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HYDROLOGIC ATLAS OF THE BLACK HILLS, PENNINGTON
COUNTY, SOUTH DAKOTA
ROCKERVILLE QUADRANGLE
Aquifer Vulnerability Maps

Aquifer Vulnerability:

Basically, vulnerability "...is the tendency or likelihood that pollutants may reach the water supply" (Hargrave, 2005) and includes human influences in the introduction of pollutants into aquifers. See the lower left corner of the aquifer vulnerability maps for information regarding the rating system used here.

Madison Aquifer (Pahasapa Limestone): (see map)

The recharge area for the Madison aquifer extends north-south through the central part of the quadrangle along the western margin of the Minnelusa aquifer. Its width varies from one-half to one and one-half miles. For much of this length it lies within the Black Hills National Forest and, as a result of the lack of urban or industrial development, is assigned a **low** vulnerability rating there.

Although not shown separately on the map, the steep-walled canyon of Spring Creek is a significant recharge area for the Madison aquifer. Water from the creek flows directly into caves in the basal canyon walls here (Figure 1). This part of the stream, therefore, although not currently undergoing development, is an area of concern regarding aquifer protection.

Minnelusa Formation (see map)

The recharge area for the Minnelusa aquifer extends north-south through the central part of the quadrangle with a width varying from one and one-quarter to two and one-half miles. Approximately one square mile of this area lies within the Black Hills National Forest. Home sites and roads are common across much of the recharge area. The wooded areas north and south of Spring Creek have a greater concentration of such features and, because the density of housing and the on-site waste water treatment facilities (note red dots on map) associated with them is in the range of 40-80 per square mile, these areas are assigned a rating of **high** vulnerability.

For part of the recharge area generally accessed from Neck Yoke Road, where home sites occur in the range of 10-40 per square mile, a **moderate** rating is assigned. In addition, a 100-meter buffer along roads is assigned values ranging from **low**, on dirt roads with lesser traffic, to **high or very high** along the highway. Updated 5-16-2011

Near the southern margin of the quadrangle a small area contains waste water treatment facilities in the range of 10-40 per square mile: These areas are assigned a rating of **moderate** vulnerability and a 100- meter buffer along dirt roads there is assigned a **low** value.

Inyan Kara Group

Only a small area in the extreme southeastern corner of this quadrangle comprises the recharge area of the Inyan Kara Group (Fall River Formation only). Permeable sandstone lenses, enclosed within mudstone layers, underlie pine tree-covered ridges here.

The averaged vulnerability of this rock unit is interpreted as **low** because of the near-absence of roads, on-site waste water treatment facilities, and other influences.



Figure 1. Waters of Spring Creek flowing into caves of the Madison karst.

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