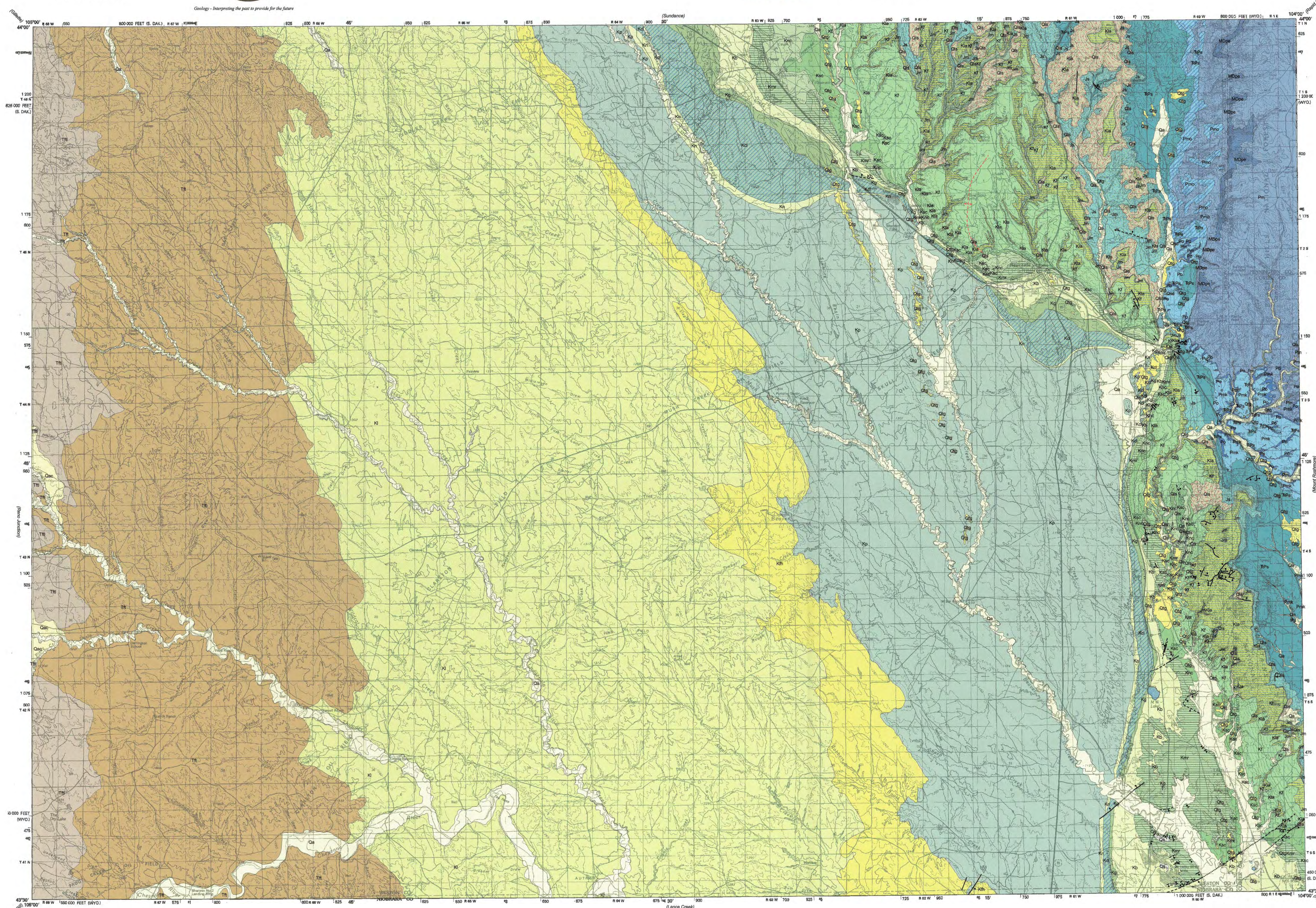




Geology - Interpreting the past to provide for the future



Prepared in cooperation with the
 U.S. GEOLOGICAL SURVEY



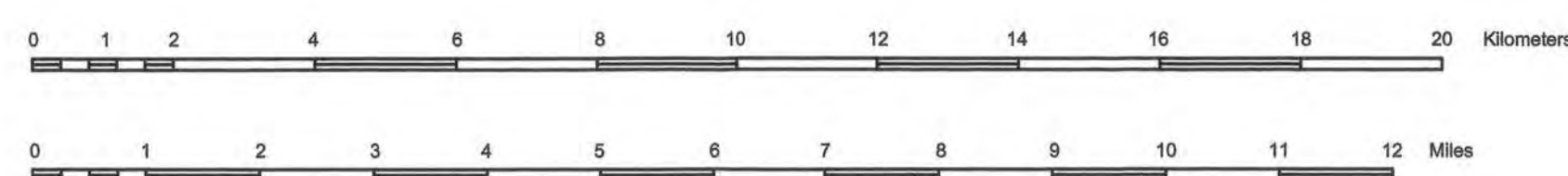
Map Symbols

- Contact
- - Fault - Dashed where approximately located and dotted where concealed. Bar and ball on downthrown block. No indication on fault trace indicates undetermined motion.
- - - Anticline - Trace of axial plane and direction of plunge.

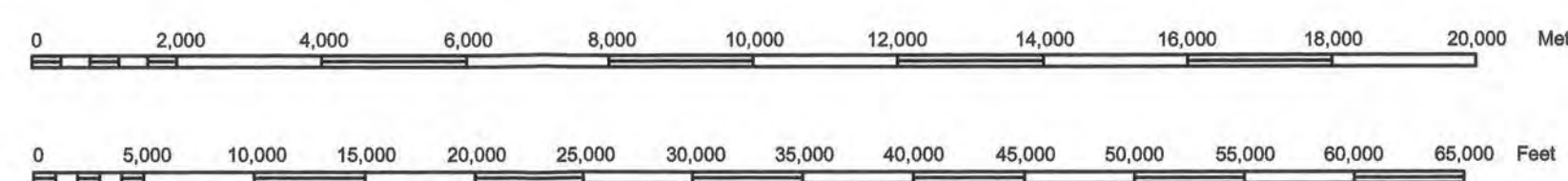
Geologic Units

- Qa** Alluvial deposits (Holocene)
- Qac** Alluvium and colluvium (Holocene/Pleistocene)
- Qtg** Terrace deposits (Holocene/Pleistocene)
- Qls** Landslide deposits (Holocene/Pleistocene)
- Qs** Loess (Holocene/Pleistocene)
- Qsd** Spring deposits (Holocene/Pleistocene)
- Tftl** Tongue River and Lebo Members (Paleocene)
- Tft** Tullock Member (Paleocene)
- Kl** Lance Formation (Upper Cretaceous)
- Kfh** Fox Hills Sandstone (Upper Cretaceous)
- Kp** Pierre Shale (Upper Cretaceous)
- Kn** Niobrara Formation (Upper Cretaceous)
- Kcl** Carlile Shale (Upper Cretaceous)
- Kg** Greenhorn Formation (Upper Cretaceous)
- Kb** Belle Fourche Shale (Upper Cretaceous)
- Kmr** Mowry Shale (Upper Cretaceous)
- Knc** Newcastle Sandstone (Lower Cretaceous)
- Ksc** Skull Creek Shale (Lower Cretaceous)
- Kf** Fall River Formation (Lower Cretaceous)
- Kla** Lakota Formation (Lower Cretaceous)
- Jm** Morrison Formation (Upper Jurassic)
- Js** Sundance Formation and Gypsum Spring Formation (Upper and Middle Jurassic)
- TPs** Spearfish Formation (Triassic and Permian)
- Pmo** Minnekahta Limestone and Opeche Shale, undivided (Lower Permian)
- Pmk** Minnekahta Limestone (Lower Permian)
- Po** Opeche Shale (Lower Permian)
- Pm** Minnelusa Formation (Lower Permian and Pennsylvanian)
- MDpe** Pahasapa Limestone and Englewood Formation (Lower Mississippian and Upper Devonian)

Projection: Universal Transverse Mercator (UTM), zone 13N
 North American Datum of 1927 (NAD 27)
 10,000-meter grid ticks: UTM, zone 13N
 25,000-foot grid ticks: Wyoming State Plane Coordinate System, east zone and South Dakota Coordinate System, south zone



SCALE 1:100,000
 Contour Interval 20 meters



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 Digital cartography by David W. Lucke and J. Fred McLaughlin

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PRELIMINARY GEOLOGIC MAP OF THE NEWCASTLE 30' x 60' QUADRANGLE,
 WESTON COUNTY, WYOMING AND WESTERN SOUTH DAKOTA

By
 J. Fred McLaughlin and Alan J. Ver Ploeg
 2005

