GEOLOGIC MAP GM-37

GEOLOGIC MAP OF THE LOGY CREEK 15-MINUTE QUADRANGLE, WASHINGTON

by

R. D. BENTLEY, N. P. CAMPBELL, and JOHN E. POWELL

WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES

GEOLOGIC MAP GM-37

1988

WASHINGTON STATE DEPARTMENT OF
Natural Resources

Brian Boyle - Commissioner of Public Lands
Art Stearns - Supervisor

Division of Geology and Earth Resources
Raymond Lasmanis, State Geologist

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Brian Boyle, Commissioner of Public Lands
Art Stearns, Supervisor
Division of Geology and Earth Resources
Raymond Lasmanis, State Geologist

Base map from U.S. Geological Survey 15 minute Logy Creek quadrangle, 1965

Scale 1:48,000

Prepared in cooperation with the U. S. Department of Energy under contract number DE-AC06-81RL10297

UTM GRID AND 1985 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

GEOLOGIC MAP OF THE LOGY CREEK 15-MINUTE QUADRANGLE, WASHINGTON

R. D. Bentley, N. P. Campbell, and John E. Powell

1988

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

Qas ALLUVIUM, sidestream facies—Stream deposits of silt, sand, and gravel, dominantly of basaltic composition; largely confined to valley bottoms; includes local lacustrine, paludal, and eolian deposits in depressions; deposited by tributaries of the Yakima River (sidestream facies of Waitt, 1979)

Qe EOLIAN DEPOSITS—Silt and fine sand; pale orange to brown; locally contains multiple caliche and tephra beds; includes the Palouse Formation and all younger loess

Qls LANDSLIDE DEPOSITS—Clay, silt, sand, and gravel; unstratified and poorly sorted; surface commonly hummocky; deposited by rotational-translational slides and flows

Qaf ALLUVIAL FAN DEPOSITS—Sand and gravel of diverse compositions with basalt clasts dominant in larger sizes; cone-shaped deposits; little or no caliche development; surface relatively undissected

Qafo OLDER ALLUVIAL FAN DEPOSITS—Sand and gravel; semiconsolidated fanglomerate; primarily basalt clasts cemented by iron-stained clays; surface of fans commonly dissected and capped by well-developed caliche

BASALT OF SIMCOE MOUNTAINS

Tsv SIMCOE MOUNTAINS BASALT, UNDIFFERENTIATED—Medium-gray to gray-black olivine-plagioclase basalt; fine to medium grained, diktytaxitic to glassy; phyric, with rare to abundant plagioclase and olivine phenocrysts as much as 1.5 cm long; high-alumina basalt chemistry; includes interstratified volcaniclastic deposits of rhyolitic and andesitic composition; jointing in most flows is columnar to blocky; most flows are intracanyon flows erupted from vents west of map area; youngest flows cover upland surfaces adjacent to canyons; includes flows of both reversed and normal polarity

COLUMBIA RIVER BASALT GROUP

YAKIMA BASALT SUBGROUP

SADDLE MOUNTAINS BASALT

Tp POMONA MEMBER, Pomona flow—Fresh surfaces are gray to blue-black, weather gray; fine grained; abundantly to slightly phyric with abundant white to colorless plagioclase microphenocrysts, sparse plagioclase glomerocrysts; sparse olivine phenocrysts; invasive contacts common; well developed entablature with fanning columns; where greater than 45 m thick, well developed 0.5-1-m-diameter columns dominate the flow; Pomona chemical type (Wright and others, 1973); reversed magnetic polarity (Reitman, 1966; Choiniere and Swanson, 1979); K-Ar age about 12 m.y. (McKee and others, 1977); single flow in map area. This flow is the Wenas basalt of Smith (1903)

Tuu UMATILLA MEMBER, Umatilla flow—Fresh exposures are gray-black; weathers reddish-brown; very fine grained and sparsely plagioclase phyric; Umatilla chemical type (Wright and others, 1973); normal magnetic polarity; single flow in map area

WANAPUM BASALT

Tpr PRIEST RAPIDS MEMBER, Priest Rapids flows—Fresh exposures are gray-black; weathers rusty brown; medium to coarse grained; aphyric, with rare plagioclase phenocrysts; diktytaxitic; well developed colonnade with 0.5-1.5-m-diameter columns; lower flows (1 to 3) of Rosalia chemical type, upper flow of Lolo chemical type (Swanson and others, 1979); reversed magnetic polarity (Reitman, 1966); age approximately 13.6 m.y. (McKee and others, 1977)

Tr ROZA MEMBER, Roza flow—Fresh exposures are gray-black; weathers reddish-brown; fine to medium grained, with plagioclase phenocrysts and glomerocrysts generally 0.5-1.0 cm; phenocrysts commonly a few hundred per square meter surface area; well developed colonnade with column diameters as much as 1.0 m; locally diktytaxitic; Frenchman Springs chemical type (Wright and others, 1973); normal magnetic polarity; laboratory results indicate transitional after demagnetization (Reitman, 1966); resembles plagioclase-phyric flows of Frenchman Springs Member, but phenocrysts generally more abundant and smaller in average size; one flow in map area

FRENCHMAN SPRINGS MEMBER

Tfu Union Gap flows—Fresh exposures are gray-black; weathers gray to reddish-gray; fine to medium grained; generally aphyric with rare plagioclase phenocrysts as large as 2.0 cm; phenocrysts average about 3 glomerocysts per 10 square meters of surface area; colonnade with 1.5-2.0-m-diameter columns and locally pillowed base; some flows have hackly entablature; Frenchman Springs chemical type (Wright and others, 1973); normal magnetic polarity; one of these flows covers most of the map area

Tfk Kelley Hollow flow—Fresh exposures are gray-black; weathers reddish-gray; fine to medium grained; phyric with abundant plagioclase phenocrysts and glomerocrysts as large as 2 cm; phenocryst abundance highly varied, from 1 to 100 glomerocrysts per square meter surface area; thin entablature and well-developed colonnade with 0.5-1.5-m-diameter columns; Frenchman Springs chemical type (Wright and others, 1973); normal magnetic polarity

Tfg Gingko flows—Fresh exposures are gray black; weathers to reddish-gray; fine to medium grained; phyric with abundant plagioclase phenocrysts and glomerocrysts as large as 2 cm; 100 to 200 glomerocrysts per square meter of surface area; thin entablature and well-developed colonnade with 0.5-1.5-m-diameter columns and pillowed base; Frenchman Springs chemical type (Wright and others, 1973); two flows in the map area

GRANDE RONDE BASALT

Nonporphyritic to very sparsely plagioclase-phyric, generally fine grained and petrographically nondistinct; chemical composition varies within a broad field named Grande Ronde chemical type (formerly called Yakima chemical type by Wright and others, 1973); divided into two chemical types: high MgO and low MgO (Swanson and others, 1979); also divided into magnetostratigraphic units on the basis of dominant magnetic polarity

Flows of normal magnetic polarity—N_2 of Swanson and others (1979)

Tgn_2h Unit contains four or five flows of high-MgO Grande Ronde chemical type (Wright and others, 1973; Swanson and others, 1979); fresh exposures are gray-black; weathers reddish-brown and gray; flows are commonly moderately microporphyritic, with 1- to 3-mm-long equant plagioclase phenocrysts in a fine- to medium-grained basalt; many flows are multi-tiered

Tgn_2l Bingen flows—Lower part of the N_2 contains flows of low-MgO Grande Ronde chemical type of Wright and others (1973) and Swanson and others (1979). The two to four flows are fine-grained, dense, black, sparsely phyric to aphyric basalt; massive, black, hackly entablatures over colonnades. Sedimentary interbeds are common at the top and bottom of this unit, but invasive relations (Byerly and Swanson, 1978) obscure their continuity, and none are shown on the map

REFERENCES

Bentley, R. D.; Campbell, N. P., 1983, Geologic map of the Yakima quadrangle, Washington: Washington Division of Geology and Earth Resources Geologic Map GM-29, 1 sheet, scale 1:62,500.

Byerly, J. P.; Swanson, D. A., 1978, Invasive Columbia River basalt flows along the northwestern margin of the Columbia Plateau, north-central Washington [abstract]: Geological Society of America Abstracts with Programs, v. 10, no. 3, p. 98.

Choiniere, S. R.; Swanson, D. A., 1979, Magnetostratigraphy and correlation of Miocene basalts of the northern Oregon coast and Columbia Plateau, southeast Washington: American Journal of Science, v. 279, no. 7, p. 755-777.

McKee, E. H.; Swanson, D. A.; Wright, T. L., 1977, Duration and volume of Columbia River volcanism, Washington, Oregon, and Idaho [abstract]: Geological Society of America Abstracts with Programs, v. 9, no. 4, p. 463-464.

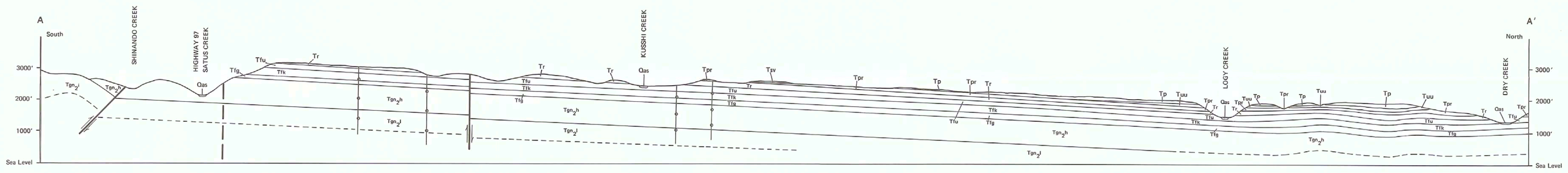
Reitman, J. D., 1966, Remanent magnetization of the late Yakima Basalt, Washington State: Stanford University Doctor of Philosophy thesis, 87 p.

Smith, G. O., 1903, Description of the Ellensburg quadrangle: U.S. Geological Survey Geologic Atlas of the United States, Folio 86, 7 maps.

Swanson, D. A.; Wright, T. L.; Hooper, P. R.; Bentley, R. D., 1979, Revisions in stratigraphic nomenclature of the Columbia River Basalt Group: U.S. Geological Survey Bulletin 1457-G, 59 p.

Waitt, R. B., 1979, Late Cenozoic deposits, landforms, stratigraphy, and tectonism in Kittitas Valley, Washington: U.S. Geological Survey Professional Paper 1127, 18 p.

Wright, T. L.; Grolier,, M. J.; Swanson, D. A., 1973, Chemical variation relative to the stratigraphy of the Columbia River basalt: Geological Society of America Bulletin,v. 84, no. 2, p. 371-385.



MAJOR ELEMENT ANALYSES OF ROCKS FROM THE LOGY CREEK QUADRANGLE, WASHINGTON

Sample locality	Geologic unit	Sample no.	Location	SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	TOTAL
1	Tsv	R828-1	NE1/4,SE1/4, sec. 28(7-17E)	51.41	15.46	2.00	9.56	5.77	8.52	2.72	1.38	2.56	0.47	0.17	100.02
2		R828-3	NE1/4, sec. 28(7-17E)	59.34	16.34	2.00	7.16	3.44	5.21	2.41	2.19	1.56	0.20	0.14	99.99
3		R828-4	NE1/4, sec. 28(7-17E)	55.07	17.34	2.00	8.17	2.75	4.69	4.15	2.75	2.25	0.68	0.16	100.01
4	Tp	R879118	SE1/4,SW1/4, sec. 33(9-18E)	51.90	15.42	2.00	8.22	6.59	10.98	2.17	0.64	1.65	0.24	0.19	100.00
5	Tuu	R8350I	SW1/4,SE1/4, sec. 35(7-18E)	55.12	14.62	2.00	10.64	2.68	5.95	2.30	2.94	2.68	0.87	0.19	99.9
6	Tpr	R8350J	SW1/4,SE1/4, sec. 35(7-18E)	50.58	14.40	2.00	12.05	5.50	8.56	1.89	1.01	3.14	0.64	0.22	99.99
7	(Lolo)	R879117	SE1/4,NE1/4, sec. 03(8-18E)	49.99	14.12	2.00	12.18	5.37	8.85	2.37	1.10	3.13	0.67	0.23	100.01
8		R879183	SW1/4,NW1/4, sec. 32(8-18E)	49.73	14.29	2.00	12.06	5.37	9.05	2.46	1.10	3.08	0.64	0.23	100.01
9		R879121	SE1/4,NW1/4, sec. 34(8-18E)	50.16	14.14	2.00	11.95	5.27	9.16	2.24	1.01	3.15	0.68	0.24	100.00
			n=4 mean	50.12	14.24	2.00	12.06	5.38	8.91	2.24	1.06	3.13	0.66	0.23	
10	Tpr	R879120	SE1/4,NW1/4, sec. 34(8-18E)	49.69	13.68	2.00	13.55	4.33	8.74	2.47	1.05	3.58	0.66	0.25	100.00
11	(Rosalia)	R879119	SE1/4,NW1/4, sec. 31(9-18E)	49.84	13.50	2.00	13.39	4.42	8.53	2.42	1.32	3.63	0.68	0.25	99.98
			n=2 mean	49.77	13.59	2.00	13.47	4.38	8.64	2.45	1.19	3.61	0.67	0.25	
12	Tr	R8350J2	SW1/4,SE1/4, sec. 35(7-18E)	50.58	14.03	2.00	13.22	4.49	8.22	2.12	1.26	3.24	0.58	0.26	100.00
13	Tf	JA79066	SE1/4,NE1/4, sec. 07(6-17E)	51.00	14.26	2.00	12.83	4.22	8.07	2.40	1.46	2.96	0.55	0.24	99.99
14		JA79077	NW1/4,SE1/4, sec. 17(6-17E)	50.62	14.09	2.00	13.02	4.08	8.32	2.76	1.21	3.12	0.55	0.24	100.01
15		R82E8	NW1/4,NE1/4, sec. 02(6-18E)	52.16	14.38	2.00	11.87	4.52	8.08	2.08	1.22	2.98	0.49	0.22	100.00
16		R82EA	NW1/4,NE1/4, sec. 02(6-18E)	52.23	13.82	2.00	12.76	4.24	7.61	2.14	1.31	3.11	0.56	0.21	99.99
17		R82F8	NE1/4,NW1/4, sec. 02(6-18E)	52.14	14.15	2.00	12.08	4.59	8.11	1.86	1.45	2.92	0.48	0.21	99.99
18		R82FC	E1/2,NW1/4, sec. 02(6-18E)	51.84	13.88	2.00	12.49	4.25	8.10	2.12	1.42	3.15	0.54	0.21	100.00
19		R82FA2	NE1/4,NW1/4, sec. 02(6-18E)	52.46	14.07	2.00	12.21	4.19	7.47	2.43	1.35	3.06	0.55	0.21	100.00
20		R82FB2	NE1/4,NW1/4, sec. 02(6-18E)	52.32	14.25	2.00	12.03	4.39	8.21	2.01	1.12	2.97	0.47	0.20	99.97
21		R817D8	NW1/4,NE1/4, sec. 17(6-18E)	53.01	14.73	2.00	10.64	3.91	8.19	2.27	1.36	3.14	0.55	0.19	99.99
22		JA79160	SW1/4,NE1/4, sec. 17(6-18E)	51.33	14.15	2.00	12.29	4.46	8.35	2.24	1.48	2.95	0.53	0.22	100.00
23		R834AJ	SE1/4,SE1/4, sec. 34(7-18E)	51.95	13.96	2.00	12.84	4.12	7.55	2.37	1.26	3.15	0.59	0.22	100.01
24		R82FA	SE1/4,SW1/4, sec. 35(7-18E)	51.18	13.79	2.00	12.88	4.43	8.20	2.20	1.32	3.23	0.56	0.22	100.01
25		R879136	NE1/4,SE1/4, sec. 18(8-17E)	51.38	14.20	2.00	12.31	4.20	8.16	2.50	1.46	3.01	0.56	0.23	100.01
26		R819C0	SE1/4,NE1/4, sec. 19(8-18E)	51.27	13.77	2.00	12.59	4.54	8.26	2.36	1.43	3.04	0.52	0.22	100.00
27		R834CJ	S1/2,SE1/4, sec. 34(8-18E)	51.89	13.99	2.00	12.52	4.14	7.96	2.23	1.40	3.08	0.59	0.21	100.01
28		R834EJ	SW1/4,SE1/4, sec. 34(8-18E)	52.31	14.17	2.00	11.60	4.42	8.27	2.17	1.31	3.02	0.50	0.22	99.99
29		R834IG	NW1/4,SW1/4, sec. 34(8-18E)	52.28	14.14	2.00	12.35	4.18	7.63	2.34	1.27	3.07	0.54	0.20	100.00
30		R830IJ	SW1/4,SW1/4, sec. 30(9-18E)	52.44	14.26	2.00	12.22	4.17	7.85	2.30	1.16	2.90	0.49	0.21	100.00
31		R830II	SW1/4,SW1/4, sec. 30(9-18E)	52.72	14.26	2.00	11.67	3.98	7.98	2.30	1.20	3.14	0.54	0.19	99.98
32		R831HA	N1/2,NW1/4, sec. 31(9-18E)	52.16	14.25	2.00	11.85	4.54	8.06	2.11	1.37	2.98	0.47	0.21	100.00
			n=20 mean	51.93	14.13	2.00	12.25	4.28	8.02	2.26	1.33	3.05	0.53	0.21	
			s.d.	0.60	0.22		0.54	0.19	0.26	0.19	0.11	0.09	0.04	0.01	
33	Tgn_2h	JA79060	SE1/4,SE1/4, sec. 02(6-17E)	54.10	15.07	2.00	9.69	4.58	8.48	2.35	1.35	1.82	0.33	0.22	99.99
34		JA79074	NE1/4,SE1/4, sec. 07(6-17E)	54.84	15.16	2.00	8.74	4.56	8.30	2.76	1.35	1.78	0.29	0.21	99.99
35		JA79090	S1/4 cor., sec. 07(6-17E)	54.34	15.20	2.00	9.49	4.86	8.25	2.44	1.29	1.62	0.25	0.24	99.98
36		JA79067	SE1/4,NE1/4, sec. 08(6-17E)	55.15	15.37	2.00	7.76	4.61	8.79	2.69	1.45	1.67	0.27	0.23	99.99
37		JA79073	NE1/4,SW1/4, sec. 09(6-17E)	53.15	15.04	2.00	10.05	4.90	9.01	2.40	1.06	1.89	0.29	0.21	100.00
38		JA79069	NE1/4,SW1/4, sec. 09(6-17E)	55.17	15.25	2.00	8.48	4.34	8.35	2.55	1.51	1.80	0.31	0.23	99.99
39		JA79065	NE1/4,SW1/4, sec. 09(6-17E)	52.89	14.81	2.00	10.76	4.83	8.94	2.46	0.93	1.86	0.28	0.23	99.99
40		JA79068	NW1/4,SE1/4, sec. 09(6-17E)	54.00	15.06	2.00	9.32	4.67	8.65	2.53	1.44	1.82	0.32	0.21	100.02
41		JA79071	NE1/4,SW1/4, sec. 09(6-17E)	53.69	15.03	2.00	9.80	4.54	8.56	2.64	1.39	1.82	0.33	0.21	100.01
42		JA79072	NE1/4,SW1/4, sec. 09(6-17E)	53.37	15.25	2.00	9.44	5.10	9.41	2.27	0.92	1.76	0.26	0.21	99.99
43		JA79070	NE1/4,SW1/4, sec. 09(6-17E)	54.65	15.10	2.00	9.19	4.53	8.16	2.79	1.34	1.74	0.30	0.20	100.00
44		JA79057	NE1/4,SW1/4, sec. 11(6-17E)	53.67	14.93	2.00	10.02	4.29	8.64	2.78	1.07	2.03	0.32	0.24	99.99
45		JA79059	NW1/4,SW1/4, sec. 11(6-17E)	52.77	14.89	2.00	10.76	4.76	8.73	2.50	1.11	1.95	0.31	0.22	100.00
46		JA79061	SW1/4,NW1/4, sec. 12(6-17E)	52.79	14.94	2.00	10.84	4.60	8.67	2.57	1.11	1.95	0.30	0.22	99.99
47		JA79127	SW1/4,NE1/4, sec. 13(6-17E)	53.63	14.54	2.00	10.85	4.45	8.06	2.74	1.20	2.02	0.29	0.21	99.99
48		JA79129	SW1/4,NE1/4, sec. 13(6-17E)	54.34	15.47	2.00	8.24	4.92	8.96	2.54	1.20	1.85	0.28	0.19	99.99
49		JA79125R	NW1/4,SE1/4, sec. 13(6-17E)	53.05	14.90	2.00	10.35	4.92	8.83	2.63	0.98	1.88	0.26	0.21	100.01
50		JA79128	SW1/4,NE1/4, sec. 13(6-17E)	53.43	14.92	2.00	9.80	4.76	8.91	2.54	1.23	1.91	0.29	0.21	100.00
51		JA79152	SW1/4,SE1/4, sec. 15(6-17E)	54.39	14.62	2.00	10.29	3.97	7.81	2.72	1.48	2.13	0.37	0.22	100.00
52		JA79089	NE1/4,NW1/4, sec. 16(6-17E)	53.88	14.97	2.00	9.14	4.76	8.76	2.73	1.25	1.97	0.28	0.25	99.99
53		JA79086	NW1/4,SW1/4, sec. 16(6-17E)	53.17	14.68	2.00	10.54	4.76	8.44	2.95	1.05	1.93	0.27	0.22	100.01
54		R816GC	NE1/4,NW1/4, sec. 16(6-17E)	54.55	14.32	2.00	11.10	4.00	7.30	2.51	1.38	2.27	0.35	0.20	99.98
55		JA79080	NW1/4,NE1/4, sec. 17(6-17E)	53.72	15.09	2.00	9.66	4.67	8.44	2.91	1.26	1.77	0.30	0.19	100.01
56		JA79079	NW1/4,SW1/4, sec. 17(6-17E)	54.14	15.15	2.00	9.12	4.97	8.56	2.72	1.23	1.64	0.27	0.19	99.99
57		JA79078	NE1/4,SW1/4, sec. 17(6-17E)	54.29	15.08	2.00	9.03	4.85	8.73	2.56	1.37	1.62	0.27	0.20	100.00
			n=25 mean	53.89	14.99	2.00	9.70	4.65	8.55	2.61	1.24	1.86	0.30	0.21	
			s.d.	0.69	0.25		0.86	0.27	0.42	0.16	0.17	0.15	0.03	0.02	
58	Tgn_2l	JA79126	NW1/4,SE1/4, sec. 13(6-17E)	55.06	14.68	2.00	10.71	3.22	7.01	2.79	1.88	2.08	0.35	0.22	100.00
59		JA79056	SW1/4,NW1/4, sec. 13(6-17E)	55.15	14.74	2.00	10.11	3.38	7.37	2.74	1.82	2.12	0.33	0.23	99.99
60		R814AB	NE1/4,NE1/4, sec. 14(6-17E)	55.77	14.79	2.00	10.39	3.15	6.90	2.56	1.70	2.20	0.34	0.20	100.00
61		JA79064	NE1/4,SW1/4, sec. 14(6-17E)	55.37	14.86	2.00	10.24	3.55	7.26	2.40	1.80	1.98	0.32	0.22	100.00
62		JA79153	SW1/4,SE1/4, sec. 15(6-17E)	55.19	14.60	2.00	10.37	3.25	7.08	2.89	1.84	2.19	0.37	0.22	100.00
63		JA79087	NW1/4,SW1/4, sec. 16(6-17E)	54.84	14.41	2.00	11.09	3.37	7.13	2.69	1.85	2.07	0.33	0.22	100.00
64		R816HD	S1/2,NW1/4, sec. 16(6-17E)	55.42	14.79	2.00	10.74	3.44	7.05	2.13	1.62	2.26	0.34	0.21	100.00
65		R816JE	SW1/4,NW1/4, sec. 16(6-17E)	56.19	14.69	2.00	9.81	3.46	6.99	2.16	2.09	2.08	0.33	0.20	100.00
			n=8 mean	55.37	14.70	2.00	10.43	3.35	7.10	2.55	1.83	2.12	0.34	0.22	

Analysis by XRF, Department of Geology, Washington State University, Pullman, WA; all analyses normalized to 100 percent on a volatile-free basis.
Samples whose numbers have a JA prefix were collected by James Lee Anderson.

EXPLANATION

Contact

Strike-slip fault — *Dashed where approximately located; dotted where concealed. Arrows indicate direction of motion*

Normal fault — *Dashed where approximately located; dotted where concealed. Bar and ball on downthrown block*

Thrust fault — *Dashed where approximately located; dotted where concealed. Sawteeth on upper plate*

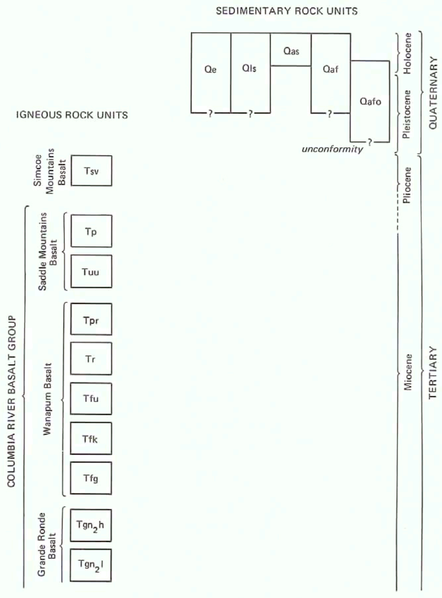
Lineament from aerial photographs

Anticline — *Showing trace of crest surface and direction of plunge; dashed where approximately located; dotted where concealed*

Syncline — *Showing trace of trough surface and direction of plunge; dashed where approximately located; dotted where concealed*

Anticlinal bend or monoclinal flexure — *Dashed where approximately located; dotted where concealed. Arrows on side with greater inclination*

Inclined — Horizontal
Strike and dip of beds

26
Geochemical sample locality

CORRELATION OF MAP UNITS