GEOLOGIC MAP OF THE

GOLDENDALE

15′ QUADRANGLE, WASHINGTON

by

J. L. ANDERSON

WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES

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This report has not been edited or reviewed for conformity with
Division of Geology and Earth Resources standards and nomenclature

WASHINGTON STATE DEPARTMENT OF
Natural Resources

Brian Boyle - Commissioner of Public Lands
Art Stearns - Supervisor

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DESCRIPTION OF MAP UNITS

Surficial Deposits

Qas ALLUVIUM--Sidestream facies; stream deposits of silt, sand, and gravel composed almost entirely of basalt with rare to abundant reworked clasts of quartzite and other durable lithologies; confined to floodplains of streams, canyon bottoms, or local depressions on upland surfaces; upland accumulations include lacustrine, eolian, and paludal deposits containing ash layers; deposited primarily by the tributaries of the Klickitat River.

Qls LANDSLIDE DEPOSITS--Consists of basalt and lesser underlying or interstratified sedimentary deposits displaced by gravity movement; composed mainly of large internally intact blocks in a matrix of finer debris; maximum block dimension measured in hundreds of meters; multiple retrogressive failures (Varnes, 1978) occurring primarily at interformational contacts; top of the Grande Ronde Basalt most common basal slip surface, with many dips less than 5^{o}; maximum thickness approximately 70 m.

QToa OLDER ALLUVIUM--Light brown to yellowish gray deposits of gravel, sand, silt, clay and tuff; weakly to moderately indurated fluvial and locally paludal deposits; contains basaltic, andesitic, metamorphic, and quartzo-feldspathic clasts; maximum thickness greater than 60 m (Brown, 1979); unconformably overlies Columbia River Basalt Group units; unconformably overlain by Qas in nested deposits; forms broad dissected terrace; includes loess locally; older deposits may be equivalent to Teu; younger deposits probably from Simcoe volcanic field; overlain by 0.9 m.y. Haystack Butte flow.

Volcanics of Simcoe Mountains

Qbs OLIVINE BASALT--Gray to medium dark-gray; weathers yellowish-brown to grayish-orange; sparsely plagioclase/olivine phyric to aphyric; fine-grained; includes at least two intracanyon flows and associated minor volcaniclastic deposits within the canyon of the Little Klickitat River and its tributaries, but is a laterally extensive unit on upland surfaces; known intracanyon occurrences are preserved as isolated nested remnants commonly less than 20 m thick; a two-flow sequence overlying basaltic boulder conglomerate along the Little Klickitat River is middle Pleistocene in age (0.85 +/- 0.14 and 0.89 +/- 0.13 Ma); flows in intracanyon exposures have well-developed colonnades and entablatures in

contrast to typical blocky columnar jointing on upland surfaces; the source vent for the older intracanyon flow of the Little Klickitat River sequence is Lorena Butte near Goldendale; other source vents and flows of this age (pending confirmation) are included in QTv and Tpbs respectively; basalt of Lorena Butte overlies QToa (terraces).

QTv VENT FACIES (undifferentiated)--Red to dark gray cinder and scoria; primarily basaltic composition; product of vent processes; includes bombs, spatter, cowpie pahoehoe, breccia, and agglutinate; most are Pliocene but some are Pleistocene; occurs in cinder cones up to 100 m tall and less commonly in cinder ridges of fissure eruptions; mostly unconsolidated and poorly sorted.

Tpvs VENT FACIES--Red to dark gray cinder and scoria of basaltic composition; product of vent and near-vent eruptive processes; includes bombs, spatter, cowpie pahoehoe, breccia, and agglutinate; occurs in cinder cones up to 100 m tall; mostly unconsolidated and poorly sorted; Pliocene in age; some vents occur along strike-slip faults or atop anticlinal uplifts of the Yakima Fold Belt.

Tpbs OLIVINE BASALT--Medium gray to medium dark gray; weathers light brown to pale yellowish brown; olivine-plagioclase phyric; commonly trachytic with early formed subhedral to euhedral magnetite crystals visible in thin section; fine to medium-grained, in places glassy; rare to abundant plagioclase and olivine phenocrysts; plagioclase phenocrysts commonly up to 1.5 cm long; generally occurs in stacked flow sequences; contains lesser interstratified volcaniclastic deposits; collective thickness of up to 220 m; jointing highly varied among flows but relatively consistent within a single flow; most older intracanyon flows have well-developed colonnade and entablature, while younger thinner flows capping upland surfaces tend to have columnar jointing; erupted from numerous cinder cone vents as flank eruptions that spread out and filled stream channels and local topographic low areas; early to late Pliocene in age (Kienle and Newcomb, 1973); includes flows with either reversed or normal polarity (NRM*).

Tpds DACITE--Light to dark gray, flow-banded, glassy, and porphyritic; phenocrysts of plagioclase, olivine, clinopyroxene, hypersthene, and oxyhornblende (Sheppard, 1960, 1967); flow banded; erupted from a single dome; overlies flows of olivine basalt unit (Tpbs) and appears to overlie rhyolite and rhyolitic volcaniclastic deposits.

*NRM refers to natural remanent magnetization; determined in the field with a portable fluxgate magnetometer.

Tprvs RHYOLITE AND ASSOCIATED VOLCANICLASTIC DEPOSITS--Light to dark gray or light brown, flow banded, porphyritic; includes domes, flows, debris flows (lahars), breccia and tuff; erupted from vents in the Simcoe Mountains primarily in the Indian Rock area (Sheppard, 1960, 1967); obsidian, perlite and tuff are present in some areas and are common components of debris flows; tuff dikes present locally; maximum exposed thickness greater than 500 m south of Indian Rock at Devils Canyon. Interstratified with olivine basalt.

Ellensburg Formation

Teu UPPER ELLENSBURG FORMATION--Gravel, sand, silt, and clay; light brown to yellowish gray; weakly to moderately indurated fluvial and volcaniclastic deposits; conglomerate is most abundant; gravel contains basaltic, andesitic, and metamorphic clasts including quartzite; the last are numerically significant in some areas; conglomerate has sandy matrix that is locally micaceous; maximum thickness approximately 15 m; deposited by ancestral Columbia River and tributary streams; conformably overlies Columbia River Basalt Group and is unconformably overlain by olivine basalt of the Simcoe Mountains (Tpbs) suggesting late Miocene age (Sheppard, 1967).

Columbia River Basalt Group

Yakima Basalt Subgroup

WANAPUM BASALT

Tpr PRIEST RAPIDS MEMBER--Medium dark gray; weathers light brown (locally yellowish gray); medium-grained; generally aphyric but contains scattered plagioclase glomerocrysts 0.5-1.0 cm long; blocky columns to vertically platy; pillowed at base locally; Rosalia chemical type (Swanson and others, 1979); two flows present locally (Lolo chemical type?) (Sylvester, 1978); reversed magnetic polarity (NRM); age approximately 13.6 m.y.

Tr ROZA MEMBER--Medium dark gray; weathers to pale brown to yellowish gray; fine- to medium-grained; abundant plagioclase phenocrysts usually less than 1.0 cm long with single crystals more numerous than glomerocrysts; flow top is aphyric locally; pillowed at base in some areas; usually has well-developed colonnade, but entablature is present where flow thins near its margins; closely resembles the basal Frenchman Springs flow; Frenchman Springs chemical type; usually has normal magnetic polarity (NRM) (TRM is transitional according to Swanson and others, 1979).

FRENCHMAN SPRINGS MEMBER--Consists of a sequence of three to five flows that are individually distinguishable but are not formally named; these flows are of three general types distinguishable on the basis of phenocryst distribution and geochemistry.

Tfu upper flow--Medium dark gray (blue tint locally); weathers moderate yellowish brown (pale reddish brown at top locally); fine- to coarse-grained; generally aphyric but contains rare plagioclase phenocrysts up to 1.5 cm long; irregularly columnar to vertically platy jointing.

Tfm middle flow--Medium dark gray; weathers pale yellowish brown to moderate yellowish brown; medium-grained; aphyric to phyric; phenocrysts are rare to abundant where present, with individual crystal clusters up to 2.5 cm; commonly has well-developed blocky to platy lower colonnade; center of flow commonly vertically platy; approximately 60 m thick.

Tfl lower sequence--Medium dark gray; weathers light brown or pale brown to yellowish gray; medium-grained; phyric with abundant phenocrysts and glomerocrysts of plagioclase; glomerocrysts are commonly 1 to 1.5 cm in diameter; mostly one flow but locally two are present; collective thickness approximately 60 m; lowest flow commonly has well-developed colonnade and entablature and lithologically resembles the Roza Member; this flow is only sporadically present; distribution not coincident with present structural low areas; in many places overlies sediment and is commonly pillowed at its base; upper flow of lower sequence is generally aphyric at its top to a depth of 5 to 10 m; this flow has blocky to platy columnar jointing and is present throughout the area; sediment underlying the lower Frenchman Springs sequence usually consists of tuff or sandstone of the Vantage Member of the Ellensburg Formation; this sediment is usually less than 2 m thick and therefore was not mapped as a separate unit.

GRANDE RONDE BASALT

Aphyric to very sparsely plagioclase phyric basalt; mostly fine- to very fine grained; generally uniform lithologic and petrographic characteristics; exposed only in the canyon of the Little Klickitat River; no formal members but divisible informally on the basis MgO content into two chemical types, high and low MgO, and into magnetostratigraphic units of paleomagnetic polarity (Swanson and others, 1979); only high MgO chemical type is present in the map area.

Tgn_2h Flows of high MgO content and normal magnetic polarity - upper part of N_2 of Swanson and others (1979)--Medium dark gray to dark gray; weathers light brown to pale yellowish brown; many flows are phyric with prismatic plagioclase phenocrysts less than 3 mm long; includes five to seven flows

of high MgO chemical type with a cumulative thickness of approximately 200 m; fine- to medium-grained; many flows consist of a series of flow lobes; fair to well developed blocky to platy colonnades are characteristic, and entablatures rare.

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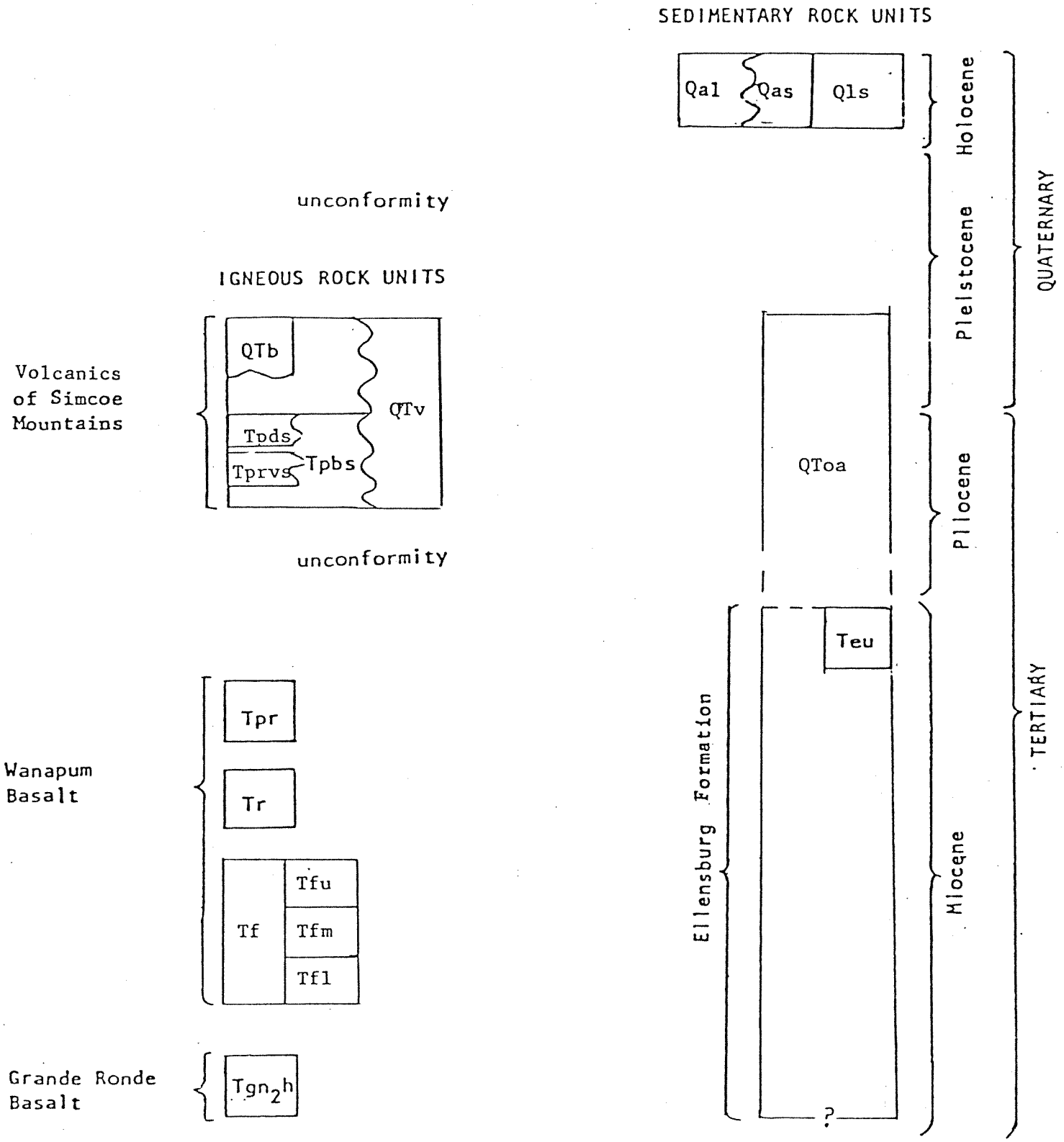
CORRELATION OF MAP UNITS



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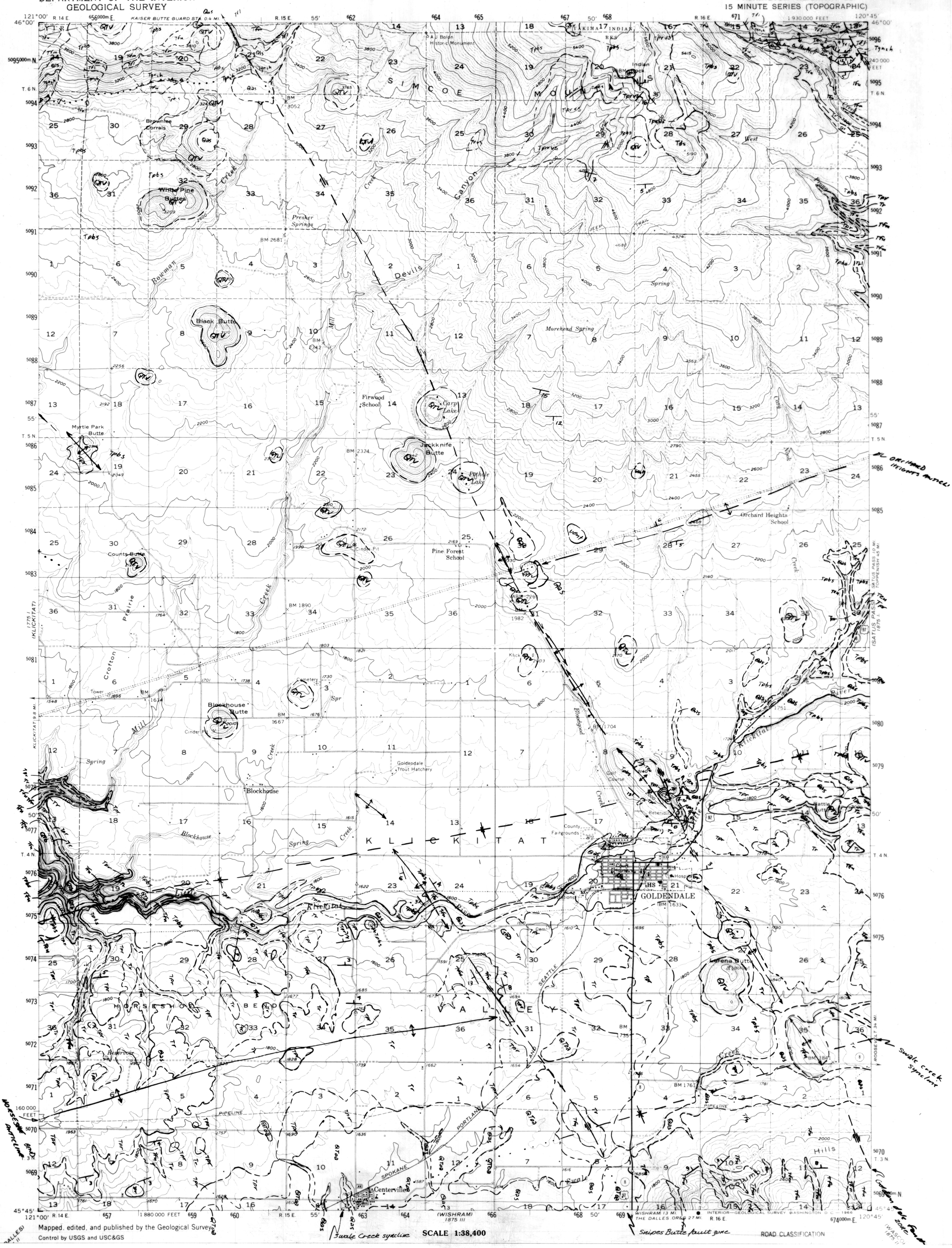

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Plate 1