



Wilkins Peak and Tipton Shale Members, undivided—Combined on cross section A-A' because Tipton is too thin to be Wilkins Peak Member—Green, brown, and gray tuffaceous sandstone, shale, and marlstone, with evaporites (halite, trona, nacholite, and related minerals) in subsurface sections (Love and Christiansen, 1985); deposited mostly in the Uinta Mountain trough and in the deeper parts of the southern Green River and southwestern Washakie basins. Total thickness ranges from 0 to more than 370 m (1,200 feet); composed of a lower part ranging from 0 to 60 m (200 feet) thick, a middle

Sandstone Lentil but this name was abandoned by Culbertson (1962); the sequence was renamed and became part of the Sand Individuals with disabilities who require an alternative form of this publication should contact the WSGS (see contact information above). TTY relay operator 800-877-9975. For more information about the WSGS or to order publications and maps, please go to www.wsgs.uwyo.edu, call 307-766-2286, ext. 224, or e-mail

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Precambrian crystalline rocks—Shown on cross section only **p€** Precambrian basement undifferentiated

part of formation has been removed by erosion, creating the topographically low Baxter Basin; contact with overlying Blair Formation is preserved on east and west sides of Baxter Basin Mesozoic and Paleozoic sedimentary rocks—Shown on cross section only Kft Frontier Formation (Upper Cretaceous), Mowry Shale (Upper Cretaceous), Muddy Sandstone (Lower Cretaceous), and Thermopolis Shale (Lower Cretaceous), undivided KJ Cloverly (or Dakota) (Lower Cretaceous), Morrison (Upper Jurassic), Sundance (or Curtis Formation and Entrada Sandstone) (Middle Jurassic), and Gypsum Spring (or Twin Creek Limestone or Carmel Formation (Middle Jurassic) Formations, undivided Nugget Sandstone [Jurassic (?) and Triassic (?)]

^{Pwr} Weber Sandstone (Upper Pennsylvanian), Morgan Formation (Middle Pennsylvanian), and Round Valley Limestone

trough cross-beds; deposited in marine shelf and slope; 394 m (1,293 feet) thick north of Rock Springs

deposited in a delta plain environment; the delta environments grade eastward into marine shoreline sandstone deposits and farther eastward into marine shelf, slope, and basin environments. Thickness ranges from a maximum of 507 m (1,665 feet) north of Rock Springs to approximately 335 m (1,100 feet) in the southeastern RSU (Roehler, 1990)

Kbl

Blair Formation—Shale, dark gray with thin interbedded very fine-grained tan sandstone and siltstone, and rare thin layers of rounded limy siltstone concretions; most sandstone occurs in thin parallel beds or parallel laminae, some small-scale

Kba Baxter Shale—Gray to black soft sandy shale and shaly sandstone; thickness from 1,200 m (3,930 feet) to approximately 1,370

m (4,500 feet) thick (Roehler, 1990), but base of unit not exposed in the RSU. Occupies central part of RSU where upper

Rcd Chugwater (Upper and Lower Triassic) and Dinwoody (Lower Triassic) Formations, undivided

Madison Limestone (Mississippian) and Darby Formation (Upper Devonian), undivided

Phosphoria Formation and related rocks (Permian)

(Middle and Lower Pennsylvanian), undivided

^{€u} Cambrian rocks undifferentiated (Upper and Middle Cambrian)

upper member is absent south of Rock Springs where it is unconformably overlain by Fort Union Formation

consisting of tan or light-gray, very fine to fine-grained sandstone and medium-gray to gray-green shale. Upper part of the **Rock Springs Formation**—White to brown sandstone, shale, carbonaceous shale, and claystone with numerous coal beds

middle Rusty zone, and upper Canyon Creek Member (Smith, 1961). upper and lower members mostly fresh-water sandstones deposited in an alluvial plain, middle member is mostly non-carbonaceous, fresh-water flood plain deposits,

shoreline sandstones that prograde into marine shales eastward into marine shales of the Lewis Shale (Roehler, 1990). Roehler (1990) measured a maximum of 190 m (623 feet) of Almond Formation north of Rock Springs. Thins by erosion to a feather edge approximately 2.4 km (1.5 miles) south of the I-80 route through White Mountain and unconformably overlain by Fort Union Formation **Ericson Sandstone**—White massive sandstone, lenticular chert-grit conglomerate in upper part; 143 m (471 feet) thick north of Rock Springs; 107 m (350 feet) thick directly south of quadrangle (Kirschbaum, 1986); divided into lower Trail Member,

Mesaverde Group—Total thickness is approximately 1,070 m (3,500 feet) (Roehler, 1993), ranging from less than 600 m (2,000 feet) to more than 1,500 m (5,000 feet) (Roehler, 1990). The group consists of four formations, in descending stratigraphic order (shown below). Combined as one unit in western part of cross section A-A' Almond Formation—White and brown soft sandstone, gray sandy shale, coal, and carbonaceous shale; lower part of formation predominantly gray carbonaceous shale and thin interbedded gray shale and sandstone, with rare thin beds of coal deposited in coastal plain environment; middle of formation mostly carbonaceous shales, bay-fill shales, splay sandstones, and coal beds deposited in a barrier plain/marsh environment; upper part of formation mostly linear sheets of marine

feather edge farther north and is absent along west side of uplift where it has been removed by post-Lance erosion

Kfl Fox Hills Sandstone and Lewis Shale, undivided—Combined only on cross section A-A' **Fox Hills Sandstone**—Tan, brown, gray, or white sandstone and some interbedded tan or brown siltstone and gray shale; local

interbeds of gray dolomite, gray or brown carbonaceous shale, and coal; thickness ranges from 23 to 69 m (75 to 225 feet) on east side of RSU (Roehler, 1993) but is only 14 m (45 feet) thick 3.2 km (2 miles) east of South Table Mountain, thinning to approximately 3 m (10 feet) where it crops out in northeastern corner of map area (west of North Table Mountain). Thins to

Lewis Shale—Dark gray shale and some thin, interbedded, ledge-forming tan or brown very fine to fine-grained sandstone and siltstone; some dolomite concretions; deposited in nearshore marine environment; upper part intertongues with Fox Hills Sandstone; thickness from 180 to 210 m (600 to 700 feet) (Roehler, 1993) in most of RSU. Maximum thickness in northeastern corner of map approximately 203 m (665 feet), but thins to 35 m (115 feet) on northwest limb of RSU anticline

to a feather edge in sec. 4, T. 22 N., R. 104 W. (Roehler, 1983 and unpublished measured sections); completely absent on remainder of west side of uplift but present in subsurface west of White Mountain

Kle

progressively older rocks from the Lance in the north to the upper Ericson south of Rock Springs Upper Cretaceous sedimentary rocks **K Lance Formation**—Interbedded tan and gray sandstone and siltstone, gray shale, dark-gray and dark-brown carbonaceous shale, and coal; dolomite and hematite concretions common; thickness up to but only 88 m (290 feet) exposed in northeastern corner of map (Roehler, 1983 and unpublished measured sections), thins to feather edge on northern plunge of anticline, and completely absent on west side of Rock Springs uplift (RSU) where it has been removed by post-Lance erosion. Present in drill holes west of White Mountain where reported thickness averages 182 m (597 feet)

where the Luman Tongue pinches out

Main body of Wasatch Formation (lower Eocene)—Drab sandstone, drab to variegated claystone and siltstone like Wasatch Formation (above); middle part of unit south of Bitter Creek is a red sandstone facies, brick red to dull purplish-red, coarse-grained, cross-bedded, locally gravelly or conglomeratic, 60 m (about 200 feet) thick (Bradley, 1964, p. A23). Total thickness of unit (including Niland Tongue) approximately 540 m (1,780 feet), measured 4.8 km (3 miles) north of Rock Springs (Bradley, 1964, p. A22). Separated from Niland Tongue of the Wasatch Formation in southern part of map area by the Luman Tongue of Green River Formation (Roehler, 1977) Niland Tongue of Wasatch Formation—Mostly mudstone, gray, green and variegated with maroon and red beds, silty to sandy, in thin and thick beds; some sandstone, gray, very fine to medium-grained, calcareous, in 0.9 to 1.2 m (3 and 4 feet) thick beds; general lithology similar to main body of Wasatch; thickness from 61 m to 112 m (200 to 369 feet) (Roehler,

and Niland Tongue and shown on cross section A-A?as part of Wasatch Formation (Tw) Formation; thickness varies from approximately 300 m (1,000 feet) in outcrops in the central and northern RSU (Roehler, 1992b) to 540 m ((1,780 feet) in western part of quadrangle

carbonaceous shale beds, to approximately 3.7 m (12 feet) thick north and south of Bitter Creek to a feather edge

approximately 16 km (10 miles) north in sec. 20, T. 20 N., R. 105 W. (Roehler, 1977). Combined with main body of Wasatch Wasatch Formation (lower Eocene)—On cross section only; includes Main body and Niland Tongue of Wasatch. Drab

Tipton Shale Member—Dark brown and gray oil shale and marlstone, thin interbedded tan algal limestone and tan-brown dolomite; thin gray tuff beds, and thin beds of fossiliferous sandstone and interbedded carbonaceous shale near base; general thickness within Green River Basin 48 to 56 m (158 to 183 feet); thickness on Rock Springs 1:100,000-scale quadrangle ranges from 6.7 to 47 m (22 to 153 feet) along White Mountain and averages 19 m (63 feet) thick (Roehler, unpublished

Luman Tongue—Consists of a thin tongue of brownish-buff lacustrine rocks mapped from south of Bitter Creek into the

ostracodal limestones; some gray sandstone, very fine grained and limy; some thin siltstones and mudstones. Thins from over 61 m (200 feet) thick south of quadrangle, where it contains oil shale, mudstone, gray and red sandstone, thin coal and

sandstone, drab to variegated claystone and siltstone interfingering with locally derived conglomerates around basin margins; interfingers primarily through changes in depositional environments with members and tongues of the Green River

1977); separates Luman Tongue and Tipton Member of Green River Formation and merges with main body of Wasatch

1985); thickness ranges from 305 to 580 m (1,000 to 1,900 feet) (Lillegraven, 1990) in the Green River Basin, but thickness on the Rock Springs 30' x 60' Ouadrangle is approximately 426 m ((1.400 feet). Unconformably overlies and truncates

Tfu Fort Union Formation (Paleocene)—Brown to gray sandstone, gray to black shale, and coal beds (Love and Christiansen,

southern third of White Mountain (Roehler, 1977); separated from Tipton Member by Niland Tongue of the Wasatch Formation. Northernmost exposures are brown oil shales, papery and flaky, with abundant ostracodes and interlaminated gray

measured sections)



MAP SERIES MS-96

Rock Springs 1:100,000 - scale

Bedrock Geologic Map

Version 1.1 December 2010

EXPLANATION

CORRELATION OF MAP UNITS

Eocene

Cretaceou