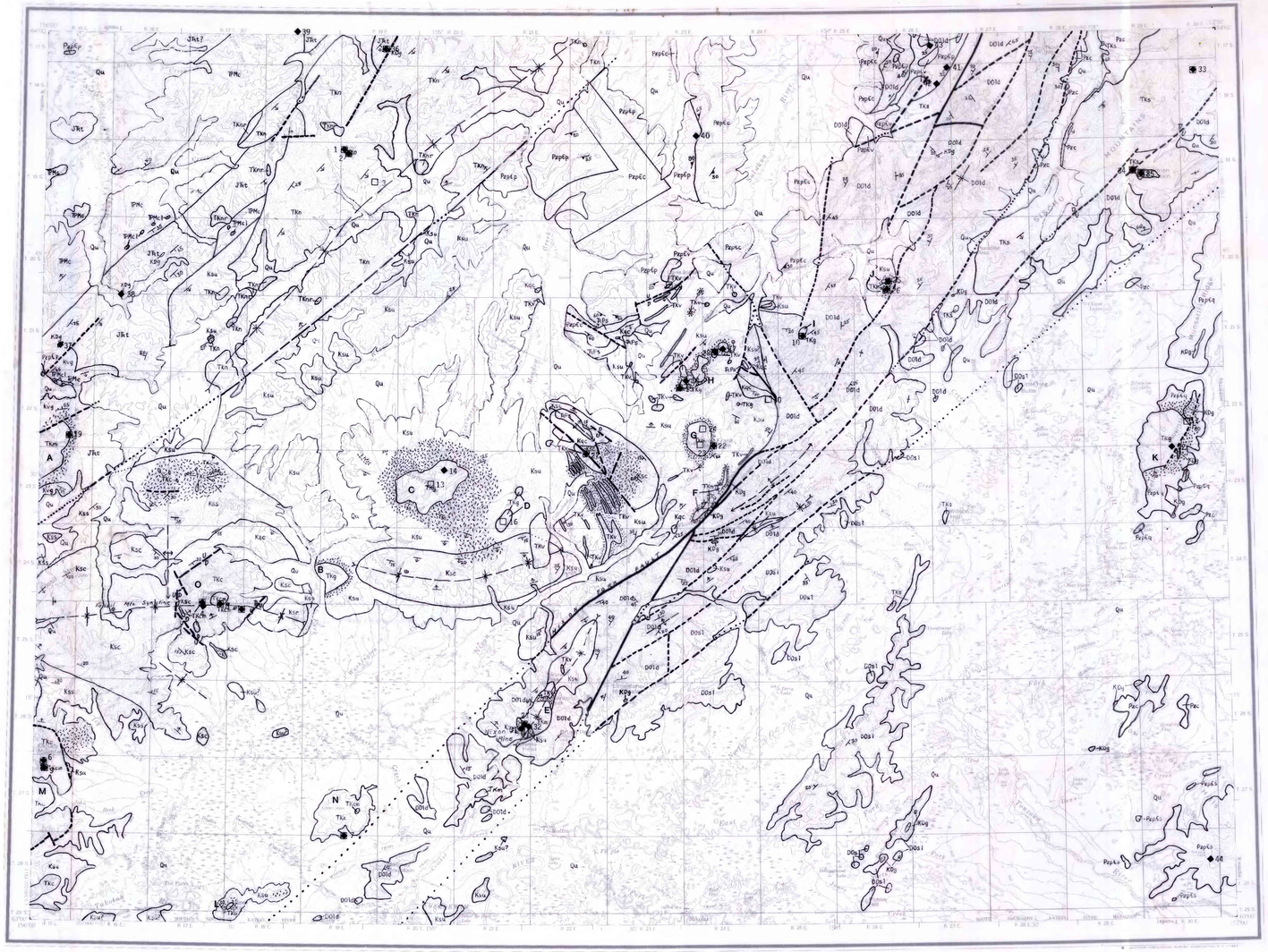
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT 80-811C

SHEET 1 OF 2

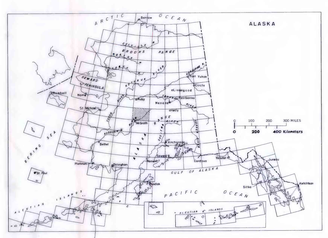
MEDFRA



Base generalized geologic map of the Medfra Quadrangle, Alaska and U.S. Geological Survey 1:250,000 Alaska Topographic Series: Medfra, 1959.

SCALE 1:250 000

CONTOUR INTERVAL FEET
DATUM IS MEAN SEA LEVEL



INDEX MAP SHOWING LOCATION OF MEDFRA QUADRANGLE, ALASKA

CHEMISTRY, MINERALOGY, AND K-AR AGES OF IGNEOUS AND METAMORPHIC ROCKS OF THE MEDFRA QUADRANGLE, ALASKA

by

E. J. Moll, M. L. Silberman, and W. W. Patton, Jr.

1981

KEY TO PLUTON LOCALITIES

A	Cripple Creek Mountains
B	West Fork
C	Sunshine Mountains
D	Meadow Creek
E	Nixon Fork
F	Whirlwind Ridge
G	Von Frank Mountain
H	Shepherd Creek
I	Upper Sulukna River
J	Stone Mountain
K	Telida Mountains
L	Appel Mountain
M	Cloudy Mountain
N	Alone benchmark
O	Page Mountain

Samples 45 and 46 collected at localities in the Mount McKinley quadrangle. See latitude and longitude, Tables 1 and 2 for sample locations.

Explanation for K-Ar Map

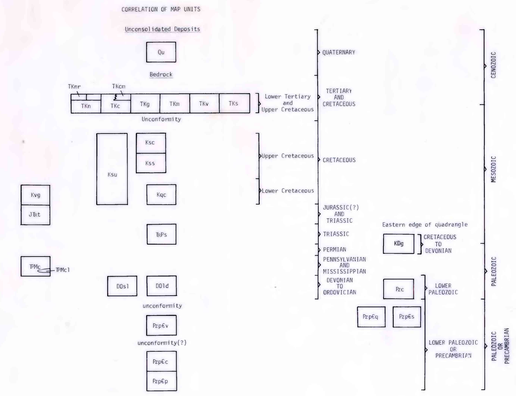
◆ K-Ar age determination

□ Chemical analysis

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

Explanation for Generalized Geologic Map

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qu	UNDIFFERENTIAL SURFICIAL DEPOSITS
Tkvr, Tkv	VOLCANIC ROCKS OF THE NOWITNA RIVER AREA--Chiefly trachyandesite, basaltic andesite, and basalt flows. Tkvr--Rhyolite domes, tuffs, and breccia
Tkm, Tkc	MAFIC TO INTERMEDIATE VOLCANO-PLUTONIC COMPLEXES--Altered basalt, andesite, and trachyandesite flows and hyaloclastic intrusive bodies. Tkcm--Small bodies of monzonite, quartz monzonite, and granodiorite
Tkg	GRANITE
Tkn	MONZONITE
Tkv	VOLCANIC ROCKS OF NIXON FORK-UPPER SULUKNA RIVER AREA--Rhyolite, dacite, and trachyandesite sills, dikes, flows, and plugs
Tks	VOLCANIC ROCKS OF THE SISCHU MOUNTAINS--Rhyolite and dacite flows and domes
KDg	GABBRO
Ksu	UNDIFFERENTIATED SHALE, SILTSTONE, AND SANDSTONE
Ksc	NONMARINE SANDSTONE AND QUARTZ-CHERT CONGLOMERATE
Kss	MARINE SANDSTONE, SILTSTONE, AND SHALE
Kgc	QUARTZ-CARBONATE SANDSTONE AND PEBBLY MUDSTONE
Kvg	VOLCANIC GRAYWACKE AND CONGLOMERATE
JTRt	CHERTY TUFF, CRYSTAL AND LITHIC TUFFS, AND VOLCANIC BRECCIA
JTRs	SANDSTONE, SANDY LIMESTONE, SPICULITE, AND CONGLOMERATE
PMc, PMc1	CHERT AND LIMESTONE--Chiefly radiolarian chert. PMc1--Limestone.
DOs1	SHALY LIMESTONE
DOld	LIMESTONE AND DOLOMITE
Pzc	CHERT AND PHYLLITE
PzpEq	QUARTZITE, GRIT, AND ARGILLITE
PzpEs	SHEARED GRIT, QUARTZITE, AND QUARTZ-MICA SCHIST
PzpEv	METAVOLCANIC ROCKS--Metarhyolite and dacite
PzpEc	CALC-SCHIST
PzpEp	PELITIC SCHIST

GEOLOGIC SYMBOLS

- Contact - Includes approximately located, inferred, and indefinite
- Fault - Dashed where approximately located, short dashed where inferred, dotted where concealed. U, upthrown side; D, downthrown side
- Anticline - Showing direction of plunge
- Syncline - Showing direction of plunge
- Strike and dip of beds. May include overturned beds
- Strike of vertical beds
- Horizontal beds
- Strike and dip of beds based on photointerpretation or distant observation
- Strike and dip of foliation
- Zone of hornfels

Contact between PzpEc and PzpEp mapped in part based on interpretation of aeromagnetic data (see Patton and others, Open-file Report 80-811E, in preparation)

OPEN-FILE REPORT 80-811C

SHEET 1 OF 2

Chemistry, Mineralogy, and K-Ar ages of Igneous and Metamorphic Rocks of the Medfra Quadrangle, Alaska

Table 2.--Potassium-argon age determinations

[K^{40} decay constants: λ_e = .581 x 10^{-10} $year^{-1}$; λ_β = 4.962 x 10^{-10} $year^{-1}$. Abundance ratio: K^{40}/K = 1.167 x 10^{-4} $mol/mole$. Potassium analysis by S. Neil, P. Klock, B. Lai, and M. Taylor; argon analysis and age calculations by M. L. Silberman, C. L. Connor, L. B. Gray, Kruger Enterprises, Inc. (Geochron Labs), and Teledyne Isotopes (Georgina Kalechitz).]

Map unit	Map no.	Field no.	Latitude and longitude	Mineral	Rock type	K_2O wt percent	Ar^{40} rad (moles/gm) (10^{-1})	Ar^{40} rad / Ar^{40} total	Calculated age (millions of years)
Tkm	1	77Pa77	63°52' N.; 155°14' W.	Whole rock$_3$	High-K andesite	2.546 2.552 avg 2.552	2.546 2.373	0.43 .50	63.8 ± 2.7
	2	77Pa203	63°52' N.; 155°14' W.	Whole rock$_3$	High-K andesite	2.010 2.010 avg 2.010	1.947 1.832	0.34 .63	64.2 ± 2.8
Tkc	4	77Pa204B	63°22' N.; 155°35' W.	Biotite$_3$	High-K andesite	8.68 8.70 avg 8.69	8.645 9.150	0.49	69.8 ± 2.6
				Plagioclase$_3$		0.788 .794 avg .791	0.755 .772	.56 .43	65.8 ± 3.5
	5	78MS132	63°21' N.; 155°29' W.	Whole rock$_1$	Altered high-K andesite	4.66 4.60 avg 4.63	3.909	0.91	59.5 ± 1.8
	6	78MS149	63°11' N.; 155°59' W.	Hornblende$_1$	High-K andesite	1.36 1.38 avg 1.37	1.335	0.70	66.4 ± 2.0
				Plagioclase$_1$		0.886 .915 avg .901	0.861	.64	65.2 ± 2.0
	7	76Pa62	63°06' N.; 155°13' W.	Whole rock$_3$	High-K andesite	3.89 3.86 avg 3.875	3.858 3.978	0.75 .67	68.9 ± 2.8
Tkcm	8	78MS134	63°22' N.; 155°33' W.	Biotite$_3$	Granodiorite	8.65 8.71 avg 8.78	9.07 9.10	0.76 .70	70.5 ± 2.6
	9	78MS152	63°10' N.; 155°58' W.	K-feldspar$_3$	Monzonite	5.28 5.17 avg 5.225	5.28 5.35	0.55 .57	69.3 ± 2.8
Tkg	10	76APa50	63°40' N.; 154°04' W.	Biotite$_3$	Granite (A-type)	8.53 8.51 avg 8.52	8.47 8.82	0.69 .34	69.2 ± 2.6
	12	77APa42	63°32' N.; 153°08' W.	Biotite$_3$	Granite (A-type)	8.54 8.54 avg 8.54	8.865 8.845	0.73 .72	70.5 ± 2.8
	14	77APa87	63°31' N.; 154°58' W.	Biotite$_3$	Granite (B-type)	7.85 7.87 avg 7.86	7.328 7.275	0.37 .65	63.4 ± 2.5
	15	78MS91	63°36' N.; 154°23' W.	Biotite$_2$	Granodiorite	7.32 7.46 avg 7.39	7.183 7.139	0.79 .77	66.2 ± 3.3
	17	78MS65	63°39' N.; 154°16' W.	Hornblende$_1$	Quartz monzodiorite	0.900 .888 avg .883	0.9056	0.73	69.9 ± 2.1
				Biotite$_3$		6.73 6.64 avg 6.685	6.565 6.500	.66 .54	66.6 ± 2.6
	18	78MS113	63°37' N.; 154°22' W.	Hornblende$_1$	Hypabyssal quartz monzonite	1.191 1.216 avg 1.204	1.1616	0.59	65.8 ± 2.0
				Biotite$_2$		5.25 5.31 5.36 avg 5.31	5.00 5.18	0.55	65.3 ± 3.3
Tkn	19	76APa007	63°33' N.; 155°56' W.	Biotite$_3$	Monzonite	9.05 9.12 avg 9.09	8.81 8.89	0.93 .37	66.4 ± 2.5
	21	78ABF20	63°14' N.; 154°16' W.	Biotite$_1$	Quartz monzonite	6.97 6.93 6.75 avg 6.91	7.136	0.84	70.4 ± 2.1
	22	70APa105f	63°32' N.; 154°18' W.	Biotite$_2$	Monzogabbro	7.54 7.64 avg 7.59	7.585 7.407	0.73 .71	67.3 ± 3.4
	25	78APa53	63°43' N.; 153°51' W.	Biotite$_3$	Gabbro	8.53 8.57 avg 8.55	8.57 8.09	0.75 .42	66.4 ± 2.5
	26	75APa151	63°43' N.; 153°51' W.	Biotite$_3$	Gabbro	8.42 8.44 avg 8.43	7.95 8.95	0.40 .76	68.3 ± 4.1
Tkv	27	78MSD08A	63°32' N.; 154°37' W.	Chloritized biotite$_1$	Dacite	2.40	2.196	0.43	62.5 ± 1.9
	28	78MS68	63°39' N.; 154°17' W.	Biotite$_2$	Dacite	6.71 6.74 avg 6.725	6.158 6.113	0.76 .69	62.2 ± 3.1
	31	78NN17	63°13' N.; 154°43' W.	Whole rock$_1$	Sericitic altered quartz porphyry	1.314 1.302 1.334 1.308 avg 1.315	1.308	0.60	67.8 ± 2.0
	32	78NF3	63°13' N.; 154°46' W.	Muscovite$_1$	Sericitic altered quartz porphyry	9.67 9.34 avg 9.51	9.638	0.90	69.1 ± 2.1
Tks	33	78APa36	63°57' N.; 153°03' W.	Sanidine$_1$	Rhyolite	7.65 7.64 avg 7.645	7.431	0.82	66.3 ± 2.0
	34	77Pa202	63°51' N.; 153°13' W.	Whole rock$_3$	Felsite	6.34 6.39 avg 6.365	6.593 6.473	0.32 .32	69.9 ± 2.7
	35	77Pa201	63°50' N.; 153°12' W.	Whole rock$_3$	Felsite	4.64 4.66 avg 4.65	4.885 4.888	0.29 .25	71.0 ± 2.8
KDg	36	78APa178	63°39' N.; 155°08' W.	Hornblende$_3$	Diabase	0.408 .415 avg .412	0.514 .516	0.29 .27	84.9 ± 4.3
	37	79APa23C	63°39' N.; 155°57' W.	Amphibole$_1$	Gabbro	0.27 .28 avg .275	1.140	0.43	267 ± 11
	38	79APa248	63°42' 155°48'	Whole rock$_2$	Gabbro	0.581 .520 avg .5505	1.606 1.584	0.75 .74	176 ± 9
	39	79APa151	64°00' N.; 155°22' W.	Whole rock$_2$	Diabase	0.325 .313 avg .320	0.482 .419 .486	.042 .052 .050	98 ± 10
PzpEp	40	75APa104C	63°53' N.; 154°20' W.	Biotite$_2$	Biotite actinolite greenstone	7.48 7.56 avg 7.52	32.35 31.45	0.89 .88	274 ± 14
	41	75APa77	63°58' N.; 153°41' W.	Muscovite$_3$	Quartz-mica schist	4.21 4.03 avg 4.12	26.55 28.20	0.92 .88	411 ± 15
	42	77APa196	63°57' N.; 153°43' W.	Muscovite$_3$	Quartz-muscovite schist	7.06 6.98 avg 7.02	58.60 61.63	0.96 .93	514 ± 18
	43	77APa198	63°59' N.; 153°44' W.	Muscovite$_3$	Quartz-muscovite schist	5.79 5.87 avg 5.83	26.48 27.63	0.91 .76	297 ± 10
							26.92	0.90	295 ± 9
PzpEs	44	79APa40	63°04' N.; 153°04' W.	Muscovite$_2$	Metaquartz-eye grit	10.34 10.29 avg 10.315	16.47 16.47	0.87 .88	108 ± 5
	45	79APa35A	63°08' N.; 152°48' W.	Muscovite$_1$	Metaquartz-eye grit	9.57 9.69 avg 9.635	41.28	0.95	276 ± 8
	46	79APa37B	63°00' N.; 152°48' W.	Green amphibole$_2$	Metagabbro	0.161 .169 avg .165	1.116 1.138	0.64 .59	421 ± 21

1 - U.S.G.S. lab 2 - Teledyne Isotopes 3 - Kruger Enterprises, Inc.

Brief description of K-Ar and chemical analyses samples:

1. High-K andesite flow, Sunset benchmark
2. High-K andesite flow, Sunset benchmark
3. Altered rhyolite dome, near Sunset benchmark
4. High-K andesite, Page Mountain
5. High-K andesite, Page Mountain
6. High-K andesite, Page Mountain
7. High-K andesite, Alone Mountain
8. Granodiorite, Page Mountain
9. Monzonite, Cloudy Mountain
10. Granite (A-type), upper Sulukna River stock
11. Granite (A-type), Telida Mountain
12. Granite (A-type), Telida Mountain
13. Granite (B-type), Sunshine Mountain
14. Granite (B-type), Sunshine Mountain
15. Granodiorite, Shepard Creek intrusive bodies
16. Granite (B-type), Meadow Creek intrusive bodies
17. Quartz monzodiorite, Shepard Creek intrusive bodies
18. Hypabyssal quartz monzonite, Shepard Creek intrusive bodies
19. Monzonite, Cripple Creek Mountains
20. Monzodiorite, Whirlwind Ridge
21. Quartz monzonite, Nixon Fork Mine
22. Monzogabbro, Von Frank Mountain
23. Quartz monzonite, Von Frank Mountain
24. Monzonite, Von Frank Mountain
25. Monzogabbro, Stone Mountain
26. Gabbro, Stone Mountain
27. Rhyolite sill, Mystery Mountains
28. Dacite intrusive, Shepard Creek intrusive bodies
29. Dacite dike, Indian Mountain
30. Dacite dike or sill
31. Sericitically altered rhyolite dike, Nixon Fork Mine
32. Sericitically altered rhyolite dike, Nixon Fork Mine
33. Red rhyolite flow, Sischu Mountains
34. Rhyolite vitrophyre, Sischu Mountains
35. Dacite flow, Sischu Mountains
36. Diabase
37. Gabbro
38. Altered gabbro
39. Olivine diabase
40. Metaplutonic rock
41. Quartz muscovite schist
42. Quartz muscovite schist
43. Quartz muscovite schist
44. Metaquartz grit, Slow Fork Hills
45. Metaquartz grit, Slow Fork Hills
46. Metagabbro, Slow Fork Hills