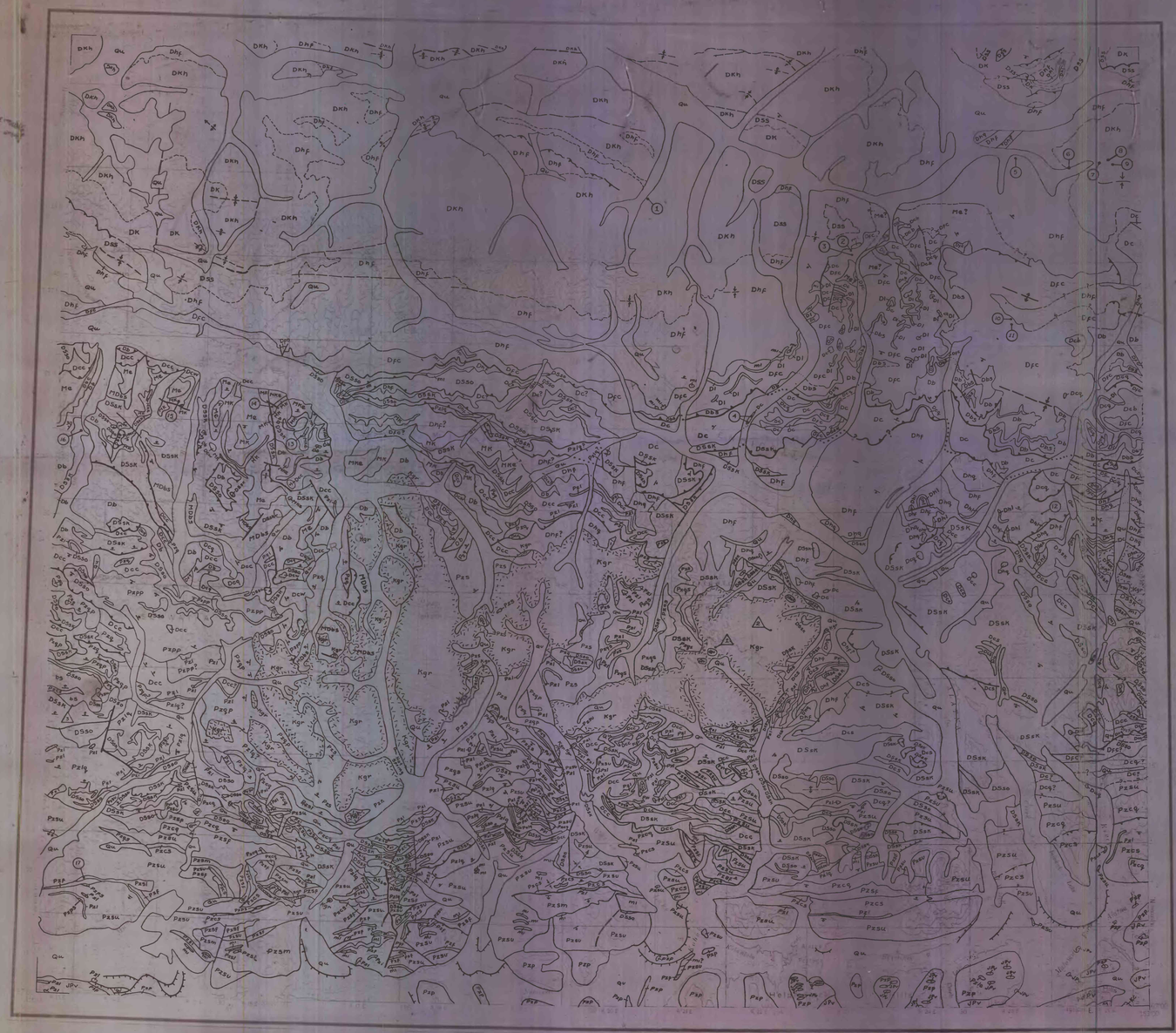
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES, DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS

U.S. GEOLOGICAL SURVEY
OPEN FILE MAP
OF 77-27



BASE BY U.S. GEOLOGICAL SURVEY, 1956

Table 1
Mississippian and Devonian fossils

Identified by Helen Duncan and Charlotte Oliver, U.S. Geological Survey, and J. Thomas Dutro, Jr., U.S. Geological Survey

Map No.	Field No. number	Fossils	Age	Map unit
1	74AJ-4	brachiopods	late Late Devonian	DKh
2	62AR23	brachiopods	late Middle or early Late Devonian	Dfc
3	62AR22	brachiopods	late Middle Devonian	Dfc
*4	74AM-8	corals, brachiopods, corals	Middle Devonian?	Dc
5	53AM200	corals?	?	Dhf
6	53AM202	brachiopods, corals	late Late Devonian	Dhf
7	53AM206	brachiopods, gastropods	?	Dhf
8	53AM207	brachiopods	late Late Devonian	Dhf
9	53AM204	brachiopods	?	DKh
10	53AM208	pelecypods, corals	?	DKh
11	62AR24	brachiopods	late Middle or early Late Devonian	Dfc
12	62AR21	brachiopods	?	Dfc
13	74F-105	corals	Late Devonian	Dhf
14	75AB-73	brachiopods, corals, bryozoans	Mississippian	Mk
15	75AB-108	brachiopods, corals	Mississippian	Mk
16	64AD-33	corals	late? Middle Devonian	Dsn
17	75AB-31, 75AB-87	unidentifiable brachiopods	Devonian? Pre-Devonian?	Pzsr

*Location approximate, between the two points shown on map.

REFERENCES

Alaska Division of Geological and Geophysical Surveys, 1973, Annual Report: State of Alaska, Department of Natural Resources, 59 p.

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Fritts, C.E., 1970, Geology and geochemistry of the Cosmos Hills, Ambler River and Shungnak quadrangles, Alaska: Alaska Div. of Mines and Geology, Report No. 39.

Fritts, C.E., Eakins, G.R., and Garland, R.E., 1971, Geology and geochemistry near Walker Lake, southern Survey Pass quadrangle, Arctic Alaska: Alaska Div. of Geol Survey, Annual Report, p 19-27.

Patton, W.W. Jr., and Miller, T.P., 1966, Regional geologic map of the Hughes quadrangle, Alaska: U.S. Geol. Survey Misc. Geol. Inv. Map I-459.

Patton, W.W. Jr., Miller, T.P., and Tailleur, I.L., 1968, Regional geologic map of the Shungnak and southern part of the Ambler River quadrangles, Alaska: U.S. Geol. Survey Misc. Geol. Inv. Map I-554.

Wilkes, M.A., 1975, Preliminary geologic map of the Arctic Camp prospect, Ambler River quadrangle, Alaska: Alaska Div. of Geol. and Geoph. Surveys open file report No. 60.

EXPLANATION OF SYMBOLS

Geologic contact
Dashed where inferred or approximately located; queried where existence probable; unknown if queried

Fault
Dashed where location is approximate; queried where existence probable; dotted where concealed

Thrust fault
Sawteeth on upper plate. Dashed where location is approximate; queried where existence probable; dotted where concealed

Anticline
Showing trace of axial plane

Syncline
Showing trace of axial plane

Overturned anticline
Showing trace of axial plane

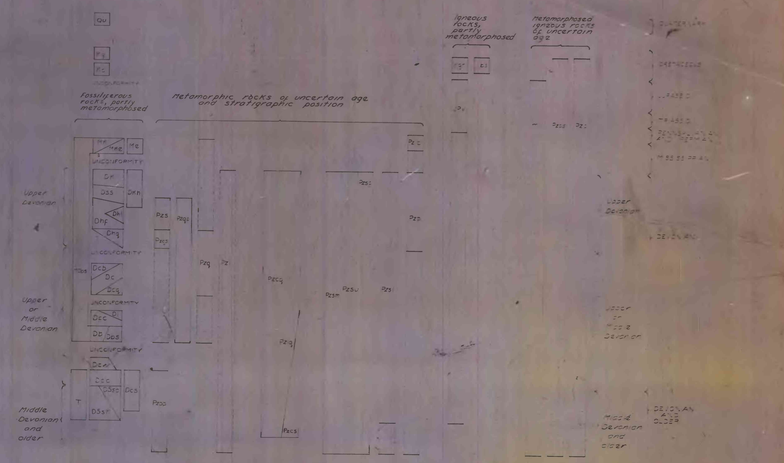
Overturned syncline
Showing trace of axial plane

Approximate position of strike and dip of adjacent or foliation

Mapping

Locality of fossil collection — "FAUN"

CORRELATION OF ROCK UNITS



DESCRIPTION OF MAP UNITS

Qu UNDIFFERENTIATED SURFICIAL DEPOSITS

Eq QUARTZ CONGLOMERATE --- Quartz-pebble conglomerate with a quartzose matrix; some clasts of chert, schist and greenstone; some interbedded quartzose sandstone and mudstone.

Ec IGNEOUS PEBBLE CONGLOMERATE --- Massive, poorly sorted, poorly stratified pebble to cobble conglomerate. Clasts of extrusive and intrusive igneous rocks in a greywacke and mudstone matrix. Some clasts of chert and mudstone. Probably Early Cretaceous (Albian) age (Patton and Miller, 1966, Patton, Miller and Tailleur, 1968)

FOSSILIFEROUS ROCKS, PARTLY METAMORPHOSED
Rocks of greenschist facies of metamorphism in most of the area, and in hornblende hornfels facies near the granitic rocks. Upper Devonian rocks in the northwestern part of quadrangle probably are not metamorphosed.

Mk KAYAK SHALE --- Dark gray slate and shaley limestone; orange-weathering crinoidal limestone. Mississippian corals and foraminifera at localities 13, 14 and 15. About 300 m thick.

Mke KEKIKTUK CONGLOMERATE --- Light gray to grey-green, massive to sheared quartz- and chert-pebble conglomerate, quartzite and sandstone, minor amounts of dark grey and red and green shale and slate. About 200 m thick.

Me EMBLYOTT GROUP --- Undifferentiated black shale and calcareous shale of the Kayak Shale, and schistose, chloritoid-bearing, partly calcareous quartzite and conglomerate of the Kekiktuk Conglomerate.

Dk KANAYUT CONGLOMERATE --- Grey-green, massive quartz- and chert-pebble conglomerate, quartzite, sandstone and shale. Over 600 m thick.

Dss SANDSTONE --- Grey-green, thin-bedded, limonitic sandstone, partly calcareous. Gradational with the Kanayut Conglomerate (Dk). About 300 m thick.

Dkh SANDSTONE, CONGLOMERATE AND SHALE --- Undifferentiated Kanayut Conglomerate (Dk), Sandstone (Dss), and minor amounts of Hunt Fork Shale (Dhf). Contains Devonian brachiopods at localities 1, 7 and 8.

Dhf HUNT FORK SHALE --- Black shale, slate and phyllite with some interbedded sandstone and quartzite; lenses of brown limonitic limestone. Contains Devonian brachiopods at locality 6. Over 600 m thick.

Dhl LIMESTONE MEMBER OF HUNT FORK SHALE --- Dark gray limestone and marble.

Dhq QUARTZITE MEMBER OF HUNT FORK SHALE --- Gray to brown gritty quartzite and sheared conglomerate.

Dc CHLORITIC PHYLLITE --- Gray, green, yellow and purple shale and chloritic phyllite and sandstone. Contains Devonian? brachiopods at locality 4. Where identification is queried in southeastern part of quadrangle, unit is chloritic schist and phyllite.

Dcb BLACK SILTSTONE --- Interbedded with, or unconformable on Chloritic Phyllite (Dc).

Dcq CHLORITIC QUARTZITE AND CONGLOMERATE --- Gray and green, schistose, feldspathic chloritic quartzite, grit and quartz- and chert-pebble conglomerate. Unit is schist and contains epidote locally, where identification is queried in southeastern part of quadrangle.

Dfc FERRUGINOUS CALCAREOUS CLASTIC ROCKS --- Light brown and orange weathering, gray calcareous micaceous siltstone and phyllite. Minor amounts of sandstone, conglomerate and dark gray phyllite. Contains Devonian brachiopods at localities 2, 3, 10 and 11. Unit is brown calcareous schist where identification is queried in southeastern part of quadrangle. About 400 m thick.

Dl LIMESTONE --- Dark gray shaley limestone.

Db BLACK LIMESTONE AND PHYLLITE --- Interbedded black, partly calcareous phyllite, blck siliceous siltstone, and black argillaceous limestone; weathers pink, orange, black. About 400 m thick.

Dbs BLACK SILTSTONE --- Differentiated locally in Black Limestone and Phyllite (Db).

MDbs BLACK SHALE AND SILTSTONE --- Undifferentiated Kayak Shale (Mk) and Black Limestone and Phyllite (Db).

Dcw CALCAREOUS WACKE --- Light grey-green, calcareous, fine-grained quartz-plagioclase wacke.

Dcc CHLORITIC AND CARBONATE ROCKS --- Green, chloritic, partly calcareous phyllite, siltstone, grit and schist, and orange-weathering impure carbonate rocks; local carbonate-pebble conglomerate. Probably includes some metamorphosed mafic igneous rocks.

DSsk SKAITI LIMESTONE --- Mostly light gray, massive marble; highly sheared and folded in part. Contains Middle Devonian corals at locality 16. As much as 1,000 m thick.

DSso ORANGE MARBLE --- Orange-weathering, medium- to coarse-grained chloritic marble, highly sheared in part; orange, fine-grained dolomite, locally conglomeratic; boudins and sills of chloritic greenstone.

Dcs CHLORITIC ROCKS AND ORANGE MARBLE --- Undifferentiated units Dcc and DSso.

T TACTITE --- Thermally metamorphosed carbonate rocks mapped locally.

METAMORPHIC ROCKS OF UNCERTAIN AGE AND STRATIGRAPHIC POSITION
Rocks of greenschist facies in most of the area, and in hornblende hornfels facies near the granitic rocks. In an irregular linear zone 5 to 10 miles wide across the southern part of the quadrangle the rocks (mostly of units Pzsu and Pzcq) contain chloritoid, biotite and garnet typical of the highest grade of greenschist facies, but also locally contain partly chloritized glaucophane.

Pzs SCHIST AND PHYLLITE --- In part thermally metamorphosed. May be equivalent to Hunt Fork Shale (Dhf)

Pzqs QUARTZOSE SCHIST AND QUARTZITE --- May be equivalent to Quartzite Member of Hunt Fork Shale (Dhq).

Pzqp QUARTZ-PHYLLITE --- Light gray, fine- to medium-grained quartzite interbedded with brown and gray phyllite.

Pzq QUARTZITE --- Rusty weathering. May be equivalent to Quartzite Member of Hunt Fork Shale (Dhq) or to Chloritic Quartzite and Conglomerate (Dcq).

Pzl LIMESTONE AND MARBLE --- Mostly light gray, medium-grained marble. Probably includes beds of many different ages.

Pzpp PURPLE PHYLLITE --- Purple and green phyllite and metamorphosed volcanic rocks.

Pzcq CHLORITIC QUARTZITE --- Mostly quartz-albite-chlorite ± magnetite schist and schistose quartzite. May include some metamorphosed eplite. Contains boudins of mafic schist. Locally contains garnet and partly chloritized glaucophane in Sec. 30, T. 21 N, R. 26 E., and Sec. 13, T. 20 N., R. 22 E.

Pzlq LIMESTONE-QUARTZITE --- Interbedded quartz-albite-muscovite schist, quartzite, and light gray marble. Schist commonly weathers orange. Marble is differentiated as Pzl where possible.

Pzcs CALC-SCHIST --- Mostly brown-weathering quartz-albite-muscovite-calcite schist, commonly with epidote and actinolite; thin beds of resistant blck very fine-grained quartzite.

Pzsu UNDIFFERENTIATED QUARTZ-MICA SCHIST --- Mostly quartz-mica schist with minor amounts of chlorite schist, greenstone, marble and felsic schist. Includes units of Pzl, Pzsl, Pzsm and Pzsf. The unit may be a structural mixture of units of several ages, from as young as Devonian to Ordovician and older. Locally contains glaucophane and garnet in Sec. 17, T. 20 N., R. 20 E.

Pzsm MASSIVE QUARTZ-MICA SCHIST --- Massive weathering, resistant quartz-mica schist, generally more intensely folded than the surrounding schist and phyllite.

Pzsf FERRUGINOUS SCHIST --- Brown and orange weathering soft highly pyritic quartz-mica schist and phyllite.

Pzsl SANDSTONE AND LIMESTONE --- Calcareous sandstone, black and white quartzite and marble containing poorly preserved fossils at locality 17.

Pzlc CHERTY LIMESTONE --- Dark gray recrystallized limestone, siliceous limestone and chert. May be equivalent to Mississippian Lisburne Group of other areas.

Pzp PHYLLITE --- Brown to dark gray phyllite and slate; commonly sericitic; gradational into quartz-mica schist (Pzsu).

IGNEOUS ROCKS, PARTLY METAMORPHOSED

Kgr GRANITIC ROCKS --- Mostly granite and quartz-monzonite, porphyritic to gneissic and schistose. Probably Cretaceous in age (Fritts and others, 1971). Biotite and muscovite at localities 1 and 2 dated 86 to 92 m.y. by K-Ar method (Brosge and Reiser, 1971) in T 23 N, R 21 and 22 E.

bs BIOTITE SCHIST --- Plagioclase-quartz-biotite schist; possibly a metamorphosed granodiorite, probably related to the intrusion of the granitic rocks (Kgr). K-Ar age of 96 m.y. reported for biotite at locality 3 by D.L. Turner (Div. Geol. and Geophys. Surveys , 1973) in T 22 N, R 13 E.

Jpv MAFIC IGNEOUS ROCKS --- Mafic hypabyssal and volcanic rocks, slightly metamorphosed to zeolite facies. Possibly Jurassic in age (Patton, Miller and Tailleur, 1968), but may be as old as Devonian (Fritts, 1970)

METAMORPHOSED IGNEOUS ROCKS OF UNCERTAIN AGE

mi GREENSTONE --- Metamorphosed basalt, dacite and other volcanic rocks. Age is very uncertain, but probably equivalent to unit Jpv in part. Contain garnet and glaucophane locally in Sec. 31, T. 20 N., R. 18 E.

Pzpo PORPHYROBLASTIC SCHIST --- Quartz-albite-K feldspar-muscovite-chlorite schist with porphyroblasts of K-feldspar. Interpreted to be meta-rhyolites by most mining geologists (Wilkes, 1975).

Pzf FELSIC SCHIST --- Mostly quartz-albite-K-feldspar schist; generally fine-grained and massive. Probably metamorphosed acidic igneous rocks, including rhyolites and aplites. Minor gray and black fine-grained quartzite.

Mineral deposits, stream sediment anomalies and large groups of claims made in the last 10 years (Alaska Div. Geol. and Geophys. Surveys, 1973, p.8) occur in a zone along the strike of units Pzf and Pzpo.

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey standards and nomenclature.

PRELIMINARY RECONNAISSANCE GEOLOGIC MAP OF SURVEY PASS QUADRANGLE, ALASKA

Compiled by W. P. Brosge and G. H. Pessel 1977