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PRELIMINARY REPORT ON THE GEOLOGY OF THE NELCHINA AREA, ALASKA

By

Arthur Grantz

May 1953

The illustrations comprising this report are preliminary and have not been edited or reviewed for conformity with the U. S. Geological Survey standards and nomenclature.

ILLUSTRATIONS

- Figure 1. General stratigraphic descriptions and tentative correlation of detailed stratigraphic sections of rocks exposed in the Nelchina area, Alaska.
2. Index map showing locations of detailed stratigraphic sections.
 3. Geologic map of the Nelchina area and the southwestern part of the Copper River basin, Alaska.
 4. Geologic map of Anchorage (D-2) quadrangle, Alaska.
 5. Explanation of symbols on the detailed stratigraphic sections.

Stratigraphic sections

- Section 1. Matanuska formation on tributaries of Squaw Creek.
2. Upper part of the Matanuska formation on upper Alfred Creek.
 3. Basal sandstone of the Matanuska formation on a southern tributary of upper Squaw Creek.
 4. Nelchina limestone and associated beds at Limestone Gap.
 5. Upper part of the Naknek formation and the Nelchina limestone and associated beds north of the Little Nelchina River one mile west of Flat Creek.
 6. Naknek formation and Nelchina limestone and associated beds near the main headwaters fork of the Little Nelchina River.
 7. Upper part of a sandstone unit equivalent to the lower part of the Tuxedni formation, the Chinitna formation, and the lower part of the Matanuska formation immediately north of Caribou Creek east of the mouth of Billy Creek.
 8. Sandstone unit equivalent to the lower part of the Tuxedni formation, and the Chinitna formation three miles north of the mouth of Alfred Creek.

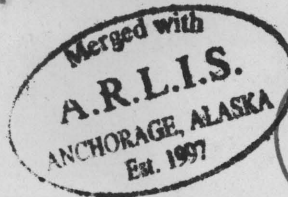


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GEOLOGICAL SURVEY

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THE GEOLOGY OF THE NELCHINA AREA, ALASKA

Release to open file of a preliminary report by the Geological Survey on the geology of the Nelchina area, Alaska, was announced today by Secretary of the Interior Douglas McKay.

Prepared by Arthur Grantz, the report consists of a generalized geologic map of the Nelchina area, a reconnaissance geologic map of Anchorage D-2 quadrangle, a chart giving a general description of the exposed sedimentary rocks, and representative detailed stratigraphic sections of the exposed marine sedimentary formations.

Field work for this report was carried out in 1952 as part of an investigation of the petroleum possibilities of the Jurassic and Cretaceous marine sedimentary rocks occurring in the southeastern part of the Talkeetna Mountains and the southern part of the Copper River Basin. This work will be continued in 1953.

The Nelchina area lies about 120 miles northeast of Anchorage and is crossed by the Glenn Highway. In recent months there has been considerable interest in its petroleum possibilities.

More than 15,000 feet of unmetamorphosed marine sedimentary rocks of middle Jurassic to Upper Cretaceous age are present in the area. Shale and siltstone are the predominant lithologic types, but many beds of sandstone and some conglomerate occur throughout the exposed sedimentary section. At least four major unconformities, representing important periods of faulting or of folding, uplift, and erosion were found within the marine sedimentary sequence.

The Jurassic and Cretaceous rocks of the Nelchina area have undergone gentle to moderate folding. Many large high-angle faults are present, and faulting rather than folding has been chiefly responsible for the present distribution of the rocks units.

The marine sedimentary rocks are underlain by a thick sequence of volcanic rocks of lower Jurassic age which is at least a few thousand feet thick. They are overlain by a variable thickness of continental sediments of early Tertiary age, above which occurs a sequence of basic volcanic flows of late Tertiary age, attaining a maximum thickness of more than 2,500 feet.

The sedimentary rocks are well exposed in the southeastern Talkeetna Mountains but are exposed only in a few places in the southern part of the Copper River basin. In most places the bedrock underlying the Copper River basin is masked by a few hundred feet of glacial deposits.

In the western part of the Nelchina area the marine sediments are intruded by numerous basaltic dikes and sills of late Tertiary age. South of Sheep Mountain several small porphyritic intrusives of intermediate composition intrude the upper Cretaceous sedimentary rocks.

This report, with hand-colored maps, is available for public inspection at the Geological Survey offices in Washington, D. C., GSA Building, Washington, D. C.; 100 Old Mint Building, San Francisco, California; Subport, Juneau, Alaska; Office of Regional Mining Supervisor, Conservation Division, Anchorage, Alaska; and Alaskan Geology Branch, College, Alaska. A copy with uncolored maps but with formations shown by letter symbols is also available at the San Francisco office of the Geological Survey for use in making reproductions at private expense.

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