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STRUCTURAL FRAMEWORK OF THE WESTERN WILLISTON BASIN,
NORTHEAST MONTANA AND ADJACENT AREAS.

BY

Ruskamto Soeripto

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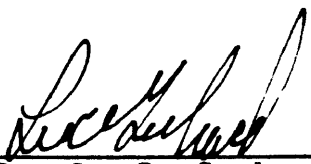
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ABSTRACT

A paleostructural study of the western part of the Williston basin identified five periods of tectonic activity during the Phanerozoic: Early Devonian; Late Devonian; Late Mississippian; Late Triassic; and Late Cretaceous - Early Tertiary. No data are available to establish pre-Silurian paleostructural history. Paleostructural trends defined by alignment of isopach thins and thicks strike north, northwest and northeast. These structural trends are interpreted as representing zones of weakness in the basement formed during Precambrian time. Deformation occurred recurrently along pre-existing zones of weakness in the basement. Block-coupling style of deformation occurred in the segmented basement that propagated upward, creating structures in the overlying strata.

A north-trending fault zone east of Poplar, Montana was active during Early Devonian deformation and remained periodically active since then. This fault zone with presently downthrown to the east is interpreted as representing a major shear zone in the basement. Northwest-trending paleostructural features were documented to be active periodically since Silurian to present time.

Northeast-trending paleostructures were dominantly active during Early Mississippian to Late Paleozoic time, and were probably developed in response to the extension of the Montana trough. Recurrent movement with reversed displacement on some of the northeast-trending faults occurred during the Laramide deformation.

TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT	iii
LIST OF ILLUSTRATIONS	vii
LIST OF PLATES	viii
ACKNOWLEDGEMENTS	ix
INTRODUCTION	1
Purpose and Scope of Study	3
Geographic Location	4
Previous Investigations	4
Database and Methods	7
REGIONAL GEOLOGY	12
Stratigraphic Summary	14
Sauk Sequence	14
Tippecanoe Sequence	14
Kaskaskia Sequence	16
Absaroka Sequence	20
Zuni Sequence	21
Structure	21
Basement related structures.	21
Non-basement structures.	28
PALEOSTRUCTURAL INTERPRETATION	30
Introduction	30

TABLE OF CONTENTS (CONT.)

	<u>Page</u>
Upper Tippecanoe Paleostucture	34
Prairie Salt Dissolution	37
Lower Kaskaskia Paleostucture	40
Upper Kaskaskia Paleostucture	42
Absaroka to Lower Zuni Paleostucture	47
Summary	50
PRESENT STRUCTURAL CONFIGURATION	56
Top Red River Structure	56
Top Bakken Structure	57
Top Charles Structure	58
Structural Growth	59
STRUCTURAL HISTORY	64
FUTURE WORK	68
CONCLUSIONS	70
REFERENCES	72
APPENDICES	
A. WELL DATABASE: WELL LOCATION AND FORMATION TOPS	77
B. WELL DATABASE: SUBSEA DEPTH AND INTERVAL ISOPACH	79

LIST OF ILLUSTRATIONS

<u>Figure</u>	<u>Page</u>
1. Index map showing location of the Williston basin.	2
2. Geographic location showing townships and ranges of the study area	5
3 A. Type log of the study area (upper section)	9
3 B. Type log of the study area (lower section)	10
4. Map showing the major structural features of the Williston basin (Anderson et al, 1982)	13
5. Generalized stratigraphic column of the Williston basin (modified from Bluemle et al., 1980)	15
6. Map showing surface lineaments in Blood Creek and Williston basins (Thomas, 1974).	23
7. Pull-apart basin origin of the Williston basin in response to the movement of Fromberg and Colorado-Wyoming shear zones (Gerhard et al., 1982).	26
8. Cross section showing thickness compensations due to Prairie salt dissolution	39
9. Cross section across Spring Lake Field, showing fault movement after deposition of Charles Formation	45
10. Maps showing paleostructural linears during Early Devonian (A) and Late Devonian (B) deformations.	51
11. Maps showing paleostructural linears during Late Mississippian (C) and Late Triassic (D) deformations	52
12. Summary map showing development of paleostructural linears during Early Devonian to Late Triassic time interpreted from isopach maps	54
13. Structure maps on tops of Charles, Bakken and Red River Formations of Lone Tree Creek Field: increasing dip with depth suggests structural growth.	60
14. Diagrammatic cross section across west flank of the Lone Tree Creek Field, illustrating structural growth.	62

LIST OF PLATES

Plates

- | | |
|---|-----------|
| 1. Isopach map of tops Red River-Interlake Fms. | In Pocket |
| 2. Isopach map of Prairie Evaporite. | In Pocket |
| 3. Isopach map of tops Dawson Bay - Bakken Fms. | In Pocket |
| 4. Isopach map of tops Bakken - Charles Fms. | In Pocket |
| 5. Isopach map of tops Charles - Greenhorn Fms. | In Pocket |
| 6. Structure map on top of the Red River Fm. | In Pocket |
| 7. Structure map on top of the Bakken Fm. | In Pocket |
| 8. Structure map on top of the Charles Fm. | In Pocket |
| 9. Stratigraphic cross section Poplar-Bainville. | In Pocket |
| 10. Stratigraphic cross section Fairview Area. | In Pocket |
| 11. Stratigraphic cross section Mondak-Williston. | In Pocket |
| 12. Stratigraphic cross section Dwyer-Bainville. | In Pocket |
| 13. Stratigraphic Cross Section Richey Field. | In Pocket |

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