OPEN-FILE REPORT 0-92-02
PRELIMINARY GEOLOGIC MAP OF THE
BOGUS BENCH QUADRANGLE
MALHEUR COUNTY, OREGON
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1992

This unpublished Open-File Report has not been reviewed and may not meet all Oregon Department of Geology and Mineral Industries' standards.

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

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Bogus Bench

The Bogus Bench quadrangle is almost entirely covered by Late Miocene to Holocene basalt flows. The small steptoes of peralkaline, porphyritic rhyolite (Ttip) exposed in the northwest corner of the quadrangle are petrographically and chemically similar to Evan's Tuff of Iron Point and comprise the oldest unit exposed in the quadrangle. Much of the northern half of the quadrangle is covered by diktytaxitic and glomeroporphyritic, high alumina and transitional, olivine basalt flows that erupted from small shield volcanoes on and north of Bogus Bench (units Tbdb and Tbab). Hart (1982) give K/Ar dates of 4.1 - 4.5 Ma for presumably equivalent flows to the north.

Younger alkali-olivine basalt flows cover much of the southern half of the quadrangle. The oldest of these flows are the basalts of Three Mile Hill (Tbtm), from which Hart (1982) reports a radiometric age of about 1.9 Ma. The Owyhee River Canyon apparently did not exist at the time at which the Tbtm flows were erupted. Younger alkali-olivine basalt flows (Qbbr, Qbcb, Qbwc, Qbrb) erupted from vents south and east of Bogus Rim and flowed westward down tributary canyons to the ancestral Owyhee River.
Colluvial deposits (Quaternary) Slope covering deposits of angular blocks of basalt from rim forming basalts of units QTbbr, Tbab and Tdb.

Lacustrine and eolian deposits (Quaternary). Unconsolidated lacustrine and eolian deposits of silt and fine sand accumulated in shallow pans peripheral to young basalt flows.

Basalt of Rocky Butte (Quaternary) Dark gray diktytaxitic olivine basalt flows, with well preserved primary volcanic structures such as tumuli, pahoehoe surfaces, and collapse structures. In thin section, consists of olivine phenocrysts 3 mm in diameter and elongate plagioclase phenocrysts set in a subophitic groundmass of clinopyroxene, opaques, and glass. Includes alkali-olivine basalt characterized by high abundances of TiO2 (Analyses, Table 1) with a maximum age of 0.03 - 0.09 Ma (Hart, 1982).

Basalt of the West Crater (Holocene?) Dark gray, plagioclase- and augite-phryic basalt flows with well preserved primary volcanic structures such as tumuli, pahoehoe surfaces, and collapse structures. Includes constructional eruptive center of scoriaceous basalt cinders at West Crater. Texturally hyalophytic with intragranular olivine crystals and phenocrysts of augite and plagioclase. Chemically an alkalic basalt (analyses, Table 1).

Basalt of Clarks Butte (Pleistocene) Grayish-black olivine basal flows forming lava field about Clarks Butte. Well preserved tumuli, pahoehoe surfaces, and collapse structures are mantled by eolian and lacustrine silts. In thin section, consists of phenocrysts of olivine and plagioclase with glomerocrysts of plagioclase and olivine set in an intergranular groundmass of plagioclase, opaques, and clinopyroxene. Chemically an alkali olivine basalt radiometrically dated at 0.25 Ma (Hart, 1982).

Alluvial fan deposits (Holocene and Pleistocene) Unconsolidated accumulation of basalt boulders mantling the north and west flanks of Bogus Bench.

Basalt of Bogus Rim (Holocene? or Pleistocene) Grayish black to black olivine basalt flow. Age based on geomorphic relationships. Flows fills part of the canyon of the ancestral Owyhee River. Equivalent to unit QTb of Plumley (1986) and unit Qb of Walker (1977).
Basalts of Three Mile Hill (Pliocene) Vesicular black
diktytaxitic olivine basalt flows. Includes
holocrystalline flows with 2mm diameter plagioclase
and olivine phenocrysts in groundmass of
plagioclase, intergranular olivine, and subophitic
titanaugite. According to Hart (1982) these are 1.9
Ma alkali olivine basalts.

Basalts of Deer Butte (Pliocene) Grayish- and bluish-
black diktytaxitic olivine basalt flows. Finely
vesicular with subophitic to ophitic clinopyroxene
(titanaugite), plagioclase, and intergranular
olivine. Characterized by variable amounts of TiO2
and generally low K2O, thus corresponding to the
high alumina olivine and transitional basalt types
of Hart (1981). Pliocene date based on K/Ar
determinations of 4.1 and 4.5 Ma by Hart (1982).
Equivalent to part of unit QTb of Walker (1977).

Sediments of Bogus Bench (Pliocene?) Pale yellowish-
white to white tuffaceous siltstones and diatomite.
Poorly exposed.

Basalt of Bogus Bench (Pliocene) Vesicular black to
bluish-black olivine basalt flows. Includes basalts
with olivine, augite, and plagioclase glomerocrysts.
Chemically a high alumina olivine basalt (analyses,
Table 1).

Rhyolite porphyry (Miocene). Pale pinkish-gray,
sandine-phyric, lithoidal rhyolite porphyry.
Spherulitic with about 10% quartz and sandine
phenocrysts. Chemically a high silica rhyolite
(Analyses, Table 1) roughly similar in composition
to the rhyolite at Iron Point (Ferns, 1992).
CENOZOIC

Miocene

Upper

Lower

10.8

17

20

10.38

Qb

Qa

Qc

Quartzite

Quartz

Other

T3eb

T3ab

T3bb

T3pm

Bogus Bench
| LAR # | 1/4 | 1/4 Sec. | T.(S.) | R.(E.) | Lithology | Map Unit | S10Z | AL203 | TI0Z | FE003 | MNO | CAO | MGO | K2O | NA2O | P205 | Cr | Co | Ni | Cu | Zn | Ab | Sr | Y | Zr | Nb | Ba | Li |
|-------|-----|---------|--------|-------|-----------|----------|------|-------|------|-------|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|
| A29-103 | NW | NW | 2 | 24 | 42 | Olivine basalt | Tbab | 48.3 | 18.0 | 0.96 | 10.9 | 0.19 | 11.6 | 7.09 | 0.22 | 2.13 | 0.14 | 254 | 46 | 192 | 111 | 33.3 | 16 | 183 | 16 | 50 | 10 | 426 | 9.3 |
| A29-106 | SW | NW | 29 | 26 | 42 | Rhyolite | Ttpp | 76.1 | 11.7 | 0.11 | 1.3 | 0.03 | 0.62 | 0.09 | 4.58 | 3.61 | 0.51 | 12 | 15 | 15 | 8.4 | 71.5 | 231 | 24 | 275 | 258 | 105 | 87 | 36.3 |
| A29-107 | NW | SW | 16 | 24 | 42 | Olivine basalt | Tbab | 45.6 | 15.0 | 1.75 | 11.9 | 0.18 | 11.4 | 7.90 | 0.60 | 2.41 | 0.22 | 212 | 45 | 122 | 39.2 | 98.4 | 10 | 287 | 21 | 104 | 18 | 529 | 9.3 |
| A29-108 | SW | SW | 7 | 29 | 42 | Pyroxene basalt | Gbwc | 48.2 | 15.4 | 1.06 | 11.6 | 0.19 | 9.95 | 6.52 | 1.06 | 2.74 | 0.41 | 304 | 42 | 86 | 59.5 | 96.0 | 38 | 432 | 25 | 145 | 40 | 651 | 14.9 |
| A29-109 | SE | SW | 25 | 29 | 42 | Olivine basalt | Tttm | 47.3 | 16.1 | 0.99 | 11.2 | 0.18 | 11.2 | 8.56 | 0.27 | 2.41 | 0.15 | 413 | 47 | 90 | 89.2 | 107.2 | 29 | 155 | 10 | 57 | 18 | 150 | 9.2 |
| A29-110 | SE | NE | 23 | 29 | 42 | Olivine basalt | Ubrb | 47.3 | 15.7 | 2.03 | 12.1 | 0.18 | 9.34 | 7.29 | 0.91 | 2.80 | 0.41 | 162 | 48 | 115 | 54.4 | 102.6 | 36 | 469 | 24 | 149 | 16 | 457 | 9.7 |
| A29-111 | NE | NE | 1 | 29 | 42 | Olivine basalt | Ttabb | 46.7 | 14.6 | 1.80 | 12.9 | 0.21 | 11.1 | 6.81 | 0.43 | 2.32 | 0.25 | 356 | 50 | 160 | 57.1 | 83.4 | 10 | 242 | 26 | 129 | 29 | 449 | 7.2 |
| A29-112 | SE | SE | 36 | 28 | 42 | Olivine basalt | Ttabb | 46.5 | 15.5 | 2.06 | 13.8 | 0.20 | 10.3 | 7.49 | 0.39 | 2.27 | 0.44 | 389 | 90 | 182 | 57.8 | 115.0 | 30 | 258 | 29 | 150 | 47 | 379 | 9.6 |
REFERENCES


Bogus Bench Quadrangle

MAP SYMBOLS

--- Contact -- approximately located

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

\( \text{\textdeg} \) Strike and dip of beds

\( \times \) Location of whole rock sample analyzed in
Table 1