Introduction

A transgressive sequence of Holocene alluvial fan and fan - delta facies is mapped in the San Jose area that consists of continental sediment overlain in its distal portion by Bay Mud graded at the top to the modern San Francisco Bay; it overlies a similar Pleistocene sequence deposited during the previous sea - level rise to the high stand of oxygen - isotope stage 5. Each sequence consists of a fining upward section of alluvial gravel, sand, silt, and clay overlain at the distal margin by estuarine mud. A thick argillic soil formed on the older sequence prior to deposition of the younger sequence.

Mapping of these depositional facies emphasizes textural differences between the units and provides a model for reconstruction of the Quaternary sedimentary basin. The facies are mapped from depositional landforms observed on pre - development topographic maps and aerial photographs with subsurface control from numerous bore holes. Their ages are determined from age - calibrated soil stratigraphy, erosional morphology, and stratigraphic position.

Although deposition was controlled principally by climate and sea level, tectonic effects are evident along the margins of the valley, especially the southwestern margin where well developed alluvial fans lie in front of a band of thrust faults that offset the Quaternary section. These fans are both large and steep and display as many as four nested alluvial terraces. The eastern margin, in contrast, is marked by steeply dipping oblique reverse faults and lacks well - developed fans and nested terraces.

The spatial patterns of the depositional units allow prediction of flow paths of groundwater. Downward percolation of groundwater is restricted by a nearly impermeable hardpan in the buried soil on the older Quaternary sequence. Within each depositional sequence, groundwater moves bayward within the coarser, better sorted sediments deposited along and near the old stream courses.

Description of Map Units

GP Gravel Pits (Historic) -- Excavations in stream channels and Holocene alluvium for the purpose of extracting sand and gravel for aggregate in construction industries.

PP Percolation Ponds (Historic) -- Excavations made in Holocene alluvial fans (Qhaf) that may be filled with surface waters for the purpose of increasing recharge to groundwater storage.

Qhsc Stream Channel Deposits (Holocene) -- Poorly- to well- sorted sandy silt, silty sand, sand, or sandy gravel with minor cobbles and boulders. Many stream channels are presently lined with concrete or riprap. Engineering works such as diversion dams, drop structures, energy dissipaters, and percolation ponds also modify the original water course, and make observation of alluvial sediments very difficult.

Qhl Natural Levee Deposits (Holocene) -- Loose, moderate- to well- sorted sandy or clayey silt grading to sandy or silty clay. Levee deposits are generally well drained. Little change was noted in grain - size with distance downstream within the map area.

Qhfp1 and Qhfp2 Alluvial Terrace Deposits (Holocene) -- Qhfp1 and Qhfp2 are the first and second erosional terraces, respectively, cut into Qhfp and Qhl deposits. Deposits are generally less than 1 meter thick and consist of rounded gravel and historic artifacts in a clayey silt matrix. In several areas, these terraces have been used for landfills.

Qhfp Floodplain Deposits (Holocene) -- Medium to dark - gray, dense, sandy to silty clay. Lenses of coarser material (silt, sand, and pebbles) may be locally present.

Qhb Floodbasin Deposits (Holocene) -- Organic - rich clay to very fine silty-clay deposits occupying the lowest topographic positions between Holocene levee deposits or Holocene floodplain deposits.

Qhbs Floodbasin Deposits (salt-affected) (Holocene) -- Clay to very fine silty-clay deposits similar to the Qhb deposits except that they contain carbonate nodules and iron - stained mottles (Soil Conservation Service, 1958). These deposits may have been formed by the interaction of bicarbonate - rich upland water and saline water of the San Francisco Bay estuary. With minor exceptions, salt - affected basin deposits are in contact with estuary deposits, Qhbm.

Qhbm Estuary Deposits (bay mud) (Holocene) -- Water - saturated estuarine mud consisting predominantly of clay and silty clay underlying tidal mudflats, marshland and salt evaporators of San Francisco Bay. Qhbm deposits may contain shelly and peaty layers and interfinger with basin deposits, Qhb, and salt - affected basin deposits, Qhbs. Estuary sediments were deposited during and after Holocene sea level rise. Thickness of Holocene bay mud varies from approximately 0 to 10 m in this area (Sarna - Wojcicki, 1966, unpublished data).

Qhaf1 Younger Alluvial Fan Deposits (Holocene) -- Brown, poorly - sorted, dense, sandy or gravelly clay. Small fans at mountain fronts have a probable debris flow origin. Larger Qhaf1 fans away from mountain fronts may represent the modern loci of deposition for Qhaf.

Qhaf Alluvial Fan Deposits (Holocene) -- Brown or tan, medium dense to dense gravelly sand or sandy gravel that grades upward to sandy or silty clay. Near the distal fan edges, deposits are typically brown, medium dense gravelly sand or clayey gravel that grades upward to sandy or silty clay. Alluvial fan surfaces typically have slopes toward the basin of about 0.5% to 0.9% (5 to 9 m/km) but may be as high as 1.0% (10 m/km). The Qhaf surface displays striking channel ridges in places.

Qls Landslide Deposits (Pleistocene and/or Holocene) -- Poorly sorted mixtures of clay, silt, sand, gravel, and boulders.

Qpaf1 Alluvial Terrace Deposits (Pleistocene) -- Crudely - bedded, clast - supported, gravels, cobbles, and boulders with a sandy matrix. Clasts as much as 35 cm intermediate diameter are present. Coarse sand lenses may be locally present. Qpaf1 deposits are cut into Qpaf alluvial fan deposits a few meters and lie up to several meters above Holocene deposits.

Qpaf Alluvial Fan Deposits (Pleistocene) -- Brown, tan or reddish - brown, dense, gravelly and clayey sand or clayey gravel that fines upward to a sandy clay. Alluvial fan surfaces typically have slopes toward the basin of about 1.0% (10 m/km) but may be as high as 2.3% (23 m/km).

Qpoaf Older Alluvial Fan and Stream Deposits (Pleistocene) -- Brown to reddish - brown, deeply weathered, locally - derived, clast supported gravels.

QTsc Santa Clara Formation (Pliocene and Pleistocene) -- Poorly sorted, poorly consolidated boulder and gravel conglomerate with poorly sorted beds of sandstone, siltstone, and clay. These sediments are highly eroded in places, displaying more than 100 feet (30 m) of local relief, and are highly weathered.

br Undifferentiated Bedrock (Pliocene and older)