DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

TABLE 1.--ULTRAMAFIC ROCKS OF THE EAGLE QUADRANGLE, ALASKA (CONTINUED)

GROUP II-A

Map No.	Field No.	Location Quad	Location Lat(N) Long(W)	Data[1]	Approx size[2]	Rock name	Mineralogy Primary	Mineralogy Secondary	Serpentinization (percent)[3]	Other significant alteration	Textural features	Adjacent country rock	Structural data	Remarks
3	68AFr2017 70AFr2376 to 70AFr2380	D-4 D-5	64°55' 142°57'	S,T,X	Large	Dominantly serpentinized dunite and harzburgite	Olivine (P_{80-95}) 10-70%; orthopyroxene (enstatite) 0-50%; clinopyroxene (augite) 0-12%; chromite 1%	Serpentine (lizardite and clinochrysotile) 0-90%; magnetite < 3% chlorite < 5%; actinolite 0-15%; talc < 3%; brucite <1%	Variable 0-100%; most rock was at least 25% serpentinized; degree of serpentinization increased toward the eastern ends of the limbs	Quartz-magnesite vein with green stain, about 1.1 m wide in NW part of mass. Hornblendite and epidote-hornblendite in local boundary zones	Massive serpentinized harzburgite and dunite; minor veinlets of late chrysotile cross-cutting rock throughout the mass; local slip-fiber developed on surfaces. Orthopyroxene commonly occurs as segregations in western part of body; usually fewer and as solitary grains as bastite in eastern part of body. Schiller structure along original cleavage; exsolving reddish-brown mineral is common in bastite. Clinopyroxene is found only in the western part; a lens consists of 90% augite. Chromite is scarce but occurs as large grains up to 1.5 mm across	Argillite, graywacke, quartzite	Faulted; has tectonic inclusions of diabase	Additional sample nos: 70AWr30, 70AWr31, 70AWr77, 70AFr241, 70AFr243, 70AFr2434, 71AFr218, 71AFr222, 71AFr223, 71AFr228, 71AWr34, 71AWr36, 71AWr37, 71AWr44, 71AWr59, 71AWr64, 71AWr126, 71AWr127, 70AFr232
26	70AFr2333 to 70AFr2349	C-1	64°43' 141°16'	S,T,X	Large	Serpentinized harzburgite	Olivine (P_{80-95}) 10-90%; orthopyroxene (enstatite) 5-35%; clinopyroxene (augite) <5%; chromite <1%	Serpentine (antigorite; locally later chrysotile veinlets) 5-90%; magnetite < 3%; actinolite 0-15%; brucite (bordering late veinlets with magnetite) <1%; chlorite variable < 5%	Variable 5-100%; most rock was at least 25% serpentinized; little was completely serpentinized	Saussuritized northern contact zone	Massive serpentinized harzburite; minor veinlets of late chrysotile with local cross-fiber near southern border. Olivine commonly granulated; orthopyroxene commonly deformed; clinopyroxene occurs sporadically but never more than 5%. Orthopyroxene grains occur as segregations in places; clinopyroxene occurs occasionally in some segregations with orthopyroxene. Chromite scarce, occurs as relatively large, poikilitic grains	Greenstone, quartzite, quartz-mica schist	Faulted; has inclusions of country rock near boundaries	Additional sample nos: 66AFr407 to 66AFr410, 66AFr533, 66AFr806, 66AFr807, 66AFr810 to 66AFr812, 66AFr1038, 66AFr1057 to 66AFr1059, 71AFr4, 71AFr1102, 71AFr1103, 71AFr1105, 71AFr1116, 71AWr4 to 71AWr6
73	64AFr345 64AFr355 65AFr797 65AFr799 65AFr800 65AFr801 65AFr805	A-1	64°30'00" 141°01'30"	T,X	Large	Serpentinized harzburgite	Olivine 1%	Serpentine (antigorite) 0-90%; talc 0-50%; chlorite 0-65%; magnesite 0-3%; magnetite 0-3%; actinolite 0-5%; dolomite 0-10%	90-100%	Antigorite is altered to talc and magnesite with local development of chlorite and actinolite	Massive, fine-grained, much deformation by squeezing and shearing. Moderately fine fibrous antigorite has replaced original minerals. Large magnetite grains up to 4 mm across occur, commonly with brucite. Late, thin, cross-cutting serpentine veinlets are common, locally showing traces of cross-fiber development; hard serpentine fibers up to 100 mm long are found locally. Much antigorite has been altered to talc and magnesite; local concentrations of coarse green chlorite and magnesite.	Quartzite, quartz-mica schist, greenschist		
GROUP II-B														
2	70AFr2438	D-5	64°59'15" 143°16'02"	S,T,X	Small	Serpentinized harzburgite or dunite	Olivine 10%; orthopyroxene 5%	Serpentine (lizardite and clinochrysotile) 78%; ± actinolite 5%; chlorite 5%; magnetite 1%; talc 1%	75	Talc and actinolite are altered from the pyroxene	Lumpy weathered surface from resistant orthopyroxene. Serpentine after olivine has mesh texture, after orthopyroxene is bastite	Granitic rock		
4	71AWr29 71AWr30	D-4	64°55'20" 142°45'00"	S,T	Small	Serpentinized harzburgite	Olivine 45%; altered orthopyroxene	Serpentine 17%; actinolite 20%; talc 10%; magnetite 3%; chlorite 5%	30			Glacial till covers bedrock		
5	71AWr124 71AWr125	D-4	64°53'50" 142°35'10"	S,T	Small	Serpentinized dunite	Olivine 0-40%	Actinolite 0-40%; serpentine 10-99%; talc 0-17%; magnetite <1%	5 to 100		Massive serpentine with some cross-fiber. Serpentine replaces olivine along fractures. Fracture obliterated where fine-grained. Some long, stiff, fibrous serpentine	Quartzite		
6	71AWr117 71AFr161	D-4	64°53'45" 142°32'30"	S,T	Small	Serpentinized dunite	Olivine 7-75%	Actinolite 10-70%; serpentine 10-25% chlorite 0-10%; magnetite < 1-3%; talc 0-10%	25-90	Talc and actinolite are altered from pyroxene	Massive serpentinized ultramafic with some cross-fiber	Hornfels and granitic rock		
18	68ACs301	D-3	64°54'50" 142°11'45"		Small	Serpentinized peridotite						Black quartz-graphite phyllite		
57	66AFr1086 67AFr54	B-1	64°29'05" 141°12'10"	S,X	Small	Serpentinized dunite	Olivine 10%	Serpentine (antigorite 75%); actinolite 10%; talc 5%; local sulfide crystals, probably pyrite	90		Serpentine is fine-grained; actinolite and talc are locally concentrated; coarse actinolite is fibrous but hard	Greenstone near Liberty Fork		
79	70AFr913 70AFr915	B-3	64°16'00" 142°06'15"	S,T,X	Small	Serpentinized dunite and serpentinite	Olivine 10-20%	Serpentine (lizardite and clinochrysotile) 50 ±; actinolite 15-20%; talc 10-15%; magnetite 5%; magnesite 0-1%; brucite 1%	30-100		Olivine grains are exceptionally large, 15 mm x 2 mm wide, and are randomly oriented. Serpentine has mesh texture after olivine. Talc increases in abundance with serpentine; actinolite decreases in abundance with increase in talc. Locally, actinolite crystals in serpentine.	Quartzite, quartz-mica schist, marble		
84	70AFr2352	B-5	64°27'58" 142°03'30"	S,T,X	Small	Serpentinized harzburgite	Olivine 10%; orthopyroxene <5%	Serpentine (lizardite + clinochrysotile) 45%; actinolite 40%; talc 0-20%; magnetite 3%; brucite 2%; chlorite 5-10%	80		Rock is dark, fine-grained massive to crumbly; relict grain outlines can be seen on weathered surfaces. Serpentine shows mesh texture after olivine. Actinolite occurs in radiating fibrous bundles	Quartz-mica schist		Dike or pod
85	70AFr2353 68AFr2365	B-5	64°28'08" 143°03'30"		Small	Serpentinized harzburgite					Similar to 84	Greenschist		Similar to 84
86	70AFr2354	B-5	64°28'17" 143°03'30"	T,X	Small	Serpentinized harzburgite	Olivine 25%; orthopyroxene <5%	Actinolite 40%; serpentine (lizardite + clinochrysotile) 15%; chlorite 10%; magnetite 5%	60		Similar to 84	Greenschist		Similar to 84
87	70AFr2355	B-5	64°28'25" 143°03'05"	S,X	Small	Serpentinized harzburgite	Orthopyroxene 25%; olivine?	Talc 40%; chlorite 15%; serpentine (lizardite + clinochrysotile) 15%; magnetite <2%	70		Similar to above. 12.5 cm veinlet of orthopyroxene trends parallel to outcrop	Greenschist and possibly granitic rock		Dike or pod parallel to and north of 86
88	68AFr2361 71AWr323 71AWr324	B-5	64°27'45" 143°06'00"	X	Small	Serpentinized dunite	Olivine (10%)	Serpentine 65%; talc 20%; chlorite 10%; magnetite 5%	90		Serpentine is probably antigorite although X-ray diffraction peaks are not clear. Possibly it is a mixture. Serpentine is partially altered to talc	Greenstone		
97	64AFr83 69AFr27 69AFr28 69AWr13	A-6	64°10'00" 143°43'00"	X S,X S,X	Medium	Serpentinized harzburgite	Olivine 0-25%; orthopyroxene (bastite) 0-30%	Serpentine (antigorite with late clinochrysotile veinlets), minor actinolite, chlorite, brucite, magnetite	60 ±		Massive antigorite cut by abundant late chrysotile veinlets. Foliated; preferred orientation of tabular bastite. Rare cross fiber and slip fiber; some fibrous actinolite	Quartz biotite schist and gneiss		Cut by fine-grained gray dike rock

GROUP III-A

Map No.	Field No.	Location Quad	Location Lat(N) Long(W)	Data[1]	Approx size[2]	Rock name	Mineralogy Primary	Mineralogy Secondary	Serpentinization (percent)	Other significant alteration	Textural features	Adjacent country rock	Structural data	Remarks
70	66AFr608	B-1	64°19'00" 141°08'25"	T,X	Small	Biotite, pyroxenite; pyroxene hornblendite, fresh and serpentinized	Clinopyroxene (diopsidic augite) 5-80%; hornblende (colorless) 0-20%; biotite 0-12%; olivine 0-2%	Actinolite 5-55%; chlorite 0-18%; sphene <1%; calcite 0-2%; epidote, local concentrations; magnetite 2%; hematite <1%	Local, variable 0-60%		Coarse (3-6 mm) to moderately fine-grained; generally massive and fairly equigranular. Serpentinized rock was noted at edge of this mass	Granitic rock(?)		Veins of pegmatite and granitic rock cut the ultramafic
71	66AFr960	B-1	64°15'45" 141°08'40"	T,X	Small	Biotite hornblendite; minor hornblende pyroxenite	Biotite 50% ±; hornblende (dark green) 50% ±; clinopyroxene (local) 80% ±; apatite <2%	Actinolite ± 5%; chlorite ± 5%; sphene <1%; serpentine <1%; magnetite <1%; phlogopite <1%; garnet (red) <1%; epidote veinlets; albite, intergranular; calcite	Local <1%		Much is very coarse-grained (50-75 mm long) hornblende and biotite crystals. Grain size ranges down to 2± mm in some parts of the mass. Late epidote veins roughly 75 mm wide cut the mass; grain size is about 2 mm. Mineral grains are commonly fractured and have crushed boundaries. Secondary minerals are found in intergranular pockets and along grain boundaries.	Quartz-mica schist and gneis		Cut by granitic stringers
81	70AFr805 70AFr806 71AFr870 63AFr476	B-3	64°18'20" 142°23'45"	S,T,X	Medium	Hornblende pyroxenite; hornblendite; minor biotite hornblendite	Clinopyroxene (diopside) 0-72%; hornblende (green) 10-80%; biotite 0-15%; apatite <1%	Hornblende (green to pale blue-green) 5-50%; actinolite 0-10%; sphene 0-1%; albite 0-3%; magnetite 0-3%; calcite 0-8%; pyrite 0-3%; chlorite 0-10%; penninite <1%; epidote 0-18%; albite 0-3%; garnet <1%	0	Clinopyroxene partially altered to hornblende, actinolite. Hornblende partially altered to actinolite, chlorite	Coarse to fine grained; hornblende crystals locally up to 40 mm long. Main intrusive part is massive; thin layers intruded into marble show good to poor foliation. Grains are fairly equigranular, ±0.75 mm diameter, subhedral	Marble	Ultramafic rock appears to be intruded into marble; marble and ultramafic folded and metamorphosed together	
89	70AFr2405 69AWr150 69AFr221	B-5	64°29'30" 143°23'15"	S,T,X	Small	Hornblendite to pyroxenite with gradations between; biotite hornblendite; magnetite pyroxenite; hypersthene hornblendite	Clinopyroxene (diopside) 0-75%; hornblende (medium to dark green) 10-95%; biotite 0-50%; orthopyroxene (hypersthene) 0-25%; magnetite 0-30%; apatite 1%	Actinolite 0-90% (local); chlorite 1-5%; quartz 0-5%; epidote 0-15%; albite 0-3%; sphene <1%; zoisite 1%; clinozoisite <1%	0	Blue amphibole rims on green hornblende near center of mass in various amounts	Coarse to medium grained, massive, generally in equigranular lenses, some with large hornblende crystals (12 mm diameter and 25-40 mm long) in finer-grained clinopyroxene matrix. Local magnetite-rich zone in pyroxenite with about 30% magnetite as large subhedral grains	Quartz-mica schist and quartzite	Possibly bounded by fault on north end	
90	69AFr841 70AFr2449 70AFr2450 70AFr2552 70AFr2553 71AFr3008 71AWr280 71AFr613 71AFr614	B-5	64°23'50" 143°07'25"	S,T,X	Medium	Hornblendite; hornblende pyroxenite; biotite hornblendite; biotite pyroxenite	Clinopyroxene (augite) 0-80%; hornblende (dark green) 10-90%; biotite 0-25%; apatite 0-1%	Actinolite 5-15%; chlorite 1-3%; magnetite 0-1%; sphene 0-1%; calcite 0-3%; minor epidote and albite	0		Generally quite coarse-grained, hornblende and biotite ranging from about 10 mm to 40 mm in length. Biotite flakes are exceptionally large in some biotite hornblendites while hornblende is exceptionally large in others. Small segregations (0.3 to 0.7 m across) are composed of 100% hornblende, biotite, or pyroxenite	Quartz-mica gneiss and schist intruded by granitic rocks	Cut by aplitic dikes about 0.6 m wide, some garnet-bearing. Large (0.3 to 2 m diameter) blocks of coarse hornblende-rich rocks are twisted up in aplitic material near the center of the outcrop	K^{40}/A^{40} age determined on hornblende 170.7 m.y. and on biotite 180.9 m.y. Determinations by Donald Turner, University of Alaska (personal commun.)
91	70AFr2533 70AFr316 70AFr317	B-5	64°23'58" 143°04'30"	T,X	Medium	Hornblendite; hornblende pyroxenite; biotite hornblendite	Hornblende 5-90%; clinopyroxene (augite) 5-90%; biotite 0-15%	Actinolite 0-18%; chlorite 0-18%; calcite 0-1%; sphene 0-1%; magnetite 0-3%; epidote 0-8%; albite 0-3%; zoisite 0-1%	0		More distortion of grains than in 90. Coarse-grained, about 40 mm maximum length for hornblende, 40 mm maximum diameter for biotite. Pyroxene grains have maximum length about 10 mm.	Quartz-biotite gneiss, quartzite	Small intrusive. Cut by aplitic dikes	May be related to or part of 90; mineralogy similar but textures indicate more deformation.
GROUP III-B														
52	69AFr748	C-3	64°38'35" 142°10'35"	S,T,X	Small	Biotite pyroxenite	Diopsidic augite 70%; biotite 25%; apatite <1%	Hornblende (dark green from clinopyroxene) <2%; actinolite <2%	0		Coarse-grained, biotite crystals 4 mm long. Diopside is mosaic of anhedral grains (~1.5 mm diameter); many embayed and partially altered to green hornblende. Biotite crystals embayed and many are bent slightly	Mafic plutonic rock	Dike	
53	71AFr332	C-3	64°37'50" 142°11'55"	S,T	Small	Biotite pyroxenite and pyroxene hornblendite	{ Diopside 75%; biotite 20% / Hornblende 50%, pigeonite 40%; biotite 1%	Chlorite 0-3%; actinolite 2-3%; albite 2-3%; magnetite <1%	0		Equigranular; random orientation of crystals; pyroxene forms mosaic. Two distinct rock types	Hornblende granodiorite	Dike	Significant platinum and palladium values, see table 2
54	69AFr2051	C-3	64°37'30" 142°24'40"		Small	Pyroxenite						Quartzite		
65	70AFr209	B-2	64°22'00" 141°41'45"	S,T,X	Small	Pyroxenite, olivine pyroxenite	Clinopyroxene 60-85%; olivine 0-10%; phlogopite 0-1%	Hornblende (green to pale blue-green, after clinopyroxene) 10%; serpentine (after olivine) 10%; magnetite 1-8%; calcite 0-2%; quartz 0-2%	0-10%		Interlocking mosaic of equigranular clinopyroxene grains with hornblende as alteration product of clinopyroxene. Scarce olivine is altering to serpentine and magnetite. Quartz and calcite are late intergranular	Quartzite	Dike?	
66	70AFr189	B-2	64°19'30" 141°38'55"		Small	Biotite pyroxenite			0		Coarse-grained, massive	Diorite		Only single boulder found
67	70AFr170 68AFr143	B-2	64°20'40" 141°33'45"	T,X	Small	Hornblende pyroxenite	Clinopyroxene (diopsidic augite) 46%; hornblende 46%; hypersthene 1%; biotite <1%	Chlorite 2%; actinolite 2%; magnetite 1%; minor local serpentine	Slight locally		Interlocking mosaic of anhedral hornblende (3 mm ±) and clinopyroxene (0.75 mm ±)	Marble, quartzite, and quartz-biotite gneiss		Stringers of hard cross fiber about 3 mm thick. Local serpentinized harzburgite
69	66AFr631	B-1	64°18'50" 141°09'10"	T	Small	Hornblendite	Hornblende (blue-green) 80%; apatite <1%	Epidote 15%; hematite 1%; calcite 1%; sphene and rutile 1%	0		Amphibole grains randomly oriented. Many grains have lighter blue-green rims. Epidote occurs in and near veinlets	Garnetiferous quartz-biotite gneiss	Dike	Cut by granitic stringers
74	65AFr655	A-1	64°00'00" 141°15'30"	T	Small	Hornblendite	Hornblende (colorless, green, pale blue-green) 80%	Actinolite 5%; chlorite 5%; albite 2%; epidote 12%; sphene <1%		Green hornblende altered to chlorite in places	Coarse-grained, fairly equigranular with grains ±0.75 mm across. Hornblende crystals up to 20 mm long	Marble	Vertical dike or intrusive	
75	70AFr970	A-3	64°00'47" 142°18'15"	T	Small	Phlogopite olivine pyroxenite	Clinopyroxene (augite) 75%; olivine 7%; phlogopite 12%; apatite 1%	Hornblende (green) 1%; actinolite 1%; chlorite 1%; magnetite 2%	0		Fairly coarse-grained, equigranular, grains 2-3 mm diameter	Hornblende-biotite granodiorite	Dike	
76	70AFr847	A-3	64°12'10" 142°[illegible]'20"		Small	Hornblendite	Hornblende		0		Large hornblende crystals up to 50 mm long	Quartz-mica schist, hornblende gneiss	Dike? May be slightly foliated	
77	70AFr852	A-3	64°12'35" 142°07'10"		Small	Hornblendite	Hornblende		0		Coarse hornblende crystals	Quartzite	Dike	
78	70AFr855	A-3	64°14'05" 142°07'03"	S,T	Small	Hornblendite	Hornblende (green to brown) 85%; biotite 2%; apatite <1%	Albite(?) <4%; chlorite <4%; pyrite <1%; magnetite <1%; sphene <1%; calcite <1%; epidote <1%	0		Coarse-grained, massive, no foliation. Stubby hornblende grains are equigranular, about 12 mm long	Marble and quartz-mica schist		
80	70AFr815	B-3	64°18'02" 142°21'25"		Small	Biotite pyroxenite					Coarse-grained	Quartz-mica schist and marble	Dike; infolded in schist	
82	69AFr306	B-4	64°25'25" 142°58'20"		Small	Pyroxenite			0		Massive	Quartz-mica schist, marble	Dike	
83	68AFr2375 68AFr2376	B-5	64°25'45" 143°01'00"	T	Small	Biotite hornblendite	Hornblende-major; biotite-minor		0		Massive large hornblende crystals; grade into finer-grained hornblendite	Quartz-biotite schist	Foliated	
92	70AFr3108	B-5	64°22'40" 143°09'30"			Hornblende(?) pyroxenite			0			Quartzite		
93	69AFr223	B-5	64°23'00" 143°09'30"	S,T	Small	Hornblende pyroxenite	Diopside 72%; hornblende 20%; apatite 3%	Zoisite 3%; sphene <1%; magnetite-hematite <1%	0		Coarse-grained	Marble and quartzite	Dike, later than marble and quartzite	
94	70AFr3106	B-5	64°23'00" 143°10'20"	S	Small	Biotite-hornblende pyroxenite			0		Coarse-grained	Quartz-mica schist and marble		
95	70AFr4041 69AWr149	B-5	64°24'30" 143°24'15"	S,T,X	Small	Biotite hornblendite	Hornblende (blue-green) 65%; biotite 5%	Chlorite 10%; epidote 10%; albite 5%; rutile-sphene 3%; muscovite 3%			Biotite grains are ±7 mm long and partially altered to chlorite in slivers parallel to cleavage. Hornblendite is fairly equigranular about 0.75 mm diameter	Quartz-mica schist and quartzite	Dike	