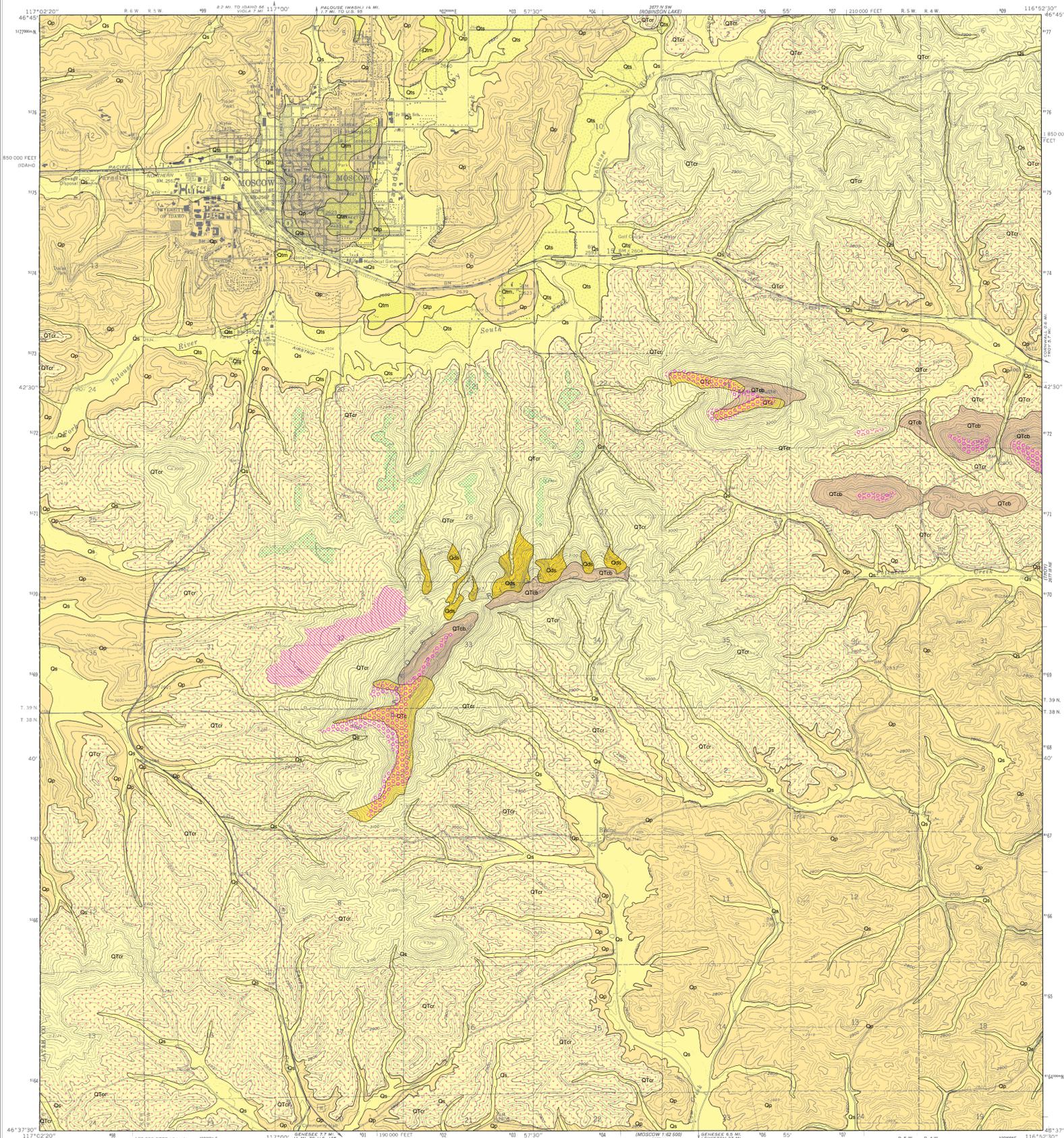
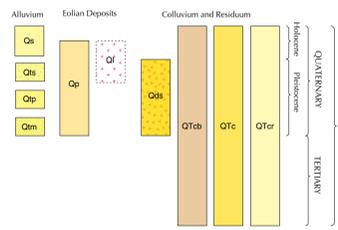


SURFICIAL GEOLOGIC MAP OF THE MOSCOW EAST QUADRANGLE AND PART OF THE MOSCOW WEST QUADRANGLE, LATAH COUNTY, IDAHO

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CORRELATION OF MAP UNITS



INTRODUCTION

The surficial geologic map of the Moscow East and Moscow West quadrangles identifies earth materials on the surface and in the shallow subsurface. It is intended for those interested in the area's natural resources, urban and rural growth, and private and public land development. The information relates to assessing diverse conditions and activities, such as slope stability, construction design, sewage drainage, solid waste sites, and the recharge of potable ground water. Details depicted at this scale provide an overview of the area's geology. Further intensive analyses at specific locations should be arranged through independent geotechnical specialists.

Combined with the adjoining surficial geologic map of the Robinson Lake and Viola quadrangles (Othberg and Breckenridge, 2001), the two maps cover the city of Moscow and surrounding area, from just south of Paradise Ridge to just north of the Palouse Range. This area encompasses the eastern part of the Moscow basin, which is bounded by the Cretaceous and Precambrian igneous and metamorphic rocks that compose the underlying basement rocks and the Northern Rocky Mountains. The Moscow basin is a long-lived system draining water westward off the Columbia River Plateau where the relatively flat region meets the mountains. A characteristic of these embayments is the accumulation of Miocene sediments between and on top of the basalt flows. The sediments were deposited by streams in the Moscow basin as the basalt plateau formed. Later, the cooler and drier climate of the Pleistocene brought on the cyclical deposition of wind-blown silt that constitutes the thick loess which composes the Palouse hills (see Figures 1 and 2), buries the plateau basalts, and blankets the foothills.

The maps on the bedrock geology of the Moscow East quadrangle by Bush and others (2000) and the Moscow West quadrangle by Bush and Provant (1998) show the basement rocks, the Columbia River basalt flows, and the Miocene sediments. The cross sections of these maps are especially useful for interpreting subsurface conditions suitable for siting water wells and assessing the extent and limits of ground water in the area.

DESCRIPTION OF MAP UNITS

ALLUVIUM

- Qs Stream-valley deposits (Holocene)**—Stream, slope-wash, and debris-flow deposits. Predominantly silt interbedded with silty sand, granules, and pebbles. Silt is mostly reworked loess; gravel fragments are basalt, granitoid mineral grains, and vein quartz. Stream channel and overbank deposits typically are thin and interfingering with laterally thickening deposits of slope wash and debris flows derived from erosion and mass wasting of the Palouse Formation. The channel and overbank sediments are deposited on beveled Miocene sediments (see Figures 1 and 2). Stream deposits in the upper reaches of Paradise Ridge are less silty and dominated more by poorly sorted, subangular to subrounded quartz granules and pebbles. Soils developed in these deposits include the Latahco, Palouse, and Westlake series (Barker, 1981).

EOLIAN DEPOSITS

- Qp Terrace alluvium of the South Fork of Palouse River (Pleistocene)**—First terrace above the Holocene flood plain; approximately 20 feet above the present channelway. Best preserved in sec. 10 and 15, T. 39 N., R. 5 W. Soils developed in these deposits include the Latahco and Palouse series (Barker, 1981).
- Qp Terrace alluvium of Paradise Valley (Pleistocene)**—Second terrace above the Holocene flood plain; approximately 40 feet above the present channelway. Best preserved in sec. 3, 11, 40 N., R. 5 W., and in sec. 4, T. 39 N., R. 5 W. Soils developed in these deposits include the Latahco and Palouse series (Barker, 1981).
- Qm Terrace alluvium of Moscow (Pleistocene)**—Third terrace above the Holocene flood plain; approximately 60 feet above the present channelway. Best preserved in sec. 8 and 17, T. 39 N., R. 5 W. May be composed of more than one level. The Palouse series is the predominant soil developed in these deposits (Barker, 1981).

COLLUVIUM AND RESIDIUM

- Qds Debris-flow and solifluction deposits (Pleistocene)**—Deposits composed of angular pebbles and cobbles in a silty sand matrix. Overlies weathered bedrock on steep, north-facing mountain slopes at elevations above 3,000 feet. Probably periglacial in origin and Pleistocene in age. Surface typically mantled by 3-5 feet of loess soils (Barker, 1981).
- Qtc Colluvium and bedrock that form erosion-resistant ridges (Quaternary and Tertiary)**—Colluvium composed of silty, sandy gravel. The gravel consists of granules and pebbles where derived from granitic rocks, and pebbles and cobbles where derived from quartzites. Ridges parallel the strike of the regional foliation and are prominent at higher elevations where physical weathering and erosion preclude colluvium from locally overlie deeply weathered rock. Soils developed in these deposits are predominantly the Spokane, Vassar, and Uvi series (Barker, 1981).
- Qtr Colluvium and common small rock outcrops (Quaternary and Tertiary)**—Colluvium composed of a silty or sandy gravel layer from 1 foot to more than 10 feet thick. The gravel consists of granules and pebbles where derived from granitic rocks, and pebbles and cobbles where derived from quartzites. Residuum is mostly a quartz-rich sandy saprolite that hardens with depth into solid rock. Colluvium is predominant at higher elevations and on steeper slopes, and is gradational with other units of colluvium and residuum. Residuum is thickest at lower elevations and on more gentle slopes. Soils developed in these deposits are predominantly the Spokane, Vassar, and Uvi series (Barker, 1981).

- Q Loss blanketing bedrock colluvium and residuum (Holocene and Pleistocene)**—Massive silty loess mostly deposited in the late Pleistocene and Holocene. Thickness is generally less than that of the Palouse Formation. Loess thins with the rise in elevation of the foothills. The transition from the plateau to the mountains at a local scale is gradual, so the boundary separating the Palouse Formation (Qp) from this unit is placed along the mapped contact between the Miocene and pre-Miocene rock units (Bush and others, 2000; Bush and Provant, 1998). Soils developed in these loess deposits include the Naff, Palouse, Southwick, and Taney series (Barker, 1981).

SYMBOLS

- Contact: Approximately located.
- Erosional or depositional surface graded to a base level ancestral to and higher than the present drainage system.
- Pediment: Beveled and graded to a base level approximately 100 feet above the present drainage system. Prior to extensive erosion, Miocene sediments may have composed a piedmont corresponding to this pediment surface.
- Patterned ground: Small circular mounds (5-15 feet in diameter) of silty deposits separated by stony inter-mound areas. May have developed during Pleistocene periglacial conditions.

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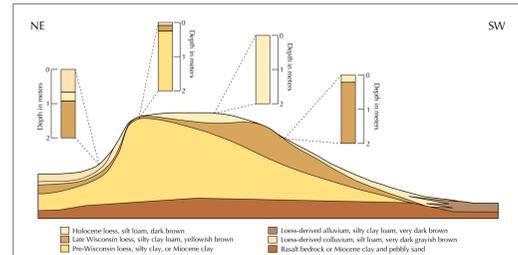
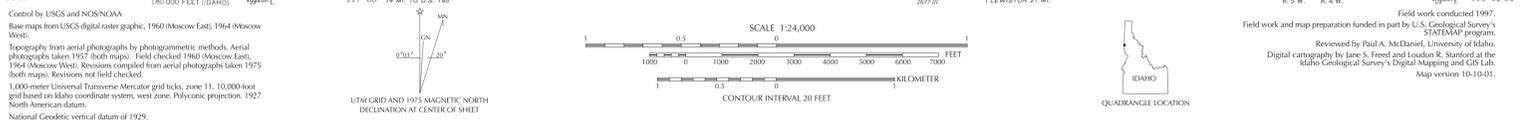


Figure 2. Schematic cross section supplied by Anthony T. O'Geen and Paul A. McDaniel, Soil Science Division, University of Idaho. Cross section is through a typical Palouse hill near Moscow and shows stratigraphy of loess units in the Palouse Formation (Qp) and soil textures at four different topographic positions. Clay mineralogy of soil B horizons is dominated by mica in the Holocene soil and by vermiculite in the late Wisconsin soil. Not to scale. Colors apply to this illustration only.

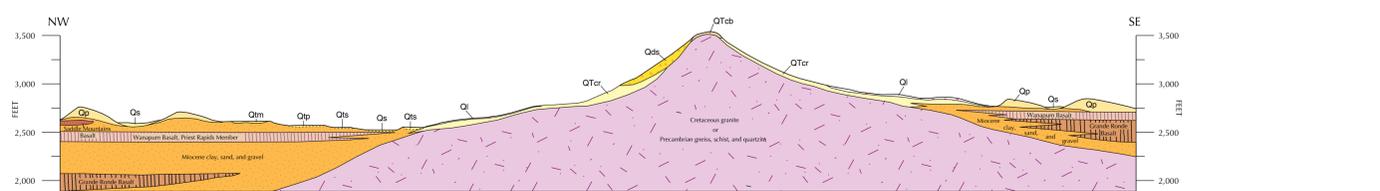


Figure 1. Schematic northwest-southeast cross section through the Moscow East and Moscow West quadrangles shows the stratigraphic and topographic relationships of units. Not to scale.