



SURFICIAL DEPOSITS

Qal

Alluvial deposits (Holocene) --

Volcaniclastic sediment deposits ranging from clay and sand to unconsolidated gravels with clasts ranging from pebble to boulder size. Polyolithic range of clasts ranging from rhyolitic to basaltic in composition. Deposits are found in the Deschutes River Canyon and tributary streams as veneers covering the bedrock channels

Q1s

Landslide Debris (Holocene) --

Unconsolidated, poorly sorted mixture of basaltic, rhyolitic, tuffaceous "clasts". Flows included rock and debris slumps, slides and earthflow deposits. Surface of the flows have abundant large boulders and preserved "blocks" of bedrock which preserve in place stratigraphic relationships. The largest block slide deposits occur along the Deschutes River Canyon, where the head scarps originate at the contact of the Grande Ronde member of the Columbia River Basalt and the John Day volcanics.

COLUMBIA RIVER BASALTS AND ASSOCIATED
FLOW

Natural Pasture basalt (Pliocene)

Large, cliff forming surface unit of Natural Pasture and the southern portion of Juniper Flat. Weathered surface is tan-brown and is almost columnar in outcrop. Fresh surface is light grey to almost purple and displays equigranular,phaneritic texture. Phenocrysts include; plagioclase laths (70%, 0.08"-0.15", altered olivine (iddingsite)(25%, 0.08"-0.2"), Fe-Ti Oxides(<5%

Tgr

Columbia River Basalt Group; Grande Ronde Member
(Miocene)--

Outcrops weather grey to dark brown and commonly display columnar jointing. Individual flows are distinguished by well-developed vesicles that increase in quantity and size upwards. Separate flows are mineralogically and texturally indistinguishable. Fresh surface is dark-grey to black and aphantic in texture with sparse plagioclase micro-phenocrysts. Porphyritic texture is common with plagioclase and augite needles common. Groundmass is microcrystalline. Flow tops are commonly vesiculated. Thicker flows display very well-formed columns near center of flow and are distinguished by dense vesiculation near flow top 16.0–15.5 Ma (Reidel 2003).

Tpb

Prineville basalts (Miocene) --

Interbedded with Columbia River Basalts between 15.7 and 15.9 Ma (Conrey, 1997) averaging 30-60' thick locally. Prineville basalts are indistinguishable from Columbia River basalts in hand sample and are indicated on the map by stippled pattern.

MUTTON MOUNTAIN VOLCANICS

Tjr

Mutton Mountain Obsidian (Oligocene) --

Unit is comprised of a thick (865') hydrated obsidian flow. Hydrated obsidian appears light blue to gray in outcrop and is amorphous, glassy, displays conchoidal fracture and is quite friable. Near the unit margins obsidian is glassy, hydrated, and highly fissile. In flow center obsidian is less hydrated, competent, forming large conchoidal blocks. Typically slope forming unit as it is less resistant to weathering. Upper surface is bounded by thick sequence of flow breccias containing hydrated obsidian, pumice and rhyolite clasts (<1" - >200") containing occasional angular polyolithic clasts (28.58 +0.15 Ma).

Tji

Mutton Mountain Rhyolites (Oligocene) --

Massive, cliff forming, devitrified rhyolite flows and interfingered ignimbrites (735' thickness) within the Mutton Mountains, stratigraphically underlying the Grande Ronde member of the Columbia River Basalts and Princeville basal. Outcrops weather reddish to dark grey and are massive to columnar in appearance with no apparent cleavage pattern at outcrop or hand sample scale. At the base, contact with underlying unit is baked, having a clay and ash horizon about 1' in thickness. Baked horizon contains clasts of mafic, pebbly boulders, some of which are highly vesicular, in a reddish-brown matrix. Overlying the baked base are alternating sections of ignimbrites and rhyolite lavas. These sections vary in thickness (6"-24") and display very thinly laminated flow-banding in outcrop. Interfingering sections of ignimbrite contain subrounded to elongate pumice clasts (<0.5", 40%), flammé, and lithics. Fresh surface of unit is red to purple to grey and varies greatly in mineralogy and texture but is largely aphanic. If present phenocrysts are typically less than 2mm and altered (29.14 ± 0.09 Ma).

Tev

Tertiary Clarno Formation (Oligocene) --

Only on cross section as there are no mappable outcrops.
Clarno formation are local basement unit.

References:

Hooper, P.R., Conrey, R.M., et al. (1993). "The Prineville basalt, north-central Oregon". Oregon Geology, volume 55, Issue 1. 3

Reidel, S.P., Tolan, T.L., et al. (1989). The Grande Ronde Basalt, Columbia River Basalt Group; Stratigraphic descriptions and correlations in Washington, Oregon and Idaho. *Volcanism and Tectonism in the Columbia River Flood-basalt Province*. Reidel, S.P., Hooper, P.R., Boulder, Colorado. Geological Society of America. Special Paper 239. 32.