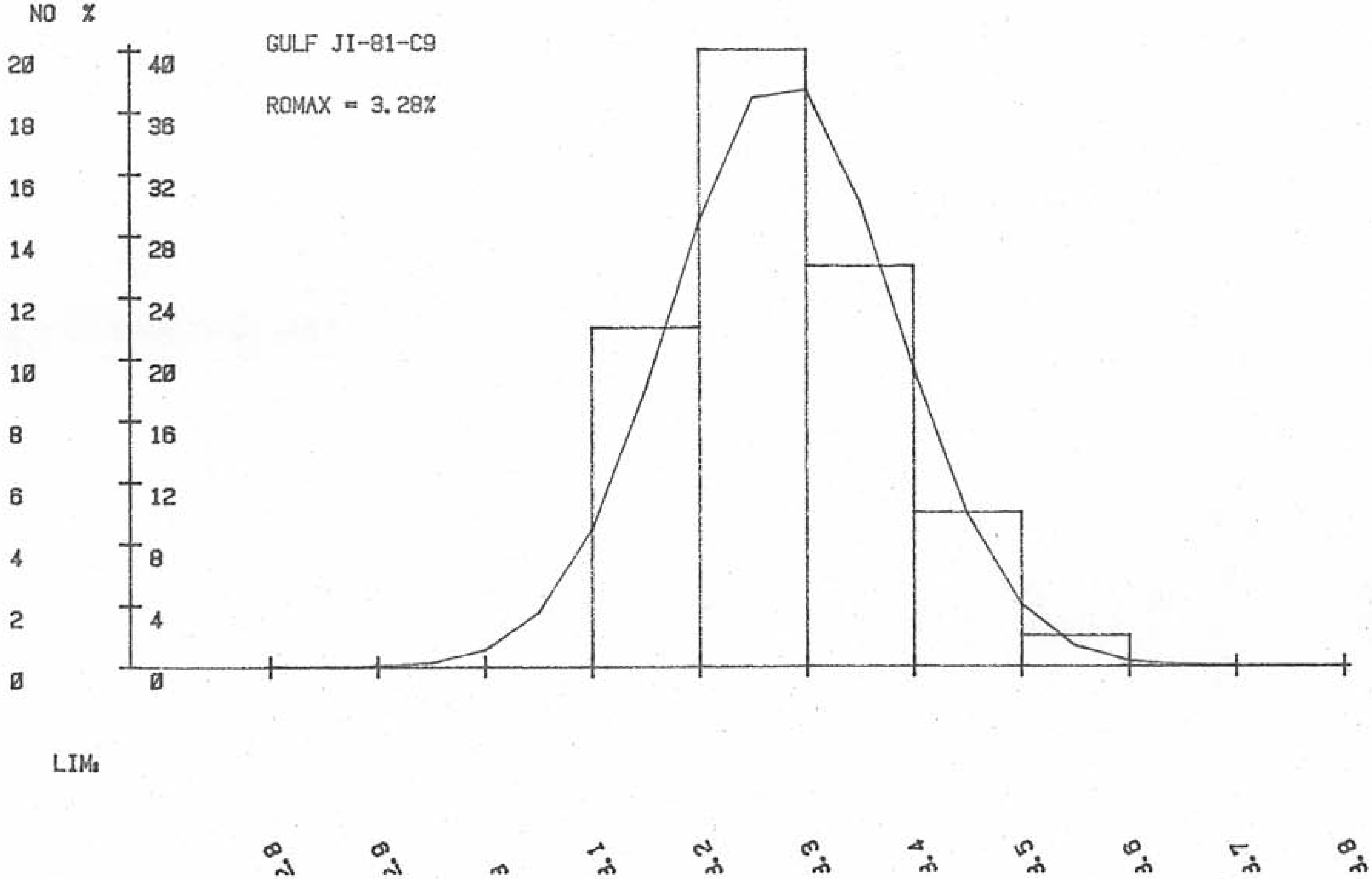

NO %
GULF JI-81-C8
ROMAX = 3.04%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

JI-81- C9.

I	X(I)	X(I+1)
1	3.1000	3.1000
3	3.2400	3.2200
5	3.1600	3.1600
7	3.2800	3.2200
9	3.2700	3.2200
11	3.1500	3.1800
13	3.4100	3.1500
15	3.2000	3.1300
17	3.1300	3.2400
19	3.1400	3.4700
21	3.3500	3.3000
23	3.4300	3.4200
25	3.2200	3.3800
27	3.1900	3.2200
29	3.2700	3.5700
31	3.2600	3.2600
33	3.2600	3.2400
35	3.2500	3.2800
37	3.2600	3.3500
39	3.3700	3.2800
41	3.3900	3.4600
43	3.2700	3.3400
45	3.3800	3.3400
47	3.3200	3.3700
49	3.3900	3.3100

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .1
MEAN = 3.2780
COEF OF VARIATION = 3.18
VARIANCE = .0109
STANDARD DEVIATION = .104
SKEWNESS = .4234
KURTOSIS = 2.8497

95.00% C.I. FOR MEAN
(3.2483, 3.3077
ONE-TAIL t(49 , .025)=
2.01003450016



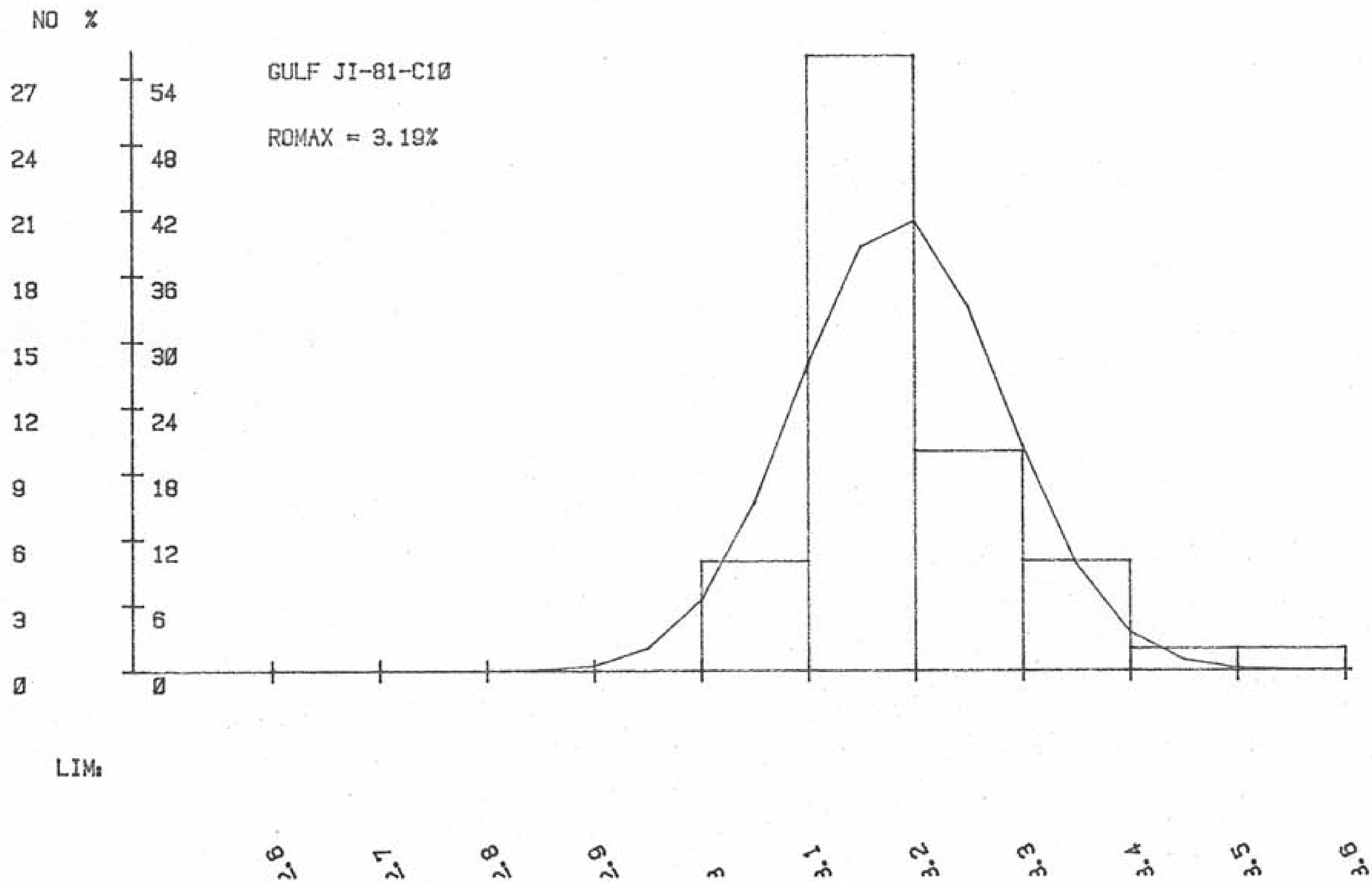
NO %
GULF JI-81-C9
ROMAX = 3.28%
20 40
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:

JI-81-C10.

I	X(I)	X(I+1)
1	3.3500	3.2000
3	3.1000	3.0700
5	3.2300	3.0700
7	3.0400	3.1000
9	3.1000	3.2200
11	3.0800	3.2800
13	3.1200	3.4200
15	3.1900	3.1300
17	3.2000	3.3000
19	3.1400	3.1500
21	3.2200	3.1900
23	3.1000	3.2200
25	3.1100	3.1900
27	3.1700	3.1600
29	3.1800	3.1200
31	3.1200	3.1400
33	3.2600	3.0600
35	3.1300	3.2100
37	3.1700	3.3300
39	3.1600	3.3500
41	3.3100	3.1500
43	3.1700	3.1900
45	3.1700	3.1300
47	3.1300	3.2600
49	3.5400	3.1700

```
BASIC STATISTICS
********************************
N =    50
STD ERROR OF THE MEAN=          .01
MEAN =         3.1858
COEF OF VARIATION =           3.02%
VARIANCE =              .0093
STANDARD DEVIATION =          .0964
SKEWNESS =             1.3866
KURTOSIS =             5.4906

     95.00% C.I. FOR MEAN:
(         3.1584,         3.2132)
ONE-TAIL t( 49 ,  .025 )=
 2.01003450016
```

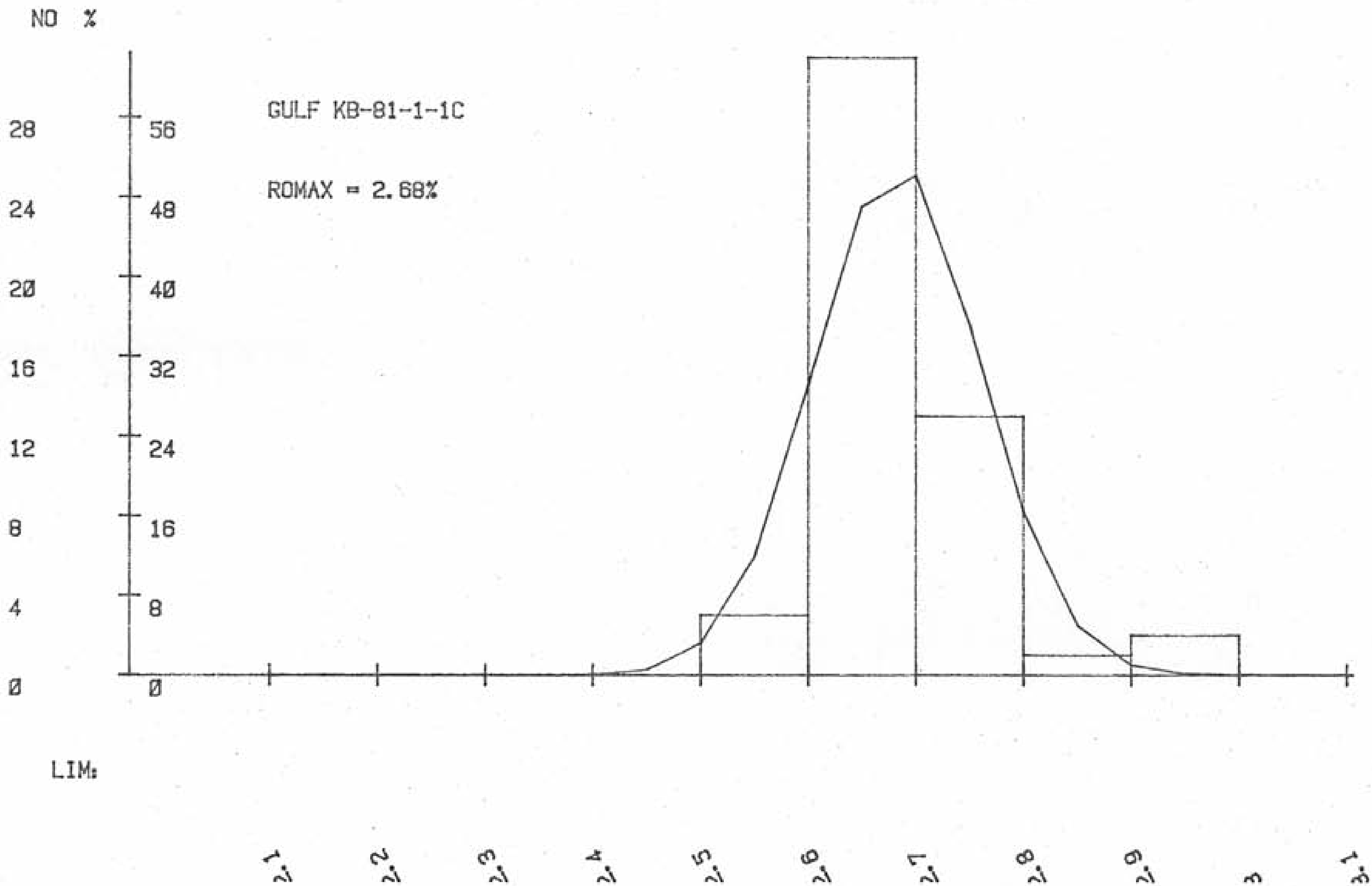

NO %
GULF JI-81-C10
ROMAX = 3.19%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6

KB-81-1-1C.

I	X(I)	X(I+1)
1	2.7800	2.7400
3	2.6600	2.7800
5	2.6200	2.6800
7	2.6400	2.7800
9	2.9100	2.6900
11	2.6500	2.6300
13	2.6300	2.6100
15	2.6500	2.7000
17	2.9100	2.6500
19	2.7200	2.7200
21	2.7000	2.6200
23	2.7400	2.6700
25	2.6400	2.6500
27	2.6500	2.6100
29	2.6100	2.6200
31	2.6700	2.7100
33	2.7700	2.6100
35	2.6300	2.6000
37	2.8900	2.5900
39	2.6600	2.6300
41	2.5900	2.6400
43	2.6900	2.6200
45	2.5900	2.6600
47	2.6900	2.7300
49	2.7800	2.6200

```
BASIC STATISTICS
*********************************
N =   50
STD ERROR OF THE MEAN=          .01
MEAN =          2.6826
COEF OF VARIATION =           2.89%
VARIANCE =              .0060
STANDARD DEVIATION =          .0775
SKEWNESS =          1.3859
KURTOSIS =          4.6858

    95.00% C.I. FOR MEAN:
(      2.6606,       2.7046)
ONE-TAIL T( 49 , .025 )=
 2.01003450016
```

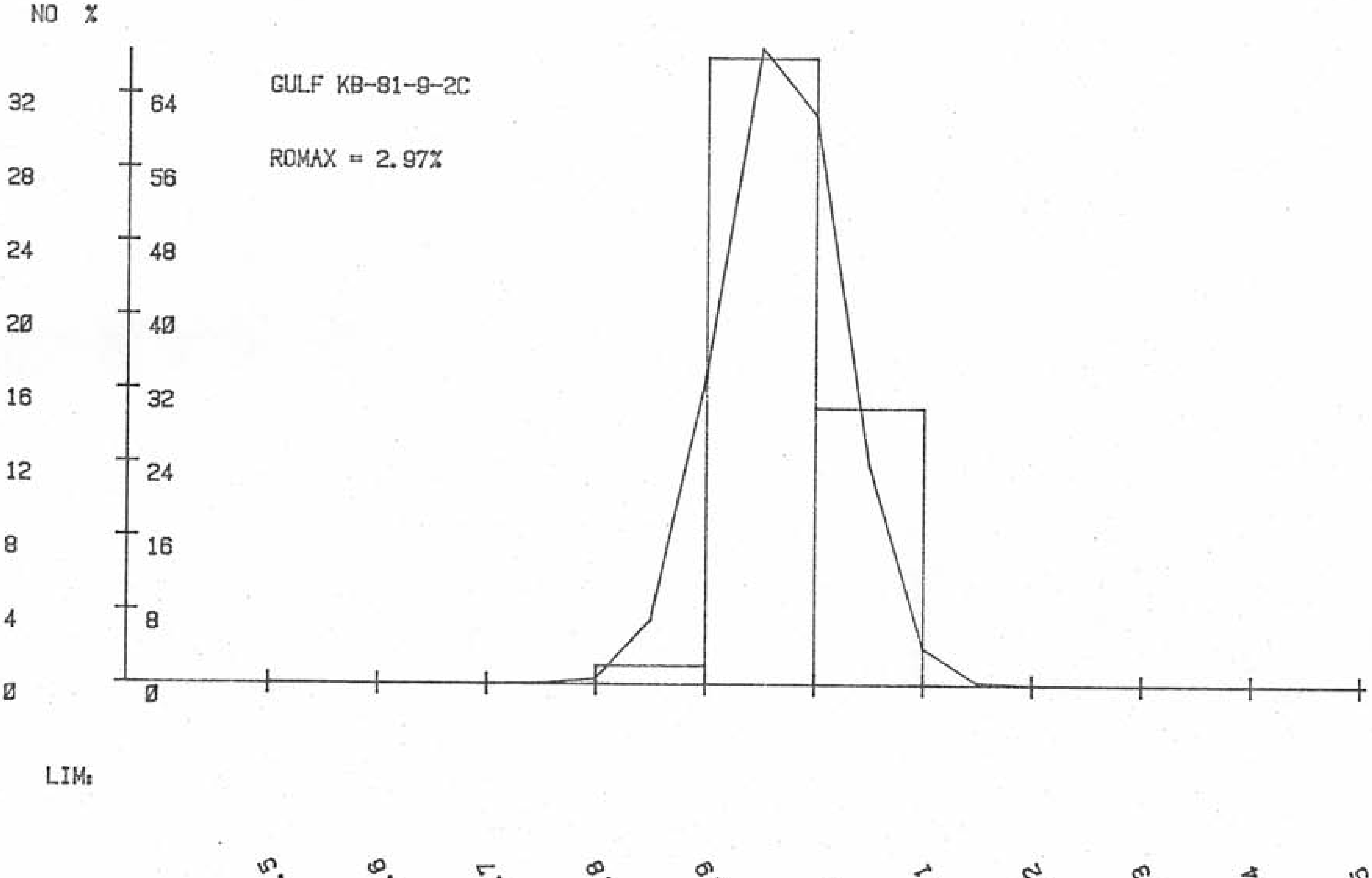

NO %
GULF KB-81-1-1C
ROMAX = 2.68%
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1

KB-81-9-2C

I	X(I)	X(I+1)
1	2.8100	3.0800
3	2.3500	3.0200
5	2.9100	2.9900
7	3.0100	2.9100
9	2.9100	2.9300
11	3.0400	2.9700
13	2.9900	2.9200
15	2.9200	2.9600
17	2.7900	2.9200
19	2.9200	2.9700
21	3.0200	3.0000
23	2.9600	2.9100
25	2.9200	2.9900
27	2.9300	3.0600
29	2.9200	2.9700
31	2.9600	3.0300
33	3.0500	2.9000
35	2.9600	2.9100
37	2.9800	3.0600
39	2.9300	2.9400
41	3.0700	3.0300
43	2.9200	3.0200
45	2.9600	2.9400
47	2.9400	3.0500
49	3.0300	3.0500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.9684
COEF OF VARIATION = 1.84%
VARIANCE = .0030
STANDARD DEVIATION = .0546
SKEWNESS = -.0206
KURTOSIS = 3.0028

95.00% C.I. FOR MEAN
(2.9529, 2.9839)
ONE-TAIL T(49 , .025)=
2.01003450016

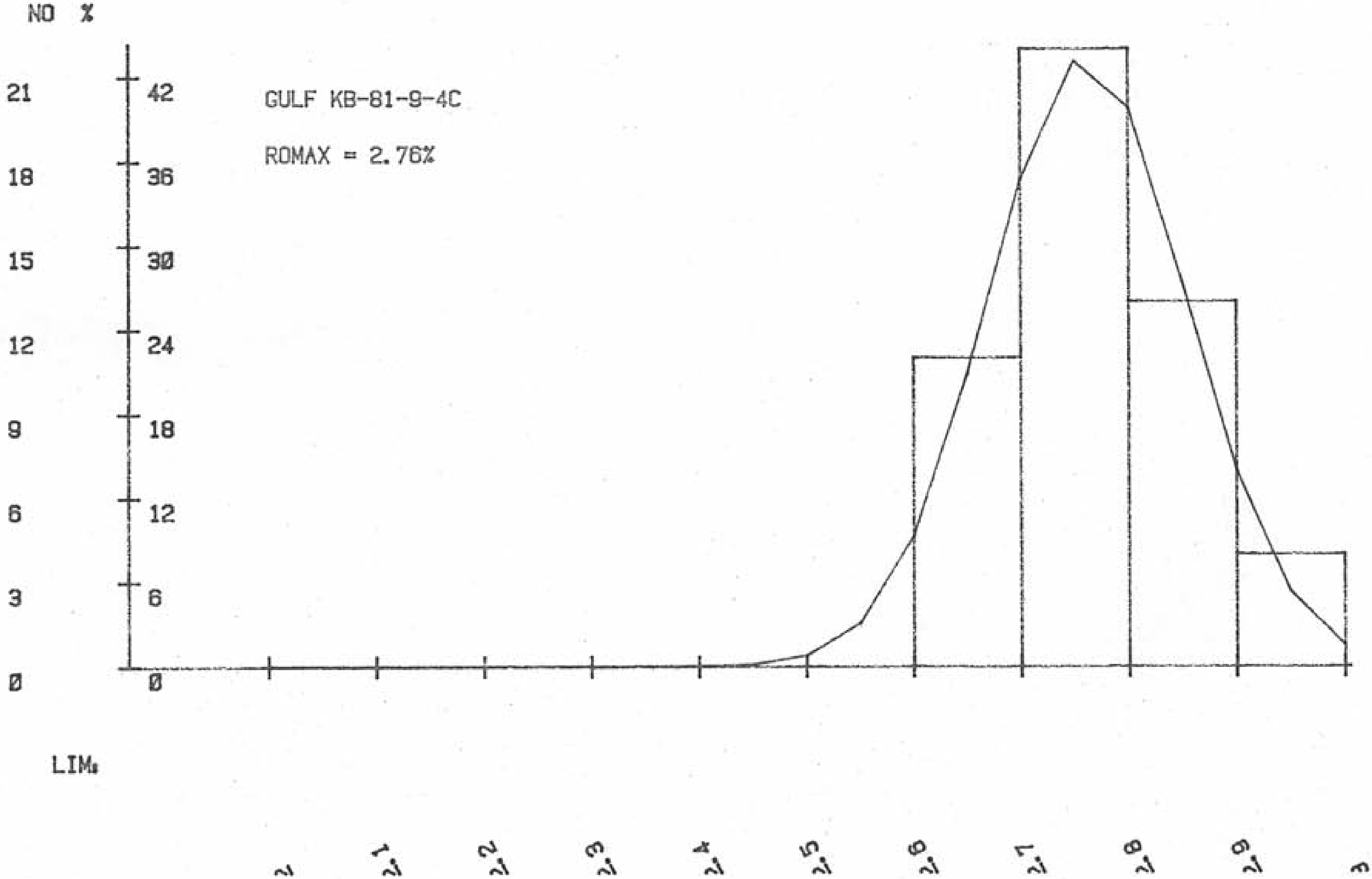

NO %
GULF KB-81-9-2C
ROMAX = 2.97%
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

KB-81-9-4C

I	X(I)	X(I+1)
1	2.7400	2.7600
3	2.9800	2.9200
5	2.7400	2.6700
7	2.8100	2.7200
9	2.8200	2.7500
11	2.7600	2.7400
13	2.7000	2.6000
15	2.7200	2.6200
17	2.8400	2.7200
19	2.6900	2.7400
21	2.7900	2.8200
23	2.6500	2.7100
25	2.7400	2.6300
27	2.8200	2.8900
29	2.7100	2.7200
31	2.6200	2.9000
33	2.7700	2.6800
35	2.8700	2.8700
37	2.6900	2.8800
39	2.8500	2.6200
41	2.8800	2.7500
43	2.7000	2.9600
45	2.7700	2.8100
47	2.6500	2.8300
49	2.7100	2.7400

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.7616
COEF OF VARIATION = 3.32%
VARIANCE = .0084
STANDARD DEVIATION = .0918
SKEWNESS = .3757
KURTOSIS = 2.5371

95.00% C.I. FOR MEAN
(2.7355, 2.7877)
ONE-TAIL t(49 , .025)=
2.01003450016

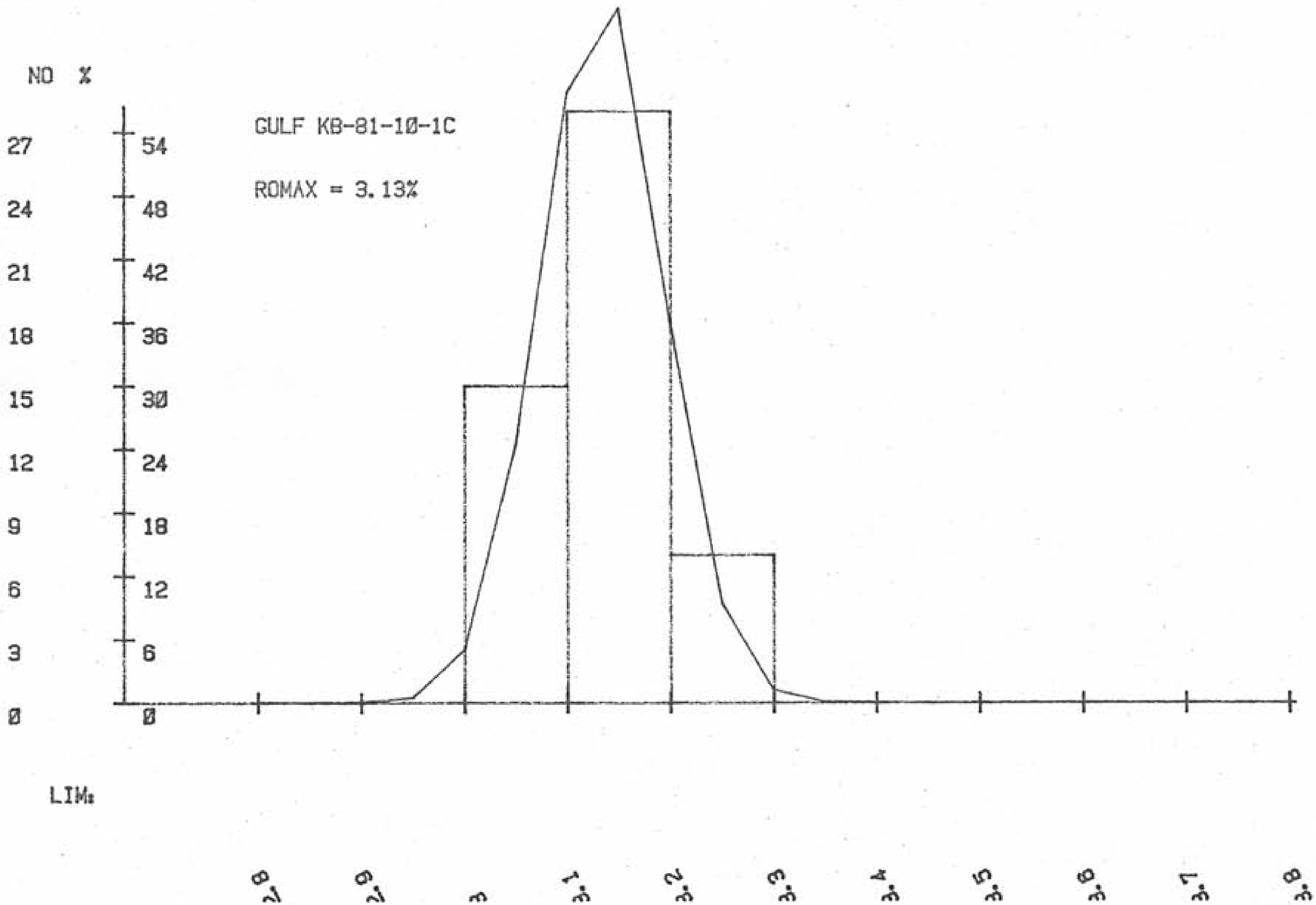

NO %
GULF KB-81-9-4C
ROMAX = 2.76%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM.
2
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3

KB-81-10-1C.

I	X(I)	X(I+1)
1	3.1700	3.1200
3	3.1700	3.1300
5	3.0900	3.2900
7	3.1000	3.2000
9	3.0600	3.2200
11	3.1800	3.1700
13	3.1000	3.0400
15	3.0700	3.0800
17	3.1400	3.2200
19	3.1400	3.0900
21	3.1300	3.0900
23	3.1500	3.1800
25	3.1600	3.1400
27	3.1700	3.0900
29	3.1700	3.1000
31	3.1400	3.0900
33	3.0500	3.1200
35	3.1700	3.0600
37	3.0600	3.2200
39	3.1500	3.2000
41	3.2200	3.0900
43	3.1100	3.1200
45	3.0500	3.1600
47	3.1000	3.1900
49	3.1000	3.0600

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.1338
COEF OF VARIATION = 1.87%
VARIANCE = .0034
STANDARD DEVIATION = .0584
SKEWNESS = .5934
KURTOSIS = 2.9829

95.00% C.I. FOR MEAN:
(3.1172, 3.1504)
ONE-TAIL t(49 , .025)=
2.01003450016



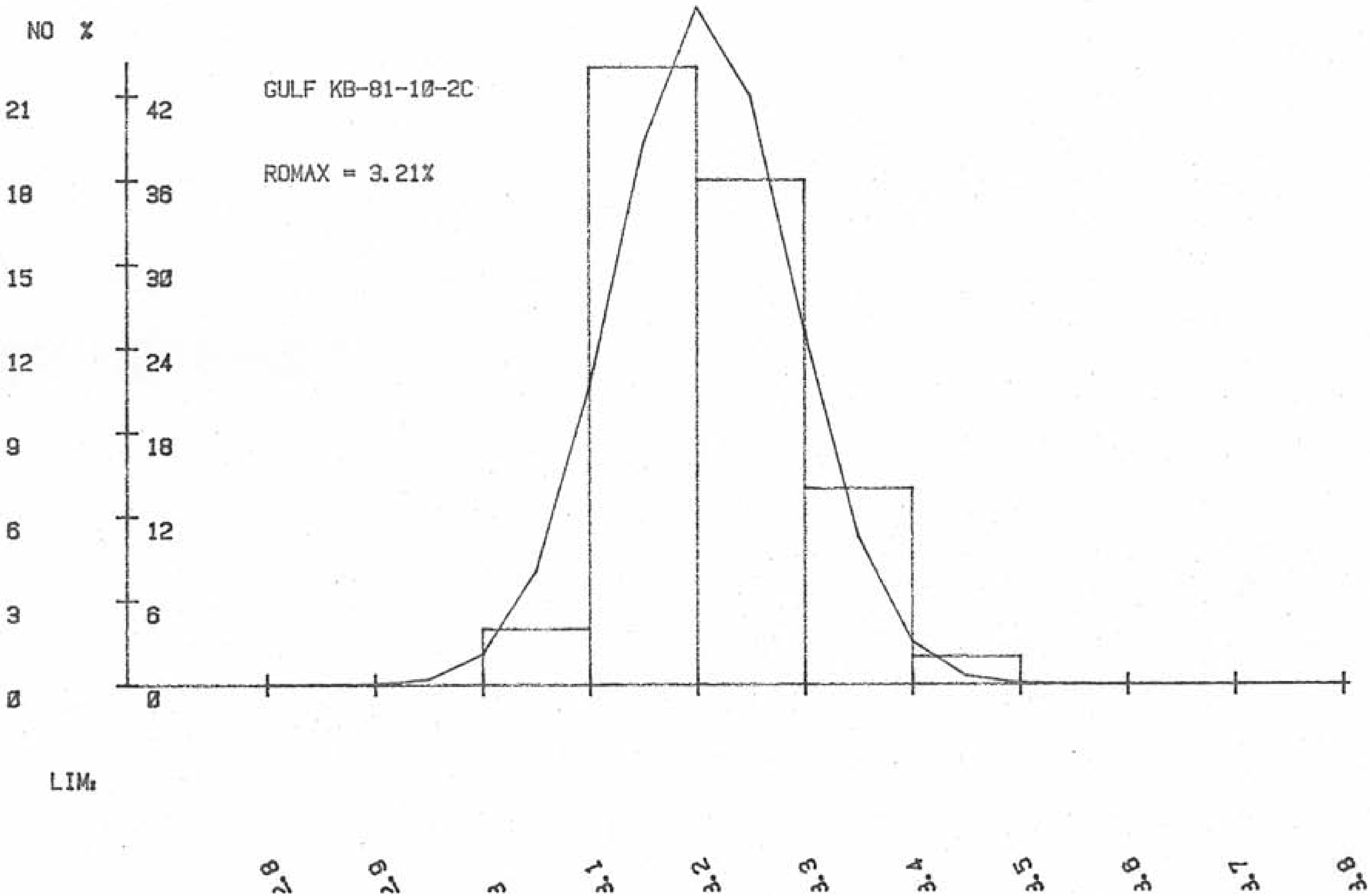
NO %
GULF KB-81-10-1C
ROMAX = 3.13%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:

KB-81-10-2C.

I	X(I)	X(I+1)
1	3.2500	3.3300
3	3.1200	3.2300
5	3.1000	3.1200
7	3.1300	3.1700
9	3.0900	3.2700
11	3.1100	3.1500
13	3.1700	3.2400
15	3.2500	3.0900
17	3.2700	3.1300
19	3.2000	3.[illegible]100
21	3.2200	3.3300
23	3.3400	3.3500
25	3.2800	3.2000
27	3.1600	3.2700
29	3.1700	3.3000
31	3.1400	3.3500
33	3.3800	3.4000
35	3.1400	3.2100
37	3.1300	3.1200
39	3.1300	3.3200
41	3.1200	3.1700
43	3.1200	3.2300
45	3.2600	3.2600
47	3.1200	3.1600
49	3.1500	3.2200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2058
COEF OF VARIATION = 2.57%
VARIANCE = .0068
STANDARD DEVIATION = .0825
SKEWNESS = .5552
KURTOSIS = 2.3454

95.00% C.I. FOR MEAN:
(3.1823, 3.2293)
ONE-TAIL t(49 , .025)=
2.01003459016



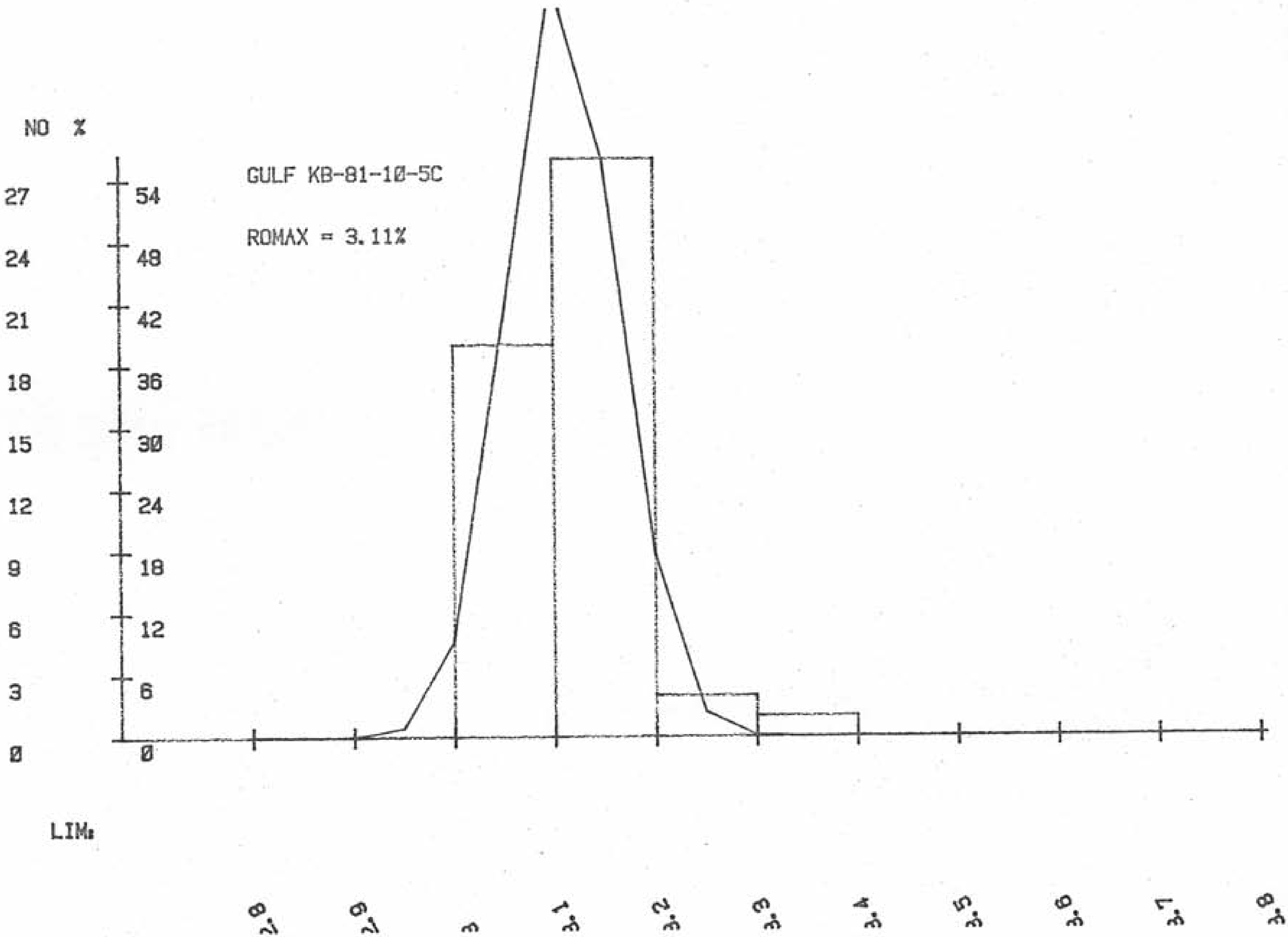
NO %
GULF KB-81-10-2C
ROMAX = 3.21%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

KB-81-10-5C.

I	X(I)	X(I+1)
1	3.1800	3.1700
3	3.1100	3.1400
5	3.1000	3.1200
7	3.1100	3.1400
9	3.1300	3.0700
11	3.1000	3.1100
13	3.1200	3.1600
15	3.3000	3.0700
17	3.0400	3.1100
19	3.0700	3.1200
21	3.2000	3.1600
23	3.1100	3.1500
25	3.0700	3.0400
27	3.0500	3.0300
29	3.0600	3.0500
31	3.1200	3.0500
33	3.0700	3.0500
35	3.0600	3.1300
37	3.1400	3.0800
39	3.0500	3.1100
41	3.1300	3.1200
43	3.1200	3.0900
45	3.0800	3.1500
47	3.1900	3.0600
49	3.1000	3.2300

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.1094
COEF OF VARIATION = 1.72%
VARIANCE = .0029
STANDARD DEVIATION = .0536
SKEWNESS = 1.6412
KURTOSIS = 4.8066

95.00% C.I. FOR MEAN:
(3.0942 , 3.1246)
ONE-TAIL t(49 , .025)=
2.01003450016

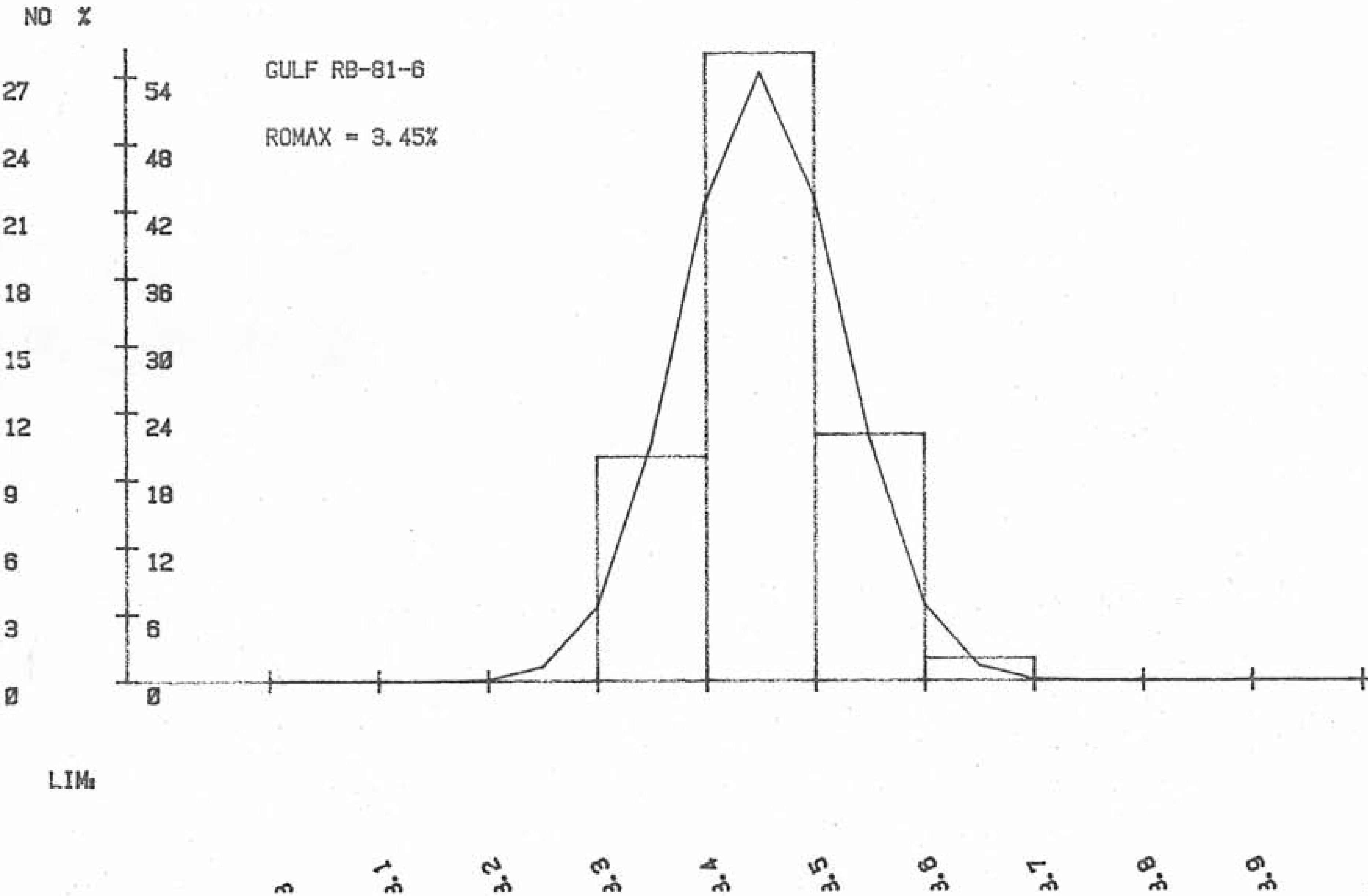

NO %
GULF KB-81-10-5C
ROMAX = 3.11%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

RB-81-6.

I	X(I)	X(I+1)
1	3.3400	3.4400
3	3.3000	3.5100
5	3.3800	3.3500
7	3.5700	3.6300
9	3.4500	3.4800
11	3.4700	3.4500
13	3.3500	3.4400
15	3.4900	3.3500
17	3.4100	3.4100
19	3.4300	3.5500
21	3.4400	3.4000
23	3.4100	3.4100
25	3.4000	3.3900
27	3.4400	3.4600
29	3.4900	3.4800
31	3.4400	3.4200
33	3.5700	3.4400
35	3.5300	3.4400
37	3.5700	3.4100
39	3.4000	3.3600
41	3.5500	3.5500
43	3.5500	3.5600
45	3.5100	3.7500
47	3.3600	3.4900
49	3.4300	3.4700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.4506
COEF OF VARIATION = 2.13%
VARIANCE = .0054
STANDARD DEVIATION = .0734
SKEWNESS = .3065
KURTOSIS = 2.5089

95.00% C.I. FOR MEAN
(3.4297 , 3.4715)
ONE-TAIL T(49 , .025)=
2.0100345001E

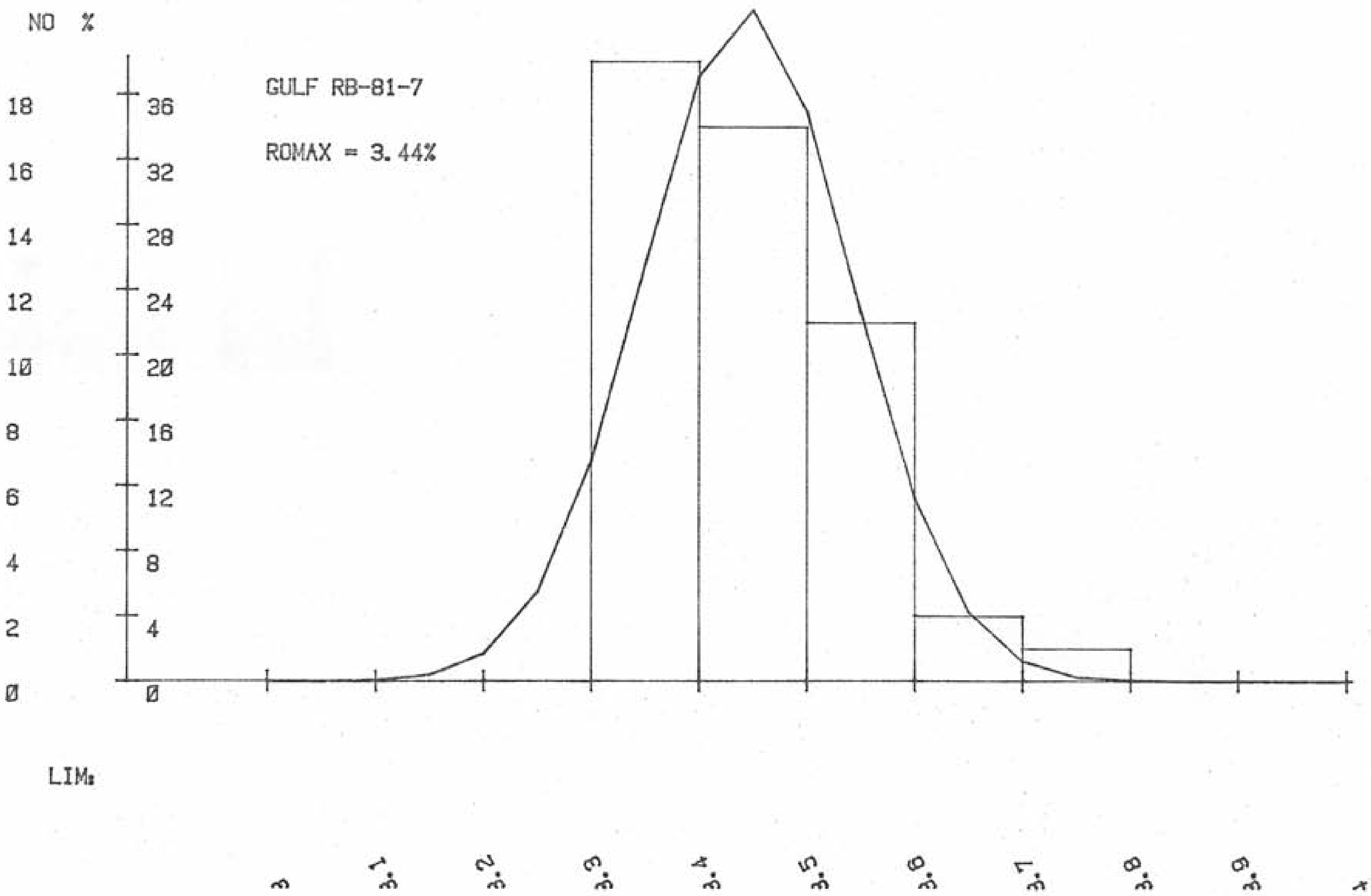

NO %
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
GULF RB-81-6
ROMAX = 3.45%
LIM:
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9

RB-81-7.

I	X(I)	X(I+1)
1	3.3800	3.3500
3	3.3300	3.3500
5	3.3900	3.4000
7	3.4300	3.3600
9	3.3400	3.4200
11	3.4400	3.3400
13	3.5600	3.4200
15	3.6200	3.4500
17	3.3700	3.5700
19	3.4300	3.7000
21	3.3800	3.4200
23	3.3300	3.5300
25	3.7000	3.3300
27	3.3300	3.4500
29	3.3400	3.3500
31	3.4600	3.3500
33	3.4400	3.4600
35	3.5600	3.3800
37	3.3800	3.5600
39	3.4000	3.4700
41	3.3900	3.4900
43	3.4200	3.5900
45	3.5300	3.5700
47	3.5900	3.5000
49	3.5400	3.4100

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= 01
MEAN = 3.4442
COEF OF VARIATION = 2.81%
VARIANCE = 0094
STANDARD DEVIATION = 0967
SKEWNESS = 6796
KURTOSIS = 2.5501

95.00% C.I. FOR MEAN
(3.4167, 3.4717)
ONE-TAIL t(49 , 025)=
2.01003450016

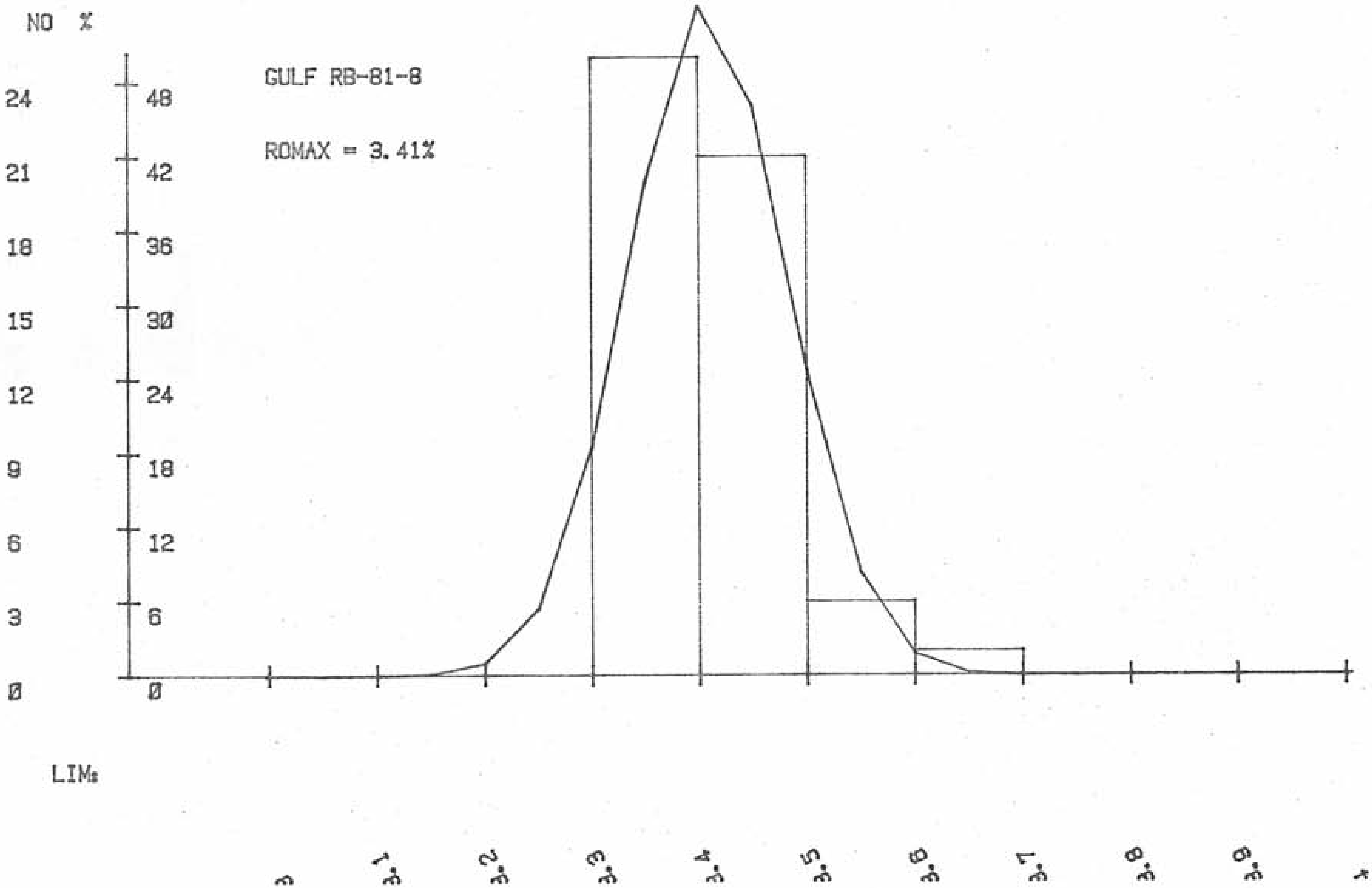

NO %
GULF RB-81-7
ROMAX = 3.44%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:

RB-81-8.

I	X(I)	X(I+1)
1	3.4100	3.4200
3	3.4700	3.4500
5	3.4300	3.3700
7	3.3500	3.3500
9	3.4800	3.3700
11	3.3300	3.3600
13	3.4000	3.3700
15	3.3200	3.3600
17	3.4200	3.4400
19	3.4200	3.3900
21	3.3500	3.3100
23	3.3600	3.4300
25	3.3800	3.3200
27	3.3100	3.3400
29	3.4600	3.4700
31	3.3300	3.4500
33	3.3400	3.3500
35	3.3500	3.4800
37	3.3700	3.5000
39	3.4300	3.3800
41	3.3100	3.4800
43	3.4200	3.3900
45	3.5500	3.4500
47	3.6800	3.5600
49	3.4600	3.4600

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN = .01
MEAN = 3.4078
COEF OF VARIATION = 2.15%
VARIANCE = .0054
STANDARD DEVIATION = .0733
SKEWNESS = 1.1593
KURTOSIS = 5.2452

95.00% C.I. FOR MEAN:
(3.3870, 3.4286)
ONE-TAIL T([illegible] .025)=
2.010034500



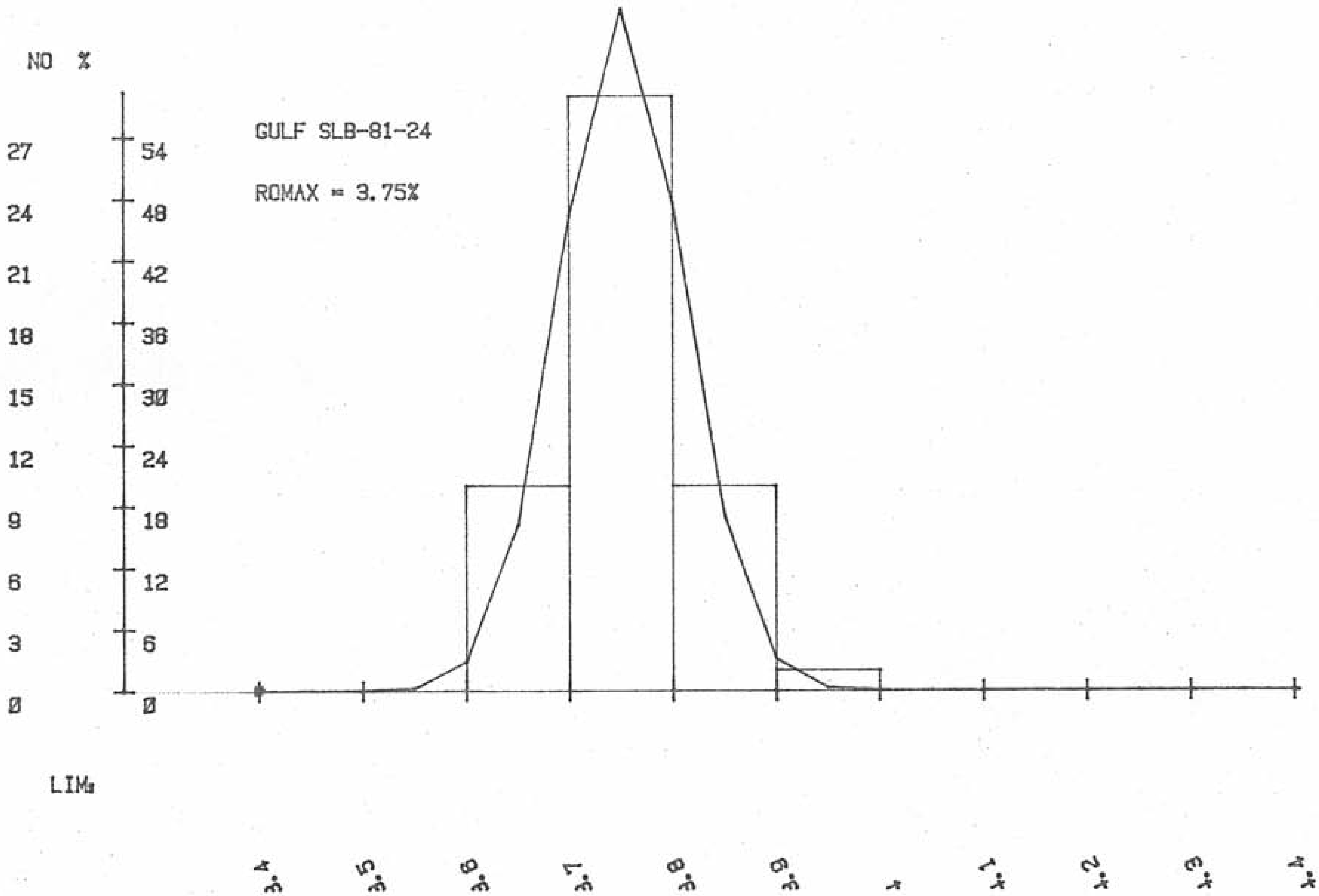
NO %
GULF RB-81-8
ROMAX = 3.41%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs

SLB-81-24.

	X(I)	X(I+1)
1	3.9200	3.7500
3	3.7000	3.8200
5	3.7600	3.8200
7	3.7400	3.6900
9	3.8300	3.7500
11	3.6700	3.7800
13	3.7100	3.7900
15	3.6800	3.7600
17	3.8000	3.7500
19	3.7200	3.7000
21	3.9900	3.7400
23	3.7800	3.7100
25	3.7400	3.7200
27	3.7400	3.7500
29	3.7900	3.7100
31	3.7100	3.7200
33	3.6700	3.6900
35	3.8600	3.6500
37	3.6900	3.7000
39	3.7400	3.6000
41	3.8400	3.7700
43	3.7200	3.6900
45	3.6900	3.8200
47	3.7100	3.8200
49	3.7700	3.8200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= [illegible]01
MEAN = 3.7[illegible]10
COEF OF VARIATION = 1.60%
VARIANCE = .0036
STANDARD DEVIATION = .0600
SKEWNESS = .6946
KURTOSIS = 3.0439

95.00% C.I. FOR MEAN
(3.7[illegible]09, 3.7681)
ONE-TAIL T(49 , .025)=
2.0100345
0016

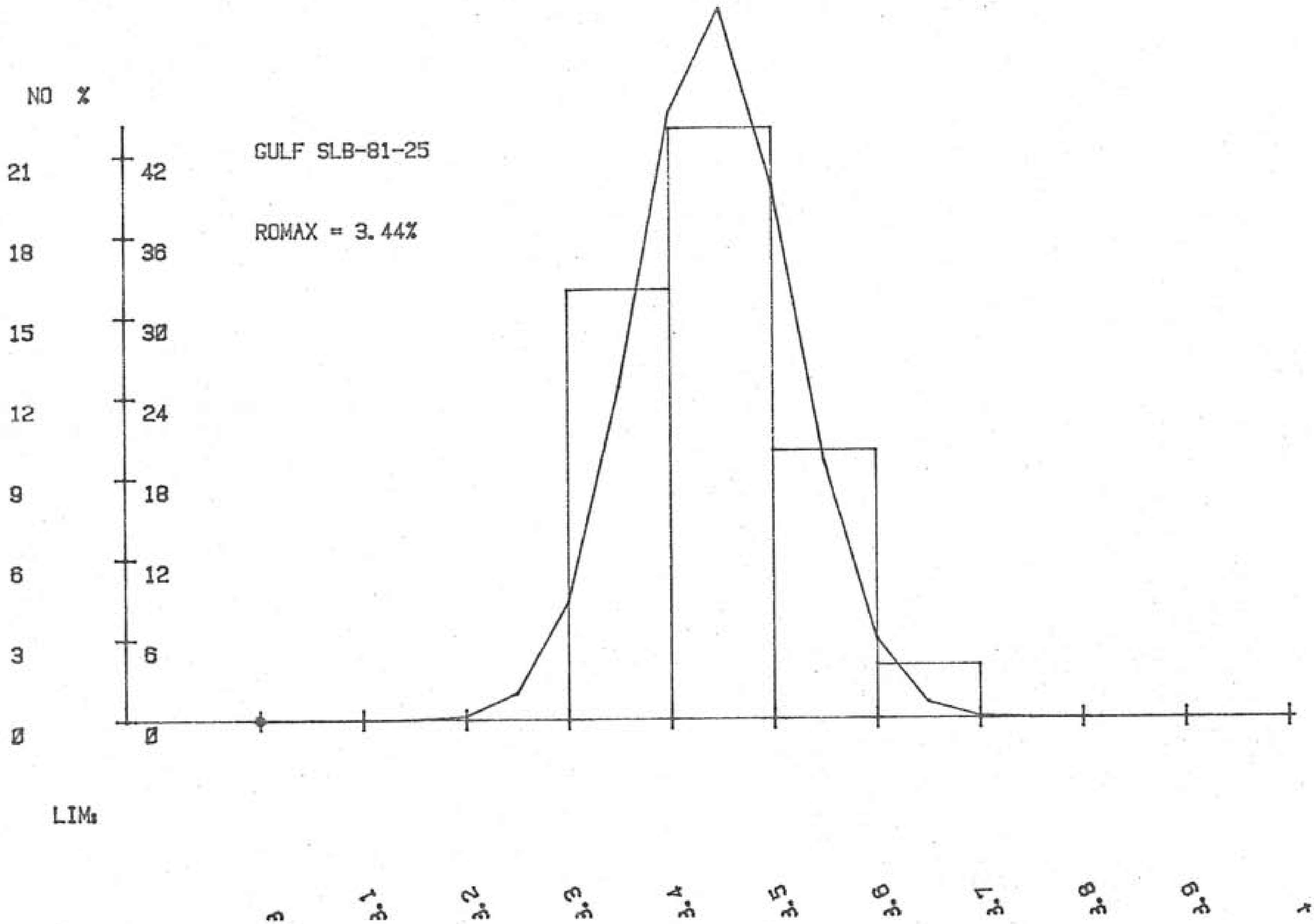

NO %
GULF SLB-81-24
ROMAX = 3.75%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
3.4
3.5
3.6
3.7
3.8
3.9
4
4.1
4.2
4.3
4.4

SLB-81-25.

I	X(I)	X(I+1)
1	3.4800	[illegible]
3	3.5200	3.3600
5	3.4300	3.4500
7	3.4400	3.3500
9	3.3300	[illegible]
11	3.4100	3.3600
13	3.4000	3.4500
15	3.4200	3.4600
17	3.3600	3.5400
19	3.4000	3.5600
21	3.3800	3.5500
23	3.4100	3.4100
25	3.4100	3.5400
27	3.4600	3.4200
29	3.3300	3.4600
31	3.5200	3.3500
33	3.3400	3.3800
35	3.3900	3.5000
37	3.4700	3.4100
39	3.4700	3.5500
41	3.6000	3.4900
43	3.4300	3.3900
45	3.5500	3.3600
47	3.3900	3.5600
49	3.3900	3.4700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.4428
COEF OF VARIATION = 2.18%
VARIANCE = .0056
STANDARD DEVIATION = .0751
SKEWNESS = .5437
KURTOSIS = 2.4428

95.00% C.I. FOR MEAN
(3.4214, 3.4642)
ONE-TAIL T(49 , .025) =
2.01003450016


GULF SLB-81-25
ROMAX = 3.44%
NO %
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9

SLB-81-26.

I	X(I)	X(I+1)
1	3.6300	3.4900
3	3.3400	3.3400
5	3.3600	3.3900
7	3.3200	3.3600
9	3.3800	3.4500
11	3.3500	3.4600
13	3.3000	3.3600
15	3.3600	3.3000
17	3.3000	3.3200
19	3.7600	3.3500
21	3.3400	3.3400
23	3.3000	3.3200
25	3.3900	3.3000
27	3.3000	3.2700
29	3.2200	3.3700
31	3.3500	3.2300
33	3.4300	3.3700
35	3.4000	3.4500
37	3.4100	3.4300
39	3.3600	3.4600
41	3.4500	3.3300
43	3.2400	3.4600
45	3.3700	3.6000
47	3.4500	3.3300
49	3.46[illegible]	3.3000

BASIC STATISTICS

****

N = 50

STD ERROR OF THE MEAN= .01

MEAN = 3.3788

COEF OF VARIATION = 2.[illegible]%

VARIANCE = .0095

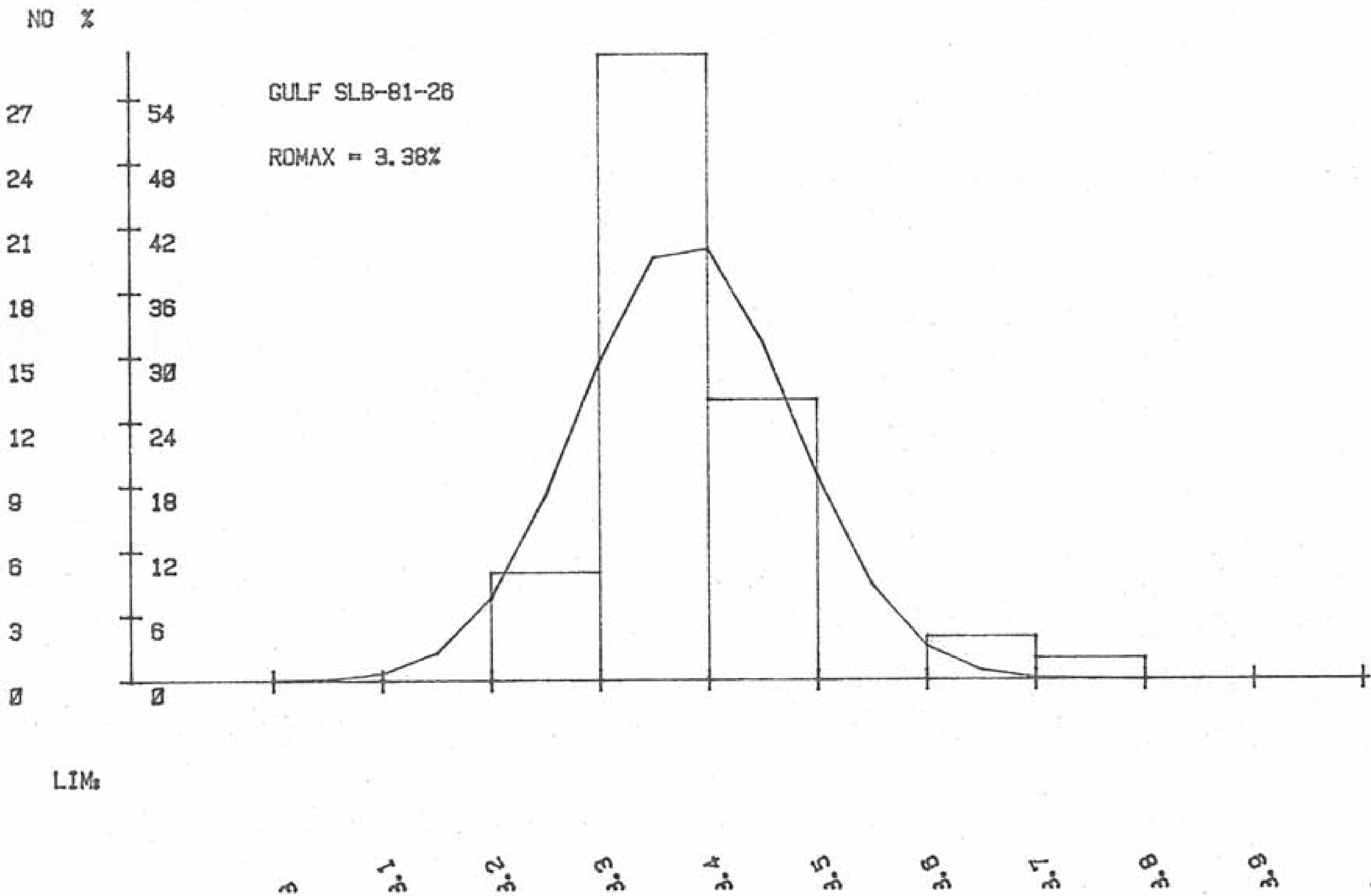
STANDARD DEVIATION = .0975

SKEWNESS = 1.5742

KURTOSIS = 6.8959

95.00% C.I. FOR MEAN
(3.3511, 3.4065)

2-TAIL T(.49 , .025)=
2.01003430016

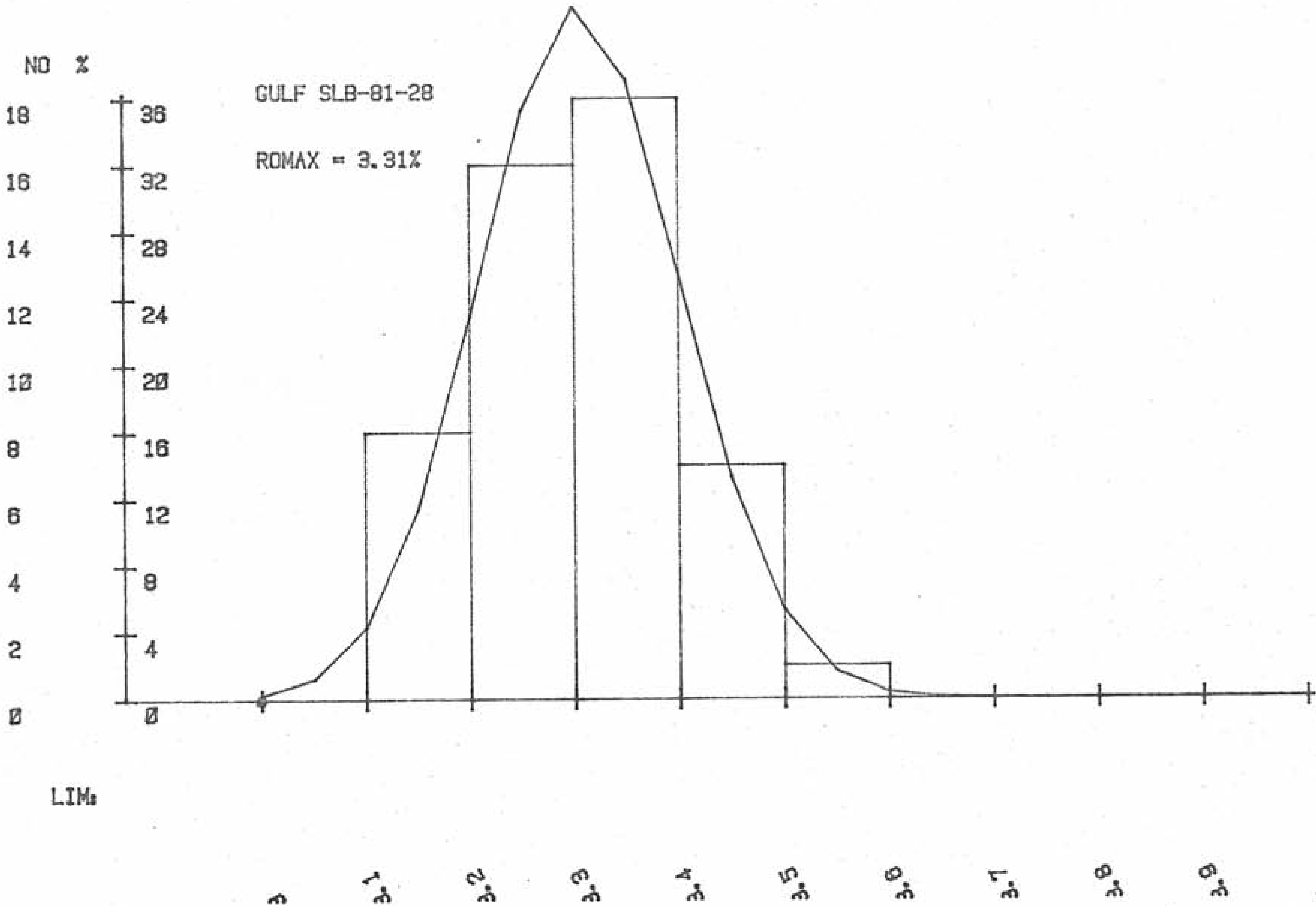

NO %
GULF SLB-81-26
ROMAX = 3.38%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs

SLB-81-28.

	X(I)	X(I+1)
[illegible]	3.3800	3.1700
[illegible]	3.3800	3.3500
[illegible]	3.2900	3.2500
[illegible]	3.[illegible]300	3.3300
[illegible]	3.2700	3.[illegible]900
[illegible]	3.2100	3.2800
[illegible]	3.3100	3.2200
15	3.2800	3.4000
17	3.4700	3.4500
19	3.3300	3.2700
21	3.2900	3.2900
23	3.4500	3.3500
25	3.3300	3.4200
27	3.4000	3.4900
29	3.3600	3.3200
31	3.2100	3.5600
33	3.2700	3.1300
35	3.3400	3.1800
37	3.2600	3.2100
39	3.2100	3.1500
41	3.2500	3.3200
43	3.3800	3.1700
45	3.3500	3.2900
47	3.2400	3.1500
49	3.1300	3.1500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.3048
COEF OF VARIATION = 2.91%
VARIANCE = [illegible]
STANDARD DEVIATION = .0962
SKEWNESS = 2.[illegible]4
KURTOSIS = 3.7[illegible]9

95.00% C.I. FOR MEAN
(3.2774, 3.3312)
ONE-TAIL T(49, .025)=
2.01003450016



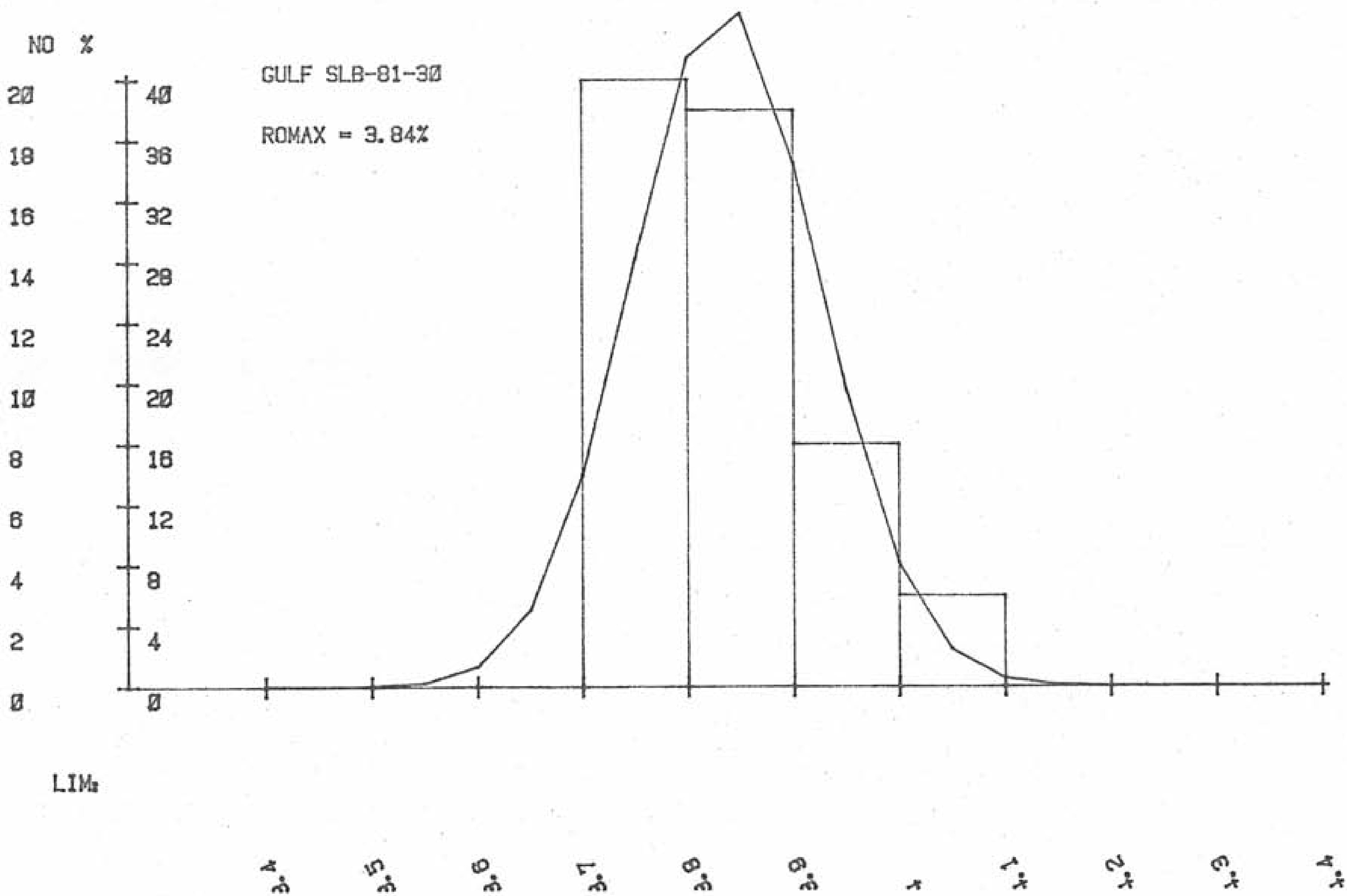
NO %
GULF SLB-81-28
ROMAX = 3.31%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:

SLB-81-30

I	X(I)	X(I+1)
1	3.7500	3.7600
3	3.8800	3.7200
5	3.8700	3.7500
7	3.7500	3.7600
9	3.9700	3.7400
11	4.0600	3.8200
13	3.7100	3.7600
15	3.8600	3.8200
17	3.8900	4.0300
19	3.7600	3.9500
21	4.0600	3.9400
23	3.9200	3.6600
25	3.7600	3.8000
27	3.9400	3.9200
29	3.8500	3.8700
31	3.8500	3.8800
33	3.8200	3.8000
35	3.7200	3.7900
37	3.7300	3.7900
39	3.9300	3.7000
41	3.9100	3.7500
43	3.9000	3.7500
45	3.9300	3.7800
47	3.7600	3.8800
49	3.9000	3.8200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.8356
COEF OF VARIATION = 3.31%
VARIANCE = .0079
STANDARD DEVIATION = .0888
SKEWNESS = .7070
KURTOSIS = 2.9922

95% C.I. FOR MEAN
(3.8104, 3.8608)
ONE-TAIL T(49 , .025)=
2.003450016

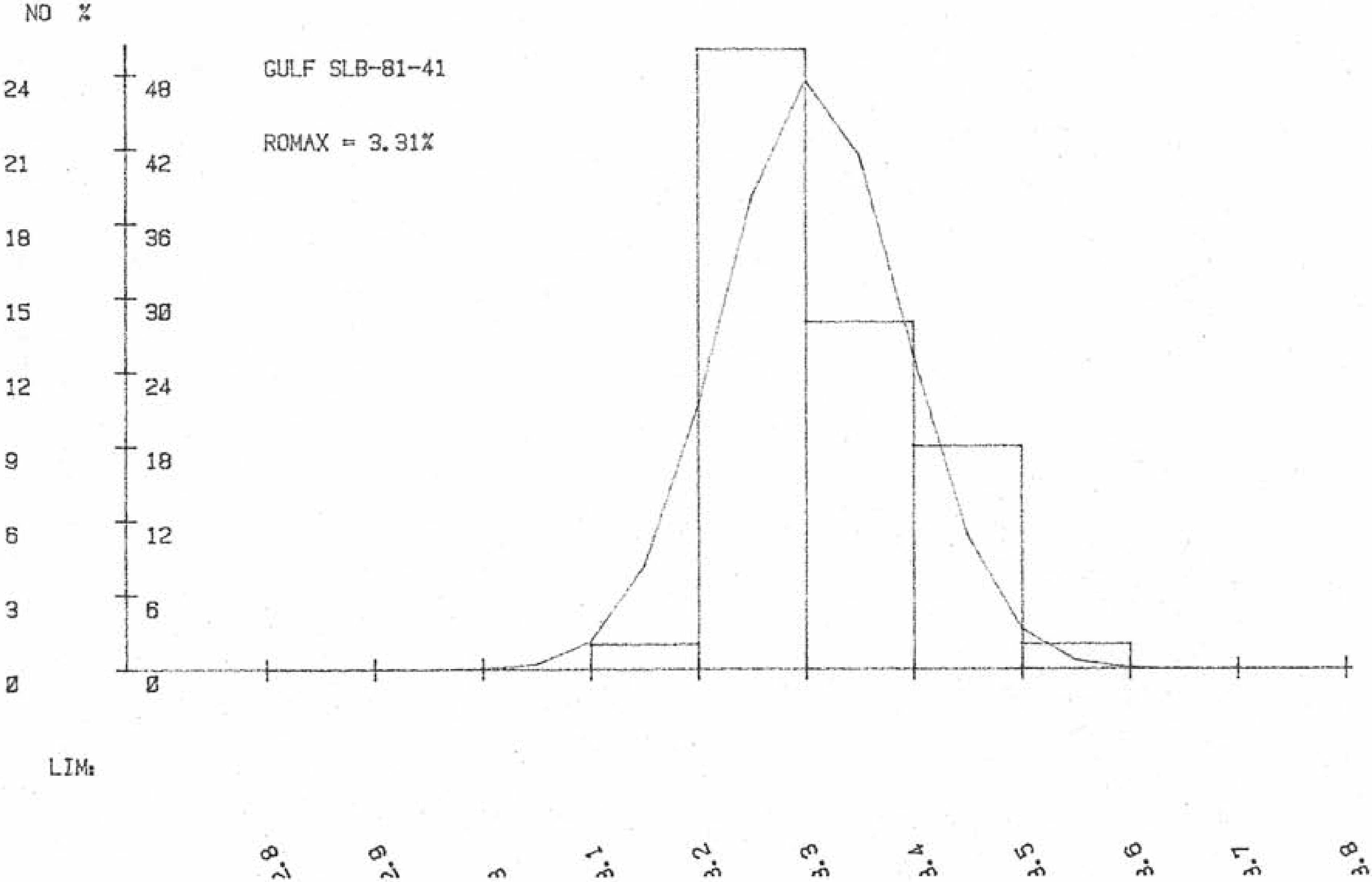

NO %
GULF SLB-81-30
ROMAX = 3.84%
20 40
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM.
3.4
3.5
3.6
3.7
3.8
3.9
4
4.1
4.2
4.3
4.4

SLB-81-41.

	X(I)	X(I+1)
1	3.2700	3.2700
3	3.2500	3.2100
5	3.2600	3.2300
7	3.2200	3.3000
9	3.2300	3.2500
11	3.2300	3.3300
13	3.4600	3.1700
15	3.3800	3.2200
17	3.3400	3.3200
19	3.2200	3.3500
21	3.2700	3.3100
23	3.3200	3.2500
25	3.2500	3.4300
27	3.5400	3.4600
29	3.3200	3.4600
31	3.4000	3.3200
33	3.2700	3.2600
35	3.2400	3.3700
37	3.3400	3.3400
39	3.4000	3.2200
41	3.2600	3.4000
43	3.4200	3.2300
45	3.2900	3.2300
47	3.2000	3.2400
49	3.3400	3.4600

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.3066
COEF OF VARIATION = 2.53%
VARIANCE = .0070
STANDARD DEVIATION = .0837
SKEWNESS = .2111
KURTOSIS = 2.9347

95.00% C.I. FOR MEAN
(3.2822, 3.3298)
ONE-TAIL T(49 , .025)=
2.01003450016

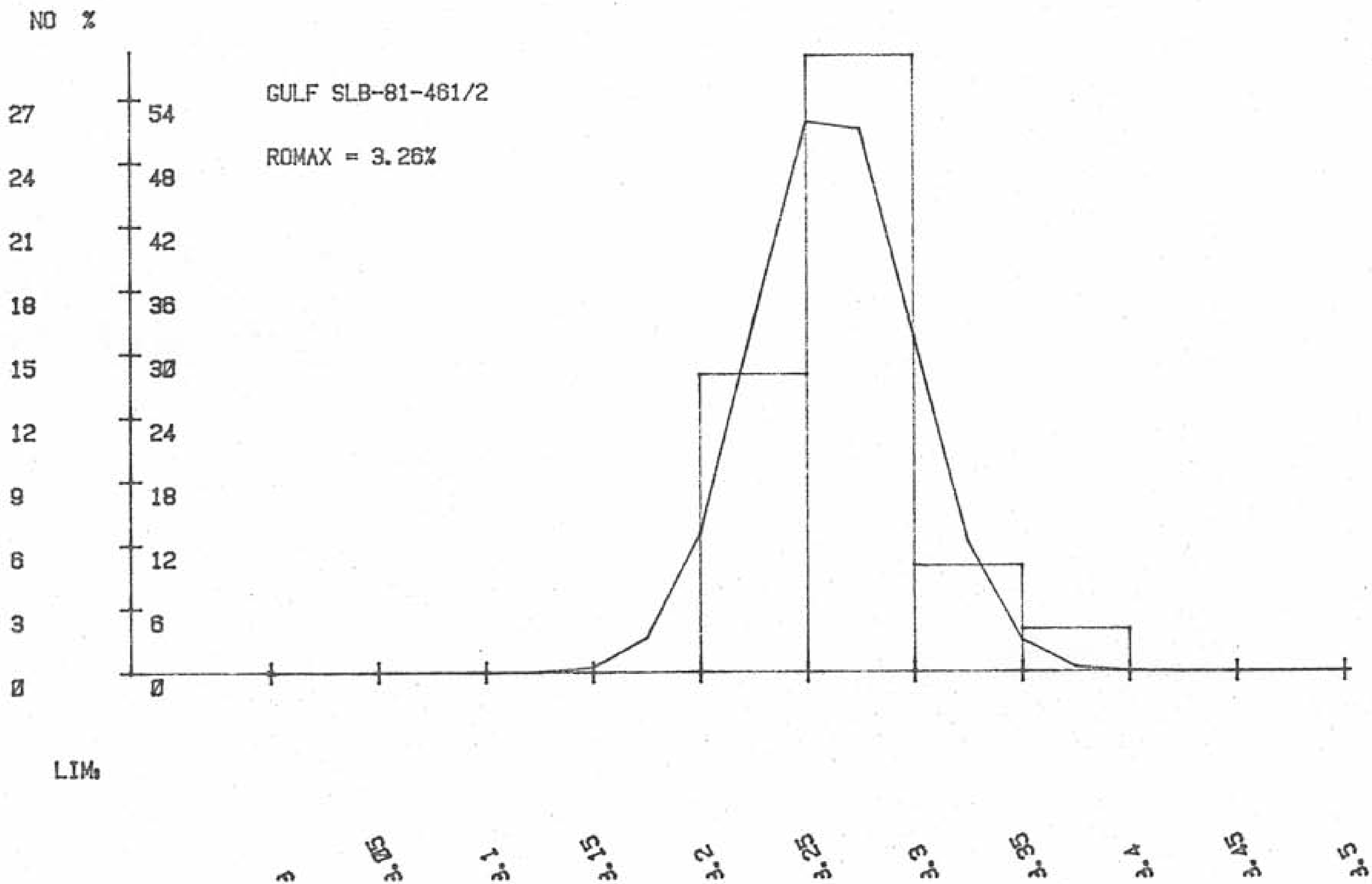

NO
%
GULF SLB-81-41
ROMAX = 3.31%
24
21
18
15
12
9
6
3
Ø
48
42
36
3Ø
24
18
12
6
Ø
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

SLB - 81 - 46½.

I	X(I)	X(I+1)
1	3.3500	3.2000
[illegible]	3.3400	3.2300
5	3.2300	3.2800
[illegible]	3.2200	3.2900
[illegible]	3.3100	3.2700
[illegible]	3.2200	3.2200
[illegible]	3.2500	3.2500
[illegible]	3.2700	3.2400
[illegible]	3.2500	3.2500
19	3.2000	3.2800
21	3.2900	3.2500
23	3.2800	3.2600
25	3.2800	3.2400
27	3.2000	3.2500
29	3.2700	3.2200
31	3.2100	3.2300
33	3.3900	3.2500
35	3.2800	3.2900
[illegible]	3.2700	3.3100
[illegible]	3.2700	3.2500
41	3.3600	3.2500
43	3.2700	3.2900
45	3.2700	3.2600
47	3.2600	3.3100
49	3.2200	3.2500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2618
COEF OF VARIATION = 1.12%
VARIANCE = .0013
STANDARD DEVIATION = .0365
SKEWNESS = .5390
KURTOSIS = 3.2850

95.00% C.I. FOR MEAN:
(3.2514, 3.2722)
ONE-TAIL t(49 , .025)=
2.01003450016



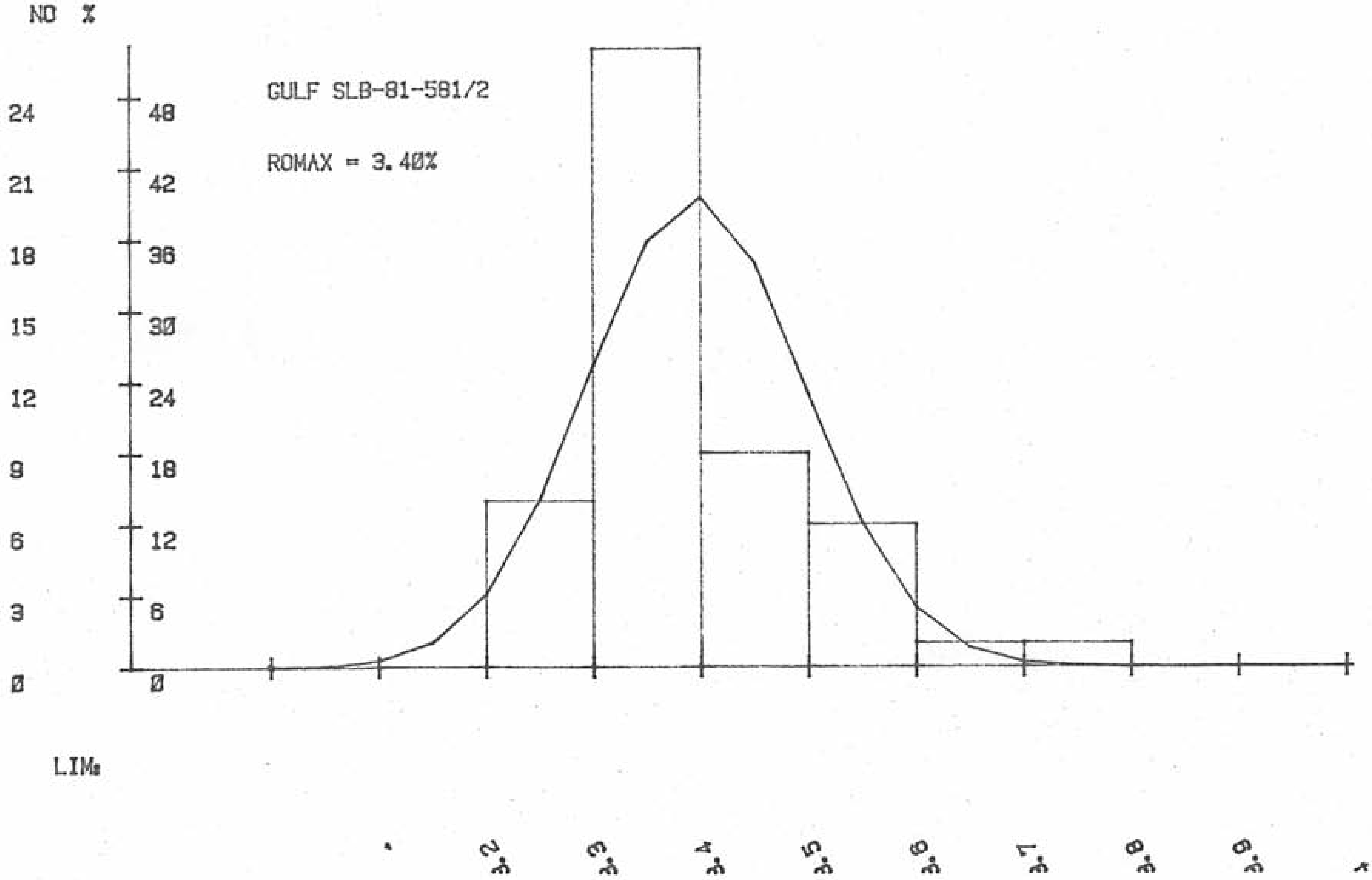
NO %
GULF SLB-81-461/2
ROMAX = 3.26%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs
3
3.05
3.1
3.15
3.2
3.25
3.3
3.35
3.4
3.45
3.5

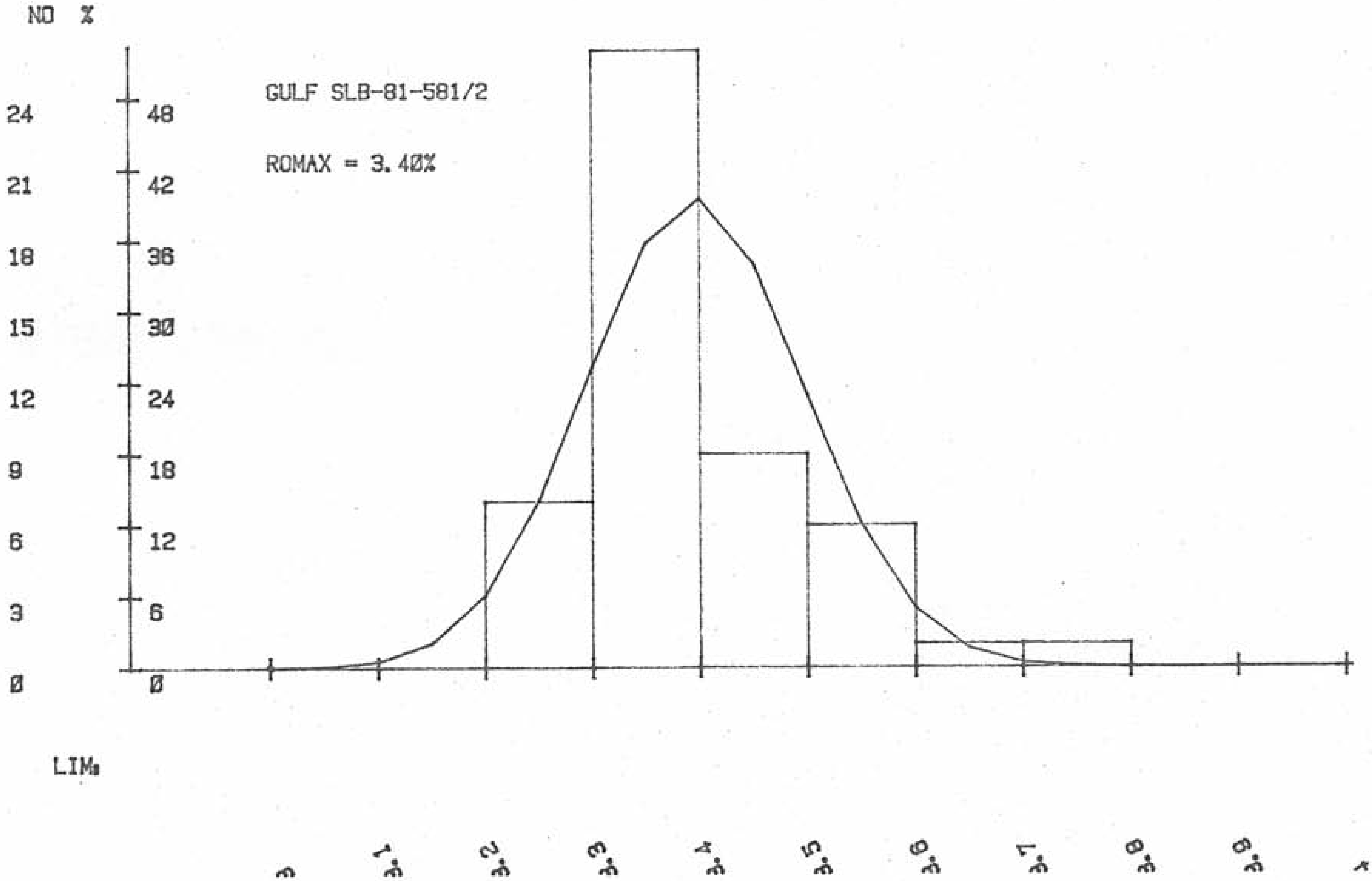
SLB-81-58½.

I	X(I)	X(I+1)
1	3.3900	3.43[illegible]
3	3.3500	3.36[illegible]
5	3.5000	3.35[illegible]
7	3.3500	3.5700
9	3.3600	3.5500
11	3.4400	3.4600
13	3.3900	3.3600
15	3.2900	3.5300
17	3.2600	3.3700
19	3.3500	3.3000
21	3.3900	3.3900
23	3.2800	3.2200
25	3.3200	3.4100
27	3.2500	3.6200
29	3.4600	3.3600
31	3.5600	3.2700
33	3.3600	3.3200
35	3.2800	3.3900
37	3.3900	3.3200
39	3.4700	3.3500
41	3.3600	3.5400
43	3.5300	3.3900
45	3.7300	3.4200
47	3.4700	3.3700
49	3.4500	3.3200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.3950
COEF OF VARIATION = 2.97%
VARIANCE = .0102
STANDARD DEVIATION = .1010
SKEWNESS = 1.0088
KURTOSIS = 4.2307

95.00% C.I. FOR MEAN:
(3.3663, 3.4237)
ONE-TAIL T(49 , .025)=
2.01003450016


NO %
GULF SLB-81-581/2
ROMAX = 3.40%
24
21
18
15
12
9
6
3
0
48
42
36
30
24
18
12
6
0
LIMs
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9

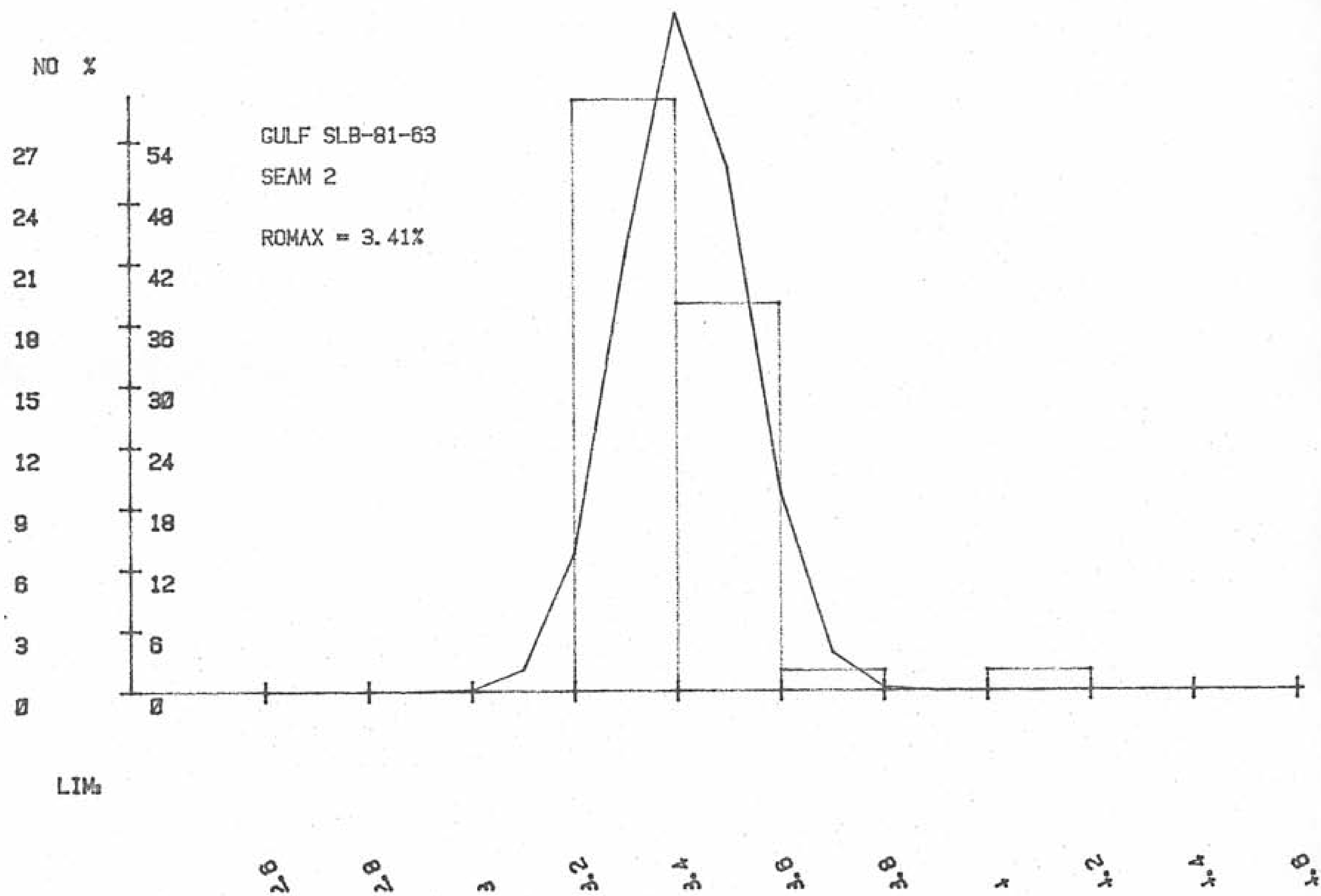

NO %
GULF SLB-81-581/2
ROMAX = 3.40%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs

SLB-81-63
Seam 2.

I	X(I)	X(I+1)
1	3.3900	3.3500
3	3.4700	3.5000
5	3.5900	3.3800
7	3.3500	3.4700
9	3.4200	4.0800
11	3.4000	3.4200
13	3.3900	3.4500
15	3.3000	3.3600
17	3.4500	3.3800
19	3.3500	3.5200
21	3.3500	3.3400
23	3.3200	3.3500
25	3.3700	3.5200
27	3.3200	3.3600
29	3.4100	3.3800
31	3.3600	3.3600
33	3.3200	3.3300
35	3.6700	3.4600
37	3.3500	3.3900
39	3.4400	3.3400
41	3.4000	3.3800
43	3.4500	3.4200
45	3.3600	3.4200
47	3.3500	3.4000
49	3.3600	3.3600

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 3.4132
COEF OF VARIATION = 3.50%
VARIANCE = .0143
STANDARD DEVIATION = .1194
SKEWNESS = 3.8075
KURTOSIS = 20.9103

95.00% C.I. FOR MEAN
(3.3793, 3.4471)
ONE-TAIL t(49 , .025)=
2.01003450016



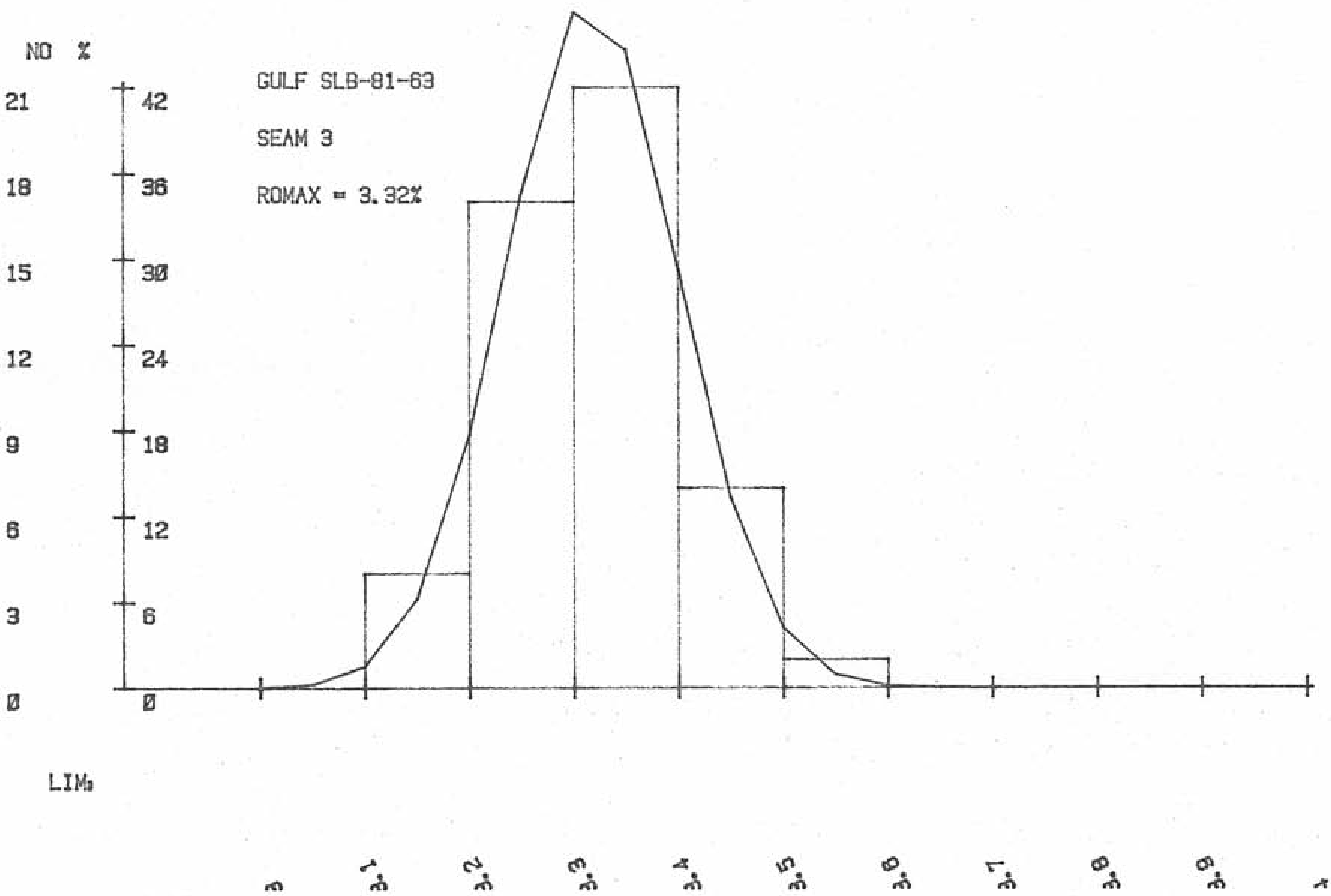
NO %
GULF SLB-81-63
SEAM 2
ROMAX = 3.41%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM.
2.6
2.8
3
3.2
3.4
3.6
3.8
4
4.2
4.4
4.6

SLB – 81 – 63
seam 3.

I	X(I)	X(I+1)
1	3.5100	3.4000
3	3.3500	3.4100
5	3.4300	3.3500
7	3.3500	3.3200
9	3.3900	3.3000
11	3.3500	3.3500
13	3.3400	3.3500
15	3.3200	3.3900
17	3.3500	3.2400
19	3.3700	3.2500
21	3.4200	3.3500
23	3.2200	3.4200
25	3.2000	3.3800
27	3.3900	3.2700
29	3.2500	3.3600
31	3.1900	3.2200
33	3.1700	3.2600
35	3.2300	3.1900
37	3.1700	3.2900
39	3.2000	3.4600
41	3.3500	3.3200
43	3.3000	3.2600
45	3.2800	3.2700
47	3.2600	3.2800
49	3.2900	3.4900

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.3172
COEF OF VARIATION = 2.49%
VARIANCE = .0068
STANDARD DEVIATION = .0827
SKEWNESS = 1445
KURTOSIS = 2.4549

95.00% C.I. FOR MEAN
(3.2937, 3.3407)
ONE-TAIL t(49 , .025)=
2.01003450016



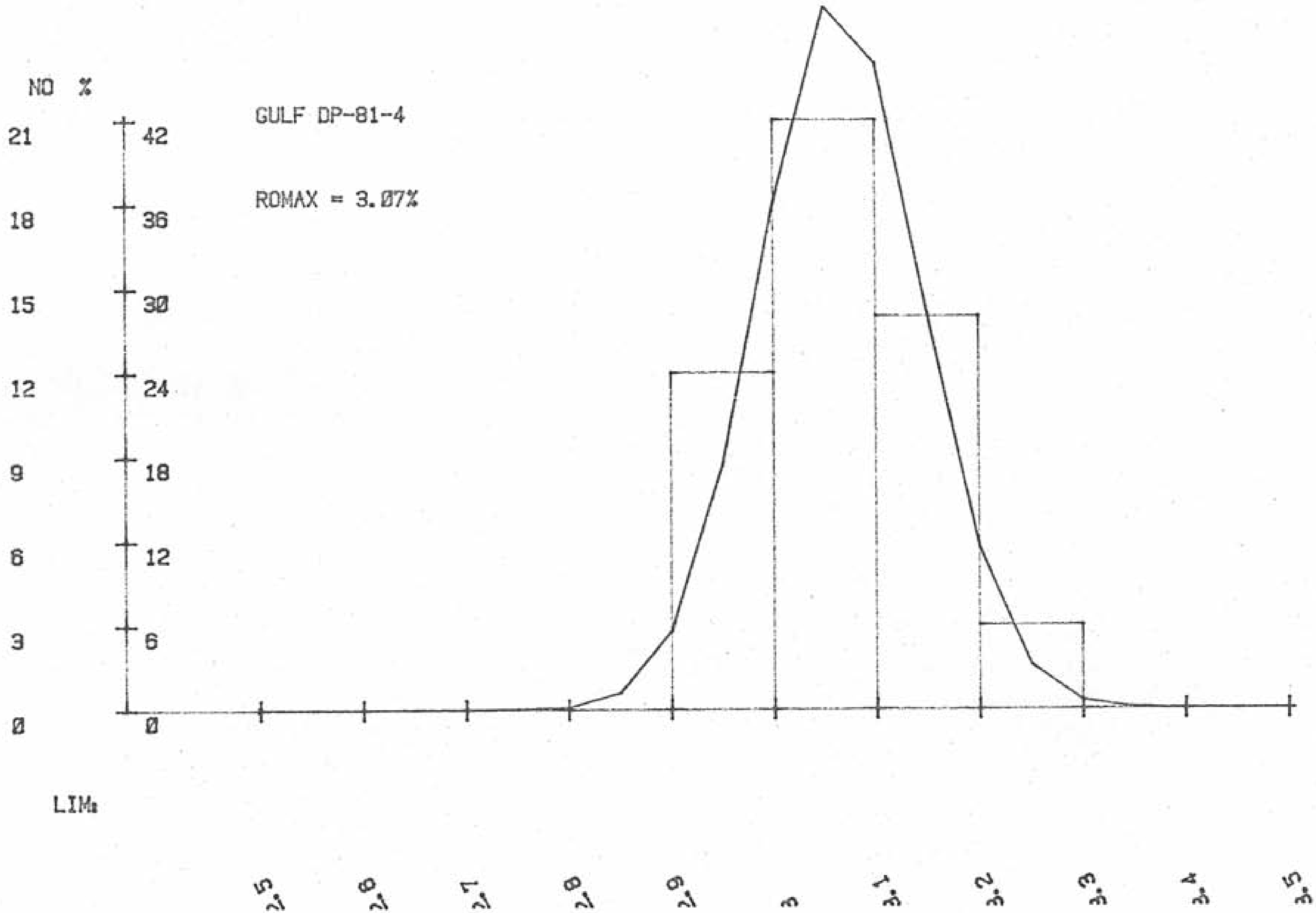
NO %
GULF SLB-81-63
SEAM 3
ROMAX = 3.32%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:

DP-81-4.

I	X(I)	X(I+1)
1	2.9000	3.1500
3	3.2200	3.0900
5	2.9700	3.0200
7	3.1500	3.0600
9	3.0700	2.9800
11	2.9200	3.0500
13	2.9900	3.0700
15	3.1500	3.1500
17	3.0600	3.1500
19	3.0600	3.0300
21	3.2000	2.9700
23	3.0200	3.1100
25	3.1500	3.1700
27	3.1600	3.1300
29	3.0200	2.9500
31	2.9800	2.9500
33	3.0112	3.0700
35	2.9900	2.9700
37	3.0300	3.0500
39	3.1300	3.0900
41	3.0900	3.0200
43	3.0800	3.0900
45	3.1300	3.0600
47	2.9500	3.1100
49	3.1200	3.2000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.0648
COEF OF VARIATION = 2.56%
VARIANCE = .0061
STANDARD DEVIATION = .0784
SKEWNESS = -.0693
KURTOSIS = 2.1930

00% C.I. FOR MEAN:
(3.0425, 3.0871)
ONE-TAIL t(49 , .025)=
2.31003450016



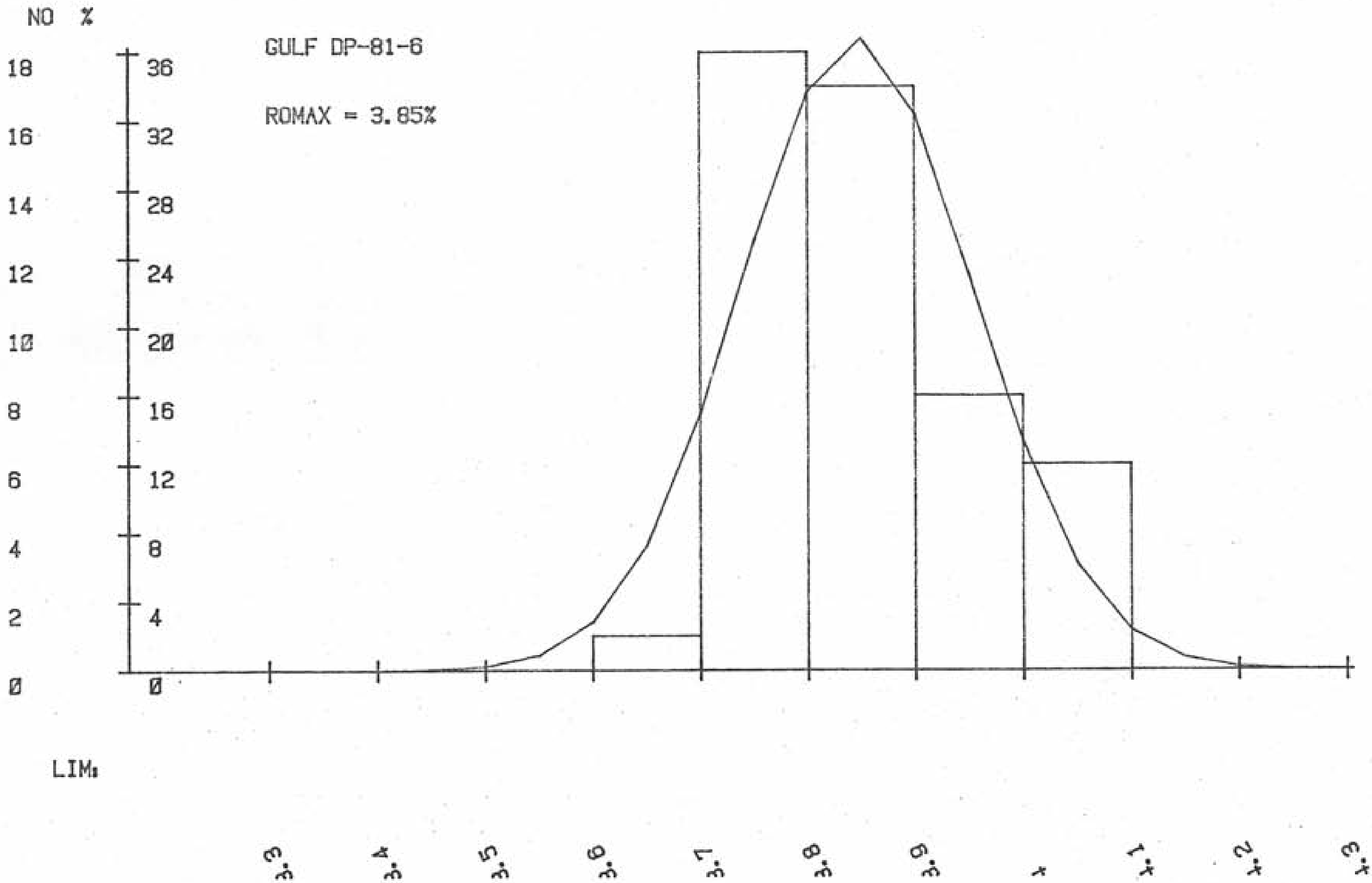
NO %
GULF DP-81-4
ROMAX = 3.07%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-6.

I	X(I)	X(I+1)
1	3.9100	3.8500
3	4.0200	4.0600
5	3.7500	3.7500
7	3.7100	3.8700
9	3.7600	3.7900
11	3.7800	3.8700
13	3.9500	3.8000
15	4.0200	3.7300
17	3.9100	3.9200
19	3.8900	3.7000
21	3.7600	3.7900
23	4.0300	4.0800
25	3.8000	3.8800
27	3.9100	3.8200
29	3.7900	3.8600
31	3.7200	3.8700
33	3.8000	3.9500
35	3.9000	3.8200
37	3.7200	3.7300
39	3.9600	3.7700
41	3.6800	3.8600
43	3.9700	3.9500
45	3.8400	3.7500
47	3.7500	3.9500
49	3.7200	4.0900

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 3.8454
COEF OF VARIATION = 2.82%
VARIANCE = .0117
STANDARD DEVIATION = .1084
SKEWNESS = .6552
KURTOSIS = 2.5327

95.00% C.I. FOR MEAN
(3.8146, 3.8762)
ONE-TAIL t(49 , .025)=
2.01003450016



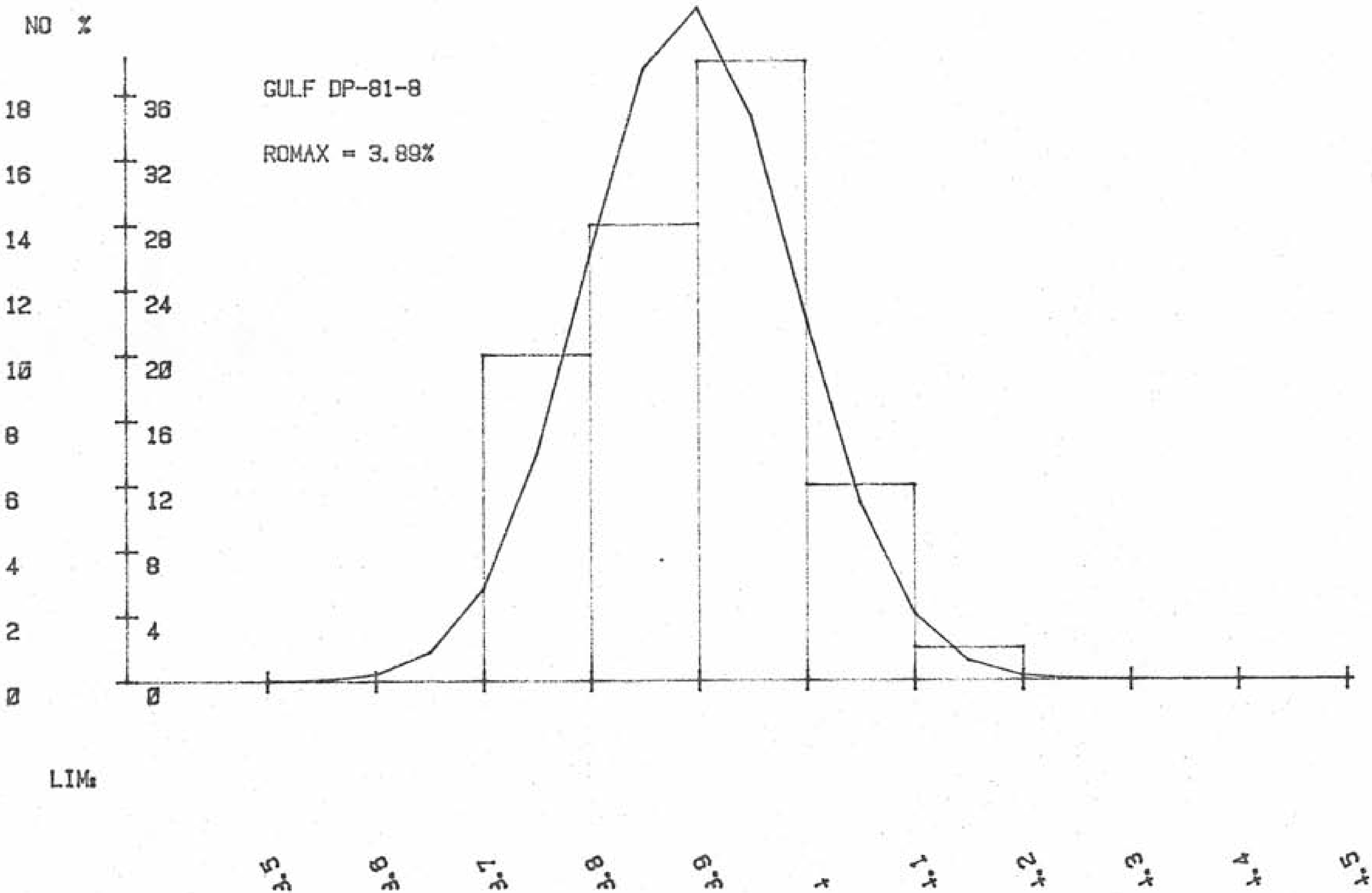
NO %
GULF DP-81-6
ROMAX = 3.85%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
3.3
3.4
3.5
3.6
3.7
3.8
3.9
4
4.1
4.2
4.3

DP- 81 - 8.

I	X(I)	X(I+1)
1	3.9500	3.9[illegible]00
3	3.8800	4.0100
5	4.0300	3.9300
7	3.9300	3.9000
9	3.9500	3.8300
11	3.7500	3.9100
13	3.9300	3.9800
15	3.9200	3.9000
17	3.9700	4.0500
19	4.0600	3.7900
21	4.1100	3.8300
23	3.7100	3.9900
25	3.7500	3.9300
27	3.9500	4.0200
29	4.0200	3.8800
31	3.7400	3.9100
33	3.8700	3.7800
35	3.7900	3.7500
37	3.8600	3.7500
39	3.9600	3.9300
41	3.9200	3.8500
43	3.9800	3.9500
45	3.9400	3.7000
47	3.9600	3.9000
49	3.8500	3.8900

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.8924
COEF OF VARIATION = 2.48%
VARIANCE = .0093
STANDARD DEVIATION = .0965
SKEWNESS = -.0439
KURTOSIS = 2.4528

95.00% C.I. FOR MEAN
(3.8650, 3.9198)
ONE-TAIL t(49 , .025)=
2.01003450016



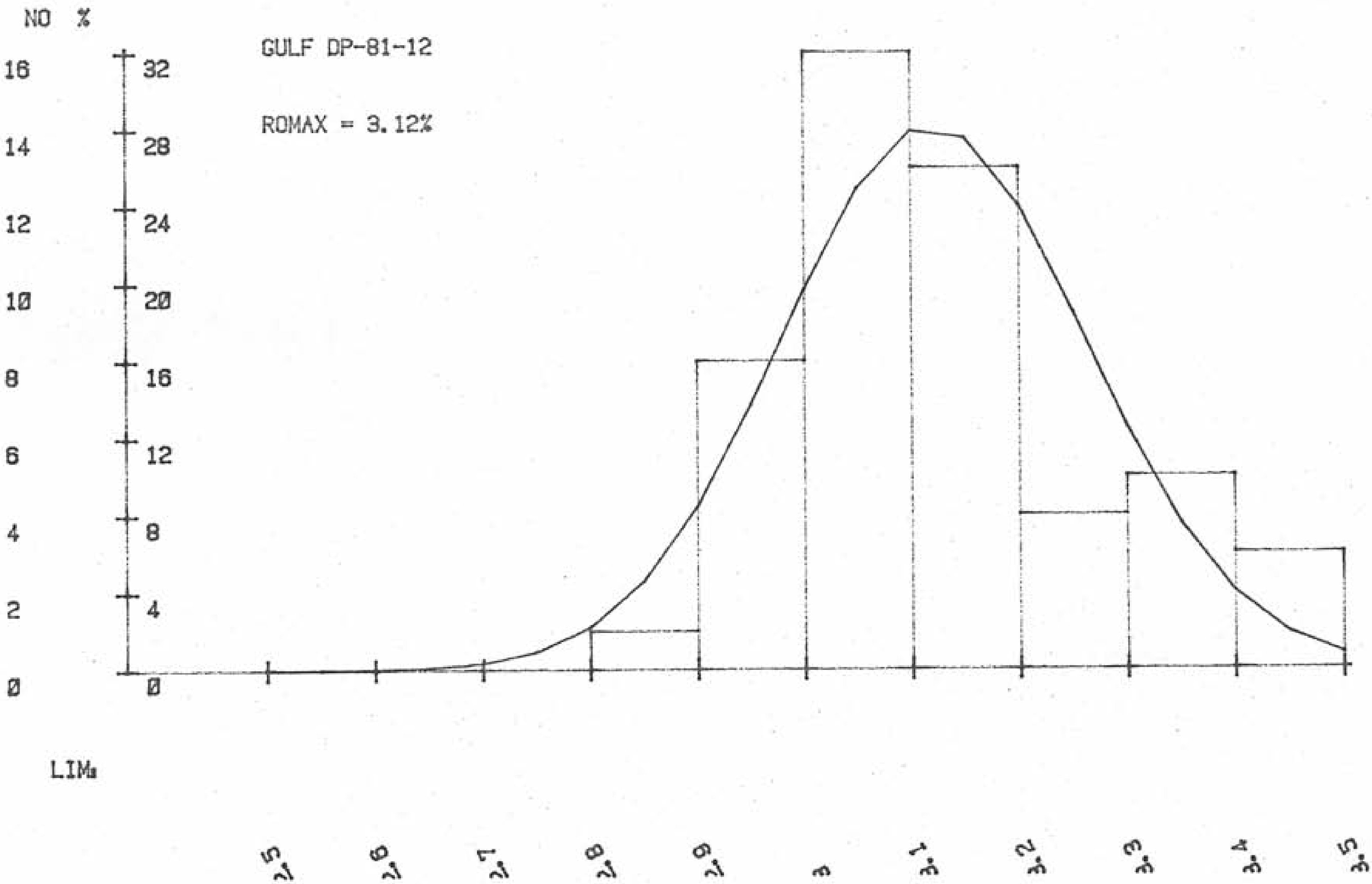
NO %
GULF DP-81-8
ROMAX = 3.89%
18 16 14 12 10 8 6 4 2 0
36 32 28 24 20 16 12 8 4 0
LIMs

DP_81-12.

I	X(I)	X(I+1)
[illegible]	3.1500	2.9200
[illegible]	2.9300	2.8800
[illegible]	3.3000	3.3000
[illegible]	2.9600	3.4200
[illegible]	3.1800	3.2600
[illegible]	3.1900	3.1800
[illegible]	3.0500	3.3400
[illegible]	3.1600	3.0200
[illegible]	3.3400	3.1500
[illegible]	3.0800	3.0800
21	3.0700	3.0700
[illegible]	3.1200	3.4500
[illegible]	3.0700	3.0400
[illegible]	3.0600	3.2600
[illegible]	3.2700	3.1500
[illegible]	3.0700	3.4400
[illegible]	2.9400	3.1100
[illegible]	3.0200	2.9800
[illegible]	2.9200	3.1900
[illegible]	3.2200	3.0000
41	2.9300	3.1300
[illegible]	3.0600	2.9300
[illegible]	3.0000	3.1100
[illegible]	3.3600	3.0200
[illegible]	2.9600	3.1200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 3.1200
COEF OF VARIATION = 4.54%
VARIANCE = .0201
STANDARD DEVIATION = .1417
SKEWNESS = .5624
KURTOSIS = 2.6591

95.00% C.I. FOR MEAN:
(3.0797, 3.1603)
TAIL T(49) [illegible] =
.0003450016

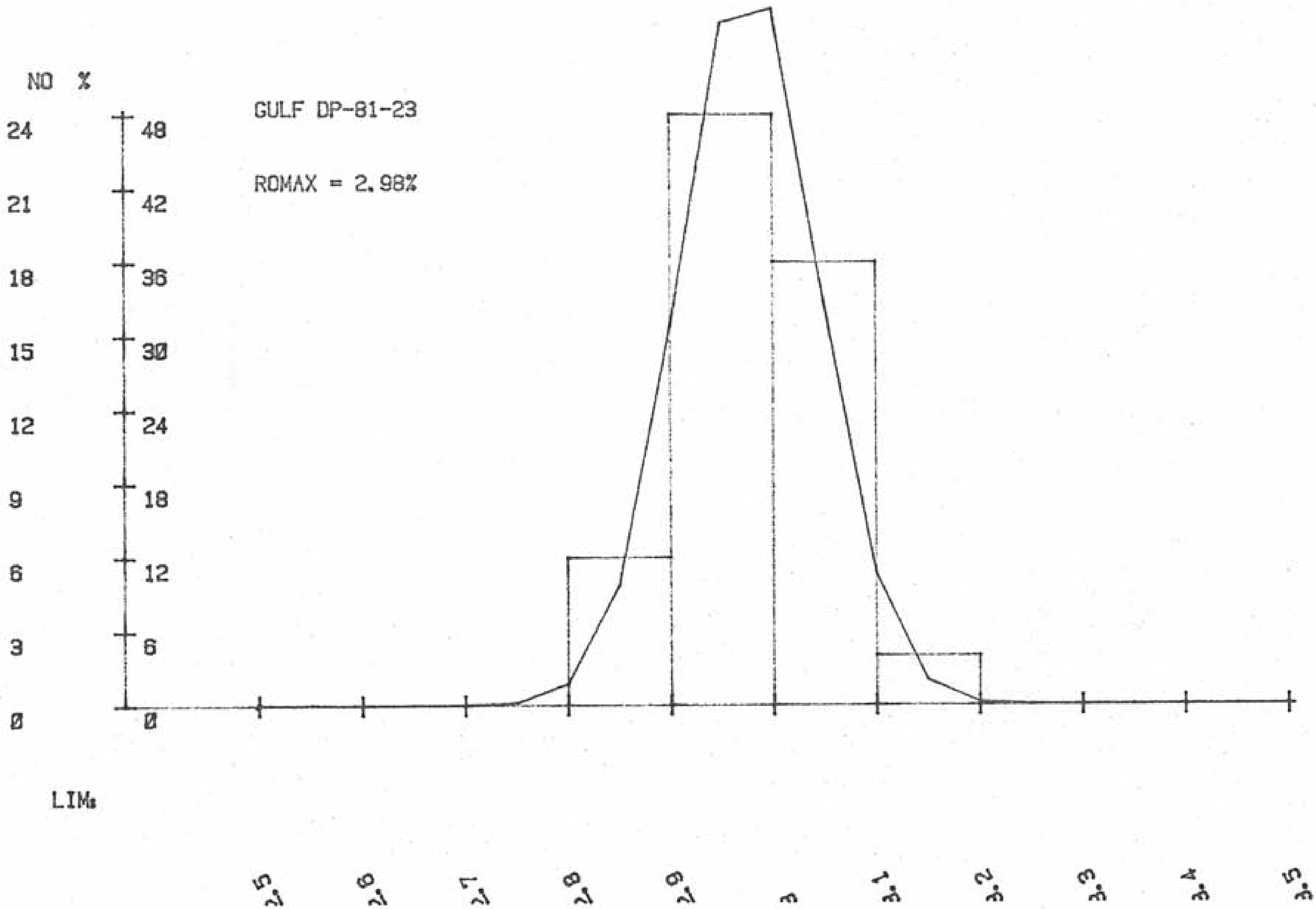

NO %
GULF DP-81-12
ROMAX = 3.12%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIMs
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-23.

I	X(I)	X(I+1)
1	3.0300	2.9900
3	2.9500	3.0300
5	3.0700	3.0500
7	2.9600	2.9800
9	3.1500	2.9400
11	3.0200	2.9600
13	3.0100	2.9500
15	2.9400	3.0500
17	2.9200	2.9700
19	3.0300	3.0300
21	3.1000	2.9900
23	3.0300	3.0500
25	3.0700	2.9200
27	3.0100	2.9500
29	3.0800	2.9300
31	2.9500	3.0100
33	3.0300	2.9500
35	2.9300	3.0300
37	3.0400	2.8800
39	2.9300	2.9100
41	2.8900	2.8900
43	2.9200	2.9700
45	2.8700	2.9100
47	2.9100	2.9000
49	2.8900	2.8700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.9766
COEF OF VARIATION = 2.23%
VARIANCE = .0044
STANDARD DEVIATION = .0664
SKEWNESS = .3346
KURTOSIS = 2.3867

95.00% C.I. FOR MEAN
(2.95 , 2.9957)
ONE-TAIL t(, .025)=
2.0100345001[illegible]


NO %
GULF DP-81-23
ROMAX = 2.98%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

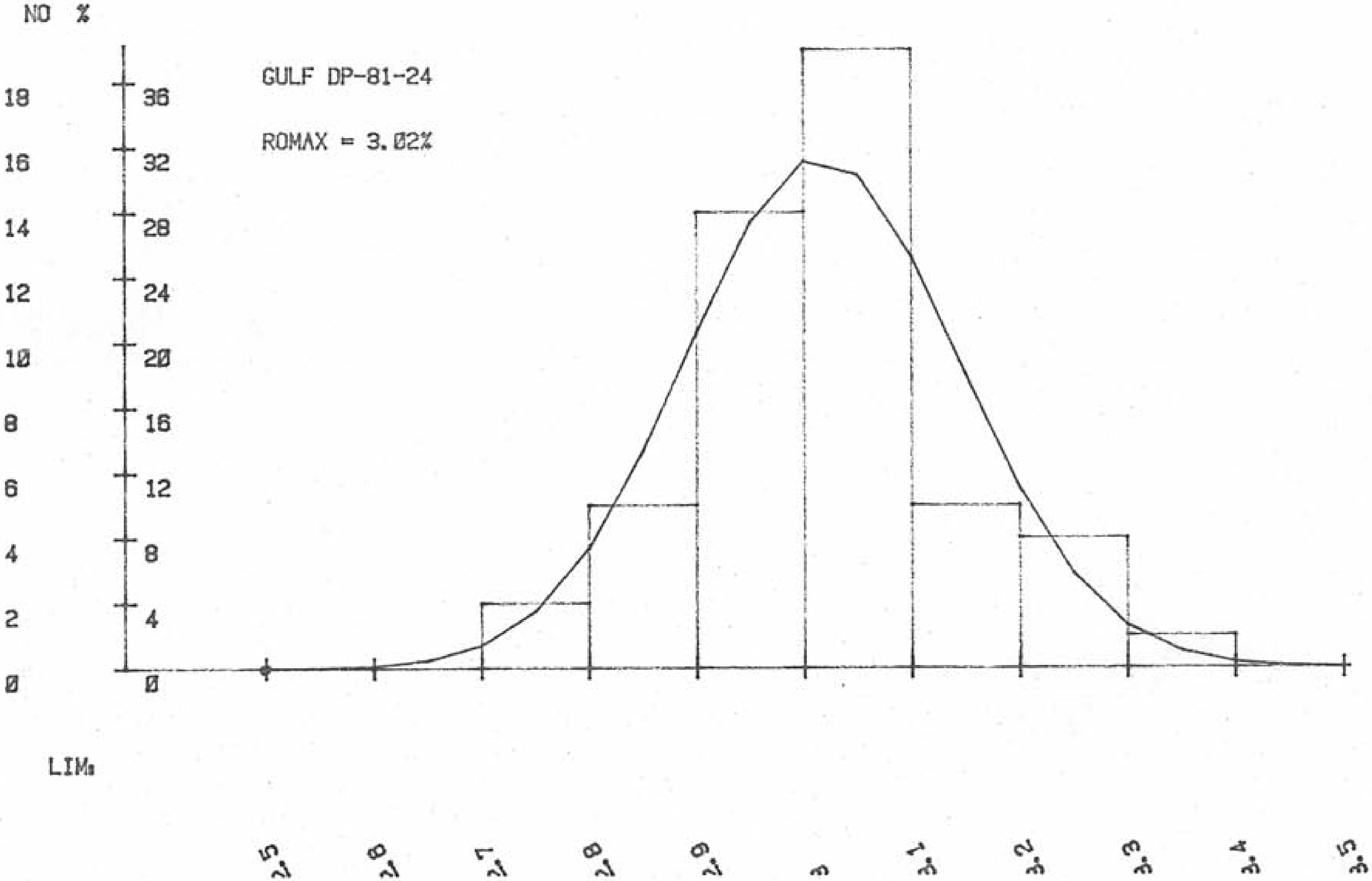
DP-81-24.

[illegible]	[illegible]	A[illegible]
[illegible]	[illegible].9400	[illegible].9200
[illegible]	2.9600	2.5500
[illegible]	3.0900	[illegible].7900
[illegible]	[illegible].7300	[illegible].9600
[illegible]	[illegible].2700	3.1300
[illegible]	[illegible].2700	2.1300
[illegible]	[illegible].1000	[illegible].0500
[illegible]	2.9100	[illegible].6600
[illegible]	3.0500	[illegible]
[illegible]	2.3000	[illegible]
[illegible]	3.2200	3.[illegible]
[illegible]	[illegible].9400	3.[illegible]
[illegible]	[illegible].3100	[illegible]
[illegible]	2.3200	[illegible]
[illegible]	3.3900	3.[illegible]
[illegible]	3.1700	3.[illegible]
[illegible]	3.0300	3.0400
[illegible]	3.0200	[illegible].0800
[illegible]	3.0100	3.6400
[illegible]	[illegible].6200	3.2200
41	[illegible].0400	[illegible]
[illegible]	[illegible].0300	[illegible].8200
[illegible]	2.9600	[illegible].9500
[illegible]	[illegible].3100	2.9900
[illegible]	[illegible].2100	[illegible].6400

BA[illegible] STATISTICS
[illegible]*****************************[illegible]

N = 50
STD ERROR OF THE MEAN = .02
MEAN = 3.0164
COEF OF VARIATION = 4.22%
VARIANCE = .01[illegible]
STANDARD DEVIATION = .1272
SKEWNESS = .23[illegible]
KURTOSIS = 3.6648

95.00% C.I. FOR MEAN
(2.9802, 3.0526)
ONE-TAIL T(49 , .025)=
2.01093450016

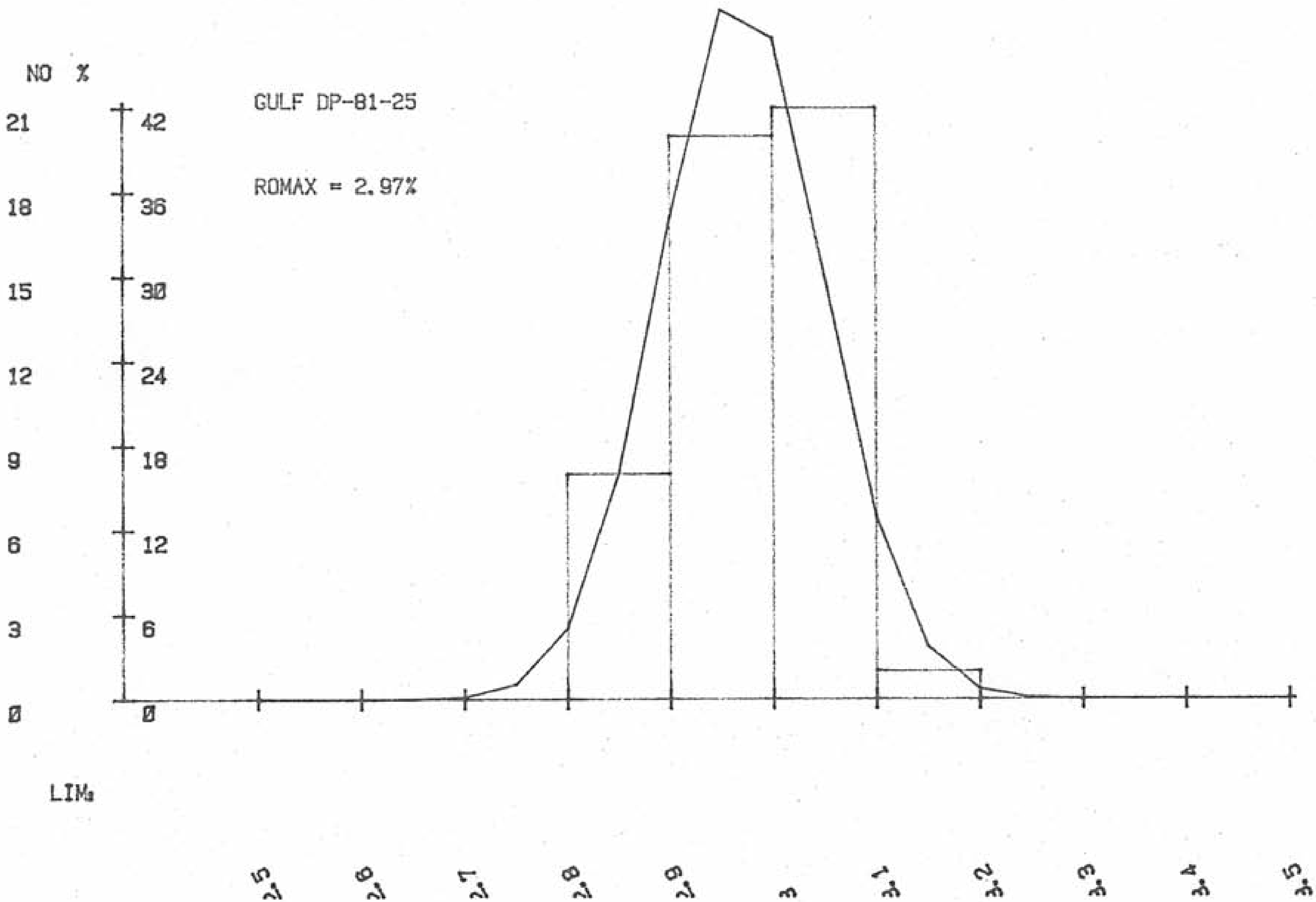

NO %
GULF DP-81-24
ROMAX = 3.02%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIMs
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-25.

I	X(I)	X(I+1)
1	3.0300	3.0600
3	2.9200	3.0200
5	3.0300	3.0500
7	3.0200	3.0600
9	2.9600	3.0300
11	2.9200	3.0600
13	3.0100	3.1100
15	3.0700	2.9100
17	3.0500	2.9500
19	3.0700	3.0400
21	2.9900	2.9700
23	3.0600	3.0600
25	2.9400	3.0000
27	3.0900	2.8900
29	2.9600	2.9100
31	2.9700	2.9400
33	2.9200	3.0600
35	2.9100	2.9100
37	2.8700	2.8200
39	3.0200	2.8100
41	3.0000	2.9100
43	2.9200	2.8000
45	2.8600	2.9500
47	2.9000	2.8600
49	2.9500	2.8700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.9696
COEF OF VARIATION = 2.66%
VARIANCE = .0062
STANDARD DEVIATION = .0790
SKEWNESS = -.2512
KURTOSIS 2.1317

95.00% C.I. FOR MEAN
(2.9473, 2.9923)
ONE-TAIL t(49 , .025)=
2.01003450016

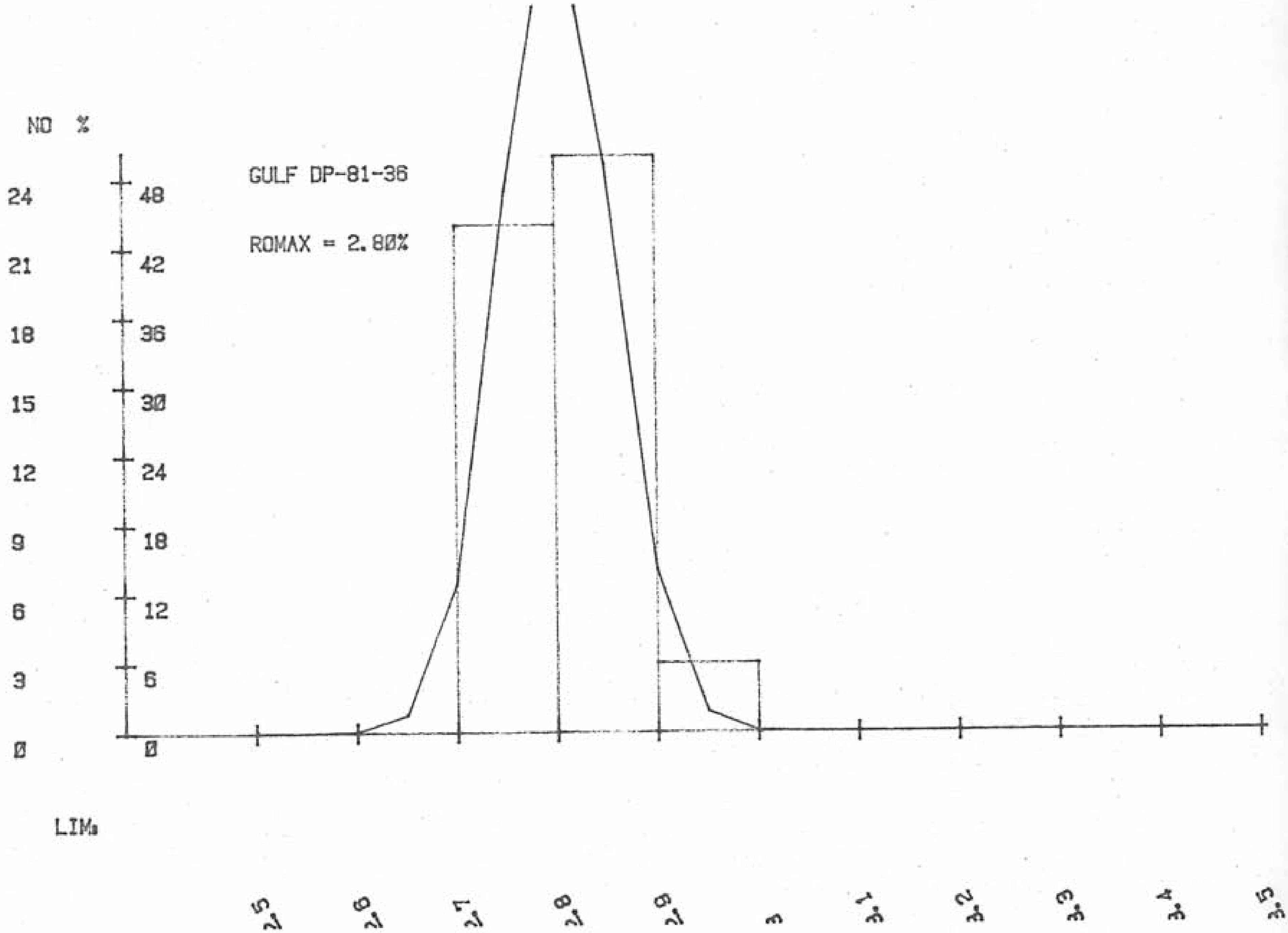

NO %
GULF DP-81-25
ROMAX = 2.97%
21
18
15
12
9
6
3
0
42
36
30
24
18
12
6
0
LIM.
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-29.

I	X(I)	X(I+1)
1	2.9900	3.0500
3	2.9500	3.1700
5	2.9100	3.0200
7	3.0500	3.0600
9	2.9000	3.0100
11	3.0900	3.1500
13	2.9600	2.9500
15	3.0200	3.0300
17	3.0500	2.9[illegible]30
19	2.9800	2.9500
21	3.0700	2.9500
23	3.0000	3.0200
25	2.9300	3.0400
27	2.9300	3.0500
29	2.9500	3.1200
31	3.0700	3.0900
33	3.2200	3.0600
35	2.9200	3.0400
37	3.0000	2.9000
39	2.9500	2.9900
41	3.0600	3.0900
43	3.0500	3.0500
45	2.9200	3.0400
47	3.0400	2.9300
49	2.9200	3.0200

```
BASIC STATISTICS
**************************************
N =    50
STD ERROR OF THE MEAN=              .01
MEAN =          3.0156
COEF OF VARIATION =             2.32%
VARIANCE =           .0049
STANDARD DEVIATION =               .0701
SKEWNESS =           .5187
KURTOSIS =          3.2141

      95.00% C.I. FOR MEAN
(      2.9957,         3.0355)
ONE-TAIL t( 49  , .025 )=
 2.01003450016
```

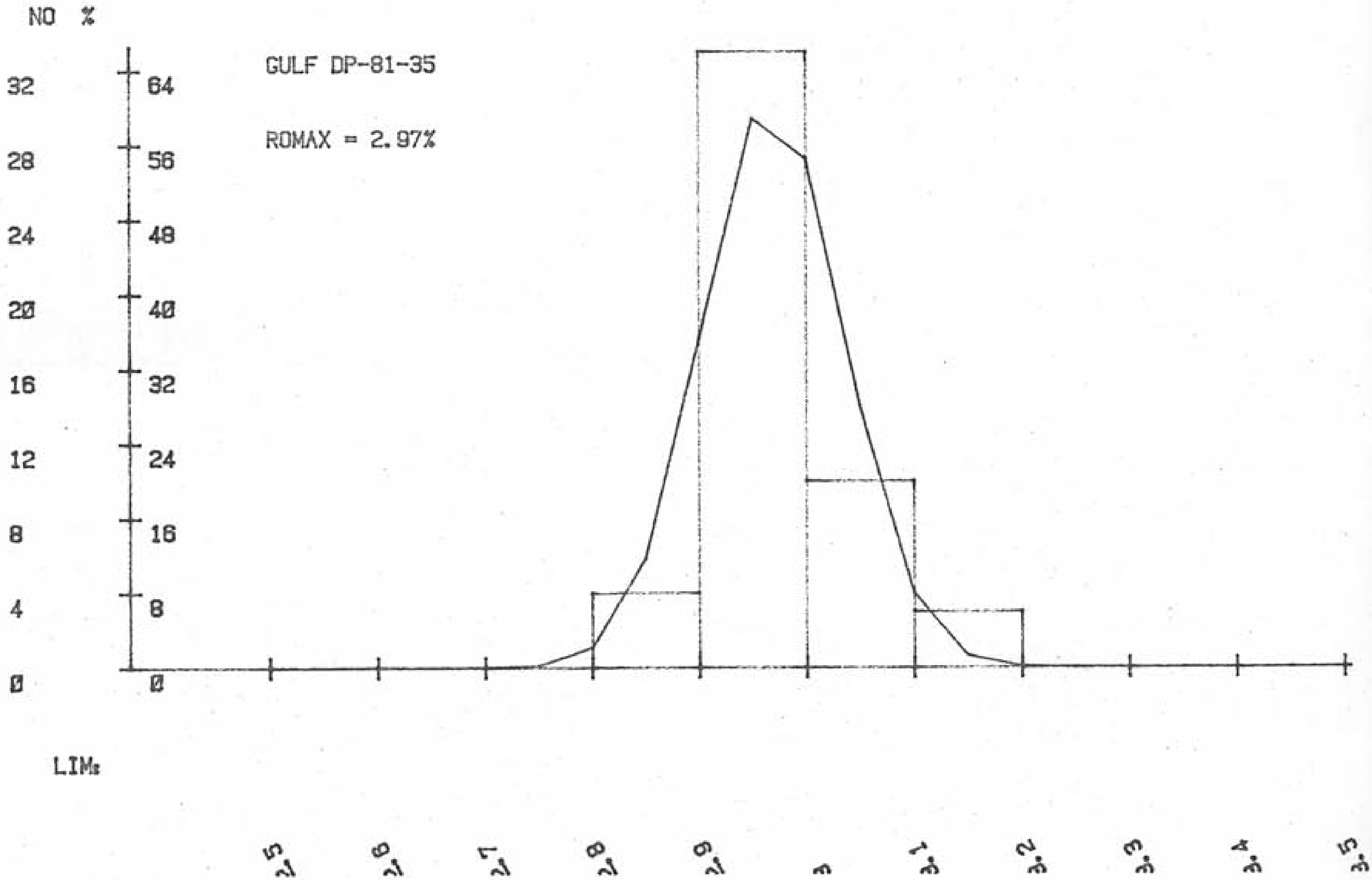

NO %
GULF DP-81-36
ROMAX = 2.80%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-36.

I	X(I)	X(I+1)
1	2.8100	2.9200
3	2.8300	2.8700
5	2.8400	2.8900
7	2.6300	2.8000
9	2.7500	2.8800
11	2.9100	2.8700
13	2.8500	2.8200
15	2.7700	2.7700
17	2.8300	2.7600
19	2.7800	2.8000
21	2.7900	2.8100
23	2.8400	2.7900
25	2.7300	2.9300
27	2.9000	2.7100
29	2.7600	2.7900
31	2.8300	2.8300
33	2.8200	2.8400
35	2.8300	2.7300
37	2.7200	2.7700
39	2.7900	2.7300
41	2.8200	2.7500
43	2.7500	2.7500
45	2.7200	2.7100
47	2.8100	2.7200
49	2.8300	2.8300

```
BASIC STATISTICS
*******************************
N =    50
STD ERROR OF THE MEAN=          01
MEAN =          2.8014
COEF OF VARIATION =          1.94%
VARIANCE =          .0029
STANDARD DEVIATION =          .0543
SKEWNESS =          .2250
KURTOSIS =          2.6201

    95.00% C.I. FOR MEAN:
(      2.7860,       2.8168)
ONE-TAIL t( 49 , .025 )=
 2.01003450016
```

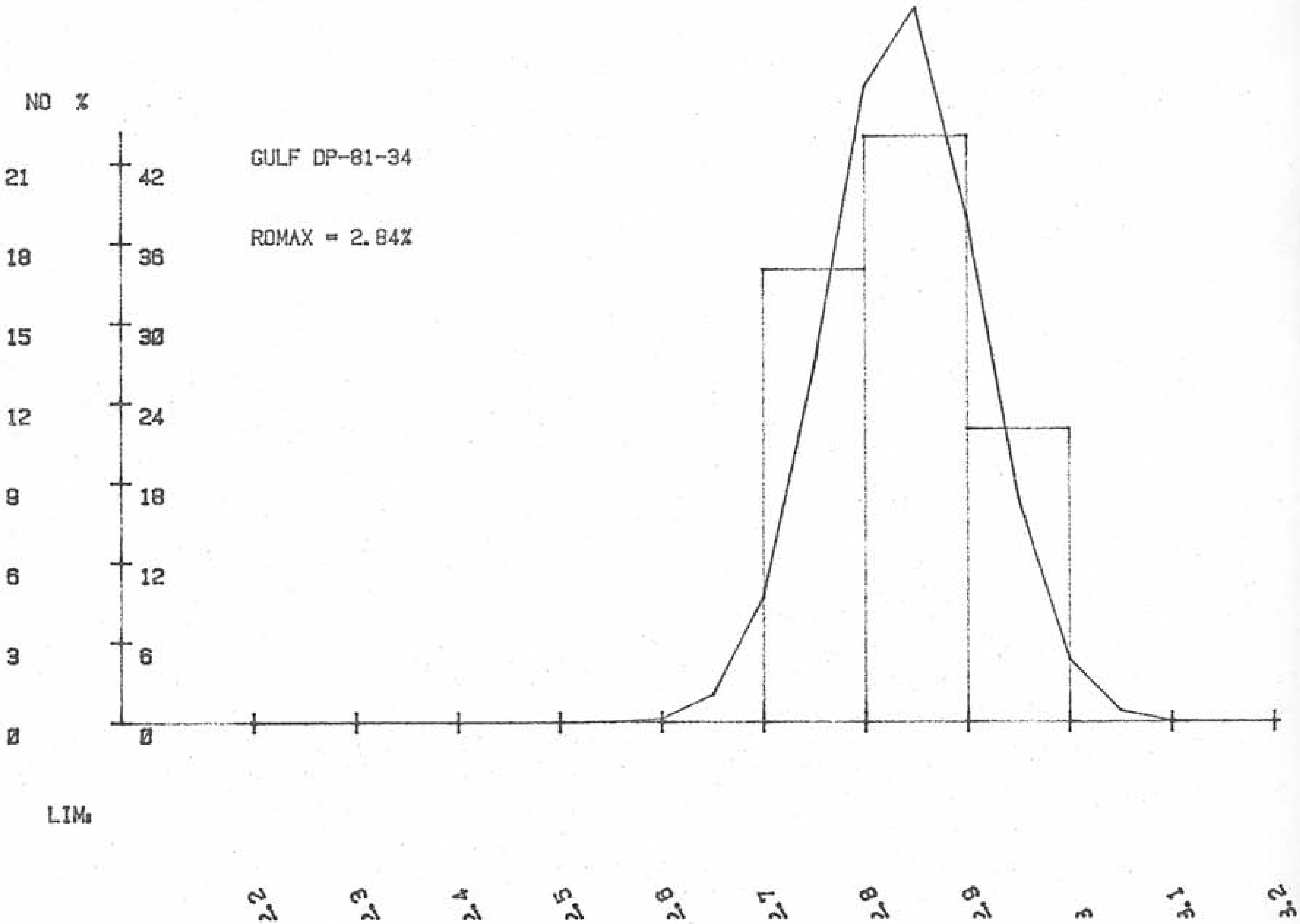

NO %
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
GULF DP-81-35
ROMAX = 2.97%
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP- 81- 35.

I	X(I)	X(I+1)
1	2.9800	[illegible]
3	2.9200	2.9200
5	3.0800	[illegible]
7	2.9900	2.8200
9	3.0900	2.9400
11	3.0300	2.9500
13	2.9300	2.9900
15	2.9500	2.9100
17	2.9200	3.0000
19	2.9100	2.9700
21	2.9100	2.9400
23	2.9300	2.8500
25	2.9500	3.0300
27	2.9900	2.9500
29	2.9600	3.0500
31	3.0500	3.1600
33	2.9900	2.9400
35	3.1100	2.9400
37	2.8800	2.9300
39	2.9000	2.9400
41	2.9300	2.8700
43	2.9400	2.9800
45	3.0000	3.1000
47	3.0200	2.9800
49	2.9500	2.9900

```
BASIC STATISTICS
********************************
N =    50
STD ERROR OF THE MEAN=          .01
MEAN =          2.9686
COEF OF VARIATION =           2.19%
VARIANCE =          .0042
STANDARD DEVIATION =           .0651
SKEWNESS =           .368
KURTOSIS =          3.[illegible]357

    95.00% C.I. FOR MEAN:
(       2.9501,        [illegible]
ONE-TAIL t( 49 ,  .025 )=
 2.01003450016
```

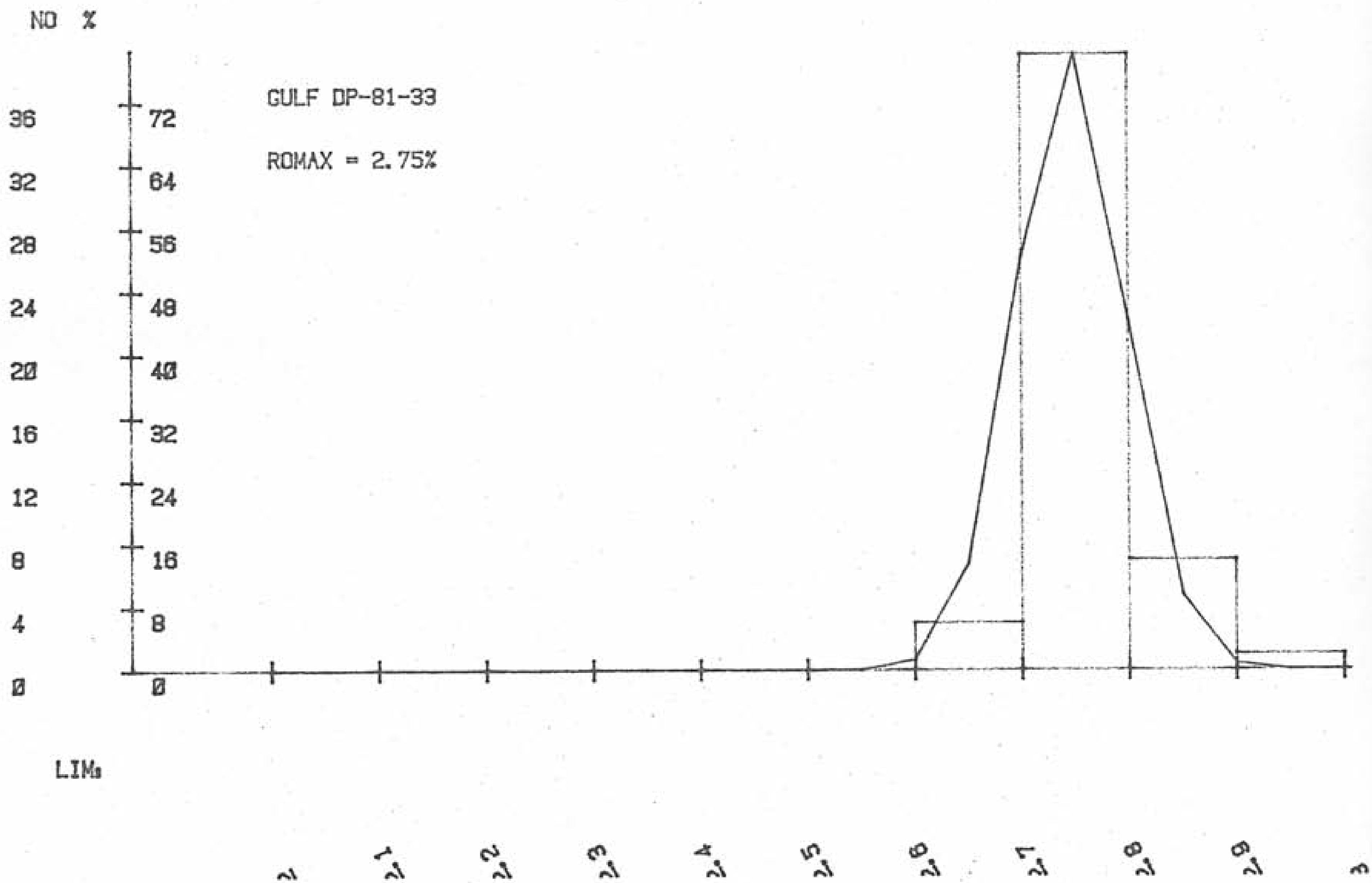

NO %
GULF DP-81-34
ROMAX = 2.84%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2

DP- 81-34.

I	X(I)	X(I+1)
1	2.8800	2.8200
3	2.8600	2.8300
5	2.9000	2.8700
7	2.7700	2.7800
9	2.7800	2.7900
11	2.7300	2.9700
13	2.7700	2.7200
15	2.9100	2.9400
17	2.8500	2.8300
19	2.0300	2.7900
21	2.8600	2.7500
23	2.9600	2.8400
25	2.9100	2.8700
27	2.8300	2.7800
29	2.8500	2.9800
31	2.7500	2.7200
33	2.9300	2.8300
35	2.3400	2.9600
37	2.9600	2.8900
39	2.7500	2.8500
41	2.9700	2.8500
43	2.7200	2.8700
45	2.8700	2.7200
47	2.7300	2.8000
49	2.7900	2.9200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8376
COEF OF VARIATION = 2.58%
VARIANCE = .0054
STANDARD DEVIATION = .0733
SKEWNESS = .1469
KURTOSIS = 2.1852

95.00% C.I. FOR MEAN
(2.8168, 2.8584)
ONE-TAIL t(49 , .025)=
2.01003450016

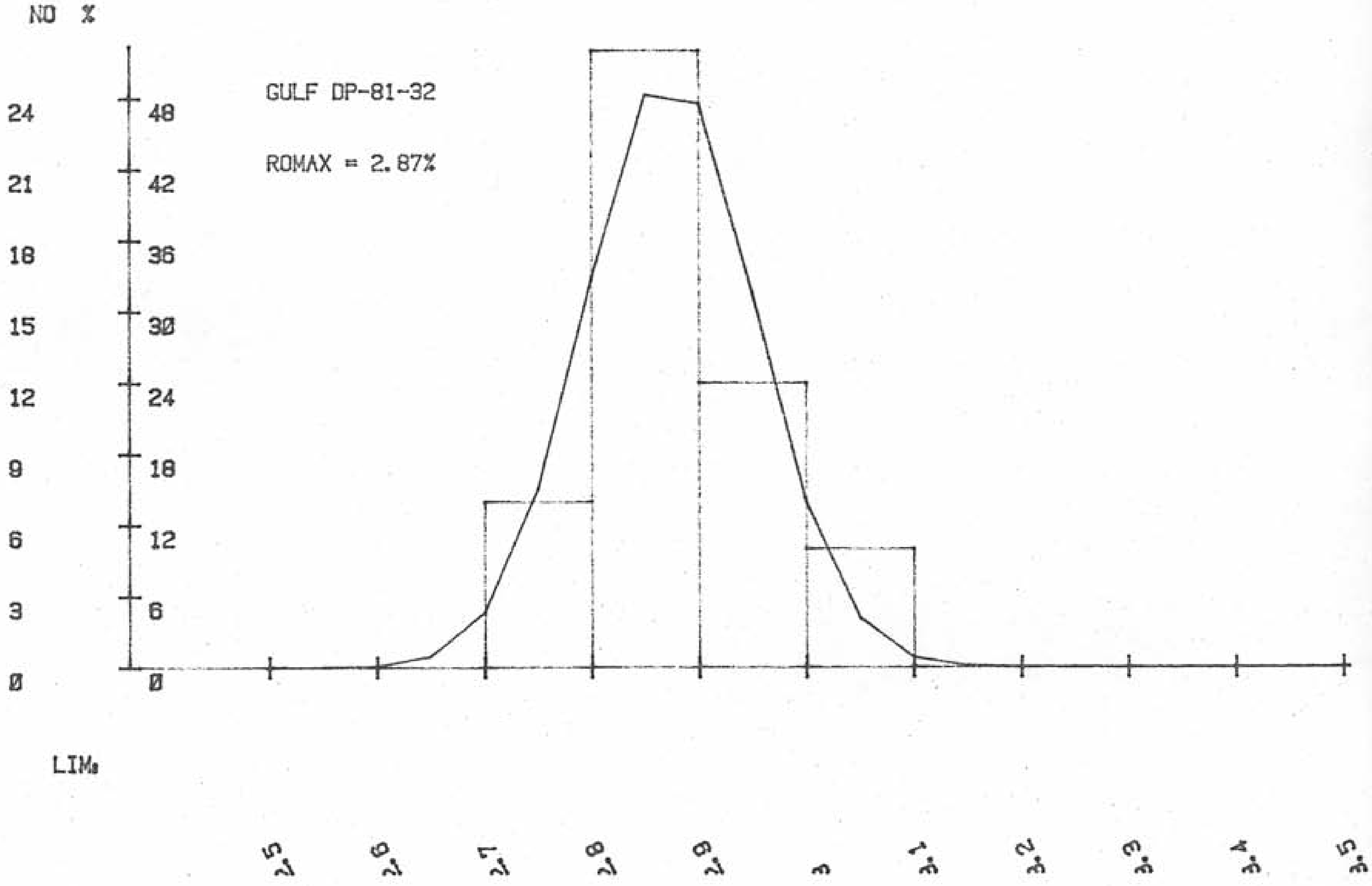

NO %
GULF DP-81-33
ROMAX = 2.75%
36
32
28
24
20
16
12
8
4
0
72
64
56
48
40
32
24
16
8
0
LIMs
2
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3

DP-81-33.

I	X(I)	X(I+1)
1	2.7200	2.8300
3	2.7400	2.8200
5	2.7900	2.7000
7	2.7100	2.6800
9	2.6900	2.7500
11	2.7500	2.7300
13	2.6900	2.7100
15	2.8400	2.9300
17	2.7200	2.7300
19	2.9000	2.7100
21	2.7800	2.7200
23	2.7000	2.7400
25	2.7300	2.7100
27	2.7200	2.7500
29	2.7000	2.7300
31	2.7000	2.7200
33	2.7300	2.7000
35	2.7300	2.7000
37	2.7700	2.7800
39	2.7600	2.8100
41	2.7000	2.7000
43	2.7700	2.7400
45	2.7100	2.8100
47	2.7600	2.7200
49	2.7900	2.8600

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.7456
COEF OF VARIATION = 1.85%
VARIANCE = .0026
STANDARD DEVIATION = .0509
SKEWNESS = 1.3893
KURTOSIS = 5.0540

95.00% C.I. FOR MEAN:
(2.7311, 2.7601)
ONE-TAIL t(49 , .025)=
2.01003450016

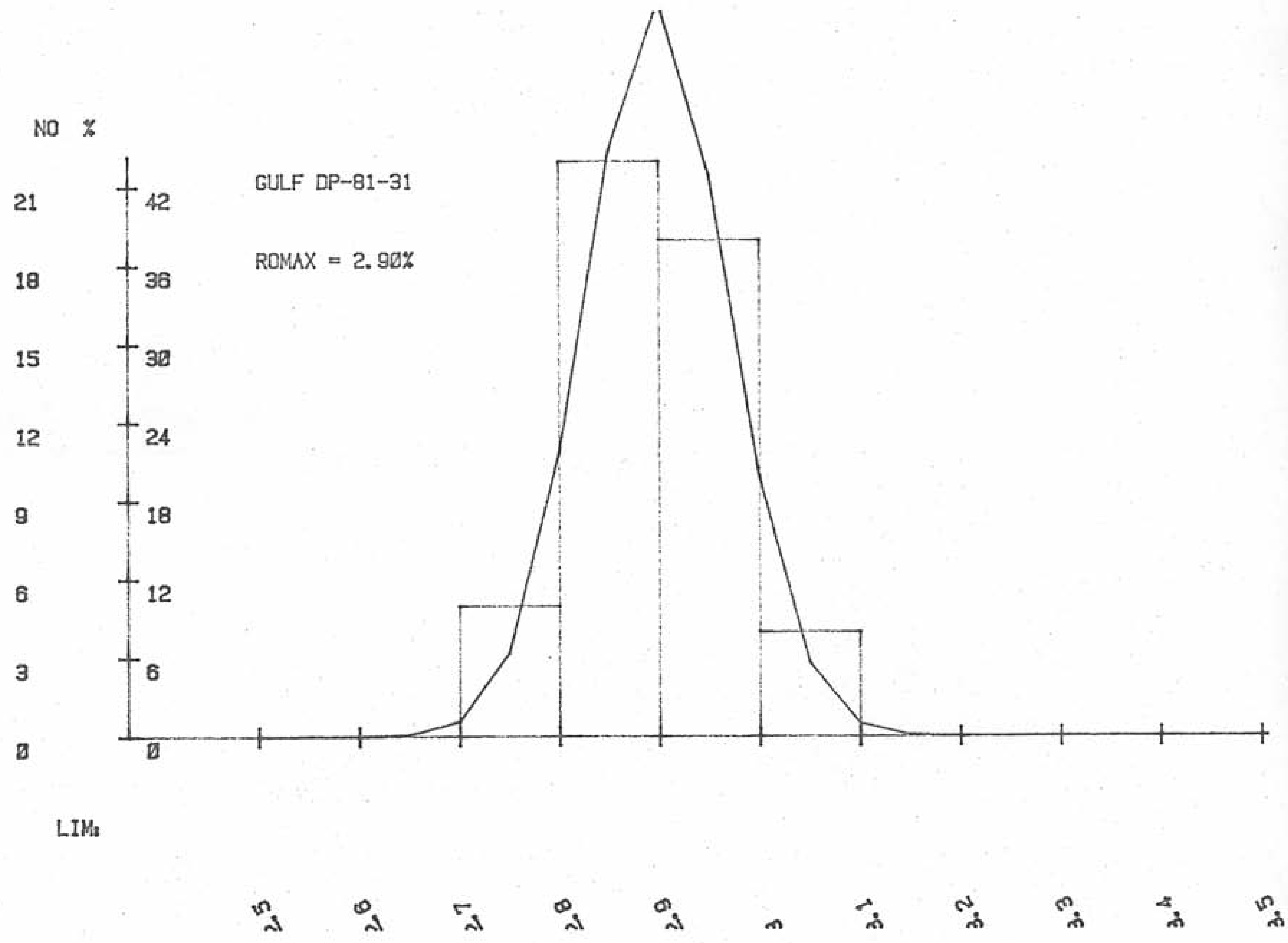

NO %
GULF DP-81-32
ROMAX = 2.87%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-32.

I	X(I)	X(I+1)
1	3.0500	2.9200
3	2.8300	2.9200
5	2.8800	2.8200
7	2.8600	2.8600
9	2.8800	2.7400
11	2.7600	2.8400
13	2.8400	2.7700
15	2.8300	2.8100
17	2.9000	2.8500
19	2.9200	2.9600
21	3.0400	3.0100
23	3.0500	2.8700
25	2.8000	2.7900
27	2.8400	2.8400
29	2.8100	3.0500
31	2.9700	2.8700
33	2.8300	2.8100
35	2.8000	2.7800
37	2.9500	2.7800
39	2.8600	2.9200
41	2.8900	2.9500
43	2.8500	2.8100
45	2.9000	2.9100
47	2.9600	2.7900
49	2.8900	2.8000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8732
COEF OF VARIATION = 2.76%
VARIANCE = .0063
STANDARD DEVIATION = .0792
SKEWNESS = .7030
KURTOSIS = 2.8318

95.00% C.I. FOR MEAN:
(2.8507, 2.8957)
ONE-TAIL t(49 , .025)=
2.01003450016



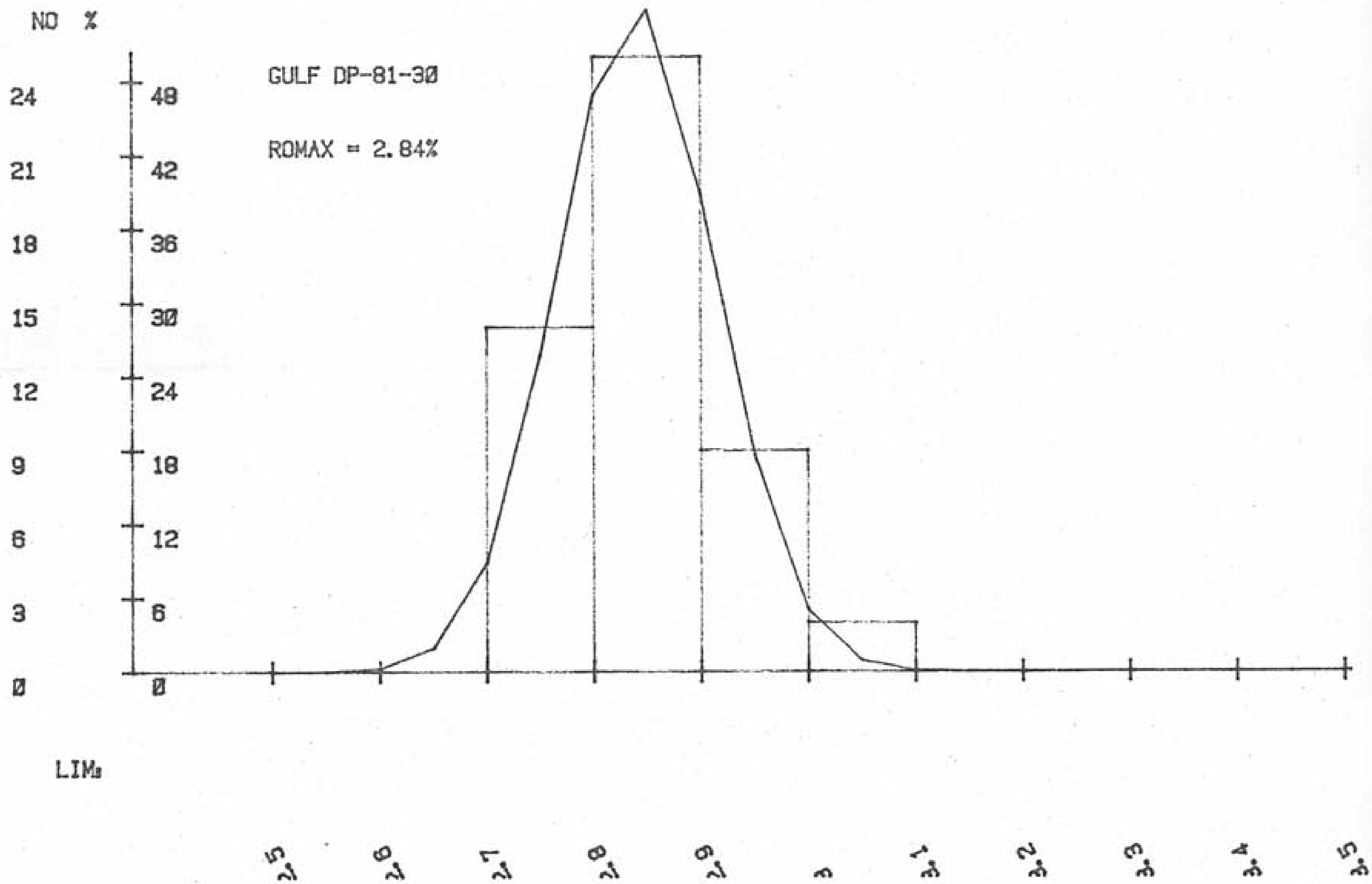
NO %
GULF DP-81-31
ROMAX = 2.90%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-31.

I	X(I)	X(I+1)
	2.8400	2.8300
	2.8700	2.8800
	2.9900	2.9100
	2.8400	2.9000
	2.8700	2.9300
11	2.8100	2.7900
13	2.9000	2.9400
15	3.0600	2.7900
17	2.9700	2.9200
19	2.8800	2.8500
21	2.7900	2.9100
23	2.8300	2.7900
25	2.9600	2.9700
27	2.9700	2.9700
29	2.8900	2.9600
31	2.8300	2.8900
33	2.9600	2.8300
35	3.0100	2.8400
37	2.8700	3.0600
39	2.8200	3.0100
41	2.8900	2.8800
43	2.9000	2.7900
45	2.9500	2.8000
47	2.9800	2.9700
49	2.8800	2.9400

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8978
COEF OF VARIATION = 2.45%
VARIANCE = .0050
STANDARD DEVIATION = .0709
SKEWNESS = .3121
KURTOSIS = 2.4479

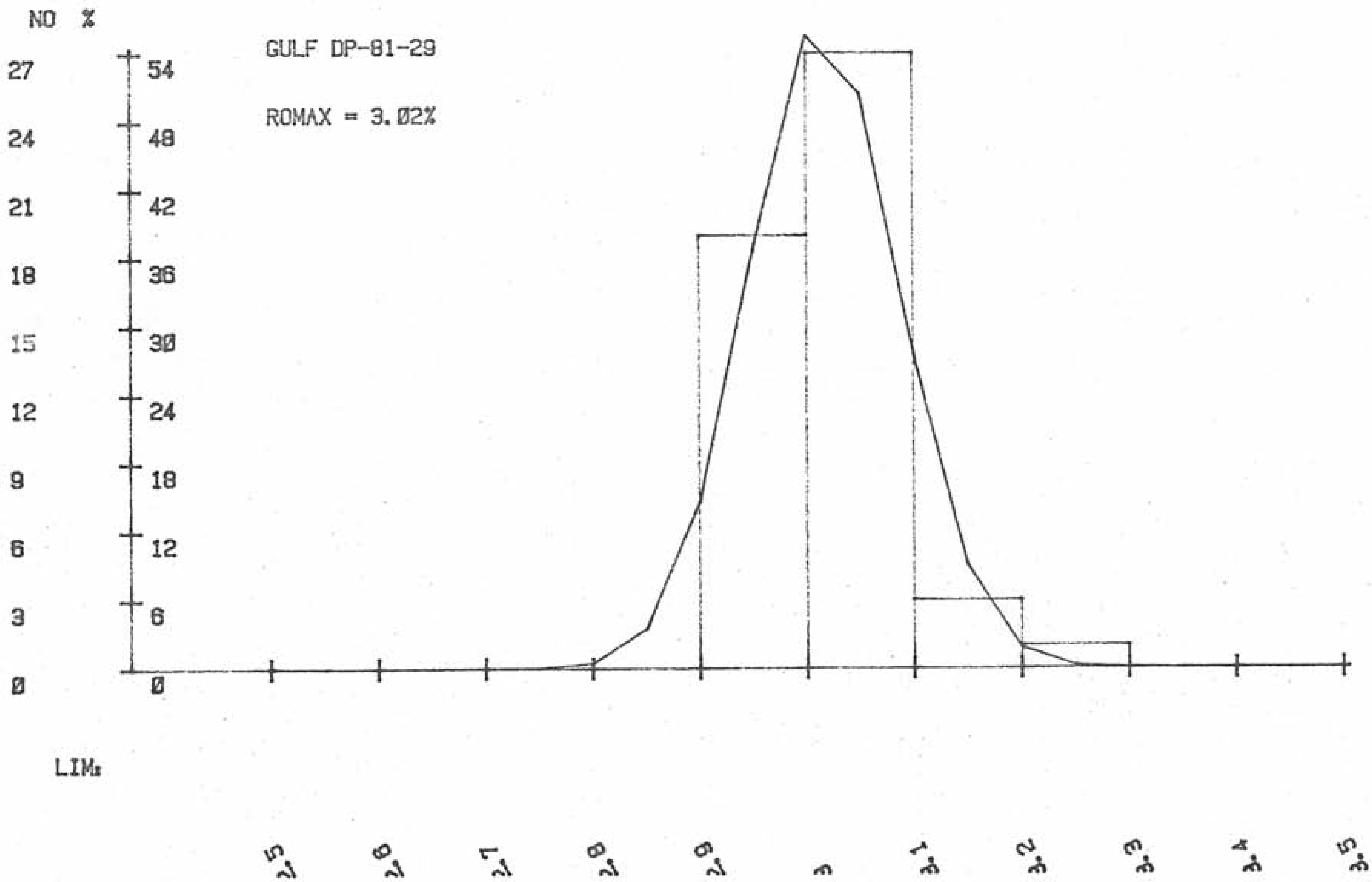
95.00% C.I. FOR MEAN:
(2.8777, 2.9179)
ONE-TAIL t(49 , .025)=
2.01003450016


NO %
GULF DP-81-30
ROMAX = 2.84%
24 21 18 15 12 9 6 3 0
48 42 36 30 24 18 12 6 0
LIMs
2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5

I	X(I)	X(I+1)
1	2.7500	2.8100
3	2.8000	2.8100
5	2.7800	2.7600
7	2.7500	2.9500
9	2.8300	2.9000
11	2.8300	2.7500
13	2.9000	2.9700
15	2.8600	2.8000
17	2.8000	2.7900
19	2.8100	2.8000
21	2.7800	2.8600
23	2.8100	2.8100
25	2.7800	2.8000
27	2.8100	2.7900
29	2.8500	2.8700
31	2.7600	2.8700
33	2.7900	2.8400
35	2.8100	3.0900
37	2.7800	2.9300
39	2.7800	2.8300
41	2.8600	2.9100
43	2.8700	2.8000
45	2.7900	2.9300
47	2.8000	2.9200
49	3.0300	2.8100

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8398
COEF OF VARIATION = 2.59%
VARIANCE = .0054
STANDARD DEVIATION = .0734
SKEWNESS = 1.3239
KURTOSIS = 4.6503

95.00% C.I. FOR MEAN
(2.8189 , 2.8607)
ONE-TAIL t(49 , .025)=
2.01003450016



NO %
GULF DP-81-29
ROMAX = 3.02%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

REPORT

on

SIXTY COAL SAMPLES

FROM THE

PANORAMA AREA

SEPTEMBER 1981

David E. Pearson & Associates Ltd.,
Consulting Coal Geologists and Petrographers,
804 Leota Place,
Victoria,
British Columbia
V8Y 1H2

INTRODUCTION

Sixty coal samples collected during detailed work on the Panorama Licences during the 1981 field season were received at the coal laboratory on July 31, 1981. The samples had been previously pelletised at the Chipmunk base camp, and were ready for grinding and polishing.

MEASURING PROCEDURE

The pellets were placed on plates for attachment to the microscope stage. A LEITZ Orthoplan microscope-photometer interfaced to a HEWLETT-PACKARD 85 series computer with HP-7225 plotter was used in the determinations. The microscope was standardised, and 50 maximum reflectance measurements on the maceral vitrinite were made. The computer then determined the mean maximum reflectance of the readings together with the standard deviation, and drew the histogram contained in the appendix. The blue line in these histograms represents the computer-derived normal distribution curve for the determined values, and is an indication of the central tendency of that sample.

RESULTS

The results of the reflectance analysis are shown in Table I; the statistical treatment of the data together with histograms are contained in the appendix.

All of the coals examined have levels of organic maturity that indicate them to be ANTHRACITES.

The lowest reflectance value determined on these coals is 2.26% from a very weathered sample; the highest is 5.22%. Corresponding volatile-matter yields would be 9% and 2.5%, as shown in Fig. 1.

TABLE I

RESULTS

Sample	Romax	Standard Deviation
KB-81- 9-1C	2.65	0.14
13-1C	2.50	0.11
13-2C	3.20	0.10
13-3C	2.99	0.07
14-1C	3.27	0.05
14-2C	2.85	0.10
14-3C	3.06	0.07
14-4C	3.23	0.07
14-5C	3.17	0.09
14-6C	2.99	0.07
17-1C	2.90	0.08
17-2C	2.97	0.07
19-2C	2.26	0.11
19-3C	2.98	0.06
19-4C	2.85	0.10
19-6C	2.89	0.07
20-1C	2.88	0.05
RB-81-10	2.90	0.05
11	2.76	0.08
12	2.98	0.07
13	3.41	0.06
15	3.59	0.06
16	3.23	0.06
17	5.22	0.07

TABLE I (Cont'd)

RESULTS

Sample	Romax	Standard Deviation
RLB-81- 1	3.12	0.09
3	3.04	0.09
4	3.32	0.07
6	2.96	0.09
7	3.06	0.09
8	3.35	0.07
9	3.58	0.06
10	3.14	0.08
11	3.22	0.08
14	3.36	0.09
16	3.32	0.08
17	3.84	0.08
18	3.58	0.07
21	3.03	0.10
22	3.37	0.06
24	3.42	0.07
25	3.24	0.05
JI -81-C11	3.50	0.07
C14	4.20	0.11
SLB-81-8-1/8	3.53	0.09
14	4.00	0.08
16-1/4	4.11	0.08
20	4.10	0.10
22-1/2	3.99	0.06
26-1/3	3.66	0.14
59	3.25	0.05
115	4.33	0.13

TABLE I (Cont'd)

RESULTS

Sample	Romax	Standard Deviation
DP-81- 5	3.07	0.05
44	3.48	0.05
45	3.11	0.12
46	3.11	0.07
47	3.17	0.05
52	2.75	0.17
55	3.16	0.05
66	3.22	0.06
67	3.26	0.05

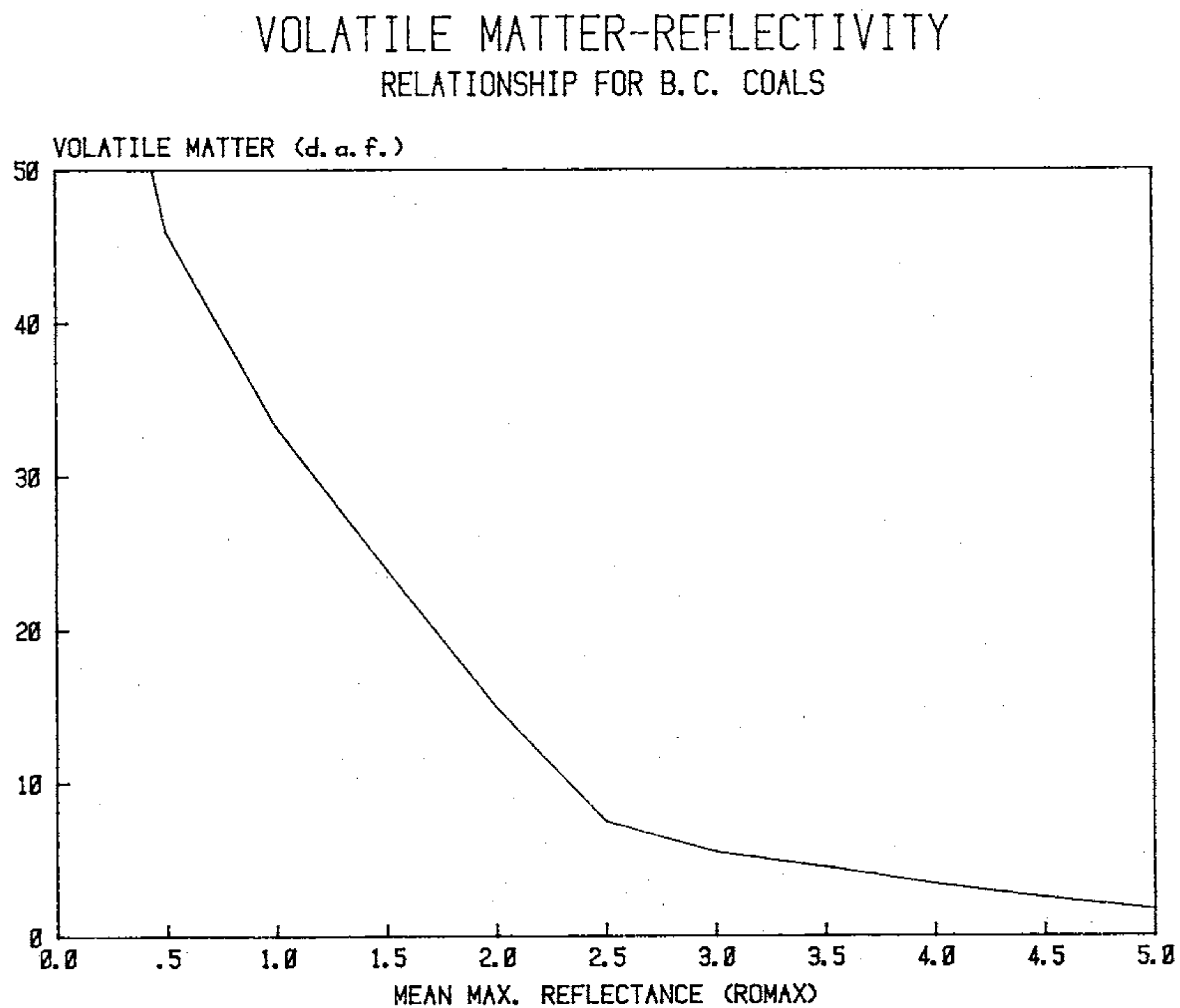

VOLATILE MATTER-REFLECTIVITY
RELATIONSHIP FOR B.C. COALS
VOLATILE MATTER (d.a.f.)
50
40
30
20
10
0
0.0
.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
MEAN MAX. REFLECTANCE (ROMAX)

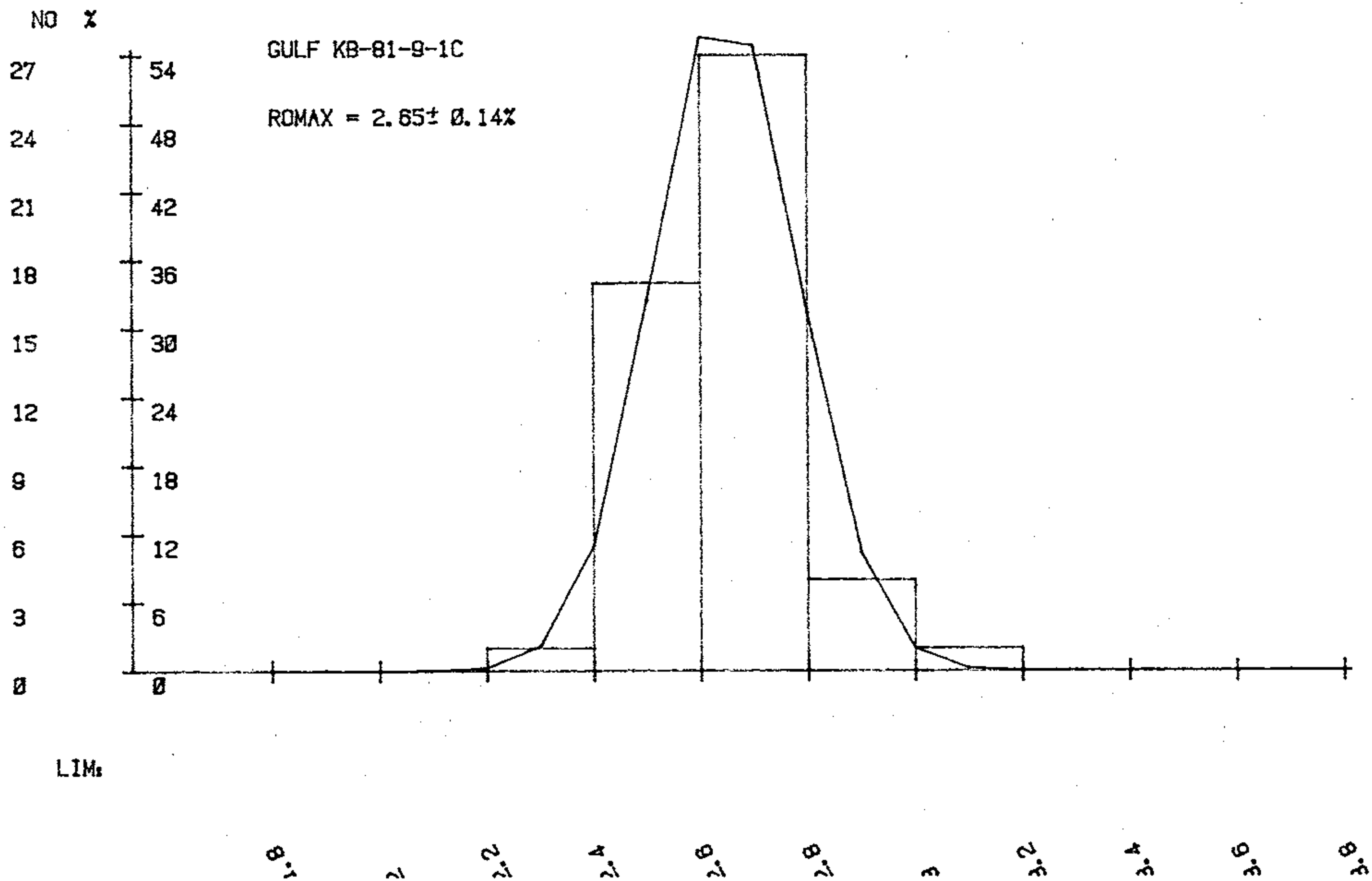
FIGURE 1

KB-81-9-1C

I	X(I)	X(I+1)
1	2.5400	2.6700
3	3.1300	2.6400
5	2.9800	2.6900
7	2.6100	2.6800
9	2.7300	2.7300
11	2.7300	2.5800
13	2.6500	2.6500
15	2.6500	2.6800
17	2.5500	2.9000
19	2.5100	2.5200
21	2.6500	2.5600
23	2.4800	2.4400
25	2.5400	2.6700
27	2.6900	2.4400
29	2.3700	2.6300
31	2.5400	2.5500
33	2.6400	2.6400
35	2.6000	2.7200
37	2.5200	2.6500
39	2.5600	2.5300
41	2.7100	2.5800
43	2.8000	2.6300
45	2.6100	2.7600
47	2.7700	2.5600
49	2.7700	2.7500

```
BASIC STATISTICS
*****************************
N =    50
STD ERROR OF THE MEAN=          .02
MEAN =          2.6476
COEF OF VARIATION =          5.10%
VARIANCE =          .0182
STANDARD DEVIATION =          .1350
SKEWNESS =          1.0124
KURTOSIS =          5.3240

    95.00% C.I. FOR MEAN:
(       2.6092,        2.6860)
ONE-TAIL t( 49 , .025 )=
 2.01003450016
```

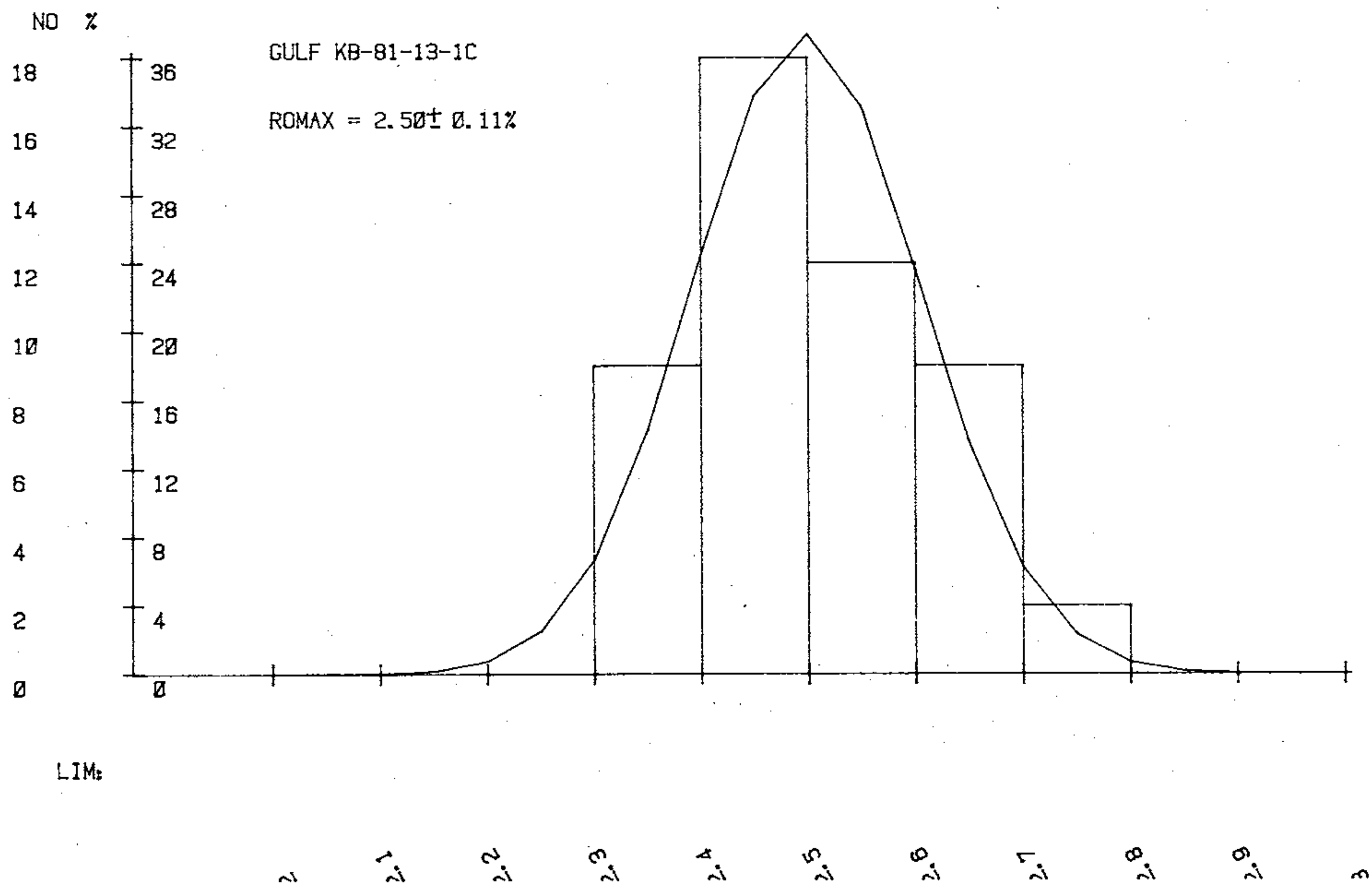

NO %
GULF KB-81-9-1C
ROMAX = 2.65± 0.14%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs
1.8
2
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8

KB-81-13-1C

I	X(I)	X(I+1)
1	2.4500	2.3900
3	2.5200	2.4600
5	2.5600	2.6000
7	2.5900	2.5500
9	2.7000	2.5900
11	2.6500	2.6500
13	2.4100	2.6000
15	2.4000	2.4200
17	2.4300	2.5700
19	2.3700	2.4200
21	2.4500	2.3400
23	2.3500	2.3400
25	2.5000	2.3400
27	2.4700	2.4500
29	2.6000	2.4600
31	2.3700	2.4000
33	2.3200	2.4300
35	2.7200	2.5400
37	2.5400	2.6700
39	2.6500	2.5800
41	2.5700	2.5600
43	2.4600	2.3900
45	2.4300	2.4400
47	2.6200	2.4800
49	2.4600	2.6400

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 2.4980
COEF OF VARIATION = 4.27%
VARIANCE = .0114
STANDARD DEVIATION = .1068
SKEWNESS = .2312
KURTOSIS = 1.9868

95.00% C.I. FOR MEAN:
(2.4677, 2.5283)
ONE-TAIL t(49 , .025)=
2.01063450016



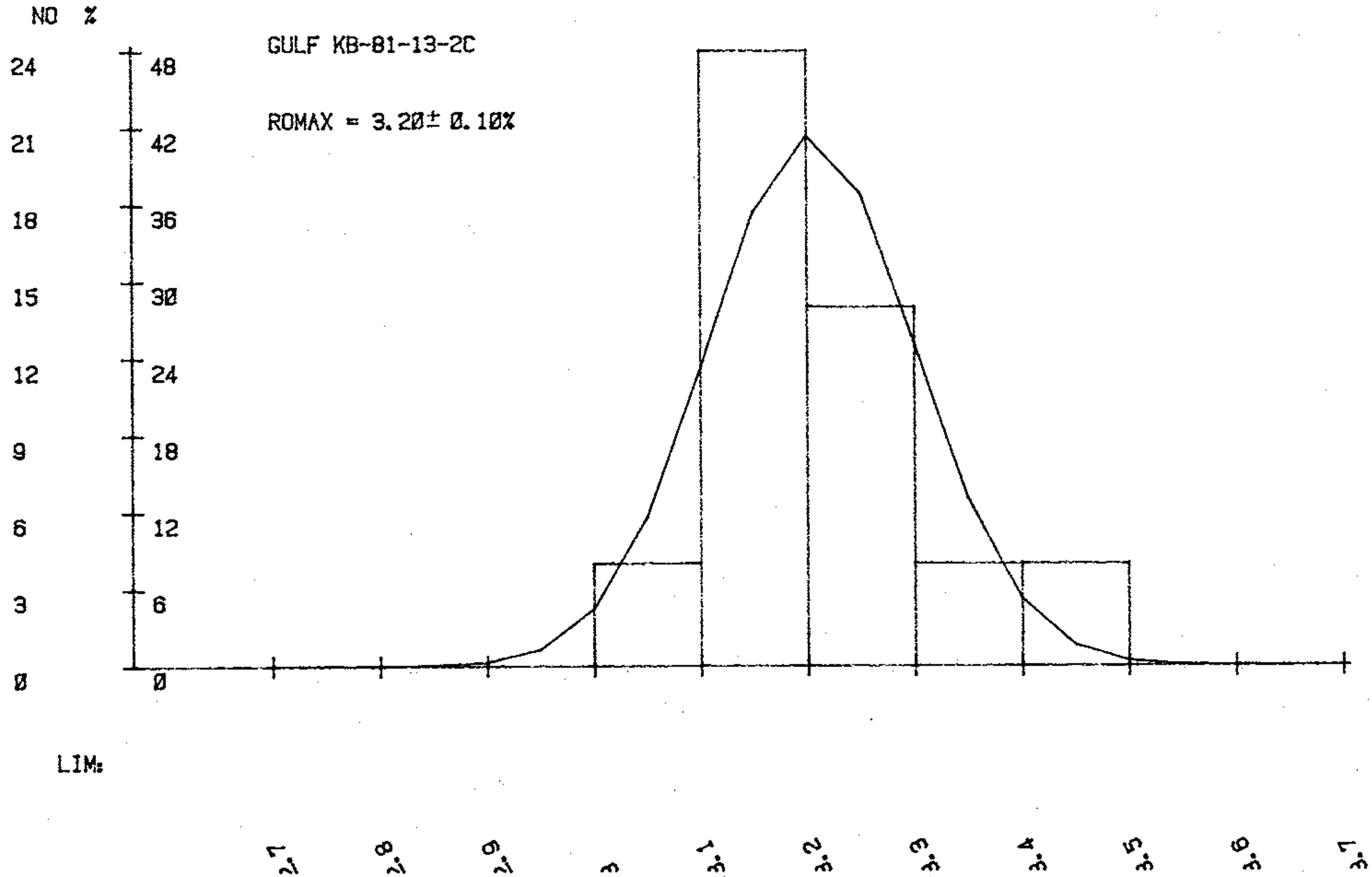
NO %
GULF KB-81-13-1C
ROMAX = 2.50± 0.11%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3

KB-81-13-2C

I	X(I)	X(I+1)
1	3.1300	3.1300
3	3.1000	3.2100
5	3.4000	3.0600
7	3.1000	3.1900
9	3.1600	3.2500
11	3.3300	3.1600
13	3.1400	3.2100
15	3.1600	3.1700
17	3.0400	3.1700
19	3.1400	3.2700
21	3.1600	3.2600
23	3.1900	3.2900
25	3.2100	3.1700
27	3.2400	3.2200
29	3.1400	3.2500
31	3.2700	3.4000
33	3.2200	3.0800
35	3.3100	3.2200
37	3.1200	3.1000
39	3.1800	3.4200
41	3.4400	3.1100
43	3.1900	3.0400
45	3.1800	3.3200
47	3.3600	3.2800
49	3.1500	3.1500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2038
COEF OF VARIATION = 3.01%
VARIANCE = .0093
STANDARD DEVIATION = .0964
SKEWNESS = .6495
KURTOSIS = 2.9582

95.00% C.I. FOR MEAN:
(3.1764, 3.2312)
ONE-TAIL t(49 , .025)=
2.01003450016



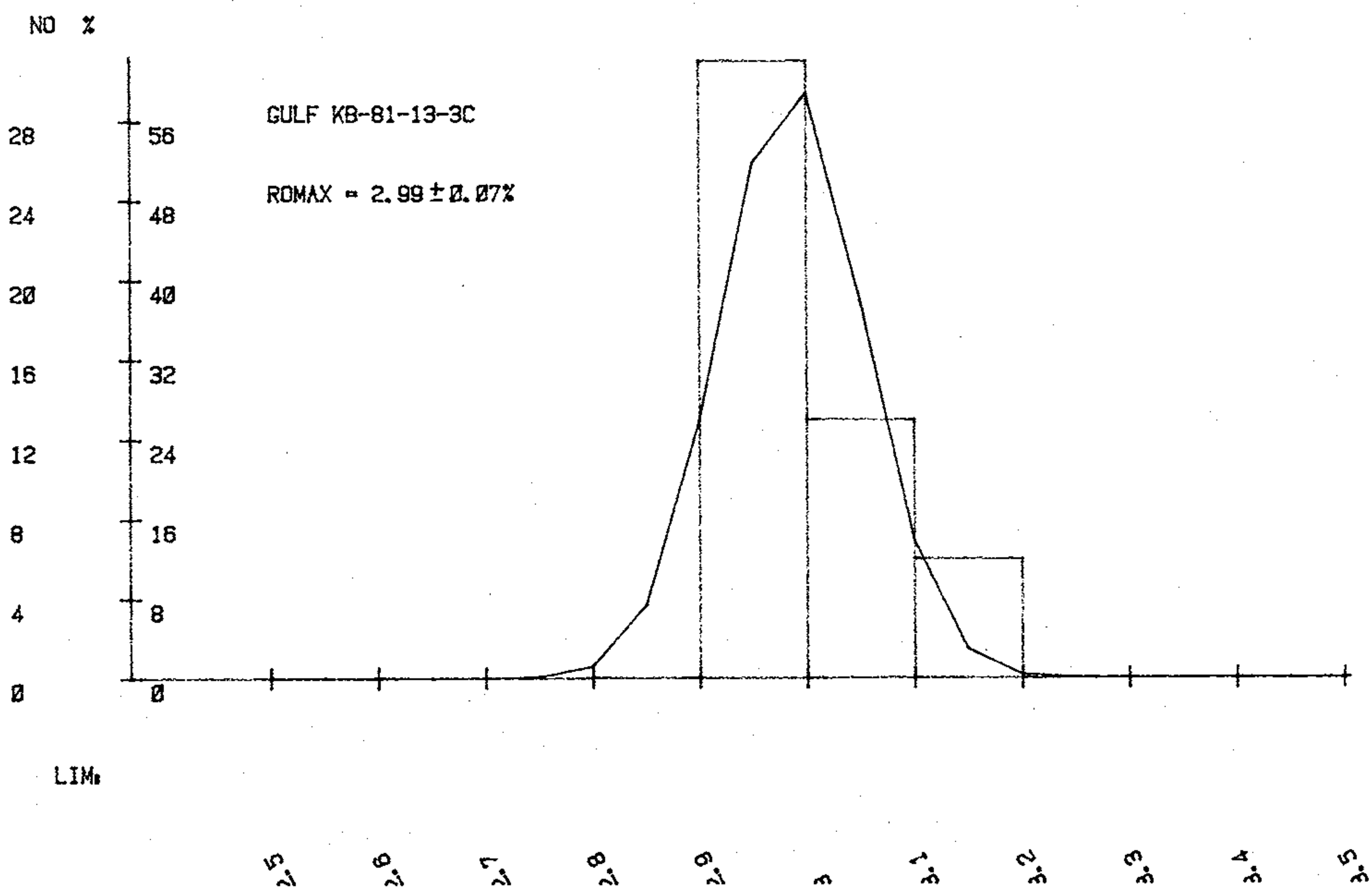
NO %
GULF KB-81-13-2C
ROMAX = 3.20± 0.10%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:

KB-81-13-3C

I,	X(I)	X(I+1)
1	3.0200	2.9000
3	2.9600	2.9300
5	2.9200	2.9700
7	3.0100	3.0500
9	2.9600	2.9800
11	2.9300	2.9500
13	2.9300	3.0200
15	2.9700	3.1000
17	3.1000	3.1300
19	2.9900	2.9000
21	2.9800	3.0600
23	3.0100	2.9600
25	2.9300	2.9000
27	2.9000	3.0100
29	2.9900	2.9200
31	2.9000	2.9100
33	2.9400	3.0800
35	3.1200	3.0400
37	3.0100	2.9300
39	3.1400	3.1000
41	2.9800	3.0500
43	2.9100	2.9400
45	2.9600	3.0100
47	3.0100	2.9600
49	2.9900	2.9500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.9862
COEF OF VARIATION = 2.23%
VARIANCE = .0044
STANDARD DEVIATION = .0665
SKEWNESS = .6704
KURTOSIS = 2.5745

95.00% C.I. FOR MEAN:
(2.9673, 3.0051)
ONE-TAIL t(49 , .025)=
2.01003450016



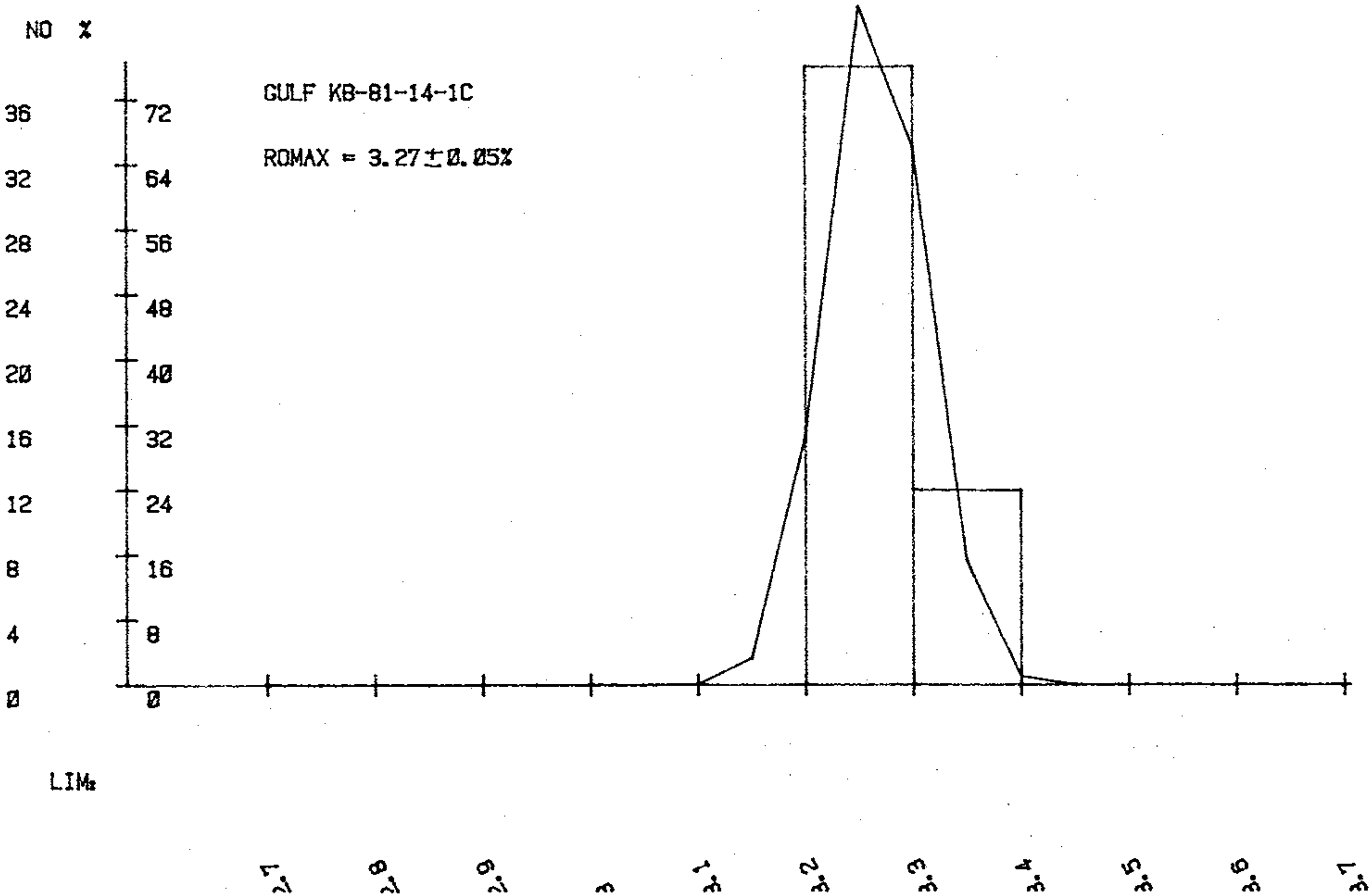
NO %
GULF KB-81-13-3C
ROMAX = 2.99 ± 0.07%
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

KB-81-14-1C

I	X(I)	X(I+1)
1	3.2500	3.2600
3	3.2300	3.2400
5	3.3100	3.3500
7	3.2200	3.2200
9	3.2600	3.3400
11	3.2200	3.2500
13	3.2500	3.2600
15	3.2700	3.2600
17	3.2500	3.2200
19	3.2200	3.2300
21	3.2700	3.2300
23	3.3300	3.2200
25	3.3200	3.2200
27	3.2500	3.2800
29	3.2000	3.2700
31	3.2600	3.2200
33	3.2400	3.3200
35	3.2100	3.3400
37	3.2900	3.3300
39	3.2400	3.2700
41	3.2500	3.3900
43	3.3400	3.2100
45	3.2900	3.3100
47	3.3300	3.2400
49	3.2300	3.2700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2656
COEF OF VARIATION = 1.38%
VARIANCE = .0020
STANDARD DEVIATION = .0450
SKEWNESS = .7751
KURTOSIS = 2.7332

95.00% C.I. FOR MEAN:
(3.2528, 3.2784)
ONE-TAIL t(49 , .025)=
2.01003450016

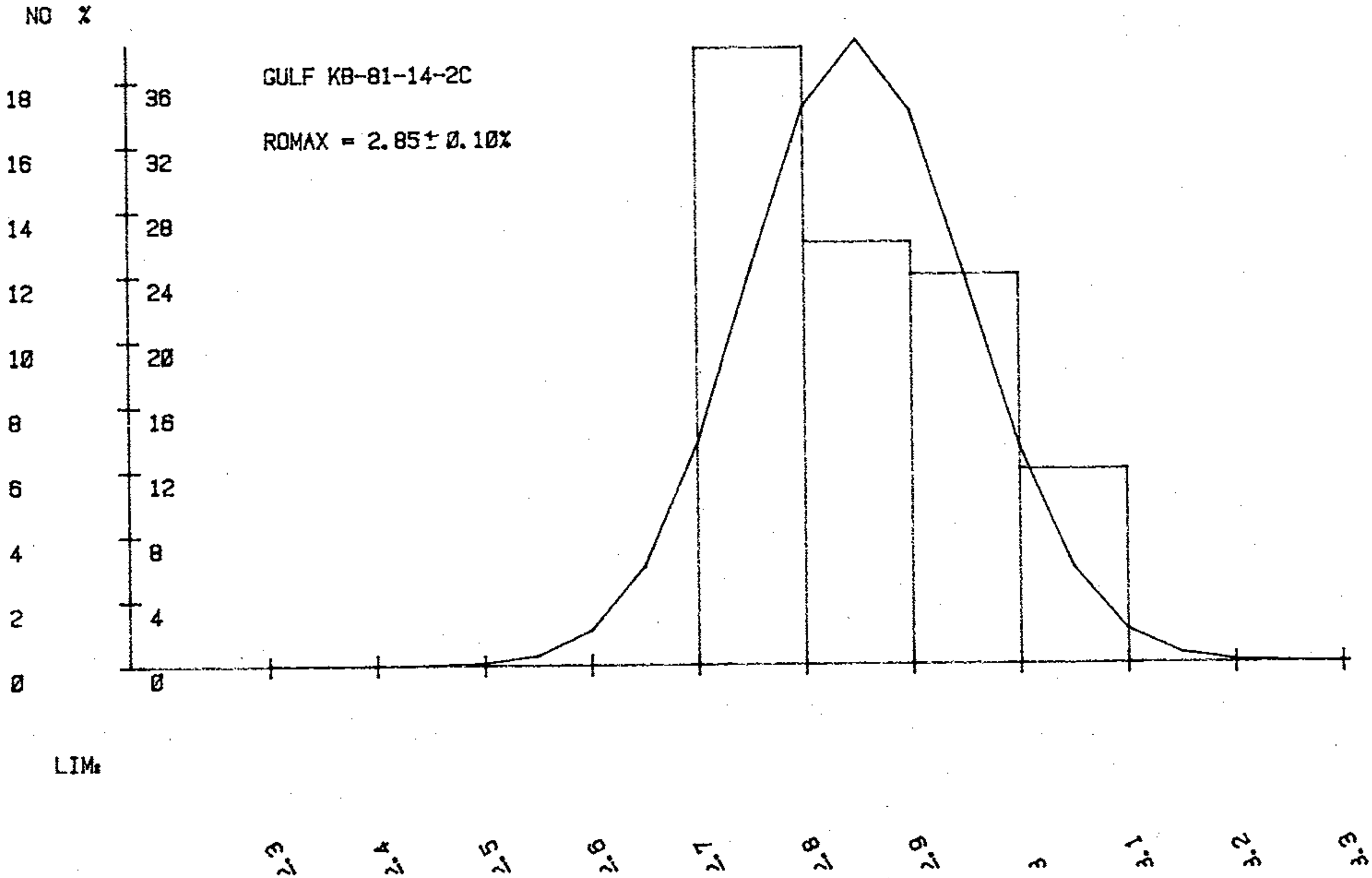

NO %
GULF KB-81-14-1C
ROMAX = 3.27±0.05%
36 72
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7

KB-81-14-2C

I	X(I)	X(I+1)
1	2.8300	2.9400
3	2.8200	2.8600
5	2.9200	2.8400
7	2.8300	2.8400
9	3.0200	2.9500
11	3.0600	2.8000
13	2.8900	2.7800
15	2.7700	2.7300
17	2.8300	2.8800
19	2.8000	2.9500
21	2.7900	2.7300
23	2.7100	2.7000
25	2.7200	2.9200
27	2.7500	2.9200
29	2.9400	2.9600
31	2.9300	2.9300
33	3.0000	3.0600
35	2.9000	3.0500
37	3.0300	2.9400
39	2.7300	2.7700
41	2.7500	2.7800
43	2.7800	2.7400
45	2.8000	2.8200
47	2.7900	2.7400
49	2.7400	2.7000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8492
COEF OF VARIATION = 3.64%
VARIANCE = .0108
STANDARD DEVIATION = .1037
SKEWNESS = .4411
KURTOSIS = 2.1226

95.00% C.I. FOR MEAN:
(2.8197, 2.8787)
ONE-TAIL t(49 , .025)=
2.01003450016



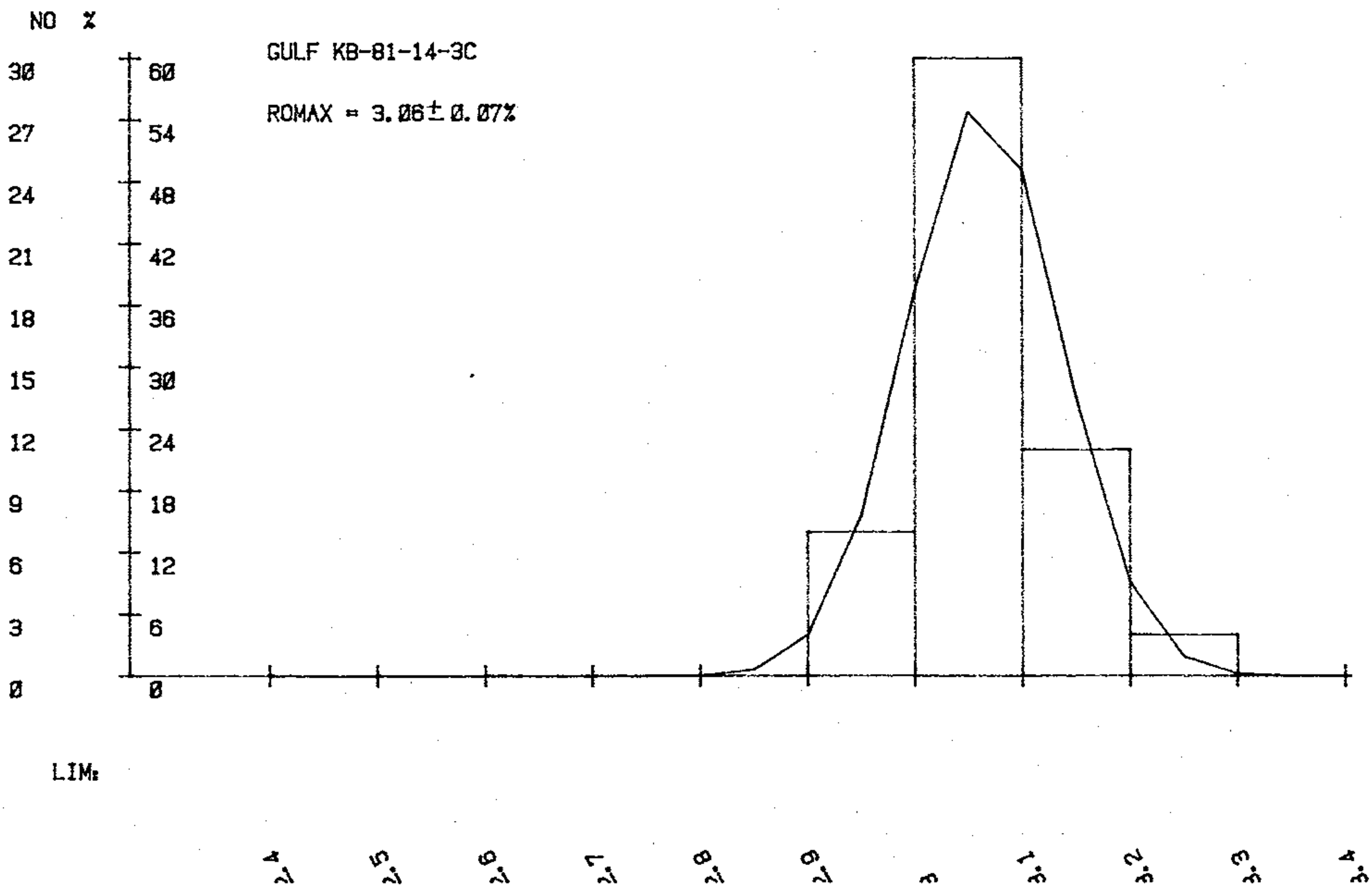
NO %
GULF KB-81-14-2C
ROMAX = 2.85± 0.10%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3

KB-81-14-3C

I	X(I)	X(I+1)
1	3.0900	2.9500
3	2.9500	3.1700
5	3.0800	3.0000
7	3.0200	3.0600
9	3.0800	3.0300
11	3.1700	3.0000
13	3.0700	3.0500
15	3.0600	2.9800
17	3.0000	3.0200
19	3.0400	3.0200
21	3.1600	2.9900
23	3.0400	3.1300
25	2.9800	3.2600
27	3.1500	3.0200
29	3.1600	3.0400
31	3.0600	3.0300
33	3.0700	3.0300
35	3.0000	3.0300
37	2.9900	3.0000
39	3.1100	2.9900
41	3.1900	3.0900
43	3.0700	3.2000
45	3.0600	3.0200
47	3.0400	3.1600
49	3.1000	3.1900

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.0640
COEF OF VARIATION = 2.33%
VARIANCE = .0051
STANDARD DEVIATION = .0714
SKEWNESS = .7293
KURTOSIS = 2.8419

95.00% C.I. FOR MEAN
(3.0437, 3.0843)
ONE-TAIL t(49 , .025)=
2.01003450016

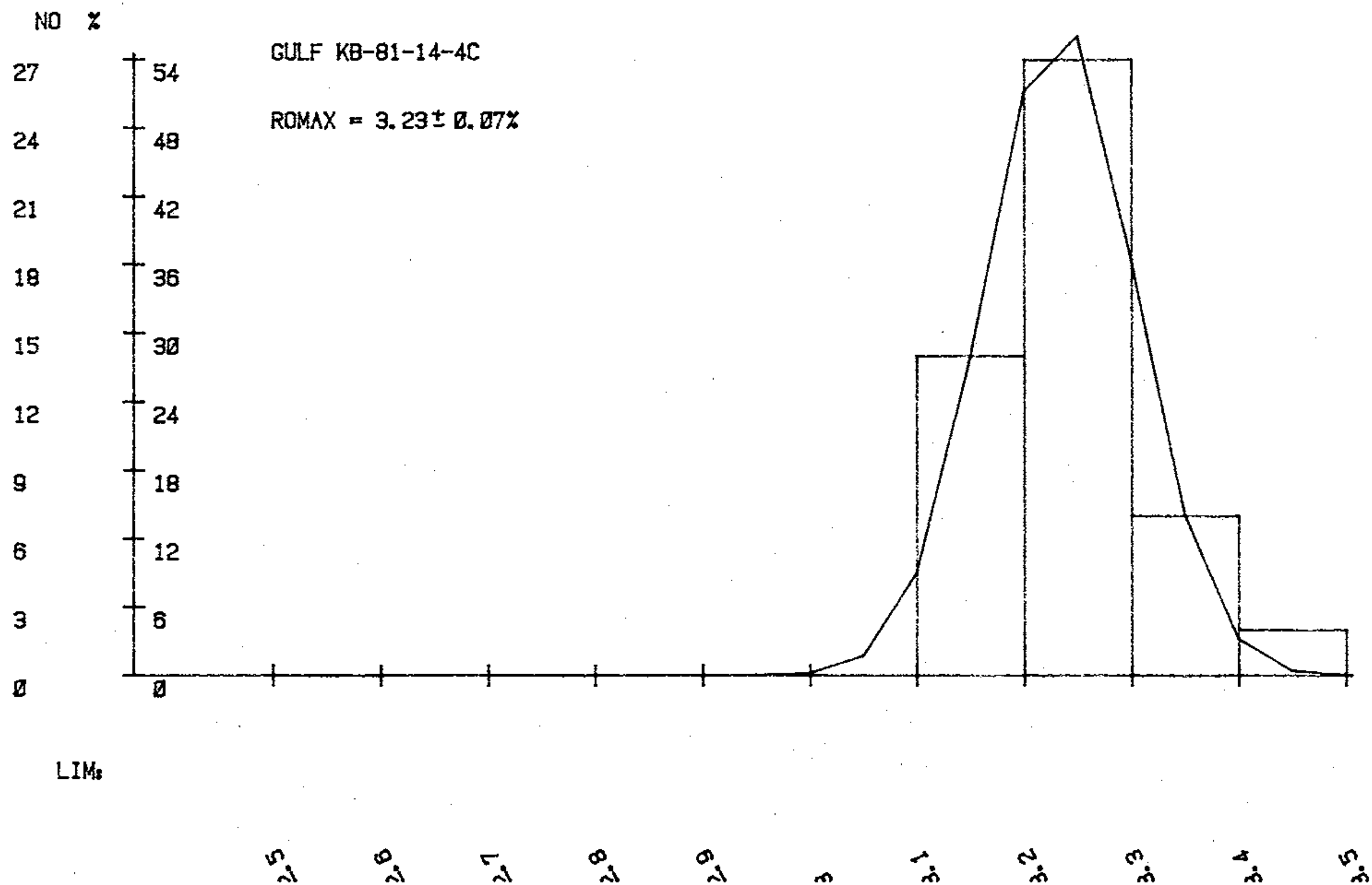

NO %
GULF KB-81-14-3C
ROMAX = 3.06±0.07%
30 60
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4

KB-81-14-4C

I	X(I)	X(I+1)
1	3.2700	3.2100
3	3.2100	3.2300
5	3.2500	3.2200
7	3.2200	3.2000
9	3.2300	3.3500
11	3.2600	3.4100
13	3.3700	3.2700
15	3.2400	3.2200
17	3.2700	3.2200
19	3.2100	3.2200
21	3.3100	3.2600
23	3.2000	3.2000
25	3.2300	3.3400
27	3.3300	3.2800
29	3.4000	3.2300
31	3.3300	3.2000
33	3.2500	3.3200
35	3.2700	3.2500
37	3.1700	3.1800
39	3.1600	3.1500
41	3.1600	3.1700
43	3.1600	3.1500
45	3.1700	3.1500
47	3.1500	3.1500
49	3.1400	3.1400

```
BASIC STATISTICS
******************************
N =    50
STD ERROR OF THE MEAN=          .01
MEAN =          3.2336
COEF OF VARIATION =          2.14%
VARIANCE =          .0048
STANDARD DEVIATION =          .0692
SKEWNESS =          .7308
KURTOSIS =          2.9193

     95.00% C.I. FOR MEAN:
(        3.2139,        3.2533)
ONE-TAIL t( 49 , .025 )=
 2.01003450016
```

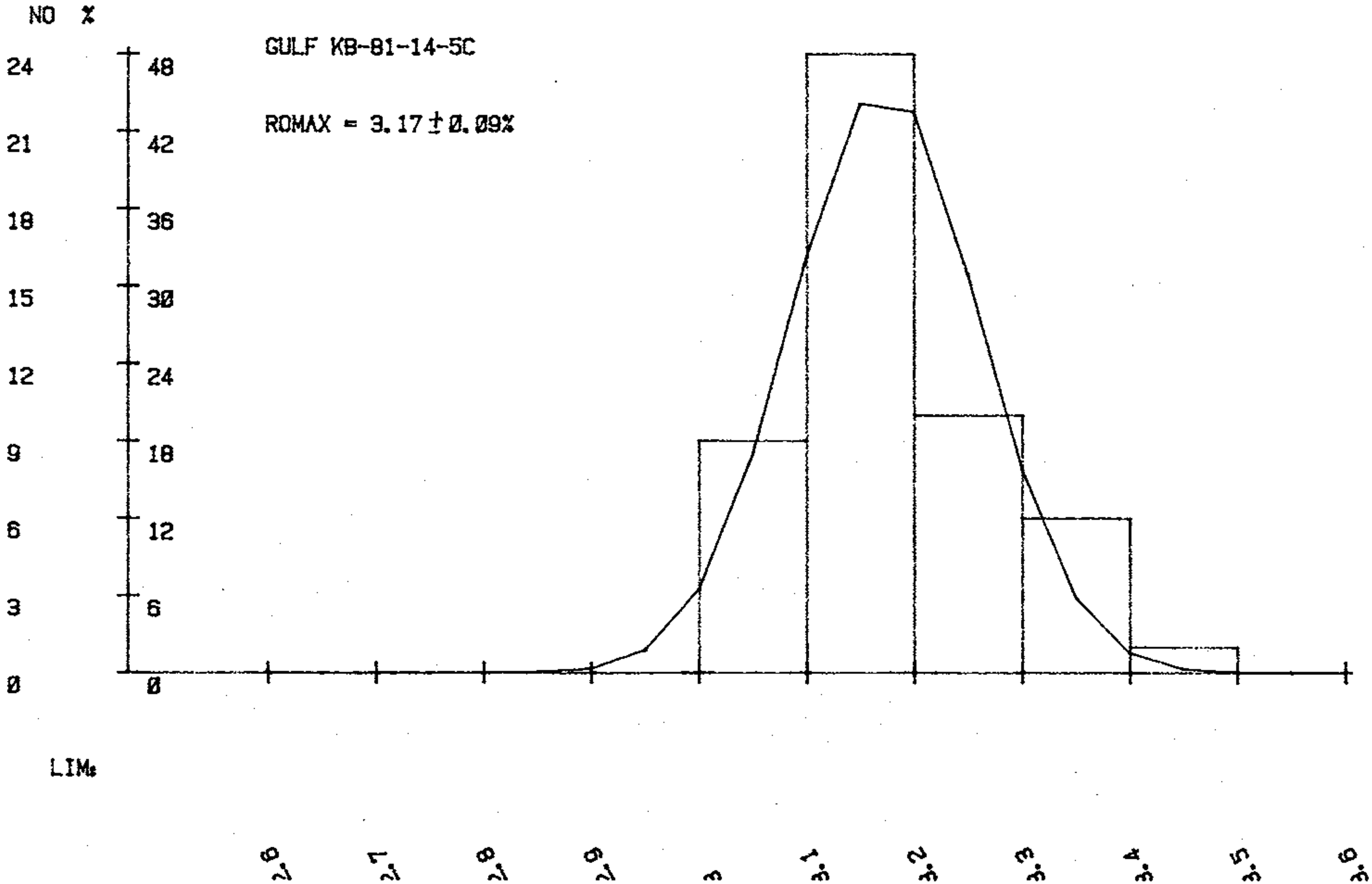

NO %
GULF KB-81-14-4C
ROMAX = 3.23± 0.07%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

KB-81-14-5C

I	X(I)	X(I+1)
1	3.1400	3.0800
3	3.1700	3.1100
5	3.1500	3.2200
7	3.2100	3.2000
9	3.1300	3.1600
11	3.0500	3.1500
13	3.0900	3.2000
15	3.1500	3.2200
17	3.2500	3.1300
19	3.1800	3.2200
21	3.3000	3.0500
23	3.0700	3.1700
25	3.3100	3.1200
27	3.3000	3.0700
29	3.0200	3.0500
31	3.1200	3.1900
33	3.1300	3.3600
35	3.1400	3.1900
37	3.1300	3.1700
39	3.4400	3.3100
41	3.2800	3.3000
43	3.2100	3.1900
45	3.1600	3.2200
47	3.1700	3.1000
49	3.0600	3.1000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.1728
COEF OF VARIATION = 2.75%
VARIANCE = .0076
STANDARD DEVIATION = .0873
SKEWNESS = .7250
KURTOSIS = 3.5283

95.00% C.I. FOR MEAN:
(3.1480, 3.1976)
ONE-TAIL t(49 , .025)=
2.01003450016



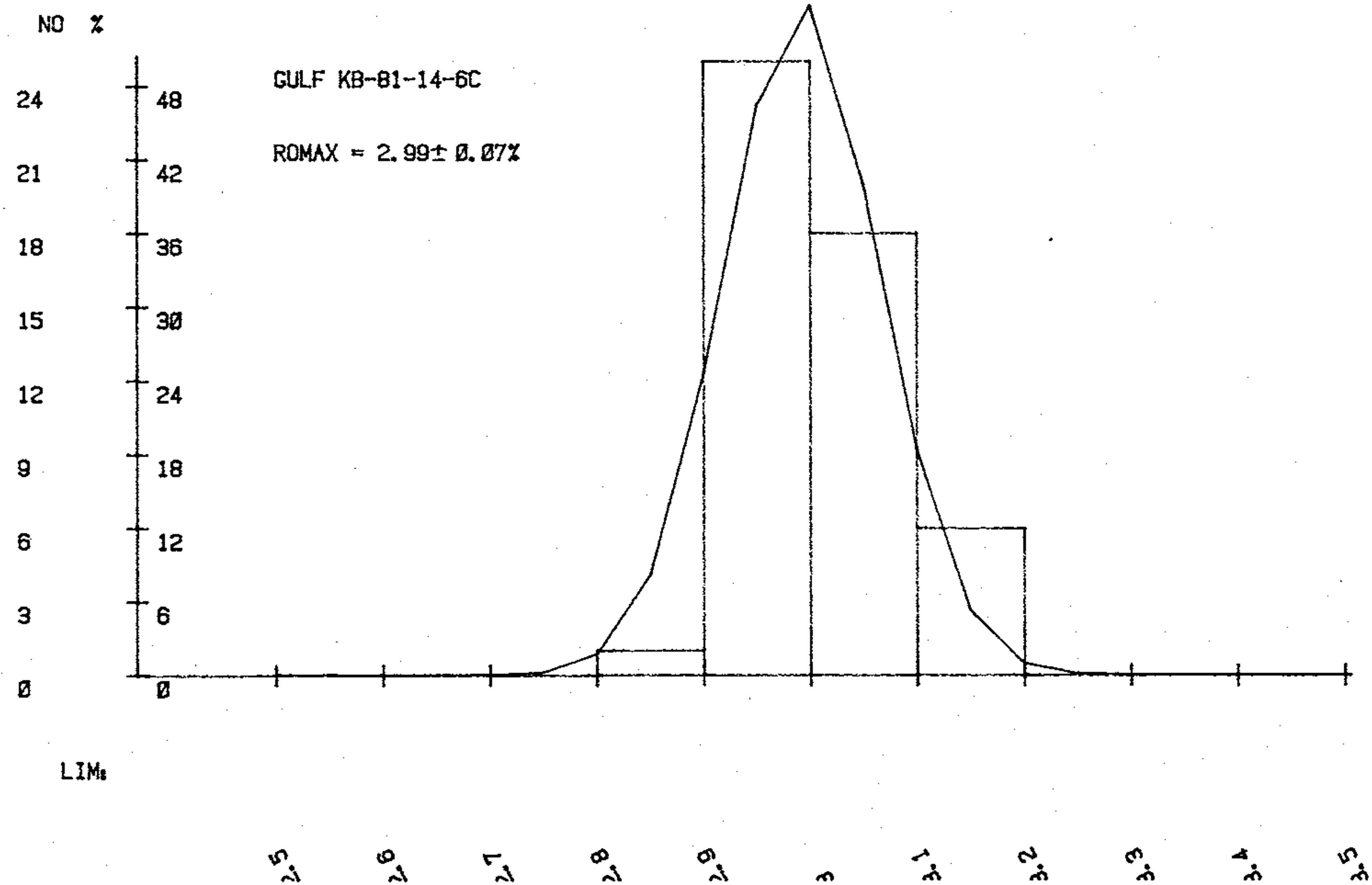
NO %
GULF KB-81-14-5C
ROMAX = 3.17 ± 0.09%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6

kB-81-14-6C

I	X(I)	X(I+1)
1	3.0900	3.0600
3	3.0200	3.0200
	2.9100	2.9600
	3.1000	3.0500
	3.0100	2 9800
11	2.9700	3.1100
13	3.0200	3.0100
15	3.0200	3.1100
17	3.1500	3.0200
19	3.0900	2.9800
21	2.9900	3.0500
23	2.9700	3.0100
25	3.1000	3.0500
27	3.0700	3.1200
29	3 0400	2.9800
31	2.9300	3.0100
33	3.0500	2.9100
35	2.9200	2.9100
37	2.9200	2.9300
39	2.9300	2.9300
41	2.9400	2.9300
43	2.9200	2.9200
45	2.9100	2.9000
47	2.9000	2.9000
49	2.8900	2.9000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= 01
MEAN = 2.9922
COEF OF VARIATION = 2.43%
VARIANCE = .0053
STANDARD DEVIATION = .0728
SKEWNESS = .3271
KURTOSIS = 1.9351

95.00% C.I. FOR MEAN:
(2.9715, 3.0129)
ONE-TAIL t(49 , .025)=
2.01003450016

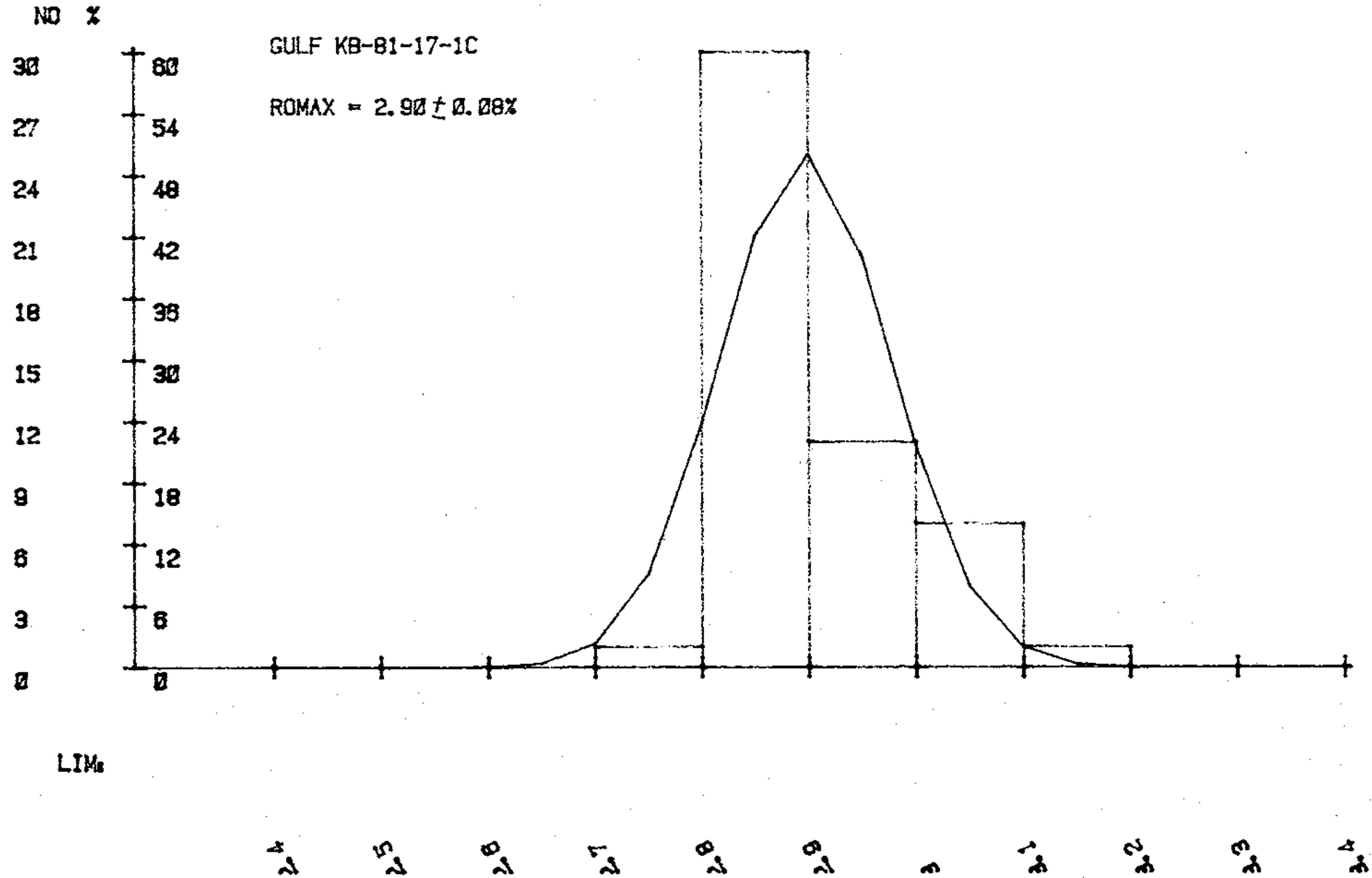

NO %
GULF KB-81-14-6C
ROMAX = 2.99± 0.07%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

KB-81-17-1C

I	X(I)	X(I+1)
1	2.9300	2.9300
3	2.8600	3.0500
5	2.8600	2.8900
7	2.8500	2.8300
9	2.8000	3.0000
11	2.9400	3.1200
13	2.8000	2.9600
15	2.8100	2.8400
17	2.8500	2.8500
19	2.8900	2.8600
21	2.8600	2.9500
23	2.9500	2.8200
25	2.8400	2.8900
27	2.8400	2.8000
29	2.7900	2.8000
31	2.9500	2.8800
33	2.8200	3.0700
35	2.9000	2.8600
37	3.0500	3.0000
39	3.0300	2.8400
41	2.8500	2.8300
43	2.8900	2.9700
45	3.0100	2.8600
47	2.8700	2.9000
49	2.9400	2.8800

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8970
COEF OF VARIATION = 2.75%
VARIANCE = .0063
STANDARD DEVIATION = .0797
SKEWNESS = .9042
KURTOSIS = 3.0850

95.00% C.I. FOR MEAN:
(2.8744, 2.9196)
ONE-TAIL t(49 , .025)=
2.01003450016



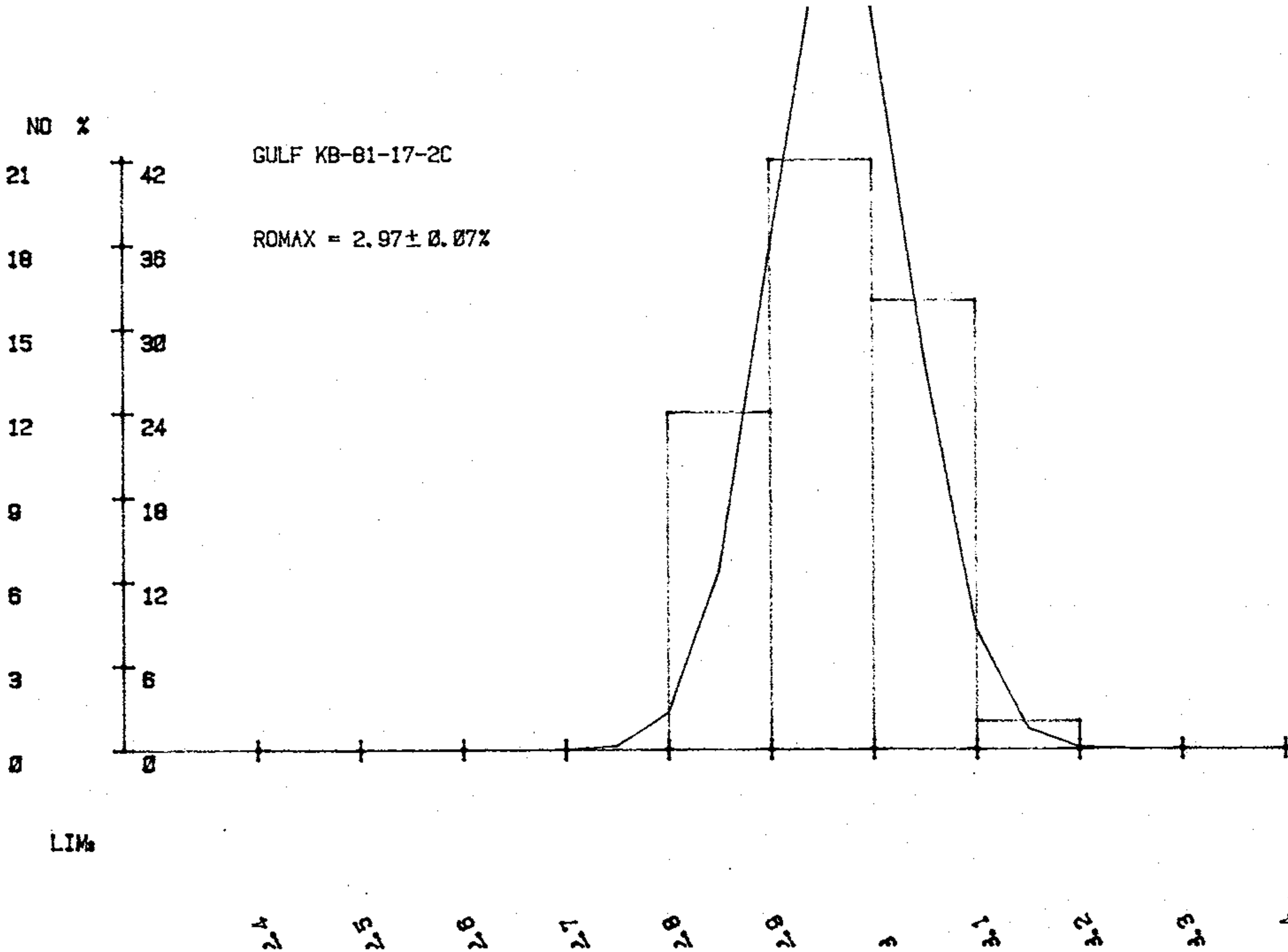
NO %
GULF KB-81-17-1C
ROMAX = 2.90 ± 0.08%
30 27 24 21 18 15 12 9 6 3 0
60 54 48 42 36 30 24 18 12 6 0
LIMs

KB-81-17-2C

I	X(I)	X(I+1)
1	3.0000	3.0200
3	3.1100	3.0600
5	3.0600	3.0000
7	3.0200	3.0600
9	3.0100	3.0600
11	3.0500	3.0200
13	3.0300	3.0300
15	3.0500	2.9600
17	2.9600	2.9600
19	2.9600	3.0500
21	2.9800	2.9800
23	2.9500	2.9800
25	2.9900	2.9600
27	2.9600	2.9700
29	2.9700	2.9800
31	2.9300	2.9500
33	2.9700	2.8700
35	2.8900	2.8900
37	2.9900	2.8400
39	2.8400	2.8900
41	2.8800	2.8500
43	2.8900	2.9800
45	3.0200	2.8500
47	2.8600	[illegible]700
49	2.9500	2.8900

BASIC STATISTICS
****
N =   50
STD ERROR OF THE MEAN=   .01
MEAN =   2.9678
COEF OF VARIATION =   2.26%
VARIANCE =   .0045
STANDARD DEVIATION =   .0672
SKEWNESS =   -.2611
KURTOSIS =   2.3437

95.00% C.I. FOR MEAN:
(2.9487,   2.9869)
ONE-TAIL t(49 , .025)=
2.01003450016

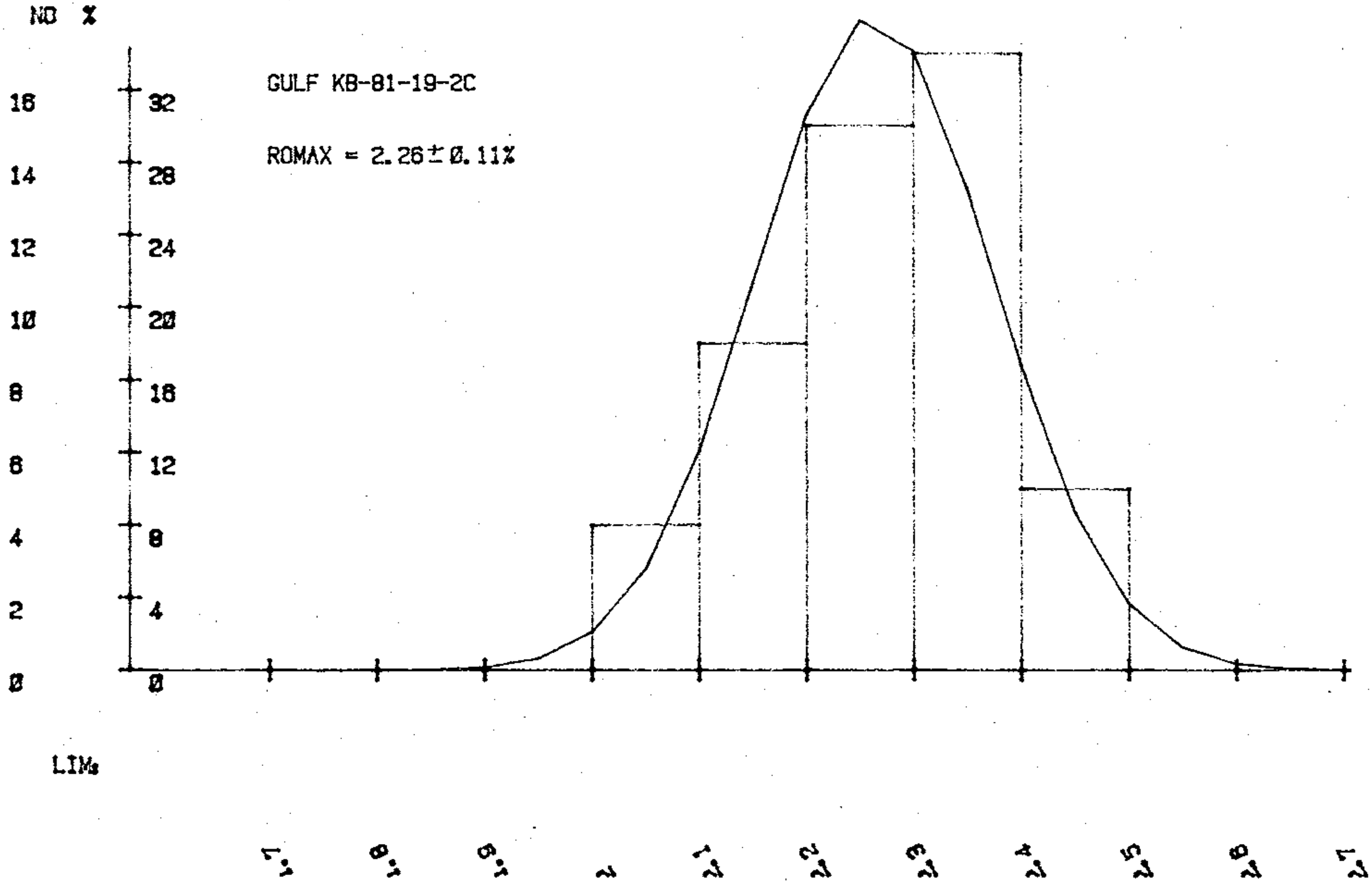

NO %
GULF KB-81-17-2C
ROMAX = 2.97 ± 0.07%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIMs
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4

KB-81-19-2C

I	X(I)	X(I+1)
1	2.3500	2.2500
3	2.3700	2.3200
5	2.3200	2.0600
7	2.1400	2.2700
9	2.4200	2.3200
11	2.4200	2.1300
13	2.1900	2.2100
15	2.0300	2.1300
17	2.3400	2.2300
19	2.2400	2.1900
21	2.3300	2.2000
23	2.2400	2.3600
25	2.4400	2.2500
27	2.2500	2.3200
29	2.1800	2.3900
31	2.2200	2.0200
33	2.1800	2.2100
35	2.3000	2.1100
37	2.1500	2.2900
39	2.3000	2.3400
41	2.2800	2.4400
43	2.4900	2.2300
45	2.3700	2.0500
47	2.2700	2.3200
49	2.3600	2.3500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 2.2634
COEF OF VARIATION = 4.89%
VARIANCE = .0122
STANDARD DEVIATION = .1106
SKEWNESS = -.2982
KURTOSIS = 2.6148

95.00% C.I. FOR MEAN:
(2.2320, 2.2948)
ONE-TAIL t(49 , .025)=
2.01003450016

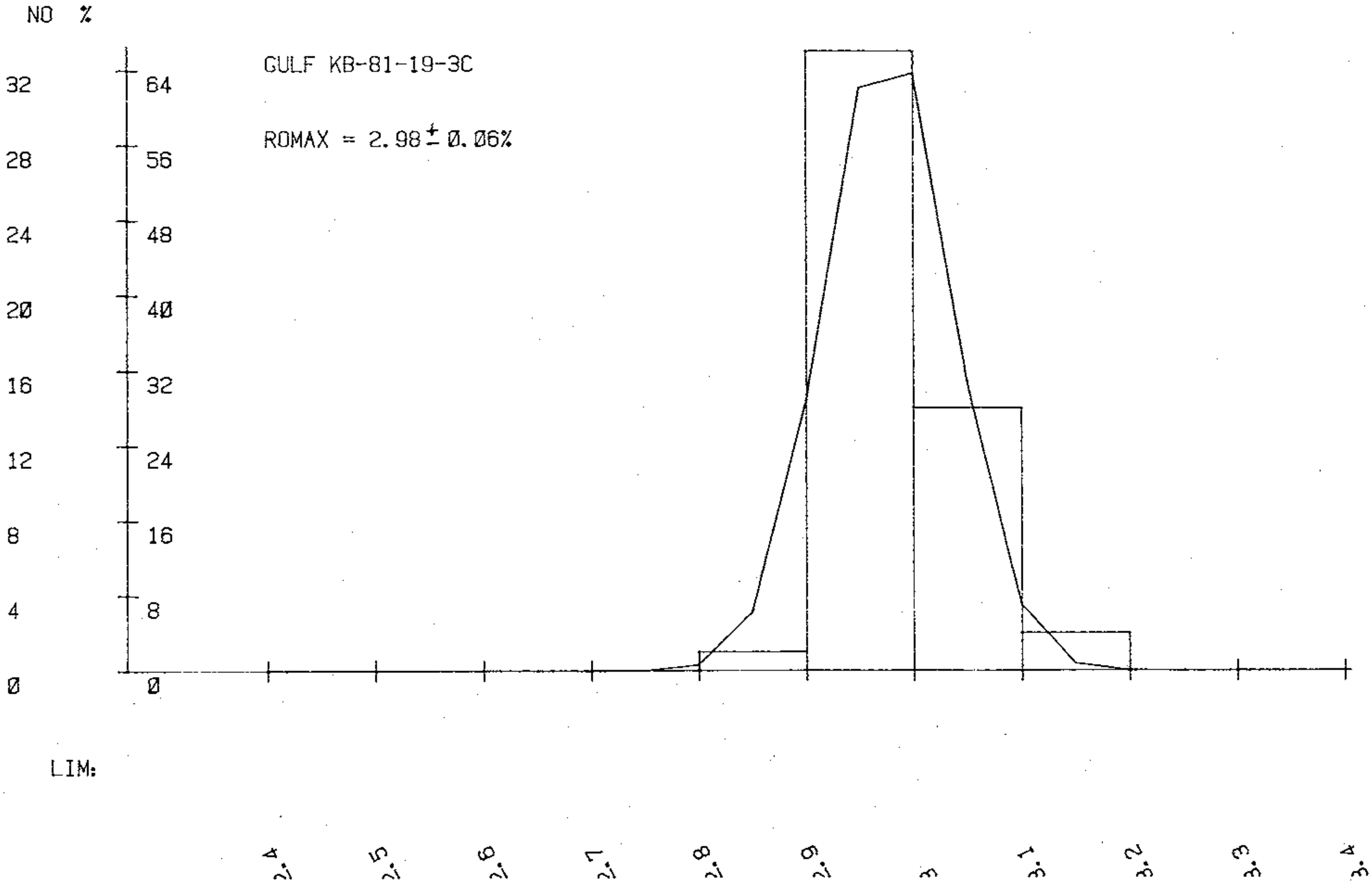

NO %
GULF KB-81-19-2C
ROMAX = 2.26 ± Ø.11%
16
14
12
1Ø
8
6
4
2
Ø
32
28
24
2Ø
16
12
8
4
Ø
LIMs
1.7
1.8
1.9
2
2.1
2.2
2.3
2.4
2.5
2.6
2.7

KB-81-19-3C

I	X(I)	X(I+1)
1	2.8800	2.9000
3	2.9200	3.0200
5	2.9200	2.9500
7	2.9600	2.9600
9	2.9900	2.9100
11	2.9300	2.9300
13	3.0300	2.9100
15	3.0500	3.0700
17	2.9300	2.9700
19	2.9800	2.9500
21	2.9100	3.0700
23	2.9300	2.9800
25	3.1000	3.0000
27	3.0100	2.9800
29	3.0300	2.9000
31	2.9000	2.9900
33	3.1000	3.0500
35	2.9300	2.9800
37	2.9900	2.9900
39	2.9800	2.9300
41	2.9900	2.9300
43	2.9500	2.9000
45	3.0000	3.0700
47	3.0700	2.[illegible]
49	3.0800	3.0200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.9766
COEF OF VARIATION = 1.94%
VARIANCE = .0033
STANDARD DEVIATION = .0577
SKEWNESS = .4282
KURTOSIS = 2.3102

95.00% C.I. FOR MEAN:
(2.9602, 2.9930)
ONE-TAIL t(49 , .025)=
2.01003450016



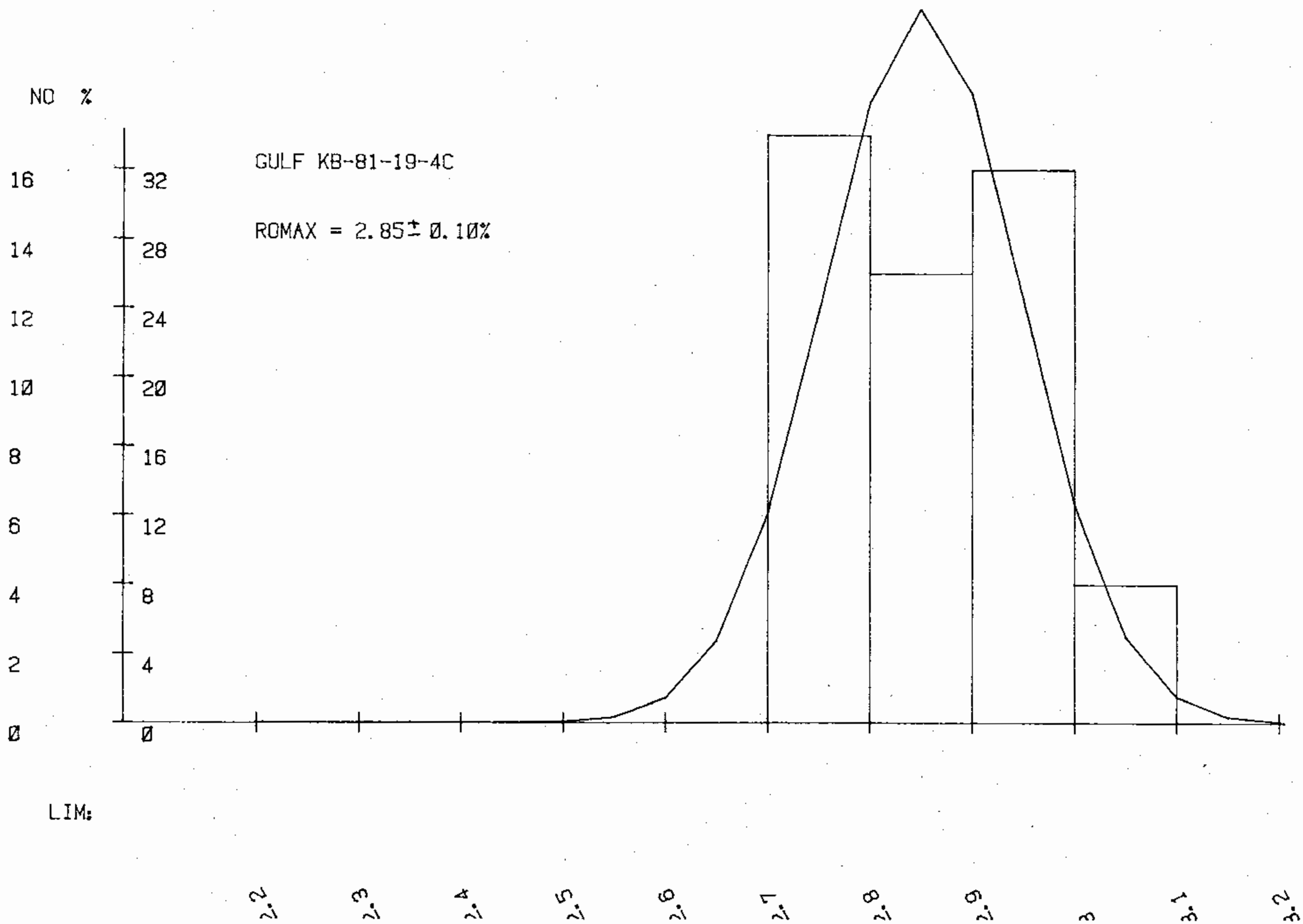
NO %
GULF KB-81-19-3C
ROMAX = 2.98 ± 0.06%
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4

KB81-19-4C

I	X(I)	X(I+1)
1	2.9700	2.9000
3	3.0100	2.9500
5	2.9200	2.9800
7	3.0600	2.9400
9	3.0000	2.9300
11	2.9500	2.9300
13	2.9100	2.9900
15	3.0100	2.9500
17	2.8600	2.8300
19	2.7300	2.9300
21	2.7400	2.7800
23	2.7000	2.8200
25	2.7300	2.7400
27	2.8500	2.8000
29	2.9500	2.7400
31	2.7900	2.7300
33	2.7900	2.7200
35	2.7000	2.7700
37	2.7700	2.8600
39	2.8600	2.8500
41	2.9100	2.8000
43	2.8100	2.7800
45	2.7800	2.8000
47	2.8100	2.7300
49	2.8100	2.9000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8514
COEF OF VARIATION = 3.39%
VARIANCE = .0093
STANDARD DEVIATION = .0966
SKEWNESS = .2270
KURTOSIS = 1.9126

95.00% C.I. FOR MEAN:
(2.8239, 2.8789)
ONE-TAIL t(49 , .025)=
2.01003450016



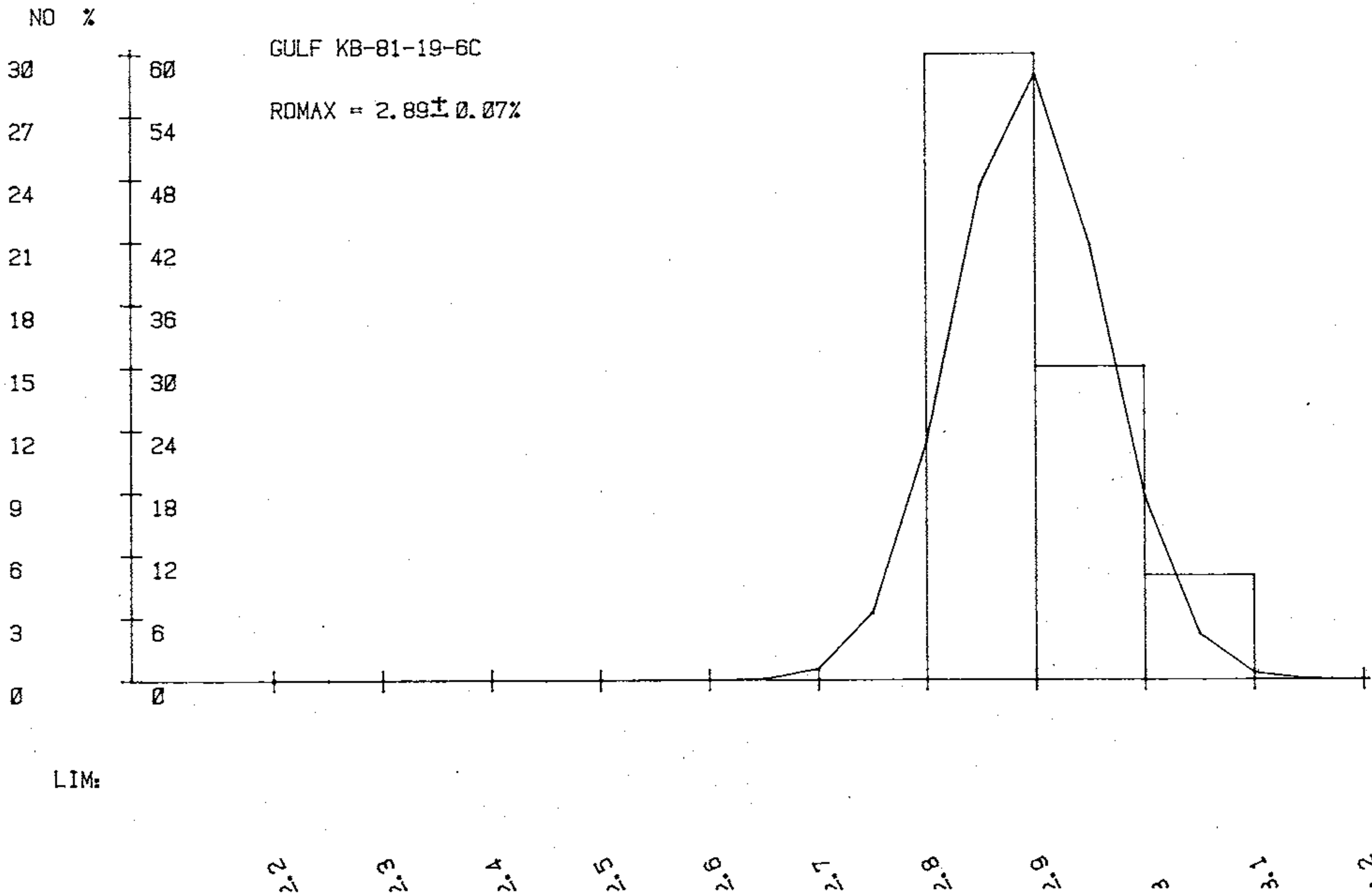
NO %
GULF KB-81-19-4C
ROMAX = 2.85± 0.10%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2

KB-81-19-6C

I	X(I)	X(I+1)
1	2.8300	2.8500
3	2.8300	2.8000
5	2.8700	2.8800
7	2.8400	2.8300
	2.8000	2.8900
1	2.8400	2.8600
13	2.9200	2.9300
15	2.8600	2.8000
17	2.9500	2.9500
19	2.9600	2.8900
21	2.8100	2.8400
23	2.8800	2.9700
25	2.8100	2.8800
27	2.9900	2.8500
29	3.0100	2.9000
31	3.0500	2.8800
33	2.8600	2.8400
35	2.8000	2.9600
37	2.9200	3.0400
39	2.9900	2.9500
41	2.9100	2.8800
43	3.0200	3.0200
45	2.8900	2.9200
47	2.8600	2.8000
49	2.9100	2.8700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8938
COEF OF VARIATION = 2.37%
VARIANCE = .0047
STANDARD DEVIATION = .0685
SKEWNESS = .5708
KURTOSIS = 2.4586

95.00% C.I. FOR MEAN
(2.8743, 2.9133)
ONE-TAIL t(49 , .025)=
2.01003450016

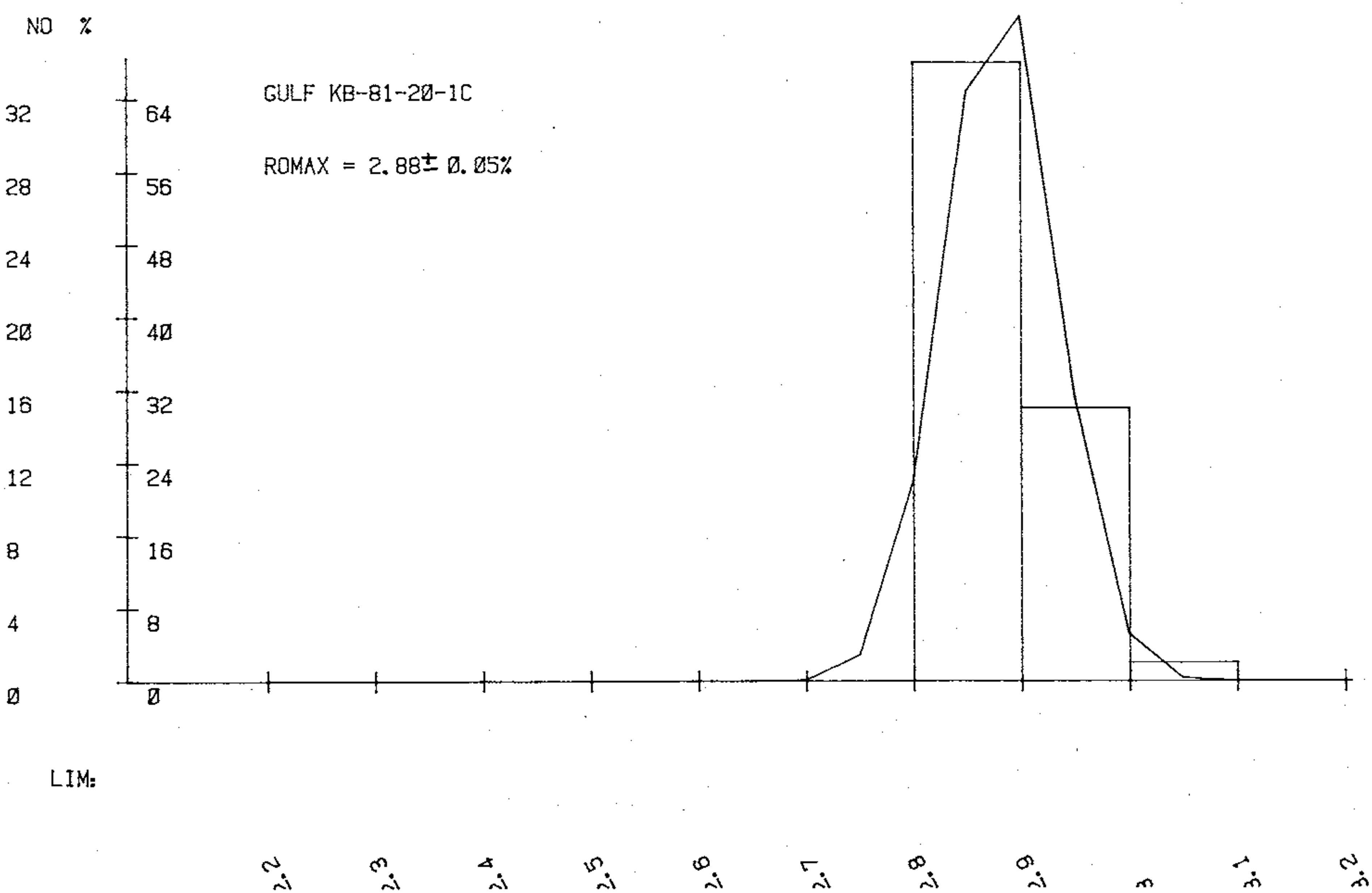

NO %
GULF KB-81-19-6C
RDMAX = 2.89±0.07%
30 60
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2

KB-20-1C

I	X(I)	X(I+1)
1	2.9000	2.8600
3	2.9100	2.8500
5	3.0700	2.8500
7	2.8600	2.9800
9	2.9000	2.8300
11	2.8900	2.9000
13	2.8800	2.8300
15	2.6900	2.8800
17	2.9600	2.8900
19	2.8800	2.9100
21	2.8000	2.8600
23	2.8500	2.8800
25	2.8800	2.8900
27	2.8000	2.9000
29	2.8900	2.8600
31	2.8900	2.9400
33	2.8700	2.9800
35	2.8100	2.9300
37	2.8200	2.8300
39	2.8100	2.8500
41	2.8700	2.8400
43	2.9000	2.9300
45	2.9300	2.8700
47	2.9400	2.8400
49	2.8500	2.8300

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.8812
COEF OF VARIATION = 1.77%
VARIANCE = .0026
STANDARD DEVIATION = .0510
SKEWNESS = 1.1043
KURTOSIS = 5.3476

95.00% C.I. FOR MEAN:
(2.8667, 2.8957)
ONE-TAIL t(49 , .025)=
2.01003450016



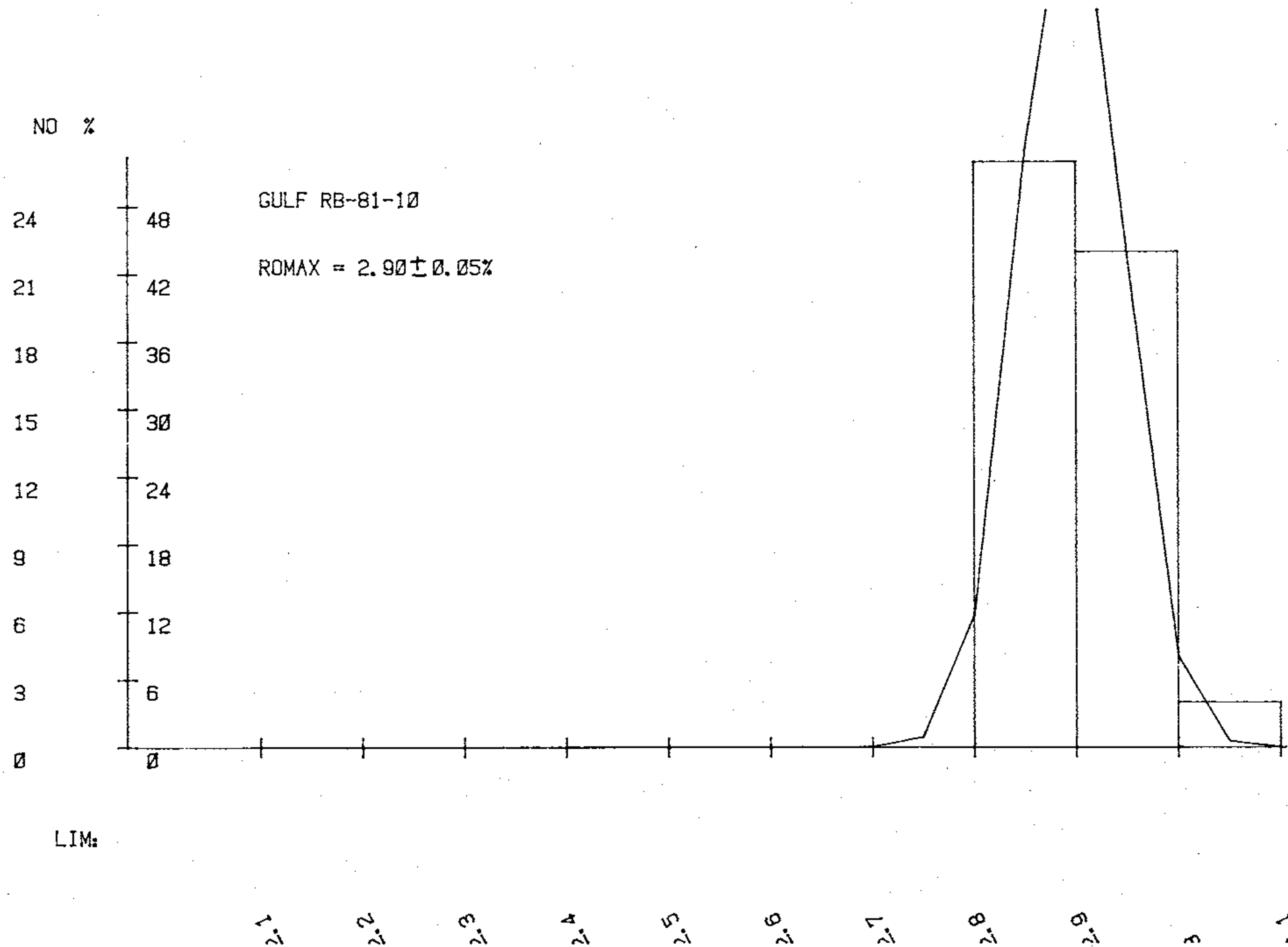
NO %
GULF KB-81-20-1C
ROMAX = 2.88± 0.05%
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2

RB-81-10

I	X(I)	X(I+1)
1	3.0200	2.8300
3	2.9000	2.9700
5	2.9400	2.8600
7	2.8600	2.9100
9	2.8500	2.8800
11	2.9300	2.9000
13	2.9000	3.0200
15	2.8700	2.9400
17	2.8700	2.9000
19	2.8400	2.8800
21	2.8600	2.8500
23	2.8600	2.9400
25	2.8600	2.9600
27	2.9200	2.8400
29	2.9200	2.9500
31	2.9100	2.9400
33	2.9500	2.9900
35	2.9200	2.8800
37	2.8500	2.9000
39	2.8800	2.8500
41	2.8300	2.8500
43	2.8500	2.8500
45	2.8400	2.9000
47	2.8500	2.8800
49	2.8700	2.9600

BASIC STATISTICS
****
N =   50
STD ERROR OF THE MEAN=   .01
MEAN =   2.8956
COEF OF VARIATION =   1.67%
VARIANCE =   .0023
STANDARD DEVIATION =   .0485
SKEWNESS =   .7733
KURTOSIS =   2.9056

95.00% C.I. FOR MEAN:
(2.8818,   2.9094)
ONE-TAIL t(49 , .025)=
2.01003450016



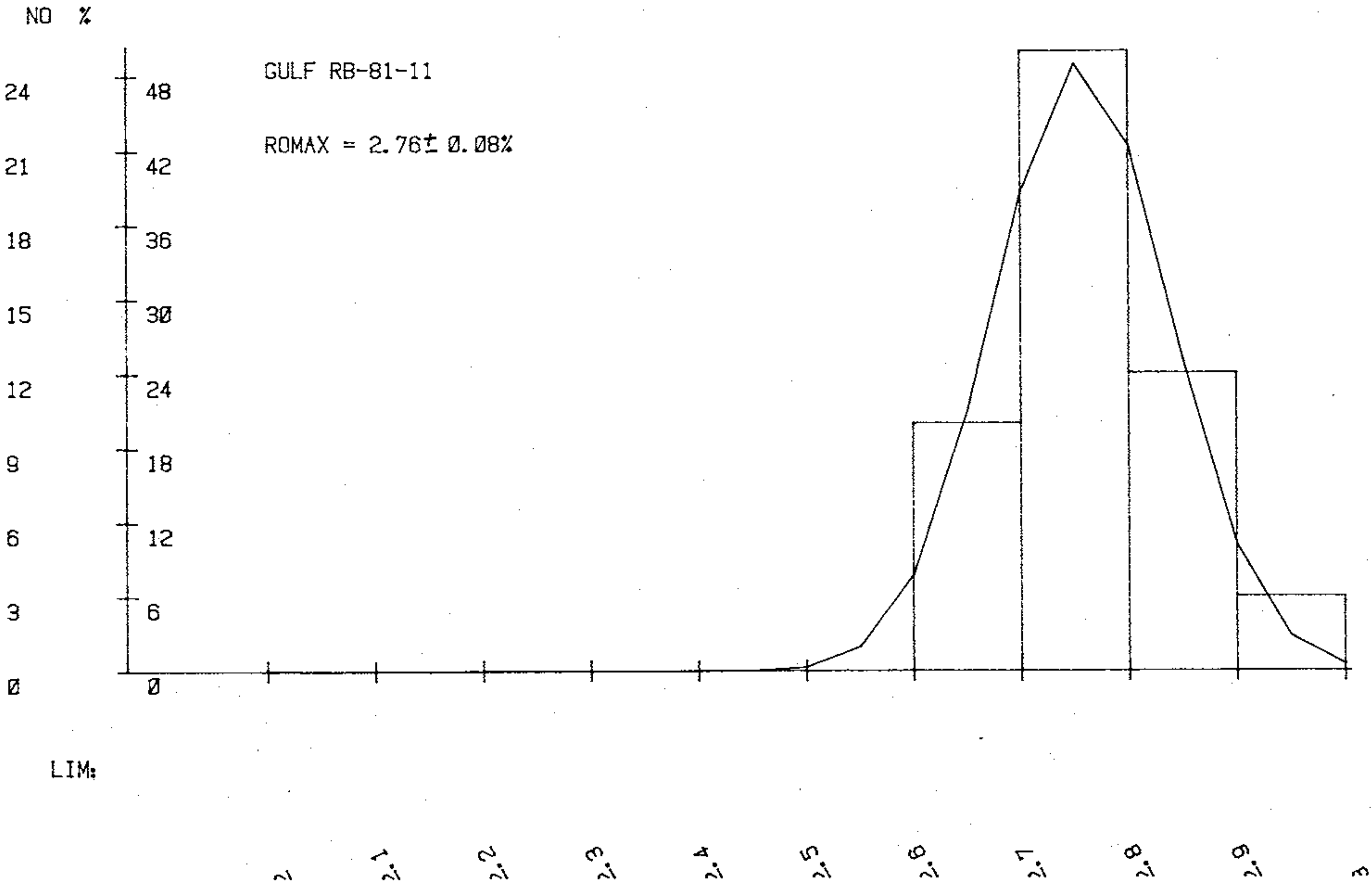
NO %
GULF RB-81-10
ROMAX = 2.90±0.05%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1

RB-81-11

I	X(I)	X(I+1)
1	2.7800	2.7500
3	2.7100	2.6600
5	2.7000	2.8000
7	2 6300	2.7700
9	2.6700	2.8000
11	2.6900	2.8100
13	2.8400	2.7100
15	2.8000	2.9300
17	2.6200	2 7700
19	2.9100	2.7200
21	2.7200	2.8900
23	2.7500	2.8700
25	2.6400	2 7100
27	2.7600	2.7100
29	2.8500	2.7500
31	2.7400	2.770(
33	2 7200	2.8500
35	2.7400	2.8300
37	2.7600	2.9200
39	2.7300	2.8800
41	2.7500	2.8800
43	2.7400	2.6200
45	2.7000	2.7000
47	2.6600	2.7700
49	2.6300	2.6900

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.7560
COEF OF VARIATION = 2.95%
VARIANCE = .0066
STANDARD DEVIATION = .0812
SKEWNESS = .3647
KURTOSIS = 2.4479

95.00% C.I. FOR MEAN:
(2.7329, 2.7791)
ONE-TAIL t(49 , .025)=
2.01003450016



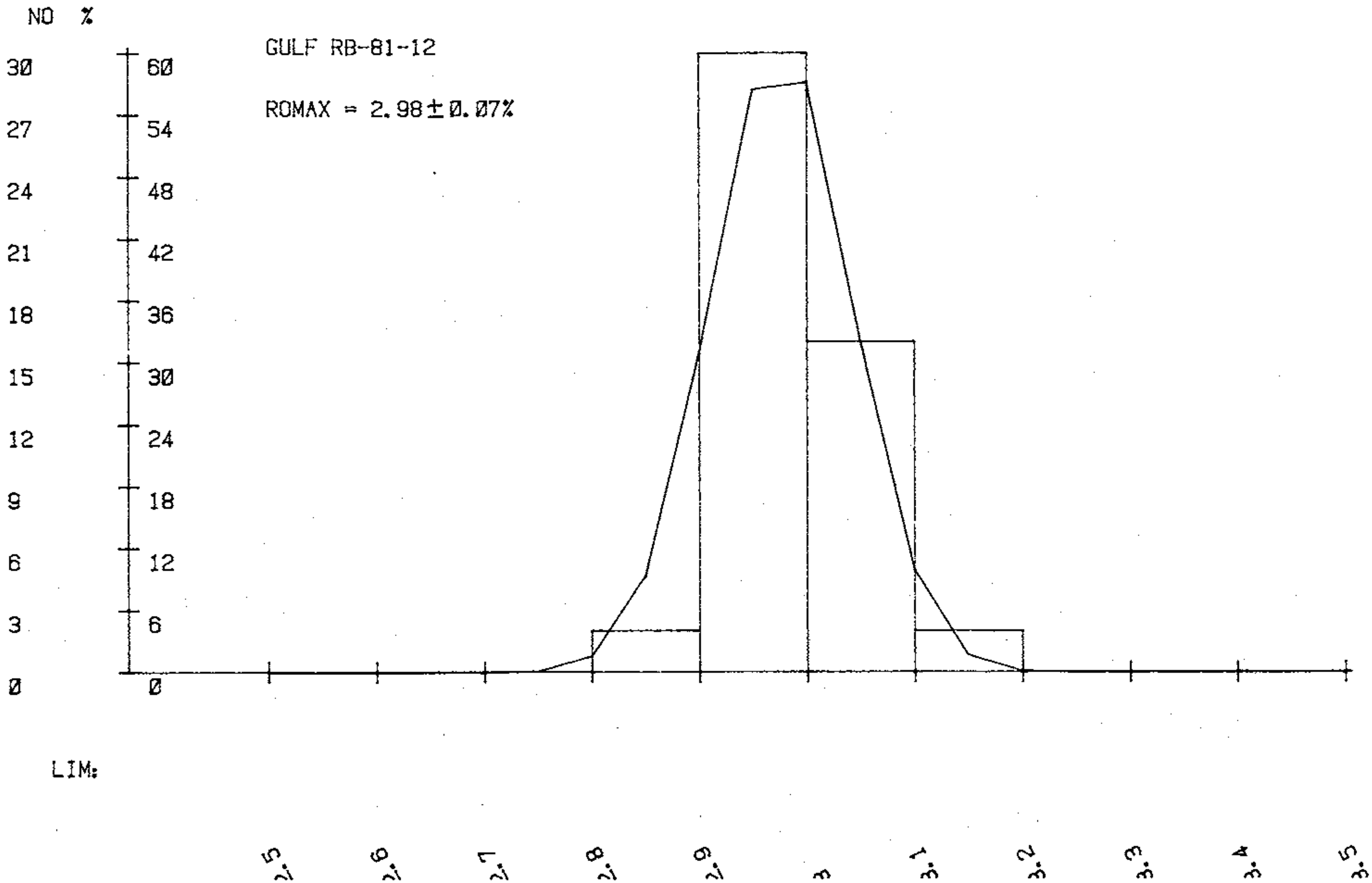
NO %
GULF RB-81-11
ROMAX = 2.76± Ø.Ø8%
24 48
21 42
18 36
15 3Ø
12 24
9 18
6 12
3 6
Ø Ø
LIM:
2
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3

RB-81-12

I	X(I)	X(I+1)
1	2.9000	2.8900
3	2.8800	2.9500
5	2.9200	3.0100
7	2.9300	3.0100
9	2.9100	3.0500
11	2.9800	2.9700
13	2.9000	2.9200
15	3.0200	2.9600
17	2.9600	3.0700
19	2.9900	3.1200
21	2.9000	2.9300
23	2.9100	2.9400
25	3.0200	2.9200
27	2.9800	2.9400
29	2.9200	3.0500
31	2.9400	3.0100
33	2.9500	3.0600
35	2.9300	2.9400
37	3.0500	2.9100
39	3.0900	2.9100
41	3.0800	3.0100
43	2.9200	3.1500
45	2.9600	3.0200
47	3.0300	3.0500
49	2.9900	2.9500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.9760
COEF OF VARIATION = 2.19%
VARIANCE = .0042
STANDARD DEVIATION = .0651
SKEWNESS = .6771
KURTOSIS = 2.6539

95.00% C.I. FOR MEAN:
(2.9575, 2.9945)
ONE-TAIL t(49 , .025)=
2.01003450016



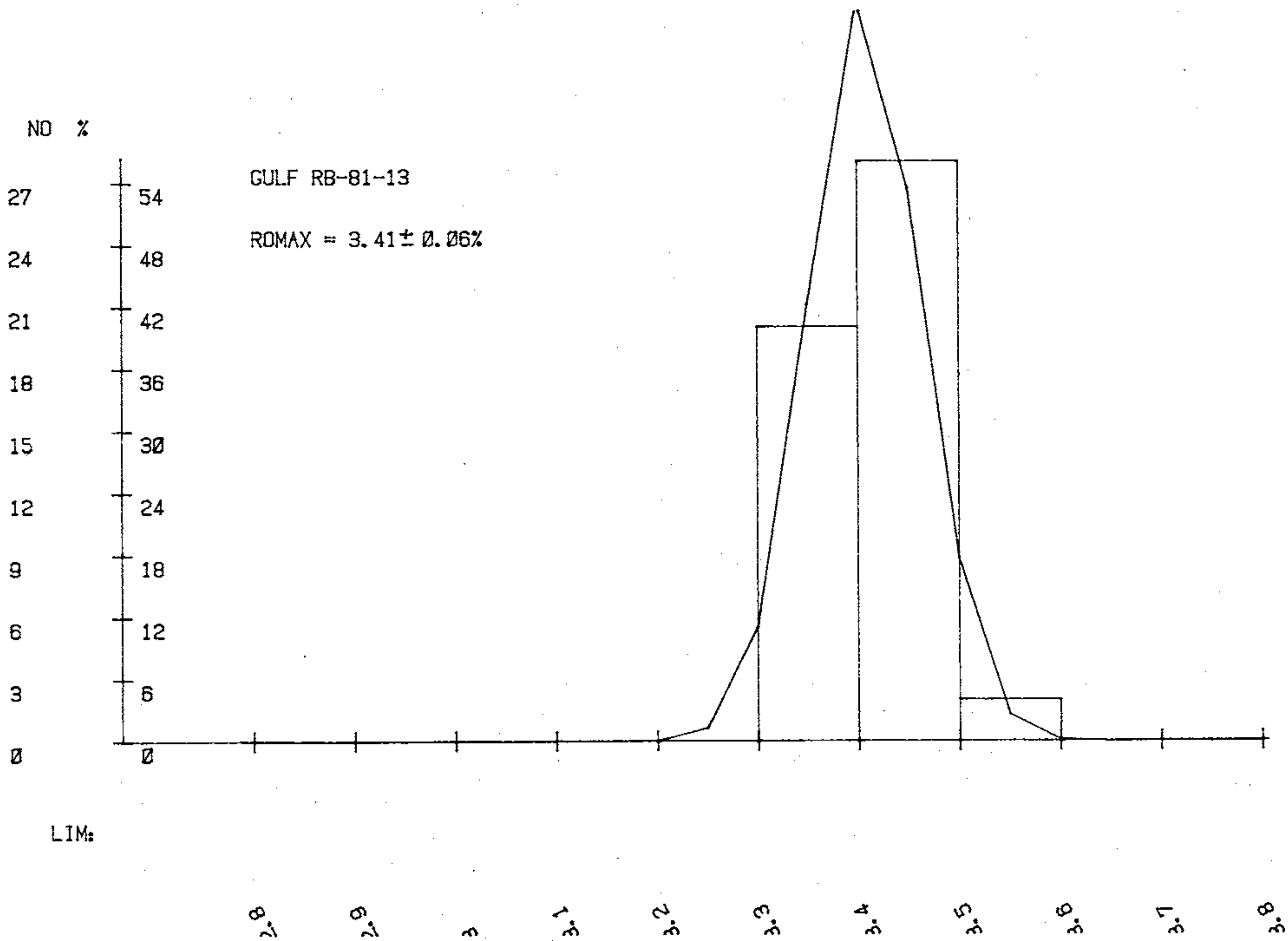
NO %
GULF RB-81-12
ROMAX = 2.98 ± 0.07%
30 60
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

RB-81-13

I	X(I)	X(I+1)
1	3.4900	3.3200
3	3.3400	3.3200
5	3.3000	3.3000
7	3.3400	3.3900
9	3.4700	3.3200
11	3.4800	3.4200
13	3.3500	3.4200
15	3.4100	3.4600
17	3.4300	3.3700
19	3.4400	3.4100
21	3.3500	3.3300
23	3.4500	3.4400
25	3.4000	3.3800
27	3.4500	3.4300
29	3.3800	3.4800
31	3.3500	3.4400
33	3.3800	3.4700
35	3.3800	3.4400
37	3.4000	3.4100
39	3.3900	3.3600
41	3.3900	3.4800
43	3.5100	3.4000
45	3.4600	3.4100
47	3.5100	3.4800
49	3.4200	3.4100

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.4072
COEF OF VARIATION = 1.63%
VARIANCE = .0031
STANDARD DEVIATION = .0554
SKEWNESS = -.1132
KURTOSIS = 2.2030

95.00% C.I. FOR MEAN:
(3.3915, 3.4229)
ONE-TAIL t(49 , .025)=
2.01003450016



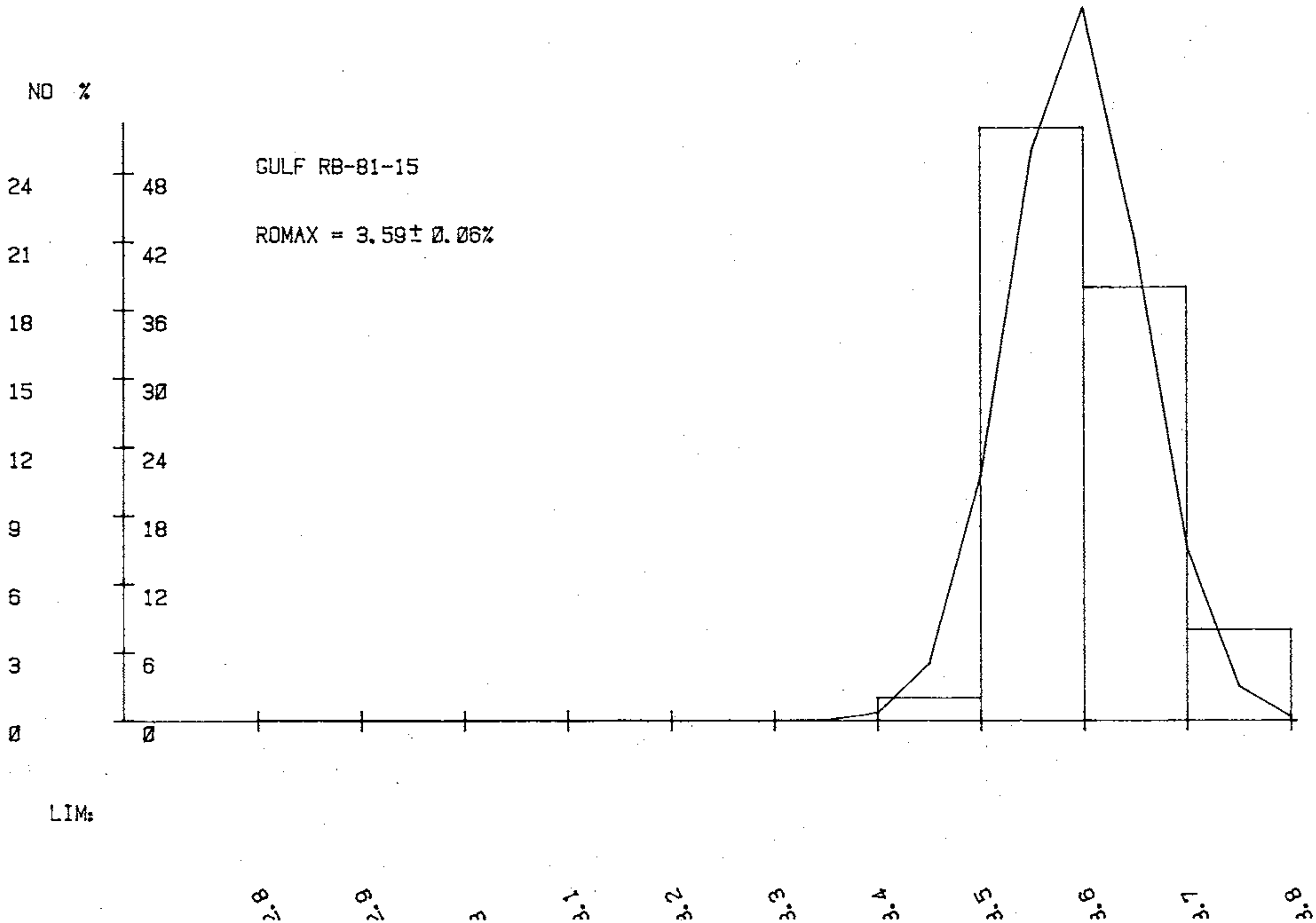
NO %
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
GULF RB-81-13
ROMAX = 3.41 ± 0.06%
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

RB-81-15

I	X(I)	X(I+1)
1	3.4900	3.6600
3	3.6800	3.5900
5	3.5200	3.5300
7	3.5200	3.5600
9	3.5100	3.5500
11	3.5800	3.5800
13	3.6000	3.6200
15	3.5400	3.5400
17	3.6300	3.5100
19	3.7200	3.7000
21	3.7500	3.5900
23	3.6200	3.6200
25	3.5500	3.7300
27	3.5800	3.5500
29	3.5400	3.5200
31	3.6100	3.5400
33	3.6200	3.6700
35	3.6300	3.5400
37	3.5400	3.5700
39	3.5100	3.5200
41	3.6000	3.6300
43	3.6800	3.6200
45	3.5600	3.6300
47	3.6300	3.5700
49	3.6300	3.6700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.5930
COEF OF VARIATION = 1.77%
VARIANCE = .0040
STANDARD DEVIATION = .0635
SKEWNESS = .5484
KURTOSIS = 2.5842

95.00% C.I. FOR MEAN:
(3.5750, 3.6110)
ONE-TAIL t(49 , .025)=
2.01003450016



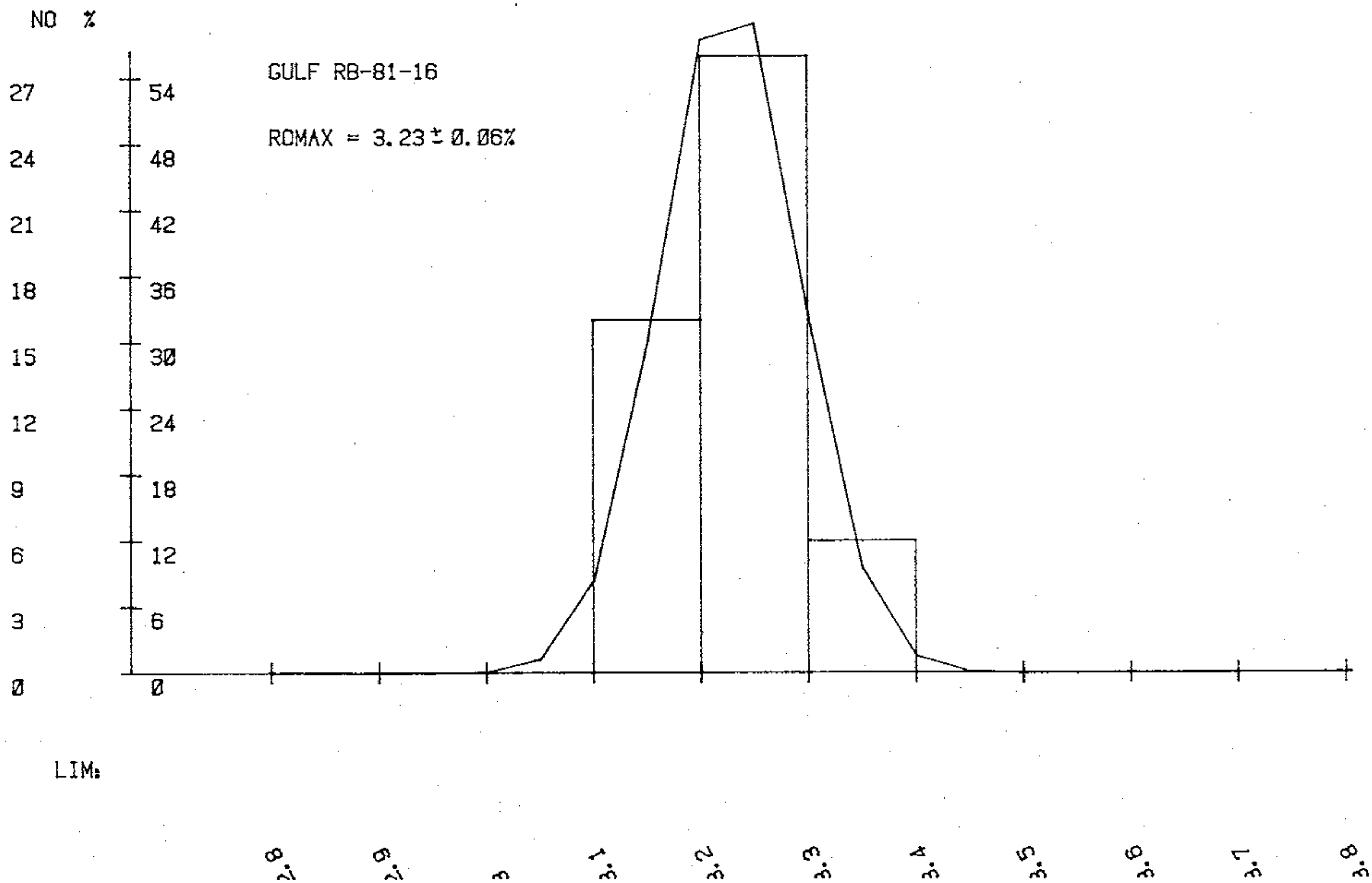
NO %
GULF RB-81-15
ROMAX = 3.59± 0.06%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

RB-81-16

I	X(I)	X(I+1)
1	3.1800	3.1500
3	3.2900	3.1200
5	3.1100	3.1600
7	3.1400	3.2000
9	3.1300	3.1300
11	3.1700	3.2500
13	3.2700	3.2100
15	3.1800	3.1600
17	3.1800	3.1600
19	3.1900	3.1500
21	3.2900	3.2500
23	3.2300	3.3200
25	3.2000	3.2900
27	3.2000	3.2700
29	3.2700	3.2300
31	3.2600	3.2400
33	3.2300	3.2200
35	3.1900	3.2600
37	3.3500	3.2600
39	3.3600	3.2400
41	3.2500	3.3800
43	3.3000	3.2200
45	3.2400	3.2300
47	3.2500	3.3300
49	3.2200	3.2400

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2270
COEF OF VARIATION = 1.96%
VARIANCE = .0040
STANDARD DEVIATION = .0633
SKEWNESS = .2799
KURTOSIS = 2.6974

95.00% C.I. FOR MEAN:
(3.2090, 3.2450)
ONE-TAIL t(49 , .025)=
2.01003450016

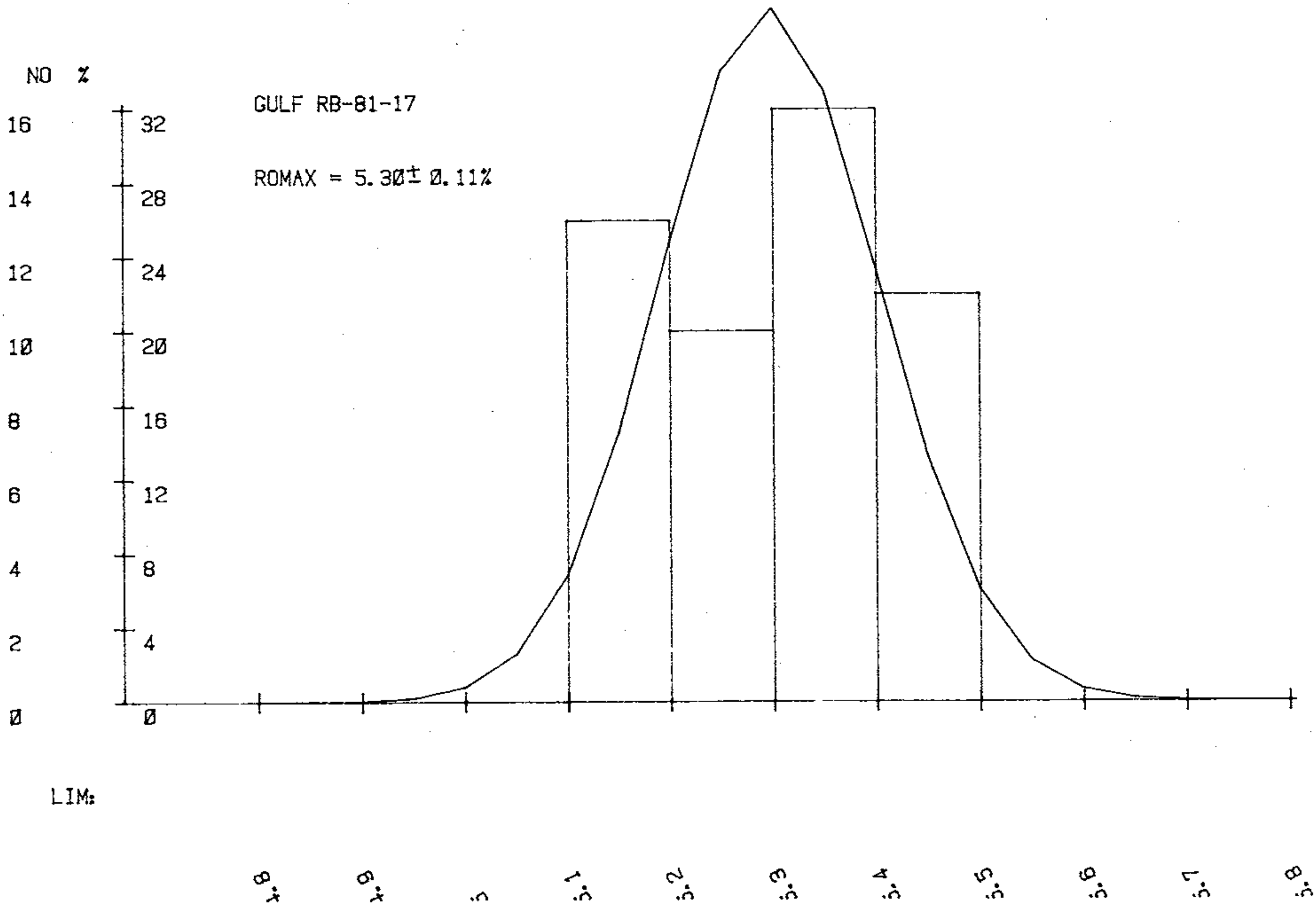

NO %
GULF RB-81-16
ROMAX = 3.23 ± 0.06%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

RB-81-17

I	X(I)	X(I+1)
1	5.1400	5.4200
3	5.4500	5.4000
5	5.3000	5.3800
7	5.4200	5.3400
9	5.3500	5.3600
11	5.2100	5.3700
13	5.2300	5.3700
15	5.2600	5.4000
17	5.3700	5.4400
19	5.3400	5.4200
21	5.4200	5.3600
23	5.3600	5.3700
25	5.3500	5.4900
27	5.3300	5.4300
29	5.4100	5.2800
31	5.2700	5.2200
33	5.2500	5.2900
35	5.2200	5.2900
37	5.3500	5.1100
39	5.1400	5.1500
41	5.1700	5.1400
43	5.1200	5.1800
45	5.1900	5.1600
47	5.1200	5.1700
49	5.1900	5.3300

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 5.2966
COEF OF VARIATION = 2.01%
VARIANCE = .0114
STANDARD DEVIATION = .1066
SKEWNESS = -.2354
KURTOSIS = 1.7948

95.00% C.I. FOR MEAN:
(5.2663, 5.3269)
ONE-TAIL t(49 , .025)=
2.01003450016

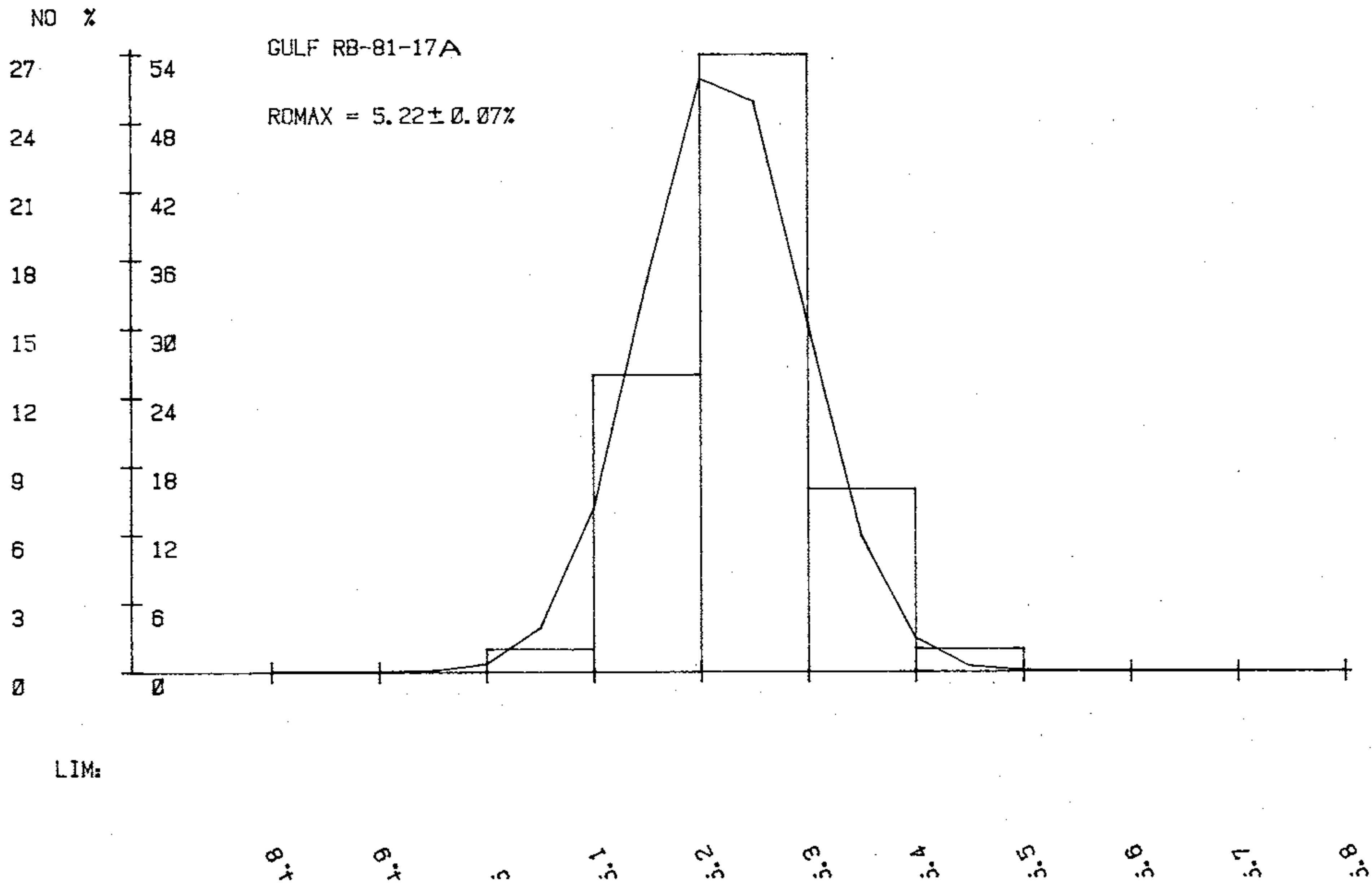

NO %
GULF RB-81-17
ROMAX = 5.30± 0.11%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:

RB-81-17A

I	X(I)	X(I+1)
1	5.2400	5.2100
3	5.2300	5.2200
5	5.1600	5.1000
7	5.1500	5.1300
9	5.1200	5.3300
11	5.3000	5.2000
13	5.3100	5.1400
15	5.1300	5.1500
17	5.1700	5.2500
19	5.0500	5.2200
21	5.2500	5.3100
23	5.2400	5.2600
25	5.2000	5.1500
27	5.2700	5.2300
29	5.1300	5.2100
31	5.1200	5.2000
33	5.2400	5.1000
35	5.3000	5.2600
37	5.2500	5.2500
39	5.2300	5.2300
41	5.2600	5.3500
43	5.3500	5.2600
45	5.4200	5.2600
47	5.3000	5.2000
49	5.2000	5.2000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 5.2208
COEF OF VARIATION = 1.42%
VARIANCE = .0055
STANDARD DEVIATION = .0741
SKEWNESS = .1100
KURTOSIS = 3.0231

95.00% C.I. FOR MEAN:
(5.1997, 5.2419)
ONE-TAIL t(49 , .025)=
2.01003450016

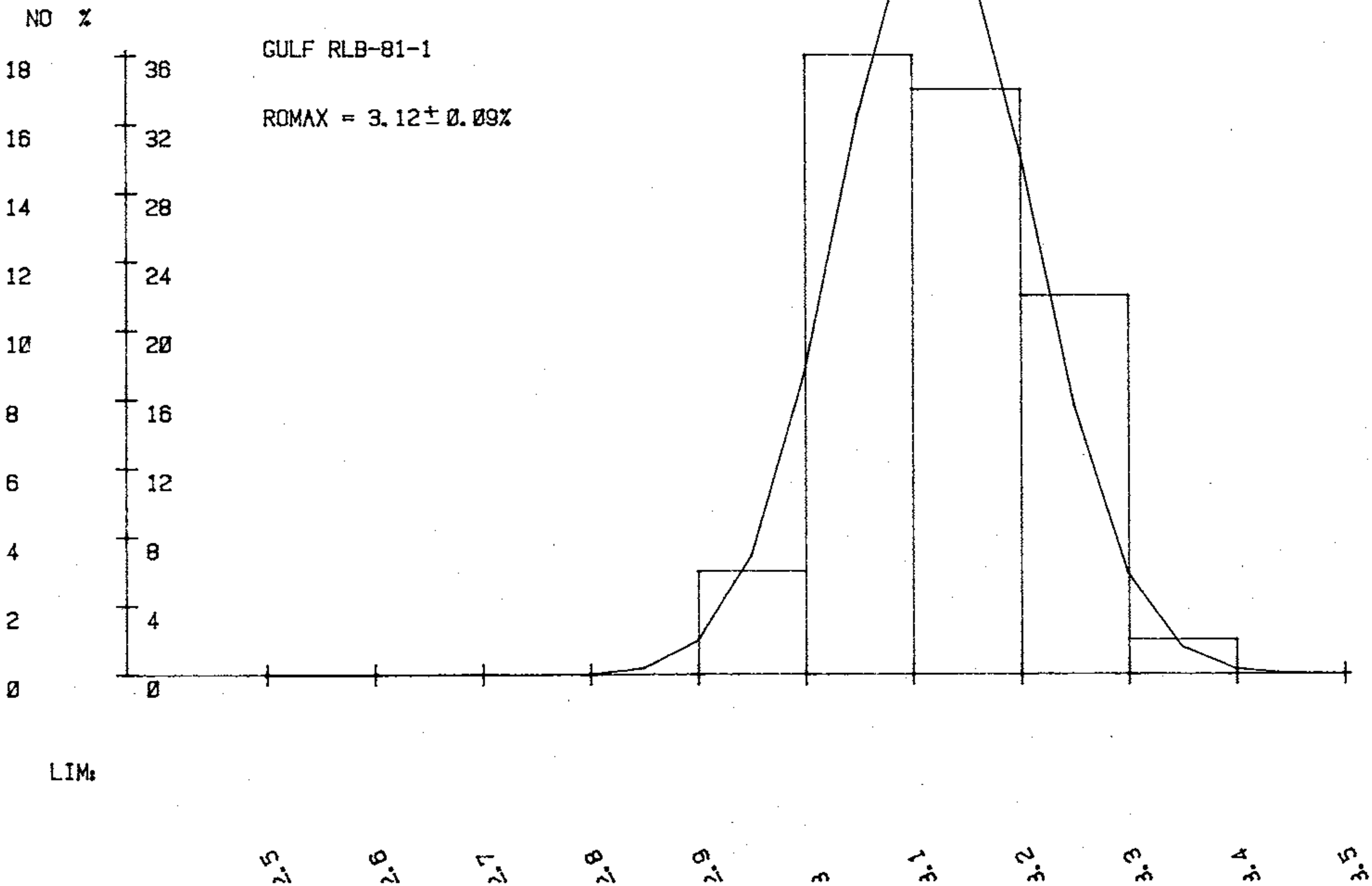

NO %
GULF RB-81-17A
ROMAX = 5.22 ± 0.07%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:

RLB-81-1

I	X(I)	X(1+1)
1	3.0000	2.9500
3	3.0400	2.9900
5	2.9600	3.0300
7	3.2300	3.1600
9	3.0700	3.0500
11	3.1500	3.1500
13	3.0300	3.0100
15	3.2600	3.0800
17	3.0300	3.2800
19	3.1900	3.1100
21	3.1900	3.1000
23	3 1500	3.2600
25	3.1200	3.2500
27	3.0800	3.0500
29	3.1400	3.2300
31	3.1400	3.1300
33	3.1400	3.0500
35	3.1300	3.0700
37	3.1000	3.0500
39	3.0600	3.3300
41	3.2000	3.2200
43	3.0600	3.2000
45	3.2200	3.0700
47	3.1200	3.2300
49	3.1600	3.0500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.1214
COEF OF VARIATION = 2.84%
VARIANCE = .0078
STANDARD DEVIATION = .0885
SKEWNESS = .2301
KURTOSIS = 2.3493

95.00% C.I. FOR MEAN
(3.0962, 3.1466)
ONE-TAIL t(49 , .025)=
2.01003450016

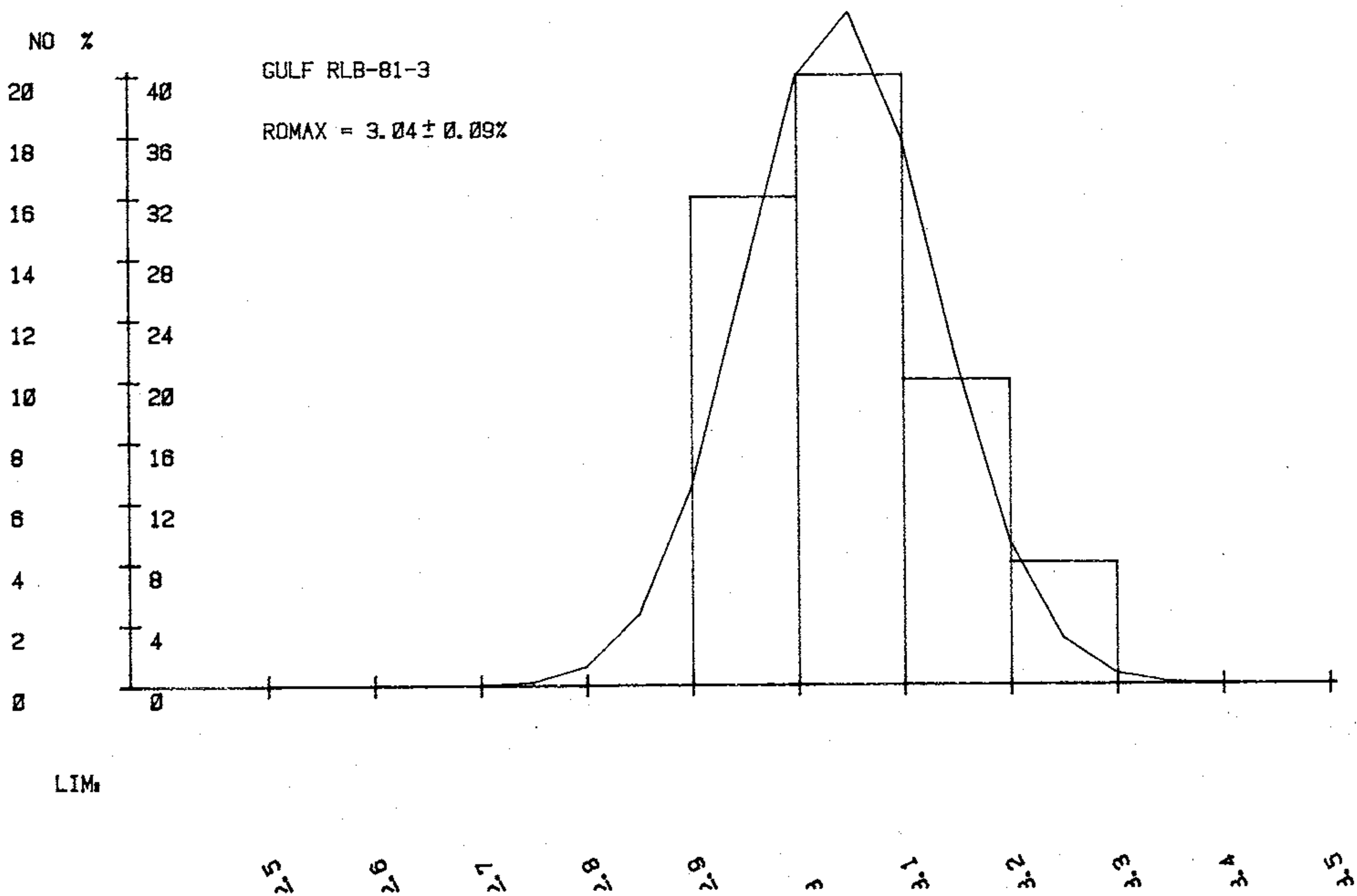

NO %
GULF RLB-81-1
ROMAX = 3.12 ± 0.09%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

RLB-81 - 3

I	X(I)	X(I+1)
1	3.0400	2.9100
3	2.9100	3.0800
5	3.0400	3.1500
7	3.2200	2.9800
9	3.2500	3.0600
11	3.0700	3.1700
13	3.1300	3.1300
15	2.9800	3.0300
17	2.9900	3.0000
19	2.9800	3.0900
21	3.1000	3.0000
23	3.0300	3.1300
25	3.2100	2.9000
27	2.9100	3.0400
29	3.1100	2.9500
31	3.0000	3.0600
33	2.9500	3.0200
35	2.9100	3.0300
37	3.0300	2.9300
39	3.0900	2.9800
41	2.9200	3.0300
43	2.9800	3.0000
45	3.0200	2.9200
47	3.2100	3.1400
49	3.1300	3.1100

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.0412
COEF OF VARIATION = 2.96%
VARIANCE = .0081
STANDARD DEVIATION = .0901
SKEWNESS = .3760
KURTOSIS = 2.4391

95.00% C.I. FOR MEAN:
(3.0156, 3.0668)
ONE-TAIL t(49 , .025)=
2.01003450016



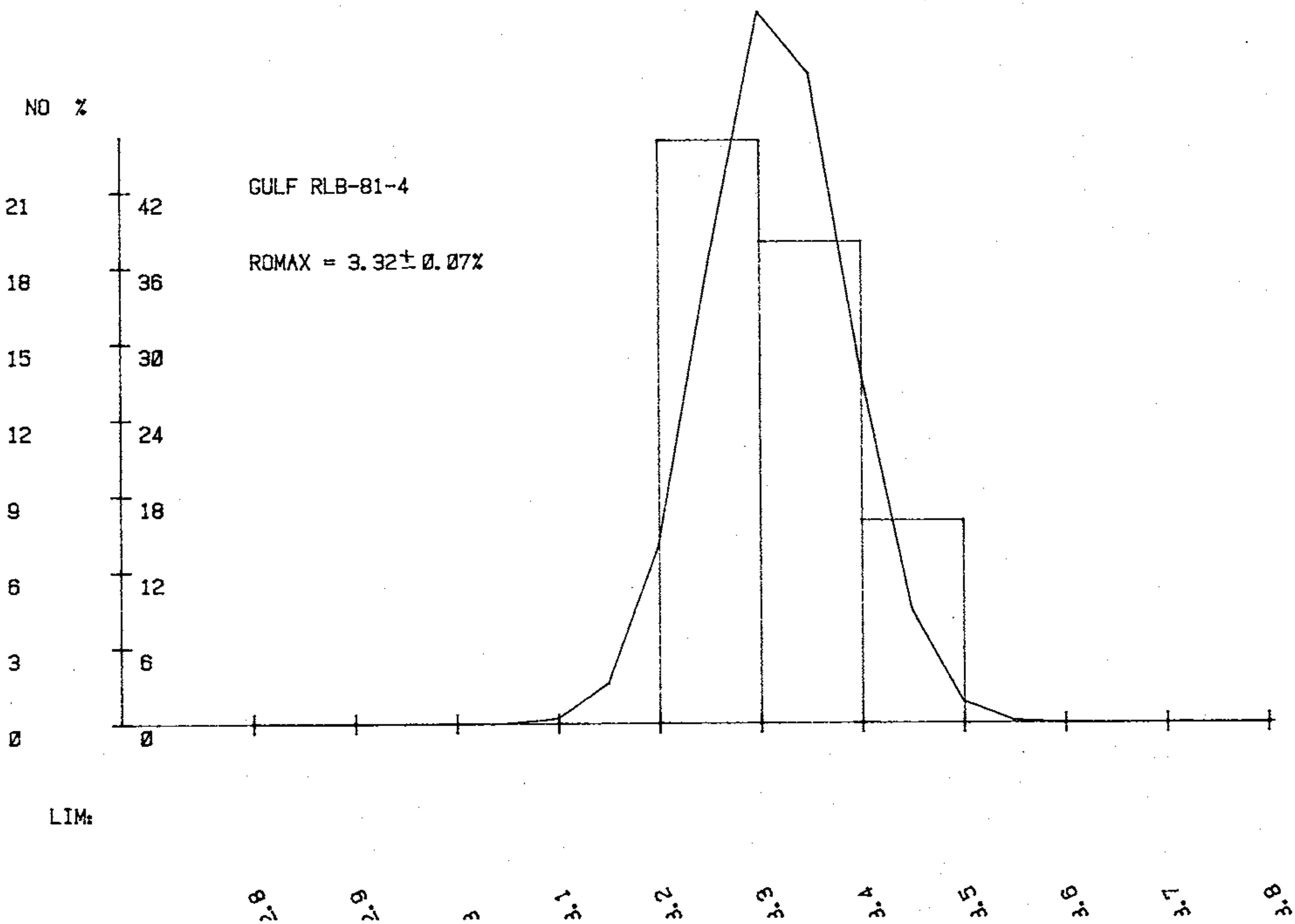
NO %
GULF RLB-81-3
ROMAX = 3.04 ± 0.09%
20 18 16 14 12 10 8 6 4 2 0
40 36 32 28 24 20 16 12 8 4 0
LIM:
2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5

RLB-81-4

I	X(I)	X(I+1)
1	3.3000	3.2600
3	3.3200	3.2700
5	3.4000	3.2600
7	3.2700	3.4200
9	3.3000	3.2300
11	3.2200	3.2600
13	3.2900	3.3100
15	3.2600	3.3900
17	3.2400	3.2100
19	3.2500	3.3000
21	3.2800	3.3800
23	3.3600	3.2600
25	3.3900	3.4300
27	3.3100	3.3400
29	3.2700	3.2300
31	3.3100	3.2900
33	3.4300	3.3100
35	3.3200	3.4600
37	3.2900	3.2500
39	3.3900	3.3000
41	3.2700	3.3500
43	3.4600	3.2500
45	3.3700	3.3900
47	3.4300	3.2600
49	3.4300	3.2500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.3164
COEF OF VARIATION = 2.08%
VARIANCE = .0048
STANDARD DEVIATION = .0691
SKEWNESS = .5627
KURTOSIS = 2.1417

95.00% C.I. FOR MEAN:
(3.2967, 3.3361)
ONE-TAIL t(49 , .025)=
2.01003450016

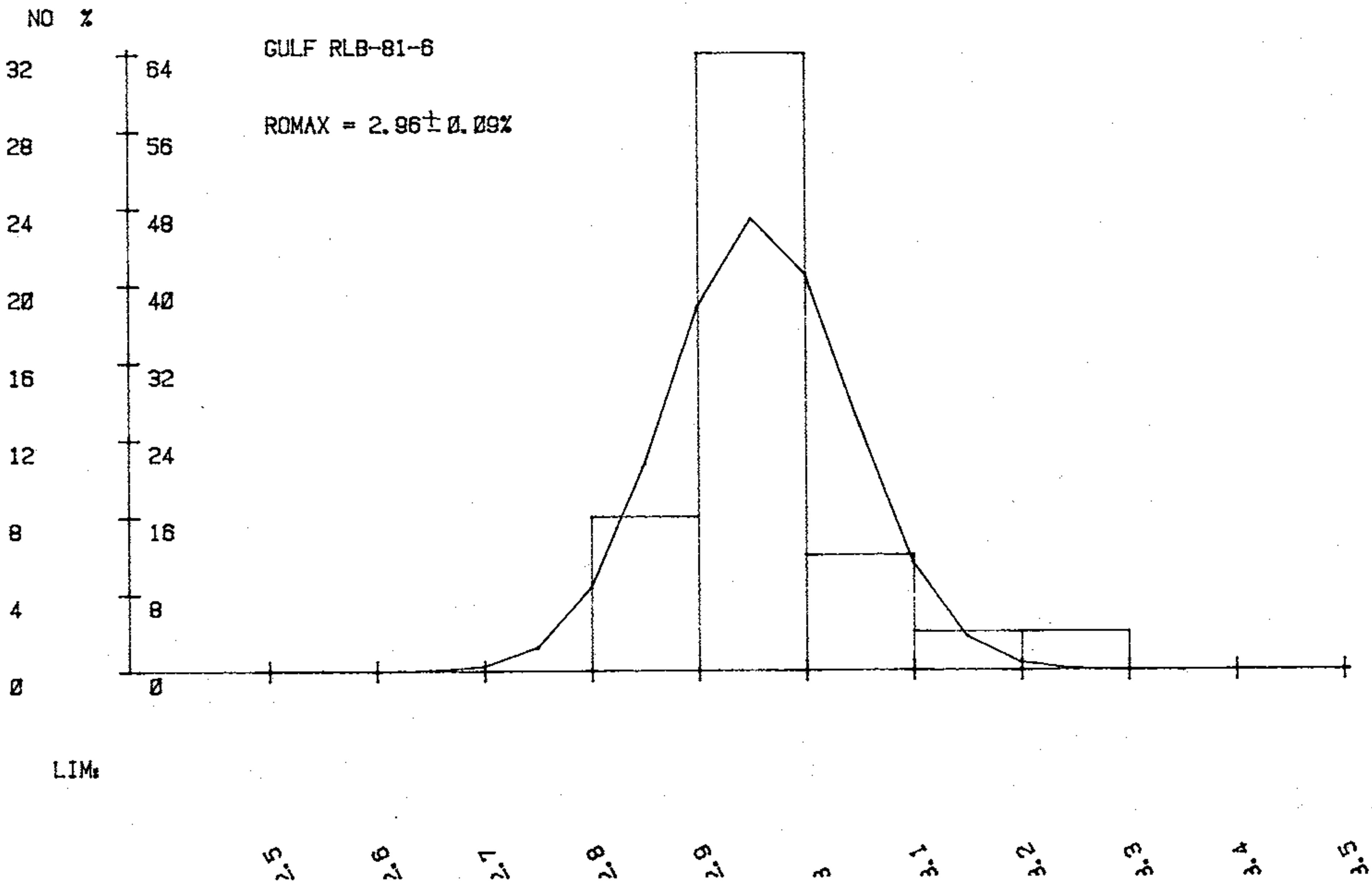

NO %
GULF RLB-81-4
ROMAX = 3.32±0.07%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

RLB-81-6.

I	X(I)	X(I+1)
1	3.1100	3.0600
3	2.9700	2.9300
5	2.9600	3.0700
7	3.0600	2.9000
9	2.9600	2.9500
11	2.9700	2.9400
13	2.9600	3.2000
15	2.8900	2.9800
17	2.9600	2.9100
19	2.9300	2.9800
21	3.0400	2.9100
23	3.1500	3.2200
25	3.0300	2.9600
27	2.9200	2.9200
29	2.9600	2.8800
31	2.9100	2.9600
33	2.9000	2.8700
35	2.9400	2.9000
37	2.9300	2.9100
39	2.8500	2.9100
41	2.9000	2.8300
43	2.9600	2.9200
45	3.0100	2.9000
47	2.8200	2.9700
49	2.8600	2.8800

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 2.9562
COEF OF VARIATION = 2.87%
VARIANCE = .0072
STANDARD DEVIATION = .0849
SKEWNESS = 1.3004
KURTOSIS = 4.7510

95.00% C.I. FOR MEAN:
(2.9321, 2.9803)
ONE-TAIL t(49 , .025)=
2.01003450016



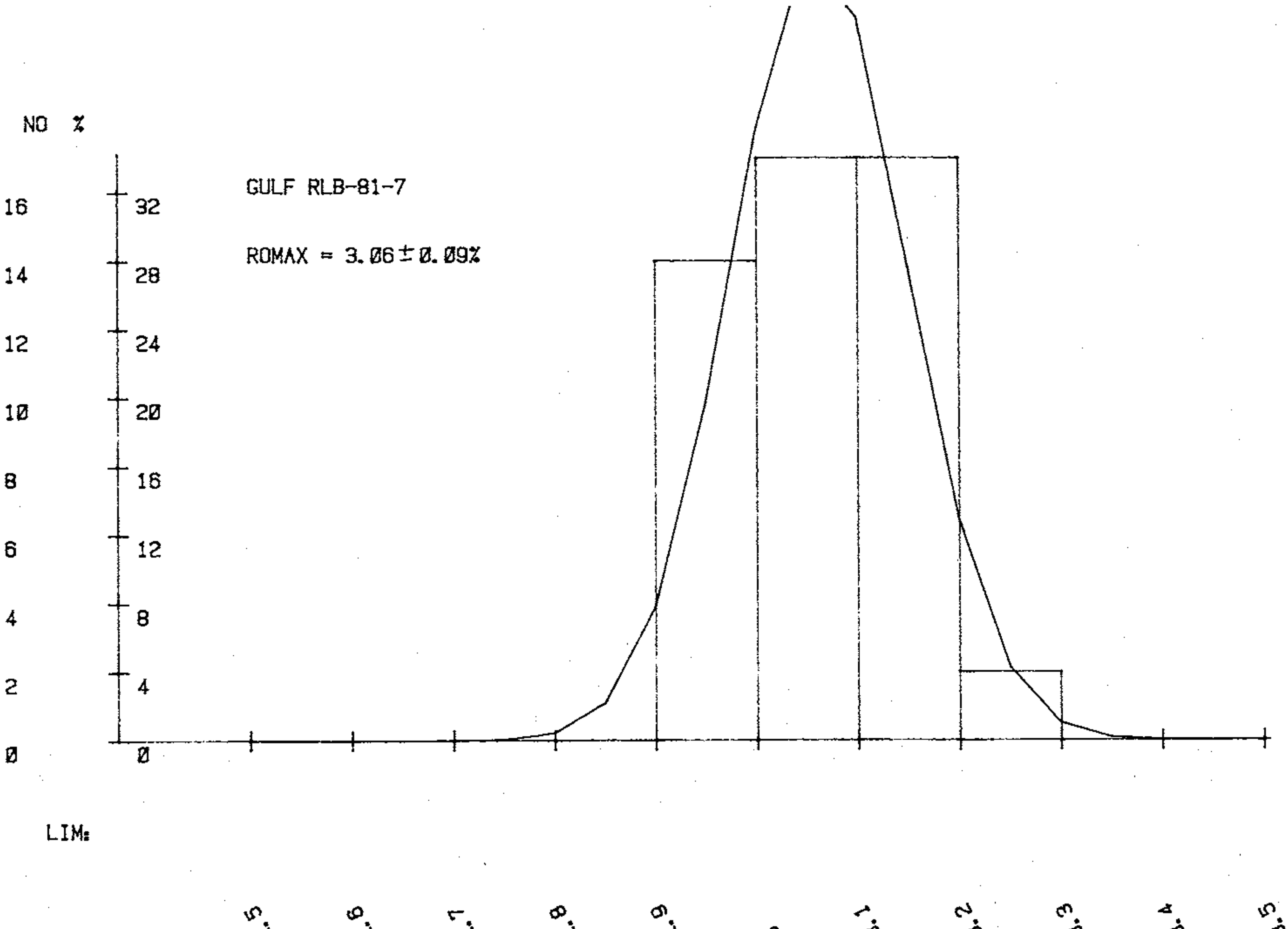
NO %
GULF RLB-81-6
ROMAX = 2.96±0.09%
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

RLB-81-7

I	X(I)	X(I+1)
1	3.1200	3.1100
3	3.1400	3.1100
5	3 1400	3.0800
7	3.0400	3.0400
9	3.0300	2.9700
11	3.0400	2.9200
13	3.0700	3.0300
15	3.1200	2.9600
17	3.0900	3.0700
19	2.9100	2.9900
21	2.9600	2.9700
23	3.0500	2.9800
25	2.9200	2.9900
27	2.9200	3.0200
29	2 9500	2.9300
31	3.0400	3.0800
33	3.1500	3.2500
35	3.1600	3.1400
37	3.1400	2.9700
39	3.1900	3.0600
41	3.0700	3.1500
43	3.1400	3.1800
45	3.1100	3.0300
47	3.1800	3.1200
49	3.0700	3.2200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.0624
COEF OF VARIATION = 2.81%
VARIANCE = .0074
STANDARD DEVIATION = .0860
SKEWNESS = -.0199
KURTOSIS = 2.1798

95.00% C.I. FOR MEAN
(3.0379, 3.0869)
ONE-TAIL t(49 , .025)=
2.01003450016



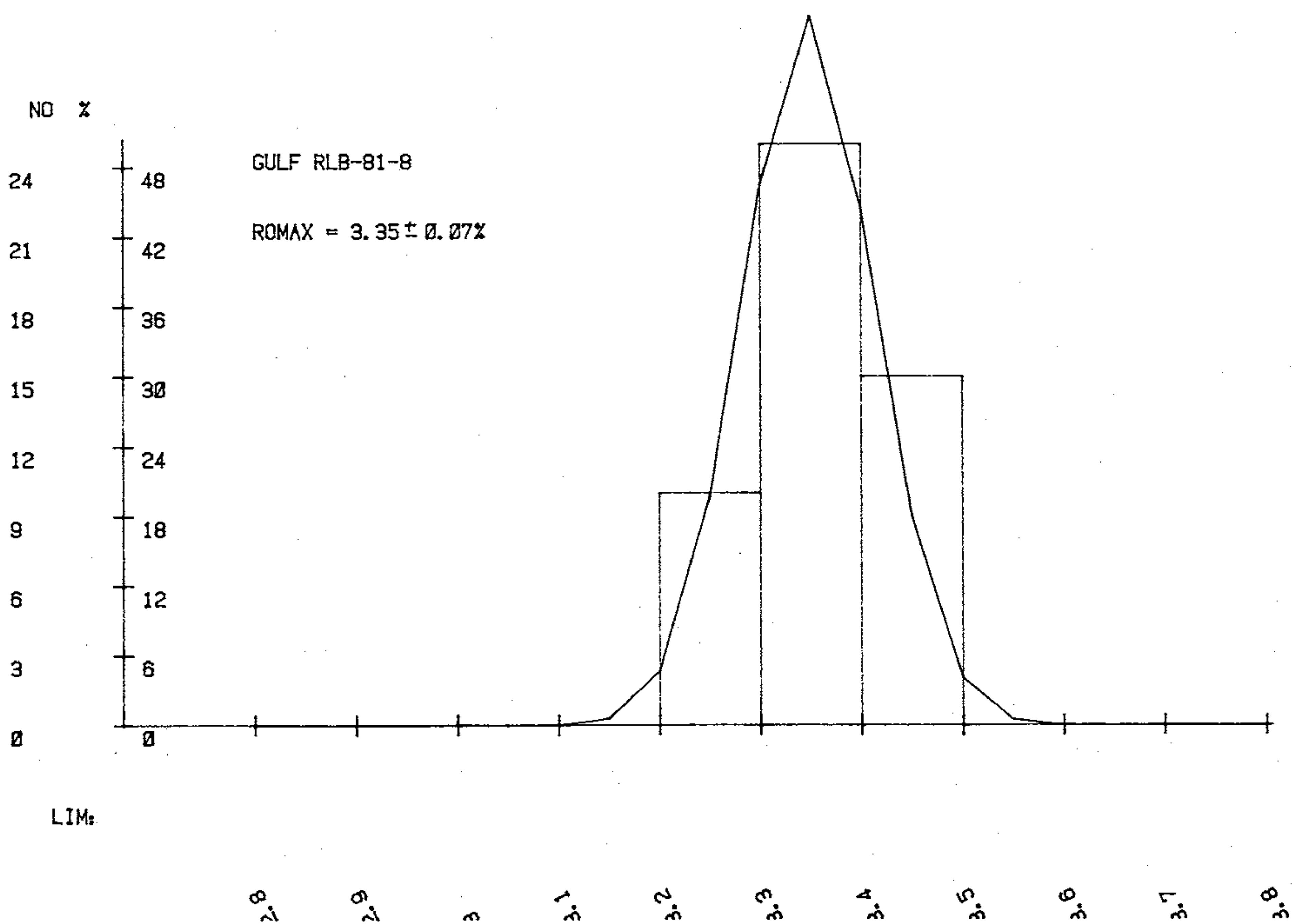
NO %
GULF RLB-81-7
ROMAX = 3.06±0.09%
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5

RLB-81-8

I	X(I)	X(I+1)
1	3.4000	3.3000
3	3.2700	3.2900
5	3.3600	3.2400
7	3.4600	3.4000
9	3.3200	3.4100
[illegible]	3.3600	3.3800
[illegible]	3.3900	3.2500
[illegible]	3.2600	3.3000
17	3.4000	3.2400
19	3.3000	3.4700
21	3.3000	3.3400
23	3.2900	3.3200
25	3.3100	3.3300
27	3.3400	3.4100
29	3.4900	3.3200
31	3.3100	3.2800
33	3.4600	3.3500
35	3.2800	3.4200
37	3.4000	3.3400
39	3.4300	3.2500
41	3.4000	3.4500
43	3.3600	3.4500
45	3.3400	3.3000
47	3.3100	3.3600
49	3.3200	3.3500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= 01
MEAN = 3.3432
COEF OF VARIATION = 1.95%
VARIANCE = .0043
STANDARD DEVIATION = .0654
SKEWNESS = .3185
KURTOSIS = 2.2279

95.00% C.I. FOR MEAN:
(3.3296, 3.3668)
ONE-TAIL t(49 , .025)=
2.01003450016



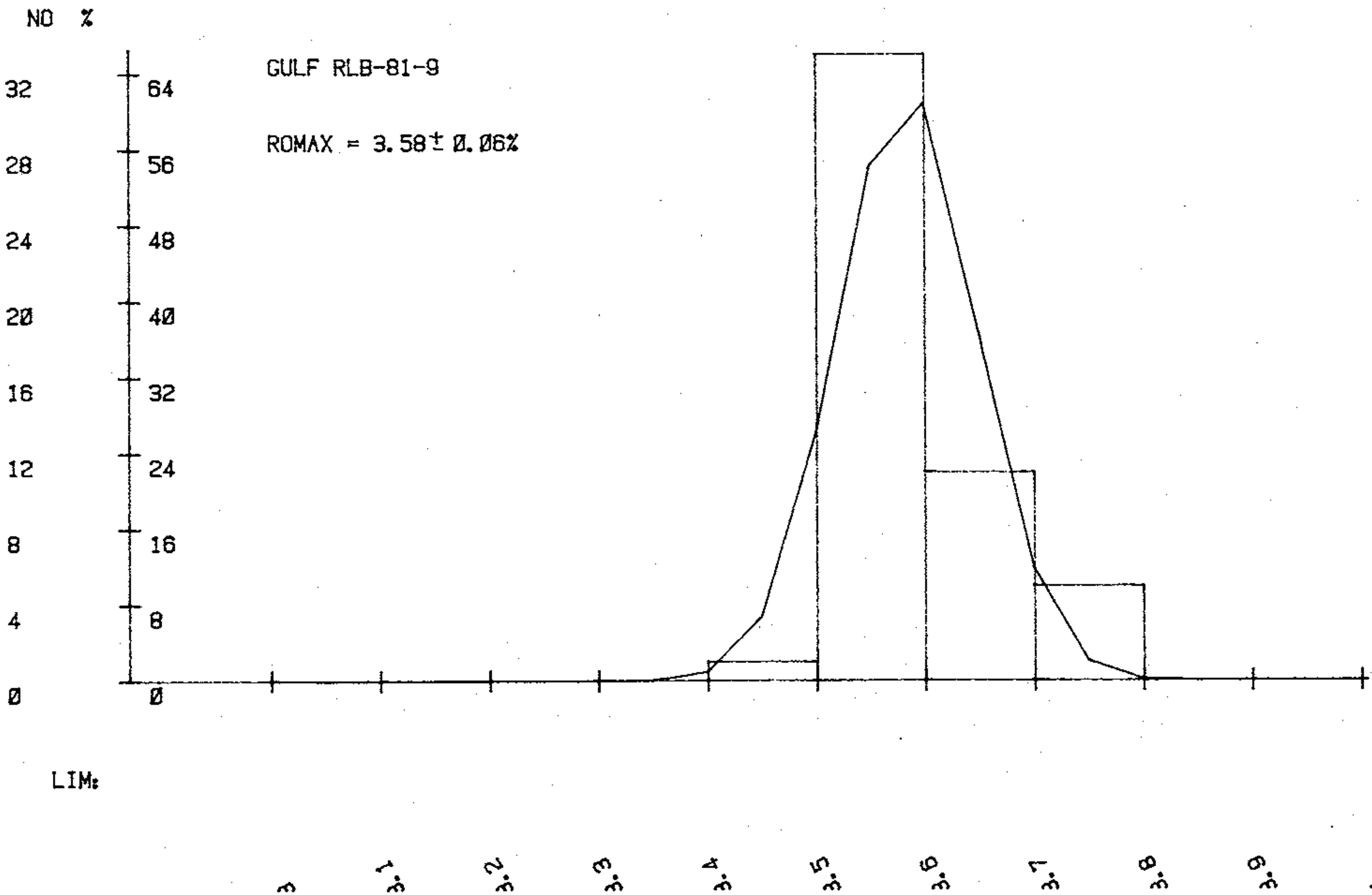
NO %
GULF RLB-81-8
ROMAX = 3.35 ± 0.07%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

RLB-81-9

I	X(I)	X(I+1)
1	3.7200	3.6400
3	3.7100	3.6300
5	3.5500	3.4800
7	3.5400	3.5300
9	3.5700	3.5400
11	3.5000	3.5300
13	3.5900	3.5200
15	3.5900	3.5300
17	3.5200	3.5600
19	3.6600	3.5600
21	3.5900	3.5200
23	3.5600	3.6100
25	3.7000	3.5500
27	3.5400	3.6200
29	3.7100	3.5900
31	3.5100	3.5600
33	3.5400	3.5700
35	3.5700	3.6000
37	3.5600	3.5600
39	3.7200	3.5800
41	3.5100	3.5400
43	3.6800	3.5200
45	3.6500	3.6500
47	3.6600	3.6600
49	3.5800	3.5300

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.5842
COEF OF VARIATION = 1.77%
VARIANCE = .0040
STANDARD DEVIATION = .0636
SKEWNESS = .7054
KURTOSIS = 2.4904

95.00% C.I. FOR MEAN:
(3.5661, 3.6023)
ONE-TAIL t(49 , .025)=
2.01003450016

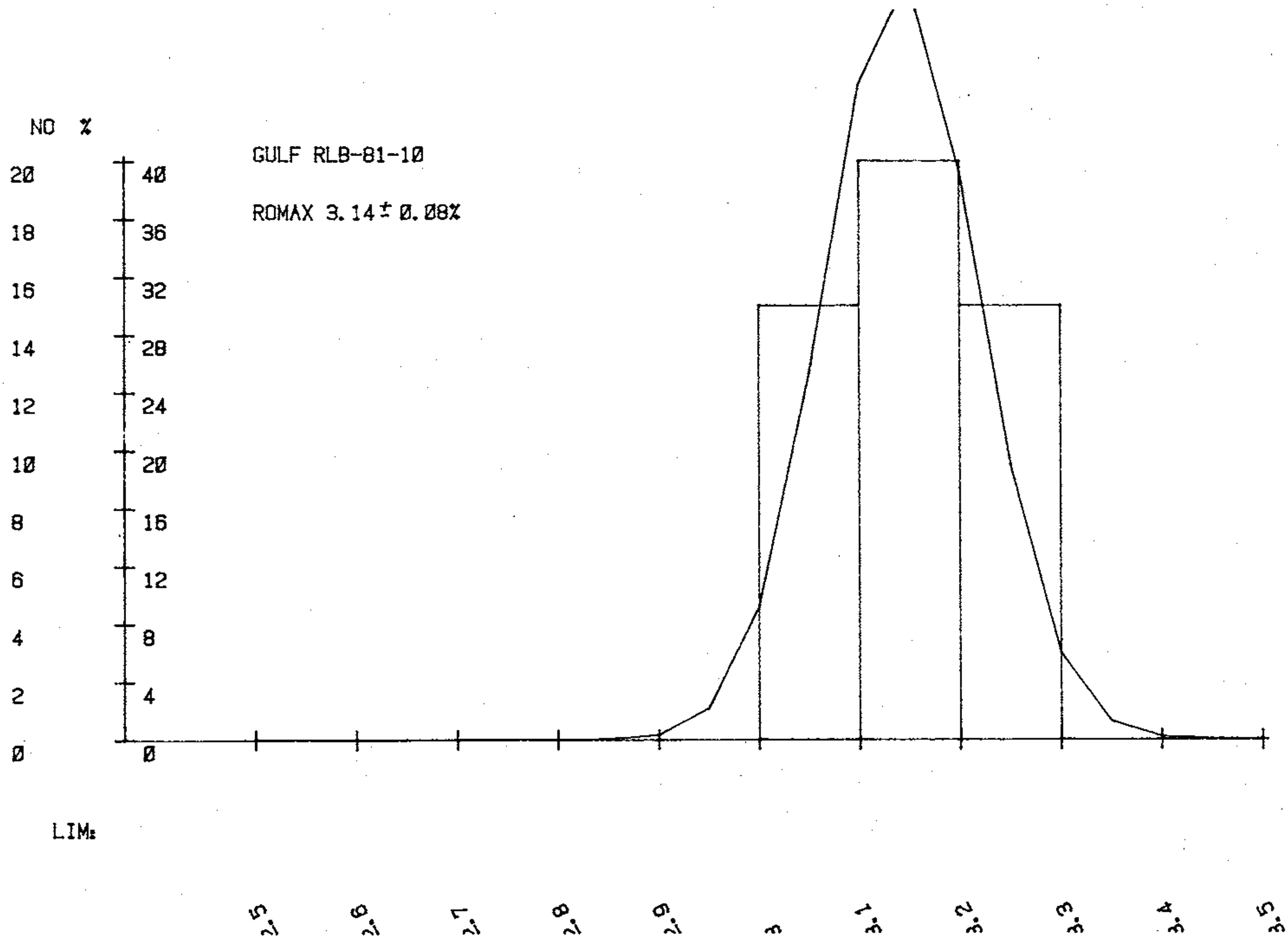

NO %
GULF RLB-81-9
ROMAX = 3.58 ± 0.06%
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:

RLB-81-10

I	X(I)	X(I+1)
1	3.2000	3.2200
3	3.1600	3.0900
5	3.1100	3.0000
7	3.0200	3.0500
9	3.1200	3.2900
11	3.1700	3.2600
13	3.1800	3.2000
15	3.1800	3.0700
17	3.2200	3.0200
19	3.1200	3.0400
21	3.0800	3.0400
23	3.1100	3.2400
25	3.1800	3.2200
27	3.2400	3.2500
29	3.1100	3.2500
31	3.0800	3.2400
33	3.1300	3.2100
35	3.1300	3.1100
37	3.1100	3.0400
39	3.1100	3.0800
41	3.2200	3.0900
43	3.1100	3 1800
45	3.0300	3.2200
47	3.0500	3.1900
49	3.1700	3.1500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.1418
COEF OF VARIATION = 2.41%
VARIANCE = .0057
STANDARD DEVIATION = .0757
SKEWNESS = -.0195
KURTOSIS = 1.9226

95.00% C.I. FOR MEAN:
(3.1203, 3.1633)
ONE-TAIL t(49 , .025)=
2.01003450016



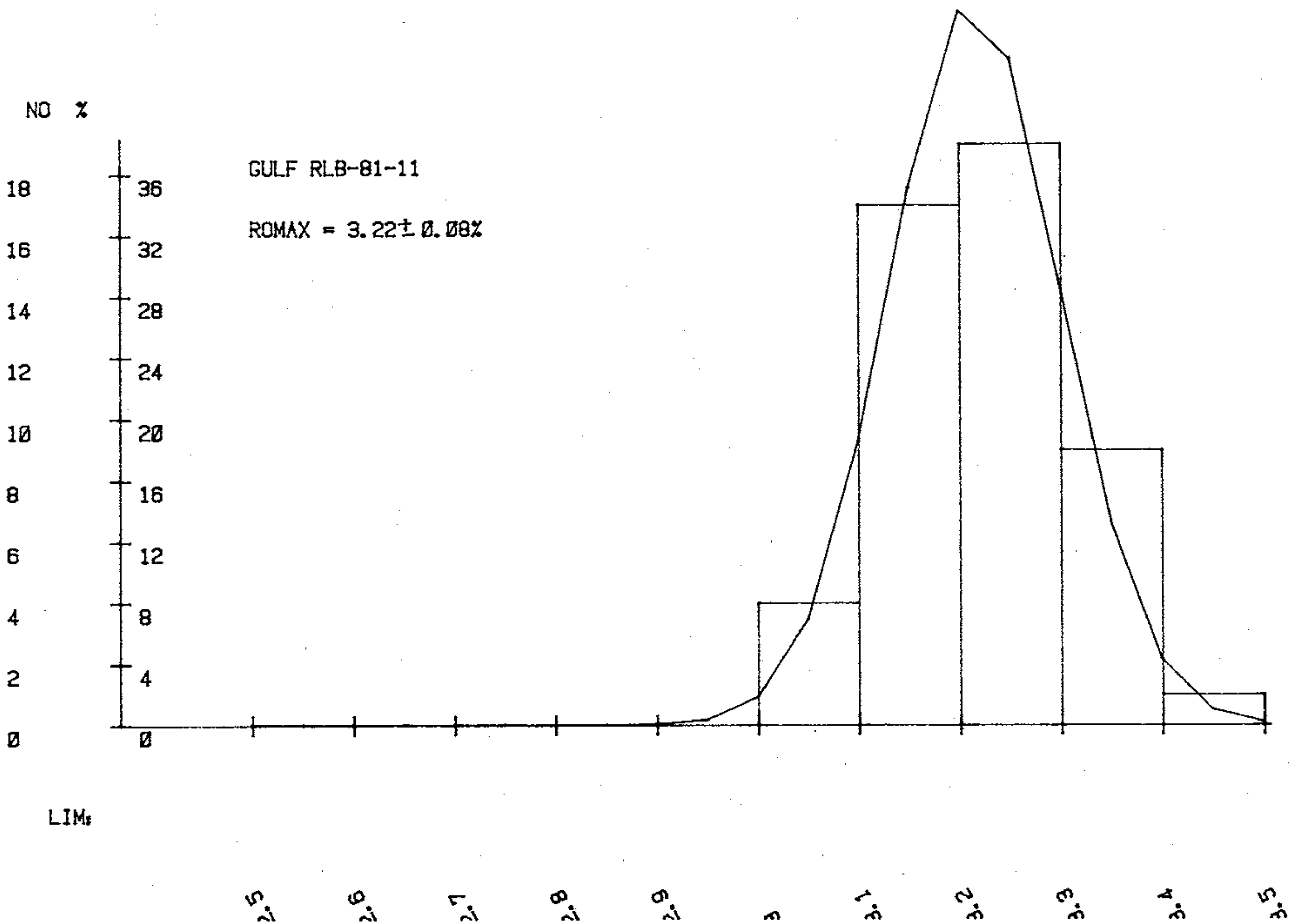
NO %
GULF RLB-81-10
ROMAX 3.14 ± 0.08%
20 18 16 14 12 10 8 6 4 2 0
40 36 32 28 24 20 16 12 8 4 0
LIM:
2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5

RLB-81-11

I	X(I)	X(I+1)
1	3.1200	3.0700
3	3.0900	3.2000
5	3.1500	3.1700
7	3.2400	3.2200
9	3.1700	3.1100
11	3.2500	3.2000
13	3.2800	3.3100
15	3.1600	3.3500
17	3.1800	3.4000
19	3.1700	3.2200
21	3.3600	3.1700
23	3.2900	3.3100
25	3.2600	3.2200
27	3.2800	3.3200
29	3.2100	3.2900
31	3.3400	3.3000
33	3.2700	3.2300
35	3.2200	3.2400
37	3.2500	3.1900
39	3.1100	3.1100
41	3.0800	3.0700
43	3.1100	3.1300
45	3.1700	3.2300
47	3.1300	3.1500
49	3.3200	3.3200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2152
COEF OF VARIATION = 2.62%
VARIANCE = .0071
STANDARD DEVIATION = .0841
SKEWNESS = .1139
KURTOSIS = 2.1581

95.00% C.I. FOR MEAN:
(3.1913, 3.2391)
ONE-TAIL t(49 , .025)=
2.01003450016

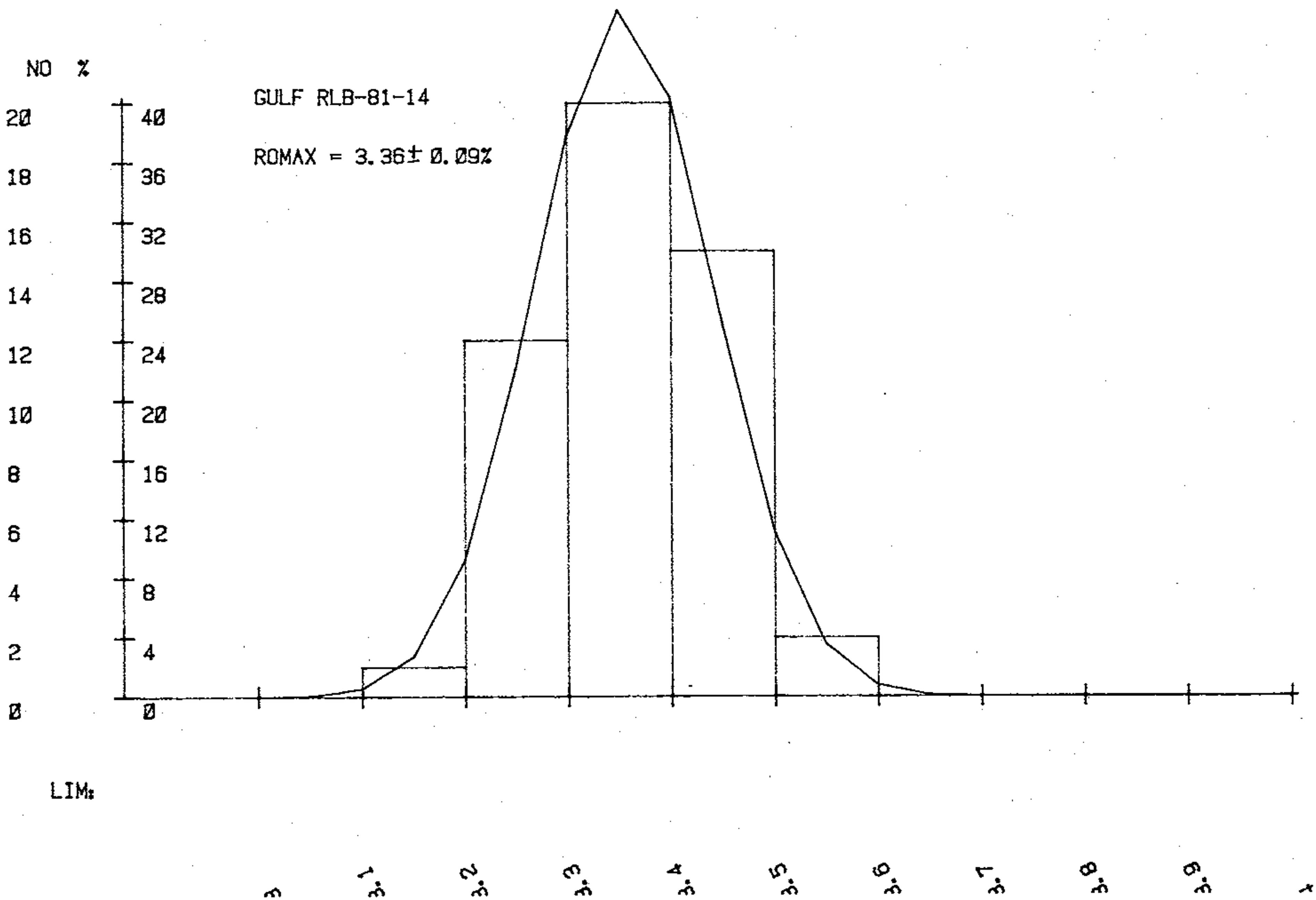

NO %
GULF RLB-81-11
ROMAX = 3.22±0.08%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

RLB-81-14

I	X(I)	X(I+1)
1	3.3600	3.2400
3	3.4100	3.4200
5	3.1800	3.3400
7	3.4700	3.3900
9	3.2300	3.4000
11	3.4100	3.3500
13	3.2900	3.2400
15	3.3300	3.3400
17	3.4300	3.2900
19	3.2500	3.4000
21	3.3000	3.4900
23	3.4300	3.3600
25	3.2400	3.4700
27	3.5300	3.3100
29	3.4500	3.2900
31	3.2300	3.3200
33	3.2700	3.3600
35	3.5300	3.3700
37	3.3400	3.2900
39	3.2000	3.3100
41	3.4900	3.3000
43	3.3900	3.3300
45	3.3500	3.3400
47	3.3500	3.4100
49	3.4800	3.4500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.3550
COEF OF VARIATION = 2.57%
VARIANCE = .0074
STANDARD DEVIATION = .0861
SKEWNESS = .1037
KURTOSIS = 2.3540

95.00% C.I. FOR MEAN:
(3.3305, 3.3795)
ONE-TAIL t(49 , .025)=
2.01003450016



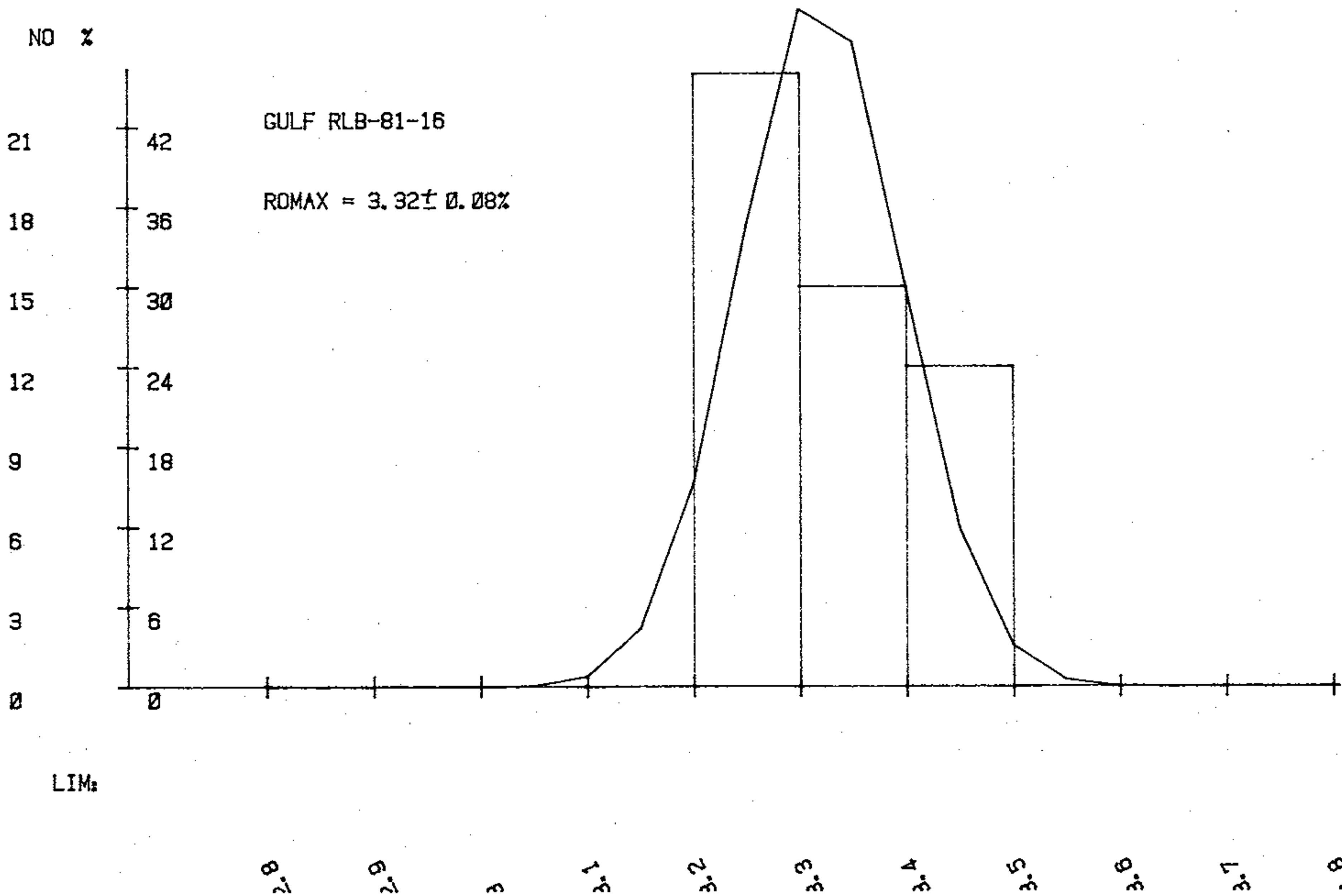
GULF RLB-81-14
ROMAX = 3.36± 0.09%
NO %
20 40
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9

RLB-81-16

I	X(I)	X(I+1)
1	3.3200	3.2100
3	3.4600	3.2400
5	3.2300	3.4000
7	3.2100	3.2800
9	3.2400	3.3500
11	3.3200	3.2100
13	3.4700	3.2700
15	3.2900	3.4200
17	3.3500	3.2400
19	3.2300	3.2600
21	3.2800	3.4500
23	3.2900	3.3400
25	3.2900	3.2300
27	3.2600	3.3200
29	3.3800	3.2700
31	3.3000	3.2300
33	3.4100	3.3700
35	3.3900	3.4000
37	3.2500	3.4000
39	3.3200	3.4000
41	3.3700	3.3700
43	3.4000	3.2000
45	3.4100	3.2700
47	3.4200	3.3600
49	3.3500	3.2400

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.3194
COEF OF VARIATION = 2.29%
VARIANCE = .0058
STANDARD DEVIATION = .0759
SKEWNESS = .1826
KURTOSIS = 1.8364

95.00% C.I. FOR MEAN:
(3.2978, 3.3410)
ONE-TAIL t(49 , .025)=
2.01003450016

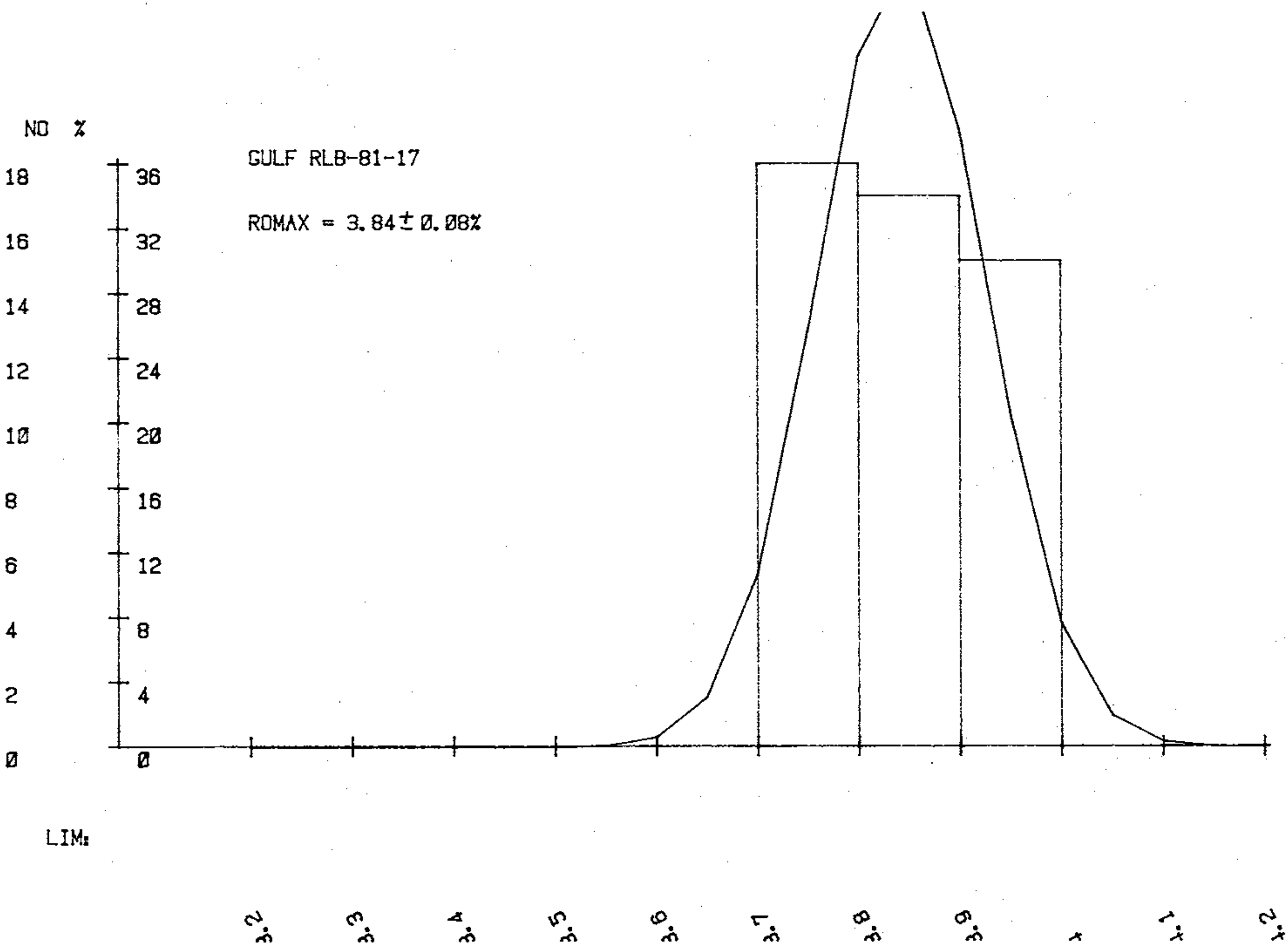

NO %
GULF RLB-81-16
ROMAX = 3.32± Ø.Ø8%
21 42
18 36
15 3Ø
12 24
9 18
6 12
3 6
Ø Ø
LIM:

RLB-81-17

I	X(I)	X(1+1)
1	3.9700	3.8500
3	3.7900	3.9600
5	3.9900	3.8000
7	3.8400	3.7900
9	3.9100	3.9900
11	3.8600	3.8200
13	3.9100	3.7900
15	3.8800	3.7700
17	3.9200	3.7100
19	3.7600	3.7700
21	3.8500	3.7900
23	3.9800	3.9300
25	3.8800	3.8000
27	3.8700	3.8000
29	3.9600	3.7700
31	3.9100	3.7600
33	3.7700	3.7700
35	3.7700	3.7600
37	3.8400	3.8200
39	3.8600	3.8500
41	3.9100	3.9700
43	3.9600	3.7000
45	3.8500	3.7800
47	3.7600	3.7000
49	3.8400	3.9000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.8426
COEF OF VARIATION = 2.13%
VARIANCE = .0067
STANDARD DEVIATION = .0818
SKEWNESS = .1723
KURTOSIS = 2.0953

95.00% C.I. FOR MEAN:
(3.8194, 3.8658)
ONE-TAIL t(49 , .025)=
2.01003450016



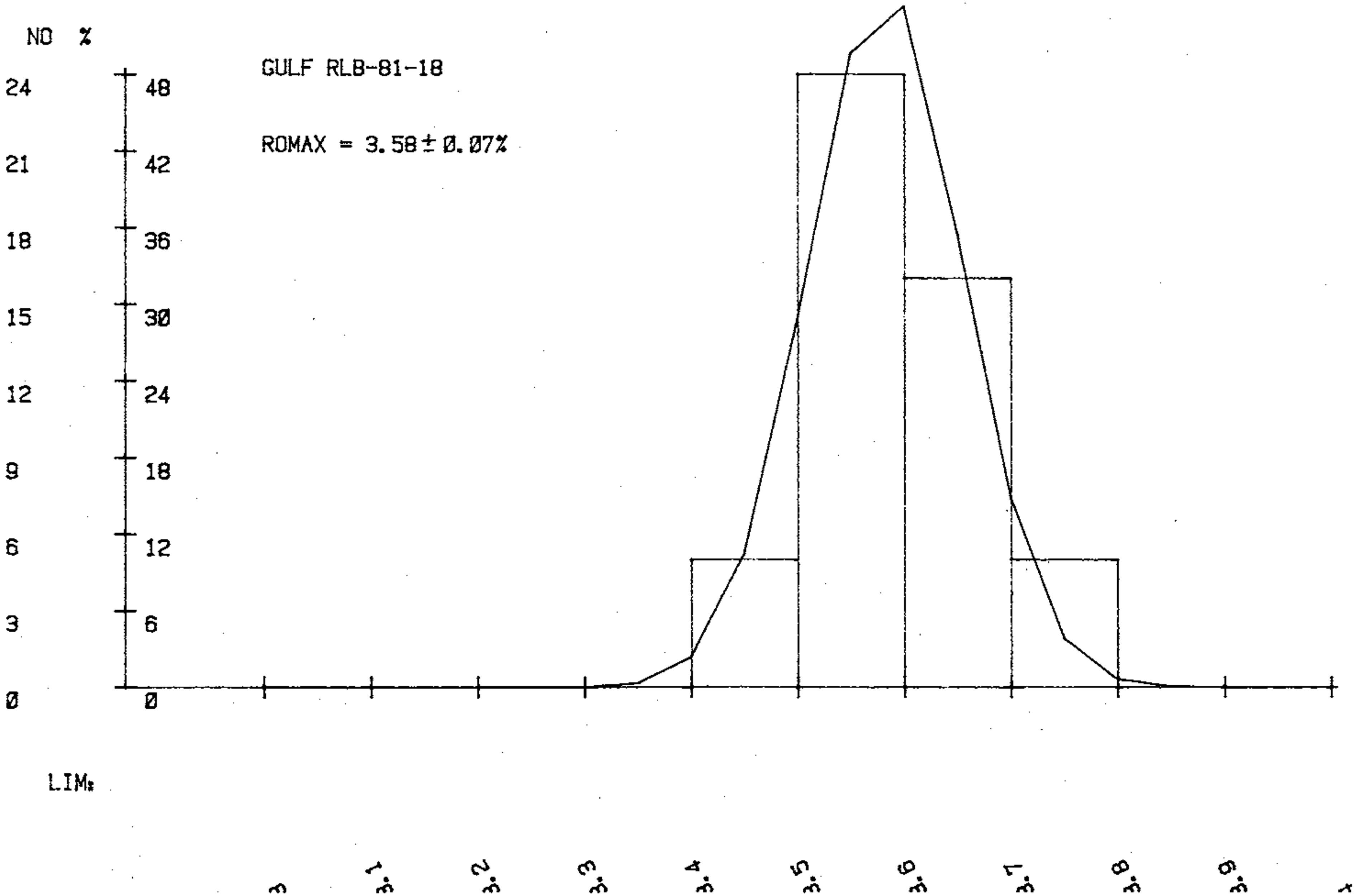
NO %
GULF RLB-81-17
ROMAX = 3.84 ± 0.08%
18 16 14 12 10 8 6 4 2 0
36 32 28 24 20 16 12 8 4 0
LIM:
3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4. 4.1 4.2

RLB-81- 18

	X(I)	X(I+1)
1	3.5500	3.5400
3	3.6300	3.5100
5	3.5100	3.4700
7	3.5600	3.7300
9	3.6200	3.5100
11	3.5900	3.5200
13	3.6300	3.5500
15	3.5100	3.6000
17	3.5100	3.6800
19	3.6400	3.5500
21	3.6100	3.4700
23	3 5000	3.5600
25	3.7200	3.5700
27	3.5000	3.7000
29	3.5500	3.6600
31	3.5600	3.6400
33	3.5400	3.7200
35	3.6000	3.5900
37	3.6800	3.6300
39	3.4900	3.6400
41	3.6000	3.4700
43	3.4800	3.5200
45	3.6100	3.6100
47	3.5700	3.5900
49	3.5900	3.7400

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.5824
COEF OF VARIATION = 2.03%
VARIANCE = .0053
STANDARD DEVIATION = .0727
SKEWNESS = .3953
KURTOSIS = 2.3856

95.00% C.I. FOR MEAN:
(3.5617, 3.6031)
ONE-TAIL t(49 , .025)=
2.01003450016

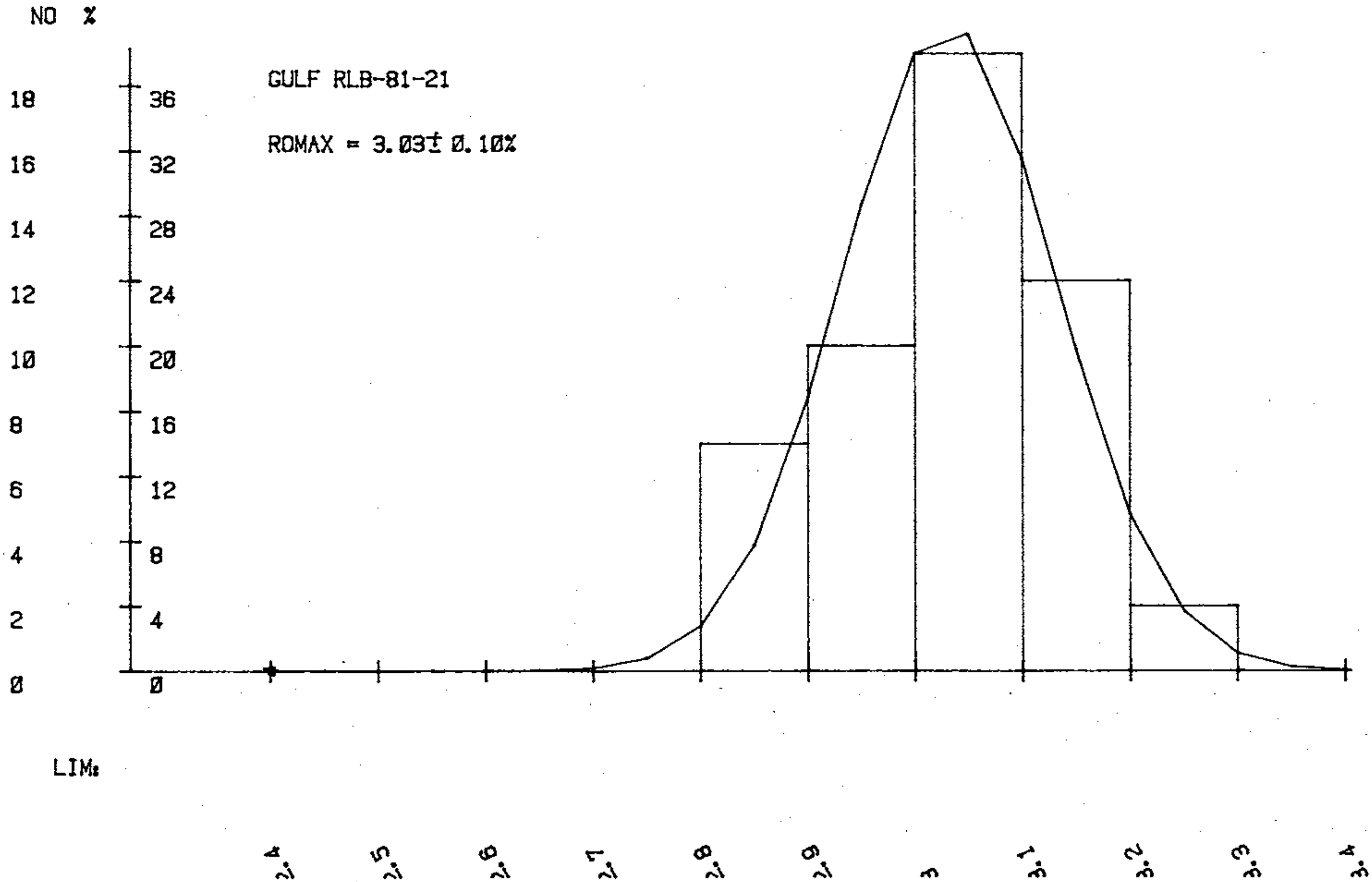

NO %
GULF RLB-81-18
ROMAX = 3.58 ± Ø.Ø7%
24 48
21 42
18 36
15 3Ø
12 24
9 18
6 12
3 6
Ø Ø
LIM:

RLB-8?-21

I	X(I)	X(I+1)
1	3.1400	3.0200
3	2.8600	3.0300
5	2.9400	2.8600
7	2.9600	3.0200
9	3.0300	3.0600
11	3.1400	2.9800
13	3.1900	3.1800
15	3.0000	2.8800
17	2.9300	2.8700
19	3.0500	2.9900
21	2.8800	2.8300
23	3.1000	3.1700
25	3.1300	2.9500
27	2.8700	2.9600
29	3.1800	3.1100
31	3.0600	3.1200
33	3.0300	3.2300
35	3.0600	3.2000
37	3.0800	3.0200
39	3.0000	3.0400
41	3.0200	3.1100
43	3.0300	3.0900
45	3.0600	3.1600
47	3.0100	2.9900
49	2.9700	2.9700

```
BASIC STATISTICS
******************************
N =    50
STD ERROR OF THE MEAN=        .01
MEAN =        3.0312
COEF OF VARIATION =         3.30%
VARIANCE =          .0100
STANDARD DEVIATION =         .1000
SKEWNESS =          -.0679
KURTOSIS =          2.3453

    95.00% C.I. FOR MEAN:
(       3.0028,         3.0596)
ONE-TAIL t( 49 , .025 )=
 2.01003450016
```

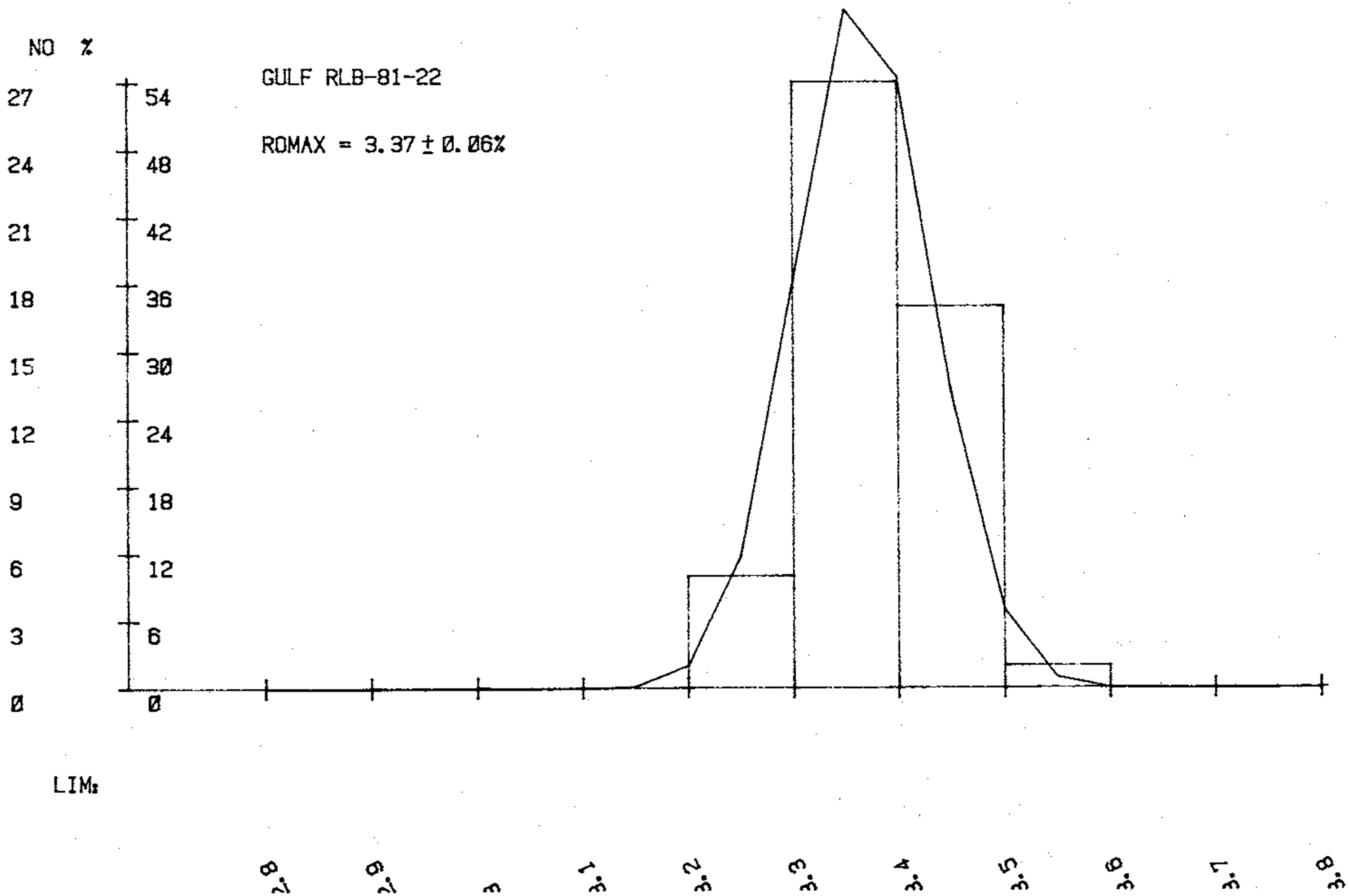

NO %
GULF RLB-81-21
ROMAX = 3.03± 0.10%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4

RLB-81-22

I	X(I)	X(I+1)
1	3.3300	3.3400
3	3.3300	3.3500
5	3.3300	3.3900
7	3.4500	3.4200
9	3.3200	3.2700
11	3.4300	3.4100
13	3.4500	3.4300
15	3.4800	3.3500
17	3.2600	3.3500
19	3.3100	3.2900
21	3.3000	3.2900
23	3.3200	3.3400
25	3.3200	3.3600
27	3.3000	3.3300
29	3.4600	3.3100
31	3.3400	3.2900
33	3.4000	3.4000
35	3.4100	3.4800
37	3.4700	3.3900
39	3.3600	3.3200
41	3.3100	3.3200
43	3.5100	3.4000
45	3.3100	3.4500
47	3.4600	3.3500
49	3.3400	3.4000

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.3666
COEF OF VARIATION = 1.89%
VARIANCE = .0041
STANDARD DEVIATION = .0638
SKEWNESS = .4397
KURTOSIS = 2.1011

95.00% C.I. FOR MEAN:
(3.3485, 3.3847)
ONE-TAIL t(49 , .025)=
2.01003450016

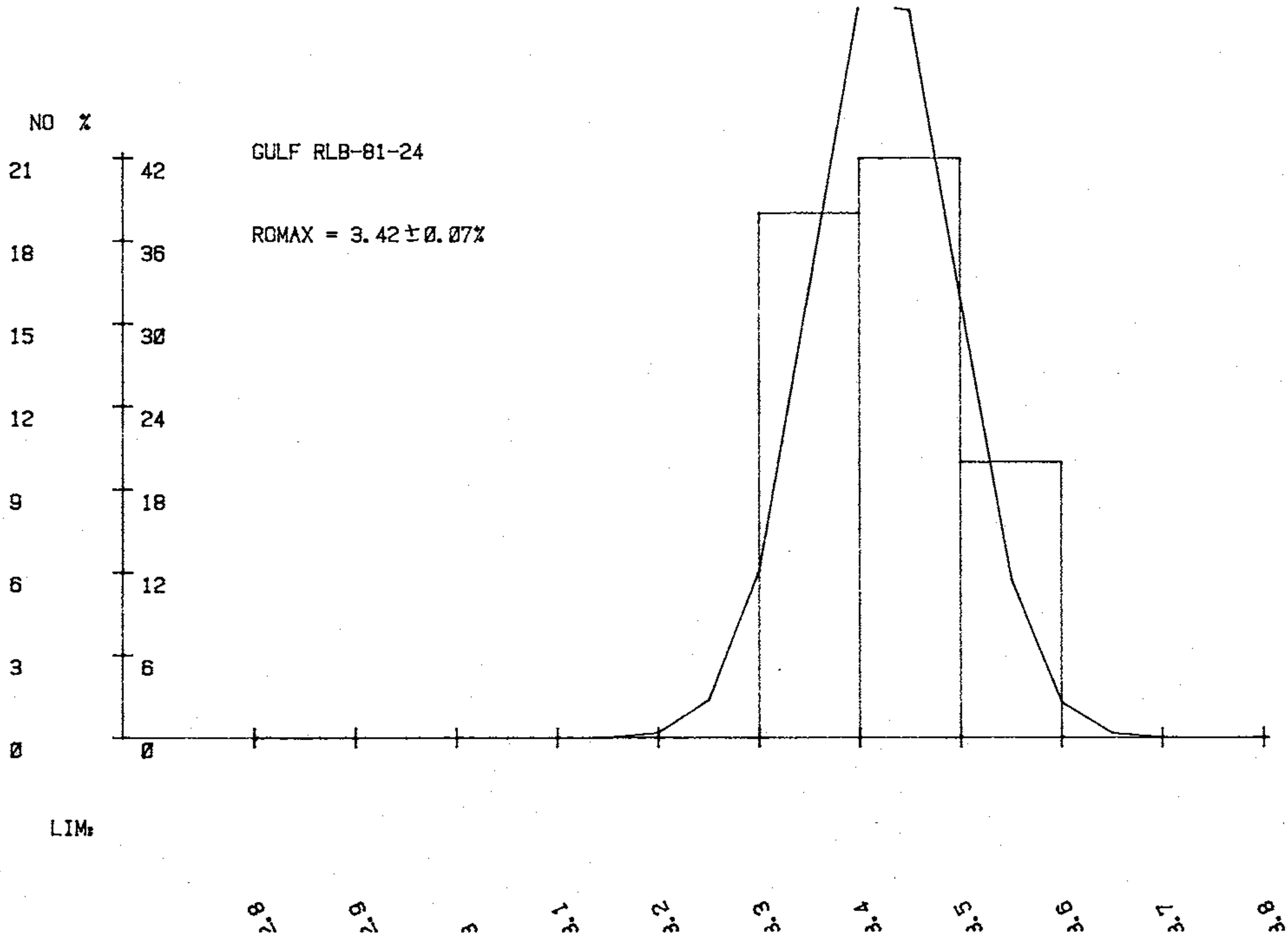

NO %
GULF RLB-81-22
ROMAX = 3.37 ± 0.06%
27
24
21
18
15
12
9
6
3
0
54
48
42
36
30
24
18
12
6
0
LIM:

RLB-81-24

I	X(I)	X(I+1)
1	3.3800	3.4800
3	3.4100	3.4200
5	3.5400	3.4200
7	3.3800	3.3700
9	3.4200	3.4000
11	3.3100	3.3400
13	3.3400	3.4200
15	3.5500	3.5200
17	3.3800	3.5200
19	3.3700	3.4600
21	3.4100	3.5200
23	3.5200	3.4700
25	3.4400	3.5400
27	3.4900	3.5600
29	3.4500	3.3200
31	3.5000	3.4800
33	3.3500	3.3900
35	3.4000	3.4300
37	3.3600	3.5500
39	3.4700	3.4200
41	3.4500	3.3900
43	3.3500	3.3800
45	3.4100	3.3500
47	3.4000	3.3400
49	3.3200	3.3100

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.4240
COEF OF VARIATION = 2.07%
VARIANCE = .0050
STANDARD DEVIATION = .0707
SKEWNESS = .3076
KURTOSIS = 2.0752

95.00% C.I. FOR MEAN:
(3.4039, 3.4441)
ONE-TAIL t(49 , .025)=
2.01003450016



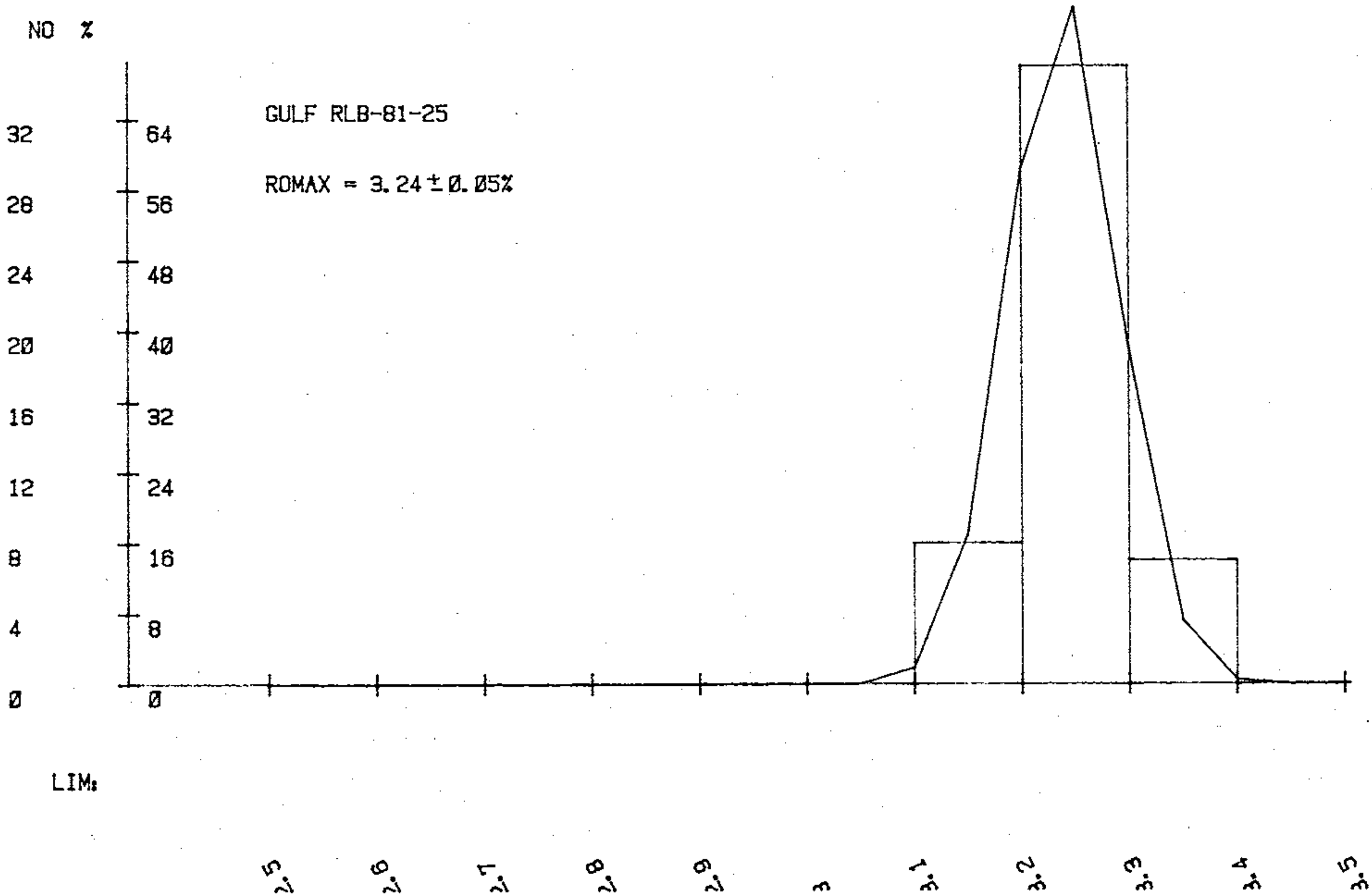
NO %
GULF RLB-81-24
ROMAX = 3.42±0.07%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

RLB-81-25

I	X(I)	X(I+1)
1	3.1800	3.1800
3	3.3100	3.2800
5	3.2400	3.1200
7	3.2200	3.3600
9	3.2000	3.2300
11	3.3900	3.2500
13	3.2400	3.2200
15	3.2000	3.2200
17	3.2300	3.2000
19	3.2200	3.2000
21	3.2100	3.3100
23	3.2800	3.2600
25	3.2500	3.2500
27	3.2200	3.2500
29	3.2400	3.3000
31	3.2400	3.1700
33	3.2700	3.2500
35	3.2500	3.2100
37	3.3300	3.2300
39	3.2900	3.2400
41	3.2300	3.2300
43	3.2200	3.2500
45	3.1800	3.1900
47	3.2300	3.3300
49	3.1700	3.1900

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2390
COEF OF VARIATION = 1.57%
VARIANCE = .0026
STANDARD DEVIATION = .0508
SKEWNESS = .6873
KURTOSIS = 3.9440

95.00% C.I. FOR MEAN:
(3.2246, 3.2534)
ONE-TAIL t(49 , .025)=
2.01003450016

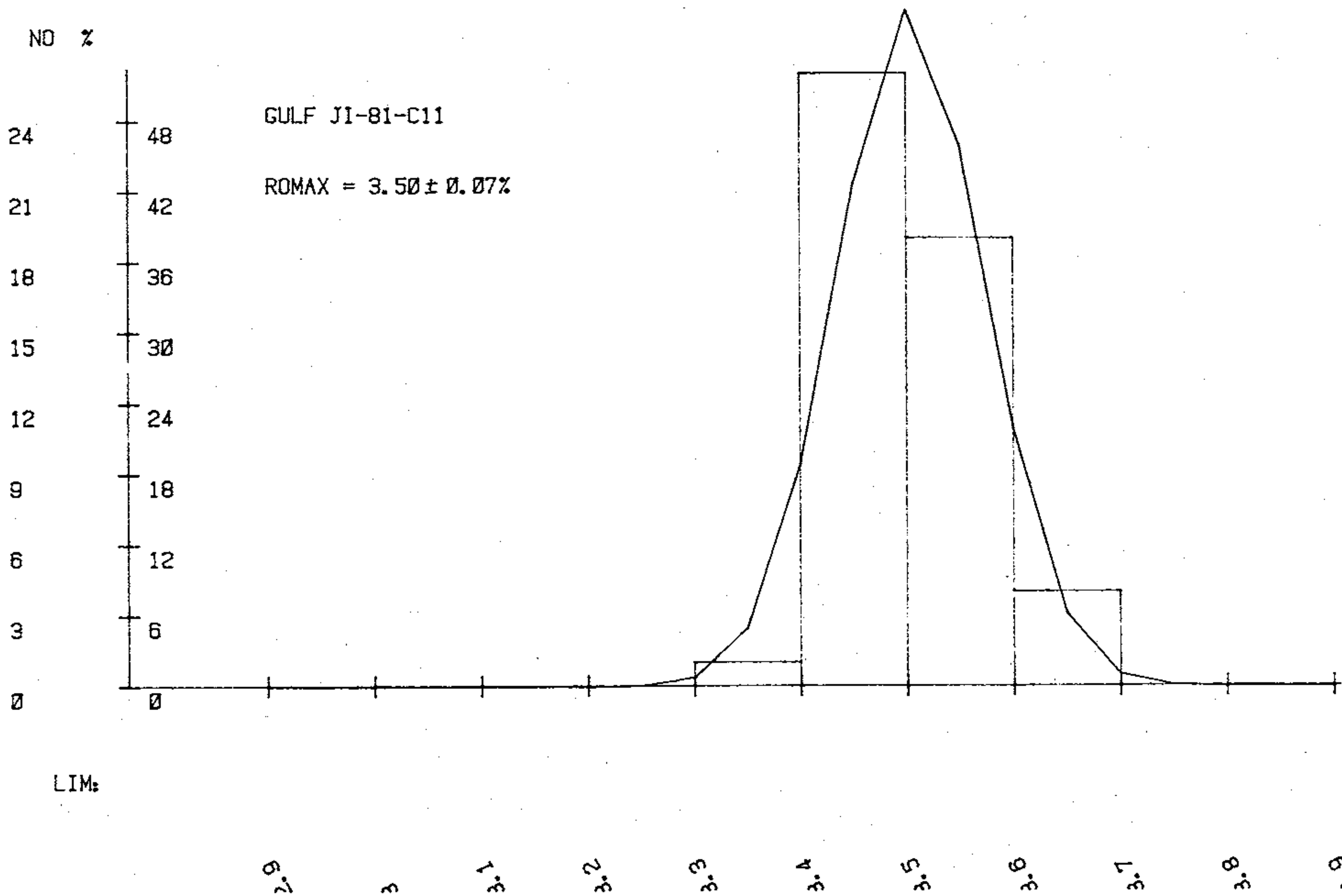

NO %
GULF RLB-81-25
ROMAX = 3.24±0.05%
32 28 24 20 16 12 8 4 0
64 56 48 40 32 24 16 8 0
LIM:
2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5

JI-81-C11

I	X(I)	X(I+1)
1	3.5300	3.4000
3	3.4200	3.6700
5	3.5300	3.5200
7	3.4700	3.5200
9	3.4500	3.4600
11	3.4500	3.4400
13	3.4800	3.4400
15	3.5200	3.5100
17	3.4100	3.5800
19	3.4800	3.4900
21	3.5800	3.4500
23	3.6000	3.5200
25	3.5600	3.5600
27	3.6900	3.6600
29	3.4700	3.5100
31	3.5000	3.4100
33	3.5600	3.4800
35	3.4600	3.4700
37	3.5500	3.4700
39	3.5900	3.4700
41	3.5600	3.4700
43	3.4300	3.4400
45	3.4500	3.3800
47	3.5800	3.5700
49	3.4800	3.4900

```
BASIC STATISTICS
******************************
N =    50
STD ERROR OF THE MEAN=          .01
MEAN =          3.5036
COEF OF VARIATION =          1.98%
VARIANCE =          .0048
STANDARD DEVIATION =          .0694
SKEWNESS =          .7099
KURTOSIS =          3.2034

    95.00% C.I. FOR MEAN:
(       3.4839,        3.5233)
ONE-TAIL t( 49 , .025 )=
 2.01003450016
```



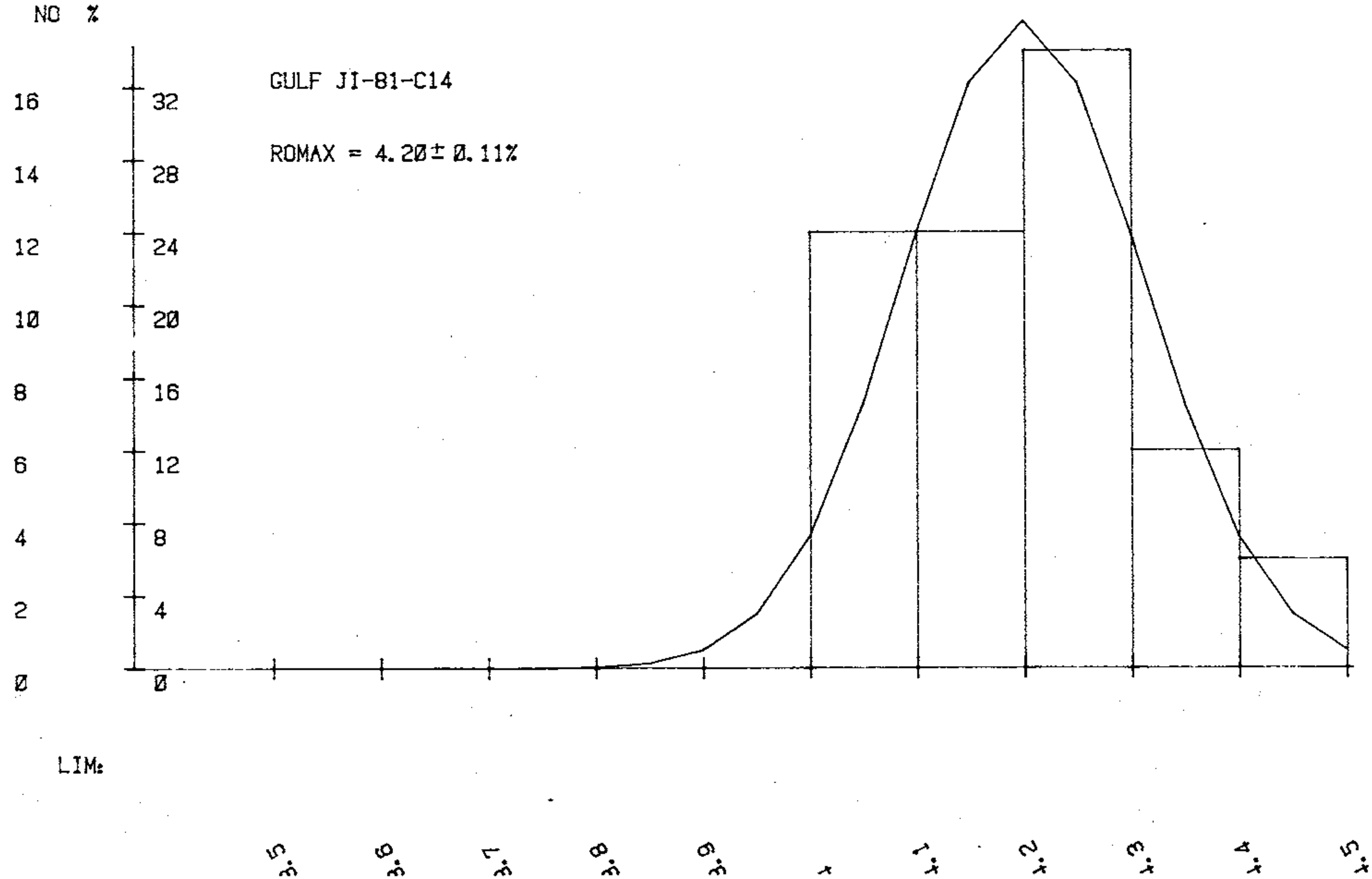
NO %
GULF JI-81-C11
ROMAX = 3.50 ± 0.07%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9

JI-81-014

I	X(I)	X(I+1)
1	4.0900	4.3600
3	4.0600	4.2700
5	4.2500	4.0700
7	4.2500	4.3300
9	4.3400	4.1200
11	4.2700	4.1300
13	4.1500	4.1100
15	4.2700	4.3200
17	4.0200	4.1500
19	4.3500	4.2200
21	4.4500	4.2000
23	4.1700	4.0200
25	4.2900	4.2200
27	4.0500	4.2400
29	4.0900	4.1700
31	4.1800	4.0800
33	4.1900	4.2100
35	4.2100	4.0300
37	4.2600	4.1600
39	4.0700	4.2500
41	4.1700	4.2700
43	4.3100	4.0700
45	4.1600	4.4100
47	4.0200	4.2000
49	4.4500	4.2700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 4.2000
COEF OF VARIATION = 2.67%
VARIANCE = .0125
STANDARD DEVIATION = .1120
SKEWNESS = .2573
KURTOSIS = 2.4533

95.00% C.I. FOR MEAN:
(4.1682, 4.2318)
ONE-TAIL t(49 , .025)=
2.01003450016

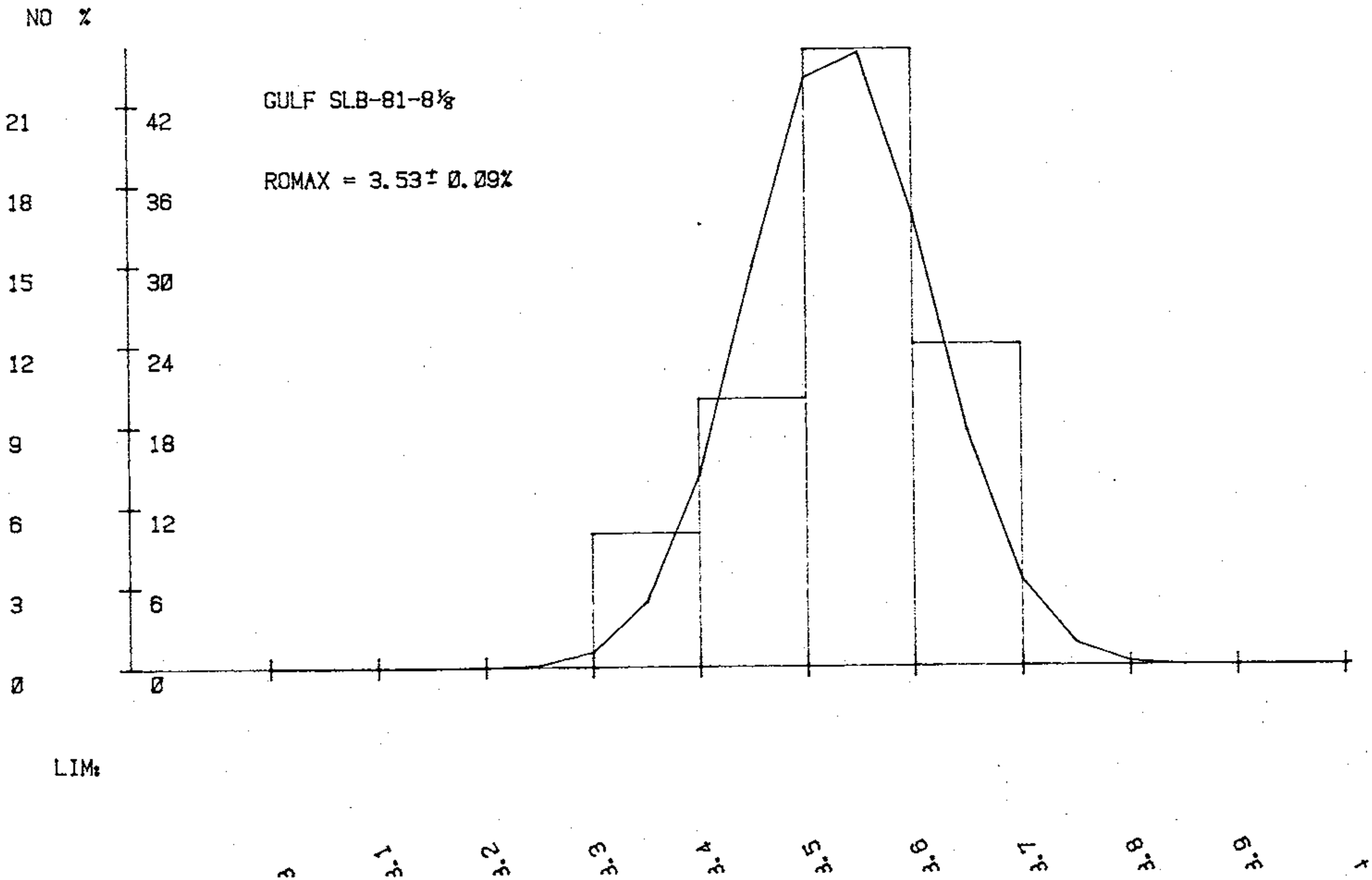

NO %
GULF JI-81-C14
ROMAX = 4.20 ± 0.11%
16
14
12
10
8
6
4
2
0
32
28
24
20
16
12
8
4
0
LIM:

SLB-81-8 1/8

I	X(I)	X(I+1)
1	3.5700	3.6500
3	3.5200	3.3500
5	3.3500	3.4700
7	3.4500	3.4500
9	3.4000	3.5000
11	3.4200	3.3500
13	3.4900	3.5300
15	3.4700	3.3900
17	3.3600	3.5600
19	3.6200	3.4800
21	3.6100	3.5700
23	3.5000	3.5700
25	3.5400	3.4800
27	3.6800	3.6100
29	3.6500	3.5900
31	3.5700	3.6500
33	3.6100	3.4800
35	3.5000	3.6000
37	3.5700	3.5500
39	3.5900	3.6000
41	3.5500	3.5000
43	3.5900	3.6200
45	3.5600	3.5200
47	3.5600	3.6400
49	3.5600	3.5400

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.5308
COEF OF VARIATION = 2.41%
VARIANCE = .0072
STANDARD DEVIATION = .0850
SKEWNESS = -.5665
KURTOSIS = 2.6410

95.00% C.I. FOR MEAN:
(3.5066, 3.5550)
ONE-TAIL t(49 , .025)=
2.01003450016



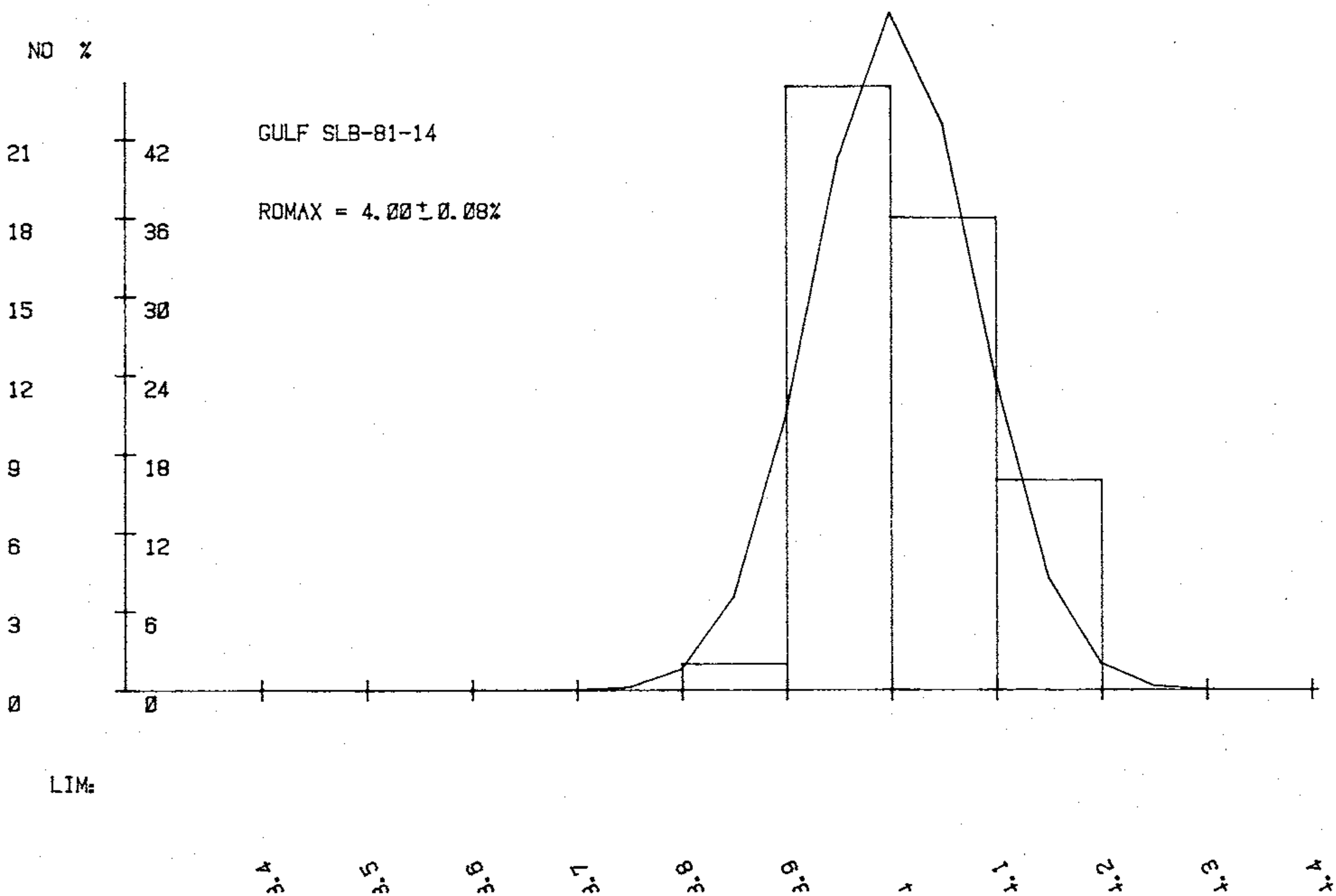
NO %
GULF SLB-81-8⅛
ROMAX = 3.53 ± 0.09%
21 18 15 12 9 6 3 0
42 36 30 24 18 12 6 0
LIM:
3 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9

SLB-81-14

I	X(I)	X(I+1)
1	3.9100	3.9300
3	3.9000	3.8900
5	4.0200	4.1500
7	3.9200	4.1000
9	4.0200	3.9300
11	3.9500	4.1500
13	3.9600	3.9600
15	3.9700	4.0500
17	4.1500	4.1400
19	3.9700	3.9100
21	4.0500	4.0500
23	3.9400	4.0200
25	4.1300	4.0500
27	4.0100	4.0000
29	3.9500	3.9400
31	4.0400	3.9100
33	3.9500	4.0400
35	4.0100	3.9200
37	3.9700	4.1800
39	4.0600	3.9600
41	3.9200	3.9600
43	4.1000	4.0200
45	3.9000	4.0200
47	4.0400	3.9900
49	4.0000	4.0800

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 4.0038
COEF OF VARIATION = 1.93%
VARIANCE = .0060
STANDARD DEVIATION = .0772
SKEWNESS = .5443
KURTOSIS = 2.3974

95.00% C.I. FOR MEAN:
(3.9819, 4.0257)
ONE-TAIL t(49 , .025)=
2.01003450016

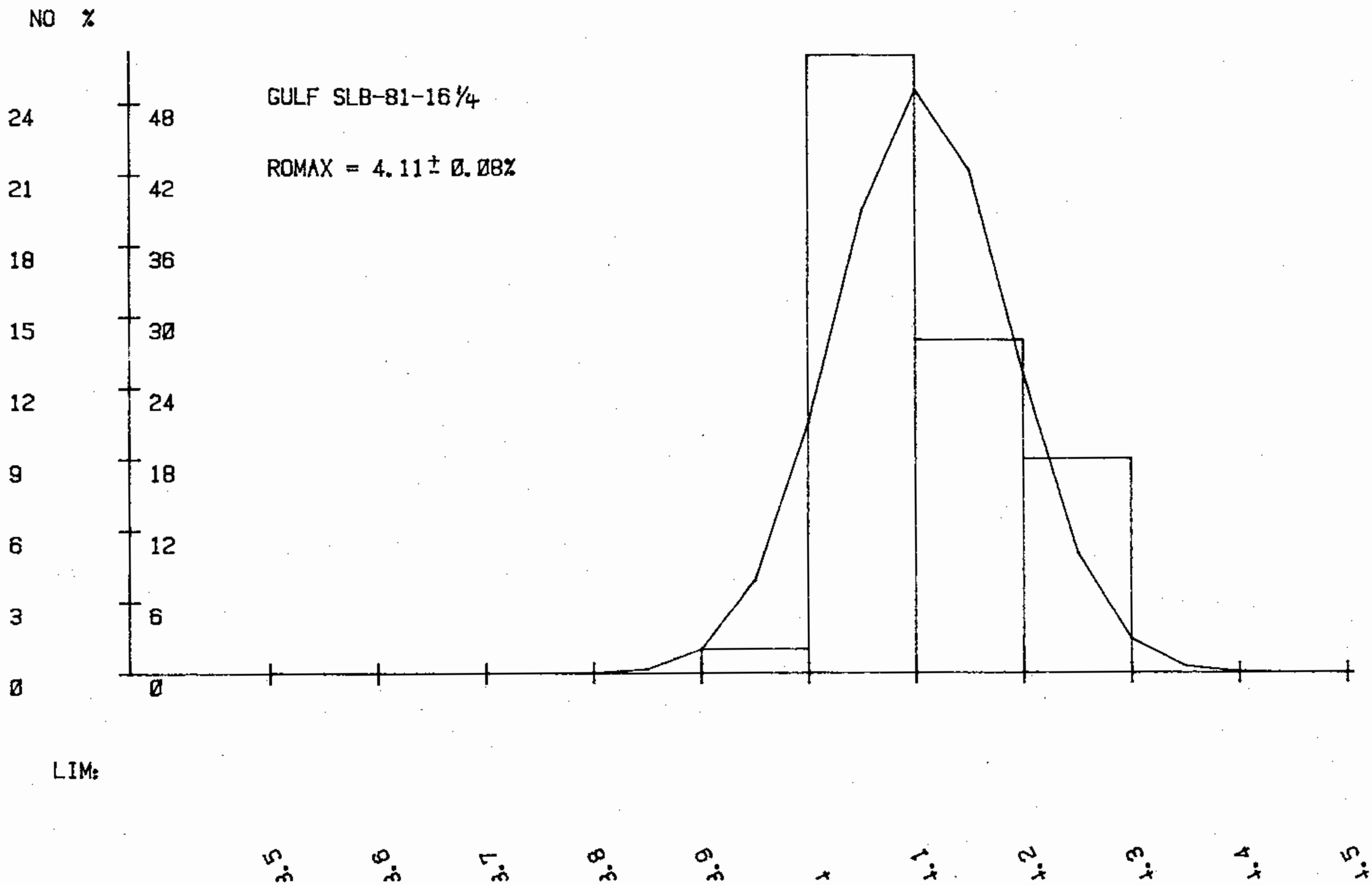

NO %
GULF SLB-81-14
ROMAX = 4.00±0.08%
21
18
15
12
9
6
3
0
42
36
30
24
18
12
6
0
LIM:
3.4
3.5
3.6
3.7
3.8
3.9
4
4.1
4.2
4.3
4.4

SLB-81-16 1/4

I	X(I)	X(I+1)
1	4.0500	4.0300
3	4.0000	4.0900
5	3.9700	4.2000
7	4.1000	4.0700
9	4.1000	4.1000
11	4.0600	4.0700
13	4.1500	4.2500
15	4.2700	4.2600
17	4.2000	4.0900
19	4.0900	4.0300
21	4.1200	4.1100
23	4.1300	4.0700
25	4.0400	4.0700
27	4.2800	4.1300
29	4.1900	4.2000
31	4.1700	4.0300
33	4.2700	4.0600
35	4.1400	4.0300
37	4.1500	4.0100
39	4.0100	4.0100
41	4.0500	4.0400
43	4.0300	4.0200
45	4.1600	4.0800
47	4.1700	4.2300
49	4.0200	4.0800

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 4.1056
COEF OF VARIATION = 1.98%
VARIANCE = .0066
STANDARD DEVIATION = .0811
SKEWNESS = .6114
KURTOSIS = 2.4147

95.00% C.I. FOR MEAN:
(4.0825, 4.1287)
ONE-TAIL t(49 , .025)=
2.01003450016



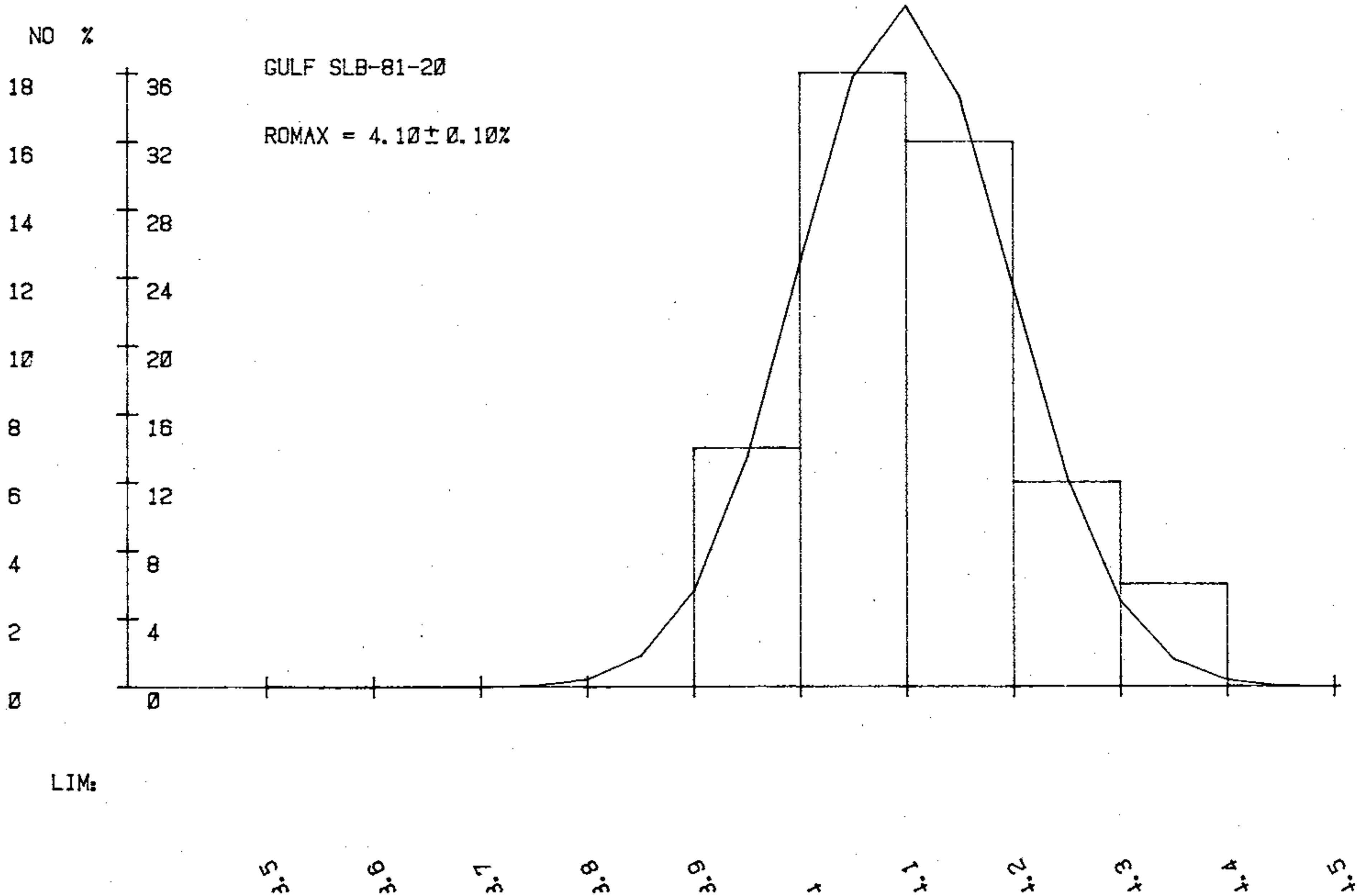
NO %
GULF SLB-81-16¼
ROMAX = 4.11 ± 0.08%
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
3.5
3.6
3.7
3.8
3.9
4.
4.1
4.2
4.3
4.4
4.5

SLB-81-20

I	X(I)	X(I+1)
1	4.2100	4.2000
3	4.1200	4.0300
5	4.1000	4.3100
7	4.0200	4.1000
9	3.9700	3.9700
11	4.1000	4.1700
13	4.3200	4.1500
15	4.1200	4.2600
17	3.9700	3.9800
19	4.2400	3.9900
21	3.9600	4.0000
23	4.1000	4.1100
25	4.1100	3.9900
27	4.3200	4.0000
29	4.0900	4.0600
31	4.0400	4.0100
33	4 1700	4.2700
35	4.0300	4.0000
37	4.1000	4.1800
39	4.2500	4.0700
41	4.0300	4.0600
43	4.0000	4.1200
45	4.1700	4.0900
47	4.0500	4.0000
49	4.1100	4.0300

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 4.0970
COEF OF VARIATION = 2.43%
VARIANCE = .0100
STANDARD DEVIATION = .0998
SKEWNESS = .6699
KURTOSIS = 2.5666

95.00% C.I. FOR MEAN:
(4.0686, 4.1254)
ONE-TAIL t(49 , .025)=
2.01003450016



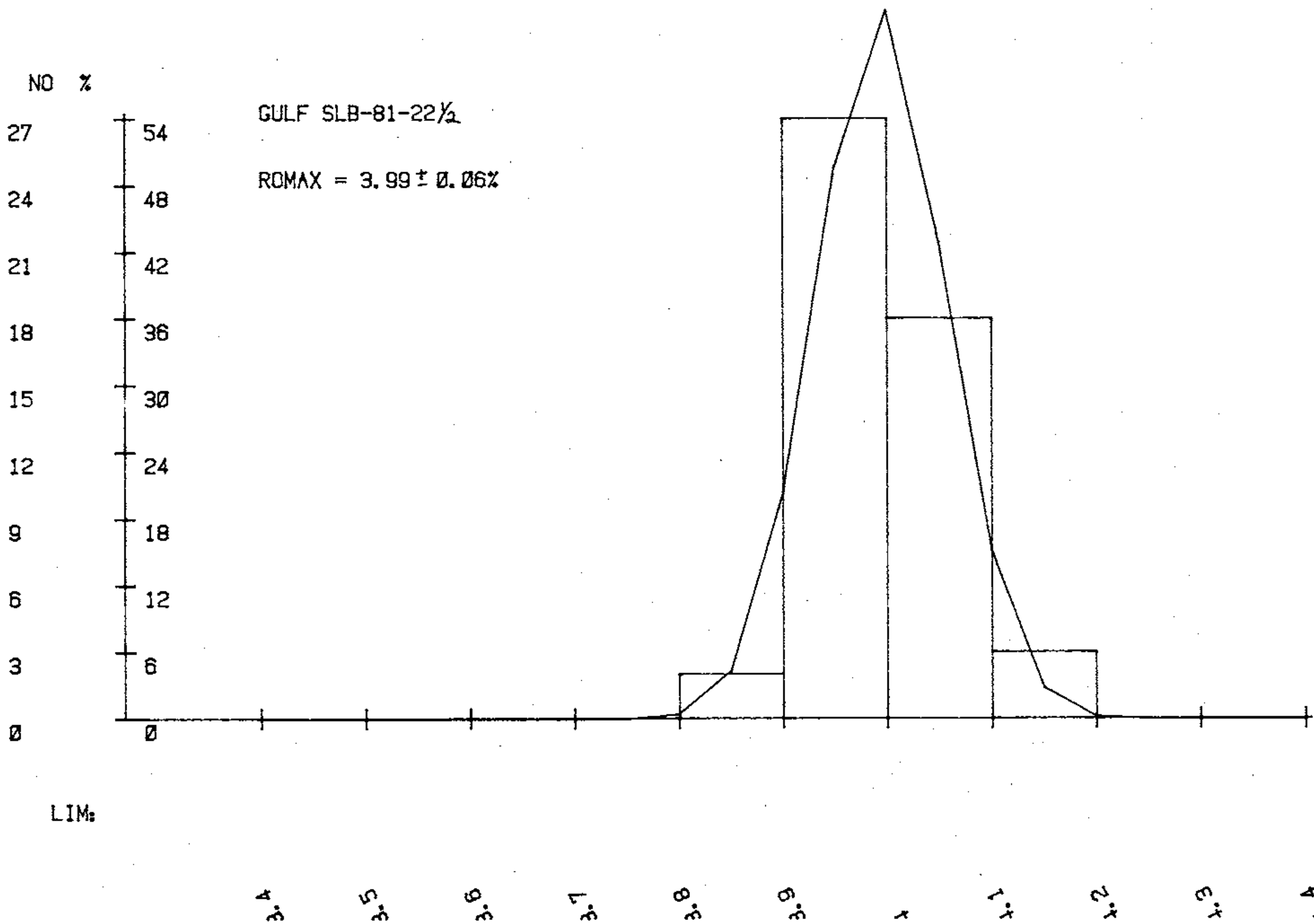
NO %
GULF SLB-81-20
ROMAX = 4.10 ± 0.10%
18 36
16 32
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
3.5
3.6
3.7
3.8
3.9
4
4.1
4.2
4.3
4.4
4.5

SLB-81-22½

I	X(I)	X(I+1)
1	4.0200	3.9500
3	3.9600	3.8700
5	4.0000	3.9600
7	4.0800	3.9000
9	4.0200	3.9700
11	3.9700	3.9500
13	3.8800	3.9800
15	3.9600	3.9300
17	3.9500	3.9100
19	3.9200	3.9600
21	4.0200	3.9800
23	4.0100	3.9900
25	4.0500	4.0500
27	4.0200	4.1200
29	4.0600	3.9700
31	4.1700	4.0800
33	3.9700	3.9400
35	4.0800	4.0300
37	3.9800	4.0100
39	4.0600	4.1100
41	4.0500	4.0600
43	4.0300	3.9500
45	3.9300	3.9700
47	3.9900	3.9800
49	3.9600	3.9600

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.9944
COEF OF VARIATION = 1.56%
VARIANCE = .0039
STANDARD DEVIATION = .0623
SKEWNESS = .4865
KURTOSIS = 3.1422

95.00% C.I. FOR MEAN
(3.9767, 4.0121)
ONE-TAIL t(49 , .025)=
2.01003450016

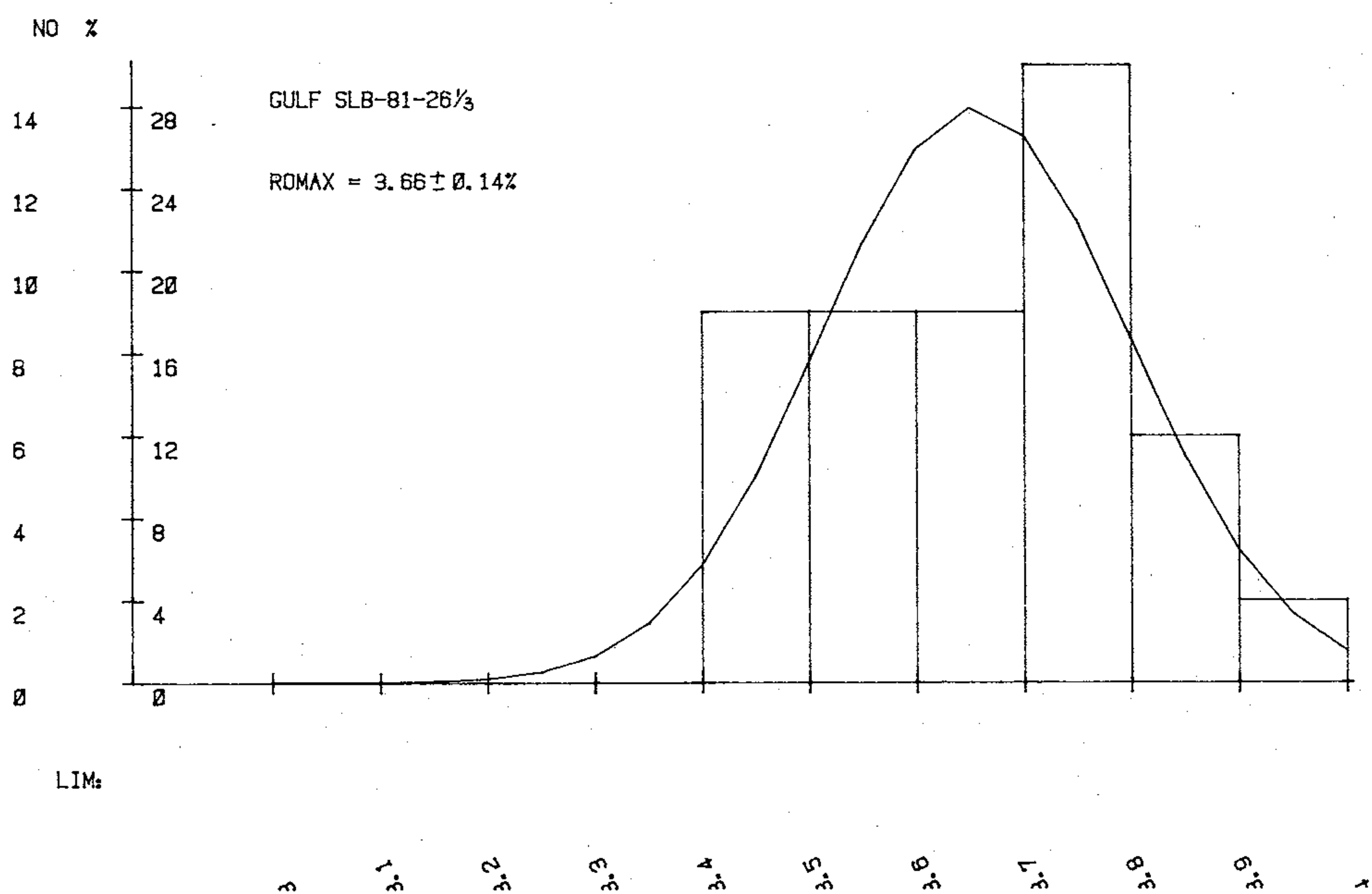

NO %
GULF SLB-81-22½
ROMAX = 3.99 ± 0.06%
27 54
24 48
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM:
3.4
3.5
3.6
3.7
3.8
3.9
4
4.1
4.2
4.3
4.4

SL8-81-26 1/3

I	X(I)	X(I+1)
1	3.5600	3.5300
3	3.7700	3.7200
5	3.7200	3.5800
7	3.6200	3.5800
9	3.4800	3.4600
11	3.5800	3.6500
13	3.7100	3.4500
15	3.7100	3.5200
17	3.4000	3.7000
19	3.9000	3.9100
21	3.6400	3.6800
23	3.7000	3.5400
25	3.6400	3.4400
27	3.4300	3.7200
29	3.7000	3.6200
31	3.7900	3.7700
33	3.4800	3.6200
35	3.5900	3.4400
37	3.8700	3.8300
39	3.6800	3.7900
41	3.6100	3.8300
43	3.4100	3.8600
45	3.7900	3.7900
47	3.5000	3.7200
49	3.8300	3.6900

```
BASIC STATISTICS
******************************
N =   50
STD ERROR OF THE MEAN=        .02
MEAN =        3.6550
COEF OF VARIATION =        3.91%
VARIANCE =            .0205
STANDARD DEVIATION =        .1431
SKEWNESS =          -.0678
KURTOSIS =          1.9976

    95.00% C.I. FOR MEAN:
(      3.6143,        3.6957)
ONE-TAIL t( 49 , .025 )=
 2.01003450016
```

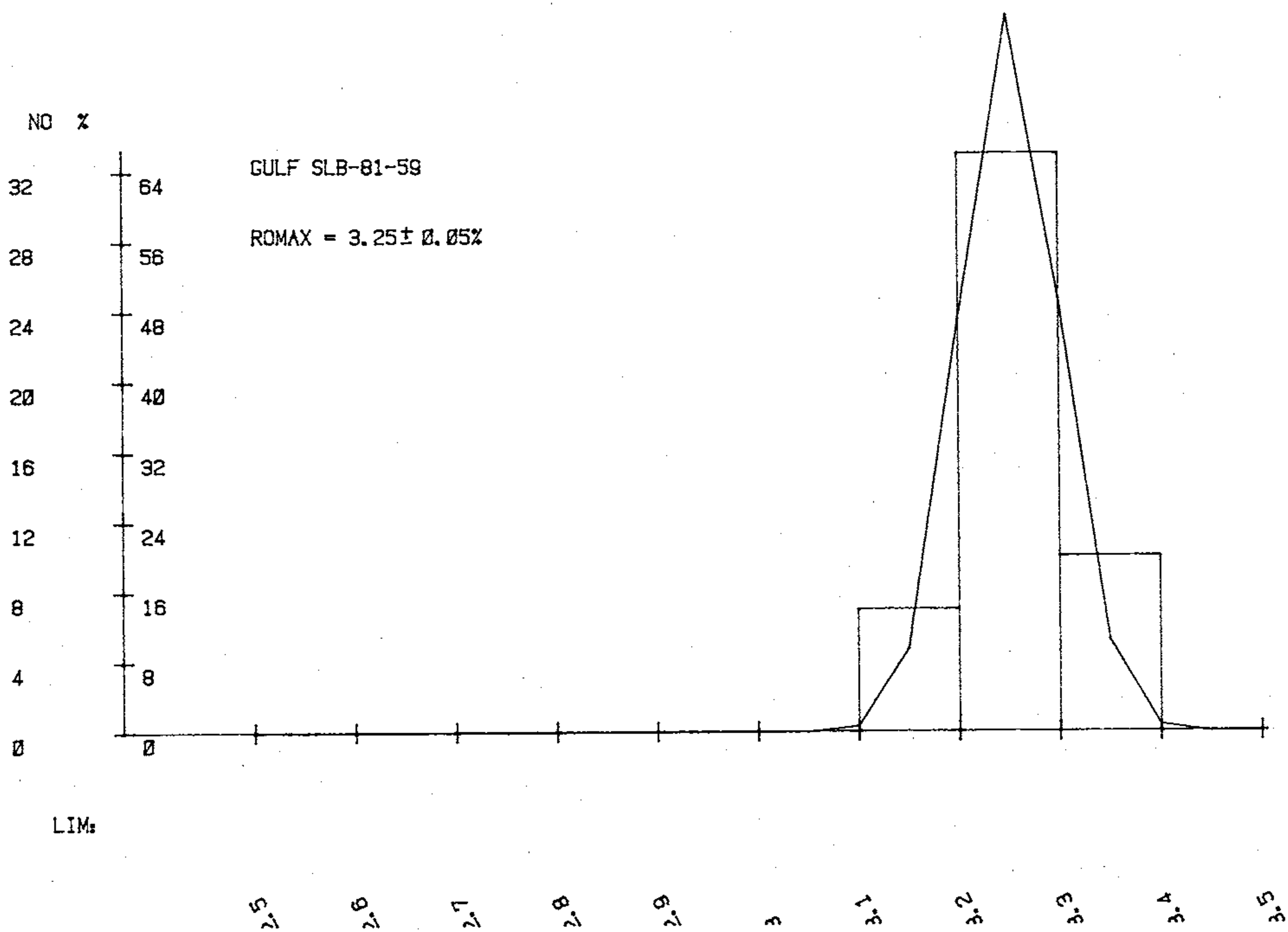

NO %
GULF SLB-81-26/3
ROMAX = 3.66±0.14%
14 28
12 24
10 20
8 16
6 12
4 8
2 4
0 0
LIM:
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8
3.9
4

SLB-81-59

I	X(I)	X(I+1)
1	3.1700	3.1900
3	3.1700	3.2400
5	3.2300	3.2000
7	3.2100	3.3100
9	3.2700	3.3700
11	3.2700	3.2300
13	3.3100	3.2900
15	3.2200	3.2300
17	3.2400	3.3200
19	3.2100	3.2700
21	3.3400	3.2900
23	3.2300	3.1900
25	3.2500	3.2300
27	3.2400	3.2700
29	3.3200	3.3100
31	3.2200	3.2300
33	3.2400	3.2800
35	3.2300	3.2300
37	3.2700	3.2400
39	3.2700	3.2600
41	3.2200	3.2600
43	3.3400	3.3400
45	3.3100	3.2400
47	3.2000	3.1900
49	3.1900	3.1800

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2512
COEF OF VARIATION = 1.50%
VARIANCE = .0024
STANDARD DEVIATION = .0487
SKEWNESS = .4440
KURTOSIS = 2.5022

95.00% C.I. FOR MEAN:
(3.2373, 3.2651)
ONE-TAIL t(49 , .025)=
2.01003450016



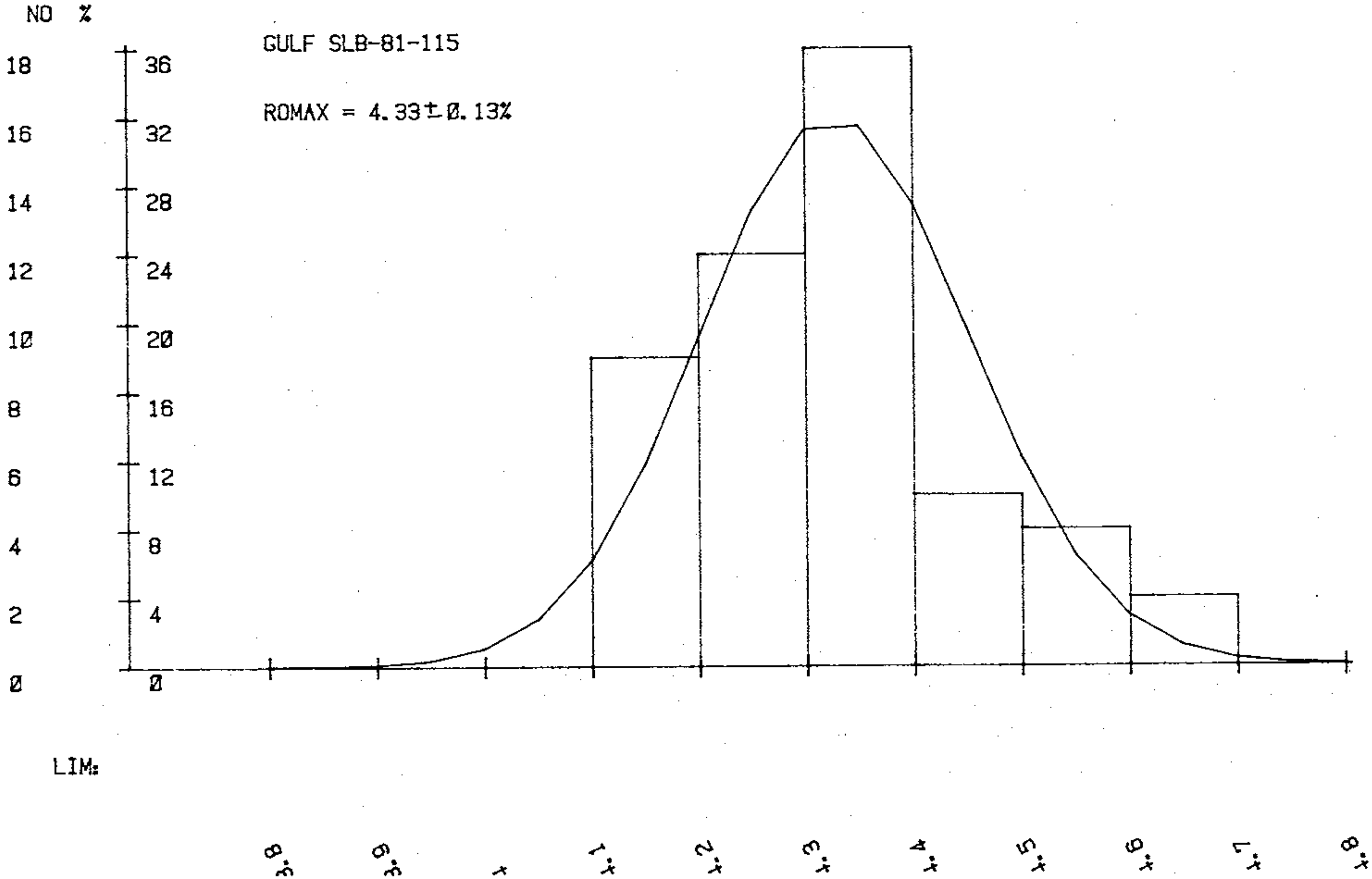
NO %
GULF SLB-81-59
ROMAX = 3.25± Ø.Ø5%
32 64
28 56
24 48
2Ø 4Ø
16 32
12 24
8 16
4 8
Ø Ø
LIM:
2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5

SLB-81-115

I	X(I)	X(I+1)
1	4.2700	4.4700
3	4.3700	4.4500
5	4.2600	4.3800
7	4.3500	4.2500
9	4.1800	4.3800
11	4.1800	4.2300
13	4.5600	4.2500
15	4.5000	4.3700
17	4.2700	4.5000
19	4.6000	4.3600
21	4.4900	4.3000
23	4.3000	4.2800
25	4.3800	4.3100
27	4.3000	4.6100
29	4.3200	4.5800
31	4.3000	4.2700
33	4.1600	4.3500
35	4.1500	4.4200
37	4.3200	4.3800
39	4.3300	4.2700
41	4.3700	4.2200
43	4.2700	4.1400
45	4.1600	4.1200
47	4.2800	4.1700
49	4.1500	4.4500

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 4.3266
COEF OF VARIATION = 2.88%
VARIANCE = .0156
STANDARD DEVIATION = .1248
SKEWNESS = .4796
KURTOSIS = 2.6691

95.00% C.I. FOR MEAN:
(4.2911, 4.3621)
ONE-TAIL t(49 , .025)=
2.01003450016



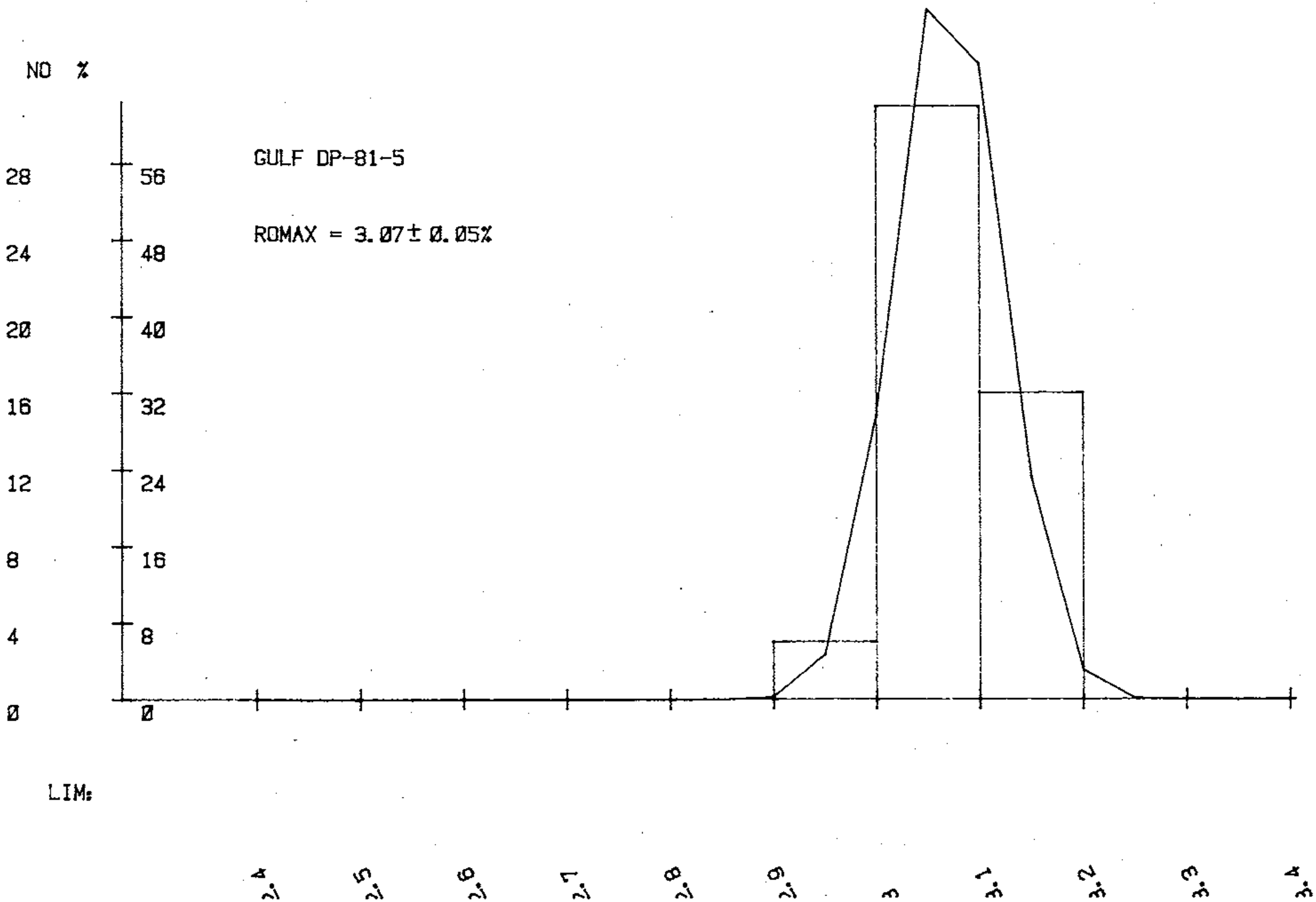
NO %
GULF SLB-81-115
ROMAX = 4.33±Ø.13%
18 16 14 12 1Ø 8 6 4 2 Ø
36 32 28 24 2Ø 16 12 8 4 Ø
LIM:
3.8 3.9 4. 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8

DP 81-5

I	X(I)	X(I+1)
1	2.9900	3.1600
3	3.0700	3.1400
5	3.0700	3.0000
7	3.0300	3.0400
9	3.0100	3.0200
11	3.0800	3.0600
13	3.0800	3.0100
15	3.1100	3.1200
17	2.9800	2.9900
19	3.1100	3.0600
21	3.0900	3.1000
23	3.0900	3.1000
25	3.1000	3.0900
27	3.0600	3.0700
29	3.0000	3.0700
31	3.0200	3.1800
33	3.0700	3.1100
35	3.0700	3.0300
37	3.0400	3.1500
39	3.1500	3.0500
41	3.0900	3.1100
43	3.0200	3.0000
45	3.0100	3.1500
47	3.0400	3.1300
49	3.1400	3.0800

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.0708
COEF OF VARIATION = 1.66%
VARIANCE = .0026
STANDARD DEVIATION = .0509
SKEWNESS = .1043
KURTOSIS = 2.1710

95.00% C.I. FOR MEAN:
(3.0563, 3.0853)
ONE-TAIL t(49 , .025)=
2.01003450016

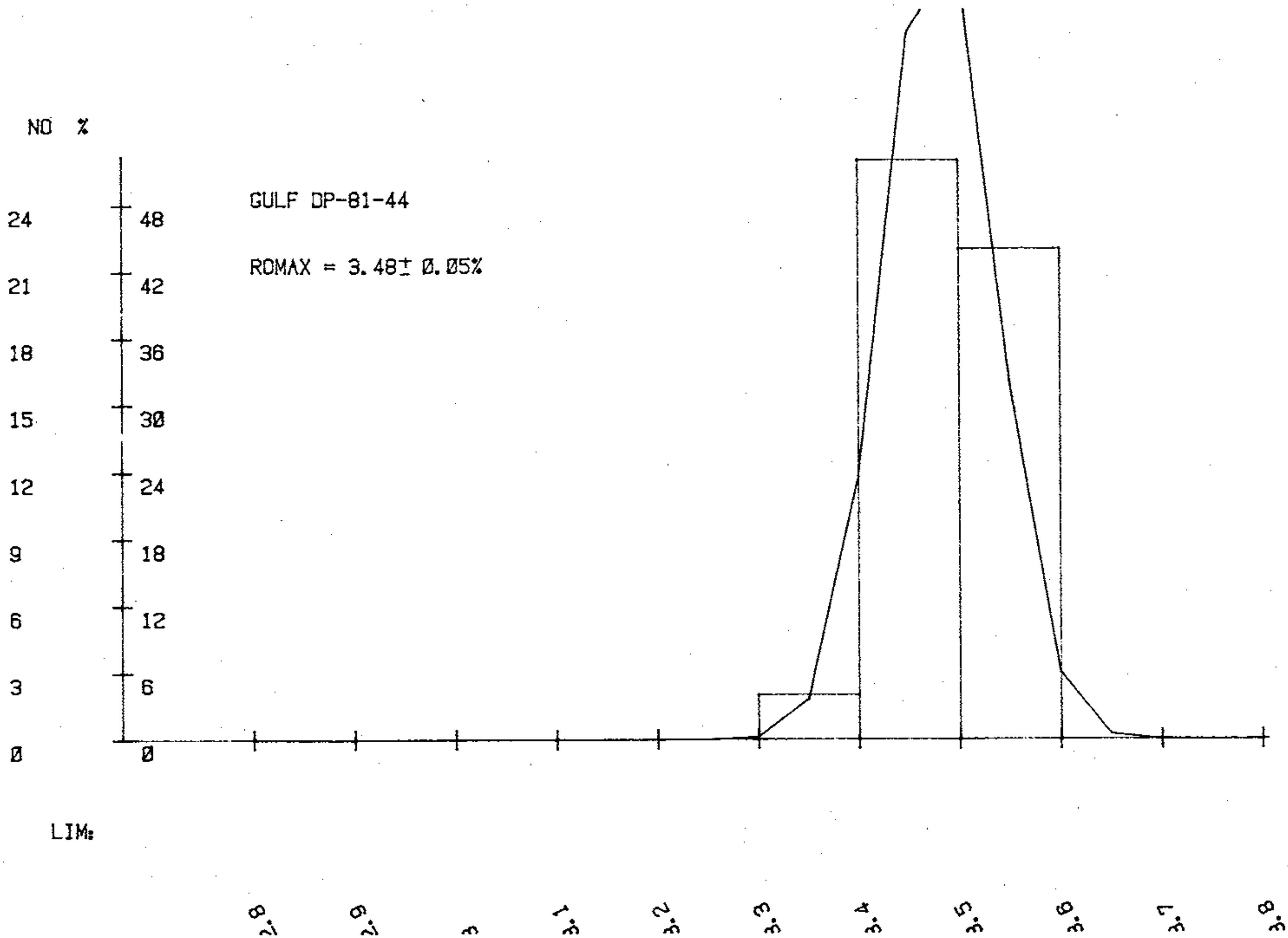

NO %
GULF DP-81-5
ROMAX = 3.07± 0.05%
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4

DP-81-44

I	X(I)	X(I+1)
1	3.4600	3.4100
3	3.5200	3.4800
5	3.5400	3.4300
7	3.5700	3.4700
9	3.5300	3.4500
11	3.3900	3.5200
13	3.4200	3.4300
15	3.5200	3.4500
17	3.4700	3.4300
19	3.4100	3.4000
21	3.4200	3.4400
23	3.4300	3.5500
25	3.5300	3.5600
27	3.4700	3.5500
29	3.5500	3.5100
31	3.4500	3.5400
33	3.4600	3.5300
35	3.5400	3.3900
37	3.5100	3.4500
39	3.5200	3.4900
41	3.5200	3.5300
43	3.4500	3.5300
45	3.5500	3.4800
47	3.4400	3.4000
49	3.4200	3.5300

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.4808
COEF OF VARIATION = 1.53%
VARIANCE = .0028
STANDARD DEVIATION = .0531
SKEWNESS = -.0748
KURTOSIS = 1.6481

95.00% C.I. FOR MEAN
(3.4657, 3.4959)
ONE-TAIL t(49 , .025)=
2.01003450016

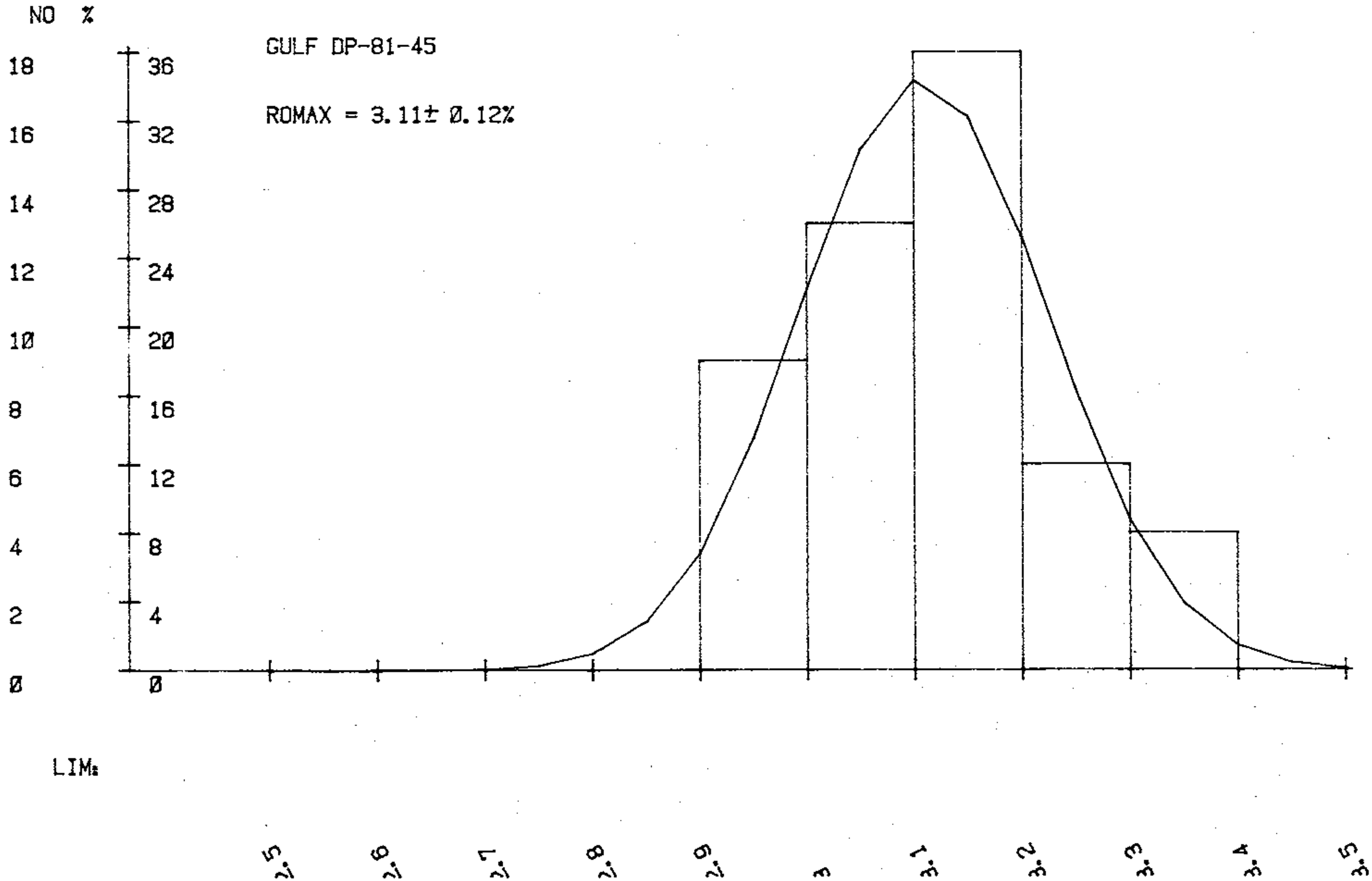

NO %
GULF DP-81-44
ROMAX = 3.48± Ø.Ø5%
24 48
21 42
18 36
15 3Ø
12 24
9 18
6 12
3 6
Ø Ø
LIM:
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7
3.8

DP. 81-45

I	X(I)	X(I+1)
1	3.1800	3.1400
3	3.1200	3.0200
5	3.0600	3.0300
7	3.1400	3.0300
9	3.1300	3.0700
11	3.3200	3.0300
13	3.1400	2.9400
15	3.3200	3.3200
17	3.1700	3.2700
19	2.9400	3.0700
21	3.0900	3.1100
23	2.9600	3.2800
25	3.3800	2.9600
27	3.0200	3.1300
29	3.2200	3.2800
31	3.2200	2.9400
33	3.1200	3.1600
35	3.0200	2.9900
37	3.1400	3.1400
39	3.1300	2.9500
41	3.0200	3.1900
43	2.9300	3.0100
45	3.2300	3.0700
47	2.9300	3.1400
49	3.1000	3.1200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 3.1084
COEF OF VARIATION = 3.73%
VARIANCE = .0134
STANDARD DEVIATION = .1158
SKEWNESS = .3392
KURTOSIS = 2.4534

95.00% C.I. FOR MEAN:
(3.0755, 3.1413)
ONE-TAIL t(49 , .025)=
2.01003450016

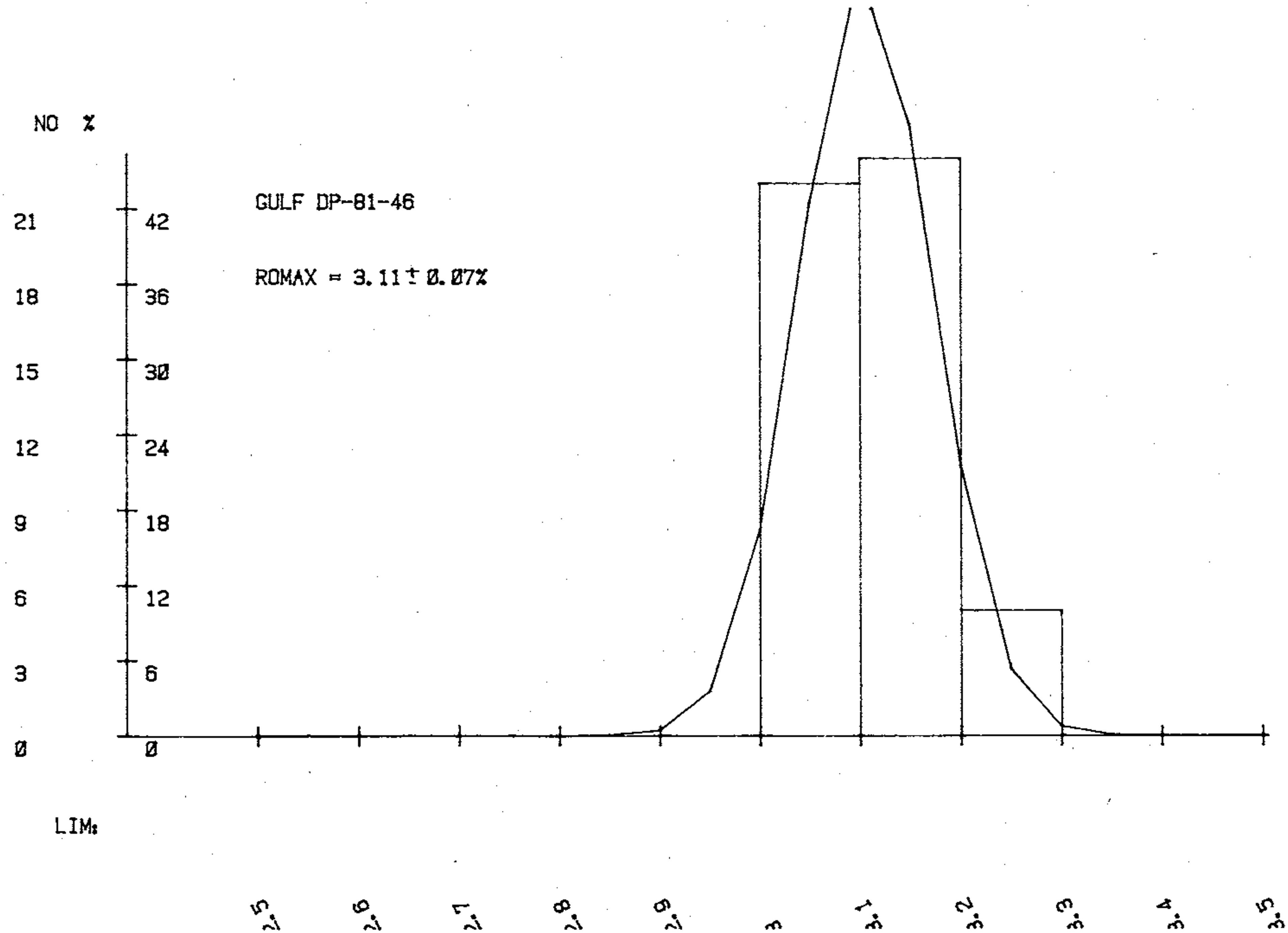

NO %
GULF DP-81-45
ROMAX = 3.11± 0.12%
18 16 14 12 10 8 6 4 2 0
36 32 28 24 20 16 12 8 4 0
LIM:
2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5

DP-81-46

I	X(I)	X(I+1)
1	3.1200	3.1800
3	3.0200	3.0000
5	3.0200	3.0800
7	3.0500	3.1900
9	3.0300	3.0200
11	3.2000	3.1900
13	3.1500	3.0900
15	3.0400	3.0200
17	3.1000	3.1200
19	3.1200	3.1100
21	3.0100	3.0200
23	3.1300	3.1[illegible]00
25	3.1500	3.0600
27	3.0000	3.0900
29	3.1000	3.1700
31	3.0300	3.0700
33	3.1300	3.1800
35	3.0900	3.1400
37	3.1700	3.1800
39	3.0600	3.0200
41	3.0700	3.1200
43	3.2200	3.1300
45	3.2300	3 1200
47	3.0800	3.1200
49	3.2000	3.2000

```
BASIC STATISTICS
*****************************
N =    50
STD ERROR OF THE MEAN=          01
MEAN =          3.1658
COEF OF VARIATION =          2.10%
VARIANCE =          .0042
STANDARD DEVIATION =          .0651
SKEWNESS =          .0391
KURTOSIS =          1.9155

     95.00% C.I. FOR MEAN:
(        3.0873,        3.1243)
ONE-TAIL t( 49 , .025 )=
 2.01003450016
```

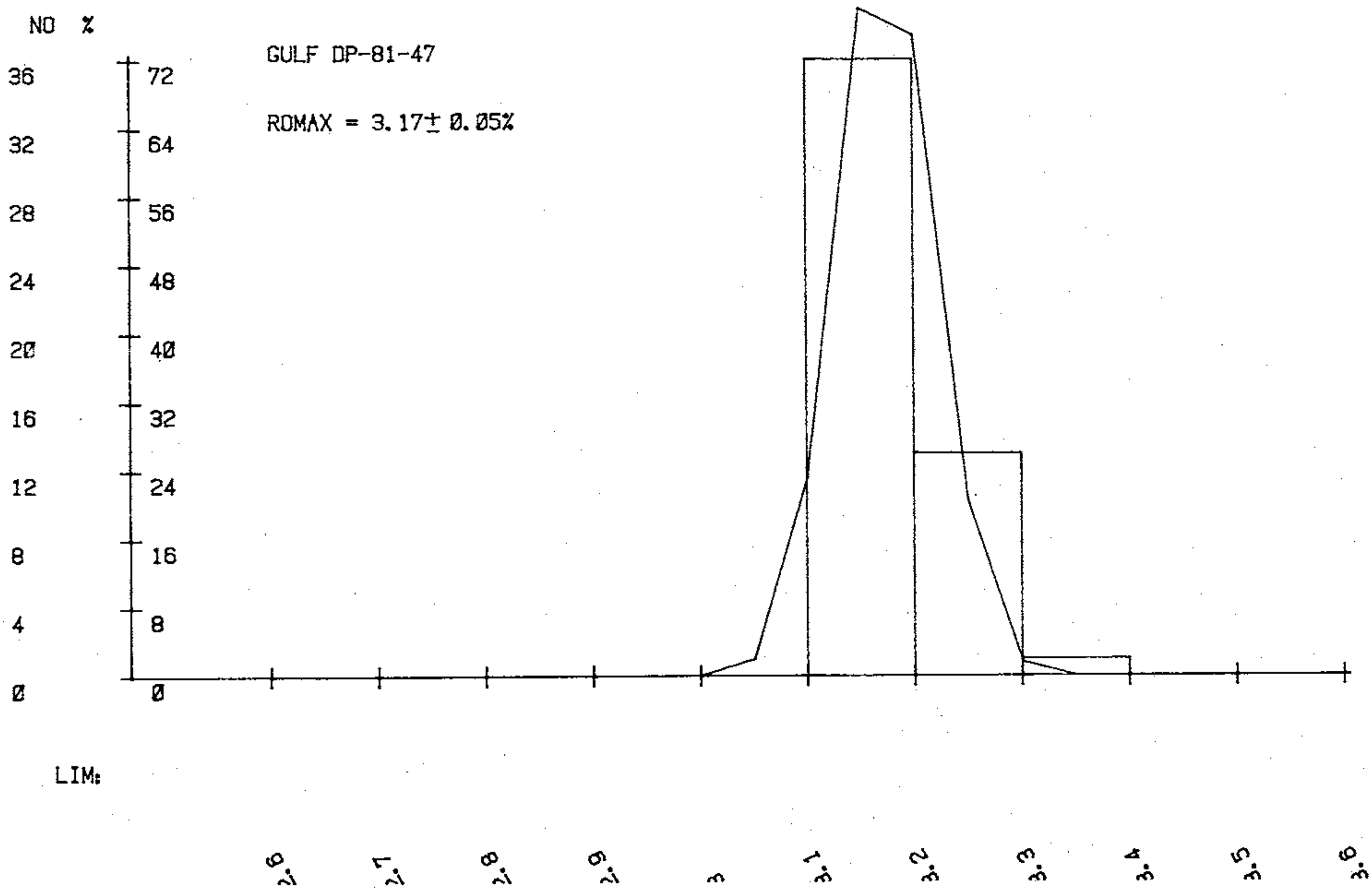

NO %
GULF DP-81-46
ROMAX = 3.11 ± 0.07%
21
18
15
12
9
6
3
0
42
36
30
24
18
12
6
0
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-47

I	X(I)	X(I+1)
1	3.1300	3.1500
3	3.1600	3.1400
5	3.1000	3.1600
7	3.1600	3.1600
9	3.1200	3.1200
11	3.1400	3.2200
13	3.1700	3.2000
15	3.1400	3.1900
17	3.1100	3.1400
19	3.1600	3.1900
21	3.1200	3.1700
23	3.1200	3.2100
25	3.2000	3.2600
27	3.2600	3.2400
29	3.3100	3.2100
31	3.1400	3.2000
33	3.2500	3.1800
35	3.1100	3.2200
37	3.1900	3.1600
39	3.2200	3.1600
41	3.1900	3.1600
43	3.1400	3.1300
45	3.2200	3.1700
47	3.1600	3.1800
49	3.1900	3.1400

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.1734
COEF OF VARIATION = 1.41%
VARIANCE = .0020
STANDARD DEVIATION = .0446
SKEWNESS = .7435
KURTOSIS = 3.4138

95.00% C.I. FOR MEAN:
(3.1607, 3.1861)
ONE-TAIL t(49 , .025)=
2.01003450016



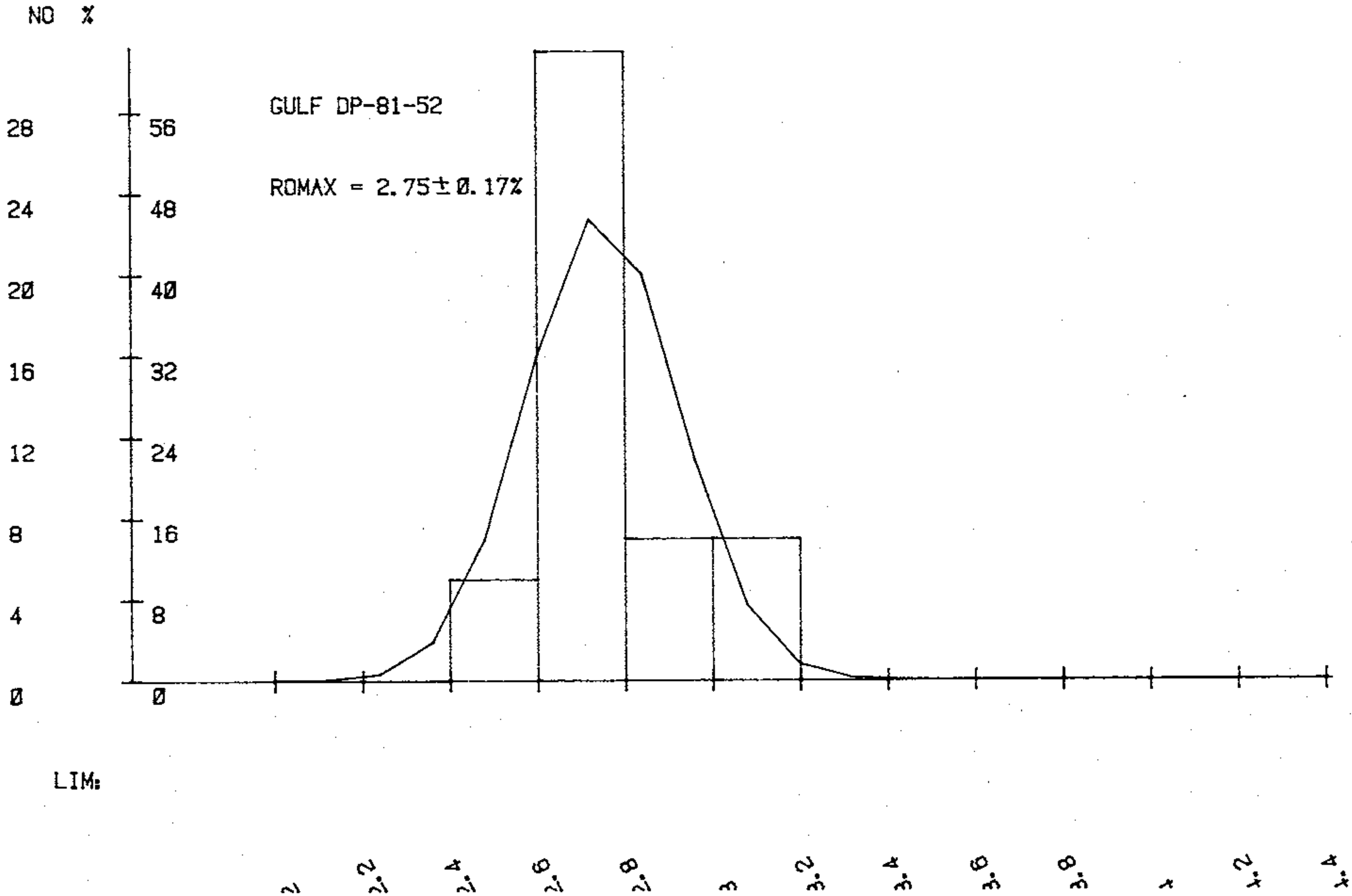
NO %
GULF DP-81-47
ROMAX = 3.17± 0.05%
36 32 28 24 20 16 12 8 4 0
72 64 56 48 40 32 24 16 8 0
LIM:
2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5 3.6

DP-81-52

I	X(I)	X(I+1)
1	2.9900	2.7100
3	2.7500	2.9400
5	2.9200	2.8300
7	2.7800	2.6800
9	2.6100	3.1900
11	3.1300	2.7200
13	2.6600	2.5800
15	2.9100	3.1100
17	2.7400	3.0300
19	2.8100	2.6700
21	2.6400	2.6400
23	2.7500	2.5400
25	2.7100	2.6700
27	2.5500	2.6100
29	2.6100	2.6400
31	2.6200	2.7100
33	2.7000	2.6600
35	2.5900	2.6200
37	2.5600	3.0200
39	2.6000	2.6700
41	2.6400	2.6000
43	2.6300	2.6100
45	3.0900	2.7200
47	2.6300	2.7200
49	3.0900	2.8200

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .02
MEAN = 2.7484
COEF OF VARIATION = 6.31%
VARIANCE = .0301
STANDARD DEVIATION = .1734
SKEWNESS = 1.0953
KURTOSIS = 3.0402

95.00% C.I. FOR MEAN:
(2.6991, 2.7977)
ONE-TAIL t(49 , .025)=
2.01003450016

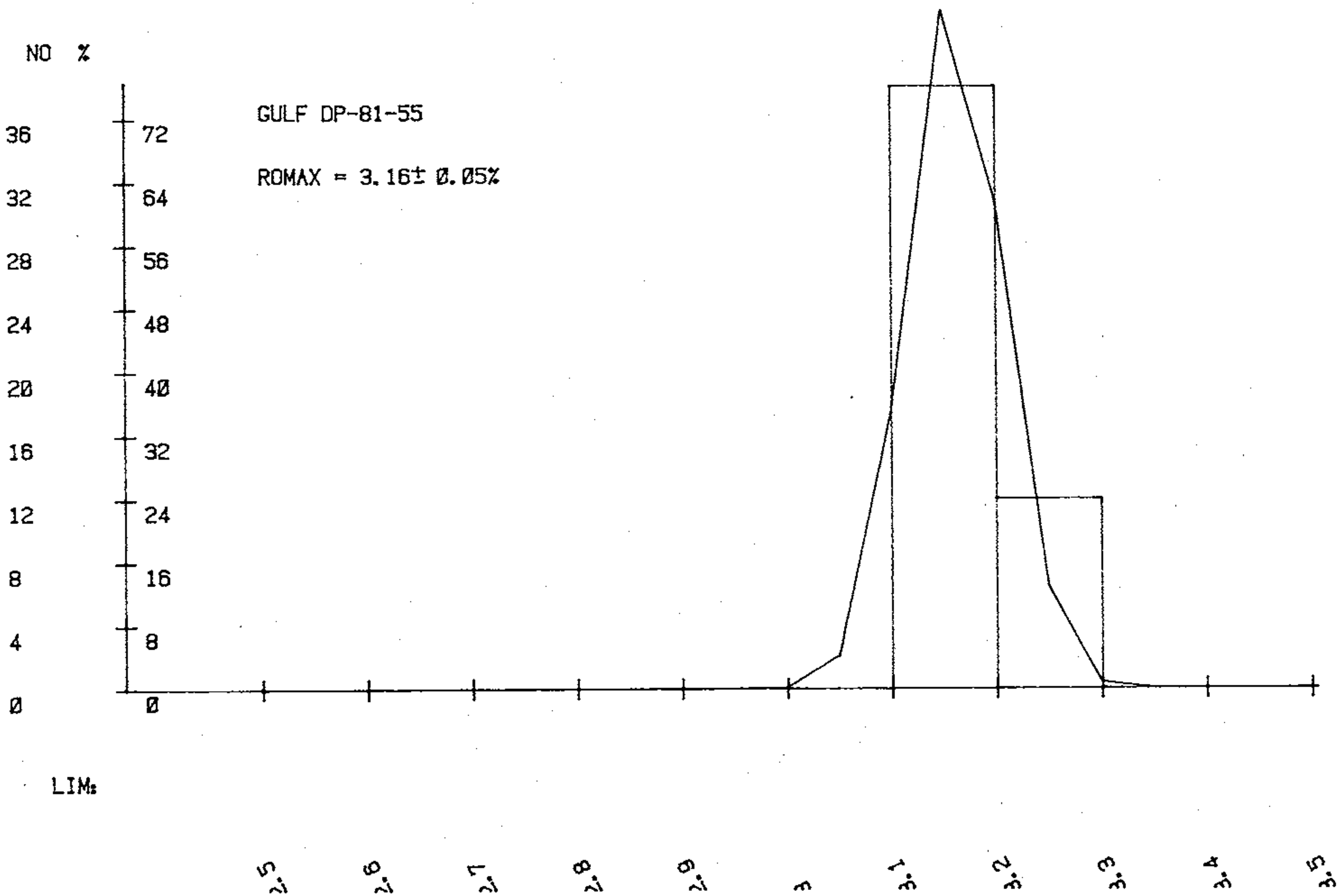

NO %
GULF DP-81-52
ROMAX = 2.75±0.17%
28 56
24 48
20 40
16 32
12 24
8 16
4 8
0 0
LIM:
2
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8
4
4.2
4.4

DP-81-55

I	X(I)	X(I+1)
1	3.1700	3.2300
3	3.1200	3.1800
5	3.1200	3.1300
7	3.2200	3.1100
9	3.1200	3.1300
11	3.1300	3.1900
13	3.2100	3.1700
15	3.1700	3.1400
17	3.2200	3.2000
19	3.2200	3.1400
21	3.1600	3.1100
23	3.1100	3.1300
25	3.1000	3.2800
27	3.1500	3.1100
29	3.1700	3.1300
31	3.2000	3.1700
33	3.1500	3.1700
35	3.1200	3.1700
37	3.1300	3.1300
39	3.1600	3.1000
41	3.1600	3.1700
43	3.2300	3.1200
45	3.1200	3.2300
47	3.2400	3.2600
49	3.1200	3.1600

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.1616
COEF OF VARIATION = 1.43%
VARIANCE = .0020
STANDARD DEVIATION = .0451
SKEWNESS = .7073
KURTOSIS = 2.6416

95.00% C.I. FOR MEAN:
(3.1488, 3.1744)
ONE-TAIL t(49 , .025)=
2.01003450016



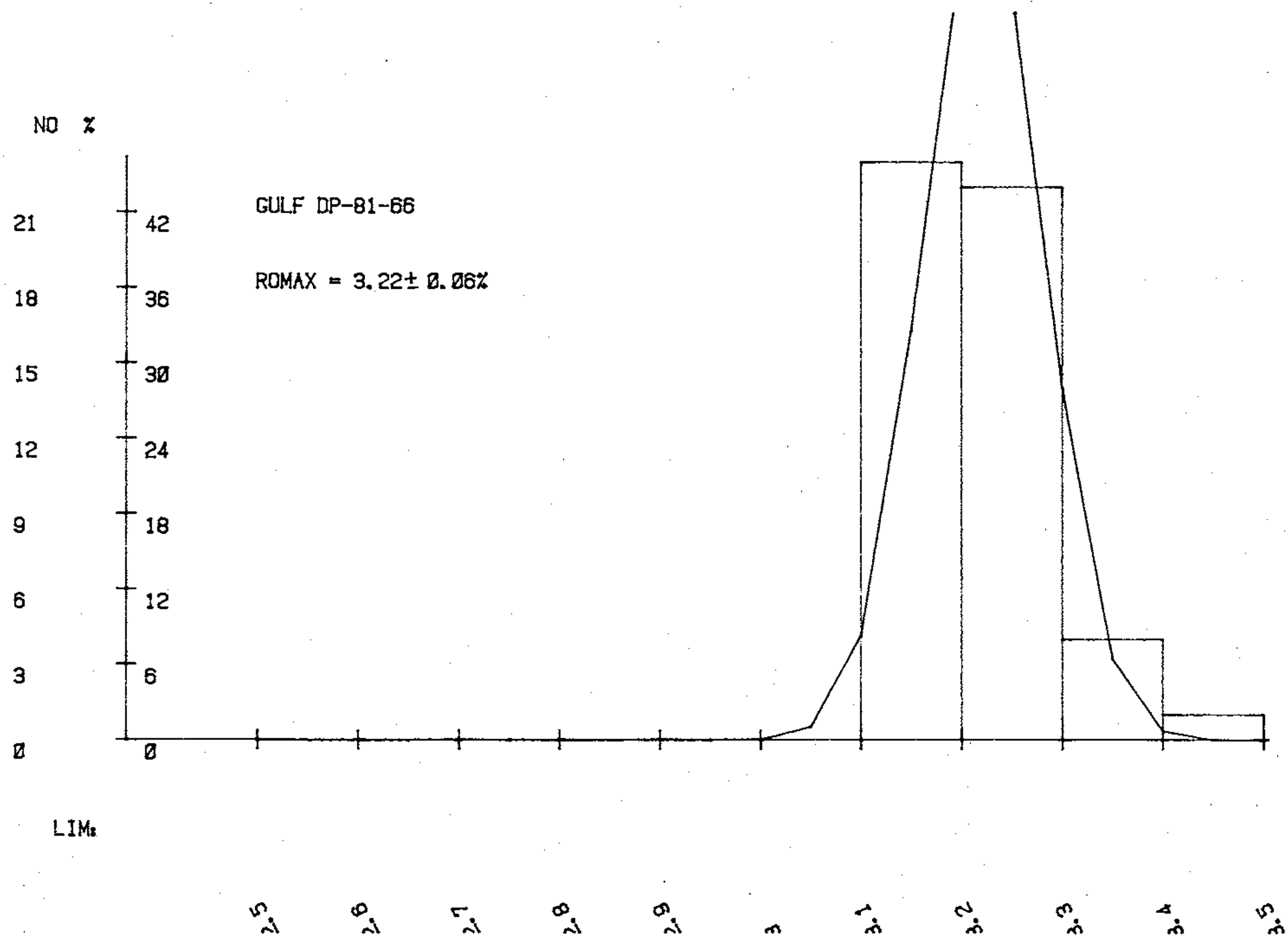
NO %
GULF DP-81-55
ROMAX = 3.16± Ø.Ø5%
36 72
32 64
28 56
24 48
20 40
16 32
12 24
8 16
4 8
Ø Ø
LIM:
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-66

I	X(I)	X(I+1)
1	3.2200	3.1800
3	3.2000	3.2300
5	3.3100	3.4100
7	3.3600	3.2800
9	3.2300	3.2000
11	3.2500	3.1900
13	3.2600	3.1500
15	3.2600	3.1900
17	3.2600	3.2600
19	3.1900	3.2700
21	3.2700	3.1600
23	3.1700	3.3200
25	3.1600	3.1600
27	3.2500	3.2200
29	3.2400	3.1800
31	3.2900	3.2700
33	3.1700	3.2200
35	3.1700	3.1500
37	3.1900	3.1500
39	3.1900	3.3500
41	3.1600	3.2200
43	3.2300	3.1900
45	3.2300	3.1800
47	3.1700	3.1800
49	3.1600	3.1700

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= 01
MEAN = 3.2214
COEF OF VARIATION = 1.85%
VARIANCE = .0035
STANDARD DEVIATION = .0595
SKEWNESS = 1.0663
KURTOSIS = 3.8691

95.00% C.I. FOR MEAN
(3.2045, 3.2383)
ONE-TAIL t(49 , .025)=
2.01003450016

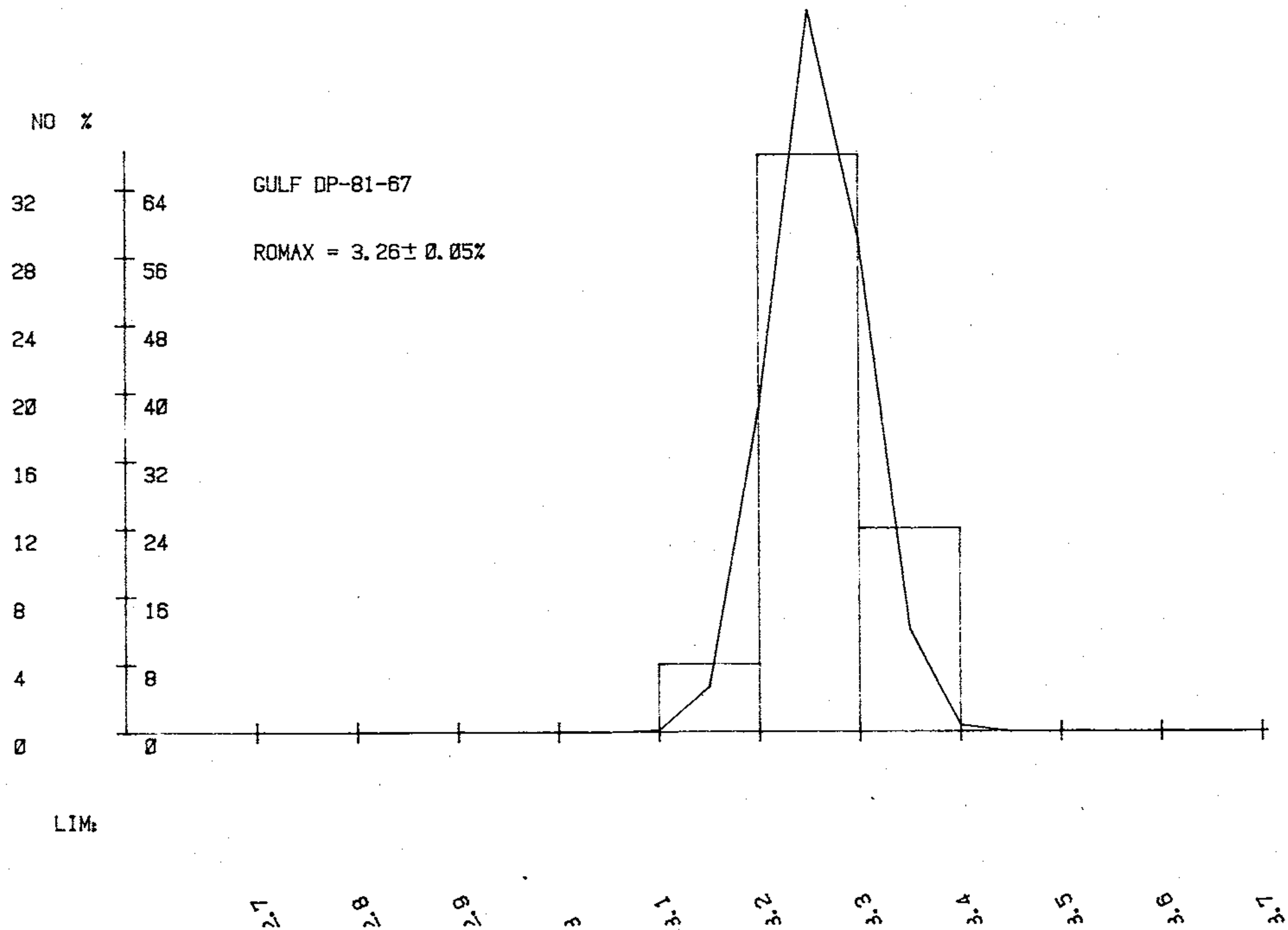

NO %
GULF DP-81-66
ROMAX = 3.22± 0.06%
21 42
18 36
15 30
12 24
9 18
6 12
3 6
0 0
LIM.
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5

DP-81-67

I	X(I)	X(I+1)
1	3.2600	3.2500
3	3.3300	3.2800
5	3.2500	3.3000
7	3.3000	3.2800
9	3.2600	3.2500
11	3.3000	3.2200
13	3.3000	3.2400
15	3.2100	3.2000
17	3.2700	3.2900
19	3.2500	3.2900
21	3.3100	3.3100
23	3.2500	3.2400
25	3.3100	3.2800
27	3.2800	3.2600
29	3.2300	3.2200
31	3.1900	3.1900
33	3.1900	3 1900
35	3.3800	3.3500
37	3.2500	3.2100
39	3.2000	3.3500
41	3.2700	3.3100
43	3 2300	3.2400
45	3.2300	3.2300
47	3.2800	3.2000
49	3.2200	3 2100

BASIC STATISTICS
****
N = 50
STD ERROR OF THE MEAN= .01
MEAN = 3.2588
COEF OF VARIATION = 1.41%
VARIANCE = .0021
STANDARD DEVIATION = .0461
SKEWNESS = .4285
KURTOSIS = 2.6583

95.00% C.I. FOR MEAN:
(3.2457, 3.2719)
ONE-TAIL t(49 , .025)=
2.01003450016


NO %
GULF DP-81-67
ROMAX = 3.26± 0.05%
32
28
24
20
16
12
8
4
0
64
56
48
40
32
24
16
8
0
LIM:
2.7
2.8
2.9
3
3.1
3.2
3.3
3.4
3.5
3.6
3.7