DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Open-file Report
77-724
Table 2

Table 2.--Analyses of rhyolite lavas of Area 20 in Silent Canyon caldera and Stockade Wash Tuff

[Major oxide analyses 1-4 and 6-9 by rapid methods by P. L. D. Elmore, G. W. Chloe, H. Smith, J. Kelsey and J. Glenn; 5 and 10-12 by P. L. D. Elmore, S. D. Botts, G. W. Chloe and Lowell Artis. Minor element analyses 2-4 and 6-9 by semiquantitative spectrographic methods by J. L. Harris, 1, 5, and 10-12 by J. C. Hamilton. Leaders, ---, no analyses made or constitutuent was absent.]

	Stockade Wash Tuff	Rhyolite lavas of Area 20										
		Lower flows		Upper part of lower flows		Upper flows			Upper part of lower flows	Upper flows		
	Partly zeolitized glassy tuff	Crystallized lava flows		Vitrophyres		Crystallized lava flows						Vitrophyre
Sample locations (figure 2)	1	2	3	4	5	6	7	8	9	10	11	12
Field no.	G58-45-2	UE20f-4536	UE19fs-3370	UE20f-3604	UE20e-1512	UE20e-3520	UE20h-2655	U20a-2-3041	UE20f-3236	U20a-2-2359	UE20c-3904	UE20c-4105
Chemical laboratory no.	156208	W175505	W175504	W175506	D700994	W175508	W175510	W175509	W175507	D700851	D700965	D700980
Spectrographic laboratory no.		W175505	W175504	W175506	D700994	W175508	W175510	W175509	W175507	D700851	D700965	D700980

A. Major oxides (weight percent), recalculated without H_2O, F, Cl and CO_2 as $CaCO_3$.

SiO_2	75.3	71.8	74.2	76.6	77.0	77.5	77.6	78.3	78.3	78.55	79.2	77.1
Al_2O_3	14.1	15.3	14.4	12.7	12.6	12.4	12.3	11.8	11.8	11.64	11.1	13.0
Fe_2O_3	1.0	1.9	1.6	.67	.67	.33	.48	.21	.00	.83	.60	.47
FeO	.17	.59	.32	.62	.33	.83	.56	.73	.91	.09	.12	.38
Sum as FeO	1.1	2.3	1.8	1.2	.93	1.1	.99	.91	.91	.84	.66	.80
MgO	.48	.78	.26	.14	.10	.12	.08	.07	.08	.05	.10	.16
CaO	1.0	2.4	.75	.74	.52	.81	.52	.49	.64	.43	.25	.79
Na_2O	2.8	3.9	3.4	3.1	3.7	2.9	3.0	3.0	3.0	2.78	1.8	4.1
K_2O	4.9	2.5	4.7	5.2	4.9	5.0	5.4	5.3	5.1	5.50	6.6	3.9
TiO_2	.12	.62	.21	.22	.06	.08	.05	.10	.10	.07	.04	.06
P_2O_5	.01	.05	.05	.00	.00	.00	.00	.00	.00	.01	.00	.00
MnO	.08	.14	.04	.00	.08	.04	.03	.03	.04	.05	.03	.06
Total	100.0	100.0	99.9	100.0	100.0	100.0	100.0	100.0	100.1	100.00	100.0	100.0

B. Minor elements (weight percent).

B	<.001	<.001	.002	.002	.002	.002	.002	.002	<.001	<.001	<.001
Ba	.05	.05	.02	.003	.03	.005	.007	.015	.005	.015	.007
Be	.0005	.0005	.0005	.0002	.0003	.0005	.0005	.0005	.0003	.0001	.0002
Ce	.05	.02	.02	<.02	.03	.01	.01	.01	<.02	<.02	<.02
Co	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Cr	.0003	.0007	.001	<.0001	.0007	.0015	.0005	.001	<.0001	.0001	.0001
Cu	.00015	.0001	.0001	.0003	.0002	.0007	.0015	.00015	.0007	.00015	.0001
Ga	.0015	.0015	.0015	.003	.001	.0015	.001	.001	.003	.002	.003
La	.01	.01	.01	.003	.01	.005	.005	.007	.003	.003	<.002
Mo	.0003	.0003	.0003	<.0001	.0003	.0003	.0003	.0003	<.0001	<.0001	<.0001
Nb	.0015	.002	.0015	.0015	.0015	.002	.002	.0015	.0015	.0015	.001
Nd	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Ni	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003
Pb	.003	.003	.003	.003	.003	.003	.003	.003	.007	.003	.003
Sc	.0003	.0003	.0003	<.0002	.0003	.0003	.0003	.0003	<.0002	<.0002	<.0002
Sr	.03	.02	.007	.0015	.01	.002	.003	.007	.002	.002	.0015
V	.0005	.0002	<.0002	<.0002	<.0002	<.0002	<.0002	<.0002	<.0002	<.0002	<.0002
Y	.005	.005	.003	.0015	.005	.003	.003	.003	.002	.002	.001
Yb	.0005	.0005	.0003	.0002	.0005	.0003	.0003	.0003	.0003	.0002	.0001
Zr	.02	.05	.015	.007	.015	.01	.015	.01	.007	.005	.002
	<.007	<.007	<.007	<.007	<.007	<.01	<.0007	<.007	<.007	<.007	<.007

C. Norms (weight percent), from recalculated analyses.

Quartz	37.3	33.2	34.2	36.6	35.3	39.2	37.7	38.9	38.8	40.4	42.4	36.4
Orthoclase	29.2	14.9	28.0	30.7	29.1	29.4	32.1	31.0	30.4	32.5	39.5	22.9
Albite	23.6	33.0	29.0	26.4	31.3	24.5	25.5	25.6	25.6	23.6	15.4	34.6
Anorthite	5.0	11.7	3.4	3.7	2.6	4.0	2.6	2.5	3.2	2.1	1.3	3.9
Corundum	2.3	1.8	2.4	.6	.3	.8	.5	.2	.1	.3	.4	.6
Enstatite	1.2	1.9	.7	.3	.2	.3	.2	.2	.2	.1	.3	.4
Ferrosilite	.0	.0	.0	.2	.1	1.2	.6	1.1	1.6	.0	.0	.3
Magnetite	.5	.5	.6	1.0	1.0	.5	.7	.3	.0	.3	.4	.7
Hematite	.6	1.5	1.2	.0	0	.0	.0	.0	.0	.7	.3	0
Ilmenite	.2	1.2	.4	.4	.1	.2	.1	.2	.2	.1	.1	.1
Rutile	.0	.0	.0	.0	0	.0	.0	.0	.0	.0	.0	0
Apatite	.0	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	0
Total	100.0	99.8	100.0	99.9	100.0	100.1	100.0	100.0	100.1	100.1	100.1	99.9

D. Minerals (volume percent).

Quartz	0.6	2.7	2.6	3.0	1.2	2.1	0.7	0.7	2.5	0.7	1.0	0.7
Alkali feldspar	2.0	3.4	4.7	3.0	2.5	1.5	0.6	0.7	1.5	0.7	1.1	1.3
Plagioclase	1.6	12.1	12.7	2.0	0.6	1.5	0.3	0.4	1.4	0.4	0.2	0.4
Biotite	0.5	1.0	0.9	0.3	0.1	0.3	0.1	0.1	0.1	0.1	0.1	tr
Clinopyroxene	---	---	---	---	---	---	---	---	---	---	---	---
Hornblende	tr	0.4	0.4	---	---	---	---	---	---	---	---	---
Sphene	---	---	---	---	---	---	---	---	---	---	---	---
Opaques	tr	0.1	0.1	0.1	tr	---	tr	tr	tr	tr	tr	---
Groundmass	95.3	80.3	78.6	91.6	95.6	94.6	98.2	98.1	94.5	98.1	97.5	97.5
Points counted	3600	1400	1500	3500	3200	5300[1]	20,200[3]	11,902[3]	3500	11,902[3]	3400	3500

E. Major oxides (weight percent), original analyses.

SiO_2	70.1	68.1	73.5	73.6	74.9	74.9	77.1	77.5	77.6	77.88	78.3	73.5
Al_2O_3	13.1	14.5	14.3	12.2	12.3	12.0	12.2	11.7	11.7	11.54	11.0	12.4
Fe_2O_3	.9	1.8	1.6	.64	.65	.32	.48	.21	.00	.82	.59	.45
FeO	.16	.56	.32	.60	.32	.80	.56	.72	.90	.09	.12	.36
MgO	.45	.74	.26	.13	.10	.12	.08	.07	.08	.05	.10	.15
CaO	1.1	2.3	.74	.71	.51	.78	.52	.49	.63	.43	.25	.75
Na_2O	2.6	3.7	3.4	3.0	3.6	2.8	3.0	3.0	3.0	2.76	1.8	3.9
K_2O	4.6	2.4	4.7	5.0	4.8	4.8	5.4	5.2	5.1	5.45	6.6	3.7
H_2O+	5.8	2.7	.81	3.3	2.5	1.7	.55	.59	.58	.39	.51	4.3
H_2O-		2.3	.07	.49	.11	1.5	.07	.05	.08	.08	.20	.32
TiO_2	.11	.59	.21	.21	.06	.08	.05	.10	.10	.07	.04	.06
P_2O_5	.01	.05	.05	.00	.08	.00	.00	.00	.00	.05	.03	.00
MnO	.08	.13	.04	.00	.00	.04	.03	.03	.04	.01	.00	.06
CO_2	.12	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Cl	---	---	---	---	---	---	---	---	---	.01	---	---
F	---	---	---	---	---	---	---	---	---	.02	---	---
Subtotal	---	---	---	---	---	---	---	---	---	99.70	---	---
Less O	---	---	---	---	---	---	---	---	---	---	---	---
Total	99.1	99.9	100.0	99.9	100.0	99.9	100.1	99.7	99.9	99.65	99.6	100.0
Powder density												

1/ Total from two thin sections.
2/ Total from six thin sections.
3/ Total from four thin sections.