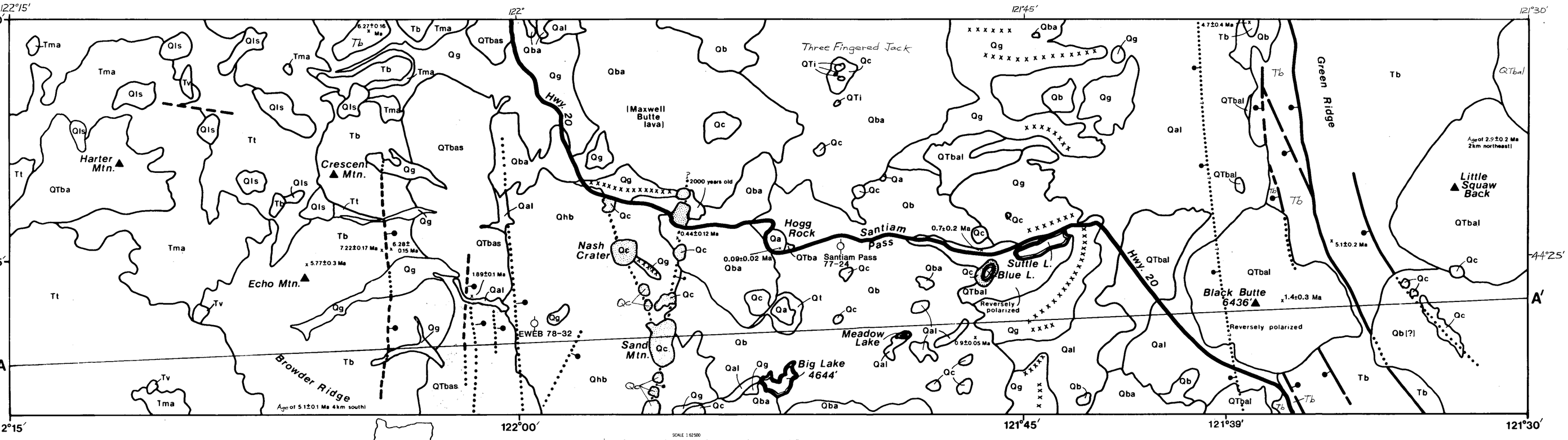
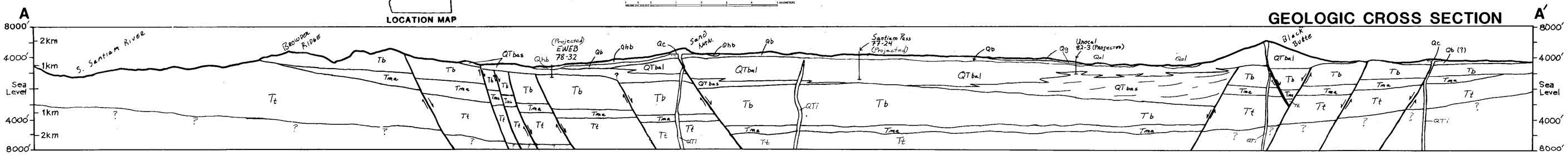
PLATE 1



LOCATION MAP

SCALE 1:62500



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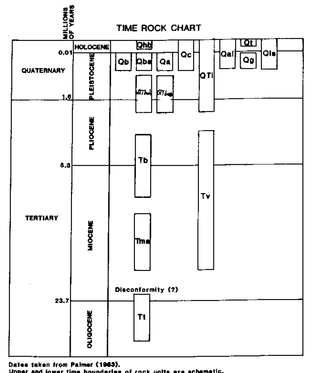

EXPLANATION

SURFICIAL UNITS

Qal **Alluvium (Holocene and Pleistocene):** Sand, gravel, and silt in valley floors; includes glacial outwash deposits east of long 121°45′ W.

Qls **Landslides (Holocene and Pleistocene).**

Qt **Talus (Holocene and Pleistocene):** Shoots and cones of coarse, poorly sorted andesite debris adjacent to Hogrick and Hogdon Buttes.

Qg **Glacial deposits (Holocene and Pleistocene):** Stratified and unstratified till deposits; includes Canyon Creek, Jack Creek, and Abbott Butte formations of Scott (1977). Lines of x's indicate moraine crests.

VOLCANIC UNITS

Qbb **Basalt (Holocene):** Lava flows and breccia that form lava field west of Santiam Pass; distribution of Holocene flows and vents from Taylor (1968). Holocene flows were erupted at about 2,000 to 3,000 years B.P.; see Taylor (1968) for ^{14}C ages of specific units.

Qc **Mafic cinder cones (Holocene and Pleistocene):** Cones and irregular accumulations of cinders with lesser volumes of lavas and intrusions; includes deeply eroded vent structures presently exposed as volcanic necks. Cinder cones and volcanic necks mark the sites of vents for the Holocene (unit Qbb) and Pleistocene (units Qba and Qb) lava flows. Holocene cinder cones are shown with a stipple pattern.

Qb **Basalt (Pleistocene):** Lava flows and breccia of predominantly basaltic (SiO_2 ≤ 53%) composition. Age and distribution queried east of Black Butte where the presence of this unit is interpreted from air photos and topographic maps.

Qba **Basaltic andesite (Pleistocene):** Lava flows and breccia of predominantly basaltic andesite (SiO_2 53-58%) composition. Units have normal paleomagnetic directions and stratigraphic relationships indicating late Pleistocene (i.e. ≤0.7 Ma) ages.

Qa **Andesite (Pleistocene):** Large, flat topped andesite domes or flows of Hogrick Butte, Hogg Rock, and a small body northeast of Hogg Rock. Tops of the units are extensively glaciated.

QTbal **Basalt and basaltic andesite (Pleistocene and Pliocene):** Lava flows, breccias, and vent rocks, with lesser amounts of interclated volcanic sediments; includes Black Butte and Little Squaw Back volcanoes. Age ranges from about 0.7 Ma to 2 Ma.

QTbas **Sedimentary rocks (Pleistocene and Pliocene):** Diatomite, claystone, siltstone, and volcanic sandstones and pebble conglomerates, with lesser amounts of interclated mafic lava flows; includes the Parkette Creek unit of Black et al. (1987) west of the Santiam Pass. Unit represents subsurface graben-fill east of the Santiam Pass. Age of the unit ranges from about 1 Ma to 2 Ma.

Tb **Basalt and basaltic andesite (Pliocene to Miocene):** Lava flows and breccia; includes the Iron Mountain and Browder Ridge formations of Avramenko (1981) west of the Santiam Pass, and the Deschutes Formation east of the Santiam Pass. K-Ar ages range from about 4 Ma to 7 Ma. Volcaniclastic rocks are predominant in the Deschutes Formation east of Green Ridge.

Tv **Vents (Pliocene and Miocene):** Volcanic plugs, cinders and lava flows that form deeply eroded vent complexes.

Tma **Andesite (Miocene):** 2-pyroxene andesite and basaltic andesite lava flows and breccia; age is mostly middle Miocene but includes rocks of late Miocene age. Unit includes the Castle Rocks andesites of Woodland (1988) east of the Santiam Pass.

Tt **Pyroclastic rocks (Miocene and Oligocene):** Tuff and tuffaceous sediments with lesser amounts of lava flows, domes, and intrusions; compositions are poorly known but petrography indicates probably compositions range from andesite to rhyolite.

INTRUSIVES

QTi **Intrusions (Holocene, Pleistocene, and Pliocene):** Dikes and plugs, shown mainly on the cross-section.

MAP SYMBOLS

Contact

Fault: Dashed where inferred; dotted where concealed; ball and bar on down-dropped side.

Crests of individual moraines

Locations of mountain peaks

Locations of K-Ar dating samples

Locations of temperature-gradient wells

Map compiled by David Sherrod, cross-section by B. Hill and D. Sherrod. Geology from Taylor (1968, 1981), Avramenko (1981), Dwire (1981), Black et al., (1987), and unpublished map data of G.W. Walker (1994). Isotopic age data from Taylor (1968, 1981), Armstrong et al., (1975), Fiebelkorn et al., (1981), unpublished data of B. Dalrymple (1982), and this report. Gravity cross section by D. Sherrod, based on data of Thiruvathukal et al., (1978), and Crosby et al., (1981).

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