

Pedotype	Horizons and Thicknesses	Macromorphology	Micromorphology	Clay Mineralogy	Variation	Classification (Mack/Soil Survey)
PT1 S1:27–33 S2:25–30 S3:21–26	A: 20–46 cm B: 40–93 cm Bc: 30–60 cm Bk: 20–45 cm Bkg: 77 cm Bss: 35–63 cm Bgc: 80 cm Bg: 30–80 cm BC: 20–40 cm BCg: 10–40 cm BCgc: 70 cm Total: 0.5–1.6 m	Very dusky purple (5p 2/2) and blackish red (5R 2/2) to grayish blue green (5BG 5/2) and grayish olive (10y 4/2) Highly calcareous, organic-matter-rich mudstone Weak horizonation with local moderately developed Bk horizons Disperse pedogenic carbonate nodules and limestone clasts (<2 – 45 mm diameter). Slickensides, wedge-shaped and prismatic peds, crack infills, massive to elongate yellow and green mottling Rhizoliths: abundant vertically oriented and laterally branching yellow, green, and gray with some organic cores (<1 – 26 mm diameter) Burrows: heterogeneous filled, meniscate backfilled, and red-rimmed	Plasmic microfabric: calciasepic to inundulic Grain microfabric: intertextic to porphyroskelic Grains: calcite microspar, quartz, rock fragments (ostracodal biomicrite or poorly laminated micrites), shell fragments, bone, teeth, fecal material, carbonate nodules (may be cracked) Opagues: illuviated organics, carbonized roots, euhedral to irregular pyrite, iron minerals, manganese dendrites Peds: wedge-shaped, blocky, angular blocky, prismatic	Calcite, smectite, illite and mica, ankerite	Profile thickness and extent of redoximorphic features may vary	vertic Calcisols and gleyed vertic Calcisols / dry climate Vertisols: Torrerts or Xererts
PT2 MPT2 S1:22–25 S2:20–23 S3:16–19 DPT2 S1:2–5 S2:2–6 S3:3–6	Total: 0.2–0.9 m Bg: 15–52 cm Btg: 20–47 cm Bk: 24 cm BC: 15–42 cm BCn: 40 cm BCgn: 30 cm C: 14–55 cm – A: 7 cm Ag: 10–20 cm Agk: 20 cm B: 5–38 cm Bss: 15–40 cm Bssg: 12–38 cm Btss: 20 cm BC: 8–12 cm BCg: 13–20 cm	Grayish green (10G 4/2) to grayish blue green (5BG 5/2); transition to dusky brown (5YR 2/2) up profile Weakly calcareous mudstone Abundant, small calcareous nodules, common relict bedding, platy peds, small clay skins, few slickensides, abundant plant fossil impressions Rhizoliths: Typically horizontally oriented, 20–40 cm deep, dominated by calcareous rhizotubules with lesser rhizoconcretions and rhizohaloes Burrows: abundant homogeneous and heterogeneous fill; vertically to horizontally oriented, widely distributed DPT2 paleosols contain more red-brown, dark gray, or dark yellow stain and illuviated clay features than MPT2 paleosols	Plasmic microfabric: inundulic to argillic lower profile, and insepic, mosepic, and rarely omniseptic upper profile Grain microfabric: granule to porphyroskelic up section Grains: micas, quartz, plagioclase, calcite Opagues: carbonized roots and rhizoids, manganese dendrites	Illite and mica, kaolinite, chlorite Illite and mica, kaolinite	Grayish green micritic lime mudstone lenses with gastropods, rhizotubules and mosepic to undulic birefringent clays present in some MPT2 paleosols More vertically oriented rhizohaloes or carbonaceous cores	MPT2: gleyed argillic Protosols / gleyed Inceptisols DPT2: argillic Protosols / Inceptisols

<p>PT3</p> <p>S1:18–21 S2:19 S3:16–17</p>	<p>O: 3–10 cm A: 15 cm B: 15 cm Bg: 30–80 cm Bk: 10–20 cm Bkg: 48 cm Bkss: 45 cm Bki: 40 cm Bgk: 17 cm Bssg: 40 cm Bgkss: 90 cm Bgss: 25 cm C: 30 cm Cg: 33 cm</p> <p>Total: 1.6–2.7 m</p>	<p>Upper profiles (0.45–0.65 m): dark reddish brown (10R 3/4) to dusky brown (5YR 2/2) mudstone with abundant yellow to green mottles, and large slickensides capped by a thin (2–5 cm) banded, organic-rich claystone</p> <p>Lower profiles (1.0–1.9 m): grayish green (10G 4/2) mudstone, generally highly calcareous, with abundant, dispersed carbonate nodules</p> <p>Rhizoliths (upper profile): yellow and green rhizohaloes dominate, lesser rhizotubules, red rhizohaloes, and ferruginous rhizoconcretions</p> <p>Rhizoliths (lower profile): red rhizohaloes, carbonaceous roots in calcareous nodules</p> <p>Burrows (upper profile): horizontally to vertically oriented, sinuous to straight burrows with or w/o chambers or Y-shaped branches; green mottled, sinuous to O-shaped burrows</p> <p>Burrows (lower profile): few clay-lined burrows and heterogeneous filled burrows</p>	<p>Plasmic microfabric: argillasepic to insepic but also crystic or calciasepic</p> <p>Grain microfabric: porphyroskelic or agglomeroplasmic</p> <p>(Upper profile): insepic and agglomeroplasmic</p> <p>(Lower profile): argillic and porphyroskelic</p> <p>Grains: quartz, calcite, and iron nodules</p> <p>Opaques: organics as flecks or alternating layers with oriented clay, carbonized roots in nodules</p>	<p>Illite/ smectite with 30% smectite, illite and mica.</p>		<p>gleyed vertic Calcisol / calcic Vertisol</p>
<p>PT4A</p> <p>S1:13–15 S2:13–15 S3:11–12</p> <p>PT4B</p> <p>S1:15, 17 S2:15–18 S3:13–15</p>	<p>A: 22–27 cm Ag: 18–27 cm B: 46 cm Bc: 20 cm Bt: 20 cm Bss: 32–108 cm Bssc: 30 cm Bkss: 37–40 cm BC: 60 cm</p> <p>Total: 0.35–2.4m</p> <p>Ag: 5–12 cm ABss: 58 cm Bg: 20 cm Bk: 9 cm Btg: 38 cm Btss: 58 cm Bss: 23 cm Bssg: 15 cm Bc: 15–30 cm Bcss: 57 cm BC: 15–17 cm C: 5–20 cm Cg: 51 cm</p> <p>Total: 0.4–1.3 m</p>	<p>Dusky red purple (5RP 2/2) to moderate brown (5YR 4/4) with grayish brown (5YR 3/2) mudstone with abundant green mottles, dispersed to concentrated carbonate nodules, and large-scale slickensides</p> <p>Rhizoliths: Green rhizohaloes and calcareous rhizotubules, large calcareous rhizoconcretions, rare green mudstone root casts</p> <p>Dusky red purple (5RP 2/2) and dark reddish brown (10R 3/4) to dusky yellow green (5GY 5/2) and pale green (10G 6/2) mudstone with abundant yellow mottles, large-scale slickensides, prismatic peds, concretions and pedotubules composed of iron, manganese, siderite, and calcite, and rare carbonate nodules</p> <p>Rhizoliths: dense, horizontally to subvertically oriented, yellow cored rhizohaloes with thin green rims, tubular rhizoconcretions (hematite, manganese oxides, goethite, and calcite); organic roots cores common in PT4B paleosols</p> <p>Burrows: tightly meniscate, horizontally oriented, and back-filled burrows</p>	<p>–</p> <p>Plasmic microfabric: argillasepic</p> <p>Grains: primarily clay, few small quartz fragments, occasional coarsely crystalline calcite spar</p> <p>Opaques: iron oxides, some alternations of clay and organics</p>	<p>Illite and mica, hematite, ordered mixed-layer illite/smectite with 30% smectite, and kaolinite</p> <p>Illite and mica, kaolinite, ordered mixed-layer illite and smectite with 20% smectite, chlorite, quartz, and hematite</p>	<p>Subtle changes in the distribution and abundance of calcareous features and organics allows the distinction between PT4A and PT4B paleosols.</p>	<p>calcic Vertisol</p> <p>gleyed Vertisol or ferric concretionary Vertisol</p>

PT5 S1:16	Ag: 25 cm Bg: 52 cm Cg: 15 cm Total: 92 cm	Dusky blue green (5BG 3/2), non-calcareous silty mudstone with platy peds, and flattened, irregular, moderate yellowish brown (10YR 5/4) goethite (?) nodules Rhizoliths: large, calcareous, vertically to horizontally oriented root casts	Plasmic microfabric: argillasepic to insepic Grain microfabric: porphyroskelic, rarely intertextic Grains: dominantly clay-sized, quartz, calcite, chlorite. Opaques: indistinct	Illite and mica, kaolinite, ordered mixed-layer illite/smectite with 30% smectite, chlorite		gleyed Protosol / gleyed Inceptisol
PT6 S1:9-12 S2:10-12 S3:10-11	A: 23 cm B: 42-62 cm Bss: 38-90 cm Bssg: 14 cm BC: 31-41 cm C: 60 cm Total: 0.3-1.5 m	Grayish brown (5YR 3/2) mudstone, relict bedding, weak platy peds, abundant to rare clay skins, rare slickensides, compression plant fossils Rhizoliths: abundant, vertically to horizontally oriented, small green rhizohaloes, lesser yellow rhizohaloes Burrows: typically horizontally oriented with red or darkened rims and green centers, horizontally to vertically oriented with larger-grained heterogeneous-fill	Plasmic microfabric: argillasepic to insepic Grain microfabric: porphyroskelic to granular. Grains: quartz, micas, and large angular or rounded clasts of bright clay in a dark red matrix Opaques: organics commonly surrounded in lighter clay	Illite and mica, hematite, kaolinite	Interbedded with bedded mudstone with minor to no pedogenesis	Protosol / Entisol or Inceptisol
PT7 S1:1 S2:1 S3:1-2	A: 10-12 cm B: 32 cm Bg: 8-20 cm Bk: 40-50 cm Bkg: 10 cm Bss: 50-178 cm C: 40 cm Cg: 17-24 cm Total: 2.1-2.3 m	Dark reddish brown (10R 3/4) to grayish brown (5YR 3/2) highly bioturbated, calcareous mudstone with abundant large-scale slickensides, small, dispersed calcareous nodules Common wedge-shaped and blocky peds Rhizoliths: common vertical to horizontally oriented green rhizohaloes with organic cores; subhorizontally oriented calcareous rhizotubules; rare yellow and red rhizohaloes; rhizoliths occur up to 1.9 m down profile Burrows: variably oriented, actively backfilled tunnels, mottled, and finer-grained heterogeneous fill burrows	Plasmic microfabric: argillasepic to inundulic Grain microfabric: intertextic to porphyroskelic Grains: shell fragments, quartz, calcite, micas, light-colored clay, and small grain aggregates Opaques: organic fragments; iron staining is pervasive	(Upper 30 cm): ordered mixed-layer illite/smectite with 30% smectite, illite and mica, calcite, hematite (Lower Profile): kaolinite, illite and mica, chlorite	Bottom 20-30 cm is typically larger-grained and pale green to blue green Upper portions may contain calcite spar as void fills	Vertisol