DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
WYOMING STATE ENGINEER

HYDROLOGIC INVESTIGATIONS
ATLAS HA-270 (SHEET 3 OF 3)

GENERALIZED SECTION OF THE GEOLOGIC FORMATIONS

ERA	SYSTEM	SERIES	SUBDIVISION (THICKNESS IN FEET)	LITHOLOGY AND DISTRIBUTION	OCCURRENCE OF GROUND WATER
CENOZOIC	QUATERNARY		Alluvial deposits (0–65+)	Unconsolidated clay, silt, sand, and gravel; includes terrace, flood-plain, and pediment deposits along major stream	Yield small to large supplies of water where the deposits are saturated; large yields could be developed in some areas. The quality of the water ranges from suitable for domestic supplies to unsuitable for stock
			Windblown sand (0–40±)	Unconsolidated fine to very fine sand; present in eastern part of project area	Yields small supplies of water of suitable quality for stock or domestic use; it is an important source of water in areas underlain by the Cody Shale
			Undifferentiated deposits	Clay, silt, sand, gravel, boulders, and travertine; includes landslide, glacial, and hot-springs deposits; present principally in and near the mountains	Yield of ground water from these deposits not known, but glacial deposits probably only potential source of more than small supplies. The quality of the water from glacial deposits would probably be good
	TERTIARY	Pliocene	Moonstone Formation (0–1,356)	Soft claystone, shale, and tuffaceous sandstone containing some interbedded limestone, conglomerate, and pumicite (Love, 1961, p. I–5); present only in the Granite Mountains	Yield small supplies to many stock and domestic wells, large supplies could be obtained where saturated thicknesses are great or where the permeability has been increased by fractures; the quality of the water generally is good
		Miocene	Arikaree Formation (0–2,732)	Poorly cemented sandstone, containing lesser amounts of conglomerate, claystone, limestone, tuff, and pumicite (Love, 1961, p. I–5); present in the southeastern part of project area	
		Oligocene	Wiggins Formation (0–1,000+)	Wiggins Formation—Tuffs interbedded with volcanic conglomerate; conglomerates consist chiefly of sub-rounded boulders of andesite and basalt; present in the mountains in the northwestern part of project area	
			White River Formation (0–650)	White River Formation—Bentonitic and tuffaceous mudstone; lenses of arkose and conglomerate; beds of tuff (Van Houten, 1964, p. 13); present in the southeastern part of project area	
		Eocene	Tepee Trail Formation (0–575±)	Tepee Trail Formation—Interbedded sandstone, conglomerate and tuff (Keefer, 1957, p. 162); present in the northwestern part of project area	Would probably yield at least small, and possibly large, supplies from sandstone and conglomerate beds; the quality of water would generally be good. Volcanic intrusive would not be a source of ground water
			Volcanic intrusives	Volcanic rocks	
			Wagon Bed Formation (0–700)	Wagon Bed Formation—Bentonitic mudstone, locally tuffaceous, zeolitic mudstone and sandstone in persistent beds; volcanic sandstone and conglomerate (Van Houten, 1964, p. 13); present in the southeastern part of project area	
			Andesite tuff sequence (0–1,000)	Andesite tuff sequence—Tuffaceous siltstone and limestone containing some conglomerate beds; present in the northeastern part of project area	
			Aycross Formation	Aycross Formation—Clay, shale, sandstone, and conglomerate (Keefer, 1957, p. 192); present in northwestern part of project area	
			Undifferentiated deposits, equivalent of Battle Spring Formation in the Great Divide Basin	Battle Spring Formation—Large boulders in a soft sandstone and shale matrix; present in the south central part of the area	Battle Spring Formation—Known to yield only small supplies, however, large yields may be possible; the quality of the water is probably good
			Wind River and Indian Meadows Formations (0–8,000)	Interbedded siltstone, sandstone, and conglomerate containing some carbonaceous shale and thin coal seams; a coarse-grained facies along the basin margin grades into fine-grained material toward the center of the basin; present throughout most of basin	Large supplies have been developed in the Riverton and Gas Hills areas and could be developed elsewhere, especially along the margin of the basin. Yields small supplies to many widely distributed stock and domestic wells. The quality of water ranges from good for domestic uses to unfit for stock
		Paleocene	Fort Union Formation (0–8,000)	Conglomerate, sandstone, shale, and carbonaceous shale in lower part of formation grading into very fine grained clastics in upper part, present at depth throughout most of project area	Sandstones yield small supplies of water that is generally unsuitable for domestic use and may be marginal for stock
MESOZOIC	CRETACEOUS	Upper Cretaceous	Lance Formation (0–6,000)	Sandstone interbedded with light- to dark-gray carbonaceous shale and thin coal beds; coarse material predominates at base of formation; present at depth throughout most of project area	
			Meeteetse Formation (0–1,335)	Meeteetse Formation—Sandstone, siltstone, shale, carbonaceous shale, claystone and coal; present in eastern and north-central part of basin	
			Lewis Shale (0–550)	Lewis Shale—Shale, sandy shale, and sandstone; present only in extreme eastern part of project area	

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MESOZOIC	CRETACEOUS	Upper Cretaceous	Mesaverde Formation (0–1,575)	Sandstone, shale, siltstone, carbonaceous shale, and coal; present in all but westernmost part of basin	Sandstones yield small supplies of water that are generally unsuitable for domestic use and may be marginal for stock
			Cody Shale (3,000–5,000)	Shale containing some sandstone beds in upper half; present at depth throughout most of project area	Yields only meager supplies of poor quality water
			Frontier Formation (600–1,034)	Sandstone interbedded with shale, present throughout most of project area	Yields small quantities of generally poor quality water although some supplies are usable for domestic purposes
		Lower Cretaceous	Mowry and Thermopolis Shales, undifferentiated (600–1,000)	Fissile and siliceous shale: Muddy Sandstone Member of Thermopolis Shale, 0–150 feet thick, consists of coarse-grained sandstone; present throughout basin	Muddy Sandstone Member yields small supplies of water suitable for stock to one well; quality elsewhere is not known
			Cloverly and Morrison Formations, undifferentiated (200–700)	Sandstone, siltstone and shale in upper part of formation; claystone and medium- to coarse-grained sandstone in lower part; present throughout project area	Yield small to moderate supplies of water suitable for domestic use near outcrops. The mineralization of water increases with distance from the outcrop
	JURASSIC	Upper Jurassic	Sundance Formation (295–435)	Shale, siltstone, sandstone, and limestone; present throughout project area	
		Middle Jurassic	Gypsum Spring Formation (0–230)	Dolomite, limestone, gypsum, and siltstone; present in the western two-thirds of the basin	No water wells known to tap this formation, but it would probably yield only poor quality water
		Lower Jurassic	Nugget Sandstone (0–425)	Fine- to medium-grained sandstone; present in all but extreme eastern part of basin	Water-bearing potential not known, but probably would yield small supplies, and larger supplies might be developed in some areas. The quality of the water is suitable for domestic use near outcrops, but the quality probably deteriorates basinward
	TRIASSIC		Chugwater Formation (1,000–1,300)	Siltstone, sandstone, and shale; Alcova Limestone Member near middle of the formation. Present throughout the project area	Yields small supplies of good quality water in and near outcrops
			Dinwoody Formation (10–155)	Fine-grained sandstone in western part of basin, grading eastward into the upper part of the Goose Egg Formation	
PALEOZOIC	PERMIAN		Park City Formation and equivalents (0–300) / Goose Egg Formation (0–300)	Park City Formation and equivalents—Interbedded dolomite, chert, limestone, siltstone, and sandstone, containing a few phosphate beds or lenses and minor amounts of shale / Goose Egg Formation—Shale and siltstone containing persistent limestone units in eastern part of basin	Probably would yield only small supplies of mineralized water
	PENNSYLVANIAN		Casper Formation, Tensleep Sandstone, and Amsden Formation (400–900)	Medium-grained well sorted sandstone, containing some limestone in upper part; increased amounts of limestone, dolomite, and shale occur in lower part	Sandstone yields large supplies of water to several wells in the foothills of the Wind River Mountains and in the Gas Hills area; rocks will yield large supplies where fracturing has increased the permeability. The quality of the water is generally excellent near the mountains; somewhat more mineralized in the Gas Hills area
	MISSISSIPPIAN		Madison Limestone (300–700)	Massive to thin bedded limestone, containing some thin beds of chert and red shales near the top. Present at depth throughout most of project area	Ground-water possibilities not known, but rocks are potential sources of large supplies where fractured or cavernous
	DEVONIAN		Darby Formation (0–300)	Dolomite, siltstone, and shale; present in western half of basin	
	ORDOVICIAN		Bighorn Dolomite (0–200)	Dolomite, thin bedded and platy in upper part but mostly massive; forms cliff; present in western half of basin	
	CAMBRIAN		Gallatin Limestone, Gros Ventre Formation, and Flathead Sandstone (100–1,200)	Limestone and flat-pebble conglomerate in upper beds; sandstone, shale, and quartzitic sandstone in lower part; thins from east to west across basin	
	PRECAMBRIAN			Igneous and metamorphic rocks	Would yield small supplies from weathered or fractured material; quality of the water is good

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GROUND-WATER RESOURCES AND GEOLOGY OF THE WIND RIVER BASIN AREA, CENTRAL WYOMING

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