Table 5 (CD-ROM). Compilation of chemical analyses for Tertiary volcanic rocks, northeastern San Juan region

[**Compilation note:** The table contains all available recent USGS analyses (1986-2005) of nonmineralized volcanic units exposed in northeastern San Juan region, supplemented by selected published analyses (1965-present). A few analyses of key units, from areas adjacent to the area of this report, are also included, especially data for central San Juan calderas from Lipman (2004).
For the new analyses, major oxides were deterimined by WDXRF (Taggart and others, 1987); minor elements were mostly by EDXRF and INAA methods (Siems, 2000, Budahn, 1987), For a few analyses published by others, precise sample locations are unavailable.]

Sample information and X-Ray Fluorescence (WDXRF); weight % (calc. to reported total w/o LOI)

Sample No.	Quadrangle[1]	Sample type, location, data source[2]	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	SiO_2	TiO_2	Al_2O_3	$FeTO_3$	MgO	CaO	Na_2O	K_2O	P_2O_5	MnO	LOI	Total
HINSDALE FORMATION																		
98L-21	MI	Lava, Fish Canyon Ridge	38	5.97	107	4.10	57.56	1.39	16.01	7.50	2.39	5.40	4.29	3.75	0.66	0.12	1.25	99.07
98L-22	MI	Lava, Powderhorn trail	38	4.67	107	6.88	54.45	1.57	15.89	8.55	3.61	6.66	4.15	3.45	0.71	0.12	1.94	99.16
00L-1	LG	Basaltic lava flow, Houghland Hill	38	7.43	106	17.68	50.14	1.86	14.83	11.53	7.30	8.03	2.99	2.68	0.49	0.14	2.87	99.99
SAN LUIS-COCHETOPA CALDERA COMPLEX																		
COCHETOPA PARK AREA, Postcaldera rocks																		
Cochetopa Dome Rhyolite																		
00L-31-B	CP	Devitrified interior, upper flow (silicified)	38	13.55	106	43.92	82.57	0.08	9.45	0.56	<0.10	0.49	2.87	3.64	0.07	0.05	2.50	99.79
00L-31-A	CP	Apache tears, base, upper flow	38	13.55	106	43.92	76.31	0.11	12.79	0.82	<0.10	0.41	3.75	5.47	<0.05	0.11	0.67	99.76
PC-1	CP	Apache tears, base, upper flow (PC)	38	13.27	106	43.15	76.71	0.10	12.87	0.77	<0.10	0.41	3.97	5.10	<0.05	0.11	0.10	100.05
Ds453	CP	Apache tears, base, upper flow (TS)	38	13.55	106	43.92	76.93	0.13	12.37	0.86	0.02	0.16	0.49	3.52	4.63	0.10	0.55	99.21
01L-28	CP	Perlite breccia, upper flow	38	14.93	106	40.45	76.49	0.10	12.99	0.67	0.21	0.44	3.77	4.99	<0.05	0.09	2.99	99.76
PC-6	CP	Fine-grain crystal-rich flow (PC)	38	13.15	106	43.07	76.62	0.09	12.87	0.69	<0.10	0.32	4.23	4.55	<0.05	0.15	0.55	99.53
01L-25	CP	Fine-grain crystal-rich flow	38	12.92	106	42.88	76.48	0.09	13.00	0.71	<0.10	0.32	4.27	4.61	<0.05	0.22	0.75	99.70
01L-26	CP	Middle flow, middle part	38	12.70	106	42.97	76.97	0.11	12.73	0.79	<0.10	0.46	3.97	4.68	<0.05	0.09	1.00	99.80
01L-27	CP	Middle flow, lower part	38	12.60	106	43.00	76.44	0.11	12.89	0.83	<0.10	0.46	4.08	4.71	<0.05	0.08	0.71	99.61
00L-33	CP	Lower flow, E side	38	12.83	106	40.55	75.84	0.13	13.01	0.81	<0.10	0.53	3.89	5.09	<0.05	0.05	0.84	99.36
00L-34	CP	Lower flow, E side	38	13.13	106	40.40	75.33	0.14	13.49	0.85	<0.10	0.49	4.11	5.22	<0.05	0.05	0.70	99.68
PC-4	CP	Porphyritic mafic inclusion (PC)	38	12.50	106	42.62	57.65	0.87	16.76	7.25	2.87	4.91	3.62	4.52	0.46	0.14	0.94	99.05
High-silicia rhyolite intrusions																		
01L-16	RD	Qtz-bearing intrusion, Sage Park	38	16.95	106	40.32	79.89	0.07	11.18	0.52	<0.10	0.32	3.64	3.87	<0.05	0.09	1.61	99.58
03L-3	RD	Rhyolite, Prosser Rock	38	20.77	106	40.68	78.00	0.10	12.07	0.68	0.16	0.61	3.39	4.61	<0.05	0.06	1.40	99.68
03L-48A	RD	Rhyolite, Prosser Rock	38	20.83	106	40.73	78.25	0.08	12.02	0.60	<0.10	0.56	3.59	4.41	<0.05	0.06	0.96	99.57
03L-48B	RD	Rhyolite, Prosser Rock, w/basalt	38	20.83	106	40.73	75.48	0.18	12.45	1.58	0.49	1.22	3.54	4.39	0.06	0.07	1.16	99.46
Welded-tuff clasts, below rhyolite flows on Cochetopa Dome																		
00L-30-A	CP	Welded tuff clast, tuffaceous sediments	38	11.42	106	43.85	75.82	0.14	13.13	1.17	0.14	0.63	3.92	4.79	0.06	0.07	2.53	99.88
00L-30-B	CP	Welded tuff clast, tuffaceous sediments	38	11.42	106	43.85	74.21	0.29	13.42	1.46	0.30	1.29	3.56	4.67	0.10	0.04	1.62	99.35
00L-30-C	CP	Welded tuff clast, tuffaceous sediments	38	11.42	106	43.85	74.57	0.26	13.17	1.58	0.35	1.27	3.88	4.33	0.10	0.06	1.30	99.58
00L-32-A	CP	Welded tuff clast, breccia above Tnr, W side of dome	38	13.55	106	43.92	73.54	0.15	13.51	1.13	0.14	0.33	2.46	8.21	0.08	0.06	1.55	99.61
00L-32-B	CP	Welded tuff clast, breccia above Tnr, W side of dome	38	13.55	106	43.92	72.78	0.29	13.56	1.69	0.33	0.89	2.59	7.07	0.11	0.04	1.20	99.36
NELSON MOUNTAIN CALDERA CYCLE																		
Baldy Cinco Dacite																		
86L-41	BC	Coarse porphyry, head Mineral Creek	37	57.25	107	1.55												
89L-172A	MI	Laccolith, lower Rough Creek	38	0.38	107	5.65	64.69	0.65	16.16	4.46	1.21	3.34	3.93	4.38	0.35	0.07	1.01	99.24
89L-177	BC	Porphyry, upper Rough Creek	37	58.38	107	4.88	61.39	0.84	16.81	6.35	2.57	5.37	3.12	2.41	0.35	0.10	3.44	99.30
89L-178	BC	Dacite, upper Rough Creek	37	57.60	107	5.15	65.59	0.60	15.73	4.29	1.38	3.39	4.23	3.39	0.29	0.12	3.22	99.01
89L-173	BC	Fine grained intrusion, Rough Creek	37	56.10	107	4.68	63.01	0.73	16.56	5.25	1.48	3.97	3.61	3.98	0.37	0.06	1.61	99.02
89L-179	BC	Fine grained, Rough Creek	37	57.92	107	6.07	60.40	0.87	16.47	6.74	1.77	5.05	3.48	3.58	0.34	0.27	1.74	98.96
LR88-564	BC	Sanidine dacite, Mineral Creek	37	57.28	107	1.63	65.75	0.63	15.09	4.89	1.62	3.46	3.64	4.15	0.30	0.06	1.89	99.58
94L-19-A	BC	Capping flow, Baldy Cinco	37	57.83	107	6.15	64.86	0.64	16.01	4.54	1.12	3.43	3.81	4.34	0.37	0.09	0.70	99.22
94L-19-B	BC	Lower flow, Baldy Cinco	37	57.63	107	6.20	65.14	0.66	16.13	4.68	0.97	3.07	3.75	4.42	0.37	0.08	0.82	99.26
89L-172-B	MI	Capping flow, Rough Creek	38	0.58	107	5.57	66.11	0.60	15.28	4.25	1.27	3.06	3.65	4.37	0.30	0.11	0.77	99.01
89L-174	BC	Head, Rough Creek	37	57.72	107	4.60	74.28	0.35	13.73	1.45	0.36	1.21	2.69	5.12	0.15	0.02	2.99	99.35
89L-175	BC	Head, Rough Creek, glassy margin	37	57.82	107	4.50	71.62	0.37	14.30	1.98	0.66	1.68	2.86	5.75	0.13	0.06	3.58	99.39
DS89-056	BC	Upper Rough Creek	37	57.80	107	4.52	71.89	0.37	14.39	2.13	0.45	1.54	3.25	5.16	0.15	0.04	0.99	99.37
Stewart Peak Volcanics																		
DS88-030	SL	Dike, upper Stewart Creek	37	59.72	106	54.47	58.87	0.94	17.23	7.76	2.16	5.18	3.56	3.55	0.39	0.11	0.91	99.75
DS88-036	SP	No Name Creek	38	0.95	106	57.03	68.43	0.53	14.55	4.30	1.42	3.69	2.85	4.27	0.23	0.12	2.70	100.39
LR88-503	SL	Spring Creek (Riciputi, 1991)	??		??		64.25	0.70	15.81	5.51	1.95	3.49	3.80	4.13	0.27	0.08	2.17	99.99
DS87-081	SP	E of Bondholder Meadows	38	0.92	106	58.25												
DS88-025	SP	Stewart Pk, SW ridge	38	0.58	106	56.80	65.85	0.59	15.60	4.82	1.35	2.74	3.85	4.38	0.28	0.08	2.77	99.54
DS88-039A	SL	West of Cascade Creek	37	59.90	106	58.92	60.76	0.82	16.57	6.37	2.36	4.41	3.89	3.69	0.38	0.11	1.36	99.37
DS87-103	SL	Resurgent porphyry, Spring Creek	37	58.95	106	56.98	62.07	0.77	16.03	5.89	2.14	3.83	3.78	3.97	0.33	0.09	1.33	98.91
DS87-104	SL	Mouth of Alto gulch	37	59.80	106	57.38	65.52	0.56	15.80	4.43	1.54	3.51	3.70	3.96	0.26	0.10	2.21	99.38
DS86-246D	SL	Equity block, subsurface mine sample	37	56.23	106	57.52	64.15	0.79	16.75	6.16	1.40	0.75	0.94	7.43	0.35	0.14	4.52	98.86
DS86-246E	SL	Equity block, subsurface mine sample	37	56.23	106	57.52	62.15	0.73	16.14	5.79	0.92	3.02	3.62	6.16	0.33	0.10	1.84	98.96
Lava dome, N of Nelson Mtn																		
85L-27	SL	Mix-lava (dacitic) N of Nelson Mtn	37	55.93	106	56.00	61.75	0.84	16.51	6.32	1.36	4.51	3.60	3.69	0.39	0.06	1.36	99.02
85L-28	SL	Mix-lava (andesite), N of Nelson Mtn	37	55.80	106	56.12	58.60	1.00	17.03	7.50	2.68	5.67	3.56	3.27	0.47	0.11	1.36	99.89
LR87-718-2	SL	Mix-lava, N of Nelson Mtn (Riciputi, 1991)	37	55.62	106	55.75	56.95	1.06	17.31	8.14	2.19	5.77	3.64	3.04	0.45	0.11	0.73	98.66
LR87-718-3	SL	Mix-lava dome, N of Nelson Mtn (Riciputi, 1991)	37	55.87	106	55.87	57.45	1.05	17.76	7.88	1.54	5.77	3.75	3.26	0.45	0.13	0.71	99.04
Lava flows, east (Clockwise from type area)																		
DS85-126	SP	Stewart Pk, upper thick flow	38	1.03	106	56.20	60.16	0.90	16.70	7.11	2.43	5.64	3.44	3.45	0.40	0.10	1.30	100.34
DS85-121	SP	Stewart Pk, lower flow	38	0.60	106	54.52	60.85	0.91	16.98	6.87	1.81	5.00	3.56	3.48	0.36	0.07	1.08	99.90
LR88-505	SP	Baldy Alto, summit (Riciputi, 1991)	38	0.32	106	55.17	59.95	0.86	16.57	6.94	2.60	5.48	3.02	3.64	0.40	0.11	2.24	99.57
DS88-023	SP	W of Baldy Alto, basal flow-below LR88-505, 12,680'	38	1.45	106	55.85	66.16	0.57	15.87	4.72	1.51	3.75	4.10	2.85	0.23	0.10	3.98	99.87
DS88-082	SL	C.D., head E Willow Cr	37	57.58	106	54.15	68.45	0.42	15.16	3.20	1.10	2.57	3.38	4.82	0.18	0.08	2.39	99.36
DS88-031	SL	Upper Stewart Creek	37	59.70	106	54.92	64.67	0.60	15.63	4.83	1.66	3.95	3.38	3.73	0.25	0.11	3.02	98.81
DS87-084	SL	S Cochetopa Cr	37	58.17	106	53.82												
DS87-091	SL	N Cochetopa Cr	37	58.72	106	53.50												
DS87-121	SP	Top, Baldy Chato	38	2.28	106	56.48												
DS87-122	SP	Baldy Chato	38	2.25	106	56.72												
DS87-123A	SP	Baldy Chato	38	2.35	106	57.52												
DS87-059	SP	NW Baldy Chato	38	3.50	106	58.78												
DS87-067	SP	S of Baldy Chato	38	1.88	106	56.47												
DS87-068	SP	Sheep Creek	38	2.07	106	57.82												
DS87-069	SP	Sheep Creek	38	1.88	106	58.07												
DS87-124	SP	Baldy Chato	38	2.12	106	58.00												
DS85-116	SL	Crystal-poor andesite, E Willow Creek	37	57.83	106	54.92	58.45	1.05	17.53	7.14	2.95	6.33	3.19	3.37	0.48	0.14	1.38	100.63
Lava flows, west side Bondholder Meadows																		
DS88-014	MI	Andsite flow	38	0.12	107	0.08	60.31	0.82	16.65	6.60	2.16	4.93	3.57	3.53	0.34	0.10	0.67	99.03
DS88-015	MI	Andsite flow	38	0.07	107		59.78	0.84	16.85	6.95	2.27	5.20	3.61	3.45	0.37	0.12	0.61	99.45
DS88-016	SP	Andsite flow	38	0.10	106	59.97	59.79	0.87	16.67	7.10	1.72	5.55	3.41	3.71	0.39	0.15	2.51	99.37
DS88-017	SP	Andsite flow	38	0.15	106	59.87	60.04	0.87	16.72	6.75	2.40	5.10	3.47	3.60	0.39	0.10	0.86	99.45
Lava flows, west side Bondholder Meadows																		
DS88-001	SP	Plag-rich flow, E of Spring Cr, above Tmm	38	2.30	106	58.85	59.97	0.89	16.83	6.68	2.55	5.53	3.91	2.90	0.42	0.21	1.95	99.88
DS88-002	SP	Plag-rich flow, E of Spring Cr, above Tmm	38	2.52	106	58.70	59.59	0.92	16.92	6.57	2.83	5.61	3.11	3.68	0.42	0.12	1.45	99.76
DS88-003	SP	Plag-rich flow, E of Spring Cr, above Tmm	38	2.50	106	58.28	59.71	0.90	16.64	7.29	2.13	5.39	3.84	3.36	0.36	0.11	0.70	99.73
DS88-004	SP	Plag-rich flow, E of Spring Cr, above Tmm	38	2.30	106	58.47	60.40	0.84	16.56	6.55	2.44	4.91	3.55	3.69	0.36	0.08	0.80	99.38
Northwest of San Luis Pass																		
85L-19	BC	Oso Creek (Miners Creek)	37	55.90	107	0.68	61.74	0.86	16.61	6.59	2.26	4.78	3.16	3.94	0.32	0.10	1.74	100.37
DS85-134	BC	N of San Luis Pass	37	59.67	107	0.03	61.35	0.84	16.58	6.58	2.30	5.04	3.43	3.72	0.36	0.10	1.37	100.30
DS85-130	SL	Dacite, N of San Luis Pass	37	58.72	106	59.43	61.13	0.84	16.51	6.74	2.54	5.42	3.19	3.06	0.42	0.12	2.47	99.97
S232	SL	Mixed-lava, W of San Luis Pass	37	57.83	106	58.25	60.87	0.81	16.82	6.40	2.34	4.82	3.61	3.69	0.38	0.14	1.79	99.89
Lava flows, head Rat Creek (C.D.)																		
LR88-565	BC	Top, peak 13034 (Riciputi, 1991)	37	56.97	107	0.13	60.70	0.89	16.95	6.87	2.08	4.57	3.42	3.62	0.36	0.09	1.47	99.55
LR88-566	BC?	(Riciputi, 1991)	--		--		60.88	0.88	16.68	6.48	2.36	4.84	3.53	3.67	0.32	0.07	0.60	99.71
LR88-567	BC?	(Riciputi, 1991)	--		--		61.32	0.85	16.96	6.17	2.15	5.05	3.36	3.67	0.37	0.09	1.38	99.98
LR88-568	BC?	(Riciputi, 1991)	--		--		60.94	0.87	16.84	6.04	2.25	4.98	3.64	3.50	0.36	0.08	0.67	99.51
LR88-569	BC?	(Riciputi, 1991)	--		--		60.23	0.89	16.75	6.99	2.12	5.25	3.42	3.41	0.36	0.14	2.64	99.56

XRF or EDXRF ("Kevex"); ppm (except where noted)

Sample No.	Zn	Rb	Sr	Y	Zr	Nb	Pb	Th	Ba	La	Ce	Nd	Cu	V	U	Cr	Cs	Ga	Mo	Ni
98L-21	109	109	909	22	317	27			1390				35							55
98L-22	112	84	996	24	283	27			1340				47							84
00L-1	101	53	653	21	160	21	5	<2	686	23	54	26	46	220	<2	225	<3	22	3	140
00L-31-B	21	153	18	18	102	21	20	11	35	28	51	25	<2	11	5	<3	<3	14	3	<2
00L-31-A	58	206	<2	23	131	31	32	17	8	37	67	26	<2	12	7	4	4	20	13	<2
PC-1	59	210	<2	23	130	31	34	16	13	36	66	<7	<2	13	6	<3	5	18	13	3
01L-28	52	199	6	22	124	30	33	17	24	40	67	30	<2	15	6	<3	7	18	8	3
PC-6	42	251	7	19	106	37	37	22	130	27	48	12	<2	5	7	<3	5	20	4	4
01L-25	52	251	10	19	111	36	34	22	127	38	63	24	4	6	7	<3	7	19	5	3
01L-26	48	188	10	21	125	25	31	13	60	43	75	21	<2	18	6	4	4	16	5	3
01L-27	60	189	10	21	127	25	29	14	28	40	74	27	<2	15	6	5	5	17	4	3
00L-33	32	178	26	17	133	23	31	12	105	56	103	33	<2	7	5	<3	4	19	2	<2
00L-34	37	185	23	21	138	24	31	13	67	56	101	36	2	8	7	<3	<3	18	3	<2
PC-4	225	126	785	31	371	17	23	8	2080	82	120	77	20	136	<2	<3	13	21	7	14
01L-16	46	219	10	20	82	31	30	16	49	16	34	<7	<2	14	8	<3	4	16	1	2
03L-3	36	165	26	11	85	21	27	11	70	25	46	22	<2	15	5	<5		16		<2
03L-48A	34	168	18	9	85	22	28	14	62	30	51	25	3	12	6	<5		16		<2
03L-48B	37	156	69	11	87	20	25	9	192	24	43	19	7	21	5	11		15		4
00L-30-A	60	291	66	35	128	47	39	24	149	33	64	29	3	18	15	5	9	21	3	4
00L-30-B	37	130	213	24	206	19	21	12	911	52	93	43	<2	21	8	10	9	16	2	2
00L-30-C	49	169	190	27	154	26	26	13	395	35	74	25	<2	28	6	10	4	17	3	<2
00L-32-A	60	162	48	38	132	49	35	29	125	26	57	23	<2	11	7	5	<3	22	2	3
00L-32-B	47	152	172	25	205	19	20	14	915	46	94	39	5	18	6	9	6	18	2	3
LR88-564	53	148	619	20	186	16	30	18	1101	57	101	43								
DS88-030	100	97	635	32	226	16	53	9	975	40	89	33								
DS88-036	50	99	507	27	168	18	15	31	826	45	76	31								
LR88-503	66	121	518	25	208	17	39	28	924	39	85	37								
DS87-081	47	103	701	14	235	10	17													
DS88-025	68	133	477	29	191	14	56	18	989	46	92	43								
DS87-103	43	110	567	25	219	14	26	12												
DS87-104	60	119	562	29	174	16	17	10												
85L-27	90	111	656	28	202	23	20						15							49
85L-28	60	104	753	30	190	20	28						11							22
LR87-718-2	90	84	759	32	187	11	42	9	1061	46	84	43								
LR87-718-3	106	84	765	33	201	14	45	13.5	1171	47	91	38								
DS85-126	83	104	665	29	193	18	36						49							46
DS85-121	78	115	644	27	195	19	24						49							80
LR88-505	82.5	104	637	26	199	15	31	13.5	1036	43	86	37								
DS88-023	78	106	683	27	213	16	23	18	1008	51	89	36								
DS88-082	81	141	380	23	179	20	38	18	797	47	84	42								
DS88-031	78	182	607	29	216	18	32	9	1145	49	89	40								
DS87-084	91	106	590	37	235	10														
DS87-091	70	104	620	29	231	15	25													
DS87-121	87	91	683	30	209	14	27	12												
DS87-122	73	99	627	23	201	16		16												
DS87-123A	97	89	675	29	202	15	31	21												
DS87-059	82	96	652	31	213	12	9													
DS87-067	76	111	628	28	197	14	16	7												
DS87-068	47	141	621	32	203	11	15	11												
DS87-069	94	160	602	25	185	21	17													
DS87-124	101	114	669	36	206	12	31	22												
DS85-116		90	782	28	196	18														
DS88-014	69	107	624	25	198	18	33	18	1028	49	87	36								
DS88-015	90	88	630	34	206	14	42	9	1048	42	87	36								
DS88-016	128	97	597	29	187	16	44	18	1093	48	84	39								
DS88-017	84	107	654	26	185	15	46	9	1105	43	84	47								
DS88-001	81.5	105	659.5	27	212	14	30	9	1109	44	82	32								
DS88-002	100	101	674	26	211	14	56	9	1098	43	87	43								
DS88-003	100	89	630	32	201	12	34	18	976	39	79	25								
DS88-004	66	105	617	27	224	15	32	18	1122	47	86	42								
85L-19	58	120	535	31	223	16	45						29							18
DS85-134	54	103	591	19	196	15	25						70							<10
DS85-130	67	59	1768	28	186	13	36						12							<10
S232		106	616	21	169	14														
LR88-565	102	98	524	29	224	10	37	18	1010	47	94	42								
LR88-566	95	98	559	32	221	19	30	18	955	41	88	33								
LR88-567	138	112	632	35	209	18	35	19	1037	47	87	42								
LR88-568	88	96	627	31	204	13	34	9	999	43	86	33								
LR88-569	94	86	543	27	192	15	47	18	981	42	81	34								

Instrumental Neutron Activation (INAA) and a few Induction-Coupled Plasma (ICP) Mass Spectrometry; ppm (except where noted)

Sample No.	Cs	Rb	Ba	Sr	Na (%)	Th	U	La	Ce	Nd	Sm	Eu	Gd	Tb	Ho	Tm	Yb	Lu	Ta	Zr	Hf	Sb	Sc	Fe (%)	Cr	Co	Ni	Zn
00L-31-B	2.77	154	38.5	27	2.16	13.3	3.7	23.6	44.5	12.2	2.14	0.07	2.1	0.33	0.58	0.58	2.39	0.37	1.5	88	3.94	0.1	1	0.36	0.2	0.08	3	16
00L-31-A	4.18	212	17.5	12.2	2.88	18.1	6.6	32.6	61	16.4	2.81	0.09	3.1	0.44	0.75	0.75	3.06	0.49	2	119	5.42	0.1	1.9	0.52	0.1	0.05	2	54
PC-1	4.26	211	30.6	8.43	3.03	17.9	6.6	32.5	59.1	15.3	2.93	0.099	2.99	0.443	0.78	0.775	3.14	0.476	2.02	120	5.46	0.168	1.9	0.51	0.286	0.052	1.93	51.3
Ds453		210	<35	<75	3.275	17.85	5.725	32.1	59.95	16.25	2.68	0.121	2.45	0.415		0.4735	3.035	0.4635	2.03	99.9	5.535	0.1825	2.1	0.654	1.7	0.393		62.6
PC-6	3.58	249	122	17.1	3.24	22.1	5.53	25.2	47	11	2	0.103	2.44	0.357	0.76	0.761	2.76	0.437	2.28	88.8	5.3	0.25	1.8	0.47	0.707	0.164	4.11	35.3
01L-25	4.69	244	123	14.4	3.21	21.8	5.84	30.8	53.4	14.4	2.61	0.184	2.61	0.335	0.59	0.587	2.63	0.429	2.24	106	5.35	0.277	1.84	0.48	0.196	0.197	3.07	38.8
01L-26	3.31	187	53.1	17.4	3.07	15.3	5.24	39.6	71.7	22.2	3.69	0.238	3.38	0.475	0.82	0.818	2.73	0.439	1.62	124	4.79	0.168	1.98	0.54	0.186	0.155	4.48	39.7
01L-27	3.77	189	35.3	30.4	3.11	15.4	5.04	38.5	72.1	21.1	3.52	0.238	3.44	0.406	0.64	0.636	2.76	0.422	1.62	110	4.86	0.185	1.89	0.57	0.471	0.114	3.65	48.4
00L-33	3.22	178	112	27	2.87	14.6	4.3	50.1	90.7	28.3	4.64	0.4	3.2	0.48	0.75	0.75	2.21	0.33	1.5	133	4.67	0.2	1.7	0.52	0.2	0.19	3	31
00L-34	3.1	189	76.6	35.6	3.15	15.5	4.8	51.7	96.1	31.3	4.93	0.4	3.8	0.51	0.79	0.79	2.62	0.41	0.16	131	5.04	0.2	2	0.54	0.2	0.18	1	37
PC-4	5.13	126	2120	846	2.81	7.24	2.62	81.4	130	67.2	11.5	2.84	8.26	1.09	1.4	1.4	3.24	0.488	0.949	370	8.4	0.163	15.1	5.32	29.7	18.9	29.2	246
DS85-121		99.2	1040	631	2.64	8.69	3.25	41.6	84.7	39.6	8	1.92	6.92	0.962		0.461	2.73	0.399	0.991	175	5.28	0.162	14.7	4.72	5.06	16.8	18.1	86
LR88-505	2.73	108	1030	717	2.25	8.37	3.35	41.4	89.2	41.1	8.31	1.83	7.2	0.899	1.1	0.439	2.75	0.399	0.951	216	5.43	0.167	13.7	4.78	6.77	17.3	18	84.3
DS88-023	21.2	106	1080	718	3.1	11.1	4.34	45.3	91.4	40.6	7.67	1.43	5.92	0.789	0.993	0.422	2.67	0.375	1.22	215	5.96	0.325	7.52	2.99	5.3	8.37	14.1	60.3
DS85-116		88	1060	777	2.35	6.95	2.5	41.1	83.7	40.2	7.81	2.03	6.67	0.933		0.447	2.69	0.39	0.835	199	4.81	0.0693	15.8	4.93	1.75	18.7	6.69	96.2

Sample No.	Quad-rangle[1]	Sample type, location, data source[2]	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	SiO_2	TiO_2	Al_2O_3	$FeTO_3$	MgO	CaO	Na_2O	K_2O	P_2O_5	MnO	LOI	Total
		Lava flows, north of Mineral Mountain																
DS85-144	MI	Andesite flow, N Mineral Mtn	38	1.90	107	0.63	58.05	1.10	17.34	8.60	2.13	5.52	3.40	3.40	0.44	0.08	1.87	100.08
DS88-010	MI	Andesite flow, N Mineral Mtn	38	1.97	107	0.65	57.16	1.05	17.19	8.12	2.94	6.44	3.01	3.21	0.40	0.13	0.97	99.65
		Nelson Mountain Tuff																
LR88-609	SL	Upper welded crystal-rich dacite, base of upper cliff	37	55.03	106	55.23	65.46	0.58	15.81	5.15	1.16	3.54	3.79	4.00	0.25	0.07	0.70	99.81
LR88-611	SL	Upper pw crystal-rich dacite, in saddle along jeep road	37	55.30	106	56.13	62.17	0.74	17.09	6.30	1.78	3.71	3.06	4.24	0.34	0.10	2.84	99.53
85L-29A	SL	Upper welded crystal-rich dacite	37	55.17	106	55.62	64.43	0.62	16.08	5.47	1.08	3.29	3.81	3.88	0.24	0.05	1.08	98.95
85L-29C	SL	Vitrophyre base of welded zone	37	55.03	106	55.18	70.24	0.37	15.32	2.40	0.68	1.89	3.63	5.44	0.10	0.09	2.61	100.17
C1048	SL	E Willow-Whited Crks (Ratte and Steven, 1967)					67.77	0.53	15.92	3.92	0.64	2.61	3.53	4.51	0.21	0.05	1.65	99.71
93L-2B	ME	Top of caprock, Palmer Mesa	37	52.27	106	41.72	65.13	0.56	16.49	4.25	1.78	3.30	3.14	3.90	0.27	0.10	4.14	98.93
DS87-135C	PT	Top of mesa, Palmer Mesa	37	51.80	106	41.78												
DS87-145	PT	Vitrophyre, Pool Table Mtn	37	50.00	106	41.58												
85L-25A	HM	Uppermost devitrified densely welded	37	54.17	106	47.13	70.70	0.34	15.09	2.19	0.55	1.59	4.18	4.82	0.08	0.09	0.48	99.64
85L-25B	HM	Lower vitrophyre	37	54.13	106	47.10	70.40	0.33	14.80	2.25	0.55	1.61	3.79	5.16	0.09	0.10	1.78	99.08
85L-25D	HM	Upper partly welded crystal poor	37	54.12	106	47.08	70.43	0.35	15.58	2.29	0.78	1.75	3.55	4.70	0.08	0.09	2.45	99.60
85L-25E	HM	Lowermost nonwelded crystal-poor	37	54.10	106	47.08	70.71	0.35	15.51	2.29	1.08	1.81	3.11	5.02	0.08	0.09	4.35	100.05
94L-18B	BC	Snow Mesa, upper partly welded	37	56.35	107	4.00	64.79	0.62	16.12	4.85	1.18	3.64	3.73	3.84	0.29	0.06	0.75	99.12
85L-18A	BC	Upper main welded crystal rich	37	56.40	107	3.92	61.91	0.75	17.41	6.30	1.30	4.20	3.78	3.44	0.30	0.08	1.49	99.48
85L-18C	BC	Middle welded ledge	37	56.23	107	3.87	70.98	0.34	15.05	2.04	0.46	1.52	4.17	4.94	0.09	0.05	0.43	99.64
85L-18E	BC	Lower near-vitrophyre crystal-rich	37	56.25	107	3.83	71.35	0.32	14.82	2.03	0.47	1.49	4.12	4.90	0.09	0.07	0.41	99.66
85L-18G	BC	Upper nonwelded crystal poor	37	56.25	107	3.68	69.60	0.38	15.69	2.62	1.12	1.95	3.39	4.74	0.11	0.04	2.70	99.64
85L-18I	BC	Lowermost nonwelded crystal-poor	37	56.23	107	3.73	72.64	0.24	14.65	2.42	1.19	2.29	1.63	4.27	0.08	0.07	7.78	99.47
DS87-072E	BC	Welded crystal-rich, Snow Mesa	37	53.52	107	7.27												
DS87-072B	BC	Nonwelded rhyolite, Snow Mesa	37	53.50	107	7.17												
DS85-143	MI	Mineral Mountain (Riciputi, 1991)	38	1.67	107	0.58	64.14	0.67	16.42	5.73	1.18	3.68	3.39	3.95	0.29	0.05	1.83	99.50
LR89-013	SP	Dacite rim, E of Spring Creek (DS87-058)	38	5.97	106	59.00	64.40	0.62	16.16	5.24	0.75	3.36	3.71	3.98	0.27	0.06	0.59	98.56
LR89-013pu	SP	Pumice lens, E of Spring Creek (Riciputi, 1991)	38	5.97	106	59.00	66.21	0.60	15.83	4.54	0.89	3.19	3.70	4.21	0.26	0.04	0.45	99.48
85L-37	CS	Rhyolite, Cochetopa Ridge	38	12.27	106	44.30	73.90	0.28	13.79	1.97	0.43	1.31	3.50	5.10	0.07	0.06	1.36	100.40
67L-13	EP	Cochetopa Park-Table Mt	38	1.77	106	49.20	71.63	0.28	15.45	1.86	0.29	1.81	3.81	4.41	0.15	0.07	0.32	99.76
DS85-119-2	SP	Upper Nutras Creek	38	1.73	106	54.25	64.14	0.66	16.72	5.48	1.61	3.97	3.53	3.47	0.27	0.05	2.10	99.91
00L-29-A	CP	Lowermost tuff, quary W side dome	38	18.13	106	44.30	77.35	0.13	12.06	1.12	0.18	0.45	3.56	4.59	0.06	0.07	1.35	99.57
00L-29-B	CP	Crystal-rich upper tuff, quarry W side dome	38	18.13	106	44.30	73.60	0.29	13.57	1.65	0.31	1.07	3.38	5.27	0.10	0.05	1.21	99.30
DS87-061A	SP	NW of Baldy Chato	38	2.87	106	58.92												
DS87-061A-	SP	Vitrophyre, NW of Baldy Chato	38	2.87	106	58.92												
DS87-128B	MI	Rough Creek	38	0.53	107	5.63												
		Intracaldera (Equity phase)																
DS85-110	SL	San Luis Peak, densely welded	37	59.22	106	55.80	62.81	0.69	16.41	5.76	1.94	4.52	3.80	3.61	0.31	0.10	1.77	99.96
DS85-137	MI	Mineral Mountain area	38	1.13	107	0.18	63.60	0.66	16.28	5.60	1.45	4.69	3.38	3.60	0.31	0.12	2.35	99.70
DS88-011	SP	NW of Bondholder, W of Spring Cr, mid-section (10,020')	38	1.63	106	59.18	62.41	0.68	16.34	6.12	1.77	4.55	4.03	4.01	0.30	0.11	1.46	100.31
DS88-012(LI	SP	Bondholder Meadow, W of Spring Creek, 10,520'	38	1.42	106	59.15	63.50	0.65	16.18	6.15	1.77	4.56	3.12	3.71	0.27	0.09	2.69	99.99
DS88-012 Pu	SP	Pumice, W of Spring Creek, 10,520'	38	1.42	106	59.13	63.04	0.64	18.55	5.20	1.98	5.42	3.38	1.85	0.26	0.09	4.65	100.41
C-980	SL	W Willow Creek (Ratte and Steven, 1967)	37	56.00	106	56.08	64.31	0.60	16.14	4.55	1.02	3.36	3.52	3.99	1.70	0.25	0.05	99.45
C-583	SL	W Willow Creek (Ratte and Steven, 1967)	37	55.12	106	57.43	67.22	0.53	15.71	4.03	1.30	3.36	3.36	4.13	0.21	0.11	3.22	99.95
85L-13A	SL	Head Whited Cr, E side	37	56.33	106	58.30	64.63	0.65	16.21	5.21	1.30	3.90	3.72	3.81	0.27	0.07	1.28	99.76
85L-13B	SL	Head Whited Cr, W side	37	58.27	106	56.40	68.52	0.51	15.29	3.74	0.83	2.61	3.62	4.43	0.18	0.05	1.25	99.77
85L-10S	SL	Whited Creek "cleaver", vitrophyre (crushed in steel)	37	57.03	106	55.47	66.29	0.55	15.94	4.23	1.39	3.32	3.65	4.33	0.23	0.09	1.90	100.03
85L-10A	SL	Whited Creek "cleaver", vitrophyre (crushed in agate)	37	57.03	106	55.47												
85L-11	SL	E Willow Cr., vitrophyre	37	57.78	106	53.30	66.49	0.53	15.90	4.15	1.37	3.36	3.56	4.42	0.22	0.09	2.16	100.10
DS87-043	SL	Basal vitro, ridge between forks Spring Cr	37	57.63	106	56.50												
DS87-063	SP	Transitional rhyolite, above Mineral Mtn Rhyolite	38	1.78	106	58.80	70.70	0.37	14.73	2.37	0.79	1.55	3.20	4.98	0.12	0.06	2.24	98.88
SD2-1064	SL	Crystal-rich vitro, Deerhorn Creek drillhole	37	55.75	106	56.58	70.73	0.33	14.84	2.25	0.57	1.84	3.72	4.77	0.08	0.08	4.80	99.21
DS87-083A	SP	W Bondholder Meadows	38	0.60	106	58.68												
DS87-089	SL	Upper Cochetopa Creek	37	59.02	106	55.37												
DS87-095	SL	SW Cochetopa Creek	37	58.47	106	55.03												
DS87-097	SL	Spring Creek	37	59.37	106	57.12												
DS87-107A	SL	W of Baldy Alto	37	59.82	106	55.92												
DS87-115A	SL	N San Luis Pass, 11,740 ft	37	58.58	106	58.25												
DS87-131B	SP	W of Spring Creek	38	1.72	106	59.25												
DS87-070	SP	Weakly welded Equity phase, Sheep Creek	38	1.78	106	58.17												
DS87-100A	SL	Partly welded, SE Spring Creek	37	58.43	106	55.68												
DS87-100A-	SL	Pumice, SE Spring Creek	37	58.43	106	55.68												
DS87-113	SL	Partly welded, San Luis Pass	37	58.00	106	57.42												
DS88-029B-	SP	Stewart Cr, S tributary, pumice (alkali exhange), 10,670'	38	0.42	106	53.67	70.30	0.35	14.47	2.54	0.79	2.03	2.99	5.47	0.14	0.09	3.25	99.18
	CEBOLLA CREEK CALDERA CYCLE																	
		Mineral Mountain Rhyolite																
DS88-005	SP	Rhyolite lava flow, Mineral Mtn area	38	2.40	106	59.57	72.96	0.28	14.05	1.68	0.48	1.33	3.06	5.45	0.06	0.09	3.65	99.44
DS88-007	SP	Rhyolite lava flow, Mineral Mtn area	38	2.02	106	59.75	74.95	0.22	13.34	1.36	0.41	0.89	3.73	4.64	0.04	0.03	3.51	99.62
DS88-008	SP	Rhyolite lava flow, Mineral Mtn area	38	1.95	106	59.82	72.36	0.27	13.88	1.77	0.50	1.52	3.42	4.79	0.07	0.09	4.36	98.68
DS88-009	MI	Rhyolite lava flow, Mineral Mtn area	38	1.43	107	0.18	75.25	0.16	12.88	1.02	0.21	0.64	3.82	4.95	0.05	0.08	5.20	99.07
DS85-138	MI	Rhyolite lava flow, Mineral Mtn	38	1.32	107	0.40	75.09	0.19	13.23	1.42	0.27	1.66	2.12	5.53		0.05	5.91	99.55
DS85-139	MI	Rhyolite lava flow, Mineral Mtn	38	1.45	107	0.42	73.85	0.23	13.70	1.64	0.38	1.37	3.39	4.87	0.05	0.08	5.74	99.57
DS88-038	SP	E of Bondholder Meadow	38	1.20	106	58.33	73.82	0.26	14.23	1.48	0.42	0.49	3.69	4.79	0.07	0.07	1.12	99.33
Ds466	SP	Spring Creek, perlite	38	3.53	106	59.88												
DS87-062	SP	Flow, NW of Baldy Chato	38	2.72	106	59.13												
97L-22A	MI	Lower Mineral Cr, dike-like mass, crystal-rich	38	1.12	107	2.27	64.44	0.66	17.40	4.94	0.84	2.96	3.83	4.10	0.27	0.05	3.07	99.49
97L-22B	MI	Lower Mineral Cr, dike-like mass, crystal-poor	38	1.12	107	2.27	71.09	0.48	14.40	2.68	0.33	2.24	3.49	4.11	0.16	0.03	1.03	99.00
		Dacite of East Willow Creek																
88L-50	SL	East Willow Creek flow (REE by ICP)	37	57.52	106	55.67	65.80	0.58	15.51	4.23	1.33	3.44	3.58	4.13	0.28	0.09	0.44	98.98
C-1047-C	SL	Perlitic vitrophyre, 12,600' (Ratte and Steven, 1967)	37	57.00	106	55.00	65.10	0.60	15.99	4.65	1.65	3.76	3.67	3.81	0.27	0.10	2.67	99.61
DS85-118	SL	East Willow Creek flow	37	57.27	106	55.98	66.57	0.57	15.25	4.34	1.37	3.56	3.41	4.08	0.25	0.07	0.55	99.48
99L-7	SL	East lava dome, glassy breccia fragment	37	57.92	106	53.83	69.64	0.41	15.02	2.90	0.93	2.28	3.27	5.15	0.22	0.09	2.79	99.92
		Cebolla Creek Tuff																
85L-33E	MI	Cebolla Creek, upper devit densely welded	38	3.68	107	4.67	65.56	0.61	15.95	4.82	1.22	3.53	3.79	3.94	0.27	0.08	0.77	99.77
85L-33D	MI	Cebolla Creek, lower devit densely welded	38	3.67	107	4.67	64.23	0.62	16.24	4.70	1.54	3.91	3.67	3.71	0.30	0.08	1.46	99.01
85L-33C	MI	Cebolla Creek, lower nonwelded	38	3.65	107	4.55	63.69	0.69	17.05	5.60	1.84	4.23	2.94	3.74	0.33	0.13	4.34	100.24
67L-79A	SP	Los Pinos Pass, densely welded basal	38	5.90	106	59.08	63.31	0.69	17.24	5.41	1.71	4.13	3.63	3.33	0.30	0.09	0.80	99.84
LR89-014	SP	Los Pinos Pass, densely welded basal, 10,260'	38	5.90	106	59.08	61.58	0.76	17.18	6.26	1.76	4.63	3.91	3.43	0.32	0.11	0.52	99.95
LR89-014p	SP	Los Pinos Pass, pumice lens (Riciputi, 1991)	38	5.90	106	59.08	65.03	0.62	16.35	4.85	1.56	3.63	3.60	4.17	0.27	0.09	1.20	100.17
93L-4A	SA	Saguache Park, densely welded	38	3.15	106	41.62	60.74	0.74	17.52	5.84	2.78	4.98	3.24	2.85	0.35	0.13	4.64	99.18
93L-1	PT	S side, Palmer Mesa; upper vapor-phase	37	52.58	106	41.30	59.53	0.78	17.98	6.36	2.73	5.08	3.17	2.66	0.35	0.14	4.86	98.78
S269	HM	W of Wheeler Monument	37	53.08	106	47.48	64.88	0.59	16.56	4.68	1.68	3.78	3.10	4.45	0.26	0.12	3.34	100.08
88L-51A	SL	E Willow Creek, intracaldera, vitrophyre	37	57.35	106	55.47	63.86	0.64	16.40	4.96	1.69	3.88	3.85	3.51	0.29	0.11	2.27	99.19
88L-51B	SL	E Willow Creek, intracaldera, devitrified	37	57.35	106	55.47	64.19	0.66	16.42	4.85	1.56	3.81	3.77	3.84	0.30	0.09	1.01	99.47
99L-9	SL	E Willow Creek, intracaldera, vitrophyre	37	57.58	106	54.75	64.39	0.63	16.66	4.73	1.54	3.81	3.34	4.22	0.33	0.10	2.78	99.76
	RAT CREEK CALDERA CYCLE																	
		Mineral Creek Dacite																
89L-161B	BC	Flow layered lava, E Fork Mineral Cr	37	58.83	107	1.38	68.63	0.44	15.58	3.06	0.64	2.55	2.51	5.48	0.22	0.04	5.14	99.17
89L-162	BC	Massive lowerflow (or intrusion?), E Fork	37	58.88	107	1.67	60.44	0.87	16.71	6.53	2.49	4.85	3.48	3.63	0.35	0.10	1.50	99.42
89L-163	BC	Flow layered lava (spherulitic), E Fork	37	59.02	107	1.58	72.87	0.39	13.87	1.55	0.40	1.64	2.56	5.79	0.18	0.02	0.92	99.25
89L-164	BC	Flow layered lava (highest flow), East	37	59.03	107	0.63	70.02	0.43	15.00	3.48	0.63	1.68	3.02	4.76	0.19	0.03	2.51	99.25
89L-165	BC	Flow layered lava (upper flow), E of Mineral Creek	37	59.65	107	0.52	68.83	0.44	15.02	3.09	0.98	2.56	3.75	4.22	0.19	0.09	4.23	99.17
89L-167	MI	Partly welded tuff, between flows, Min Creek trail	38	0.43	107	2.28	70.22	0.67	16.94	3.70	0.83	0.90	0.38	5.04	0.31	0.04	5.83	99.03
89L-170	MI	Vitrophyric flow base, SW of Mineral Mtn	38	0.15	107	1.05	69.89	0.42	15.41	3.02	0.76	3.31	3.04	3.21	0.18	0.08	7.48	99.31
97L-20	BC	Biotite-rich lava flow, near Cebolla Creek trail	37	59.82	107	3.07	61.28	0.82	16.69	6.04	2.07	4.77	3.61	3.81	0.33	0.09	1.06	99.51
97L-21	MI	Biotite-rich lava flow, near Cebolla Creek trail	38	0.02	107	2.50	60.73	0.87	17.27	6.67	1.70	4.91	3.56	3.54	0.34	0.06	2.01	99.65
		Rat Creek Tuff																
85L-29F	SL	Vitro base, densely welded crystal rich	37	54.98	106	55.18	65.82	0.57	16.61	3.87	1.37	3.22	3.89	4.17	0.21	0.09	2.03	99.82

XRF or EDXRF ("Kevex"); ppm (except where noted)

Sample No.	Zn	Rb	Sr	Y	Zr	Nb	Pb	Th	Ba	La	Ce	Nd	Cu	V	U	Cr	Cs	Ga	Mo	Ni
DS85-144	76	104	673	27	194	21	50						34							47
DS88-010	107	80	678	31	198	14	32	18	946	43	79	43								
LR88-609	67	116	551	24	204	15	30	9	987	45	86	32								
LR88-611	79	99	614	26	188	11	36	26	1015	44	90	38								
85L-29A	51	105	566	19	221	17	27													
85L-29C	24	144	310	22	280	18	38													
C1048		127	435	13	181	17														
93L-2B		116	510	30	215	17			900	55	76									
DS87-135C	70	152	231	23	242	19	43	29												
DS87-145	53	153	199	27	214	22	25	21												
85L-25A	33	133	290	25	268	20	38													
85L-25B	40	145	278	29	224	19	21													
85L-25D	66	134	298	27	225	21	40													
85L-25E	42	153	257	28	231	24	24													
94L-18B	47	102	600	24	184	17			1000	30	83		20			<20				<10
85L-18A	42	91	713	20	185	10	39													13
85L-18C	52	138	275	22	244	23	20													<10
85L-18E	65	147	291	28	236	20	40													7
85L-18G	54	88	338	24	241	17	47													44
85L-18I	63	214	443	24	150	26	38													<10
DS87-072E	100	146	307	26	254	19	12	16												
DS87-072B	75	141	274	33	238	23	30	20												
DS85-143	54	106	621	26	171	17	32													
LR89-013	65	112	573	25	186	17	41	18	1027	51	89	28								
LR89-013pu	58	117	534	22	183	14	32	22	963	41	84	32								
85L-37	34	144	206	33	203	19	39													
67L-13	55	146	344	23	261	18	65													
DS85-119-2	42	87	661	24	180	21	42						59							48
00L-29-A	30	281	41	33	111	45	22	24	129	32	67	43	2	<5	7	4	6	20	2	4
00L-29-B	31	139	175	26	187	19	20	11	847	55	97	42	<2	21	4	8	6	17	2	4
DS87-061A	63	139	310	27	270	23	30	16												
DS87-061A-	68	182	195	29	356	21	33	9												
DS87-128B	80	141	374	27	318	19	19	19												
DS85-110	75	107	671	26	183	13	20						46							45
DS85-137	52	111	657	23	166	16	39						16							10
DS88-011	80	101	605	20	181	14	31	9	1000	41	81	33								
DS88-012(LI	81	104	634	20	172	14	30	9	858	41	79	33								
DS88-012 Pu	101	77	684	23	167	13	41	18	733	47	87	40								
C-583	42	123	392	19	203	11	45													
85L-13A	64	119	631	29	201	21	39						35							72
85L-13B	82	150	433	31	199	26	39						42							93
85L-10S	73	115	524	27	224	21	38						68							
85L-11	58	130	511	25	208	16	33													
DS87-043	50	132	435	25	207	17	18	7												
DS87-063		134	265	30	235	19			1200	41	89									
SD2-1064	61	118	313	26	226	28	40						40							29
DS87-083A	91	106	613	20	166	16	15	18												
DS87-089	70	87	706	21	183	14	38	26												
DS87-095	20	106	306	22	162	13	21	6												
DS87-097	80	83	709	27	177	12	23													
DS87-107A	57	89	566	21	165	12	20													
DS87-115A	81	101	600	20	177	14	33	15												
DS87-131B	94	131	614	22	174	14	36	18												
DS87-070	52	97	768	20	170	14	8	21												
DS87-100A	61	64	586	19	158	14	18													
DS87-100A-	69	37	733	12	98	8	14	12												
DS87-113	46	107	486	23	172	13	22	24												
DS88-029B-	64.5	141	291.5	28	181	20	31	15.5	684	38	75	35								
DS88-005	50	181	177	30	169	22	34	32	625	41	71	26								
DS88-007	50	163	124	27	157	23	35	19	394	39	80	26								
DS88-008	64	158	216	31	174	23	41	29	565	41	81	27								
DS88-009	50	161	64.5	27	135	24	35	25	348	38	80	36								
DS85-138		224	367	25	156	34														
DS85-139		182	169	24	161	26														
DS88-038	50	159	106	31	184	24	35	22	626	47	85	35								
Ds466	22	165	75	17	121	23	42													
DS87-062	53	155	124	23	152	19	33	9												
97L-22A		107	386	27	275	15			1190											
97L-22B		96	496	15	219	10			903											
88L-50	65	106	532	29	203	14	40	18	1003	49	91	37								
C-1047-C	66	123	542	18	167	15	60													
DS85-118	66	121	582	23	165	17	39						50							33
85L-33E	50	109	570	23	201	14	15													7
85L-33D		96	571	23	205	19														
85L-33C	59	138	618	25	195	14	34													18
67L-79A	55	123	671	22	204	14	55						54							9
LR89-014	62	93	696	28	212	18	50	9	1104	45	87	40								
LR89-014p	105	122	526	28	217	17	42	9	1093	45	86	39								
93L-4A		98	700	28	210	13			1000	41	65									
93L-1		106	710	30	210	14			920	53	86									
S269		132	513	20	185	13														
89L-165	55.5	138	389	28	186	18	42	22.5	795	45	82	32								
97L-20		113	544	26	248	14			935											
97L-21		84	561	28	224	12			956											
85L-29F	49	97	622	26	337	14	76						47							

Instrumental Neutron Activation (INAA) and a few Induction-Coupled Plasma (ICP) Mass Spectrometry; ppm (except where noted)

Sample No.	Cs	Rb	Ba	Sr	Na (%)	Th	U	La	Ce	Nd	Sm	Eu	Gd	Tb	Ho	Tm	Yb	Lu	Ta	Zr	Hf	Sb	Sc	Fe (%)	Cr	Co	Ni	Zn
DS88-010	1.98	80.2	953	756	2.28	6.79	2.62	39	84.6	42.1	8.76	1.98	7.31	1	1.29	1.29	3.08	0.449	0.852	195	5.06	0.191	18.5	5.7	8.47	22.4	6.36	87.4
85L-29A		134	1330	320	2.57	10.9	3.53	44.8	89.3	37.1	6.41	1.42	4.63	0.789		0.426	2.73	0.403	1.28	263	7.47	0.235	4.64	1.62	1.05	2.21	9.74	64.1
85L-29C	3.51	137	1340	332	2.72	11.3	4.63	48.2	97.9	44.6	7.97	1.43	6.62	0.798	1.1	0.45	2.89	0.41	1.38	321	7.75	0.258	4.72	1.71	1.14	2.3	0.81	56.8
85L-18E		138	1230	265	3.02	11.7	4.05	46.5	93.5	38.5	7.31	1.34	5.61	0.847		0.486	2.85	0.418	1.44	214	6.7	0.238	4.42	1.39	0.847	1.87		62.6
LR89-013								45	81	36	6.3	1.5	4.6	0.57	0.76	0.28	1.9											
85L-37		133	894	197	2.65	12	3.84	45	90	35	6.47	1.11	5.2	0.773		0.455	2.77	0.402	1.41	184	6.09	0.353	3.65	1.32	0.522	1.66	5.82	46.1
DS88-012 Pu	4.73	69.6	675	756	2.39	10.9	1.91	44.5	87.7	38.8	6.91	1.61	5.79	0.697	0.876	0.322	2.06	0.301	1.02	173	4.9	0.459	7.4	3.21	9.03	10.2	8.78	94.8
85L-10S	3.12	128	1160	601	2.98	11.9	4.55	48.7	106	44.5	8.44	1.72	7.49	0.866	1.19	0.459	2.83	0.413	1.26	258	6.96	0.294	8.92	3.47	16	8.56	4.61	73.4
85L-10A	2.84	117	1100	540	2.82	10.9	4.28	45.8	94.6	40.9	7.72	1.57	6.2	0.816	1.05	0.432	2.65	0.381	1.16	264	6.61	0.26	7.99	2.95	6.07	7.21	0.81	65.6
SD2-1064		117	1070	304	2.74	11.5	4.3	41.6	87	35.9	6.92	1.25	5.43	0.788		0.454	2.73	0.391	1.38	207	6.61	0.264	4.27	1.57	1.41	2.57	8.09	64.9
DS85-139		164	513	176	2.48	12.1	4.45	37.4	75	30.3	5.66	0.716	4.9	0.685		0.382	2.57	0.379	1.5	139	5.15	0.163	2.56	1.07	0.335	1.49	4.88	56.4
88L-50								42	81	36	6.1	1.3	4.9	0.5	0.71	0.36	2.4											
DS85-118		101	942	544	2.56	10.9	3.51	40	78.7	32.7	6.07	1.43	5.05	0.695		0.348	2.15	0.326	0.938	165	5.17	0.227	7.95	2.96	6.95	9.52	12.6	70.9
85L-33D		90.6	1020	589	2.75	9.07	3.13	42.5	83.6	35.9	6.49	1.58	5.22	0.808		0.359	2.55	0.376	1.03	198	5.86	0.24	8.68	3.36	4.12	9.68	11.4	80.4
LR89-014p	2.28	108	1000	518	2.56	9.04	3.3	40.8	86.7	37.5	7.01	1.45	5.84	0.751	1	0.397	2.45	0.344	1.2	202	5.27	0.196	7.82	2.96	4.44	7.17	6.18	67.6
89L-165	3.1	136	777	418	2.72	11.3	4.62	40.2	83.3	37.2	6.71	1.06	5.61	0.694	0.97	0.39	2.5	0.366	1.34	194	5.39	0.183	5.07	2.13	2.35	4.86	4.04	56.3
85L-29F		93.4	1910	614	2.77	9.24	2.76	49.1	94	39.1	6.78	2.08	5.57	0.82		0.416	2.74	0.415	0.973	322	8.36	0.255	7.49	2.58	3.56	4.81	15	76.9

X-Ray Fluorescence (WDXRF); weight % (calc. to reported total w/o LOI)

Sample No.	Quad-rangle[1]	Sample type, location, data source[2]	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	SiO_2	TiO_2	Al_2O_3	$FeTO_3$	MgO	CaO	Na_2O	K_2O	P_2O_5	MnO	LOI	Total
85L-29H	SL	Partly welded transition	37	54.95	106	55.18	65.34	0.59	17.30	3.83	2.24	3.54	3.38	3.53	0.20	0.09	4.82	100.05
85L-29I	SL	Lower nonwelded crystal poor	37	54.92	106	55.15	70.02	0.35	15.97	2.24	1.22	1.93	2.94	5.11	0.08	0.08	4.74	99.94
LR89-007	SL	Upper densely welded crystal rich (~85L-29F)	37	55.28	106	54.97	64.42	0.64	16.02	5.35	1.14	3.65	3.77	3.95	0.27	0.09	0.40	99.31
LR89-007pu	SL	Pumice, crystal rich (Riciputi, 1991)	37	55.28	106	54.97	60.54	0.95	17.45	6.11	1.74	4.72	3.82	3.77	0.47	0.09	0.83	99.67
LR89-008	SL	Lower nonwelded crystal poor, lowest outcrop, 11,280'	37	55.28	106	54.97	70.71	0.34	15.46	2.59	0.84	1.78	2.98	5.40	0.07	0.09	3.36	100.26
LR89-006-1	SL	Pumice, crystal poor (Riciputi, 1991)	37	55.27	106	54.93	72.41	0.31	15.52	1.55	1.11	1.69	1.99	5.86	0.05	0.09	5.10	100.57
LR89-006-G	SL	(Riciputi, 1991)	37	55.27	106	54.93	72.81	0.28	14.96	1.41	0.28	1.21	3.37	5.93	0.04	0.10	3.18	100.39
67L-77A	MI	Cathedral Ranch section, upper densely welded	38	4.80	107	0.18	68.04	0.57	15.44	4.31	0.58	3.23	3.43	3.43	0.30	0.05	0.93	99.38
67L-77B	MI	Cathedral Ranch section, upper welded dacite	38	4.78	107	0.18	64.98	0.65	17.29	4.11	1.12	3.25	4.07	4.27	0.25	0.10	1.66	100.09
67L-77D	MI	Cathedral Ranch section, upper rhyolite	38	4.75	107	0.17	73.78	0.33	14.14	2.08	0.35	1.22	3.46	4.58	0.08	0.05	1.73	100.06
67L-77F	MI	Cathedral Ranch section, middle rhyolite	38	4.73	107	0.17	72.95	0.27	14.35	1.67	0.30	1.21	3.74	5.05	0.06	0.07	1.03	99.68
67L-77G	MI	Cathedral Ranch section, lower rhyolite	38	4.70	107	0.15	72.85	0.28	14.61	1.59	0.33	1.32	3.65	4.87	0.06	0.07	1.43	99.64
SJ-85-53	MI	Cathedral Ranch, upper vitrophyric dacite	38	4.80	107	0.20	67.81	0.47	16.09	2.79	0.67	2.21	4.44	4.56	0.14	0.07	0.62	99.26
SJ-85-56	MI	Cathedral Ranch, middle pink pumice-rich	38	4.78	107	0.25	74.30	0.30	13.16	1.83	0.35	1.54	3.51	4.84	0.08	0.03	1.35	99.95
SJ-85-58	MI	Cathedral Ranch, lower haloween rhyolite	38	4.77	107	0.27	71.08	0.30	15.08	1.69	0.51	1.36	3.66	5.52	0.06	0.05	1.98	99.31
SJ-85-60	MI	Cathedral Ranch, uppermost nw pumiceous rhy	38	4.73	107	0.40	72.39	0.26	14.29	2.04	0.87	2.88	1.51	5.02	0.08		8.47	99.34
SJ-85-64	MI	Cathedral Ranch, lowermost nw pum-rich rhyolite	38	4.70	107	0.42	72.74	0.28	14.46	2.19	0.86	2.99	1.87	4.45	0.09	0.04	9.15	99.97
LR89-015	SP	Los Pinos Pass rd, vitrophyric dacite,10,200'	38	5.93	106	59.40	68.50	0.54	16.65	3.32	0.90	2.49	4.04	4.83	0.14	0.10	2.09	101.52
85L-33A	MI	Cebolla Creek, nonwelded	38	3.62	107	4.58	69.35	0.33	15.97	1.64	1.11	3.77	2.72	4.69	0.07	0.11	9.74	99.75
85L-36	CS	McDonough Reservoir (silicified?, correlation uncertain)	38	11.97	107	50.60	73.06	0.45	11.99	3.68	1.12	2.77	2.44	3.55	0.19	0.05	1.89	99.30
C-375A	SL	SW side Nelson Mtn	37	56.30	106	54.93	72.03	0.52	13.09	4.30	0.79	2.67	2.77	3.27	0.21	0.03	2.97	99.67
BM-36C-85	CR	Cobble in Creede Fm (K-metasomatic), Bulldog drillhole	--		--		64.62	0.47	16.08	3.19	0.52	0.33	0.81	12.36	0.20	0.04	0.49	98.63
BM-47C-435	CR	Cobble in Creede Fm (K-metasomatic), Bulldog drillhole	--		--		65.07	0.53	15.94	3.40	0.67	0.32	0.64	11.70	0.23	0.05	0.86	98.55
OLDER UNITS ASSOCIATED WITH CENTRAL AND WESTERN SAN JUAN CALDERAS																		
SOUTH RIVER CALDERA CYCLE																		
Wason Park Tuff																		
02L-50	TM	Sheep Creek	38	9.85	106	27.50	70.34	0.40	15.30	2.16	0.42	1.53	4.00	5.24	0.12	0.08	0.63	99.60
00L-17	RC	Distal winnowed partly welded, near Pinto Basin	38	9.10	106	53.15	70.08	0.41	15.27	2.25	0.39	1.49	3.96	5.15	0.12	0.10	1.11	99.23
00L-18	RC	Distal winnowed partly welded, near Pinto Basin	38	9.07	106	52.78	70.12	0.41	15.05	2.28	0.41	1.66	3.91	5.12	0.14	0.10	1.02	99.22
Andesite of Mountain Lion Creek																		
03L-10	GC	Mafic lava, Round Park	38	1.57	106	31.70	61.28	0.86	15.37	5.63	2.24	4.74	4.27	4.08	0.57	0.08	0.45	99.12
06L-32-A	LM	Xenocrystic mafic lava, W Park Creek	38	0.99	106	26.74	62.26	0.90	15.31	5.65	2.19	4.57	4.14	4.24	0.57	0.08	0.74	99.92
BACHELOR CALDERA CYCLE																		
Carpenter Ridge Tuff																		
02L-20-A	TM	Devitrified interior, roadcut Hwy 114	38	10.48	106	28.63	75.11	0.21	13.11	1.26	0.08	0.75	3.49	5.40	0.19	0.08	0.81	99.68
02L-20-B	TM	Devitrified interior, roadcut Hwy 114	38	10.48	106	28.63	75.33	0.20	12.92	1.22	0.07	0.75	3.39	5.30	0.18	0.08	0.96	99.45
02L-3	CP	Clast landslide breccia, Samora Creek	38	14.25	106	38.33	74.44	0.23	13.53	1.40	0.07	0.89	3.66	5.31	0.22	0.08	0.99	99.84
02L-5	CP	Clast landslide breccia, Samora Creek	38	14.90	106	37.58	74.66	0.22	13.28	1.36	0.12	0.79	3.62	5.34	0.21	0.09	0.62	99.71
02L-37-B	RD	Clast (silicified) in landslide breccia, Wolverine Creek	38	15.62	106	39.35	82.64	0.17	9.12	1.02	0.05	0.74	2.30	3.63	0.20	0.08	3.68	99.95
03L-32	CS	Clast in slide breccia, Los Pinos narrows	38	11.90	106	50.75	77.64	0.18	11.65	1.14	0.22	0.80	3.09	4.70	<0.05	0.04	2.10	99.46
LA GARITA CALDERA CYCLE																		
Huerto Andesite																		
99L-1	EP	Hbl dacite lava flow, Nutras Cr	38	2.33	106	51.08	65.07	0.59	17.08	3.83	1.12	2.97	4.17	4.58	0.29	0.07	1.64	99.77
99L-2	EP	Flow-laminated hbl-bio dacite lava, Nutras Cr	38	2.42	106	51.25	65.14	0.55	16.94	3.07	0.56	2.72	4.24	4.64	0.27	0.11	1.42	98.25
02L-58	TM	Dacite flow, Trickle Mtn	38	9.12	106	23.42	62.42	0.89	15.78	5.06	1.50	3.45	4.44	4.66	0.65	0.07	0.50	98.92
03L-44A	LM	Andesite flow, lower, E Mt Lion	38	3.67	106	23.50	56.87	1.20	15.73	7.70	2.95	5.99	4.03	4.12	0.70	0.11	0.82	99.41
03L-44B1	LM	Andesite lava flow, upper, E Mt Lion	38	3.75	106	23.57	61.88	0.98	16.00	5.47	1.41	3.70	4.30	4.62	0.63	0.07	0.61	99.06
05L-46	LG	Hbl-plag andesite flow, Caps S side Spruce Mtn	38	1.12	106	21.51	63.63	0.82	15.30	5.24	1.48	3.49	3.99	4.35	0.44	0.09	0.67	98.83
06L-19-A	LO	Andesite, Storm King Mtn	37	57.02	106	24.90	57.50	1.09	15.64	7.58	3.92	6.02	3.68	3.47	0.53	0.11	0.87	99.55
06L-19-B	LO	Andesite, Storm King Mtn	37	57.02	106	24.91	55.40	1.16	15.93	8.45	4.61	6.75	3.48	3.08	0.63	0.13	1.43	99.61
Dacite of Nutras Creek																		
90L-21	EP	Base of cliff, NW of Eddysville junction	38	1.85	106	50.33	70.61	0.48	14.06	3.65	0.69	2.21	3.09	4.12	0.22	0.06	1.14	99.18
90L-21	EP	Same site, separate sample (Riciputi, 1991)	38	1.85	106	50.33	64.97	0.60	16.91	4.53	0.85	3.45	3.83	3.93	0.23	0.10	1.27	99.40
BFC115	EP	Lava flow (Bachmann and others, 2002)	38	1.62	106	50.05	67.93	0.49	15.23	4.14	0.85	2.79	3.66	4.42	0.10	0.20	0.94	99.81
Fish Canyon Tuff																		
B6-62-39		Sapinero quad, col. by W. Hanson (Lipman, 1975)					70.20	0.40	14.20	3.96	1.40	2.70	2.90	4.10	0.19	0.09	1.60	100.14
G-2384		Gateview quad (Olson and others, 1968)					70.60	0.30	16.15	1.86	0.26	1.40	4.10	4.90	0.08	0.08	0.78	99.73
LR89-016		Gateview area, Hwy 149, junction with Sapinero Mesa rd	38	16.38	107	10.67	66.31	0.56	16.31	4.36	0.76	3.16	3.84	3.92	0.20	0.09	0.56	99.51
LR89-016pum		Gateview area (Riciputi, 1991)	38	16.38	107	10.67	68.33	0.53	15.30	3.74	0.83	2.78	3.63	4.11	0.20	0.13	0.61	99.58
WESTERN SAN JUAN IGNIMBRITES																		
Sapinero Mesa Tuff																		
00L-21A	CS	Los Pinos Creek road, distal, partly welded	38	11.87	106	50.87	76.46	0.23	12.29	1.21	0.15	0.72	2.94	5.44	0.06	0.07	1.51	99.58
00L-21B	CS	Los Pinos Cr road, distal, most dense welded	38	11.87	106	50.87	75.14	0.26	12.66	1.46	0.22	1.07	3.13	5.11	0.08	0.05	2.03	99.19
03L-6	GC	Partly welded distal tuff, Fourmile Creek	38	5.28	106	34.45	74.84	0.26	13.09	1.45	0.29	1.11	3.23	5.26	0.10	0.06	2.19	99.69
03L-45	LG	Partly welded distal tuff, Houselog Creek	38	5.93	106	21.95	73.54	0.27	13.67	1.41	0.19	0.77	3.30	6.05	0.07	0.05	1.27	99.33
CONEJOS FORMATION, UPPER UNITS																		
Rhyolite of Barret Creek																		
03L-20B	RD	Sanidine-quartz flow, S of Lion Head	38	22.28	106	37.78	74.95	0.24	13.25	1.60	0.33	1.11	3.24	4.87	0.08	0.03	1.13	99.70
03L-21	RD	Upper sanidine-quartz flow, S of Lion Head	38	21.37	106	37.70	72.90	0.27	14.28	1.73	0.30	1.27	3.77	4.96	0.10	0.06	0.54	99.63
04L-5	WB	Crystal-rich rhyolite flow, Barret Creek	38	20.57	106	36.52	74.28	0.24	13.45	1.56	0.43	1.23	2.89	4.95	0.08	0.04	1.84	99.16
04L-6	WB	Crystal-rich rhyolite flow, Barret Creek	38	21.67	106	36.88	74.70	0.25	13.21	1.39	0.35	1.22	3.24	4.87	0.08	0.02	0.80	99.33
04L-7	WB	Crystal-rich rhyolite flow, Barret Creek	38	21.85	106	35.75	72.19	0.31	14.09	1.92	0.52	1.55	3.43	4.97	0.11	0.06	1.36	99.15
04L-21	WB	Crystal-poor rhyolite, Green Mountain	38	21.15	106	31.49	76.13	0.12	12.69	0.90	<0.10	0.93	3.48	4.47	0.05	0.04	0.69	98.81
Basalt of Point Benny																		
03L-42	NP	Basalt, dike, Point Benny	38	10.07	106	32.77	52.00	1.75	16.22	9.65	4.21	7.47	3.71	3.45	0.75	0.13	1.33	99.33
Andesite of Lone Tree Gulch																		
05L-40	LMNE	Andesite flow, S of Lone Tree Gulch	38	9.38	106	22.41	59.01	1.18	16.29	7.67	1.49	4.68	4.02	3.45	0.58	0.18	2.35	98.55
Tuff of Big Dry Guch																		
03L-1	TM	Partly welded tuff, Alkali Gulch	38	9.70	106	24.60	67.11	0.60	16.43	3.01	1.21	2.34	2.39	6.07	0.15	0.10	6.23	99.39
Andesite of hill 9519																		
05L-42	TM	Porphyritic hornblende andesite	38	9.70	106	26.72	58.11	1.01	15.15	6.33	2.50	5.33	2.34	7.62	0.56	0.18	2.92	99.12
NORTH PASS CALDERA CYCLE																		
Luders Creek Tuff																		
02L-12	TM	Dacite cobble, channel below FCT, Spanish Cr	38	12.95	106	29.78	66.00	0.38	17.20	2.97	0.71	2.26	4.56	5.29	0.22	0.09	0.60	99.69
02L-26	NP	Crystal-rich dense welded upper tuff, Luders Creek	38	10.15	106	34.93	66.93	0.36	16.73	2.71	0.57	1.74	4.59	5.48	0.18	0.11	0.79	99.42
02L-25-B	NP	Dacite clast, debris-flow, Buffalo Creek CG	38	11.23	106	30.93	67.55	0.35	16.51	2.55	0.53	1.78	4.57	5.36	0.18	0.08	0.66	99.46
02L-28	NP	Crystal-poor partly welded lower tuff, Luders Creek	38	9.97	106	35.52	72.50	0.27	15.04	1.36	0.20	2.03	3.12	5.30	0.10	0.04	6.90	99.96
02L-25-A	NP	Rhyolite clast, debris flow, Buffalo Creek CG	38	11.23	106	30.93	73.02	0.28	13.90	1.88	0.30	1.84	2.64	5.74	0.11	0.04	5.76	99.74
02L-10	NP	Crystal-rich sanidine tuff, E of Slane Cr	38	14.40	106	35.12	72.76	0.25	14.79	1.51	0.54	1.98	2.50	5.33	0.09	0.02	8.04	99.78
02L-10-2	NP	Nw san-quartz tuff, E of Slane Cr (2nd sample)	38	14.40	106	35.12	72.67	0.24	14.84	1.47	0.65	1.95	2.27	5.42	0.07	0.02	8.32	99.61
Dacite of East Pass Creek																		
03L-26	NP	Dacite flow, North Pass	38	11.80	106	32.28	61.40	0.74	17.11	5.57	1.89	4.46	3.79	4.09	0.38	0.10	1.79	99.54
03L-39	NP	Dacite flow, W of North Pass	38	14.38	106	35.15	63.52	0.60	15.85	4.52	1.66	3.43	3.36	4.32	0.34	0.09	3.41	97.69
03L-41	NP	Dacite flow, Luders Creek	38	10.58	106	34.37	65.95	0.51	16.03	2.96	0.86	2.39	4.20	4.57	0.22	0.07	0.81	97.77
05L-3	GC	Bio-hbl dacite flow, Fourmile Creek	38	4.81	106	36.24	65.57	0.49	17.57	3.69	1.03	3.77	3.44	4.45	0.35	0.12	2.10	100.48
Caldera-related rhyolite lava flows																		
04L-4	NP	Crystal-poor rhyolite, Corduroy Creek	38	11.27	106	26.50	76.95	0.18	12.42	0.46	<0.10	0.46	3.42	5.21	<0.05	0.01	0.96	99.11
05L-43	NP	Crystal-poor rhyolite, Benny Creek	38	10.67	106	33.57	75.03	0.19	12.89	1.05	<0.10	0.53	4.01	4.96	0.09	0.08	0.70	98.83

XRF or EDXRF ("Kevex"); ppm (except where noted)

Sample No.	Zn	Rb	Sr	Y	Zr	Nb	Pb	Th	Ba	La	Ce	Nd	Cu	V	U	Cr	Cs	Ga	Mo	Ni
85L-29H	69	103	650	25	344	13	35													35
85L-29I	54	160	306	27	210	19	22													
LR89-007	85	102	610	29	199	15	41	9	1122	53	87	43								
LR89-007pu	137	102	809	33	285	14	44	9	1986	48	94	40								
LR89-008	74	145	300	30	217	19	43	27	1630	63	113	39								
LR89-006-1	72	135	237	34	205	17	38	26	1199	54	112	47								
LR89-006-G	63	148	240	37	208	22	50	18	1386	66	122	48								
67L-77A	39	114	535	18	145	11	46													
67L-77B	66	102	677	20	361	11	39													
67L-77D	38	118	321	21	219	18	63													
67L-77F	35	125	218	23	199	17	36													
67L-77G	29	122	231	19	191	13	63													
SJ-85-53	51	116	552	33	409	16	24													
SJ-85-56	35	116	271	21	195	13	29						3							
SJ-85-58	40	174	270	29	213	21	41						20							
SJ-85-60	44	138	1156	22	147	27	27						12							6
SJ-85-64	40	109	1331	23	147	22	24						3							31
LR89-015	75	124	587	28	468	15	35	9	2511	59	104	45								
85L-33A	58	124	430	28	182	22	36						33							39
85L-36	73	425	18	146	10			800	<30	56									68	791
C-375A	49	101	510	16	134	17	76						47							<10
BM-36C-85		375	86	38	255	16			1900	46	96									
BM-47C-435		365	106	43	210	13			1950	30	78									
02L-50	49	144	314	27	309	18	20	14	1300	65	111	58	7	32	4	6	14	17		10
00L-17	49	135	308	41	301	18	19	13	1370	77	126	68	9	37	5	5	8	19	3	7
00L-18	51	130	339	25	296	18	20	12	1400	62	109	46	6	31	5	5	10	18	2	3
03L-10	98	88	1130	17	317	20	19	8	2010	92	154	79	37	116	<4	65		24		30
06L-32-A	87	89	1030	13	322	19	17	<2	2130	95	172	103	37	109	4	57		18	<2	12
02L-20-A	42	156	80	25	201	19	23	19	470	59	102	42	4	18	6	<3	7	15		7
02L-20-B	38	151	84	25	188	18	24	18	455	60	102	37	5	18	5	<3	7	15		6
02L-3	43	152	103	26	209	20	26	18	552	57	105	37	3	19	8	<3	8	16		5
02L-5	47	152	88	27	207	19	26	18	606	59	100	38	6	20	6	8	9	15		6
02L-37-B	23	102	88	17	139	13	13	11	451	57	89	57	3	13	11	6	14	10		5
03L-32	34	128	95	27	177	17	21	17	557	50	84	38	5			6		12		3
02L-58	97	112	1060	15	426	35	21	8	2180	111	182	88	24	88	<4	10		24		14
03L-44A	98	85	1210	18	265	23	14	6	1810	74	130	65	55	148	<4	155		22		56
03L-44B1	104	104	1040	16	420	31	20	5	2070	105	180	77	32	115	<4	16		25		16
05L-46	82	105	767	13	292	20	14	<4	1860	97	158	102	31	96	4	41		16		5
06L-19-A	90	63	1090	18	259	16	11	<4	1760	63	121	70	46	150	<4	133		16	<2	32
06L-19-B	96	51	1230	22	260	17	11	<4	2010	73	137	76	55	173	<4	182		17	2	51
90L-21	37	112	365	20	154	15			820	<30	74		12			<20				<10
90L-21	57.5	111	398.5	24	154	17	36	21.5	861	51	86	31								
BFC115	64	123	436	26	192	17	17	13	849				11	56	4	6		18		7
LR89-016	69	101	525	24	182	18	55	27	1164	51	90	38								
LR89-016pum	50	118	407	24	181	18	60	27	819	53	87	36								
00L-21A	28	148	101	24	188	23	23	28	519	58	105	37	6	15	4	<3	4	14	2	3
00L-21B	41	123	190	24	230	20	22	22	1130	62	106	47	6	24	6	3	10	14	2	3
03L-6	31	125	196	24	234	20	25	22	1220	68	102	47	4	24	5	<5		14		2
03L-45	35	144	142	24	247	22	26	26	1050	70	105	39	4	25	6	5		15		4
03L-20B	36	101	237	13	149	16	22	8	803	59	102	42	3	20	<4	<5		17		4
03L-21	45	114	300	12	187	18	25	10	1090	58	98	45	9	21	<4	11		19		4
04L-5	21	117	29	30	248	56	24	11	289	86	149	5	<2	14		inf	<5	15	24	24
04L-6	42	103	233	12	150	40	22	7	823	55	95	7	7	19		9	8	17	17	22
04L-7	46	104	241	13	150	41	22	8	889	57	91	7	5	19		8	8	17	17	22
04L-21	32	98	203	15	111	27	29	<4	1300	62	89	61	<2	13		<1.1	10	16	23	<0.6
03L-42	108	64	1190	24	204	24	11	<4	1420	51	96	56	35	236	<4	85		23		45
05L-40	92	67	1010	17	255	18	10	<4	1860	67	125	75	41	153	<4	47		18		20
03L-1	65	143	332	32	365	19	20	15	979	54	101	48	8	36	6	<5		17		5
05L-42	85	129	312	14	230	17	11	<4	1810	66	121	67	42	130	4	91		15	<2	34
02L-12	60	89	546	27	465	17	26	7	2580	116	179	81	4	37	3	6	17	18		10
02L-26	67	98	357	28	416	20	29	12	1620	114	186	78	3	34	3	5	12	20		8
02L-25-B	65	97	416	26	406	19	27	12	1970	109	173	91	3	31	4	6	16	20		6
02L-28	44	154	319	23	266	22	24	11	984	79	128	53	<2	28	5	5	11	15		6
02L-25-A	47	109	170	30	237	24	28	10	337	77	136	55	<2	20	4	4	6	17		7
02L-10	52	107	212	26	215	24	26	13	375	63	117	48	3	16	4	<3	5	17		4
02L-10-2	54	111	243	23	212	24	26	13	383	55	121	49	3	19	4	<5		17		3
03L-26	74	87	875	24	267	18	24	10	1540	66	106	54	21	101	<4	8		19		11
03L-39	66	86	598	22	231	20	22	10	1620	70	115	61	14	77	<4	7		19		12
03L-41	57	99	609	26	264	20	27	12	1620	82	121	62	14	61	<4	5		19		7
05L-3	58	115	573	23	282	14	12	<4	1700	51	91	49	<2	9	4	7		15		3
04L-4	21	117	29	30	248	56	24	11	289	86	149	5	<2	14		inf	<5	15	24	24
05L-43	39	123	32	22	201	25	26	10	309	85	146	65	<2	29	<4	<5		11		2

Instrumental Neutron Activation (INAA) and a few Induction-Coupled Plasma (ICP) Mass Spectrometry; ppm (except where noted)

Sample No.	Cs	Rb	Ba	Sr	Na (%)	Th	U	La	Ce	Nd	Sm	Eu	Gd	Tb	Ho	Tm	Yb	Lu	Ta	Zr	Hf	Sb	Sc	Fe (%)	Cr	Co	Ni	Zn
85L-29I		141	1410	293	2.04	11	3.47	56.3	110	45.2	7.85	1.76	5.9	0.831		0.422	2.75	0.413	1.22	206	6.1	0.394	7.38	1.42	4.72	2.69	7.17	57.3
LR89-007pu	2.53	92.5	1990	852	2.85	7.17	2.89	43.2	95	48.4	9.49	2.19	7.48	0.97	1.19	0.487	3.05	0.466	0.866	262	6.38	0.18	10.3	4.24	2.77	10.1	8.2	94.6
LR89-006-G	4.25	141	1250	250	2.4	11.4	4.12	60.2	123	54.2	9.63	1.73	8.11	1.04	1.33	0.565	3.5	0.489	1.38	210	5.88	0.374	6.56	0.92	0.78	0.523	10.5	50.4
85L-36	410	1.81	8.5	2.14	32.3	60.2	27.5	4.98	1.13	3.91	0.56		0.261	1.76	0.26	0.753	132	4.07	0.154	6.01	2.47	5.18	6.68	6.73	56.4			
02L-50		135	1220	293	3.04	14.8	4.28	53.3	97.1	40.5	7.36	1.42	5.17	0.75		0.44	2.81	0.42	1.21	291	7.72	0.37	4.76	1.45	1.2	1.85	6.81	38.8
06L-32-A													18	<2	12													
90L-21	9.23	106	745	385	2.41	11.7	3.48	42.4	78.6	30.9	5.64	1.16	4.96	0.621	0.838	0.346	2.13	0.309	1.11	176	4.4	2.63	5.28	2.43	3.51	6.07	7.2	46
BFC115						12.9	4.5	45.4	85.3	32.1	5.44	1.22		0.67			2.32	0.36	1.1		5		6			7.1		64
LR89-016pum	3.13	114	782	432	2.68	13.9	4.72	47.5	91	35.8	6.14	1.25	5.13	0.65	0.846	0.357	2.25	0.328	1.34	181	5	0.323	6.41	2.82	6.48	11.1	8.6	54.4

Sample No.	Quad-rangle[1]	Sample type, location, data source[2]	Latitude Deg	Latitude Min	Longitude Deg	Longitude Min	SiO_2	TiO_2	Al_2O_3	$FeTO_3$	MgO	CaO	Na_2O	K_2O	P_2O_5	MnO	LOI	Total
X-Ray Fluorescence (WDXRF); weight % (calc. to reported total w/o LOI)																		
05L-49	NP	Brecciated rhyolite (san), Taylor Creek	38	10.57	106	31.59	76.61	0.21	11.65	1.23	0.10	0.65	3.13	4.70	0.11	0.09	2.97	98.49
		Saguache Creek Tuff																
00L-3	CP	Crystal-poor rhyolite welded tuff, Corduroy Creek	38	11.72	106	37.68	72.48	0.22	14.60	1.34	0.16	1.19	3.94	5.24	0.05	0.12	6.14	99.36
00L-23-A	NP	Lower welding zone, Pine Creek	38	12.62	106	36.40	72.28	0.24	14.76	1.50	0.15	0.75	4.22	5.53	0.09	0.06	1.08	99.58
00L-24	NP	Upper welding zone, Pine Creek	38	12.40	106	36.42	72.41	0.22	14.75	1.37	<0.10	0.66	4.39	5.66	0.08	0.07	0.98	99.61
01L-32A	ST	Lower cooling unit, upper Rock Creek	38	19.30	106	49.33	73.50	0.21	14.28	1.36	0.14	0.68	4.19	5.39	0.09	0.08	1.13	99.84
01L-32B	ST	Upper cooling unit, upper Rock Creek	38	19.35	106	49.43	72.26	0.22	14.87	1.43	0.12	0.67	4.45	5.55	0.07	0.07	0.49	99.64
02L-24	LE	Separate unit above Bonanza Tuff, Cross Cr	38	11.73	106	19.83	73.62	0.23	13.94	1.37	0.15	0.65	4.20	5.39	0.09	0.11	0.97	99.75
02L-32	SA	Densely welded crystal-poor rhyolite, Saguache Park	38	2.12	106	38.38	74.45	0.21	13.78	1.47	0.13	0.53	4.10	5.34	0.09	0.04	1.28	100.14
02L-11	TM	Lower crystal-rich dark phase, Bear Creek	38	13.48	106	29.25	73.72	0.21	13.90	1.30	0.14	0.59	4.20	5.32	0.09	0.06	0.70	99.53
02L-42	ST	Clast in landslide breccia, W of Cochetopa Cr	38	16.23	106	46.23	75.55	0.21	12.76	1.60	0.21	0.67	3.62	4.76	0.09	0.07	2.04	99.56
02L-29-A	SA	Crystal-rich dw "dacitic" upper tuff, Mexican Joe Gulch	38	6.60	106	41.23	73.17	0.21	14.33	1.29	0.17	0.63	4.06	5.51	0.09	0.04	1.59	99.51
02L-29-B	SA	Crystal-poor dw rhyolite lower tuff, Mexican Joe Gulch	38	6.60	106	41.23	75.40	0.21	13.58	1.00	0.20	0.64	3.33	5.49	0.08	0.02	2.79	99.95
02L-30	SA	Crystal-poor dw rhyolite lower tuff, Mexican Joe Gulch	38	6.58	106	40.68	75.36	0.21	13.65	0.77	0.13	0.60	3.92	5.16	0.08	0.02	1.80	99.91
02L-33	SH	Densely welded crystal rhyolite tuff, Soldier Park road	38	22.47	106	52.82	72.98	0.23	14.56	1.45	0.10	0.64	4.32	5.38	0.08	0.04	1.07	99.77
03L-47	NP	Crystal-poor nw tuff, Hwy 114	38	13.00	106	35.32	74.05	0.21	12.87	0.57	0.12	0.43	2.93	6.56	0.06	0.01	1.26	97.81
04L-2	NP	Dw tuff, clast in conglomerate, Los Creek	38	8.33	107	8.33	76.33	0.19	12.23	1.20	<0.10	0.67	3.51	4.77	0.05	0.07	1.85	99.02
04L-3	NP	Dw tuff (silicified), clast in conglomerate, Los Creek	38	8.38	107	8.38	82.14	0.16	9.31	0.87	<0.10	0.59	2.31	3.90	0.05	0.05	3.31	99.38
04L-9	NP	Nonwelded tuff, lower Slade Creek	38	13.43	107	13.43	75.09	0.22	13.06	0.62	0.12	0.48	3.03	6.41	<.05	0.12	1.18	99.15
04L-10	NP	Nonwelded tuff, lower Slade Creek	38	13.67	107	13.67	73.45	0.24	14.16	1.50	0.45	1.37	1.67	6.52	0.05	0.01	6.03	99.42
04L-11	NP	Nonwelded tuff, lower Slade Creek	38	13.38	107	13.38	72.43	0.25	14.73	1.61	0.30	0.84	3.59	5.63	0.06	0.03	2.24	99.47
05L-2A	GC	Breccia clast, Tsc?, Fourmile Creek	38	4.95	106	36.23	74.48	0.20	13.13	1.62	0.14	0.58	3.51	5.29	0.10	0.04	1.70	99.09
05L-2B	GC	Breccia clast, Tsc?, Fourmile Creek	38	4.95	106	36.23	73.90	0.21	13.44	1.68	0.20	0.61	3.41	5.55	0.11	0.03	1.75	99.15
05L-47	LM	Nonwelded rhyolite tuff, mouth Squaw Creek	38	7.26	106	27.67	72.41	0.26	14.35	1.67	0.63	2.00	2.11	5.57	0.09	0.10	7.96	99.19
05L-48	TM	Nonwelded rhyolite tuff	38	13.50	106	29.27	70.28	0.29	15.32	1.97	0.99	1.48	2.62	6.24	0.12	0.16	5.35	99.46
05L-49	NP	Brecciated rhyolite (san), Taylor Creek	38	10.57	106	31.59	76.61	0.21	11.65	1.23	0.10	0.65	3.13	4.70	0.11	0.09	2.97	98.49
		Precursor(?) tuff of Spanish Creek																
02L-34-A	NP	Dense welded crystal-rich rhyolite (vitro), Spanish Cr	38	14.50	106	32.55	73.00	0.24	14.37	1.79	0.48	1.36	3.50	5.17	0.12	0.07	2.61	100.11
02L-34-B	NP	Densely welded crystal-rich rhyolite, Spanish Cr	38	14.70	106	32.63	75.13	0.20	13.34	1.48	0.31	1.10	3.46	4.76	0.10	0.05	1.77	99.93
OLDER NORTHEASTERN TUFFS & RELATED LAVAS																		
		Bonanza Tuff																
02L-23	LE	Densely welded upper tuff (silicic), Cross Creek	38	8.67	106	15.72	81.00	0.15	10.29	1.00	0.12	0.44	2.97	4.04	0.08	0.04	1.85	100.14
02L-21-B	LE	Dense welded interior, upper tuff, Poison Gulch	38	9.30	106	16.33	73.73	0.22	12.70	1.34	0.19	2.89	3.78	5.10	0.09	0.03	3.16	100.07
02L-21-A	LE	Partly welded base, upper tuff, Poison Gulch	38	9.28	106	16.35	74.52	0.24	13.20	1.55	0.24	0.78	3.57	5.69	0.12	0.03	1.50	99.95
02L-40	WB	Partly welded crystal-poor upper tuff?, C.D. trail	38	18.00	106	30.95	73.80	0.25	14.31	1.59	0.16	0.69	3.46	5.54	0.09	0.06	2.84	99.94
02L-16	WB	Crystal-rich tuff, Razor Creek Trail access road	38	17.00	106	30.77	66.54	0.57	16.48	3.39	0.66	2.08	3.99	5.46	0.25	0.06	1.10	99.48
02L-22-A	LE	Winnowed top, main crystal-rich dacite, Findley ridge	38	9.25	106	16.28	75.13	0.36	12.35	2.29	0.37	1.26	3.15	4.76	0.16	0.04	2.03	99.86
02L-22-B	LE	Vitrophyric lower dacite, Findley ridge area	38	9.23	106	16.30	64.28	0.74	17.31	3.87	1.03	2.95	3.83	5.16	0.31	0.05	1.21	99.53
00L-2	LG	Welded dacite, Houghland Hill	38	6.60	106	16.50	65.78	0.70	16.34	4.13	0.96	2.43	3.48	5.23	0.28	0.07	2.09	99.41
02L-14	LE	Crystal-rich dacite vitrophyre, C.D. trail	38	16.60	106	31.70	63.09	0.71	17.69	4.41	1.35	3.28	3.34	5.49	0.29	0.10	3.30	99.75
02L-9	NP	Crystal-rich sanidine-quartz tuff, Hwy 114	38	13.25	106	36.23	63.85	0.68	17.46	4.05	0.92	2.86	3.67	5.66	0.28	0.06	3.19	99.49
		Conejos Formation (and related early rocks)																
95L-4	MI	Glassy top, large flow, Cebolla Creek	38	7.03	107	1.70	71.94	0.21	14.89	1.36	0.29	1.26	3.48	5.40	0.08	0.11	2.37	99.03
95L-5	MI	Flow-laminated interior, large flow, Cebolla Creek	38	6.63	107	1.88	73.47	0.20	14.15	0.83	0.24	1.22	3.81	4.59	0.08	0.06	0.71	98.66
95L-6	BC	Andesite flow, cirque west of Baldy Cinco	37	57.45	107	7.03	60.56	0.88	16.83	6.78	1.59	4.33	3.72	3.82	0.46	0.16	1.25	99.13
DS87-148	MI	Dacite lava flow	38	5.78	107	2.13												
LR88-501	MI	Dacite lava flow, confluence with Spring Creek	38	5.58	107	2.25	67.50	0.52	15.03	3.99	1.32	2.85	2.81	5.35	0.17	0.06	2.68	99.70
LR88-502	MI	Dacite lava flow	38	5.60	107	2.30	68.06	0.53	15.20	3.74	1.31	2.85	2.97	5.20	0.17	0.06	2.46	100.11
99L-3	SP	Flow-laminated dacite lava, Los Pinos Pass	38	6.58	106	58.17	65.68	0.74	16.90	3.71	0.61	3.16	4.23	4.23	0.30	0.07	1.19	99.64
99L-4	SP	Vitrophyric crystal-rich dacite flow, Elk Creek	38	7.58	106	52.42	66.57	0.61	15.85	4.17	1.31	3.31	3.56	4.35	0.29	0.07	2.21	100.09
LR88-507	SP	East Los Pinos Creek (lat, long: unreliable)	38	6.07	106	55.80	66.48	0.59	15.35	4.53	1.83	3.46	2.92	4.88	0.19	0.11	2.28	100.35
LR88-508	SP	East Los Pinos Creek (lat, long: unreliable)	38	6.17	106	55.70	65.32	0.57	15.10	4.18	1.79	3.44	3.03	4.69	0.18	0.10	2.08	98.41
		Intermediate-composition intrrusions																
00L-22	CS	Blue Creek intrusion	38	10.05	106	50.65	69.30	0.39	15.63	3.29	0.71	2.57	3.81	3.36	0.20	0.03	1.43	99.28
01L-15	RD	Fine-grain granodiorite dike, Sage Park	38	17.17	106	40.08	62.32	0.74	17.19	6.09	1.50	4.38	3.86	3.21	0.36	0.08	2.27	99.73
02L-7	CP	Fine-grained intrusion, Samora Creek	38	13.88	106	36.18	68.28	0.36	15.75	2.90	0.80	2.94	3.70	4.68	0.23	0.08	3.47	99.72
03L-31	ST	Hbl-rich dike (Conejos), Hwy 114	38	17.25	106	45.00	56.94	1.06	16.37	8.35	3.61	5.95	3.63	3.00	0.52	0.11	1.65	99.54
03L-17	WB	Granodiorite intrusion, upper Needle Creek	38	19.70	106	34.12	59.97	0.78	16.52	6.52	2.67	5.39	3.90	3.19	0.36	0.12	1.94	99.41
03L-18	WB	Intrusion, (high point), upper Needle Creek	38	19.57	106	35.20	58.49	0.99	15.67	7.11	3.68	5.69	3.75	3.20	0.50	0.10	2.36	99.18
05L-12	WB	Bio-hbl intrusion, Left Hand Needle Creek	38	20.62	106	31.78	61.98	0.69	16.51	5.43	1.68	4.19	4.02	3.67	0.44	0.11	1.24	98.71
03L-20A	WB	Dike, Needle Rock	38	21.53	106	33.17	60.06	0.87	16.31	6.85	2.69	4.95	3.91	3.22	0.41	0.08	1.26	99.35
05L-15	DV	Hbl-bio-pagl dike, Barret Creek	38	22.69	106	35.40	59.19	0.85	16.56	6.88	2.92	5.16	3.71	3.08	0.49	0.20	2.16	99.05
04L-12	DV	Aplitic rhyolite, Tomichi Dome	39	32.20	107	37.07	76.11	0.06	13.61	0.46	<0.10	0.37	3.89	4.47	<0.05	0.11	0.80	98.98
06L-39	SM	Dacite intrusion, upper Long Branch	38	18.19	106	24.30	61.23	0.77	16.61	5.37	1.81	4.72	3.74	3.77	0.42	0.12	2.46	98.57
							S											
		Tuff																
03L-47	ST	Pink nw tuff of Home Gulch	38	17.70	106	45.17	75.39	0.16	13.94	0.85	1.25	2.89	0.50	4.13	0.06	0.05	11.70	99.21
		Flows																
00L-7	CP	Rhyolite lava dome, S of Archuleta Creek	38	8.52	106	37.93	73.33	0.26	14.81	0.95	0.22	0.65	3.90	5.43	0.06	0.06	1.40	99.68
00L-10	CP	Crystal-poor rhyolite lava, head of Pine Creek	38	10.63	106	35.72	75.37	0.20	13.22	1.02	<0.10	0.50	4.21	4.94	0.06	0.07	0.88	99.59
01L-13	RD	Rhyolitic lava, Sage Park	38	17.12	106	39.68	65.31	0.37	18.05	3.38	0.47	3.03	4.77	3.77	0.22	0.05	1.39	99.42
01L-14	RD	Rhyolitic lava, Lightening Park	38	17.60	106	41.70	76.99	0.06	13.17	0.53	0.31	0.87	3.24	4.65	<0.05	0.06	2.06	99.87
01L-10	WB	Dacite flow, Lujan Creek (Tfc mineralogy)	38	15.05	106	34.10	70.96	0.29	15.32	2.12	0.38	1.59	4.06	4.74	0.12	0.05	0.79	99.64
01L-20	ST	Rhyolitic lava, Cochetopa Canyon Tfc mineralogy?)	38	17.78	106	46.12	76.79	0.18	12.56	1.30	0.31	0.99	3.37	4.27	0.08	0.02	1.29	99.88
02L-13	NP	Quartz-rich rhyolite, south of Spanish Creek	38	13.45	106	31.42	73.15	0.25	14.11	1.77	0.39	1.43	3.84	4.60	0.14	0.05	0.75	99.74
05L-1	SM	Crystal-poor rhyolite, Upper Dutchman Cr	38	20.22	106	29.84	76.00	0.13	12.80	0.95	<0.10	0.94	3.55	4.63	0.07	0.05	0.78	99.11
03L-23	RD	Large lava dome, Razor Cr	38	19.47	106	38.17	70.38	0.38	14.91	2.55	0.78	1.92	3.69	4.71	0.17	0.07	1.39	99.55
03L-15	GC	Coarsely porphyritic dacite	38	0.28	106	27.73	66.90	0.61	15.69	3.94	1.07	2.63	3.49	4.97	0.21	0.05	1.19	99.56
04L-22	LG	Plag dacite flow, above Campo Santo cemetary	38	8.38	106	4.44	70.48	0.32	15.55	2.28	0.39	2.05	4.08	4.48	0.15	0.07	0.96	99.86
00L-15	CS	Dacite lava flow, north of Pinto Basin	38	9.00	106	56.48	64.55	0.70	16.16	5.27	1.22	3.76	3.62	3.84	0.31	0.11	1.01	99.55
00L-20	CS	Lava flow, fine-grained hbl dacite	38	11.08	106	51.13	62.17	0.72	16.73	6.15	1.51	4.78	3.91	2.82	0.40	0.11	0.75	99.29
01L-18	RD	Fine-grained andesite, Razor Creek Dome	38	18.70	106	43.00	61.54	0.73	17.00	6.26	1.62	4.92	4.08	2.99	0.37	0.08	1.19	99.59
01L-19	RD	Fine-grained andesite, summit Razor Creek Dome	38	18.97	106	42.95	60.59	0.84	16.63	6.79	2.08	5.08	4.04	2.97	0.40	0.10	0.80	99.53
01L-29	ST	Dacite lava, Sawtooth Mtn, top flow	38	16.43	106	51.90	63.20	0.72	16.21	5.67	2.00	4.20	3.56	3.93	0.33	0.10	1.89	99.91
02L-38	SM	Dense aphyric mafic lava, Middle Baldy	38	18.88	106	29.88	57.11	1.10	15.89	8.00	3.71	6.28	3.60	3.28	0.64	0.12	0.54	99.73
02L-39	WB	Olivine-rich mafic lava, Middle Baldy	38	18.87	106	30.30	53.12	1.06	15.08	9.44	7.36	8.16	3.13	1.94	0.41	0.14	1.16	99.84
04L-1	BP	Dacite flow, Bowers Peak	38	20.75	106	35.62	66.02	0.62	15.59	4.81	0.82	3.07	3.32	4.41	0.27	0.06	1.23	99.00
04L-20	WB	Fine-grain crystal-rich dacite, Left Hand Needle Cr	38	20.09	106	31.71	67.03	0.52	15.40	3.91	1.18	2.93	3.82	3.97	0.25	0.07	0.64	99.08
05L-45	LO	Coarse porph dacite (san), S of Carnero Pass	37	59.73	106	25.99	65.57	0.70	15.30	4.60	1.13	2.93	3.59	4.79	0.27	0.08	1.32	98.96
06L-9	LO	Dark andesite flow, Lookout Mtn	37	59.42	106	28.32	63.50	0.99	16.30	5.52	1.11	3.86	3.77	4.14	0.52	0.11	1.25	99.82
06L-3	SM	Crystal-rich dacite flow, Marshall Creek	38	22.42	106	22.85	65.11	0.69	17.8	3.89	0.76	3.27	3.96	5.07	0.26	0.05	0.79	100.89
06L-23	S	Crystal-rich dacite flow, Long Branch	38	22.92	106	24.61	64.49	0.71	17.67	3.44	1.10	3.52	3.69	5.10	0.30	0.07	1.54	100.10
PC-2	ST	Porphyritic lava flow, top north Sawtooth Mtn	38	17.40	106	49.88	61.70	0.77	17.15	5.76	2.14	4.25	3.98	3.86	0.38	0.09	2.60	100.08
		Wall Mountain Tuff (36.9 Ma)																
01L-22	ST	Rheomorphic tuff, Alkali Creek	38	17.72	106	46.63	74.68	0.41	13.71	1.57	0.31	0.53	2.22	6.15	0.07	0.03	2.24	99.67
01L-30	ST	Rheomorphic tuff, Bead Creek	38	20.12	106	50.30	69.90	0.50	15.48	2.19	0.30	1.25	3.68	6.08	0.10	0.04	1.13	99.53
LA GARITA CALDERA CYCLE																		

XRF or EDXRF ("Kevex"); ppm (except where noted)

Sample No.	Zn	Rb	Sr	Y	Zr	Nb	Pb	Th	Ba	La	Ce	Nd	Cu	V	U	Cr	Cs	Ga	Mo	Ni
05L-49	32	103	85	25	194	21	21	4	458	78	132	51	<2	65	<4	<5		9		2
00L-3	66	221	164	32	265	25	28	12	397	88	165	61	<2	15	<2	<3	13	18	3	2
00L-23-A	69	127	83	31	279	26	28	14	482	85	148	53	3	17	5	<3	3	19	3	<2
00L-24	60	129	52	29	289	27	30	14	430	100	177	69	<2	8	3	<3	4	19	3	2
01L-32A	56	123	53	38	280	25	27	13	396	95	160	64	3	38	3	<3	5	17	<1	6
01L-32B	69	128	52	33	303	27	31	15	399	93	167	62	3	19	5	<3	4	17	2	4
02L-24	73	125	50	32	282	27	29	13	391	97	169	60	3	28	3	<3	8	17		6
02L-32	73	124	43	28	272	24	28	12	365	88	147	51	<2	14	4	<3	6	17		6
02L-11	70	124	42	33	292	27	30	14	307	90	158	71	<2	18	4	<3	5	17		6
02L-42	54	107	66	26	247	23	21	11	399	77	133	53	3	18	5	4	6	14		5
02L-29-A	57	123	54	30	290	26	27	13	409	94	154	57	<2	20	3	<3	4	17		6
02L-29-B	69	115	55	30	277	24	21	11	443	88	150	65	<2	15	4	4	7	17		7
02L-30	38	112	58	33	283	25	29	9	357	88	153	65	<2	19	6	<3	4	15		7
02L-33	48	123	64	39	295	27	21	14	459	107	151	77	<2	16	6	<3	7	16		7
03L-47	57	115	45	29	245	23	25	12	385	80	138	51	4	18	5	<5		16		3
04L-2	43	105	50	29	242	23	20	11	368	78	140	23	5	16	<4		<5	15		6
04L-3	20	73	67	21	172	17	18	9	385	75	121	17	3	11	<4		8	11		4
04L-9	33	120	44	31	255	23	21	12	387	69	128	23	4	18	<4		<5	15		8
04L-10	63	115	374	28	208	25	19	14	394	79	140	25	5	18	4		6	17		8
04L-11	68	126	92	25	289	26	25	14	456	46	148	26	5	17	<4		<5	17		9
05L-2A	34	125	63	29	278	22	17	6	501	88	168	61	<2	27	<4	<5		11		2
05L-2B	23	127	86	30	282	24	14	6	570	93	162	78	<2	34	<4	<5		12		2
05L-47	55	120	224	27	214	25	22	9	309	77	139	42	<2	19	<4	<5		12		2
05L-48	59	126	164	29	282	22	26	5	632	99	173	64	<2	38	<4	<5		13		2
05L-49	32	103	85	25	194	21	21	4	458	78	132	51	<2	65	<4	<5		9		2
02L-34-A	48	130	223	15	143	18	31	11	727	48	80	34	8	22	3	10	8	19		6
02L-34-B	40	100	191	16	136	17	27	10	707	49	73	37	2	18	4	11	8	16		7
02L-23	28	193	31	22	160	35	19	41	83	58	98	35	<2	33	7	6	7	13		6
02L-21-B	39	237	82	26	202	46	24	52	106	68	108	30	<2	16	8	4	5	16		7
02L-21-A	49	233	56	30	212	45	32	52	143	87	136	49	<2	24	8	<3	4	18		7
02L-40	36	158	86	27	218	19	23	19	511	66	114	50	5	16	5	4	7	16		6
02L-16	65	168	426	34	445	33	28	25	1200	107	186	83	6	50	7	4	11	19		8
02L-22-A	50	182	178	23	218	37	25	37	411	66	113	41	5	36	6	4	8	16		6
02L-22-B	77	126	659	30	528	25	25	21	1720	101	183	92	11	76	6	6	13	21		9
00L-2	72	115	515	30	460	23	43	19	1410	105	196	89	4	63	6	<3	8	18	1	6
02L-14	73	121	626	31	524	25	28	23	1510	102	190	86	10	69	5	5	10	20		10
02L-9	74	131	439	31	513	27	26	26	1560	104	188	92	9	66	7	4	10	18		10
DS87-148	56	199	336	29	274	14	34	14												
LR88-501	52.5	207	439	24	280	16	42	27.5	1036	51	93	47								
LR88-502	56	213	349	32	282	16	35	31	1008	56	95	35								
LR88-507	50	131	356	27	173	23	36	22	729	41	75	31								
LR88-508	66	141	354	29	169	27	47	9	751	41	72	36								
00L-22	62	67	637	13	136	13	19	6	1560	48	78	40	7	51	3	12	12	20	1	3
01L-15	80	62	840	22	210	13	19	8	1410	46	84	51	20	94	4	18	8	20	2	10
02L-7	57	98	422	19	196	16	26	6	1350	56	95	40	3	36	<2	11	8	18		9
03L-31	95	58	958	23	216	13	18	7	1260	46	81	43	48	163	<4	47		22		26
03L-17	77	61	865	22	221	19	21	5	1540	58	97	56	33	109	4	26		22		14
03L-18	89	54	1040	20	215	13	15	6	1640	60	105	57	41	141	<4	68		17		37
05L-12	80	67	985	22	264	12	17	<4	2250	68	114	82	2	88	<4	18		17		3
03L-20A	84	56	918	23	212	11	20	6	1620	48	85	49	38	131	4	36		21		20
05L-15	75	56	882	25	281	14	14	<4	1710	47	97	68	19	112	<4	19		16		3
04L-12	73	260	14	30	43	19	36	12	52	11	26	5	<2	7		inf	5	28	56	36
06L-39	63	73	709	24	275	16	13	<2	1750	62	117	68	12	98	<4	<5		15	<2	3
03L-47	40	66	1210	17	90	16	17	6	1740	48	68	41	5	19	<4	14		15		8
00L-7	31	133	112	17	255	27	27	16	895	41	148	29	<2	10	<2	<3	8	18	2	<2
00L-10	58	128	24	28	211	27	28	14	180	79	146	60	<2	9	6	<3	<3	18	3	<2
01L-13	88	81	998	27	396	25	35	5	2490	93	140	73	<2	31	3	8	15	20	<1	7
01L-14	45	142	59	16	52	25	27	3	226	12	21	20	<2	<5	4	<3	5	18	1	<2
01L-10	79	104	363	15	193	17	26	8	1110	49	79	34	3	26	3	9	8	18	3	3
01L-20	51	90	396	6	116	11	31	7	1540	38	58	39	14	18	2	9	16	20	1	4
02L-13	39	102	301	15	183	15	26	9	972	52	87	45	<2	21	4	9	10	17		6
05L-1	30	99	194	13	96	17	23	<4	1330	45	71	48	<2	6	<4	<5		11		2
03L-23	51	110	469	13	223	19	20	8	1560	72	106	52	8	38	<4	9		19		6
03L-15	64	142	412	33	280	21	23	17	1050	71	122	52	32	62	4	42		19		25
04L-22	52	105	472	22	247	24	23	25	1700	76	112	54	6	45		<5	<5	18	19	3
00L-15	73	109	500	29	204	14	19	12	1150	55	86	49	30	79	6	19	5	20	3	11
00L-20	78	56	870	23	181	11	16	6	1240	42	82	41	13	82	2	13	4	21	3	6
01L-18	73	59	947	23	199	12	17	7	1510	43	76	25	30	97	3	21	6	19	3	12
01L-19	84	58	980	22	214	12	16	7	1540	49	90	57	38	107	<2	42	6	21	2	18
01L-29	72	96	775	23	223	15	24	12	1390	49	91	51	16	86	4	19	9	19	3	12
02L-38	101	73	1180	28	318	24	20	15	1420	75	136	66	34	167	4	56	5	24		44
02L-39	92	34	769	24	155	12	8	<2	954	25	55	46	64	197	3	610	<3	18		211
04L-1	68	128	450	33	324	58	19	13	1360	65	117	15	29	65		<5	8	20	17	19
04L-20	54	100	656	21	226	26	23	11	1630	70	114	78	18	76		8	<5	20	22	4
05L-45	51	126	478	33	317	22	17	8	1210	74	137	68	21	99	4	87		14		3
06L-9	68	81	552	43	250	21	16	<4	1730	74	130	106	9	97	<4	<5		15	<2	3
06L-3	43	198	657	25	491	39	21	29	1320	97	176	72	19	58	5	<5		18	4	3
06L-23	54	200	638	29	493	40	24	<4	1260	97	185	92	18	61	5	<5		17	<2	3
PC-2	75	76	850	22	202	17	21	9	1390	50	88	47	15	86	4	<3	9	21	2	5
01L-22	32	184	158	29	383	22	29	35	1580	100	161	77	<2	30	7	7	17	15	2	5
01L-30	53	195	250	41	482	31	40	42	1520	135	197	108	<2	32	7	5	14	19	<1	5

Instrumental Neutron Activation (INAA) and a few Induction-Coupled Plasma (ICP) Mass Spectrometry; ppm (except where noted)

Sample No.	Cs	Rb	Ba	Sr	Na (%)	Th	U	La	Ce	Nd	Sm	Eu	Gd	Tb	Ho	Tm	Yb	Lu	Ta	Zr	Hf	Sb	Sc	Fe (%)	Cr	Co	Ni	Zn
LR88-501	9.67	206	960	347	2.14	22.1	12.4	48.8	94.7	37.9	7.19	1.12	5.64	0.738	0.928	0.344	2.04	0.287	1.66	269	7.19	0.373	7.15	2.62	18	7.7	7.45	73.7
LR88-508	3.71	137	692	361	2.3	14.9	6.53	38.7	73.5	31.7	6.66	1.15	6.16	0.802	1.09	0.425	2.75	0.398	1.64	165	4.65	0.245	9.8	2.95	18.6	10.3		61.1
01L-14	2.98	142	208	47.5	2.42	4.86	2.67	6.47	12.8	7.92	2.64	0.312	2.84	0.439	0.6	0.602	1.59	0.235	2.19	55.7	2.92	0.176	3.15	0.35	0.58	0.126	6.61	44.2
01L-20	1.92	86.2	1430	414	2.53	6.64	1.64	24.9	45.2	20.2	3.8	0.748	2.53	0.266	0.26	0.258	0.416	0.0647	0.593	122	3.7	0.0981	1.79	0.89	1.74	1.62	3.64	42.4
01L-30	2.9	190	1460	277	2.79	42.2	6.88	124	201	104	17.1	2.75	13.2	1.58	1.81	1.81	3.92	0.568	2.13	494	13.2	0.615	4.95	1.53	1.87	1.84	14	35.8

1. Quadrangles names: CP, Cochetopa Park; CS, Cold Spring Park; DN, Del Norte; DP, Del Norte Peak; DV, Dolyseville; GC, Grouse Creek; LM, Lake Mountain; LG, Laughlin Gulch; LO, Lookout Mountain; NP, North Pass; PC, Pole Creek; RD, Razor Creek Dome; RC, Rock Creek; SS, Sargents; SM, Sargents Mesa; ST, Sawtooth Mountain; TM, Trickle Mountain; WB, West Baldy

2. Sample source (other than those collected by Lipman): DS, David Sawyer; DM, David Matty; KH, Ken Hon; LR, Lee Riciputi; MD, Michael Dungan; OB, Olivier Bachmann; OR, Olivier Roch; PC, Pierre Christe; TS, Thomas Steven;

Abbreviations: bio, biotite; C.D. Continental Divide; CG, campground; col, collected; cr, creek; devit, devitrified; dw, densely welded; fk, fork; hbl, hornblende; hwy, highway; Mt, Mount; mtn, mountain; pk, peak; plag, plagioclase; pt, point; rd, road; san, sanidine; Tfc, Fish Canyon Tuff; vitro, vitrophyre

Data-source and analytical-methods references:

Askren, D.R., 1992, Origin of andesites interlayered with large-volume ash-flow tuffs in the western United States: PhD dissertation, University of Georgia, 281 pp.

Sample No.	Quad-rangle[1]	Sample type, location, data source[2]	Latitude		Longitude		X-Ray Fluorescence (WDXRF); weight % (calc. to reported total w/o LOI)												XRF or EDXRF ("Kevex"); ppm (except where noted)																				Instrumental Neutron Activation (INAA) and a few Induction-Coupled Plasma (ICP) Mass Spectrometry; ppm (except where noted)																											
			Deg	Min	Deg	Min	SiO_2	TiO_2	Al_2O_3	$FeTO_3$	MgO	CaO	Na_2O	K_2O	P_2O_5	MnO	LOI	Total	Zn	Rb	Sr	Y	Zr	Nb	Pb	Th	Ba	La	Ce	Nd	Cu	V	U	Cr	Cs	Ga	Mo	Ni	Cs	Rb	Ba	Sr	Na (%)	Th	U	La	Ce	Nd	Sm	Eu	Gd	Tb	Ho	Tm	Yb	Lu	Ta	Zr	Hf	Sb	Sc	Fe (%)	Cr	Co	Ni	Zn

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