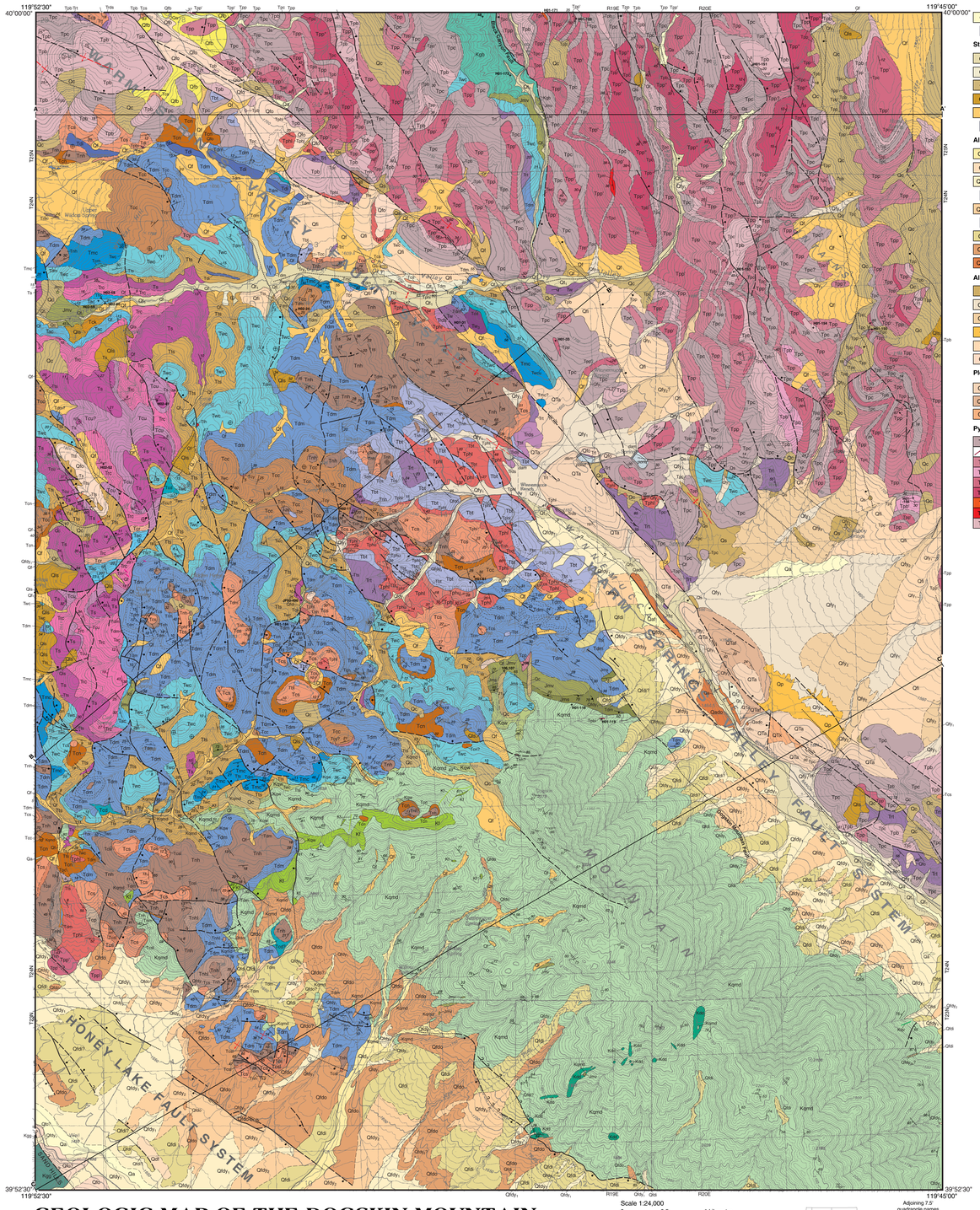
Prepared as part of the STATEMAP component of the National Cooperative Geologic Mapping Program in cooperation with the U.S. Geological Survey



Qa Active alluvium

Qaf Fine-grained alluvium (Holocene and late Pleistocene)

Stream Channel Deposits of Winnemucca Valley

Qt_1 Alluvial terrace deposits (late and middle Holocene)

Qt_2 Alluvial terrace deposits (earliest Holocene and latest Pleistocene)

Qc Undifferentiated Quaternary colluvium and talus

Qls Landslide deposits

Qf Undifferentiated Quaternary alluvial fan deposits

Qfb Undifferentiated Quaternary alluvial fan deposits (basalts)

Alluvial Fans and Other Deposits of Dogskin Mountain

Qfd_1 Alluvial terrace deposits (late and middle Holocene)

Qdf Fine-grained deposits (Holocene and late Pleistocene)

$Qfdy_1$ Younger alluvial fan deposits (late and middle Holocene)

$Qfdy_{1b}$ Megabreccia of granite (late and middle Holocene)

$Qfdy_2$ Alluvial fan deposits (early Holocene and latest Pleistocene)

$Qfdy_{2b}$ Megabreccia of granite (early Holocene and latest Pleistocene)

Qfdi Intermediate-age alluvial fan deposits (late and middle Pleistocene)

Qfdo Alluvial fan of granite (middle and early Pleistocene)

Qado Older/deformed fan deposits (late? and early Pleistocene)

Alluvial and Other Deposits of the Virginia Mountains

Qs Spring deposits

Qfy_1 Alluvial fan and stream terrace deposits (late and middle Holocene)

Qfy_2 Alluvial fan and stream terrace deposits (early Holocene and latest Pleistocene)

Qp Ponded deposits

Qfi Intermediate-age alluvial fan deposits (late and middle Pleistocene)

Qfo Alluvial fan deposits (middle? and early Pleistocene?)

Pleistocene(?) and Late Pliocene Alluvial Deposits

QTa Pleistocene and late Pliocene(?) alluvial deposits

QTaf Finer grained alluvial deposits

QTk Pleistocene(?) and late Pliocene sandstone

Pyramid Sequence

Tpc Conglomerate, sandstone, and breccia

Tpb' Basaltic andesite dike

Tpp Porphyritic basaltic andesite lava

Tpb' Sparsely porphyritic basaltic andesite lava

Tpp' Finely porphyritic basaltic andesite lava

Tpp' Bimodal porphyritic basaltic andesite lava

Tpr Porphyritic rhyolite lava

Tpm Tuff of Mullen Pass

Tpb Basalt to basaltic andesite lava

Miscellaneous Intrusions

Tdi Porphyritic dacite intrusions

Thi Hornblende andesite dike

Rhyolite Group

Trds Rhyolite-clast conglomerate

Trt Rhyolite-dacite ash-flow tuff

Tbt Tuff breccia; includes megabreccia

Tbd Rhyolite-dacite breccia

Tri Rhyolite intrusion (cross section B - B' only)

Oligocene Ash-Flow Tuffs

Tphu Upper tuff of Painted Hills

Tphl Lower tuff of Painted Hills

Tcp Sedimentary rocks below tuff of Painted Hills

Tcs, Tcsl Tuff of Chimney Spring; Tcsl, poorly welded basal part of Tcs

Tnh, Tnhl Nine Hill Tuff; Tnhl, basal part of Tnh

Tcn Conglomerate/breccia

Tw Tuff of Winnemucca Ranch

Tcc Tuff of Campbell Creek

Tcy Conglomerate below tuff of Campbell Creek

Tdm Tuff of Dogskin Mountain

Tcd Debris-flow deposits and conglomerate within the tuff of Dogskin Mountain

Tw3 Tuff 30

Tmc Tuff of Mine Canyon

Tcm Conglomerate below the tuff of Mine Canyon

Twc, Twcu Tuff of Cove Spring; Twcu, upper part of tuff of Cove Spring

Tts Bedded tuff and tuffaceous sedimentary rock

Ts Tuff of Sutcliffe

Tcu Sedimentary rocks below tuff of Sutcliffe

Trc Tuff of Rattlesnake Canyon

Tcr Sedimentary rocks below tuff of Rattlesnake Canyon

Thc Tuff of Hardscrabble Canyon

Tac Tuff of Axehandle Canyon

Tck Basal Tertiary conglomerate

Mesozoic Rocks

Cretaceous granitic rocks

Kgg Granite of Granite Peak

Kgb Granodiorite of Black Canyon

Kl Aplitic to pegmatitic dikes and irregular intrusions

Kdd Diorite dikes

Kqw Weathered quartz monzodiorite

Kqmd, Kqv Quartz monzodiorite; quartz vein (Kqv)

Jurassic(?) metamorphic rocks

Jmv, Jms Jurassic(?) metavolcanic and metasedimentary rocks

Contact Long dashes where approximately located; short dashes between different tuffs, cooling units, lavas or alluvial fans within same map unit; queried where uncertain; dotted where concealed.

Fault Bar and ball on downthrown side; double arrows show sense of strike-slip offset; dashed where approximately located, queried where uncertain, dotted where concealed. On cross sections, A = away; T = toward.

Monocline axial trace Arrow indicates direction of dip.

Syncline axial trace Showing plunge, dashed where approximately located.

Landslide headwall scarp Ticks point down slope.

Strike and dip of beds
Inclined — Horizontal

Strike and dip of compaction foliation in ash-flow tuff
Inclined — Vertical — Overturned

Strike and dip of flow bands in lava or intrusion
Inclined — Vertical
Continuous curving flowbands

Strike and dip of metamorphic foliation
Inclined — Continuous curving foliation

Joint
Inclined — Vertical

Columnar joint Showing bearing and plunge.

Sample location for $^{40}Ar/^{39}Ar$ date or chemical analysis
H01-49

Field work done in 2001-03.

Office Review: Stephen Castor, NBMG; John Dilles, Oregon State University; Larry Garside, NBMG; Kyle House, NBMG; Alan Ramelli, NBMG; Marith Reheis, U.S. Geological Survey

Field Review: Stephen Castor, NBMG; Larry Garside, NBMG; Kyle House, NBMG; Alan Ramelli, NBMG; Marith Reheis, U.S. Geological Survey

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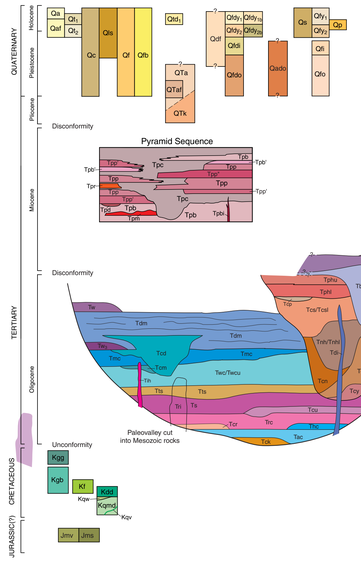
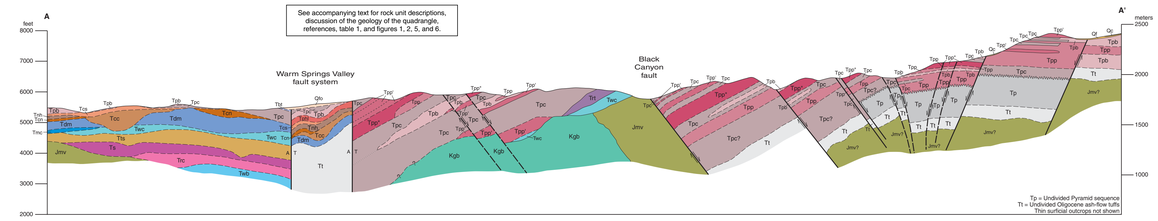
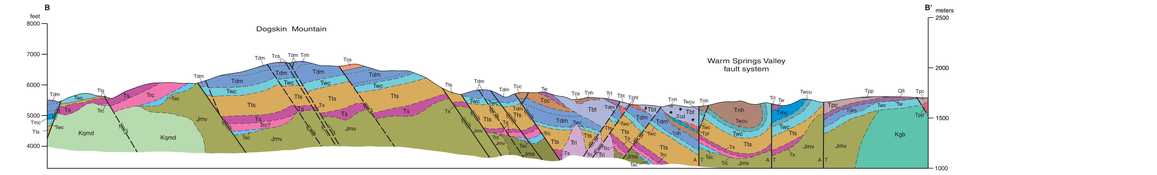
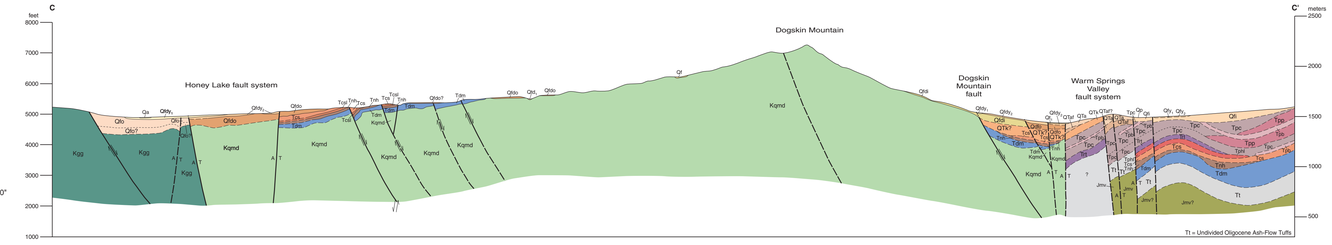


See accompanying text for rock unit descriptions, discussion of the geology of the quadrangle, references, table 1, and figures 1, 2, 5, and 6.







GEOLOGIC MAP OF THE DOGSKIN MOUNTAIN QUADRANGLE, WASHOE COUNTY, NEVADA

Christopher D. Henry, James E. Faulds,
Craig M. dePolo, and David A. Davis
2004

Scale 1:24,000
0 0.5 1 kilometer
0 0.5 1 mile
0 1000 2000 3000 4000 5000 feet

CONTOUR INTERVAL 10 METERS

Base map: East half of the U.S. Geological Survey Dogskin Mountain Nevada - California, 7.5'x15' 1:25,000-scale Quadrangle which includes Seven Lakes Mtn, 7.5' Quadrangle, 1979 Digital Raster Graphic (DRG) 1927 North American Datum

Adjoining 7.5' quadrangle names

1	2	3
4		5
6	7	8

1 State Line Peak
2 Spanish Flat
3 Pyramid SW
4 Seven Lakes Mtn.
5 Tule Peak
6 Granite Peak
7 Bedell Flat
8 Fraser Flat

Table 2. Data on ash-flow tuffs of the Dogskin Mountain area.

Tuff	Map symbol	Maximum thickness (m)	Age* (Ma)	±2s	Phenocrysts total %	plagioclase %	plagioclase diam	quartz %	quartz diam	sanidine %	sanidine diam	biotite %	biotite diam	hornblende %	hornblende diam	other
rhyolite-dacite tuff	Trt	50	23.7		35–45	25–35	<1–4	2–4	1–4	0–4	5–13	4–5	<1-3	1–4	<1–5	
upper tuff of Painted Hills	Tphu	25	24.90	0.06	sanidine	MC-15**		caldera, Stillwater Range		20–25	10	5–2	3–4	1–3	8	1–3 2–3 1..2
lower tuff of Painted Hills	Tphl	50	24.9					caldera, Stillwater Range		20–25	8	<1–3	3–5	1–5	10	x3 1–3 1..2
tuff of Chimney Spring	Tcs	50	25.07	0.06	sanidine	MC-12**		caldera, Stillwater Range		25–40	0–3	<1–2	10–20	1–3	10–20	1–3 <1–2 <1
Nine Hill Tuff	Tnh	100			sanidine			unknown; beneath Carson Sink?		12–15	<1–2	1–2	<1	1–2	3–8	1–4 <1 <1
	Tnhl		25.25	0.06		MC-10**				20		<1	1–2	3–8	1–4	<1 <1 anorthoclase,
tuff of Winnemucca Ranch	Tw	50	28.54	0.10	sanidine	HD-11		unknown		20		<1	3	<1	10	<1.5 0.5 <1 clinopyroxene
			28.58	0.10	sanidine	H01-31										
tuff of Campbell Creek	Tcc	160	28.86	0.06	sanidine	H01-61		caldera, Desatoya Mts		10–15	2–6	1–2	5–7	<1–5	4–8	1–3 <1 1..2
			28.86	0.10	sanidine	H02-24										
tuff of Dogskin Mountain	Tdm	120	29.21	0.10	plagioclase	MC-6**		unknown		25–35	20–25	1–3	<1	1–2	<1	<1 2–4 1..2
tuff 30	Tw_3	30						unknown		15–20	8–10	< 2			5–7	<1.5 2 <1-2
tuff of Mine Canyon	Tmc	30	29.92	0.07	sanidine	MC-2**		unknown		15	8–10	<1–3			3–5	1–4 1–2 <1-2
tuff of Cove Spring	Twcu	50						unknown		10–12	6–8	<1–3	tr	1–2	3–4	1–5 0–1 1..2
	Twc		30.13	0.06	sanidine	H01-194										
bedded tuff and sediment	Tts	100								30–40	25–30	<1–4	tr	<1	0–1	<1 2–8 1..3
tuff of Sutcliffe	Ts	100	30.42	0.07	sanidine	H02-41		unknown		20–30	10–20	1–3	1	<2	5–8	1–4 1–4 <3 clinopyroxene
			30.24	0.07	sanidine	JF00-496										
tuff of Rattlesnake Canyon	Trc	100	31.12	0.08	sanidine	H02-52		Toiyabe, Clan Alpine Mts		10	8	1–4	1	<1.5	12	1–5 1 <2
tuff of Hardscrabble Canyon	Thc	20	31.33	0.09	sanidine	H02-58		unknown		10	2	<1	5	<2	3	<2 <1 1
tuff of Axehandle Canyon	Tac	>60	31.31	0.09	sanidine	H02-59		unknown		20	13	<1–2	<1	<2	4	<1–2 2–3 <3
			31.24	0.09	sanidine	H02-60				8	3		tr	<2	4	<1–2 1 1..2

* Age with a value in $^{40}Ar/^{39}Ar$ age determined on sample listed in table 3; age without a ± is based on stratigraphic relations to dated units; age in italics is too young, probably because of alteration.
** In Tule Peak Quadrangle
diam = diameter in millimeters.

Table 3. $^{40}Ar/^{39}Ar$ dates, Dogskin Mountain area.

Sample #	Material	Age (Ma)	±2s	K/Ca	±1s	n**	Map symbol	Map unit	Latitude Degrees	Latitude Minutes	Longitude Degrees	Longitude Minutes
CD00-TP01*	plagioclase	3.59	0.17	0.067	0.012	17	QTs	late Pliocene sandstone	39	52.660	119	43.120
H01-171	plagioclase	14.98	0.10	0.092		97.6	Tpr	porphyritic rhyolite lava	39	59.990	119	48.300
H01-154	sanidine	23.77	0.08	0.6	7.2	9.5	Trt	rhyolite-dacite breccia	39	52.800	119	49.990
CD8-75*	sanidine	23.87	0.08	37.5		82.5	Trt	porphyritic rhyolite dome	39	53.860	119	50.290
CD8-75*	biotite	23.91	0.39	18.8		14.9	Tri		39	52.550	119	49.280
MC-15*	sanidine	24.90	0.06	47.0	3.5	14	Tphu	upper tuff of Painted Hills	39	53.770	119	41.200
MC-12*	sanidine	25.07	0.06	37.1	11.3	15	Tcs	tuff of Chimney Spring	39	53.790	119	41.200
MC-10*	sanidine	25.25	0.06	9.1	2.4	15	Tnh	Nine Hills Tuff	39	53.930	119	41.180
H01-31	sanidine	28.58	0.10	8.6	8.5	14	Tw	tuff of Winnemucca Ranch	39	58.000	119	48.970
H01-61	sanidine	28.86	0.06	57.5	5.8	16	Tcc		39	56.400	119	48.860
H01-61	sanidine	28.86	0.06	57.5	5.8	16	Tcc	tuff of Campbell Creek	39	56.400	119	48.860
H02-24	sanidine	28.86	0.10	59.6	6.6	15	Tcc		39	58.120	119	50.370
MC-6*	sanidine	29.21	0.10	28.1	1.7	4	Tdm	tuff of Dogskin Mountain	39	54.000	119	41.300
MC-2*	sanidine	29.92	0.07	25.6	1.4	14	Tmc	tuff of Mine Canyon	39	53.990	119	41.930
H01-194	sanidine	30.13	0.06	32.4	5.2	15	Twc	tuff of Cove Spring	39	57.540	119	50.090
H02-41	sanidine	30.41	0.07	33.4	5.2	16	Ts	tuff of Sutcliffe	39	57.545	119	50.095
JF00-496	sanidine	30.04	0.07	30.8	7.9	13	Ts		39	56.260	119	50.330
H02-52	sanidine	31.11	0.08	39.0	8.0	15	Trc	tuff of Rattlesnake Canyon	39	57.251	119	51.988
H02-58	sanidine	31.33	0.09	69.3	47.4	15	Thc	tuff of Hardscrabble Canyon	39	58.219	119	52.006
H02-59	sanidine	31.31	0.09	46.7	12.1	16	Tac	tuff of Axehandle Canyon	39	58.182	119	51.973
H02-60	sanidine	31.24	0.09	43.9	8.6	15	Tac	"	39	58.164	119	51.889

* Tule Peak Quadrangle
** n = number of single grains analyzed or % of total *^39Ar* in plateau (H01-171, CD8-75)
Age of sample JF00-496 is too young, probably because of alteration.
Minerals were separated from crushed, sieved samples by standard magnetic and density techniques; feldspars were leached with dilute HF to remove matrix and handpicked. All analyses at New Mexico Geochronological Research Laboratory, New Mexico Institute of Mining and Technology. Analytical methods in McIntosh and Chamberlin (1994); Waghord mass *^40Ar/^39Ar* ages calculated by the method of Samson and Alexander (1987). Samples were irradiated in Al discs for 7 hours in D-3 position, Nuclear Science Center, College Station, TX. Neutron flux monitor Fish Canyon Tuff sanidine (FC-1); assigned age = 28.02 Ma (Renne and others, 1998). Decay constants and isotopic abundances after Steiger and Jäger (1977).

Table 4. Petrographic data for rocks of the Pyramid sequence.

Map unit	Map symbol	total %	Phenocrysts plagioclase %	plagioclase diam	olivine %	olivine diam	clinopyroxene %	clinopyroxene diam	orthopyroxene %	orthopyroxene diam	biotite %	biotite diam	hornblende %	hornblende diam	other
Basalt to basaltic andesite	Tpb					0–5									
Basaltic andesite dike	Tpb'	15–30	10–25	5–20	0–5	0.1–1	3	0.5							
Sparsely porphyritic basaltic andesite	Tpb'	10	3–5	5–10	0–3										
Finely porphyritic basaltic andesite	Tpp'	25–35	20–25	2–5	1–5	0.5–2	4–8	1–5							
Bimodal porphyritic basaltic andesite	Tpp'	25–35	20–30	2–4	10x2	<1	1–2	3–8	1–4						
Porphyritic rhyolite	Tpr	25	24	1–5			<1	<1							
Tuff of Mullen Pass	Tpm	25–30	20–25	<1–3			2	<=2	<1	0.7	<1	<1	0.5–3	magnetite	
Basaltic andesite dike	Tpp	10–25	10–20		1–3	1	1–2	1							

diam = diameter in mm. Olivine is altered to iddingsite in many samples.

Table 5. Chemical analyses of rocks of the Dogskin Mountain area.

	Pyramid Sequence										Rhyolite domes and related dikes and tuffs									
Sample	H00-20	H01-152	H00-15	H99-57	H00-14	H02-40	H01-156	H01-153	H01-155	H01-151	H01-33	H00-25	H01-119	H01-154	H01-171	H01-123	H99-67	H00-27	H99-50	C98-79
Map symbol	Tpb	Tpb	Tpb	Tpb	Tpb	Tpb'	Tpb'	Tpb'	Tpp'	Tpp'	Tpp'	Tpp'	Tpb	Tpb	Tpr	Tpm	Tcs	Tcs	Tcs	Tri
Rock name	basalt	basalt	basalt	bas-and	bas-and	bas-and	bas-and	bas-and	bas-and	bas-and	bas-and	bas-and	bas-and	andesite	rhyolite	rhyolite	dacite tuff	andesite	andesite	rhyolite
Quadrangle	TP	SF	TP	TP	TP	TP	D	D	D	D	D	TP	D	D	D	D	D	TP	TP	S
Longitude 119°	43.6	47.1	44.5	38.1	44.4	44.5	45.2	46.7	45.6	46.6	48.2	43.1	47.8	46.1	48.3	47.5	52.6	38.8	55	39.28
Latitude 39°	56.2	40°0.5	55.5	53.7	55.5	56.0	56.9	58.4	58.0	59.7	57.9	55.4	55.5	58.0	59.99	59.9	53.2	52.7	52.8	52.55
SiO_2	51.04	51.46	51.53	52.15	52.25	52.57	54.10	54.22	54.68	56.02	56.22	56.10	56.91	62.15	70.47	71.47	66.84	61.79	60.60	70.21
TiO_2	1.32	1.18	1.28	1.11	1.94	1.14	1.52	1.73	1.10	0.98	1.03	1.37	0.84	1.28	0.55	0.37	0.72	0.87	0.74	0.43
Al_2O_3	16.99	17.18	16.61	16.67	15.17	18.22	17.48	17.23	18.64	17.74	18.31	17.24	18.75	16.48	16.00	15.48	16.01	16.73	16.87	15.15
FeO*	8.92	8.70	9.28	9.36	10.45	8.23	9.05	8.02	7.42	7.09	7.83	8.33	5.93	2.37	1.86	3.56	8.33	5.49	5.48	2.76
MnO	0.16	0.15	0.16	0.16	0.19	0.15	0.15	0.15	0.13	0.14	0.13	0.13	0.10	0.12	0.03	0.08	0.12	0.12	0.30	0.04
MgO	6.16	6.15	6.16	6.15	6.19	6.15	6.15	6.15	6.13	6.14	6.13	6.13	6.10	6.12	0.03	0.08	0.12	0.12	0.30	0.04
CaO	9.94	9.94	9.35	8.44	8.18	9.50	7.56	7.06	7.57	7.71	7.49	7.19	9.66	4.15	1.29	1.73	3.83	6.22	7.95	2.43
Na_2O	3.32	3.11	3.14	3.31	3.37	3.43	3.90	4.16	3.86	3.55	3.57	3.80	3.10	4.61	4.22	4.05	3.53	3.75	3.69	3.73
K_2O	0.94	1.18	0.96	0.97	1.58	1.06	1.95	2.20	1.38	1.67	1.53	2.22	1.29	3.21	4.70	4.33	4.73	2.70	2.54	4.04
P_2O_5	0.34	0.34	0.33	0.34	0.92	0.31	0.56	0.75	0.30	0.31	0.31	0.53	0.23	0.55	0.09	0.10	0.29	0.22	0.23	0.149
Total*	99.52	99.44	99.35	99.91	99.40	99.60	99.40	99.50	99.64	100.38	100.23	99.19	96.17	99.58	99.38	98.85	95.15	97.31	96.99	99.09
Sc	21	29	28	25	23	27	23	21	15	18	17	23	18	16	9	0	7	14	19	11
V	224	212	216	217	220	248	253	241	215	196	190	231	173	95	20	14	44	142	135	59
Cr	196	271	319	307	112	87	37	17	24	53	58	68	10	3	0	0	3	27	32	8
Ni	95	149	215	185	46	50	28	15	27	33	30	51	7	3	6	4	17	15	18	4
Cu	41	44	46	47	30	29	29	27	27	27	27	27	27	27	27	27	27	27	27	27
Zn	84	85	94	91	134	83	102	115	96	89	69	106	83	113	42	51	85	73	77	51
Ga	16	17	18	17	17	19	24	22	18	20	21	20	22	22	19	17	19	19	18	18
Rb	17	23	17	12	22	13	36	43	25	34	20	51	28	86	140	105	79	63	52	107
Sr	525	509	506	514	590	684	611	549	682	679	642	566	674	410	239	271	454	623	632	322
Y	27	22	25	22	45	22	32	36	21	22	21	30	18	39	34	19	27	15	15	13
Zr	109	115	106	102	258	92	181	212	106	124	123	178	113	240	303	200	278	118	120	154
Nb	9.6	7.0	8.4	5.2	18.7	4.5	10.2	12.5	5.4	6.3	7.4	9.8	3.7	13.2	14.2	9.5	14.7	5.8	6.6	10.9
Ba	465	553	636	471	1015	507	790	872	583	656	794	836	731	1144	1536	1137	1633	990	961	1242
La	41	44	46	53	87	32	65	73	32	50	44	54	28	68	74	41	62	50	28	50
Ce	41	44	46	53	87	32	65	73	32	50	44	54	28	68	74	41	62	50	28	50
Pb	3	3	5	9	9	6	15	11	15	10	7	11	9	17	19	18	17	18	19	21
Th	3	3	2	2	5	1	7	5	3	5	7	4	2	11	15	12	7	12	9	12

Analyses by XRF at Washington State University
Quadrangles: D = Dogskin Mountain, S = Sutcliffe, SF = Spanish Flat, TP = Tule Peak
All analyses normalized to 100% anhydrous. FeO* = all Fe expressed as FeO; Total* = total before normalization to 100% anhydrous
bas-and = basaltic andesite

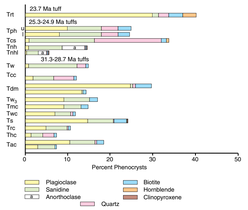


Figure 3. Phenocryst assemblages and average abundances in ash-flow tuffs of the Dogskin Mountain Quadrangle.

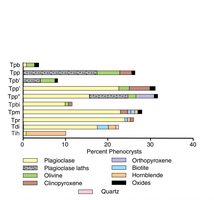


Figure 4. Phenocryst assemblages and average abundances in lava and ash-flow tuff of the Pyramid sequence and miscellaneous intrusions in the Dogskin Mountain Quadrangle.