



(1972), the only data available on area distribution of permeability of the sandstone in the Bighorn Basin are for the Tensleep Sandstone. Breckhoff (1964, p. D170) cites a wide but systematic variation in permeability from high values of 14.6 and (gallons per foot per square foot in the outcrop area to low values of 0.03 and per square foot in the center of the basin. Breckhoff (1964, p. D166-D167) further states that "the size and sorting of the sand grains makes up the sandstone are reasonably uniform over the basin, and differences in porosity, as well as in permeability, appear to be primarily the result of secondary cementation and recrystallization of sand grains. This results in an increasingly interlocking fabric of sand grains with increased depth of burial."

Other sandstone aquifers that predominate in the center of the basin are illustrated by geologic maps in the center of the basin. Breckhoff (1964, p. D166-D167) further states that "the size and sorting of the sand grains makes up the sandstone are reasonably uniform over the basin, and differences in porosity, as well as in permeability, appear to be primarily the result of secondary cementation and recrystallization of sand grains. This results in an increasingly interlocking fabric of sand grains with increased depth of burial."

Recharge and discharge of ground water. Aquifers receive recharge from precipitation, streamflow infiltration, and from adjacent formations. Natural discharge may be by springs or seeps, evapotranspiration, inflow to streams, and movement to adjacent formations. The aquifers serve as reservoirs in which the water is in transient storage. The following examples illustrate the recharge-discharge relations that are prevalent in the basin.

Recharge to and discharge from the Tensleep Sandstone. The Tensleep Sandstone is a massive, fine-grained, sandstone that is highly permeable. It is the primary aquifer in the Bighorn Basin. Recharge to the Tensleep Sandstone is primarily from precipitation and streamflow infiltration. Discharge from the Tensleep Sandstone is primarily to streams and to adjacent formations.

Recharge to and discharge from the Tensleep Sandstone. The Tensleep Sandstone is a massive, fine-grained, sandstone that is highly permeable. It is the primary aquifer in the Bighorn Basin. Recharge to the Tensleep Sandstone is primarily from precipitation and streamflow infiltration. Discharge from the Tensleep Sandstone is primarily to streams and to adjacent formations.

Chemical analysis of untreated water from municipal supplies and the quantity used during 1970 (Analytical results in milligrams per liter except iron, total, specific conductance, and pH. Analyses by U.S. Geological Survey.)																			
Municipality	Source of water	Water used (million gallons)	Popul. (1960)	Popul. (1970)	Date of collection	SiO <sub>2</sub> (mg/l)	Total iron (mg/l)	Calc. (mg/l)	Mg. (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Bromine (mg/l)	Chloride (mg/l)	Sulfate (mg/l)	Calc. (mg/l)	Mg. (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Bromine (mg/l)
Bain	Bighorn River	759	1,143	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171
Bighorn	Bighorn River	1,143	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020
Shoshone	Shoshone River	927	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020
Shoshone	Shoshone River	927	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020
Shoshone	Shoshone River	927	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020
Shoshone	Shoshone River	927	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020
Shoshone	Shoshone River	927	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020
Shoshone	Shoshone River	927	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020
Shoshone	Shoshone River	927	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020
Shoshone	Shoshone River	927	10-15-70	9.2	280	11	31	39	3.8	226	0	383	16	0.5	1.0	130	132	171	1,020