

*Citation Information:*

*Originator:* Kellogg, K.S., Williams, V.S.      *Publication\_Date:* 1997

Geologic Map of the Ennis 30' x 60' Quadrangle, (1:100,000), Gallatin and Madison Counties, Montana: U.S. Geological Survey, Open File Report OF-97-851

*Citation Information:*

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Geologic Map of the Maxey Ridge Quadrangle, Montana (1:24,000): U.S. Geological Survey Miscellaneous Geologic Investigations Map I-396

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Geologic Map of the Mystic Lake Quadrangle, Montana (1:24,000): U.S. Geological Survey Miscellaneous Geologic Investigations Map I-398

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Geologic Map of the Bozeman Pass Quadrangle, Montana (1:24,000): U.S. Geological Survey Miscellaneous Geologic Investigations Map I-399

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Geologic Map of the Bozeman 30 x 60 Quadrangle (1:100,000)

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Montana Bureau of Mines and Geology Open File Report 334

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Igneous Geology of the Fridley Peak Quadrangle, Montana(1:62,500): Montana Bureau of Mines and Geology Geologic Map 31

Geologic maps covering the LWQD were compiled in order to build a hydrogeologic map for the district (Table). The geologic maps used were in electronic and paper formats. The electronic maps used were joined together using ArcEdit. The paper maps had to be digitized to complete the coverage of the LWQD. The digitized paper maps were joined to the previously joined maps. Each of the source maps used different geologic units. Original map-unit designations were preserved as one attribute in the ArcView coverage (Figure x). In addition, the boundaries between the maps were preserved to close polygons that do not extend across map boundaries. The geologic maps were edge matched only where contacts cross map boundaries. When necessary contacts were added (Figure x) to define hydrostratigraphic units based on the local hydrostratigraphic column (Plate). An example of the addition of contacts occurs in the area mapped by Roberts (1963a-d). Roberts (1963a-b) mapped the Madison Group as one unit. However, the expected hydraulic properties of the Lodgepole Formation and the Mission Canyon Limestone, two of the formations that make up the Madison Group, are sufficiently different that they were split into different hydrostratigraphic units. Therefore, the Madison Group of Roberts (1963 a-d) was divided into the Lodgepole and Mission Canyon based on regional thickness, measured dips, and mapped relations with other formations (Custer, 1998; personal communication). The Fridley Peak (1:62,500) geologic map by Chadwick (1982) was used to complete the geologic coverage of the southeastern most portion of the LWQD. This map focused on the igneous geology of the area, therefore the Paleozoic and Mesozoic units in the map area were undifferentiated by the Chadwick (1982). Paleozoic and Mesozoic strata were added to the Fridley (1:62500) map by interpolating the rock units from the adjacent maps (Custer, 1998, personal communication). Although there were new polygons created in the editing process, the original map unit's name was preserved as well as a new attribute designating either the surficial unit or hydrostratigraphic unit represented by the polygon. New hydrostratigraphic unit attributes were created for all polygons. These attributes allowed for the creation of a hydrogeologic map with consistent units.

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