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Geologic Map of the City of Tacoma, Pierce County, Washington

by

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Explanation

Holocene

af Artificial fill: topography modified by artificial deposition of vegetative debris, garbage, or other types of materials.

Qal Qp Qls

Qal: Alluvium; consists mostly of sand, silt, and clay deposited by the Puyallup River. Some gravel and organic-rich sediments may also be included in these flood plain deposits.

Qp: Peat; organic material deposited in swamps and bogs. May include small amounts of sand, silt, clay, and volcanic ash.

Qls: Landslides; deposits of slumps, slides, and flows. Included deposits and scarps of old, seemingly inactive, slumps as well as recently active landslides.

Quaternary

Pleistocene

Fraser Glaciation
Vashon Stade

Qv Vashon drift undifferentiated: Interbedded sand, gravel and silt. Occurs in northeast Tacoma. The deposit is unweathered and light gray in color.

Qvr Vashon recessional outwash: Light brown, loosely compacted sand and gravel. Stones are usually covered with a light brown dusty coating. Vashon recessional outwash usually occurs above and in direct contact with Vashon till, but meltwater streams may have eroded away the till, depositing the sand and gravel directly on older underlying units.

Qvt Vashon till: Poorly sorted, nonstratified lodgment till deposited as ground moraine. Mixture of clay, silt, sand, pebbles, and cobbles with occasional large boulders. Appears gray to blue on fresh surface; may weather to brown or yellow. Extremely compact; will stand in near vertical cliffs; generally lacks surficial cracks or joints. Stones are subangular to rounded. Some larger clasts show striations and faceting. Some areas mapped as Vashon till are covered by a thin veneer of loosely consolidated, nonsorted ablation till and(or) thin outwash.

Qva Vashon advance outwash: Light-gray, stratified, compact sand and gravel deposited by meltwater streams from the advancing Vashon glacier. Stones are well-rounded and not weathered.

Qe Esperance Sand: Thinly bedded, unweathered light-gray pebbly sand. May contain a few gravel lenses. Deposited by slow-moving meltwater streams from the advancing but distant Vashon glacier. Usually overlain by Vashon advance outwash or Vashon till.

Qns Qdr Qu

Qns: Pre-Fraser non-glacial sediments, undifferentiated; along Tacoma Narrows from Salmon Beach south to the Narrows bridge, consists of massive to thinly bedded gray to blue-gray compact silt and clay.

From the Tacoma smelter along Commencement Bay to downtown Tacoma, consists of massive, compact, blue-gray silt, sand, and brown to yellow-brown and gray silt and clay with peat and gravel in the lower one-half of the beach cliff. The gravel is devoid of granitic and metamorphic pebbles from the northern Cascades, and is rich in hypersthene-hornblende andesite pebbles from Mt. Rainier. The gravel and interbedded silts may represent deposits of a pre-Fraser Puyallup River.

Near Northeast Tacoma, Qns occurs as compact interbedded silts and sands, underlying Salmon Springs drift.

These deposits all occur stratigraphically beneath Vashon drift. Stratigraphic relations of these units to each other are not clear and correlations are therefore difficult. The deposits along the Narrows and Commencement Bay are possibly of the same age. Those along Commencement Bay have been mapped as Kitsap Formation (Walters & Kimmel, 1968) and may correlate with the Whidbey Formation in Kitsap County (Smith and Fiksdal, in press).

Qdr: Pre-Fraser drift, undifferentiated; mostly sand and gravel with some lenses of silt, clay, and till. Color varies from orange to gray. Stones are usually covered with iron oxide stain. Small zones of openwork gravel show dark-brown manganese oxide stain. Frequently granitic pebbles are completely disintegrated. Some volcanic clasts are also badly weathered and decomposed. Sands exhibit cross bedding, and frequently have incised channels filled with gravel. Till is very compact and varies from gray to oxidized orange. Silts are light gray to light brown and often contain a large amount of volcanic ash. Has been mapped as Salmon Springs Drift by Walters and Kimmel (1968).

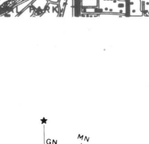
Qu: Pre-Fraser deposits, undifferentiated; occurs as interbedded silts, sands, peats and diamictons at Salmon Beach, and grades laterally into massive to medium bedded gray to blue-gray pebbly silt at Point Defiance. Deposit appears to be non-glacial at Salmon Beach, but a glacial facies is prominent at Point Defiance. Minor faulting and folding occur at Point Defiance, but do not extend upward past the erosional unconformity into the overlying sediments of the Fraser glaciation.

——— ----Contact between geologic units; dashed where approximately located; dotted where inferred.

References Cited

Smith, M., and Fiksdal, A., in press, Washington coastal zone altas, Kitsap County; Washington State Department of Ecology.

Walters, K.L., and Kimmel, G.F., 1968, Ground-water occurrence and stratigraphy of unconsolidated deposits, central Pierce County, Washington; Washington Department of Water Resources, Water Supply Bulletin No. 22, 428 p., 3 pl.



Base is parts of Poverty Bay, Tacoma North, Tacoma South, Gig Harbor, and Steilacoom 7 ½' Quadrangle Maps.

SCALE 1:24 000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER