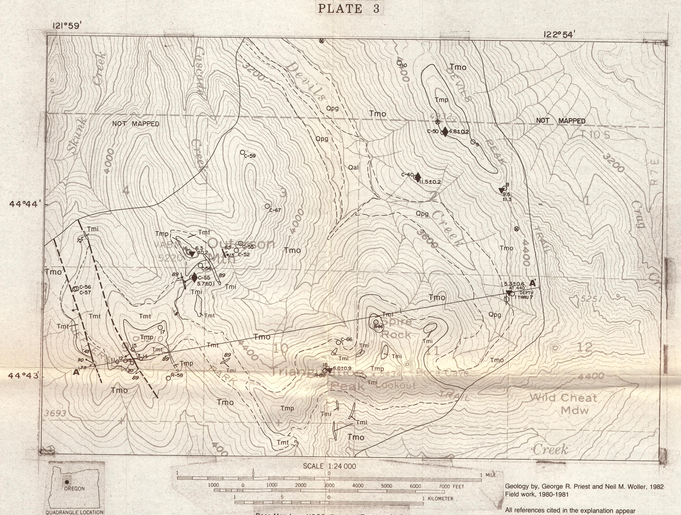
STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
DONALD A. HULL, STATE GEOLOGIST

PRELIMINARY GEOLOGIC MAP OF THE OUTERSON MOUNTAIN, DEVILS CREEK AREA MARION COUNTY, OREGON

1982

PLATE 3

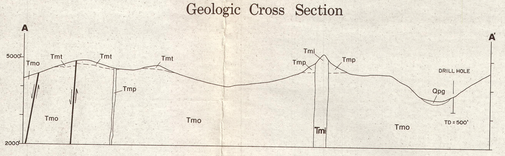


Geology by, George R. Priest and Neil M. Woller, 1982
Field work, 1980-1981

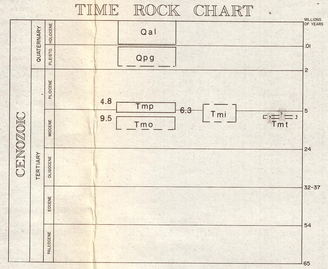
Base Map from USGS 15' series (Topographic)

All references cited in the explanation appear in the list of references cited at the end of Open-File Report 0-82-7.

Geologic Cross Section



TIME ROCK CHART



EXPLANATION

SURFICIAL DEPOSITS

Qal — Recent alluvium: Unconsolidated sediments in present river and creek channels; consists of sand and gravels

Qpg — Pleistocene glacial deposits: Chiefly unsorted till some glacial outwash gravels

BEDROCK GEOLOGIC UNITS

Volcanic rocks of early High Cascade time

Tmp — Upper Miocene-Pliocene lavas: Fine-grained, gray basaltic to andesitic lavas of fresh aspect. Mapped as Triangulation Peak volcanics and the Collawash volcanics by Clayton (1976), Plio-Pleistocene lavas by White (1980c), older basalt and basaltic andesite by Hammond and others (1982), unit QTv by Hammond and others (1980), unit QTba by Wells and Peck (1961), unit QTv by Peck and others (1964), and Outerson Volcanics by Thayer (1939). K-Ar date on flow at top of Outerson Mountain is 6.3±0.2 m.y. B.P.; near Triangulation Peak a K-Ar date of 6.0±0.9 m.y. B.P. was obtained near the top of the sequence; Sutter (1978) obtained a date of 4.8±0.1 m.y. B.P. on a sample near Devils Peak (recalculated by Fiebelkorn and others (1982))

Tmi — Subvolcanic intrusive rocks: Dikes and small plugs of basaltic to dacitic lava. Distribution in Triangulation Peak is taken from Rollins (1976). Unit Tmi is contemporaneous with unit Tmp and probably partially with unit Tmo. Unit Tmi is equivalent to Plio-Pleistocene dikes and plugs of Clayton (1976) and White (1980c), unit QTim of Wells and Peck (1961), and unit QTa of Peck and others (1964). One K-Ar date listed by White (1980c) also lists a K-Ar date of 11.5±0.2 m.y. B.P. for basaltic andesite sill in unit Tmo (K-Ar dates have been recalculated by Fiebelkorn and others (1982))

Volcanic rocks of late Western Cascade time

Tmt — Tuffs of Outerson Mountain (Miocene): Five small ash-flow tuff units with thin interbedded epiclastic and probable surge deposits. Oldest and fourth ash flows compromise 90 percent of unit. Oldest ash flow is cream-colored, partially welded orthopyroxene dacite; fourth ash flow is a gray, nonwelded crystal-poor andesite tuff. Unit Tmt definitely occurs below unit Tmp and lies on unit Tmo. Mapped as the upper part of Clayton's (1976) Cheat Creek sediments. First ash flow and probably some uppermost unit Tmo breccias and surge deposits are Rollins' (1976) Cheat Creek beds. Unit was mapped as Plio-Pleistocene lavas by White (1980c), unit QTba by Wells and Peck (1961), unit QTv by Peck and others (1964), Outerson basalt by Hammond and others (1980) and Rhododendron Formation by Hammond and others (1982). Thayer (1939) included unit Tmt in his Outerson volcanics

Tmo — Lavas of Outerson Mountain (Miocene): Moderately phyric, olivine-bearing high-silica basalt (51-53 percent SiO_2), basaltic andesite, and andesite. More highly siliceous units more common in upper part of unit, where partially palagonitized surge deposits, aa flows, and cinder deposits are abundant. Some heavily palagonitized surge deposits occur in middle part. Lower part is chiefly moderately altered lavas; upper part is gradationally fresher and less altered. Greenish phyllosilicates replace olivine in lower part, whereas only reddish phyllosilicates, generally iddingsite, replace olivine in upper part. Mapped as Outerson lava and breccia and lower part of Cheat Creek sediments by Clayton (1976) and as Nan Creek volcanics by Rollins (1976). Probably equivalent to Rollins' (1976) Grizzly Creek lavas below about 3,600-ft elevation. Mapped as unit QTba by Wells and Peck (1961), unit QTv by Peck and others (1964), Outerson basalt by Hammond and others (1980), and basalt of Outerson Mountain and Rhododendron Formation by Hammond and others (1982). Corresponds to Outerson volcanics of Thayer (1939). A sample from a depth of 440 ft in Devils Creek drill hole yielded K-Ar date of 5.3±0.6 m.y. B.P., but this date has probably been affected to some degree by pervasive low-grade alteration. Unit is older than 9.5±1.3 m.y. B.P. date of uppermost flow near Devils Peak.

GEOLOGIC SYMBOLS

- Bedrock contact: Dashed where inferred beneath thin colluvial deposits or in areas not traversed
- Normal fault with dip of fault plane: Bar and ball on the downthrown side; dashed where inferred; dotted where covered by younger deposits. Arrow shows dip
- Strike and dip of thinly bedded sedimentary unit
- Dike: Dip shown by arrow
- K-Ar date, this study
- K-Ar sample location from Sutter (1978) and White (1980a): Recalculated ages cited using currently accepted abundance and decay constants from Fiebelkorn and others (1982)
- Chemically analyzed sample: Number = sample number of this study; R = number = sample number of Rollins (1976); C = number = sample number of White (1980a)
- (R) (N) Paleomagnetic station: R = reversed polarity; N = normal polarity
- Temperature-gradient hole: 152 m deep, 16.58° C @ 152 m; terrain-corrected gradient = 72.6° C/km; heat flow = 101 mW/m²; sample numbers 1 through 7 analyzed for chemical composition; one sample at 134 m (440 ft) yielded a K-Ar date of 5.3±0.6 m.y. B.P. (sample somewhat altered)
- Strike and dip of shear zone with rake of slickensides

PRELIMINARY GEOLOGIC MAP OF THE SWIFT CREEK AREA LANE COUNTY, OREGON

1982

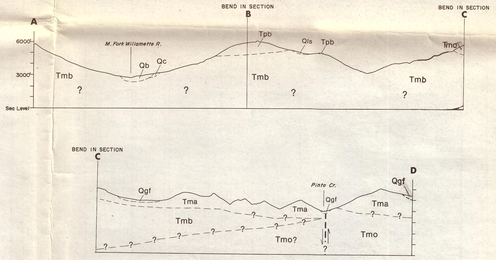
PLATE 6

Geology by Neil M. Woller, 1982
Field work, 1980-1982

Base Map from USGS 15' series (Topographic)

All references cited in the explanation appear in the list of references cited at the end of Open-File Report 0-82-7.

Geologic Cross Sections

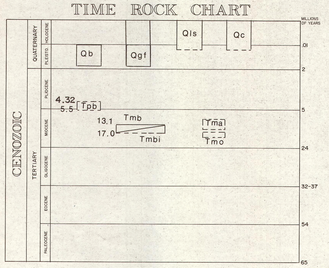


0-82-7

Geology and Geothermal Resources of the Cascades, Oregon 1982

The work was supported by the United States Department of Energy (Cooperative agreement No. DE-FC07-79ID12044).

TIME ROCK CHART



EXPLANATION

SURFICIAL DEPOSITS

Qc — Colluvium: Recent unconsolidated deposits including local Mazama ash-fall deposits of ash and pumice lapilli, debris slopes, and thin soil covering bed rock

Qls — Landslide deposits: Unconsolidated landslide debris; includes slumps and slide blocks

Qgf — Glacial and fluvial deposits: Unconsolidated and semiconsolidated sedimentary deposits of glacial and fluvial origin; includes terrace deposits, till, and moraines. Bed rock shown where till is thin

BEDROCK GEOLOGIC UNITS

Volcanic rocks of late High Cascade time

Qb — Pleistocene basaltic rocks: Olivine-bearing basalts and basaltic andesites; black to gray; very fresh; diktytaxitic to compact. Found in glaciated valleys of Pioneer Gulch, Entrgrant Creek, upper Swift Creek, and Pinto Creek, and in valley of Willamette River. Vent areas are from east of map area in the vicinity of Diamond Peak. Undeformed. Equivalent to High Cascade lavas of White (1980a) and basalts of High Prairie of Brown and others (1980b); partially equivalent to volcanic rocks of the High Cascades...(undivided) of Peck and others (1964). Oldest flow 1.98±0.25 m.y.; youngest flow 0.174±0.48 m.y.

Volcanic rocks of early High Cascade time

Tpb — Miocene-Pliocene basaltic lavas: Olivine-bearing basalts; gray; compact; fresh. Caps highest areas of Bear Mountain. Oldest flow K-Ar age of 8.56 m.y.; upper part K-Ar dated at 4.32±0.40 m.y. B.P. Undeformed. Includes sedimentary interbeds. Equivalent to Outerson volcanics of Thayer (1939), Pliocene volcanic rocks of Brown and others (1980b), and Outerson formation of White (1980a)

Volcanic rocks of late Western Cascade time

Tma — Andesitic lavas of Moss Mountain (Miocene): Pyroxene andesites and basaltic andesites; gray to black. In lower part, flows are plagioclase-rich two-pyroxene andesites. In upper part, flows become increasingly mafic plagioclase-rich olivine-pyroxene basaltic andesites. One K-Ar date of 17.3±0.8 m.y. B.P. was obtained (see Chapter 6 for explanation). Includes interbedded epiclastic volcanic rocks and minor thin ash flows. Equivalent to Sardine Formation of Peck and others (1964) and Miocene volcanic rocks of Brown and others (1980b)

Tmb / Tmbi — Basaltic lavas of Tumblebug Creek (Miocene): Olivine- and pyroxene-bearing basalts and basaltic andesites; black to gray; compact to diktytaxitic. Includes interbedded epiclastic volcanic rocks and minor thin ash flows. K-Ar dates between 17.0±0.9 m.y. B.P. and 13.1±0.6 m.y. B.P. were obtained on various parts of the sequence. Equivalent to Sardine Formation of Peck and others (1964) and Miocene volcanic rocks of Brown and others (1980a,b). Tmbi: Intrusive plug

Tmo — Older volcaniclastic sediments and lavas (Miocene): Immature sediments containing aphyric andesites and dacites of various colors that resemble lavas of the underlying Little Butte Volcanic Series (Peck and others, 1964) (not visible in map area). Also contains tree euhedral hypersthene crystals. Lavas are fine-grained, altered, frequently discolored or oxidized silicic rocks associated with these sediments. This is probably the oldest unit in map area, but no K-Ar data are available. Equivalent to Sardine Formation of Peck and others (1964) and Miocene volcanic rocks of Brown and others (1980b). May be older, more deformed members of unit Tma

GEOLOGIC SYMBOLS

- Contacts: Solid where visible, dashed where inferred below cover or from aerial photo interpretation
- Fault: Solid where visible, dashed where approximately located, dotted where concealed by alluvium or landslide. Dip on fault plane indicated; bar and ball on downthrown side
- Shear: Strike and dip of shear plane with rake of slickensides shown; rakes are not always measurable
- Geothermal heat-flow hole: Terrain-corrected gradient (°C/km) and heat flow (mW/m²) shown
- Geochemical sample
- K-Ar date
- Dike, dip shown by arrow
- Strike and dip
- Horizontal attitude
- Fault with extreme brecciation or numerous shears

Map prepared by
STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
C. A. Schumacher Chief Cartographer
Geo-Graphics