



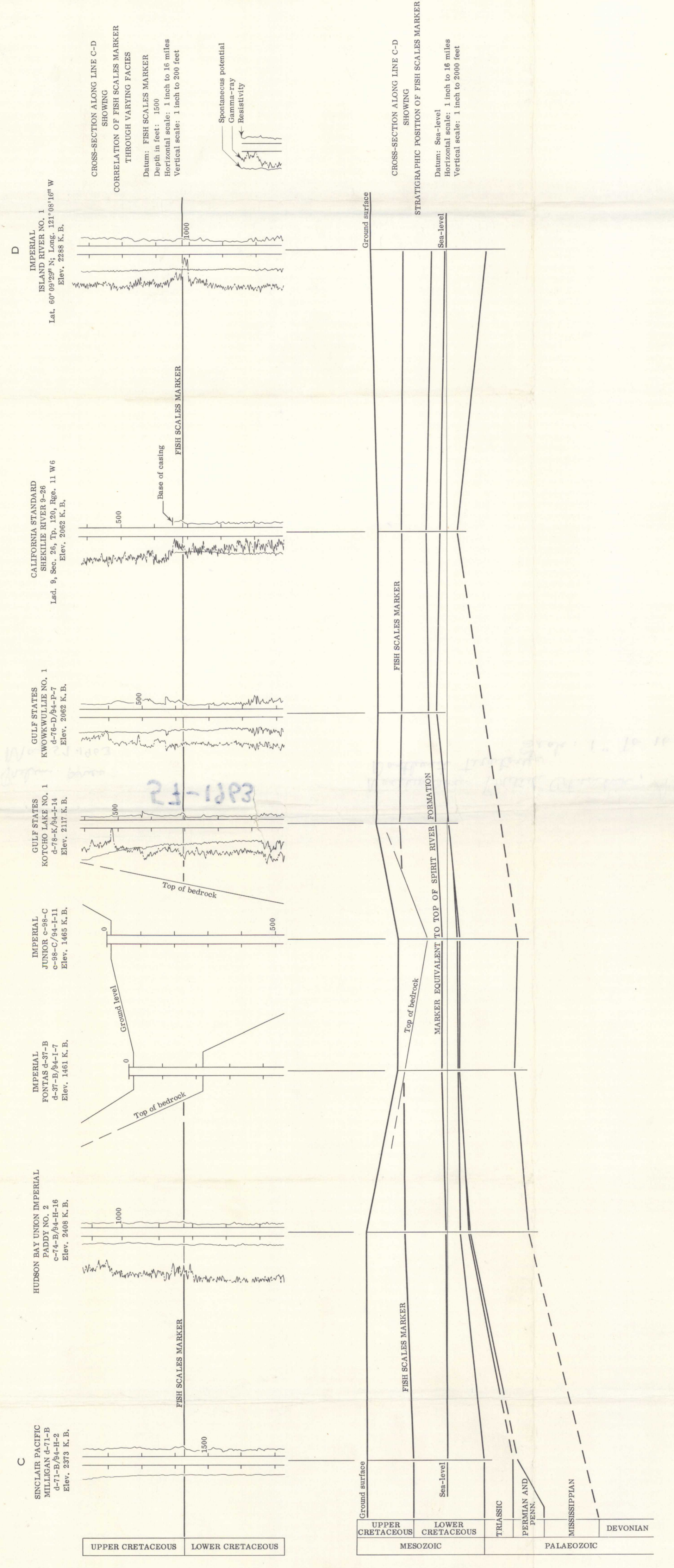
LEGEND

- Approximate geographic limit of Upper Cretaceous rocks
- Structure contour, interval 100 feet (defined, assumed)
- Depression contour
- Subsurface control point
- Control point using interpolated data

Compiled by L. L. Price, 1963
Cartography by the Geological Survey of Canada, 1964
Datum: Sea-level
500 foot contours south and east of Spirit River modified from C. F. Burk, Jr., 1963

MAP 57-1963
**STRUCTURE CONTOURS ON FISH SCALES MARKER HORIZON
NORTHEASTERN BRITISH COLUMBIA, AND ADJOINING
ALBERTA AND NORTHWEST TERRITORIES**

Scale 1:1,013,760
1 inch to 16 miles
Miles 0 16 32 48
Kilometres 0 25 50 75



DESCRIPTIVE NOTES

A persistent sandstone bed with fish remains in a thick succession of Cretaceous shale is an easily recognized stratigraphic interval in most areas of the Western Plains. The base of the sandstone has been used for many years as a marker horizon throughout Alberta (e.g., Glastier, 1959). This horizon occurs at a depth of 1,975 feet at Imperial Spirit River No. 1, 12-20-76-6 W6, in the Peace River area and has been traced northward using electric-log data from northeastern British Columbia and Northwest Territories. Virtually all available well control has been used in compiling this map with the exception of a few congested producing areas.

The Fish Scales marker horizon as used by Burk (1963) is at the top of the sandstone, about twenty feet higher at Imperial Spirit River No. 1. This horizon is taken by Stetck et al. (1958) as the base of the Upper Cretaceous Series in the Peace River area. Although the "Fish Scales sandstone" is one of several sandstone beds in the shale of the upper part of the Fort St. John Group, it is easily differentiated on mechanical logs. It commonly coincides with high gamma-ray emission. However, gamma-ray intensities of the "Fish Scales sandstone" are variable and other discontinuous beds with greater natural radiation associated with high organic content are present in the same interval, making the gamma-ray log unreliable by itself.

Control density is sufficient to permit correlation across several facies changes north and west of Peace River. Between the gradational facies boundaries, however, are large areas with laterally persistent lithology. The cross-sections are designed to show correlation across facies boundaries of marker beds typical of the various areas.

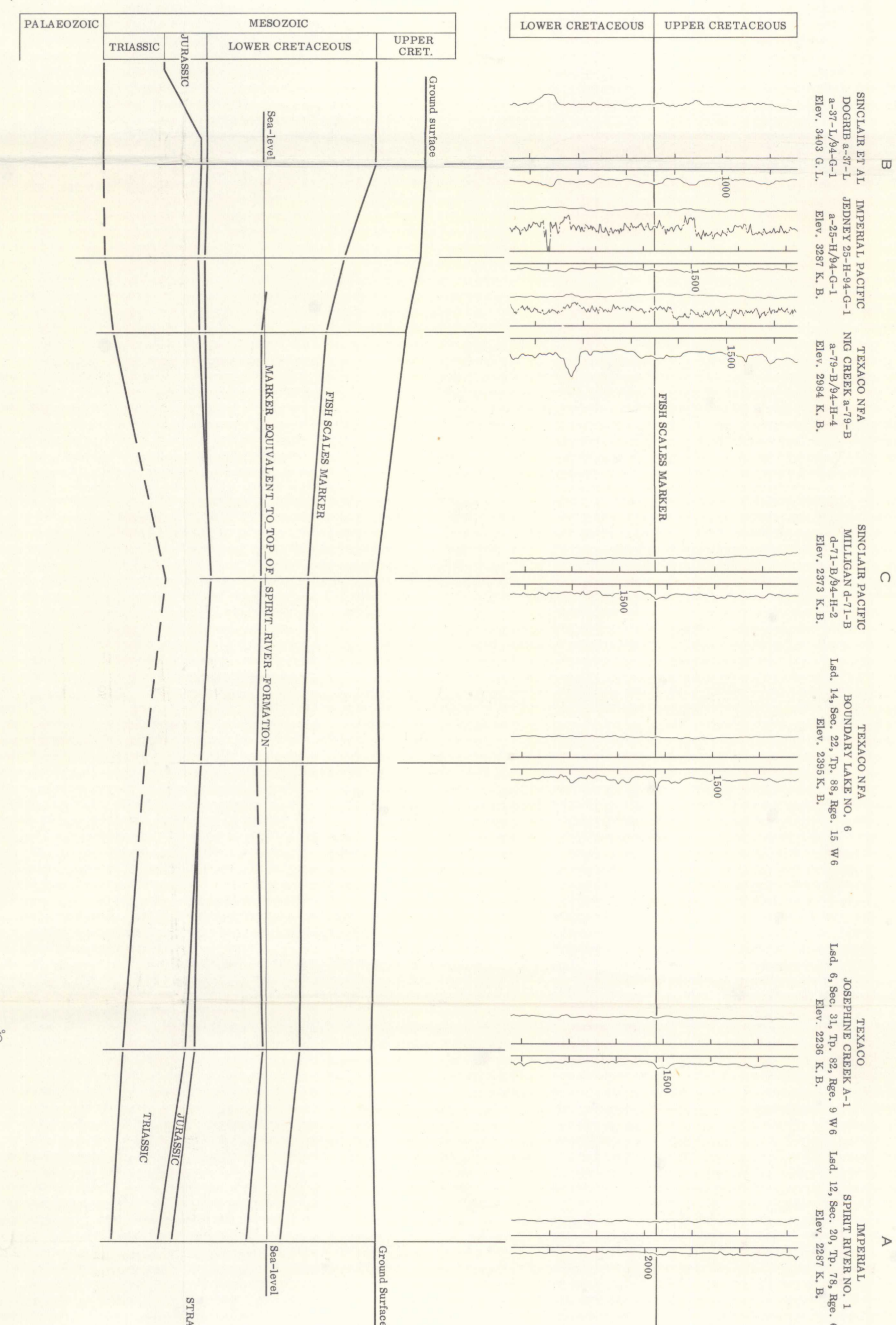
The Fish Scales marker is distinguished by characteristic electrical and radioactive log patterns reflecting a variety of lithologies ranging from sandstone to silty shale. The patterns are modified by factors related to organic content of the rock, nature of clay minerals and to a lesser extent more obscure chemical and physical properties. The marker horizon used here occurs at the base of a 20-foot interval with high resistivity representing a change downward from sandstone to marine shale with little or no silt as seen in the log of Texaco Josephine Creek A-1 in 6-31-82-9 W6 in cross-section ACB. Individual beds down to at least two feet in thickness are recognizable on the logs. The marker itself is associated with facies boundaries; the change in lithology occurs in individual beds at various locations rather than through the entire interval at one place. It is thus possible to trace the marker through abrupt facies changes, where, although the pattern of the marker itself may be altered, the new equivalent of the marker is clearly defined within narrow limits given adequately spaced well control. The marker at Pacific Milligan d-71-B (cross-section ACB), traced by this method through well control not shown in the cross-section, occurs in the new facies at about the middle of a much thicker zone of more or less shaly silt in which the "Fish Scales sandstone" is barely discernible as an interval of slightly higher resistivity. The accuracy of the method is reduced without closely spaced control where rapid thickening introduces new beds within the fish scales interval. In section ACB new strata appear in the interval containing the marker, approaching the mountain front between Texaco NFA Nig Creek A-79-B and Sinclair et al. Dogrib A-37-1.

Correlation northward across the band of erosion between Imperial Paddy No. 2 and Gulf States Kokocho Lake No. 1 (cross-section CD) is not certain because of the distance involved; the marker traced north of the eroded band may differ by as much as 100 feet in stratigraphic position from that used to the southward.

Near its erosional limits the Fish Scales marker may occur between the surface and base of surface casing. In these cases depths to the marker are estimated from average thickness data from nearby wells for intervals between the marker and nearest recognizable horizon below. The relationship of this estimated marker depth to the depth to top of bedrock is largely unknown, and the position of the erosional limits of the Fish Scales marker is only an approximation.

A major structure is the east-west hinge line immediately south of Peace River. Contours suggest faulting along this line affecting Cretaceous beds in township 16, ranges 12 and 13, 6th meridian. From Peace River northward beds are relatively flat-lying away from the foothills region as far north as Kokocho Lake. North of Kokocho Lake is a broad ridge which trends eastward to northeastward as far as Bischo Lake. North of this ridge the structural trend swings northward parallel to the mountain front in a manner similar to the trend south of Peace River.

Glastier, R. P. (1959): Lower Cretaceous of Southern Alberta and Adjoining Areas; Bull. Am. Assoc. Petrol. Geol., vol. 43, No. 3, pt. 4, p. 595.
Burk, C. F., Jr. (1963): Structure, Isopachs and Facies Maps of Upper Cretaceous Marine Succession, West-Central Alberta and Adjoining British Columbia; Geol. Surv. Can., Paper 62-31.
Stetck, C. A., Wall, J. H., Wetter, R. E. (1958): Lower Cretaceous Foraminifera from Peace River Area, Western Canada; Res. Council, Alberta, Bull. No. 2, p. 13.



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A. Coel

Northwestern B.C.
MAP 57-1963