# DEPOSITIONAL FACIES, DIAGENESIS AND RESERVOIR QUALITY OF THE
## IVISHAK SANDSTONE (SADLEROCHIT GROUP), PRUDHOE BAY FIELD

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### ABSTRACT

*The Sadlerochit Group is a large fan-delta system comparable in size to the modern Kosi River wet alluvial fan of Nepal and India. Braided-stream processes distributed chert gravel and quartz and chert sand in radial fashion to construct the subaerial part of the fan delta. Fluvial energy, slope of the fan surface, and grain size decrease in a north to south basinward direction. There is also a decrease in scale of sedimentation units from source area seaward. Facies of the subaerial fan delta can be broadly categorized as midfan delta (alternating conglomerate and sandstone), distal fan-delta (chiefly sandstone), and abandoned channel-fill, overbank, and pond facies (mudstone, siltstone, fine-grained sandstone). Seaward of the subaerial fan delta are the delta-front and prodelta facies. Subaerial fan-delta and delta-front facies compose the Ivishak sandstone, which grades basinward into the Kavik shale, a prodelta facies. Diagenetic effects were gradually superimposed on the sediments deposited in the Sadlerochit fan-delta system. The sedimentary facies, and in particular their textural characteristics, seem to control the size and degree of diagenesis, including enhancement of porosity and permeability. Comparison of permeability trends among the facies of the Ivishak Sandstone with permeability patterns displayed by unconsolidated sands with analogous grain size and texture, indicates that the general trends that existed in the Ivishak sediments are still recognizable in spite of the diagenetic overprint.*

FIGURE 6. — DISTRIBUTION OF FACIES IN THE NANUSHUK AND COLVILLE GROUPS
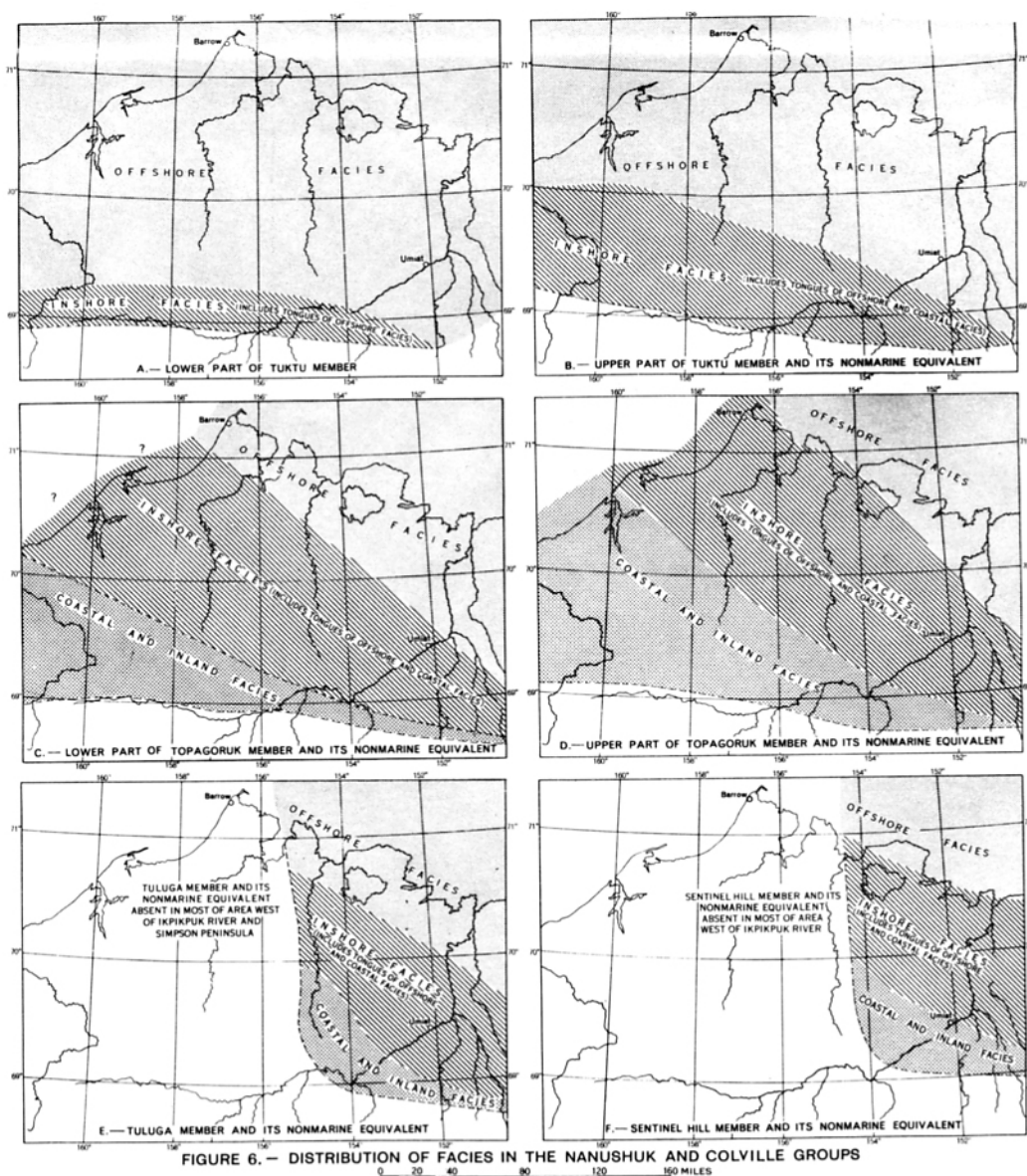
*Payne, T. G., and others, 1952, Geology of the Arctic Slope of Alaska:
U. S. Geological Survey Oil and Gas Investigations, Map OM-126.*