

**FACIES MODELING AND RESERVOIR EVALUATION
OF MESOZOIC SEQUENCE, SAWAN GAS FIELD,
CENTRAL INDUS BASIN, PAKISTAN**



By

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ABSTRACT

Sawan Gas Field, located in Central Indus Basin, Pakistan. Geologically the area lies in an extensional regime. It is situated in Pannu-Aqil Graben which is located in between Mari-Kandhkot High in the north and Jacobabad-Khairpur high in the south. 2 D seismic and well log data is used to carry out subsurface structural interpretation, reservoir evaluation and facies modeling respectively. Seismic interpretation inferred the presence of normal faults in the study area. The area under investigation displays a combination of two types of normal faults, 1) Major Faults (Type-1) and 2) Minor Faults (Type-2) with a dominant strike slip component (wrench faults). Total seven reflectors have been marked including Sui Main Limestone, Ranikot, Top Upper Goru, Lower Goru, C-interval, B-interval and Chiltan Limestone, seismic section shows that Lower Goru Formation is thinning towards the western side. There is a prominent eastward tilt in the horizons due to uplifting on the western side. Lower Goru C sands act as reservoir having sufficient potential of hydrocarbons. NPHI-RHOB chart has been generated which is super imposed on the benchmark chart for lithology identification, the reservoir marked in all wells mostly constitutes sandstone facies. The mineral cross plots generated for the mineral identification proposed that the major minerals present in reservoir zone are quartz and feldspar whereas clays act as a diagenetic cement. The study area comprises of alternate sand shale beds deposition. 3-D Facies modeling performed on the basis of stochastic object property modeling, where environment of deposition is provided i.e. Shelf edge delta deposits, deposition in form of channels geometry. Sand and shale lithology have been categorized by using GR Log and generated a 3-D model showing the amount of facies in the study area on the basis of well logs and alternate depositional pattern of sand and shale. The data have been extrapolated in between the wells using different algorithms and final model show that the reservoir quality sand was deposited in channel levee complex with a shelf edge deltaic depositional system.

DEDICATION

I dedicate this research work to my beloved parents.

CERTIFICATE OF ORIGINALITY

This is to certify that the intellectual contents of the thesis “**FACIES MODELING AND RESERVOIR EVALUATION OF MESOZOIC SEQUENCE OF SAWAN GAS FIELD, CENTRAL INDUS BASIN, PAKISTAN**” are the products of my own research work except, as cited properly and accurately in the acknowledgements and references, the material taken from such sources as research papers, research journals, books, internet, etc. Solely to support, elaborate, compare and extend the earlier work. Further, this work has not been submitted by me previously for any degree from this University, or any other University or institution. The incorrectness of this information, if proved at any stage, shall authorize the University to cancel my degree.

Signature: _____

Dated: _____

Name of the Research Candidate: Muhammad Atif Zafar

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CONTENTS

ABSTRACT	i
DEDICATION	ii
CERTIFICATE OF ORIGINALITY	iii
ACKNOWLEDGEMENT	iv
CONTENTS	v
FIGURES	vii
TABLES	vii

CHAPTER 1

INTRODUCTION

1.1	Introduction	1
1.2	Location map of study area	1
1.3	Exploration history of Central Indus Basin	2
1.4	Literature review	3
3.1	Objectives	6
1.5	Dataset	6
1.6	Methodology	6
3.1	Software	7

CHAPTER 2

TECTONICS AND STRATIGRAPHY

2.1	Regional Tectonics	8
2.2	Tectonic and structure of study area	9
2.3	Generalized stratigraphy of Central Indus Basin	11
2.3.1	Sembar Formation	11
2.3.2	Lower Goru Formation	12
2.4	Petroleum play of the study area	13
2.4.1	Source rock	14
2.4.2	Reservoir rock	15
2.4.3	Seal	15
2.4.4	Trap	15

CHAPTER 3

SEISMIC DATA INTERPRETATION

3.1	Introduction	16
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3.1.1	Base map of study area	16
3.1.2	Well to seismic tie and generation of synthetic seismogram	16
3.2	Interpretation of seismic lines	18
3.2.1	Interpreted Seismic line PSM-114	18
3.2.2	Interpretation of PSM-115	19
3.2.3	Interpretation of PSM-131	19
3.2.4	Interpretation of PSM-129	19
3.3	Time and Depth Maps of Cretaceous Sequence	20
3.3.1	Time and depth map of Upper Goru Formation	20
3.3.2	Time and depth map of Lower Goru Formation	29
3.3.3	Time and depth map of Lower Goru Formation C-Interval	29
CHAPTER 4		
RESERVOIR EVALUATION		
4.1	Introduction	36
4.2	Methodology	36
4.3	Formation evaluation of Sawan-01 well	37
4.4	Formation evaluation of Sawan-02 well	44
4.5	Formation evaluation of Sawan-03 well	50
CHAPTER 5		
FACIES MODELING		
5.1	Introduction	55
5.2	Environment of Deposition	56
5.3	Well correlation	57
5.4	Up scaling of Well Logs	57
5.5	Polygon formation and surface creation	58
5.6	Facies Model Generation	63
CHAPTER 6		
RESULTS AND DISCUSSION		
6.1	Introduction	66
6.2	Structural settings	66
6.3	Results and discussion	68
CONCLUSIONS		70
REFERENCES		71

FIGURES

Figure 1.1.	Location map of the study area (Siyar et al., 2017).	2
Figure 1.2.	Creaming curve for the discoveries in the Central Indus platform area, mainly targeting the Lower Goru Sand Bodies at reservoir interval (Ahmad et al., 2010).	4
Figure 1.3.	Generalized methodology adapted for the current research work.	7
Figure 2.1.	The structural elements of Pakistan with the classification of the Indus Basin into three subdivisions. The White box on the map displays the study area (After Farah et al., 1984; Kadri, 1995).	10
Figure 2.2.	Structural element of the study area (Farah et al., 1984 and Qadri, 1995).	12
Figure 2.3.	General stratigraphy of the Lower Indus Basin. Hydrocarbon discoveries from different reservoirs are also highlighted in the stratigraphic column (Kadri, 1995).	13
Figure 2.4.	Lower Goru stratigraphy in the study area with its nomenclature being used by different Exploration and Production operators (Ahmed et al., 2004).	14
Figure 3.1.	Base map showing the extent and geographical location of seismic sections and wells (Generated on IHS Kingdom 8.6).	18
Figure 3.2.	Synthetic seismogram generated by using well logs of Sawan 01 well on PSM-114 line.	18
Figure 3.3.	Uninterpreted Strike line PSM-114	22
Figure 3.4.	Interpreted Strike line PSM-114	23
Figure 3.5.	Uninterpreted Seismic dip line PSM-115	24
Figure 3.6.	Interpreted Seismic dip line PSM-115.	25
Figure 3.7.	Uninterpreted seismic dip line PSM-131	26
Figure 3.8.	Interpreted Seismic dip line PSM-131	27
Figure 3.9.	Uninterpreted dip line PSM-129	28
Figure 3.10.	Interpreted Seismic dip line PSM-129	29
Figure 3.11.	Time map of Top Upper Goru Formation.	31
Figure 3.12.	Depth map of Top Upper Goru Formation.	32
Figure 3.13.	TWT map of Top Lower Goru Formation.	33
Figure 3.14.	Depth map of Top Lower Goru Formation.	34

Figure 3.15.	TWT map of Lower Goru C-interval.	35
Figure 3.16.	Depth map of Lower Goru C-interval.	36
Figure 4.1.	Generalized methodology adopted for formation evaluation.	38
Figure 4.2.	Uninterpreted raw log curve of Sawan-01 well before Quality check of the log data.	40
Figure 4.3.	Uninterpreted log curve of Sawan-01 well after Quality check of the log data.	41
Figure 4.4.	Interpreted log curves top and bottom 20m of reservoir in Sawan-01 well.	43
Figure 4.5.	Interpreted log curves in reservoir zone showing perspective Hydrocarbon bearing zone in Sawan-01 well.	44
Figure 4.6.	RHOB VS NPHI in reservoir zone of Sawan-01 well.	45
Figure 4.7.	DGA VS UMa in reservoir zone of Sawan-01 well.	46
Figure 4.8.	Uninterpreted log curve of Sawan-02 well before Quality check of the log data.	47
Figure 4.9.	Uninterpreted log curve of Sawan-02 well after Quality check of the log data.	48
Figure 4.10.	Interpreted log curves top and bottom 20m of reservoir in Sawan-02 well.	49
Figure 4.11.	Interpreted log curves in reservoir zone showing perspective Hydrocarbon in Sawan-02 well.	50
Figure 4.12.	RHOB VS NPHI in reservoir zone of Sawan-02 well.	51
Figure 4.13.	DGA VS UMA in reservoir zone of Sawan-02 well.	51
Figure 4.14.	Uninterpreted log curve of Sawan-03 well before Quality check of the log data.	52
Figure 4.15.	Uninterpreted log curve of Sawan-03 well after Quality check of the log data	53
Figure 4.16.	Interpreted log curves top and bottom 20m of reservoir in Sawan-03 well.	54
Figure 4.17.	Interpreted log curves in reservoir zone showing perspective Hydrocarbon in Sawan-02 well.	55
Figure 4.18.	RHOB VS NPHI in Reservoir Zone of Sawan-03 well.	56
Figure 4.19.	DGA VS UMA in Reservoir Zone of Sawan-03 well.	56

Figure 5.1.	Hypothetical depositional model of Sawan gas field.	59
Figure 5.2.	Well correlation showing facies log.	61
Figure 5.3.	Well displayed in 3D grid.	62
Figure 5.4.	Up scaled facies log.	63
Figure 5.5.	Layers and polygon among Sawan wells.	64
Figure 5.6.	Sand and shale percentage within the study area.	66
Figure 5.7.	Facies model for the study area.	67

TABLES

Table 1.1 Data required for study	6
Table 3.1. Horizon marked and their color codes.	16