

# 127, 17 27, 17 (20) 77, 17 (20









## جامعة عين شمس

التوثيق الالكتروني والميكروفيلم



نقسم بللله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأفلام قد اعدت دون آية تغيرات



### يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15-20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of 15 – 25c and relative humidity 20-40 %



ثبكة المعلومات الجامعية





Information Netw. " Shams Children Sha شبكة المعلومات الجامعية @ ASUNET بالرسالة صفحات لم ترد بالأص



## EFFECT OF TECTONIC SETTING ON RESERVOIRS CHARACTERISTICS

#### IN

SIDI-BARRANI, NORTH WESTERN DESERT, EGYPT. USING SEISMIC DATA AND WELL LOGGING.

#### A thesis

Submitted in partial fulfillment of the requirements for the MASTER DEGREE OF SCIENCE (GEOPHYSICS)

BY

SALAH KHALED ABD EL DAYEM (B. Sc.)

To

Geophysics Department Faculty of Science Ain Shams University

#### **Supervisors**

Dr. Said Abd El Waahoud Aly

Assistant Prof. of Geophysics, Geophysics Department, Faculty of science, Ain Shams University. Dr. Mounir Abd El Mohsen Ismail

Assistant Prof. of Geophysics,
Geophysics Department,
Faculty of science,
Ain Shams University

Dr. Ibrahim Mohammed Hussein

Ihrahim Mohamma

Department Head, Exploration, EGPC

CAIRO, Egypt, 2000

BTKKE

my to the second

.

.

.

#### NOTE

This thesis submitted to the Faculty of Science, Ain Shams University in partial fulfillment for the requirements of the Master of Science in Applied Geophysics. Beside the research work materialized in this thesis, the author did attend post-graduate courses for one academic year in the following topics: -

- 1. Elastic Wave Theory.
- 2. Seismic Data Acquisition.
- 3. Seismic Data Processing.
- 4. Seismic Interpretation.
- 5. Earthquake Seismology.
- 6. Engineering Seismic.
- 7. Earth Structure.
- 8. Deep Seismic Sounding.
- 9. Numerical Analysis.
- 10. Computer Applications.
- 11. Field Geophysics and Lab. Measurements.
- 12. English Language.

He successfully passed the final examination in these courses held in September, 1997.

Prof. Dr. Nasser Ma H. Abu Ashour

Head of Geophysics Department.



#### **ACKNOWLEDGMENT**

The author wishes to express his deep thanks and sincere gratitude to Prof. Dr. Nasser Mohammed Hassan, Professor of Geophysics, Head of Geophysics Department, Faculty of Science, Ain Shams University, For his generous help and support during this work.

The author also wishes to express his deep thanks and sincere gratitude to Dr. Said Abd El Maaboud Aly, Assistant Professor of Geophysics, Geophysics Department, Faculty of Science, Ain Shams University, For his supervision, suggesting the point, valuable leading comments and critical reading and reviewing this manuscript.

The author also records his special thanks to Dr. Mounir Abd El Mohsen Ismail, Assistant Professor of Geophysics, Geophysics Department, Faculty of Science, Ain Shams University, for his continuous moral support, stimulating guidance, valuable discussions, conclusions and critical reading added greatly to the material of this thesis.

A special word of gratitude is due to Dr. Ibrahim Mohammed Hussein, Department Head, E.G.P.C. for his generous help and support during this work.

I express my gratitude to all of the E.G.P.C. staff for providing the required data upon which this thesis is based, especially Mr. Sami Shahin, Mr. Mohammed Tantawi and Mr. Atef Shaalan, whose help is highly and honorably appreciated.

Last but not least, Grateful and true appreciation are expressed to my Family for their true help patience and encouragement.



# LIST OF CONTENTS



### LIST OF CONTENTS

<u>Chapter</u>	No. Subject	Page
СНАР	TER ONE	1
		1,
1.	GENERAL STRATIGRAPHY AND	1
	GEOLOGY	1
1.1.	Introduction	1
1.2.	Stratigraphy	4
1.2.1	Paleozoic	4
1.2.2.	Mesozoic	4
1.2.2.1		6
1.2.2.2.	Cretaceous	8
a-	Lower Cretaceous	8 8 9
b-	Upper Cretaceous	9
1.2.3.	Cenozoic	10
1.3.	Structural Setting	12
1.4.	Tectonic Framework	14
1.5.	Geologic History	<u>1</u> 7
1.6.	Exploration History	20
СНАР	TER TWO	23
2.	WELL LOGGING ANALYSIS	23
2.1.	Introduction	23
2.2.	Log Data	$\overset{ op}{23}$
2.3.	Formation Evaluation Techniques	24
2,3,1.	Determination of formation temperature (FT)	24
2.3.2.	Corrections of the mud resistivities (R <sub>m</sub> , R <sub>me</sub> ar	
<u>-</u> .	$R_{\rm mf}$ )	25
2.3.3.	Determination of the formation water resistivity (R	l l
2.3.4.	Measurements and corrections of rock resistivities	26

Chapter N	No. Subject	Page
2.3.4.1.	Flushed zone resistivities (R <sub>x0</sub> )	26
	Microspherically-focused log (MSFL)	26
2.3.4.2.	Uninvaded-zone resistivities (Rt)	27
	Borehole correction	28
1-	Dual Laterolog Shallow (LLS)	28
2-	Dual-Laterolog Deep (LLd)	29
3-	Induction Log Deep (ILD)	30
2.3.5.	Determination of volume of shale (Vsh)	30
1-	Shale parameters	31
2-	Matrix parameters	31
3-	Fluid parameters	31
A-	Single-Curve Indicators	. 33
1-	Self-Potential Log	33
2-	Gamma-Ray Log	33
3-	Resistivity Log (R <sub>1</sub> )	33
4-	Neutron Log (φN)	34
B-	Double Curve Indicators	34
1-	Neutron and Density Logs	34
2-	Sonic and Density Logs	34
3-	Neutron and Sonic Logs	35
	Shale Volume Correction	35
2.3.6.	Determination of Formation Porosity (\$\phi\$)	35
2.3.6.1.	Corrections of porosity tools	36
1-	Bulk density (pb) correction	36
2-	Neutron porosity (\( \phi N \)) correction	36
Α-	Matrix correction (C <sub>1</sub> )	36
B-	Environmental corrections	37
1-	Borehole size correction (C <sub>2</sub> )	37
2-	Temperature/pressure correction (C <sub>3</sub> )	38
3-	Mud cake thickness correction (C <sub>4</sub> )	38
4-	Formation fluid salinity correction (C <sub>5</sub> )	39
5-	Borehole fluid salinity correction (C <sub>6</sub> )	39
6-	Mud weight correction (C <sub>7</sub> )	39