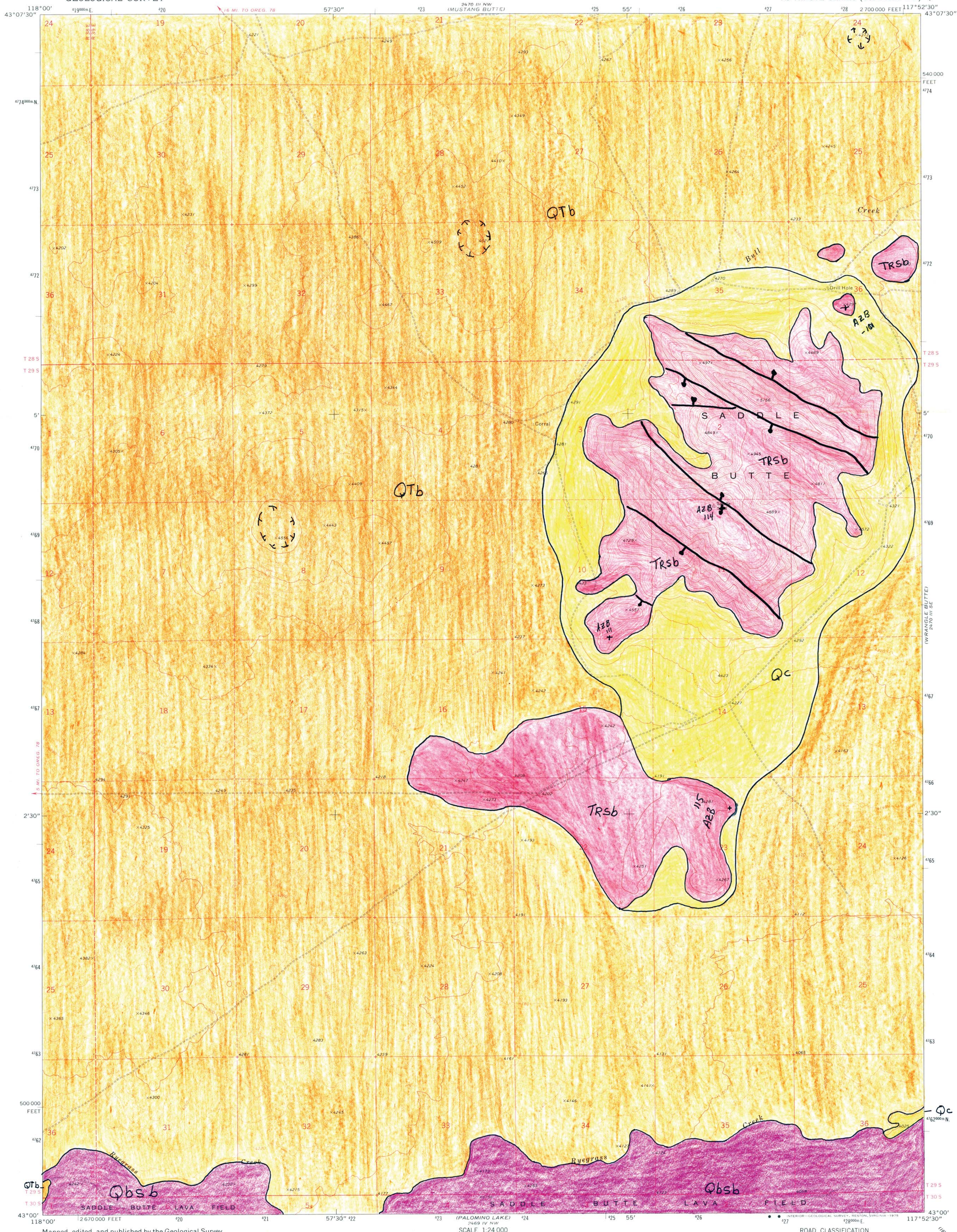
OPEN-FILE REPORT O-92-14
PRELIMINARY GEOLOGIC MAP OF THE SADDLE BUTTE QUADRANGLE
MALHEUR COUNTY, OREGON
1992
BY MARK L. FERNS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SADDLE BUTTE QUADRANGLE
OREGON—MALHEUR CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1971. Field checked 1972

Projection and 10,000-foot grid ticks: Oregon coordinate system, south zone (Lambert conformal (conic)
1000-metre Universal Transverse Mercator grid ticks, zone 11, shown in blue. 1927 North American datum

Fine red dashed lines indicate selected fence lines

UTM GRID AND 1972 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET

OREGON DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES

Field work conducted 1991

Funded jointly by the Oregon Department of Geology and Mineral Industries, the Oregon State Lottery, and the U. S. Geological Survey COGEOMAP Program.

ROAD CLASSIFICATION

Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route

SADDLE BUTTE, OREG.
N4300—W11752.5/7.5

1972

AMS 2470 III SW—SERIES V892

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PRELIMINARY GEOLOGIC MAP OF THE SADDLE BUTTE QUADRANGLE MALHEUR COUNTY, OREGON

By M. L. Ferns
Oregon Department of Geology and Mineral Industries

1992

Field work conducted in 1991
Map Scale: 1:24,000

Funding Statement: Funded jointly by the Oregon Department of Geology and Mineral Industries, the Oregon State Lottery, and the U. S. Geological Survey COGEOMAP Program as part of a cooperative effort to map the west half of the 1^{O} by 2^{O} Boise sheet, eastern Oregon.

Saddle Butte

A large rhyolitic dome complex is exposed at Saddle Butte. The main dome is breached by a northwest-trending axial graben. Compositions of the Saddle Butte dome ranges from quartz latite to metaluminous, high-silica rhyolite. Age of the complex is unknown at this time.

Saddle Butte is surrounded by a sea of diktytaxitic olivine basalt flows. Small shield volcanoes mark a series of northeast-aligned vents east of Saddle Butte that constitute part of the source for the QTb flows. Dark-colored, diktytaxitic olivine basalt flows with well preserved tumuli, pahoehoe surfaces, lava tubes, and collapse structures fill the lowlands in the southern part of the quadrangle. These flows constitute a part of the Saddle Butte Lava field.

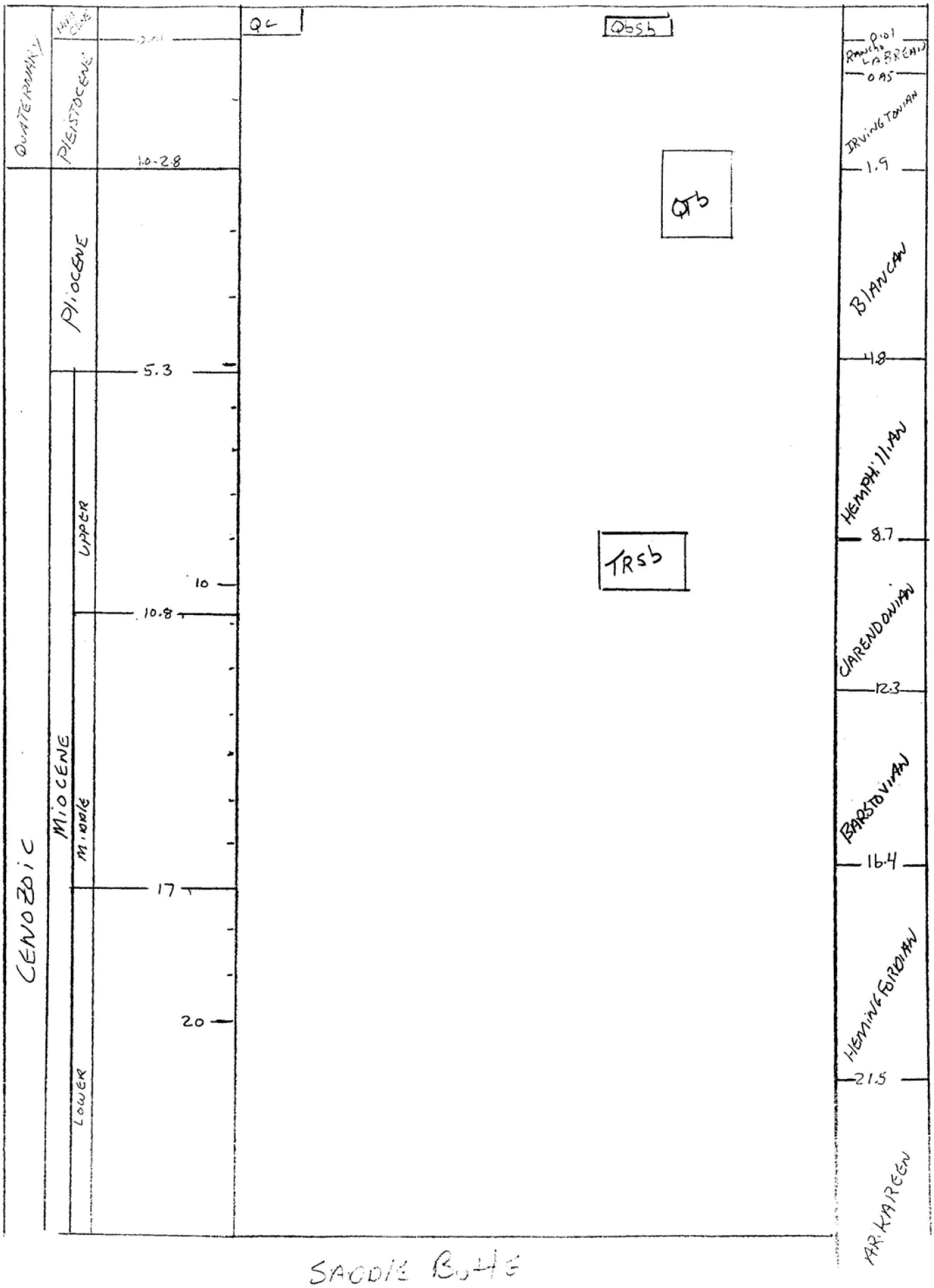
SADDLE BUTTE

Qc — Colluvial deposits (Quaternary) Slope covering deposits of angular blocks of basalt from unit QTb.

Qbsb — Basalt of Saddle Butte (Quaternary) Dark grayish-blue diktytaxitic olivine basalt flows with well preserved primary volcanic structures such as tumuli, pahoehoe surfaces, and collapse structures forming the Saddle Butte Lava Field. Flow top features partially mantled by soil and wind-blown silts. Lava field contains several segments of lava tubes southeast of the quadrangle boundary (Ciesiel and Wagner, 1969). Chemically a high alumina basalt (Analyses 1, Table 1, Wrangle Butte quadrangle). Equivalent to unit Qlb of Walker and Repenning (1966) and Walker (1977). Age based on K/Ar determination of 0.43+0.09 Ma reported by Hart and Mertzman (1982).

QTb — Olivine basalt (Pliocene?) Gray and grayish-black diktytaxitic olivine basalt flows with well preserved flow tops. Locally heavily mantled by windblown silt. Includes holocrystalline basalts with less than 2% olivine pheno-crysts as large as 3mm in diameter in a groundmass of inter-locking plagioclase lathes and subophitic clinopyroxene which are chemically high alumina basalts (Analyses 1, Table 1, Mustang Butte quadrangle). Equivalent to unit Qb of Walker, 1977).

Trsb — Rhyolite at Saddle Butte (Miocene) Rhyolitic, exogenous dome comprised of reddish-brown porphyritic, locally flow-banded, laminated, and spherulitic rhyolite and rhyolite vitrophyre comprised of 5% sanidine and plagioclase phenocrysts as large as 5 mm in diameter. Rhyolite also contains sparse phenocrysts of quartz and yellow-green augite. The dome complex ranges in composition from quartz latite to metaluminous high-silica rhyolite (Analyses, Table 1). Equivalent to part of unit Tsv of Walker (1977).



SADDLE BUTTE

LAB #	1/4	1/4	Sec.	T.(S.)	R.(E.)	Lithology	Unit	SIO2	AL203	TIO2	FE203	MNO	CAO	MGO	K2O	NA2O	P2O5	LOI	Cr	Co	Ni	Cu	Zn	Rb	Sr	Y	Zr	Nb	Ba	LI
									%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
AZB-101	NE	SW	36	29	39	Rhyolite	Trsb	70.8	13.4	0.19	2.38	0.09	0.96	0.2	5.81	3.87	0.04	2.39	-10	<5	<5	10.3	80.	175	-10	76	446	50	157	25.8
AZB-111	SW	SE	10	29	39	Rhyolite	Trsb	72	13.8	0.19	2.57	0.08	0.8	0.21	5.46	4.44	0.07	0.77	-10	<5	<5	12.4	76.	176	-10	75	466	34	205	9.6
AZB-114	NE	NW	11	29	39	Rhyolite	Trsb	68.3	14.3	0.30	3.83	0.12	1.43	0.39	5.83	4.31	0.1	1.08	-10	5	<5	12.5	150.	145	40	56	717	46	677	11.0
AZB-115	NW	NE	23	29	39	Rhyolite	Trsb	73.5	12.4	0.10	1.46	0.05	0.87	0.17	4.73	3.73	0.34	2.31	-10	<5	<5	10.1	44.	198	86	63	201	49	144	32.9

REFERENCES OF-O-92-14

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Hart, W.K. and Mertzman, S.A., 1982, K-Ar ages of basalts from southcentral and southeastern Oregon: Isochron West, vol. 33, p. 23-26.

Walker, G.W., 1977, Geologic map of Oregon east of 121st meridian: U.S. Geological Survey Miscellaneous Investigations Map I-902, scale 1:500,000

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MAP SYMBOLS

Contact -- approximately located

Fault contact -- dashed where approximately located, dotted where concealed. Ball and bar on down throw side

Strike and dip of beds

Location of whole rock sample analyzed in Table 1