

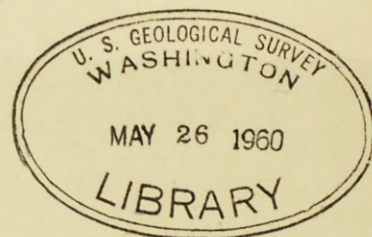
200)
page
27

United States

Department of the Interior

✓ U.S. Geological Survey

Washington



Geological Investigations

Naval Petroleum Reserve No. 4

Alaska

Special Report No. 27

REVIEW AND PHOTOGEOLOGIC EVALUATION OF SOME SELECTED

ANTICLINES IN THE MAYBE CREEK AREA

1950

page
27

United States

Department of the Interior

✓ U.S. Geological Survey

Washington

Geological Investigations

Naval Petroleum Reserve No. 4

Alaska

Special Report No. 27

REVIEW AND PHOTOGEOLOGIC EVALUATION OF SOME SELECTED

ANTICLINES IN THE MAYHE CREEK AREA

By

William A. Fischer

November 1950

CONTENTS

	Page
Introduction	1
Tabulated Data	2

ILLUSTRATIONS

Fig. 1	Postulated stratigraphic sequence of proposed drilling locations, Maybe Creek area	7
Fig. 2	Photogeologic map #23 showing suggested locations for proposed 1,500 foot holes	(Separate)
Fig. 3	Photogeologic map #24 showing suggested locations for proposed 1,500 foot holes	(Separate)

REVIEW AND PHOTOGEOLOGIC EVALUATION OF SELECTED ANTICLINES

OF THE MAYBE CREEK AREA, ALASKA

By

William A. Fischer

Introduction

The following report presents in tabulated form the location, structure, and stratigraphy of various anticlines in the Maybe Creek area which are presently considered to be reasonably favorable drilling sites. References to more complete sources of information for each anticline are listed.

The accompanying diagram (Fig. 1) presents a generalized stratigraphic picture of the section that would be penetrated by a hole located on the crest of each of these structures. The zonal thicknesses, as shown in this diagram, are average figures and they probably vary from anticline to anticline within this area as they do elsewhere on the North Slope. The thickness of postulated favorable sands and also the stratigraphic horizon reached by each of the proposed 1,500-foot holes may be further affected by the postulated prezone F unconformity. It seems probable that zone E is essentially absent at Umiat. At the Weasel Creek anticline a total of approximately 1,700 feet of zone E sediments appear to be present. This is probably the complete zone E section. Thus the thickness of zone E sediments may vary considerably from place to place within the area west of Umiat covered by this report, and these possible variations are not shown in the diagram (Fig. 1). Interpretations of depth and thickness of favorable sands are based on the facies studies of T. G. Payne^{1/}.

Discussions presented are limited to Nanushuk Group rocks and no reference is made nor inference intended as to possible favorable stratigraphic or structural conditions in the older sedimentary rocks.

^{1/} Payne, T. G., Areal evaluation of petroleum possibilities of major stratigraphic units in northern Alaska; U. S. Geological Survey, Navy Oil Unit Report No. 24, November 1948.

Tabulated Data

SQUARE LAKE ANTICLINE

Quadrangle H-13

Approximate position $69^{\circ}34'$ N - $153^{\circ}15'$ W.

Structure

Precise axial position impossible to establish by surface methods. East plunge is probable, judging from regional trends and the configuration of the structures to the east. No information is available concerning west plunge.

Stratigraphy

Rock at the surface, near the axis, is probably zone G. Total depth of favorable sands would probably not exceed 2,500 feet; this figure may not be accurate because of the postulated pre-zone F unconformity.

References

U. S. Navy Geological report of the Square Lake area.
Special 1950 photogeologic map of the Square Lake area, Alaska.

WOLF CREEK ANTICLINE

Quadrangle I-13

Approximate position $69^{\circ}23'$ N - $153^{\circ}30'$ W.

Structure

East plunge established; approximately 1,000 feet.
West plunge established; only 20 feet proved but probably totals more than 300 feet.

Stratigraphy

Rock at the surface, near the axis, probably zone F. Total depth of favorable sands approximately 4,600 feet. This should not be considered as an exact figure because of the postulated pre-zone F unconformity.

References

U. S. Geological Survey, Navy Oil Unit, Regular Reports Nos. 4, 13, 25, and 30.

WEST TITALUK ANTICLINE

Quadrangle I-14

Approximate position $69^{\circ}25'$ N. - $154^{\circ}33'$ W.

Structure

Closure established by surface mapping and geophysical work.
Total closure exceeds 300 feet.

Stratigraphy

Rock at the surface, near the axis, is upper zone E.
Total depth of favorable sands approximately 4,500 feet. This figure may be inaccurate because of possible thinning of the zone E sediments.

References

U. S. Geological Survey, Navy Oil Unit, Regular Reports Nos. 4, 25, 30, and 32.
1950 reports of United Geophysical Party 144.

WILLOW ANTICLINE

Quadrangle H-14

Approximate position $69^{\circ}35'$ N. - $154^{\circ}35'$ W.

Structure

Little is known about the structure of this anticline. It has been generally located by photogeologic studies and the axis positioned by geophysical studies. No information on closure is available although there is a strong possibility of west plunge.
The relationship of this structure to the Wolverine, Wolf Creek, or Square Lake anticlines is not known.

Stratigraphy

It is probable that the rock at the surface, near the axis, is zone E, probably somewhat lower in the section than that exposed at the axis of the Titaluk anticline. Total depth of favorable sediments should not exceed 4,200 feet. This may be lessened by the postulated pre-zone F unconformity.

References

Photogeologic quadrangle map H-14
1950 reports of United Geophysical Party 144.

EAST TITALUK ANTICLINE

Quadrangle I-13

Approximate position $69^{\circ}20'$ N. - $154^{\circ}00'$ W.

Structure

Established closure in excess of 80 feet. This is a continuation of the Titaluk anticlinal axis and represents only a local structural high. It is structurally lower than the Titaluk anticline.

Stratigraphy

Rock exposed at the surface, near the axis, is zone F. Probable total depth of favorable sediments is approximately 4,800'. This should not be considered as an exact figure because of the postulated pre-zone F unconformity.

References

U. S. Geological Survey, Navy Oil Unit, Regular Report No. 32

MAYBE CREEK DOME

Quadrangle I-13

Approximate position $69^{\circ}20'$ N. - $153^{\circ}45'$ N.

Structure

Established closure approximately 20 feet. This is a continuation of the Titaluk anticlinal axis and represents only a small structural high. It is structurally lower than the Titaluk or East Titaluk highs.

Stratigraphy

Rocks exposed near the axis are zone G in age. Probable total depth of favorable sediments is approximately 5,100 feet. This figure may be lessened by the postulated pre-zone F unconformity.

References

U. S. Geological Survey, Navy Oil Unit, Regular Reports Nos. 4, 25, 30, and 32.

WEASEL CREEK ANTICLINE

Quadrangle J-13

Approximate position $69^{\circ}13'$ N. - $153^{\circ}45'$ W.

Structure

Closure highly probable. East plunge cannot be demonstrated in great amount but probably exceeds 1,000 feet. West plunge is limited and probably does not exceed 200 feet.

Stratigraphy

Rock exposed near the axis is upper zone E. A total of from 1,500 to 1,800 feet of zone E sediments are exposed on this anticline, indicating the absence of an erosional unconformity during zone E time in this area. The total depth of favorable sediments underlying this anticline should not exceed 4,500 feet.

References

U. S. Geological Survey, Navy Oil Unit, Regular Reports Nos. 4 and 25.

KNIFE BLADE RIDGE ANTICLINE

Quadrangle J-14

Approximate position $69^{\circ}08'$ N. - $154^{\circ}45'$ W.

Structure

This portion of the Knifeblade Ridge anticline is divided into four more-or-less equal parts by a high-angle fault approximately paralleling the strike, and a tear fault approximately perpendicular to the strike. The two recommended positions for shallow drilling lie east of the tear fault and north and south of the strike fault. Plunge of the entire structure to the east is evident and is probably present in considerable amount. West closure is effected only by the tear fault. It is probable that at least one more structural high is present eastward along this axis. The position of this high is approximately $69^{\circ}08'$ N. - $154^{\circ}22'$ W. This probable high could not be mapped by surface means.

Stratigraphy

North of the strike fault and east of the tear fault rock of upper zone D is exposed. A total of 3,500 feet of favorable sediments may be present beneath this part of the structure. South of the strike fault and east of the tear fault rock of either upper zone B or lower zone C are exposed. It is improbable that more than 1,500 feet of favorable section is present below this part of the anticline.

References

U. S. Geological Survey, Navy Oil Unit, Regular Reports Nos. 4 and 17.
U. S. Geological Survey, Navy Oil Unit, Preliminary Report No. 11.

AUPUK ANTICLINE

Quadrangles J-14 and J-15

Approximate position $69^{\circ}05'$ N. - $154^{\circ}30'$ W., and $69^{\circ}04'$ N. - $155^{\circ}05'$ N.

Structure

Two local highs are probably present along this axis. The eastern high is higher structurally than the western one. Closure is not definitely established but is probable at both positions. No definite amount of closure may be determined from surface studies. The eastern high is complicated by longitudinal faulting. Active gas seeps are present near this fault line.

Stratigraphy

Rock exposed near the axis is zone D in age. Sediments above zone B are largely continental in this area. Because of a thickening of zone D it is improbable that favorable sands would be found above 1,300-1,400 feet at the eastern high or above 3,100 feet at the western high. Below these depths approximately 2,000 feet of intermittantly favorable sands should be present.

Reference

U. S. Geological Survey, Navy Oil Unit, Regular Reports Nos. 5, 25, and 38.

MAYBE CREEK AREA, ALASKA

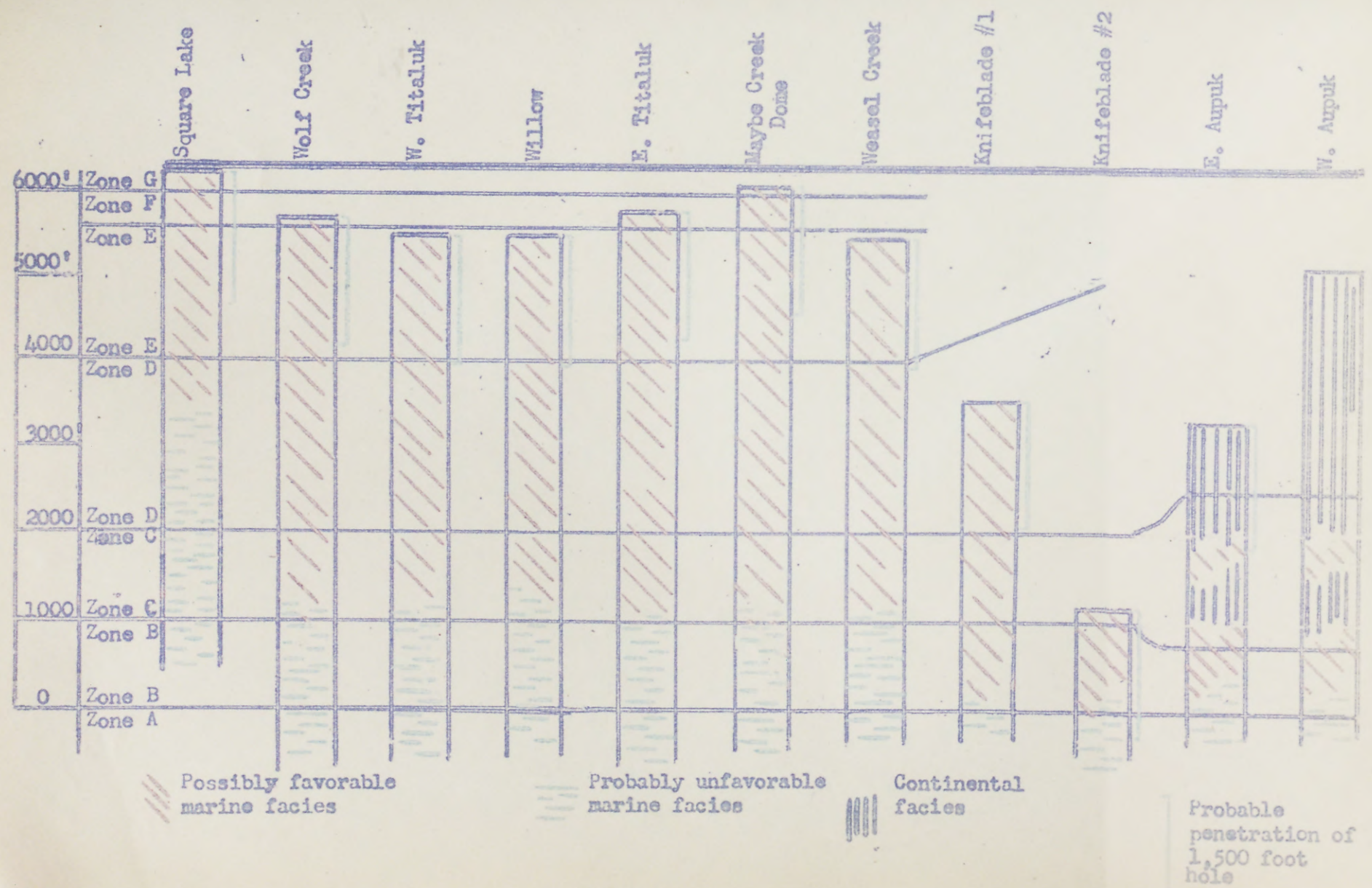


Figure 1.