Supplementary material: Oxygen isotope analysis by laser fluorination

Unit	Sample	Mineral	δ18O, ‰ SMOW		
Kilgore tuff	2000-17b	Qz	4.31		
	2000-17b	Qz	4.85		
	2000-17	ZRC	1.60		
	2000-17	ZRC	1.40		
	2017B	QZ, 10XTL	3.79		
	2017B	QZ, 25XTL	4.21		
	TNP96-43	Qz, 30 small	4.33		
	TNP96-43	>150UM ABRADED	1.58		
	TNP96-43	ZRC, 50<X<100	1.00		
	TNP96-43	50<X<100UM	1.69		
	TNP96-43	ZRC <53UM	1.63		
	TNP96-43	ZRC <53UM	1.54		
	2015	Plag	2.54		
rhyolite of Long Hollow, post-Kilgore					
	626.1	Qz, 10med	4.64		
	626.1	QZ 30 SMALL	4.71		
	626.1	ZRC	1.92		
	626.1	ZRC>105	1.92		
	626.1	ZRC, <78um	1.65		
rhyolite of Indian Creek, post-Kilgore					
	HS-1	San-2	3.28		
	HS-1	San	2.75		
	HS-1	ZRC, >105um	1.29		
	HS-1	ZRC, >105um	1.12		
	HS-1	ZRC, <53um	1.40		
	HS-1	ZRC, >53,<106	1.12		
rhyolite of Juniper Buttes, post-Kilgore					
	HS-4	San	4.03		
	HS-4	San	3.61		
rhyolite of Sheridan Res. Post-Kilgore					
	HS-19	Qz-1	4.47		
	HS-19	Qz	4.80		
	HS-19	Qz-1	4.50		
	HS-19	Qz-1	4.34		
	HS-19	San-1	3.75		
	HS-19	San-1	3.73		
	HS-19	ZRC, >53,<105	2.37		
	HS-19	ZRC, >105um	2.51		
	HS-19	ZRC, <53um	2.07		
	HS-19	ZRC, <53um	2.42		
Blacktail Creek tuff					
	2001a	Qz, 5medium	6.66		
	2001a	Qz, 5 small	6.74		
	2001a	QZ MED 25	6.06		
	2001a	Qz 10 LARGE	6.15		
	2001a	ZRC, bulk	4.81		
	2001a	ZRC, bulk	4.80		
tuff of Wolverine Creek					
	HS-16	glass	6.35		
	HS-16	glass	6.36		
Conant Creek tuff					
	MD1	Qz	6.30		
	MD1	Qz	6.50		
	HS-5	San	5.19		
	HS-5	San	5.79		
	HS-5	San	5.31		
Walcott tuff					
	HS-18	San	5.41		
	HS-18	San	5.55		
Regional Basalts*				1stdev	Locality, latitude:
	SRP-19	Olivine	5.19	±0.43	Spencer-Kilgore, 111°W
	SRP-02	Olivine	4.99	±0.08	Spencer-Kilgore
	SRP-13	Olivine	4.82	±0.21	Quaking Butte, 113°W
	SRP-10	Olivine	4.77	±0.10	Idaho Falls, 112°
	SRP-17	Olivine	4.95	±0.14	Antelope Butte 112°
	SRP-07	Olivine	4.93	±0.23	Gem Valley 111°W south of the SRP
	SRP-16	Olivine	4.98	±0.02	N Robbers Butte, 112°W

* David Graham's samples with primitive 3He/4He ratios

Analytical technique

Oxygen isotope analyses were performed at the University of Oregon stable isotope lab using CO2-laser fluorination. Individual and bulk mineral grains ranging in weight between 0.6 and 2mg were reacted in the presence of purified BrF5 reagent to liberate oxygen. The gases generated in the laser chamber was purified through a series of cryogenic traps held at liquid nitrogen temperature, and mercury diffusion pump to get rid of traces of fluorine gas. Oxygen was converted to CO2 gas by a platinum-graphite converter, the yield was measured, and then CO2 gas was analyzed on a MAT 253 mass spectrometer.

Four to seven standards were analyzed together with the unknowns during each analytical session. San Carlos olivine (d18O= 5.35‰ and Gore Mt Garnet (d18O = 5.75‰) were used. Day-to-day d18O variability on standards ranged from –0.1 to –0.25‰ and these values were added to the unknowns to correct for days to day variability and absolute values on SMOW scale. The precision on standards and duplicates of individual olivine analyses is better than 0.1‰.

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Supplementary Material: U/Pb ages of zircons in the Heise volcanic field Idaho

	238U/206P	38U/206P	207Pb*/ 206Pb*	207Pb*/ 206Pb*	Correlatio Concord Ellipses	206/238 age t [Ma]	1s t [Ma]	radiogen %	U ppm	Th ppm	Coordinates weighted average (ages are disequilibrium corrected)	York regression age (fixed intercept) (ages have no disequilibrium correction)
BLACKTAIL CREEK TUFF		1 s.e.		1 s.e.							**44.1292° -112.5378°**	
2005_12_21Dec\ 2000-17b_q5_s1.ais	1228.7	95.3	0.1231	0.0114	0.16	4.81	0.41	90.2	393	226	Mean = 4.59±0.26 [5.7%] 95% conf. Wtd by data-pt errs only, 0 of 10 rej. MSWD = 0.18, probability = 0.997	Model 1 Solution (±95%-conf.) on 10 points Lower intercept: 4.50±0.22 Ma Anchored at 207/206 = .8283±.02 MSWD = 0.36, Probability of fit = 0.96
2005_12_21Dec\ 2000-17b_q5_s2r.ais	1274.9	93.9	0.1147	0.0069	-0.09	4.70	0.38	91.2	423	238		
2005_12_21Dec\ 2000-17b_q6_s1.ais	1237.3	100.1	0.1189	0.0187	0.15	4.81	0.44	90.7	247	109		
2005_12_21Dec\ 2000-17b_q4_s1.ais	1235.2	75.7	0.1510	0.0124	-0.02	4.60	0.33	86.6	251	130		
2005_12_21Dec\ 2000-17b_q7_s1.ais	301.0	18.6	0.6937	0.0232	-0.05	3.77	1.87	17.2	235	105		
2005_12_21Dec\ 2000-17b_q9_s1.ais	283.9	19.8	0.6966	0.0133	0.06	3.90	2.02	16.8	463	279		
2005_12_21Dec\ 2000-17b_q12_s1.ais	1333.7	82.2	0.1113	0.0133	-0.13	4.52	0.31	91.7	266	128		
2005_12_21Dec\ 2000-17b_q11_s1.ais	1222.3	89.8	0.1454	0.0101	0.00	4.68	0.40	87.3	432	262		
2005_12_21Dec\ 2000-17b_q13_s1.ais	1309.1	76.6	0.1486	0.0181	-0.30	4.36	0.32	86.9	207	105		
2005_12_21Dec\ 2000-17b_q17_s1.ais	723.6	44.3	0.4415	0.0138	0.12	4.48	0.61	49.4	471	293		
CONANT CREEK TUFF											**43.3209° -111.1394°**	
2006_12_18Dec\ HS_conant_q1_sp1_r	1099.6	36.4	0.0739	0.0065	-0.28	5.75	0.20	96.5	652	190		
2006_12_18Dec\ HS_conant_g2_sp1_c	1087.1	43.1	0.1182	0.0114	-0.37	5.48	0.26	90.8	380	106	Mean = 5.70±0.19 [3.3%] 95% conf. Wtd by data-pt errs only, 0 of 10 rej. MSWD = 2.2, probability = 0.018	Model 1 Solution (±95%-conf.) on 10 points Lower intercept: 5.64±0.19 Ma Anchored at 207/206 = .8283±.02 MSWD = 2.5, Probability of fit = 0.008
2006_12_18Dec\ HS_conant_g2_sp2_r	1081.2	30.4	0.0765	0.0076	-0.04	5.83	0.18	96.1	514	134		
2006_12_18Dec\ HS_conant_q3_sp1_c	1107.7	40.6	0.0709	0.0062	-0.04	5.73	0.22	96.8	500	152		
2006_12_18Dec\ HS_conant_g3_sp2_r	1130.2	28.6	0.0649	0.0063	0.38	5.66	0.15	97.6	495	131		
2006_12_18Dec\ HS_conant_g4_sp1_c	1040.6	30.1	0.0629	0.0051	-0.24	6.16	0.18	97.9	479	112		
2006_12_18Dec\ HS_conant_q5_sp1_c	1099.4	32.5	0.0571	0.0064	-0.22	5.87	0.18	98.6	460	136		
2006_12_18Dec\ HS_conant_g5_sp2_r	1067.2	33.0	0.0676	0.0056	0.07	5.97	0.19	97.3	464	138		
2006_12_18Dec\ HS_conant_g6_sp1_c	1201.8	32.1	0.0727	0.0051	-0.04	5.28	0.15	96.6	603	155		
2006_12_18Dec\ HS_conant_q7_sp1_c	1151.0	30.6	0.0686	0.0068	-0.04	5.53	0.16	97.1	654	304		
TUFF OF WOLVERINE CREEK											**43.8065° -112.8422°**	
2006_12_18Dec\ HS_wolverine_g1_sp1	1187.4	38.9	0.0667	0.0045	-0.12	5.38	0.18	97.4	698	212	Mean = 5.45±0.14 [2.6%] 95% conf. Wtd by data-pt errs only, 0 of 15 rej. MSWD = 1.7, probability = 0.041	Model 1 Solution (±95%-conf.) on 15 points Lower intercept: 5.38±0.14 Ma Anchored at 207/206 = .8283±.02 MSWD = 2.0, Probability of fit = 0.016
2006_12_18Dec\ HS_wolverine_q2_sp1	1085.4	32.8	0.1233	0.0125	-0.33	5.45	0.21	90.1	488	112		
2006_12_18Dec\ HS_wolverine_g3_sp1	1267.1	40.8	0.0631	0.0081	-0.17	5.07	0.17	97.8	513	140		
2006_12_18Dec\ HS_wolverine_g5_sp1	1231.2	35.0	0.0730	0.0089	0.51	5.14	0.16	96.6	426	184		
2006_12_18Dec\ HS_wolverine_q6_sp1	1173.0	26.1	0.0585	0.0043	-0.11	5.49	0.13	98.4	1380	793		
2006_12_18Dec\ HS_wolverine_g6_sp2	1113.8	25.2	0.0590	0.0044	0.13	5.77	0.13	98.4	1586	879		
2006_12_18Dec\ HS_wolverine_g7_sp1	817.7	44.5	0.3020	0.0199	-0.26	5.40	0.52	67.3	569	158		
2006_12_18Dec\ HS_wolverine_q8_sp1	1117.9	29.1	0.0753	0.0057	0.16	5.65	0.16	96.3	675	182		
2006_12_18Dec\ HS_wolverine_g9_sp1	835.4	36.4	0.3417	0.0301	-0.37	4.89	0.50	62.2	423	130		
2006_12_18Dec\ HS_wolverine2_g1_sp	1063.2	70.0	0.1389	0.0182	-0.32	5.44	0.43	88.1	193	67		
2006_12_18Dec\ HS_wolverine2_g1_sp	1181.8	49.6	0.0779	0.0076	0.28	5.32	0.23	95.9	579	297		
2006_12_18Dec\ HS_wolverine2_g2_sp	1172.9	41.0	0.0626	0.0093	-0.27	5.47	0.20	97.9	377	140		
2006_12_18Dec\ HS_wolverine2_g2_sp	1029.4	49.2	0.0647	0.0100	0.09	6.20	0.31	97.6	574	247		
2006_12_18Dec\ HS_wolverine2_g3_sp	1175.8	39.8	0.0729	0.0063	-0.11	5.39	0.19	96.6	408	116		
2006_12_18Dec\ HS_wolverine2_g3_sp	1136.8	35.7	0.1074	0.0094	-0.03	5.32	0.19	92.2	691	194		
KILGORE TUFF											**43.8553° -110.5636°**	
2005_12_21Dec\ TNP-96-43_g1_s1.ais	1166.5	137.4	0.1228	0.0089	0.00	5.06	0.66	90.2	574	387	Mean = 4.49±0.25 [5.6%] 95% conf. Wtd by data-pt errs only, 0 of 12 rej. MSWD = 0.57, probability = 0.85	Model 1 Solution (±95%-conf.) on 12 points Lower intercept: 4.44±0.28 Ma Anchored at 207/206 = .8283±.02 MSWD = 1.5, Probability of fit = 0.14
2005_12_21Dec\ TNP-96-43_g2_s1.ais	207.2	22.9	0.7950	0.0178	0.05	1.41	4.65	4.3	301	174		
2005_12_21Dec\ TNP-96-43_g5.ais	1196.9	212.0	0.0991	0.0102	-0.10	5.10	0.96	93.2	384	233		
2005_12_21Dec\ TNP-96-43_g6.ais	1117.7	162.4	0.0893	0.0089	0.01	5.54	0.84	94.5	444	195		
2005_12_21Dec\ TNP-96-43_q7.ais	462.7	32.8	0.5949	0.0229	0.05	4.24	1.24	29.8	196	91		
2005_12_21Dec\ TNP-96-43_g8.ais	1207.6	179.4	0.1732	0.0147	-0.18	4.55	0.83	83.7	297	204		
2005_12_21Dec\ TNP-9643_g9_s1.ais	1354.8	77.6	0.1663	0.0221	-0.13	4.11	0.31	84.6	284	151		
2005_12_21Dec\ TNP-9643_q11_s1.ais	1301.9	66.8	0.0967	0.0082	-0.16	4.71	0.26	93.5	508	361		
2005_12_21Dec\ TNP-9643_g14_s1.ais	1147.2	75.5	0.2013	0.0202	-0.09	4.57	0.41	80.2	303	252		
2005_12_21Dec\ TNP-9643_g17_s1.ais	1328.4	87.0	0.1195	0.0175	-0.03	4.48	0.34	90.6	489	325		
2005_12_21Dec\ TNP-9643_q17_s2.ais	870.3	47.6	0.4063	0.0195	0.01	4.07	0.48	53.9	393	245		
2005_12_21Dec\ TNP-9643_g22_s1.ais	1304.5	80.3	0.1485	0.0132	-0.23	4.37	0.32	86.9	515	354		
KILGORE TUFF											**43.3174° -111.1629°**	
2005_12_21Dec\ 95-2001a_g2.ais	881.1	47.9	0.0844	0.0056	-0.10	7.03	0.40	95.1	469	337	Mean = 6.89±0.30 [4.4%] 95% conf. Wtd by data-pt errs only, 0 of 12 rej. MSWD = 0.73, probability = 0.71	Model 1 Solution (±95%-conf.) on 12 points Lower intercept: 6.91±0.28 Ma Anchored at 207/206 = .8283±.02 MSWD = 1.18, Probability of fit = 0.30
2005_12_21Dec\ 95-2001a_g10.ais	59.3	5.3	0.7806	0.0122	0.00	6.68	13.38	6.1	211	153		
2005_12_21Dec\ 95-2001a_q20.ais	823.7	67.6	0.0750	0.0055	0.01	7.61	0.65	96.3	674	417		
2005_12_21Dec\ 95-2001a_g15.ais	716.8	49.4	0.1736	0.0166	-0.04	7.61	0.66	83.7	464	212		
2005_12_21Dec\ 95-2001a_g12.ais	539.4	55.0	0.2819	0.0193	-0.05	8.43	1.33	69.9	169	71		
2005_12_21Dec\ 95-2001a_q3.ais	947.9	54.8	0.1001	0.0086	-0.03	6.41	0.40	93.1	313	171		
2005_12_21Dec\ 95-2001a_g27.ais	912.4	53.4	0.0990	0.0105	-0.20	6.68	0.43	93.2	340	123		
2005_12_21Dec\ 95-2001a_g28.ais	859.8	54.7	0.1039	0.0098	0.10	7.03	0.49	92.6	325	137		
2005_12_21Dec\ 95-2001a_q29.ais	837.5	49.2	0.1181	0.0102	0.06	7.06	0.46	90.8	503	361		
2005_12_21Dec\ 95-2001a_g30.ais	797.4	79.5	0.1006	0.0087	0.12	7.60	0.81	93.0	278	154		

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2005_12_21Dec\	95-2001a_g31.ais	23.3	2.1	0.8205	0.0142	0.01	2.88	35.11	1.0	286	211
2005_12_21Dec\	95-2001a_g3_s1.ais	922.5	43.9	0.1126	0.0124	-0.25	6.47	0.36	91.5	481	374
post KILGORE, INTRACALDERA RHYOLITE OF LONG HOLLOW											
2005_12_21Dec\	621.1_g4.ais	1445.7	77.8	0.1037	0.0116	0.03	4.21	0.25	92.6	476	346
2005_12_21Dec\	621@1.1_q6.ais	1282.5	87.8	0.1563	0.0190	0.04	4.41	0.37	85.9	162	66
2005_12_21Dec\	621.1_g7.ais	1423.7	80.5	0.1294	0.0171	0.34	4.13	0.27	89.4	430	225
2005_12_21Dec\	621_1_g8.ais	1258.3	74.4	0.0807	0.0047	-0.04	4.98	0.31	95.6	776	352
2005_12_21Dec\	621_1_q10.ais	1469.3	103.0	0.0998	0.0058	0.11	4.16	0.31	93.1	1060	743
2005_12_21Dec\	621_1_g16.ais	1360.5	216.6	0.0842	0.0070	0.07	4.60	0.76	95.1	755	322
2005_12_21Dec\	621_1_g15_s2.ais	1374.0	147.3	0.0963	0.0118	0.03	4.47	0.51	93.6	414	249
2005_12_21Dec\	621_1_q22_s1.ais	1326.1	145.1	0.1307	0.0162	0.23	4.42	0.54	89.2	259	156
2005_12_21Dec\	621_1_g28_s1.ais	1018.3	130.7	0.2943	0.0289	-0.04	4.41	0.90	68.3	396	191
2005_12_21Dec\	621_1_g31_s1.ais	1266.1	132.4	0.1624	0.0192	-0.09	4.41	0.56	85.1	573	344
2005_12_21Dec\	621_1_q31_s1r.ais	828.5	148.3	0.4378	0.0635	-0.27	3.96	1.84	49.9	500	313
2005_12_21Dec\	621-1-g9.ais	1395.9	66.2	0.1455	0.0157	-0.02	4.11	0.24	87.3	503	354
2005_12_21Dec\	621-1-g12-1.ais	1522.8	63.5	0.0693	0.0056	-0.14	4.17	0.18	97.0	2622	2463
post KILGORE, INTRACALDERA RHYOLITE of INDIAN CREEK											
Cores											
2006_12_18Dec\	HS_indian_g1_s1_c.a	369.5	43.4	0.5761	0.0569	0.40	5.72	2.35	32.3	153	42
2006_12_18Dec\	HS_indian_g1_s2_r.ai	1338.5	66.6	0.0901	0.0160	0.21	4.64	0.26	94.4	186	58
2006_12_18Dec\	HS_indian_g2_s1_c.a	1328.4	60.0	0.1194	0.0160	0.22	4.49	0.24	90.6	198	53
2006_12_18Dec\	HS_indian_g2_s2_r.ai	1312.0	102.8	0.1352	0.0225	0.41	4.45	0.40	88.6	145	44
2006_12_18Dec\	HS_indian_g3_s1_c.a	852.5	61.3	0.2852	0.0383	-0.39	5.35	0.72	69.4	119	29
2006_12_18Dec\	HS_indian_g3_s2_r.ai	1227.6	54.0	0.1641	0.0234	-0.29	4.55	0.29	84.9	213	72
2006_12_18Dec\	HS_indian_g4_s1_c.a	1017.7	91.2	0.3162	0.0260	-0.03	4.24	0.64	65.5	165	48
2006_12_18Dec\	HS_indian_g4_s2_r.ai	585.8	20.3	0.4155	0.0238	0.28	5.90	0.49	52.8	261	78
2006_12_18Dec\	HS_indian_q5_s1_c.a	1219.4	46.4	0.1517	0.0216	-0.34	4.67	0.25	86.5	168	53
2006_12_18Dec\	HS_indian_g5_s2_r.ai	1203.5	72.9	0.1260	0.0182	-0.06	4.90	0.35	89.8	156	42
2006_12_18Dec\	HS_indian2_g1_sp1.a	1373.4	75.8	0.0884	0.0140	0.58	4.53	0.27	94.6	196	78
2006_12_18Dec\	HS_indian2_q2_sp1.a	1440.7	78.0	0.0967	0.0217	0.28	4.28	0.27	93.5	281	106
2006_12_18Dec\	HS_indian2_g3_sp1.a	1473.2	57.5	0.0975	0.0149	-0.26	4.18	0.19	93.4	314	132
2006_12_18Dec\	HS_indian2_g4_sp1.a	684.0	75.8	0.5099	0.0504	-0.14	3.93	1.42	40.7	204	77
2006_12_18Dec\	HS_indian2_q5_sp1.a	1350.1	53.2	0.0895	0.0137	0.03	4.60	0.20	94.5	334	143
2007_01_03Jan\	HS3_Indian3_g1c.ais	1232.0	61.9	0.1890	0.0271	0.09	4.36	0.32	81.7	154	71
2007_01_03Jan\	HS3_Indian3_g2c.ais	1401.0	73.0	0.1770	0.0185	0.34	3.91	0.26	83.3	249	149
2007_01_03Jan\	HS3_Indian3_q3c.ais	1245.6	49.8	0.1507	0.0137	0.16	4.57	0.22	86.6	256	139
2007_01_03Jan\	HS3_Indian3_g4c.ais	1165.5	64.0	0.2583	0.0345	-0.16	4.12	0.40	72.9	123	52
2007_01_03Jan\	HS3_Indian3_g5c.ais	1345.5	54.3	0.1182	0.0076	-0.09	4.43	0.20	90.8	294	190
2007_01_03Jan\	HS3_Indian3_q6c.ais	1321.2	63.4	0.1592	0.0208	0.14	4.26	0.26	85.5	263	154
Rims (unpolished)											
2006_12_20Dec\	HS_Indian3_g1_s1_u	1342.1	61.4	0.2180	0.0246	0.46	3.84	0.25	78.0	242	91
2006_12_20Dec\	HS_Indian3_q2_s1_u	1358.9	47.5	0.1911	0.0148	0.43	3.95	0.18	81.5	306	136
2006_12_20Dec\	HS_Indian3_g3_s1_u	1361.7	68.0	0.2562	0.0214	0.47	3.56	0.26	73.1	198	67
2006_12_20Dec\	HS_Indian3_g4_s1_u	1379.7	63.6	0.1748	0.0219	0.32	3.99	0.24	83.5	274	114
2006_12_20Dec\	HS_Indian3_q5_s1_u	1367.2	48.8	0.1669	0.0133	0.08	4.08	0.19	84.6	283	115
2006_12_20Dec\	HS_Indian3_g6_s1_u	1236.4	55.5	0.2006	0.0240	-0.18	4.27	0.29	80.3	231	88
Intermediate											
2006_12_22Dec\	HS3_Indian3_q1@1.a	1305.8	120.7	0.2351	0.0354	-0.18	3.84	0.53	75.8	174	52
2006_12_22Dec\	HS3_Indian3_g2@1.a	1521.6	86.8	0.1152	0.0156	0.08	3.95	0.26	91.2	307	123
2006_12_22Dec\	HS3_Indian3_g3@1.a	1530.2	103.7	0.1033	0.0152	0.10	4.00	0.30	92.7	377	146
2006_12_22Dec\	HS3_Indian3_q4_s1.a	1309.4	109.6	0.1487	0.0211	0.26	4.37	0.43	86.9	202	67
2006_12_22Dec\	HS3_Indian3_g5@1.a	1467.1	100.3	0.0970	0.0186	0.08	4.20	0.32	93.5	214	75
2006_12_22Dec\	HS3_Indian3_g6@1.a	1331.9	93.1	0.1322	0.0156	0.16	4.40	0.35	89.0	302	120
post KILGORE, INTRACALDERA RHYOLITE SHERIDAN RESERVOIR											
2006_12_18Dec\	HS_sheridan_g1_sp1_	1106.7	70.9	0.4256	0.0350	-0.27	3.09	0.53	51.5	235	103
2006_12_18Dec\	HS_sheridan_q1_sp2	1681.8	171.1	0.4794	0.0748	-0.32	1.80	0.63	44.6	193	68
2006_12_18Dec\	HS_sheridan_g2_sp1_	1364.6	188.1	0.5082	0.0549	-0.14	2.03	0.87	40.9	84	31
2006_12_18Dec\	HS_sheridan_g2_sp2_	1128.2	150.2	0.5409	0.0883	0.19	2.20	1.02	36.7	43	10
2006_12_18Dec\	HS_sheridan_q3_sp1	2001.2	128.2	0.1921	0.0261	0.12	2.71	0.23	81.3	269	120
2006_12_18Dec\	HS_sheridan_g3_sp2_	3181.7	200.4	0.2357	0.0257	0.06	1.63	0.15	75.8	197	63
2006_12_18Dec\	HS_sheridan_g4_sp1_	2233.1	177.0	0.2428	0.0402	0.24	2.25	0.27	74.8	118	37
2006_12_18Dec\	HS_sheridan_g4_sp2_	2659.6	178.2	0.1711	0.0342	-0.08	2.13	0.19	84.0	156	48
2006_12_18Dec\	HS_sheridan_g5_sp1_	3048.8	139.4	0.1033	0.0255	0.36	2.06	0.11	92.7	361	98
2006_12_18Dec\	HS_sheridan_g5_sp2_	2120.0	120.4	0.1934	0.0255	0.36	2.57	0.19	81.2	196	49
2006_12_18Dec\	HS_sheridan2_g1_s1.	1801.5	155.5	0.3265	0.0287	0.05	2.39	0.35	64.1	207	67
2006_12_18Dec\	HS_sheridan2_g2_s1.	2368.0	203.5	0.3753	0.0365	-0.06	1.67	0.29	57.9	166	54
2006_12_18Dec\	HS_sheridan2_g3_s1.	2237.6	196.8	0.2115	0.0356	-0.21	2.36	0.30	78.9	97	34
2006_12_18Dec\	HS_sheridan2_g4_s1.	3256.3	156.9	0.0980	0.0208	-0.04	1.95	0.11	93.4	347	80

43.7099° -111.5273°

Mean = 4.28±0.18 [4.2%] 95% conf.
Wtd by data-pt errs only, 0 of 13 rej.
MSWD = 0.61, probability = 0.84

Model 1 Solution (±95%-conf.) on 13 points
Lower intercept: 4.24±0.17 Ma
Anchored at 207/206 = .8283±.02
MSWD = 0.82, Probability of fit = 0.63

44.2949° -112.4111°

Mean = 4.46±0.14 [3.1%] 95% conf.
Wtd by data-pt errs only, 0 of 21 rej.
MSWD = 1.14, probability = 0.30

Model 1 Solution (±95%-conf.) on 21 points
Lower intercept: 4.39±0.16 Ma
Anchored at 207/206 = .8283±.02
MSWD = 1.5, Probability of fit = 0.059

Mean = 3.96±0.18 [4.6%] 95% conf.
Wtd by data-pt errs only, 0 of 6 rej.
MSWD = 0.85, probability = 0.51

Model 1 Solution (±95%-conf.) on 6 points
Lower intercept: 3.91±0.18 Ma
Anchored at 207/206 = .8283±.02
MSWD = 0.95, Probability of fit = 0.45

Mean = 4.11±0.27 [6.5%] 95% conf.
Wtd by data-pt errs only, 0 of 6 rej.
MSWD = 0.38, probability = 0.86

Model 1 Solution (±95%-conf.) on 6 points
Lower intercept: 4.03±0.25 Ma
Anchored at 207/206 = .8283±.02
MSWD = 0.48, Probability of fit = 0.79

44.4574° -111.682°

Mean = 2.07±0.19 [9.1%] 95% conf.
Wtd by data-pt errs only, 0 of 14 rej.
MSWD = 2.5, probability = 0.002

Model 1 Solution (±95%-conf.) on 14 points
Lower intercept: 2.06±0.24 Ma
Anchored at 207/206 = .8283±.02
MSWD = 4.0, Probability of fit = 0.000

post KILGORE, INTRACALDERA RHYOLITE of JUNIPER BUTTES, RESEARGENT DOME **44.0585° -111.8364°**

2006_12_18Dec\ HS_juniper_q8_sp1.a	1128.5	70.6	0.2272	0.0328	-0.37	4.48	0.46	76.9	243	91
2006_12_18Dec\ HS_juniper2_g1_sp1.	1410.6	45.4	0.0968	0.0086	-0.16	4.37	0.16	93.5	496	179
2006_12_18Dec\ HS_juniper2_g1_sp2.	1449.5	48.1	0.0716	0.0072	-0.03	4.40	0.15	96.7	419	138
2006_12_18Dec\ HS_juniper2_q2_sp1.	1460.3	40.5	0.0764	0.0088	0.06	4.33	0.13	96.1	595	235
2006_12_18Dec\ HS_juniper2_g3_sp1.	1394.3	57.2	0.1187	0.0134	0.03	4.29	0.20	90.7	195	63
2006_12_18Dec\ HS_juniper3_g1_sp1.	1516.8	44.6	0.0682	0.0048	-0.09	4.22	0.13	97.2	915	334
2006_12_18Dec\ HS_juniper3_q2_sp1.	1548.2	60.4	0.0836	0.0135	-0.16	4.05	0.18	95.2	637	253
2006_12_18Dec\ HS_juniper3_g2_sp2.	1453.1	53.0	0.1466	0.0155	0.63	3.96	0.18	87.2	320	113
2006_12_18Dec\ HS_juniper3_g3_sp1.	1383.9	54.8	0.0543	0.0083	0.01	4.70	0.19	99.0	471	171

Mean = 4.29±0.15 [3.5%] 95% conf.
Wtd by data-pt errs only, 0 of 9 rej.
MSWD = 1.4, probability = 0.19

Model 1 Solution (±95%-conf.) on 9 points
Lower intercept: 4.23±0.11 Ma
Anchored at 207/206 = .8283±.02
MSWD = 1.4, Probability of fit = 0.19

Xenocrysts

2006_12_22Dec\ HS3_Juniper3_g1.ais	110.2	7.4	0.0909	0.0094	-0.18	55.09	3.98	94.4	293	80
2006_12_22Dec\ HS3_Juniper3_q2_s1.	99.5	7.8	0.2367	0.0406	-0.38	48.98	6.46	75.7	423	74

XRF analyses of analyzed units

	95-2001a	HS-17	HS-6	HS-18	HS-5	HS-16	TNP-96 43	95-2005	95 -2010	95-2015	95-2017b	HS-10	HS-14	626.1	HS-1	HS-19	HS-4A	Repeat analyses HS-19	HS-19R
	Blacktail tuff	Blacktail tuff	Blacktail tuff	Walcott tuff	Conant Cree	Wolverine Cr	Kilgore tuff	Kilgore tuff	Kilgore tuff	Kilgore tuff	Kilgore tuff	Kilgore tuff	Kilgore tuff	ny Long Holl	Indian Creek	ridan Reserv	Juniper Buttes		
Normalized Major Elements (Weight %):																			
SiO2	74.40	75.30	75.16	75.49	74.26	75.16	75.75	76.63	76.13	76.42	76.01	75.95	70.78	76.31	75.27	75.85	76.32	75.85	75.81
TiO2	0.31	0.287	0.33	0.224	0.212	0.335	0.28	0.14	0.24	0.23	0.24	0.244	0.550	0.23	0.249	0.262	0.236	0.262	0.263
Al2O3	13.14	12.89	13.17	12.03	14.17	13.17	12.48	12.47	12.23	12.29	12.30	12.49	15.86	12.39	12.82	12.17	12.58	12.17	12.21
FeO*	1.95	1.78	1.92	1.27	2.07	1.92	2.14	1.33	1.73	1.69	1.67	1.79	3.93	1.40	1.88	2.48	1.26	2.48	2.48
MnO	0.05	0.019	0.05	0.030	0.038	0.049	0.02	0.02	0.04	0.03	0.04	0.040	0.099	0.03	0.030	0.053	0.024	0.053	0.053
MgO	0.31	0.13	0.55	0.28	0.74	0.55	0.09	0.04	0.15	0.08	0.19	0.15	1.11	0.22	0.17	0.06	0.19	0.06	0.04
CaO	1.22	0.87	1.21	2.11	1.06	1.21	0.48	0.44	0.70	0.44	0.81	0.69	1.20	0.66	0.48	0.63	0.76	0.63	0.63
Na2O	3.30	3.61	2.60	3.45	2.08	2.60	3.53	3.82	3.20	3.60	3.06	3.07	2.54	3.36	3.51	3.70	2.71	3.70	3.70
K2O	5.27	5.05	4.98	5.09	5.36	4.98	5.19	5.07	5.55	5.19	5.65	5.55	3.84	5.34	5.32	4.78	5.90	4.78	4.80
P2O5	0.04	0.055	0.03	0.031	0.024	0.033	0.04	0.03	0.03	0.03	0.03	0.026	0.086	0.06	0.280	0.025	0.019	0.025	0.024
Sum	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
T Zrc sat	*848*	*838*	*851*	*876*	*859*	*799*	*874*	*829*	*849*	*852*	*842*	*850*	*945*	*816*	*858*	*886*	*811*		
Rb/Sr	**2.1**	**2.3**	**2.9**	**4.4**	**6.0**	**4.2**	**5.4**	**9.7**	**7.0**	**6.2**	**5.5**	**6.3**	**1.4**	**5.7**	**4.5**	**2.3**	**4.9**		
Ni	4	2	3	3	2	5	4	4	4	4	4	3	7	3	7	4	4	4	1
Cr	2	5	3	2	5	8	3	3	2	1	2	3	13	4	9	5	4	5	4
Sc	5	3	4	3	3	2	4	3	5	4	4	4	9	3	3	4	3	4	4
V	9	9	26	24	2	9	7	3	5	4	6	4	31	6	6	1	6	1	2
Ba	1099	1083	733	914	509	573	1063	766	815	973	832	876	974	774	1061	2010	894	2010	2006
Rb	174	174	165	171	147	165	184	174	174	175	176	162	114	189	156	143	198	143	144
Sr	84	77	58	39	25	40	34	18	25	28	32	26	82	33	34	61	40	61	62
Zr	327	286	286	221	273	185	395	257	324	325	301	312	538	224	332	462	203	462	462
Y	44	48	46	54	77	75	56	54	57	52	56	63	78	52	65	65	47	65	64
Nb	31.8	32.0	34.4	41.4	56.3	54.1	47.8	56.9	47.2	48.5	47.4	48.0	49.5	41.7	49.8	36.0	37.0	36.0	36.0
Ga	18	18	17	17	22	22	20	23	20	20	19	20	24	20	19	20	17	20	22
Cu	1	3	2	5	4	5	3	2	2	2	4	5	10	4	7	7	4	7	5
Zn	61	51	56	41	90	86	63	62	61	57	72	60	116	48	62	91	38	91	93
Pb	26	21	26	23	26	28	25	25	26	23	24	25	28	27	27	29	24	29	27
La	66	65	61	71	81	78	89	88	83	85	84	81	75	81	87	79	69	79	78
Ce	120	116	121	136	159	154	161	155	163	146	157	156	160	142	160	123	128	123	125
Th	27	26	28	26	26	25	26	28	26	27	26	26	26	29	26	21	28	21	21
Nd	45	47	45	54	65	61	68	70	61	61	61	58	63	56	60	66	44	66	66
U	7	7	7	7	5	6	7	8	6	6	7	7	5	8	5	5	6	5	3

Major elements are normalized on a volatile-free basis, with total Fe expressed as FeO.
"R" denotes a duplicate bead made from the same rock powder.

Analyses were made at GeoAnalytical laboratory of the Wahington State University in Pullman