TABLE 2. CHEMICAL AND PALEOMAGNETIC DATA FOR CRBG FLOWS, WESTERN COLUMBIA RIVER GORGE

Sample no.	06BV-G536	04BV-G218	05BV-G363	05BV-G365A	04BV-G338	07BV-G842	05BV-G429	04BV-G220A	05BV-G325	05BV-G368
Latitude N	45°35.39'	45°33.29'	45°34.47'	45°34.43'	45°34.34'	45°33.14'	45°39.58'	45°32.86'	45°34.96'	45°34.23'
Longitude W	122°04.39'	122°10.97'	122°07.57'	122°07.48'	122°11.66'	122°11.02'	122°01.65'	122°11.77'	122°11.61'	122°07.40'
Formation	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde
Member	Downey Gulch	Wapshilla Ridge	Wapshilla Ridge	Grouse Creek	Grouse Creek	Grouse Creek	Ortley	Ortley	Ortley	Ortley
Flow group		high-P				low-Cr				low-Cr
Paleomagnetic site no.	CB8399	T7090	T7162	T7178	T6105	CB8187	T6239	T6033	T5001	T6359
Inclination	62.1	-76.5	-63.8	-66.4	-28.0	-75.7	71.5	79.2	59.0	74.9
Declination	12.7	304.7	178.7	185.2	212.8	212.5	349.8	34.0	99.3	15.3
a_{95} †	4.0	6.0	16.2	3.3	8.0	6.8	11.3	4.3	4.7	7.0
Major elements (wt%)										
SiO_2	55.37	55.36	55.57	55.94	56.16	57.06	55.89	55.47	56.6	56.54
TiO_2	2.22	2.35	2.36	1.93	2.02	2.00	1.98	2.06	1.96	1.95
Al_2O_3	13.65	13.54	13.85	13.93	14.04	13.78	13.97	13.77	13.96	13.97
FeO*	12.49	12.59	11.87	11.61	11.25	11.58	11.67	12.26	11.16	11.30
MnO	0.21	0.20	0.20	0.19	0.19	0.18	0.19	0.20	0.19	0.19
MgO	3.52	3.42	3.52	3.74	3.67	3.30	3.72	3.68	3.60	3.61
CaO	7.32	7.11	7.15	7.28	7.25	6.86	7.26	7.28	7.18	7.24
Na_2O	3.29	3.22	3.08	3.14	3.29	3.08	3.26	3.17	3.20	3.12
K_2O	1.56	1.79	2.04	1.91	1.77	1.85	1.71	1.74	1.81	1.76
P_2O_5	0.37	0.40	0.37	0.32	0.35	0.31	0.34	0.37	0.33	0.33
Original total	97.83	98.31	97.94	97.64	98.29	96.97	98.07	98.66	98.37	98.34
Trace elements (ppm)										
Ba	604	716	705	652	697	730	675	674	707	736
La	23	25	27	26	23	27	27	30	27	27
Ce	46	55	57	51	51	52	49	55	50	52
Rb	47	48	56	50	49	52	48	43	50	49
Sr	305	314	311	311	326	306	321	301	308	319
Y	35	37	37	33	35	36	33	37	36	38
Zr	175	175	192	166	172	186	169	171	179	182
Nb	11.1	11.4	12.7	10.7	12.0	11.3	12.1	11.0	12.4	12.8
Ni	10	7	11	12	11	2	14	9	11	9
Cu	16	19	19	19	22	17	20	17	16	14
Zn	124	126	127	117	124	120	119	123	118	126
Cr	10	9	10	13	15	4	14	17	12	8
Sc	34	31	32	32	32	29	32	33	31	32
V	385	380	365	323	338	325	329	350	324	321
Ga	20	23	21	20	23	21	22	21	23	23
Pb	8	9	10	10	9	8	10	8	9	9
Th	5	5	5	4	4	5	4	5	4	4

(*continued*)

TABLE 2. CHEMICAL AND PALEOMAGNETIC DATA FOR CRBG FLOWS, WESTERN COLUMBIA RIVER GORGE (*continued*)

Sample no.	06BV-G557B	06BV-G564B	03CM-T262	07BD-R06	07CM-T327	06BV-G564C	06BV-G532B	04CM-T261	04CM-T260	05CM-T307	08BV-G1106
Latitude N	45°34.28'	45°34.42'	45°32.47'	45°41.41'	45°32.58'	45°34.43'	45°32.24'	45°32.39'	45°32.35	45°26'	45°33.26'
Longitude W	122°06.23'	122°06.47'	122°17.14'	121°59.01'	122°16.44'	122°06.56'	122°13.00'	122°17.14'	122°17.00'	122°15.64'	122°10.66'
Formation	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Wanapum	Wanapum	Wanapum	Saddle Mountains
Member	Winter Water	Winter Water	Sentinel Bluffs	Sentinel Bluffs	Sentinel Bluffs	Sentinel Bluffs	Sentinel Bluffs	Frenchman Springs	Frenchman Springs	Priest Rapids	Pomona
Flow group	high-Ti	low-Ti	McCoy Canyon	McCoy Canyon	McCoy Canyon	Spokane Falls	Museum	Sand Hollow	Sentinel Gap	Rosalia	
Paleomagnetic site no.	T7114	T7186	T7082	T7038	T7098	T7202	--	T2167	--	--	CB8203
Inclination	52.8	35.7	62.8	63.3	72.8	58.2	--	63.1	--	--	-56.5
Declination	1.3	345.0	17.3	3.3	357.7	12.0	--	6.5	--	--	180.8
a_{95} †	6.5	6.9	3.7	1.9	2.3	6.6		1.9			4.2
SiO_2	55.80	54.77	54.01	53.97	53.99	53.94	54.52	52.10	52.25	50.16	51.82
TiO_2	2.18	2.05	1.896	1.980	1.954	1.836	1.805	2.86	2.99	3.62	1.68
Al_2O_3	13.63	13.65	14.07	13.99	13.93	14.30	14.17	13.31	13.11	12.86	14.81
FeO*	12.02	12.76	11.48	11.79	12.10	11.33	11.35	14.56	14.30	15.69	10.57
MnO	0.21	0.21	0.21	0.22	0.21	0.20	0.20	0.25	0.23	0.27	0.19
MgO	3.52	3.88	5.04	4.88	4.77	5.06	4.81	3.90	4.05	4.30	6.87
CaO	7.37	7.70	8.83	8.69	8.69	8.90	8.50	8.25	8.00	8.14	10.74
Na_2O	3.16	3.01	2.86	2.95	2.95	2.87	3.01	2.94	2.82	2.88	2.38
K_2O	1.75	1.65	1.31	1.21	1.11	1.27	1.30	1.25	1.57	1.29	0.72
P_2O_5	0.36	0.31	0.30	0.33	0.29	0.29	0.33	0.57	0.66	0.79	0.23
Original total	97.87	99.16	99.11		97.68	99.66	98.61	97.66	98.25	97.33	97.52
Ba	634	565	481	508	464	492	558	564	637	582	248
La	28	24	20	26	26	22	23	22	25	32	18
Ce	55	50	40	41	41	48	44	57	52	68	38
Rb	45	39	26	27	27	29	33	31	38	33	16
Sr	326	316	307	314	312	313	311	296	293	266	228
Y	38	36	33	35	32	36	33	41	45	52	29
Zr	186	175	157	162	156	158	163	171	193	221	138
Nb	11.3	10.9	9.6	10.2	9.8	10.3	9.6	12.7	14.0	18.3	10.9
Ni	0	8	7	8	4	21	7	15	10	19	47
Cu	9	10	34	28	28	36	27	24	19	23	53
Zn	131	127	117	118	115	114	117	135	145	158	100
Cr	8	11	37	35	22	44	36	46	19	13	102
Sc	35	37	39	38	37	37	36	38	36	38	36
V	366	373	323	322	330	326	308	418	405	409	278
Ga	21	22	19	20	19	20	19	21	21	21	19
Pb	8	7	4	5	6	5	6	7	7	8	4
Th	6	6	3	5	4	5	5	4	4	3	5

Note: X-ray fluorescence analyses performed at GeoAnalytical Laboratory of Washington State University using methods described in Johnson et al. (1999). Major element analyses recalculated anhydrous and normalized to 100%. FeO*, total Fe calculated as FeO; Mg#, atomic ratio 100Mg/(Mg+Fe^{2+}) with Fe^{2+} set to 0.85x Fe^{total}. --- indicates not determined.

†Radius of 95% confidence interval, in degrees.

TABLE 3. CHEMICAL AND PALEOMAGNETIC DATA FOR CRBG FLOWS, CATHLAMET—LONGVIEW, WASHINGTON SECTION

Sample no.	RW8047	T2120	RW8028	RW80027	RW8040	RW80CATH3	RW8038	RW8037	RW8036	RW8034
Stratigraphic section	Abernathy	Abernathy	Mill Creek	Mill Creek	Storedahl quarry	Cathlamet roadcut	Stordahl Quarry	Storedahl quarry	Storedahl quarry	Skamokawa
Latitude °N	46.21	46.236	46.19	46.19	46.18	46.18	46.18	46.18	46.18	46.273
Longitude °W	123.09	123.159	123.18	123.18	123.05	123.35	123.05	123.05	123.05	123.46
Formation	Saddle Mts	Saddle Mts	Wanapum	Wanapum	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde
Member	Pomona	Huntzinger	Frenchman Springs	Frenchman Springs	Sentinel Bluffs	Sentinel Bluffs	Sentinel Bluffs	Sentinel Bluffs	Sentinel Bluffs	Winter Water
Flow group			Sand Hollow	Sand Hollow	Museum	Museum	Museum (weathered)	McCoy Canyon	McCoy Canyon	
Paleomag site no.	MS 11	T2120	1W04	1W06	1W03	1W21				
Inclination	-51.20	73.8	58.6	57.6	74.4	61.5				
Declination	203.9	13.3	3.2	5.7	340.4	18.1				
a_{95} †	2.1	2.9	3.8	3.3	2.3	3.7				
										Normalized major elements (wt%)
SiO_2	51.93		51.87	52.30	55.78	55.13	55.92	54.80	54.66	56.35
TiO_2	1.672		3.012	2.943	1.887	1.840	2.156	2.014	2.022	2.038
Al_2O_3	14.56		13.36	13.55	14.73	14.41	14.94	14.36	14.08	13.76
FeO*	10.65		14.51	13.76	9.55	10.84	9.24	11.06	11.49	11.53
MnO	0.182		0.223	0.232	0.202	0.202	0.190	0.207	0.213	0.200
MgO	7.12		4.31	4.30	4.60	4.70	3.96	4.45	4.66	3.92
CaO	10.91		8.52	8.56	8.78	8.73	9.13	8.88	8.57	7.39
Na_2O	2.06		2.45	2.49	2.65	2.64	2.72	2.64	2.63	2.70
K_2O	0.69		1.17	1.28	1.46	1.17	1.39	1.29	1.36	1.77
P_2O_5	0.232		0.577	0.582	0.367	0.354	0.352	0.303	0.319	0.359
Original total	98.77		98.01	97.87	97.89	97.51	98.13	98.58	98.38	97.27
										Trace elements (ppm)
Ba	255		555	583	596	499	576	470	482	687
La	20		20	20	16	17	21	27	32	9
Ce	35		57	54	52	38	68	47	38	37
Rb	17		23	30	34	29	29	26	29	52
Sr	225		311	312	320	308	338	320	312	312
Y	30		42	43	42	36	39	34	36	37
Zr	132		179	186	159	160	170	158	158	181
Nb	11.2		12.4	14.9	10.6	11.3	12.3	12.0	10.8	11.4
Ni	48		17	14	16	11	20	9	7	8
Cu	39		14	16	12	15	14	16	12	4
Zn	83		128	131	115	108	122	110	111	116
Cr	115		61	60	47	48	53	35	38	25
Sc	35		35	38	36	42	45	39	46	33
V	288		440	420	309	308	349	336	344	339
Ga	20		21	22	21	20	24	20	21	22
Pb	1		10	10	3	5	0	2	3	9
Th	3		4	7	7	2	2	2	0	2

(*continued*)

TABLE 3. CHEMICAL AND PALEOMAGNETIC DATA FOR CRBG FLOWS, CATHLAMET—LONGVIEW, WASHINGTON SECTION (*continued*)

Sample no.	RW80CATH1	RW8020B	RW8020A	RW8094	RW8093	RW8092	RW8091	RW80104	RW80103
Stratigraphic section	Cathlamet roadcut	Alder Bluff	Alder Bluff	Cathlamet quarry	Cathlamet quarry	Cathlamet quarry	Cathlamet quarry	Abe Creek	Abe Creek
Latitude °N	46.18	46.19	46.19	46.19	46.19	46.19	46.19	46.181	46.181
Longitude °W	123.35	123.09	123.09	123.36	123.36	123.36	123.36	123/35	123.35
Formation	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde
Member	Ortley	Ortley	Ortley	Ortley	Ortley	Ortley	Grouse Cr	Wapshilla Ridge	Wapshilla Ridge
Flow group			E. dir						
Paleomag site no.	1W23	1W09	1W08	1W15	1W14	1W13	1W12		
Inclination	58.4	65.1	63.6	68.6	66.7	67.5	-22.7		
Declination	27.6	5.5	71.7	40.2	38.6	33	229.30		
a_{95}[†]	3.1	6.7	4.2	6.0	5.0	4.1	15.0		
SiO_2	57.16	56.79	57.04	56.98	56.49	56.57	56.11	55.43	55.77
TiO_2	2.052	2.072	2.085	2.084	2.071	2.095	2.057	2.355	2.377
Al_2O_3	14.06	14.01	14.26	14.04	14.01	14.09	14.17	13.83	13.95
FeO*	10.79	11.02	10.61	10.79	11.27	11.13	11.34	12.25	11.83
MnO	0.195	0.205	0.201	0.201	0.201	0.196	0.196	0.211	0.188
MgO	3.54	3.45	3.46	3.60	3.62	3.55	3.71	3.43	3.48
CaO	7.26	7.37	7.32	7.40	7.52	7.45	7.47	7.68	7.53
Na_2O	2.76	2.76	2.85	2.72	2.74	2.88	2.97	2.78	2.71
K_2O	1.83	1.96	1.79	1.83	1.72	1.68	1.61	1.65	1.77
P_2O_5	0.343	0.365	0.373	0.360	0.362	0.378	0.380	0.380	0.385
Original total	98.46	97.73	97.75	97.51	96.69	97.25	97.63	97.02	97.28
Ba	722	716	742	688	738	705	701	664	671
La	7	9	28	21	18	10	28	26	20
Ce	45	58	73	59	21	56	72	52	62
Rb	46	51	49	46	43	43	39	43	44
Sr	317	312	316	306	314	311	328	332	331
Y	37	38	40	37	38	39	39	37	38
Zr	180	182	182	180	179	179	169	177	179
Nb	12.4	14.5	13.8	12.3	14.1	13.4	13.9	11.7	11.7
Ni	5	6	6	6	11	6	9	8	7
Cu	3	7	5	3	5	7	11	5	5
Zn	120	123	118	122	120	118	121	124	124
Cr	25	27	25	26	27	29	28	29	29
Sc	37	38	34	38	39	33	31	32	38
V	329	318	323	340	328	328	336	425	431
Ga	23	22	21	20	22	21	22	22	23
Pb	8	14	18	10	13	12	17	8	8
Th	0	13	8	10	9	10	8	2	6

Note: X-ray fluorescence analyses performed at GeoAnalytical Laboratory of Washington State University using methods described in Johnson et al. (1999). Major element analyses recalculated anhydrous and normalized to 100%. FeO*, total Fe calculated as FeO; Mg#, atomic ratio 100Mg/(Mg+Fe^{2+}) with Fe^{2+} set to 0.85x Fe^{total}.

[†]Radius of 95% confidence interval, in degrees.

TABLE 4. CHEMICAL AND PALEOMAGNETIC DATA FOR COLUMBIA RIVER BASALT GROUP BASALTS, NW OREGON

Sample No.	N08-62	N08-63	N08-61	N08-53	N08-83	N08-64	N08-52	NO2-46
Stop	Stop 3-2	Stop 3-2	Stop 3-3	Stop 3-3	Stop 3-3	Stop 3-4		Stop 3-5
Location	Rippet Quarry	Fisher and Tiven Quarry	Ecola State Park, N end Indian Beach	Chapman Point	Crescent Beach	Humbug Point	Arch Cape tunnel	Onion Peak filled tube near top
Latitude N	45.9540	45.9510	45.9310	45.9170	45.9170	45.8480	45.8030	45.8140
Longitude W	123.9310	123.9200	123.9800	123.9730	123.9730	123.9620	123.9680	123.8850
Formation	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde
Member	Winter Water	Winter Water	Winter Water	Sentinel Bluffs	Winter Water	Ortley	Winter Water	Winter Water
Flow group				Spokane Falls				
Paleomagnetic site no.	T3304-3311	T3312-3319	T3320-3327	T3339-3344	T3333-3339	T2008-2015	T2032-2039	N02-46
Inclination	54.6	58.2	27.2	50.8	68.8	77.5	53.3	21.7
Declination	22.7	41.2	15.9	15.9	348.8	78.2	51.9	326.6
a_{95} †	9.0	3.6	5.8	4.1	6.4	5.7	6.7	nd
SiO_2	55.84	55.98	55.84	53.98	55.69	56.23	55.83	56.16
TiO_2	2.162	2.130	2.085	1.851	2.147	2.013	2.124	2.114
Al_2O_3	13.54	13.63	13.61	14.51	13.76	14.00	13.61	13.65
FeO*	12.55	12.54	12.60	11.24	12.64	11.73	12.51	11.99
MnO	0.204	0.195	0.212	0.186	0.304	0.185	0.214	0.222
MgO	3.27	3.29	3.33	5.01	3.46	3.53	3.29	3.30
CaO	6.78	7.25	6.87	8.69	7.08	6.86	6.81	7.33
Na_2O	3.54	3.33	3.37	3.18	3.61	3.38	3.60	3.63
K_2O	1.74	1.29	1.72	1.06	0.93	1.73	1.64	1.22
P_2O_5	0.373	0.371	0.365	0.292	0.376	0.336	0.365	0.388
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ba	694	542	645	451	629	695	681	648
La	26	28	25	19	26	25	26	24
Ce	59	55	54	40	55	56	53	58
Rb	48	40	47	22	13	45	46	50
Sr	297	296	301	311	358	302	300	316
Y	37	37	36	32	37	35	38	37
Zr	193	192	191	153	193	187	192	191
Nb	13.0	12.1	11.9	9.5	12.0	12.0	12.1	12.5
Ni	2	2	2	14	1	6	1	1
Cu	10	7	12	31	10	18	9	10
Zn	126	77	133	111	134	118	120	134
Cr	4	2	5	40	3	11	5	5
Sc	33	33	30	38	33	31	32	32
V	338	332	326	319	333	329	329	339
Ga	21	20	20	20	20	19	21	23
Pb	7	4	7	3	7	6	5	8
Th	7	7	7	3	5	7	7	7

(*continued*)

TABLE 4. CHEMICAL AND PALEOMAGNETIC DATA FOR COLUMBIA RIVER BASALT GROUP BASALTS, NW OREGON (*continued*)

Sample No.	NO2-49	N08-49	N08-57	N08-56	N08-03	N09-03	N11-03	NO2-154
Stop	Stop 3-5	Stop 3-5	Stop 3-6	Stop 3-6	Stop 3-6	Stop 3-6	Stop 3-6	Stop 3-6
Location	Onion Peak, middle breccia	Onion Peak, basal breccia	Humbug Mtn., sill at top	Humbug Mtn., clast in interbed	Humbug Mtn., filled lava tube	Saddle Mtn., dike	Saddle Mtn., breccia	Kidders Butte, filled lava tube
Latitude N	45.8120	45.80133	45.9259	45.91899	45.9220	45.9660	45.9660	45.8530
Longitude W	123.9200	123.9085	123.69199	123.68838	123.6880	123.6810	123.6820	123.8110
Formation	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde	Grande Ronde
Member	Winter Water	Winter Water	Ortley/ Grouse Creek	Wapshilla Ridge	Wapshilla Ridge	Sentinel Bluffs	Sentinel Bluffs	Winter Water
Flow group						McCoy Canyon	McCoy Canyon	
Paleomagnetic site no.	N02-49	N02-50	N03-66	na	T3353-3360	T3361-3368	T3369-3371	N02-154
Inclination	34.6	nd	nd	na	-73.4	66.1	nd	69.0
Declination	348.6	nd	nd	na	202.8	43.8	nd	11.2
a_{95} †	21.7	nd	nd	na	8.9	2.2	nd	8.2
SiO_2	56.03	55.70	55.93	54.67	55.80	53.55	53.65	55.76
TiO_2	2.106	2.113	2.042	2.319	2.379	1.912	1.984	2.149
Al_2O_3	13.80	13.72	13.90	13.90	13.99	14.11	14.18	13.70
FeO*	12.00	12.40	11.89	12.37	11.46	12.02	12.08	12.30
MnO	0.221	0.214	0.203	0.218	0.192	0.206	0.215	0.209
MgO	3.46	3.44	3.65	3.64	3.55	5.05	4.73	3.50
CaO	7.24	7.21	7.19	7.55	7.32	8.73	8.85	7.29
Na_2O	3.44	3.55	3.33	3.44	3.42	3.06	3.21	3.51
K_2O	1.31	1.27	1.53	1.52	1.52	1.06	0.79	1.20
P_2O_5	0.383	0.372	0.354	0.382	0.369	0.299	0.324	0.361
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ba	628	631	682	696	824	476	468	631
La	24	25	25	23	26	22	16	27
Ce	52	51	55	52	53	45	37	52
Rb	45	44	43	41	50	26	23	45
Sr	316	317	306	338	320	306	312	313
Y	36	37	35	35	36	33	34	37
Zr	188	190	186	180	196	159	162	184
Nb	11.8	12.9	10.9	11.2	11.9	10.5	10.8	12.3
Ni	2	1	6	8	7	12	10	3
Cu	11	8	18	17	21	33	28	10
Zn	134	133	126	132	132	122	124	135
Cr	5	4	12	8	10	37	33	9
Sc	34	34	31	32	32	39	36	34
V	338	338	325	403	363	322	315	359
Ga	22	21	20	20	19	19	19	21
Pb	8	7	9	8	7	5	6	8
Th	7	6	7	6	8	4	5	7

Note: X-ray fluorescence analyses performed at GeoAnalytical Laboratory of Washington State University using methods described in Johnson et al. (1999). Major oxide analyses recalculated anhydrous and normalized to 100%; total Fe calculated as FeO; Mg#, atomic ratio 100Mg/(Mg+Fe^{2+}) with Fe^{2+} set to 0.85 x Fe^{total}; nd, not determined, na, not applicable.

†Radius of 95% confidence interval, in degrees.