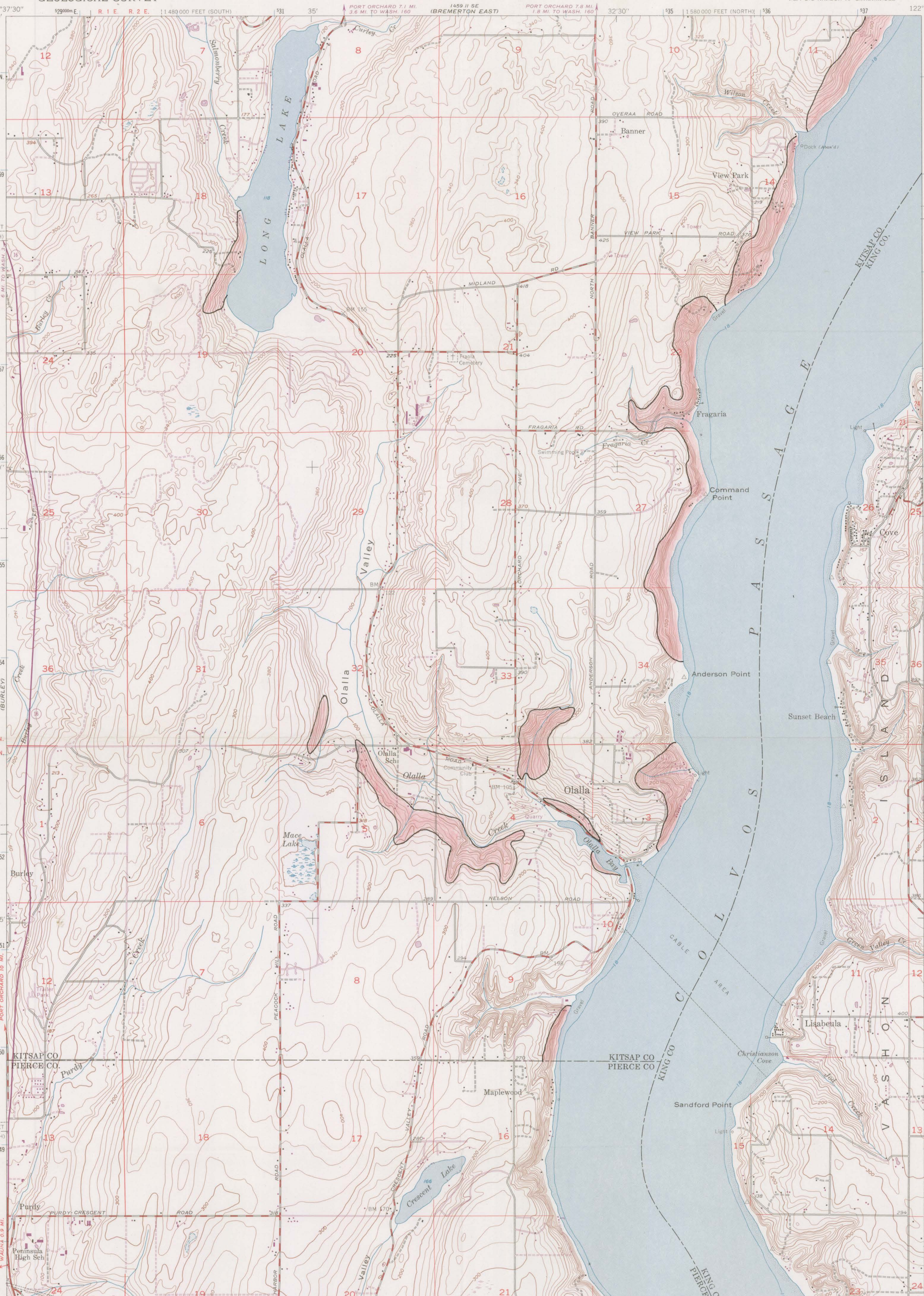
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OLALLA QUADRANGLE
WASHINGTON
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 GIG HARBOR 15' QUADRANGLE



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1951. Field check 1953

Polyconic projection. 1927 North American datum
10,000-foot grids based on Washington coordinate system, north and south zones

Hydrography from USC&GS chart 6460

1000-meter Universal Transverse Mercator grid ticks, zone 10, shown in blue

Revisions shown in purple compiled from aerial photographs taken 1968. This information not field checked

(FOX ISLAND) 1478 I SW

GN MN 0°19' 6 MILS 22° 391 MILS

UTM GRID AND 1968 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE AVERAGE RANGE OF TIDE IS APPROXIMATELY 8 FEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

WASHINGTON
QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty | Light-duty
Medium-duty | Unimproved dirt
State Route

(TACOMA NORTH) 1578 IV SW

OLALLA, WASH.
NE/4 GIG HARBOR 15' QUADRANGLE
N4722.5—W12230/7.5

1953
PHOTOREVISED 1968
AMS 1478 I NE—SERIES V891

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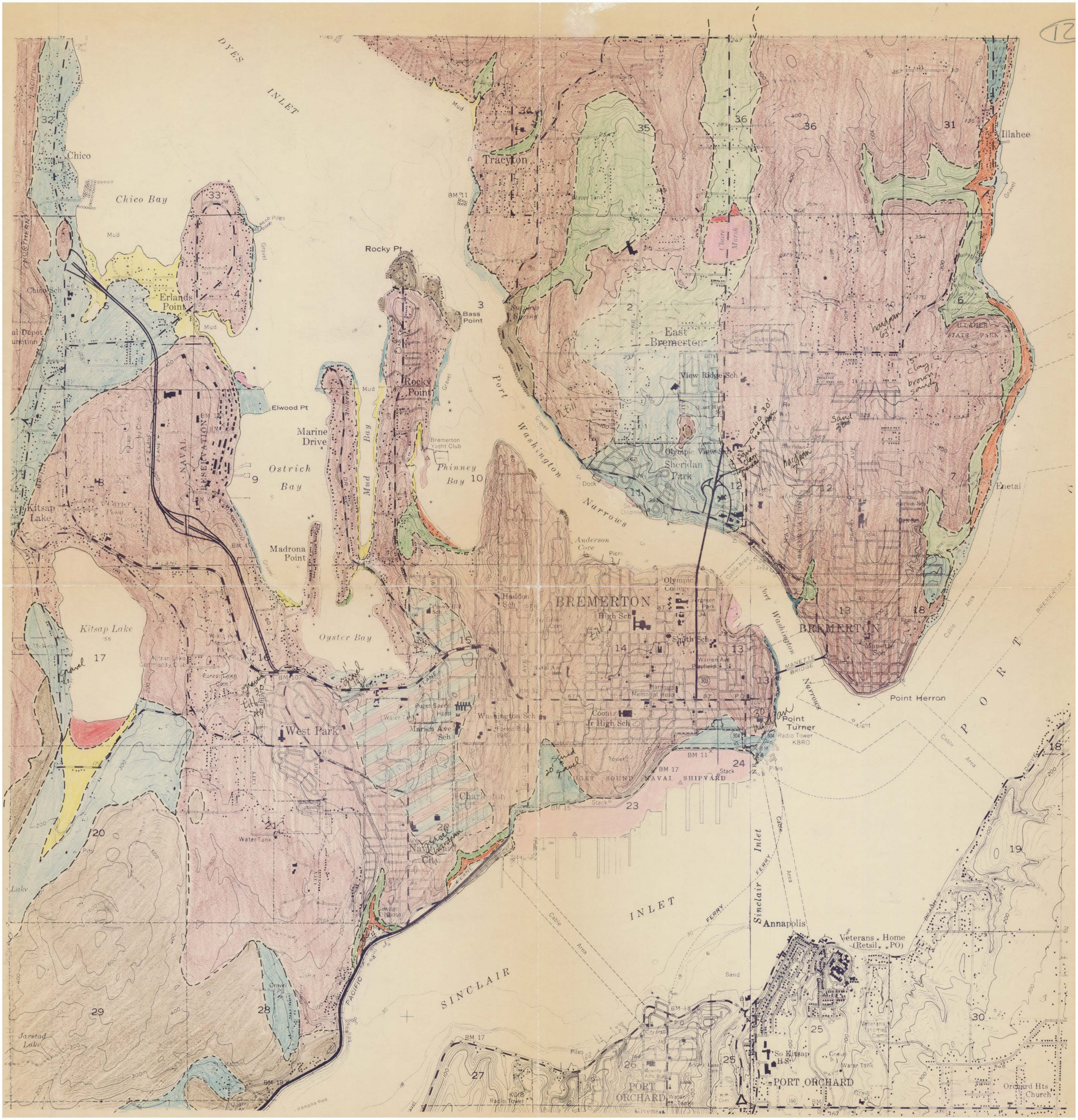
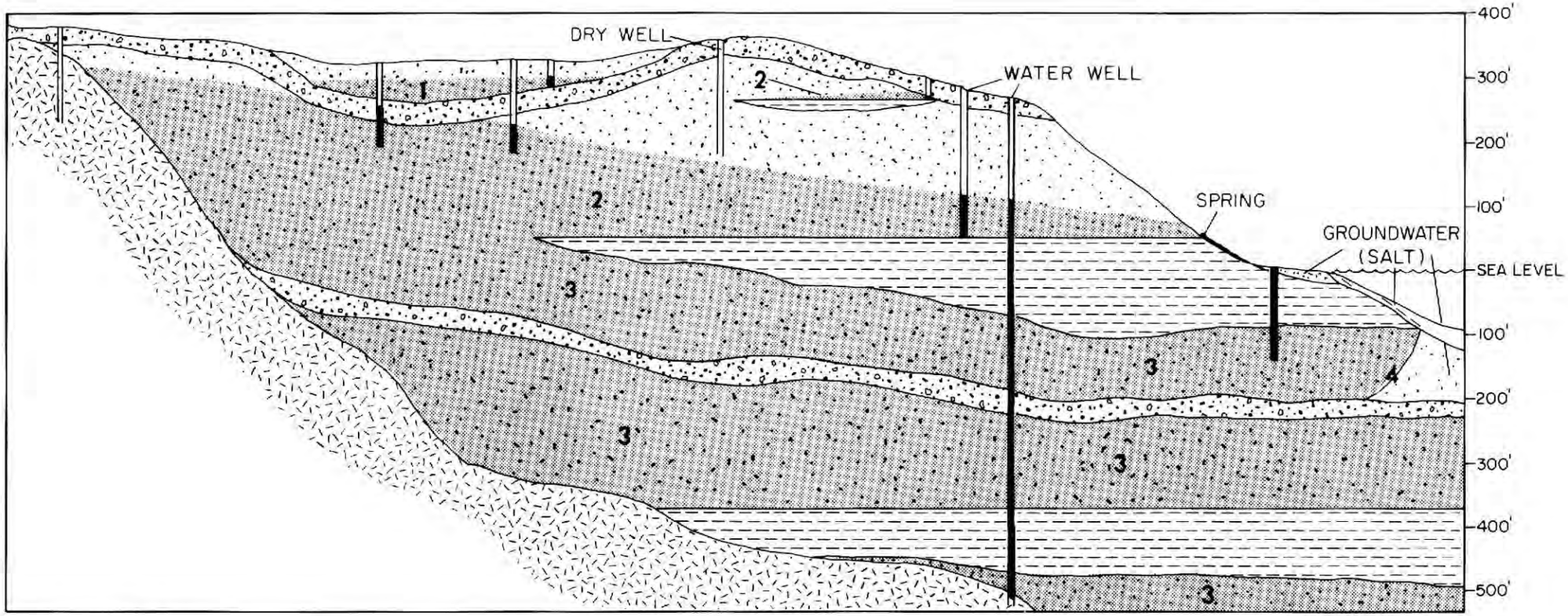


DYES INLET
Chico
Chico Bay
Chico Sch
Erlands Point
Mud
Piles
Gravel
Rocky Pt
Bass Point
Tracyton
Tracyton Cem
BM 11
Elwood Pt
Marine Drive
MARINE DR
Mud Bay
Rocky Point
Bremerton Yacht Club
Phinney Bay
Ostrich Bay
NAVAL RESERVATION
SHOREWOOD
Kitsap Lake
Carter Pond
Madrona Point
Oyster Bay
Kitsap Lake Community Club
Forest Lawn Cem
West Park
Puget Sound Hosp
Marion Ave Sch
Washington Sch
Forest Ridge Park
Charleston
Navy City
Water Tank
Gravel Pit
Sewage Disposal
Jarstad Lake
PACIFIC
NORTHERN PACIFIC
Sulphur Spring
Port Washington Narrows
East Bremerton
View Ridge Sch
East High Sch
Olympic View Sch
Sheridan Park
Claire Marsh
Substation
Illahee
ILLAHEE STATE PARK
Enetai
Anderson Cove
Piers
Dock
Sewage Disposal
BREMERTON
Olympic College
Evergreen Park
High Sch
Smith Sch
Warren Ave Playfield
Harrison Memorial Hosp
Coontz Jr High Sch
Haddon Sch
Naval Ave Sch
MANETTE BRIDGE
Manette Sch
Point Herron
Point Turner
Radio Tower KBRO
PUGET SOUND NAVAL SHIPYARD
Stack
BM 17
BM 15
Cable Area
PORT
SINCLAIR INLET
Sinclair Inlet
FERRY
Annapolis
Veterans Home (Retsil PO)
Veterans Home Cem
So Kitsap H S
PORT ORCHARD
City Hall
County Adm Bldg
Orchard Hts Church
KGY8 Radio Tower
Sand
BEACH DRIVE
hardpan 63'
15' clay, brown, sandy
Sand 20'
hardpan 7
3' sand clay gravel
-60 30' hardpan
17 till
till
gravel
gravel 30 till 40
gravel 14 till
20' Sand & gravel
30 hardpan
gravel hardpan

GEOLOGICAL MATERIALS MAP EXPLANATION -- BREMERTON

MAP UNIT	MATERIALS DESCRIPTION	IMPLICATIONS FOR LAND-USE PLANNING	GEOLOGIC HISTORY
COARSE-GRAINED DEPOSITS			
sand and gravel	Loose sand and pebble-to cobble-size gravel; locally contains some lenses of silt and clay and till-like material.	Permeability high. Easily excavatable. Good quality sand, gravel, and fill material. Good to excellent foundation material. Generally stable in slopes upto 57%, but much less when saturated with ground water. Landslides due to earthquake vibrations unlikely except on steep, saturated slopes.	"Vashon Advance Outwash and Vashon Recessional Outwash". Deposited by meltwater streams in front of the last Puget Sound glacier (13,500-15,000 years ago). Mostly "recessional gravel", that is, deposited as the glacier retreated toward the North, and therefore is a surficial deposit, usually overlying till. Some "advance gravel", that is, deposited as the glacier advanced toward the south, and therefore is usually buried beneath lodgement till.
sand	Loose fine to medium sand; well sorted (poorly graded); locally includes some thin beds of silt or beds of coarse sand and pebble gravel.	Permeability high. Easily excavatable. Good quality sand and fill material. Fair to excellent foundation material, but best on areas of little or no slope. Unstable on slopes steeper than 60%. Landsliding may occur when the unit is saturated with ground water due to an underlying impermeable layer. Earthquake vibrations may cause some ground settlement, and will increase the danger of landsliding.	Deposited by meltwater streams and lakes at a greater distance from the glacier than the sand and gravel. Sand exposed in gullies along sea cliffs is chiefly pre-Vashon glacier advance, commonly underlies till or advance gravels, and is an important aquifer. Surficial sand is chiefly post-Vashon glacier retreat, commonly overlies lodgement till, and often contains perched ground water.
FINE-GRAINED DEPOSITS			
recent silt-clay	Uncompacted silt, clay, and some very fine sand.	Permeability variable. Water table near surface. Fair foundation material. Differential settlement hazard great. Slope stability poor because of saturation. Differential settlement and ~~landslides~~ hazard is ~~hazards are~~ severe during earthquakes.	Deposited by marine tidal waters in protected bays; also deposits associated with Kitsap Lake. All younger than about 13,000 years.
older silt-clay	Compacted silt and clay; locally contains beds of sand, sand and gravel, and peat.	Permeability low; serves as an aquiclude, confining ground water below and perching ground water above. Generally poor foundation material. Slide hazards great, on slopes where saturated sand unit lies above the silt-clay. Landslide hazard will be increased during earthquakes	Deposited by non-glacial streams and lakes prior to the Vashon glaciation.

MAP UNIT	MATERIALS DESCRIPTION	IMPLICATIONS FOR LAND-USE PLANNING	GEOLOGIC HISTORY
FINE-GRAINED DEPOSITS			
recent peaty silt 	Decomposing vegetative matter mixed with lake mud.	Generally saturated with ground water which lies near the surface. Easily excavated. Poor foundation material. Differential settlement hazard is great because of irregularly spaced layers of highly compressible organic material. Differential settlement hazard is severe during earthquakes.	Bog and lake border deposits; younger than 13,000 years.
DEPOSITS OF MIXED COARSE-TO-FINE GRAINED SEDIMENT			
MIXED COARSE-AND FINE-GRAINED DEPOSITS			
till 	Very compact mixture of silt, sand, pebbles and cobbles; occassional boulders and lenses of sand and gravel; often covered with a thin deposit of loose sand and gravel (too thin to map).	Permeability very low; infiltration very slow. Difficult to excavate even with light power equipment. Foundation & slope stability excellent. Ground failure due to earthquake vibrations is unlikely except where underlying weaker material fails.	Deposited as "lodgement till", that is, plastered down along the base of moving glacier ice that was up 3000 feet thick. Fluctuations in the advance of the ice resulted in lenses of sand and gravel.
BEDROCK 	Highly consolidated sediments and volcanic rocks.	Permeability generally very low. Foundation and slope stability excellent in basalt flows and conglomerates; variable from fair to excellent in siltstones and sandstones. Ground failure due to earthquake vibrations unlikely.	Siltstones, sandstones, and conglomerates of the 30 million year old Blakely Formation, and basalt lava flows approximately 50 million years old. These rocks provide the base upon which the younger, unconsolidated deposits lie.
MODIFIED LAND 	Variable fill materials.	Engineering structures placed on land filled without engineering control may be susceptible to differential settlement. This hazard may especially occur where fill has been placed over compressible deposits such as peaty silts. Differential settlement may be severe during earthquakes.	
	Variable sand and gravel and till deposits.	See implications for sand and gravel and till.	Morainal deposits from the Vashon continental ice lobe.



EXPLANATION

- Sand or sand & gravel-acquifer
- Sand or sand & gravel-acquifer with fresh groundwater
- Silt-clay of low permeability
- Till of low permeability
- Bedrock of low permeability
- 1 Perched groundwater above till
- 2 Groundwater below surficial till but above sea level
- 3 Deep confined sand, and sand & gravel acquifers
- 4 Transitory saltwater-freshwater zone in groundwater. (moves inland during periods of low precipitation, as demands on groundwater increase, and as infiltration is decreased by urbanization.)