EXPLANATION

Quaternary:

- **Qls** — Landslides.
- **Qal** — Pleistocene and Recent alluvium

Tertiary to Quaternary:

- **QTg** — Late Miocene to early Pleistocene gravels and sands.

Angular Unconformity

Tertiary:

- **TKf** — Late Miocene Keating Formation: Tuffaceous lacustrine and fluvial sediments; diatomite, tuff, and siltstone. Equivalent to the Chalk Butte Formation in the area of Vale, Oregon. Fossils include diatoms, leaves (Keating flora), fish, gastropods, rhinos (*Aphelops*), and mastodont. Ar/Ar ash date: 8.7 ± 0.1 Ma (Prater Creek Tuff?)

Disconformity:

Powder River Volcanic Group:

- **Tab** — Middle Miocene alkali-rich basalts, basanite, and basaltic trachyandesites.
- **Ta**, **Td** — Middle Miocene andesite (Ta) and dacite (Td) flows and domes. Age ~13 Ma.
- **Tob** — Middle Miocene olivine basalt flows at base of the Powder River Volcanic Group. Age ~14.5-13.5 Ma.

Dooley Mountain Volcanic Group:

- **Tr** — Middle Miocene rhyolite flows and associated pyroclastics related to the Dooley Mountain volcanic center. Age ~15.0-14.5 Ma.
- **Tdv** — Middle Miocene ash flow deposits, lahars, and associated pyroclastics related to the Dooley Mountain volcanic center.
- **Twt** — Middle Miocene welded tuff and associated pyroclastics at the base of the Dooley Mountain Volcanic Group.

Columbia River Basalt Group:

- **Tcr** — Middle Miocene Columbia River Basalt Group flows; undivided. Primarily Imnaha and Grande Ronde Basalts.

Nonconformity

Mesozoic:

- **KJi** — Upper Jurassic to Lower Cretaceous plutons; medium-grained hornlende and biotite quartz diorite and granodiorite.
- **JTrh** — Upper Triassic to lower Jurassic Hurwal Formation; greywacke sandstone and laminated siltstone; minor chert, thin-bedded limestone, and conglomerate.

Paleozoic to Mesozoic:

- **TrPv** — Permian to Triassic volcanic and sedimentary rocks. Lava flows, flow breccia, and agglomerate; pyroclastic rocks; subordinate conglomerate, sandstone, and argillite; minor chert and limestone. Volcanic rocks include spilite and keratophyre. Includes Clover Creek Greenstone of Gilluly (1937).

Sparta Complex:

- **TrPqd** — Permian to Triassic quartz diorite and "albite" granite.
- **TrPgb** — Permian to Triassic gabbro and altered gabbro with minor peridotite, pyroxenite, and serpentinite.

- **MzPza** — Sedimentary and volcanic rocks: Argillite, chert and tuff; subordinate lava flows, conglomerate and limestone. Includes Elkhorn Ridge Argillite of Gilluly (1937).

GEOLOGIC SYMBOLS

- Contact (dashed where inferred)
- Fault showing downthrown side (dashed where inferred)
- 30 — Strike and dip of beds or flows.
- 15 — Strike and dip of fault plane.

Based on mapping by Gilluly (1937), Brooks, McIntyre, and Walker (1976), Whitson (1988), and Bailey (1990), plus fieldwork in 2007-2009 by Jay Van Tassell.