

Map Unit Properties Table

Age	Map Unit (Symbol)	Unit Description	Erosion Resistance	Suitability for Development	Hazards	Paleontologic Resources	Cultural Resources	Mineral Specimens	Karst Issues	Mineral Resources	Habitat	Recreation	Global Significance
QUATERNARY (HOLOCENE)	Alluvium (Qa)	Unit Qa contains broad deposits of sand, gravel, clay, and silt layers flanking active stream channels.	Very low	Avoid stream edge/riparian areas for heavy development, especially for wastewater-treatment facilities due to proximity to water and high permeability.	Unit Qa is associated with stream banks and riparian zones and may be unstable if exposed on a slope or saturated with water.	Modern remains	May contain artifacts and/or settlement sites along major waterways.	None documented	None	Sand, gravel, silt, clay.	Riparian zones and burrow habitat.	Unit Qa is suitable for some trail development.	Unit Qa contains a record of modern stream-valley development throughout the Quaternary.
QUATERNARY (HOLOCENE AND PLEISTOCENE)	Terrace deposits, low level (Qt)	Unit Qt deposits are concentrated near stream confluences and contain reworked alluvial sand, gravel, silt, and clay as well as larger colluvium clasts.	Very low	Avoid most terrace deposits for heavy development due to instability of slopes and high permeability.	Unit is associated with stream-edge slopes deposited by gravity and water.	May contain modern remains and plant fragments, pollen(?).	May contain artifacts and/or settlement sites along major waterways.	None documented	None	Cobbles, gravel, sand.	Forms upland areas supporting larger trees and bushes with more soil development along waterways.	Suitable for most recreation unless unstable slopes are present.	Terrace units record the evolution of local waterways and changes in channel morphology.
EARLY JURASSIC AND LATE TRIASSIC	Diabase dikes and sills (JTRd)	Unit contains linear, nearly vertical dikes and nearly horizontal sheets (sills) of dark to black diabase. These intrusions are rimmed with gray hornfels (JTRtm) formed through contact metamorphism. Units are cut by normal faults and are commonly marked by light-gray, subrounded cobbles and boulders of float. Most cobbles weather to a rust color.	Very high	Unit acts as an aquitard.	Rockfall possible where unit is exposed on high-angle slopes.	None	Cobbles may have been used as weapons of last resort during Civil War battles.	Coarse-grained crystalline diabase.	None	Attractive fieldstone.	Unit retards percolating water and commonly hosts perched swamp areas.	Cobbles and boulders of unit present at the surface may be unstable trail base.	Unit is cut by normal faults providing a relative dating of extension in the area. Ar40/Ar39 age of amphibole grains is ≈200 million years.
LATE JURASSIC AND EARLY TRIASSIC	Thermally metamorphosed rocks (JTRtm)	Unit is hornfels formed through contact metamorphism upon intrusion of dikes and sills of unit JTRd. Hornfels was originally siltstone, shale, and sandstone and appears light-grayish green, very fine grained, and brittle. Siltstone and shale were metamorphosed to cordierite-spotted hornfels in the inner aureole closest to the diabase. The outer aureole is epidote-chlorite hornfels. Sandstone was metamorphosed to tourmaline granofels and quartzite.	High	Suitable for most forms of development unless brittle and highly fractured.	Units may pose rockfall hazard if exposed on slopes.	None documented	Unit underlies strategic ridges (Battery Heights, Stony Ridge, for example) at Manassas used for advantage during Civil War battles; cobbles were also used as weapons of last resort.	Porphyroblast minerals include cordierite, epidote, chlorite, tourmaline.	None	Quartzite for building material, abrasives.	Unit supports upland forest development.	Suitable for most recreation unless highly fractured.	Unit records extensive intrusion during Triassic basin extension.
TRIASSIC	Chatham Group, Groveton Member of the Bull Run Formation (TRbg)	Unit contains gray-brown and red siltstone and sandy shale. These layers are present in thin beds with silty and sandy shale interlayered with clayey and sandy siltstone in cyclic sequences as much as 33 ft thick. Some dark-gray lacustrine clays are poorly exposed and weather to reddish or gray soils.	Moderate	Suitable for most development except in clay-rich areas and fractured layers.	Unit may contain slippery shrink-and-swell clays; heterogeneous nature of unit may render it unstable on slopes and prone to mass wasting.	Fish fossils (teeth and scales), notostracans (<i>Triops cf. cancriformis</i> ; tadpole shrimp) conchostracans (<i>Cyzicus</i> sp.; clam shrimp), ostracodes (<i>Darwinula</i> sp.), insects (staphylinid beetle), plant remains, spores, pollen, lacustrine stromatolites, ichnofossils (<i>Gwyneddichnium majore</i>), crustaceans, mollusks, reptile footprints, gastroliths, parasuchian remains.	Red shale from this unit was used to construct several historical structures in the area as well as the stone bridge at Bull Run.	None documented	Not enough carbonate present.	Red shale and sandstone make good dimension stone for building material.	Unit weathers to a shale-rich soil.	Unit is suitable for most recreation unless rich in clay.	Unit records lacustrine environments in basins during active Triassic extension events.