OPEN-FILE REPORT O-92-08

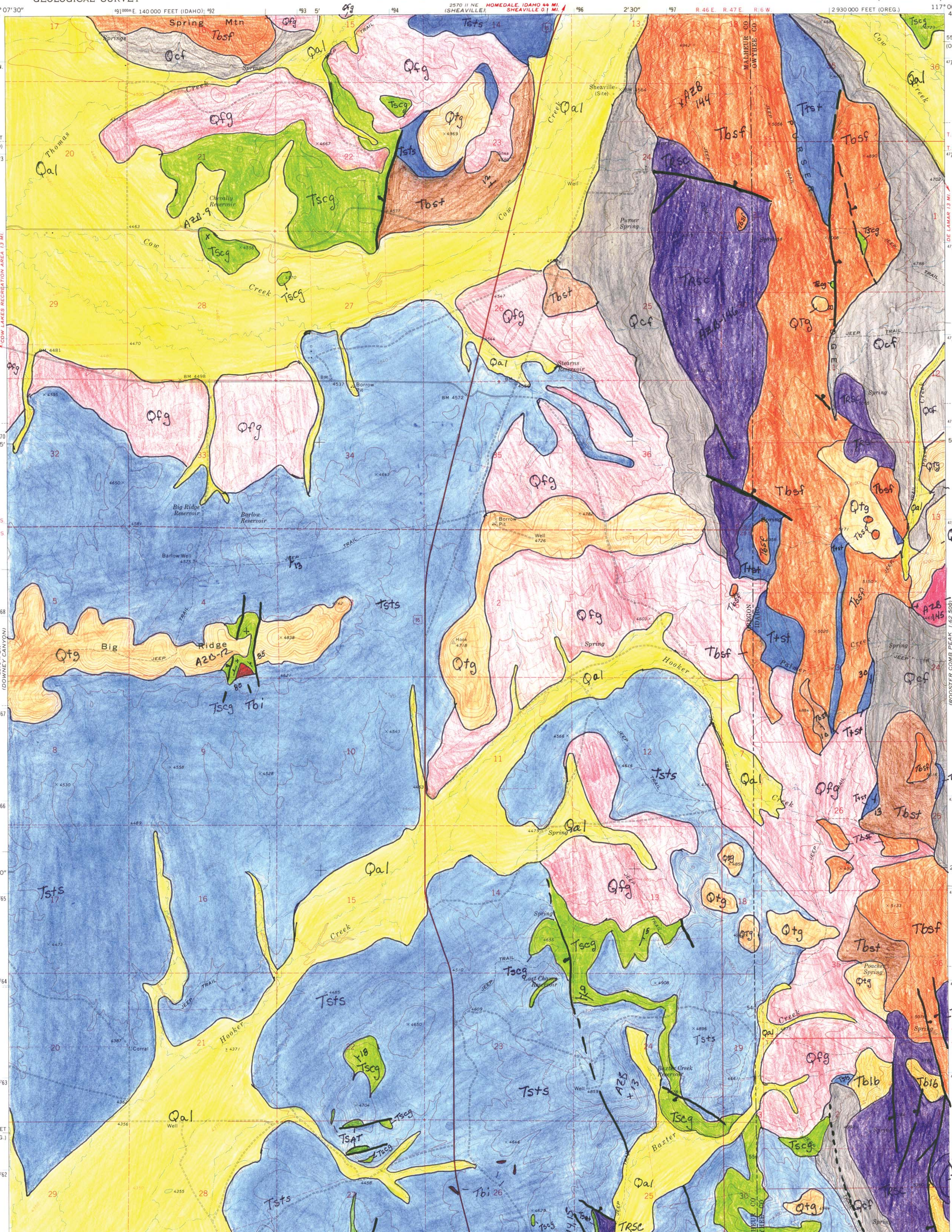
PRELIMINARY GEOLOGIC MAP OF THE HOOKER CREEK QUADRANGLE

MALHEUR COUNTY, OREGON
OWYHEE COUNTY, IDAHO
1992

BY MARK L. FERNS/NORMAN MACLEOD

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

HOOKER CREEK QUADRANGLE
OREGON—IDAHO
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1968. Field checked 1969

Polyconic projection. 1927 North American datum
10,000-foot grids based on Oregon coordinate system, south zone, and Idaho coordinate system, west zone
1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue

Fine red dashed lines indicate selected fence lines

UTM GRID AND 1969 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 1990/1991

ROAD CLASSIFICATION

Primary highway, hard surface — Light-duty road, hard or improved surface

Secondary highway, hard surface — Unimproved road

Interstate Route — U. S. Route — State Route

QUADRANGLE LOCATION

HOOKER CREEK, OREG.—IDAHO
N4300—W11700/7.5

1969

AMS 2570 II SE—SERIES V892

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

OPEN-FILE REPORT O-92-08

PRELIMINARY GEOLOGIC MAP OF THE HOOKER CREEK QUADRANGLE MALHEUR COUNTY, OREGON AND OWYHEE COUNTY, IDAHO

By M. L. Ferns, and N. S. MacLeod
Oregon Department of Geology and Mineral Industries

1992

Field work conducted in 1990/1991
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° by 2° Boise sheet, eastern Oregon.

Hooker Creek

The oldest unit in the quadrangle consists of interbedded rhyolite flows and tuffs that are exposed along the Idaho-Oregon border. The flows include aphyric, flow-banded rhyolites and, together with the tuffs, constitute the rhyolites of the Silver City Range that were erupted at about 16.1 Ma (Ekren and others, 1981, 1982).

Overlying basalt (Tbsf) and palagonite (Tbst) units can be traced northward into the Sheaville quadrangle, to a large shield volcano at Spring Mountain (MacLeod, 1990). The thick section of palagonite exposed on the east edge of the quadrangle may be the result of interaction between advancing basalt flows and water.

The tuff of Swisher Mountain (Ttsm) overlies Tbsf on the eastern edge of the quadrangle. Here unit Ttsm can be traced directly into the exposures mapped by Ekren and others (1981), who report an age of about 13.9 Ma for the tuff of Swisher Mountain.

Tuffaceous and diatomaceous siltstones (Tsts) are locally interbedded with arkosic sandstones and pebble conglomerates (Tscg) which crop out to the west of the older section of basalts and rhyolites exposed along the Idaho-Oregon border. The sedimentary rocks were apparently deposited in a basin flanked on both sides by lobes of the tuff of Swisher Mountain. Several areas within the basin are made up of silicified tuffaceous silt- and mudstones (Tsta). The alteration zones include apparently bedded deposits that may record hot spring discharge into a shallow lake setting.

HOOKER CREEK QUADRANGLE

Qal Fluviatile deposits (Holocene and Pleistocene). Mainly unconsolidated deposits of stream gravels and floodplain silts deposited along Cow and Hooker creeks.

Qfg Alluvial fan and pediment gravel deposits (Holocene and Pleistocene) Mainly fan and pediment gravel deposits, but includes deposits of basalt colluvium on the south flank of Spring Mountain. Alluvial fan deposits consist of unconsolidated accumulations of partially- to well-rounded boulders and cobbles of rhyolite. Size of blocks and boulders decreases and degree of rounding increases westward from ridge east of the Idaho-Oregon border. Alluvial fans grade westward into pediment and terrace gravels exposed on benches and ridges above the modern course of Cow Creek. Clasts are well rounded and consist mainly of rhyolite and rhyolite vitrophyre derived from the flanks of Purser Ridge to the east but include granitic and metamorphic clasts derived from underlying sedimentary units.

QTg Fluviatile gravel deposits (Pleistocene? and Pliocene)
Unconsolidated, poorly to moderately well-sorted deposits of rounded pebbles, cobbles, and boulders. Clasts are mostly of local rock types, mainly rhyolite and basalt, but include granitic and metamorphic clasts derived from older graves and conglomerates.

Tscg Arksoic sandstone and conglomerate (Middle Miocene) Mainly unconsolidated to highly indurated, cross-bedded arkose sandstone with thin conglomerate lenses. Often micaceous, with both muscovite and biotite. Clasts are mainly granitic and silicic volcanic rock fragments, but include metamorphic and black cherty clasts. Strongly indurated where silica-cemented, otherwise weathers to sandy soils. Locally includes abundant wood fragments, and, at F, vertebrate fossils. Equivalent to unit Tcg of MacLeod (1990).

Tsts Tuffaceous lacustrine and fluviatile sediments (Late Miocene?) Mainly white to pale yellow tuffaceous siltstones and fine-grained epiclastic sandstones. Locally includes thin lenses of diatomite and crossbedded micaceous epiclastic sandstones. Equivalent in part to unit Tsu of MacLeod (1990).

Tsat Altered tuffaceous rocks (Middle Miocene) Mainly massively bedded tuffaceous siltstones which have been silicified. Includes yellow to yellowish-brown, thin banded opaline cherts interbedded with yellow silicified tuffaceous siltstones. Also includes white to brown vitreous opaline tuffs and dark bluish-black, sulfidic cherts. Interpreted as syngenetic hotspring deposits emplaced in a shallow lake. Weak mercury, arsenic, and gold anomalies are associated with the alteration.

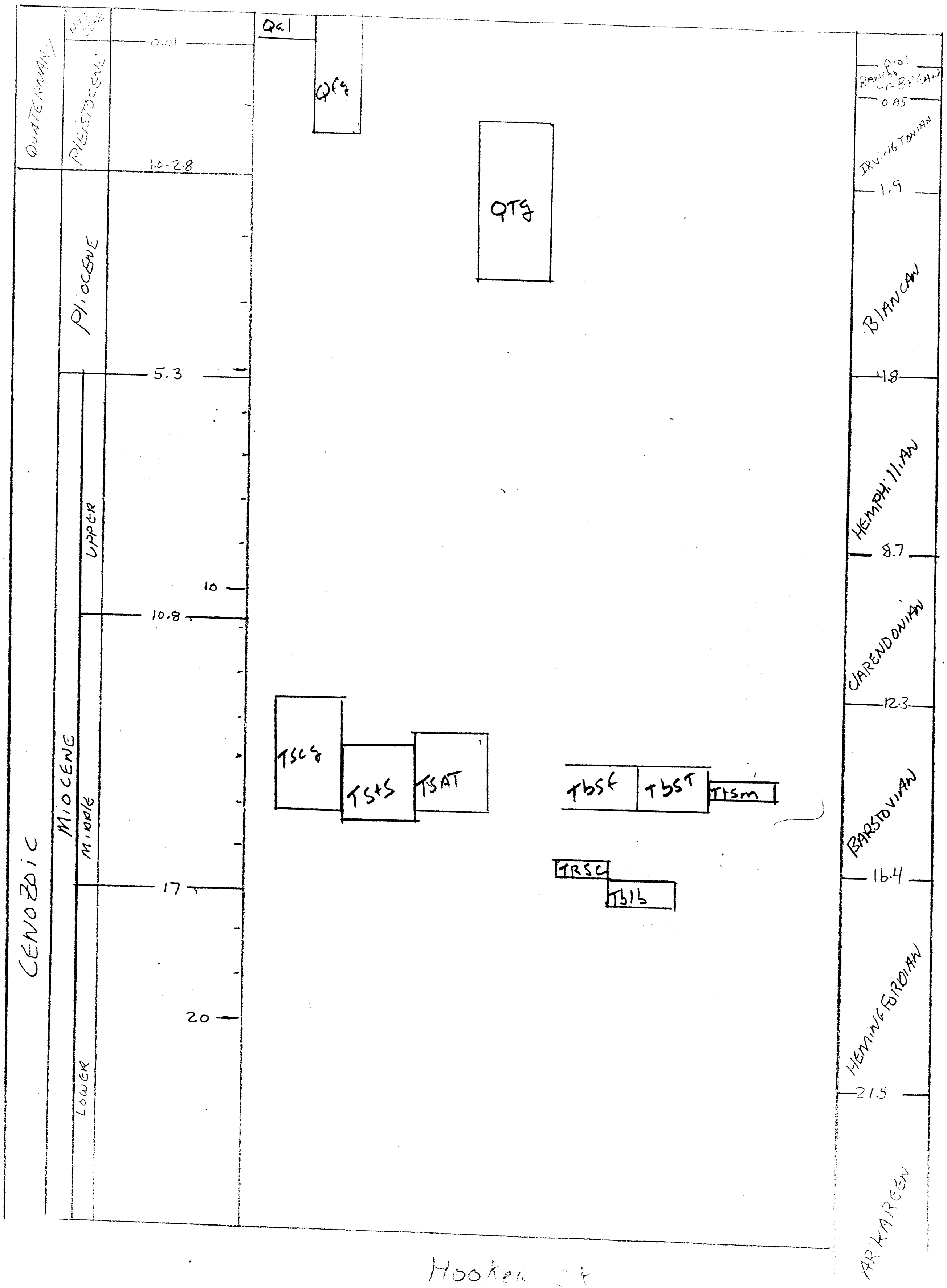
Ttsm Plagioclase-phyric rhyolite vitrophyre (Miocene) Densely welded, dark purple to reddish purple, rhyolitic crystal-lithic ashflow tuff. Interior of flow devitrified. Flow top is locally marked by pumiceous carapace breccias containing blocks of black and banded red and black vitrophyre and vesicular red devitrified rhyolite porphyry. Contains about 10 - 15% broken plagioclase phenocrysts, 2 - 5% lithic fragmented minor amounts of sanidine and pigeonite crystals. Chemically a low-silica metaluminous rhyolite and mapped as part of the tuff of Swisher Mountain (Ekren and others, 1981). Age is about 13.9 Ma (Ekren and others, 1984).

Tbsf Basalt flows of Spring Mountain (Miocene) Subareal and subaqueous basalt and basaltic andesite flows. Includes glomeroporphyritic olivine basalts and aphyric basalts with subophitic clinopyroxene. Includes high alumina olivine tholeiite basalt, basaltic andesite, and andesite flows erupted from the large shield volcano at Spring Mountain (MacLeod, 1990a).

Tbst Palagonite tuffs and breccias (Middle Miocene) Pale yellow brown to greenish brown, massive to thinly bedded hyaloclastic tuff, lapilli tuff, tuff breccia, and breccia deposits. Original ash and lapilli large replaced by hydrous clay minerals. Occurs under flows of Tbsf and equivalent to unit Tbst of MacLeod (1990a).

Trsc Rhyolite of Silver City (Middle Miocene) Reddish to purple-gray and gray, aphyric, flow-foliated rhyolite and rhyolite vitrophyre flows and breccias. Includes flow-foliated vitrophyres with thin interbedded pumaceous ash flow and air fall tuffs. Flow at Sheaville is capped with a perlitic carapace that contains chalcedony-filled spheralites. Includes metaluminous, high-silica rhyolites characterized by high K_2O/Na_2O ratios (Analyses, Table 1). Considered to be part of the rhyolite of Silver City by Ekren and others (1981) and thus about 16.1 Ma in age (Ekren and others, 1984).

Tblb Basalt (Middle Miocene) Dark grayish- and bluish-black to black, aphyric olivine basalt flows and breccias. Includes hyaloclastite breccias. Part of unit Tblb of Ekren and others (1981) and dated at 17 Ma (Pansze, 1971).


CENOZOIC
QUATERNARY
PLEISTOCENE
PLIOCENE
MIOCENE
UPPER
MIDDLE
LOWER
0.01
1.0-2.8
5.3
10
10.8
17
20
Qal
Qfg
QTg
Tscg
Tsts
TSAT
Tbsf
TbST
Ttsm
TRSC
Tblb
0.95
IRVINGTONIAN
1.9
BLANCAN
4.8
HEMPHILLIAN
8.7
CLARENDONIAN
12.3
BARSTOVIAN
16.4
HEMINGFORDIAN
21.5
ARIKAREEN

Hooker [illegible]

LAB #	1/4	1/4	Sec.	T.(S.)	R.(E.)	Lithology	Unit	SiO2	Al2O3	TiO2	Fe2O3	MnO	CaO	MgO	K2O	NA2O	P2O5	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-144	NE	NE	24	28	46	Olivine basalt	Tbsf	47.2	16.2	1.39	12	0.23	10.3	6.61	0.39	2.64	.32	57	45	100	89.7	104.	27	448	38	101	<10	222	8.0
AZB-145	NW	NW	24	4S	6W	Rhyolite tuff	Ttsm	70.7	13.5	0.59	3.7	0.03	1.32	0.19	4.9	3.61	0.14	<10	<5	<5	9.0	61.	170	127	62	539	32	1740	19.7
AZB-146	NE	SE	25	28	46	Aphyric rhyolite	Trsc	70.9	11.9	0.19	1.7	0.05	0.32	0.14	6.24	2.79	0.02	<10	<5	5	4.0	137.	136	18	100	445	41	396	4.2
BAB-312	NW	SW	12	5S	6W	Basalt	Tbtl	52.1	13.7	1.72	13.3	0.22	9.21	5.05	1.01	2.7	.42	58					22	366	30	159	35	528	

Laboratoy Number	1/4	1/4	Sec.	T.	R.	Map Unit	Ag ppm	As ppm	Au ppb	Cu ppm	Hg ppm	Mo ppm	Pb ppm	Sb ppm	Tl ppm	Zn ppm	Bi ppm	Cd ppm	Ga ppm	Se ppm	Te ppm	Ba ppm	Co ppm	Cr ppm	Fe %	Li ppm	Mn ppm	Ni ppm
AZB-009	NW	NE	28	28S	46E	Tscg	.203	27.2	<1	7.20	.143	5.04	3.13	3.66	<.5	5.34	<.25	<.1	<.5	<1.0	<.5	856	2	93	0.33	6	79	1
AZB-010	NW	NE	34	29S	46E	Tsat	.152	1.93	2	6.03	<.1	6.97	1.80	.348	<.5	7.30	<.25	<.1	<.5	<1.0	<.5	36	2	171	0.44	72	146	<1
AZB-011	NE	NW	34	29S	46E	Tsat	.163	5.59	6	8.63	.121	4.54	5.33	.643	<.5	21.0	.333	<.1	.720	<1.0	<.5	173	3	140	0.65	78	144	4
AZB-012	SE	SE	4	29S	46E	Tscg	.171	<1.0	<1	3.32	<.1	2.33	2.56	.311	<.5	10.5	<.25	<.1	<.5	<1.0	<.5	495	3	72	0.21	6	95	1
AZB-013	SE	SW	24	28S	46E	Tsts	.158	13.0	2	6.23	<.1	3.05	1.57	.374	<.5	9.01	.256	<.1	<.5	<1.0	<.5	36	1	81	0.32	81	181	1
AZB-014	NW	SW	25	29S	46E	Tsat	.160	1.23	5	7.76	<.1	5.43	3.14	<.25	<.5	25.4	<.25	<.1	<.5	<1.0	<.5	175	4	134	0.8	130	172	<1
AZB-015	NW	SW	25	29S	46E	Tsat	.167	5.07	<1	7.40	<.1	8.61	3.33	<.25	<.5	11.9	<.25	<.1	<.5	<1.0	<.5	80	4	177	0.8	53	156	<1
AZB-021	NW	SW	25	29S	46E	Tsat	.168	1.09	<1	10.3	<.1	3.06	2.86	<.25	<.5	21.7	<.25	<.1	<.5	<1.0	<.5	100	4	113	0.91	83	173	3

Ekren, E.B., Mc Intyre, D.H., Bennet, E.H., and Malde, H.E., 1981, Geologic map of Owyhee County, Idaho, west of longitude 116 W.: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-1256.

Ekren, E.B., Mc Intyre, D.H., Bennett, E.H., and Marvin, R.F., 1982, Cenozoic stratigraphy of western Owyhee County, Idaho: in Bonnichsen, Bill and Breckenridge, R.M., Cenozoic Geology of Idaho:Idaho Bureau of Mines and Geology Bulletin 26, p. 215-235.

Ekren, E.B., Mc Intyre, D.H., and Bennett, E.H., 1984, High-temperature, large-volume, lavalike ash-flow tuffs without calderas in southwestern Idaho: U.S. Geological Survey Professional Paper 1272, 76 p.

Macleod, N.S., 1990a, Geology and Mineral Resources Map of the Mahogany Mountain Quadrangle: Oregon Department of Geology and Mineral Industries Geological Map Series GMS-65, scale 1:24,000

Macleod, N.S., 1990b, Geology and Mineral Resources Map of the Sheaville quadrangle, Malheur County, Oregon, and Owyhee County, Idaho: Oregon Department of Geology and Mineral Industries Geological Map Series GMS-64.

Pansze, A.J. Jr., 1975, Geology and ore-deposits of the Silver City-De Lamar-Flint region, Owyhee County, Idaho: Idaho Bureau of Mines and Geology Pamphlet 161, 79 p.

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

Location of mineralized sample analyzed in Table 2