Improved Hydrogeologic Characterization of the Prairie du Chien Group

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## HYDROGEOLOGY OF THE PALEOZOIC BEDROCK IN SOUTHEASTERN MINNESOTA

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## Reasons for the study...

- Paleozoic bedrock aquifers in Minnesota have been commonly characterized as homogeneous and isotropic porous media.
- Technological advances in borehole geophysics allow measurements to be made showing the importance of secondary flow features.
- Can aquifer heterogeneity be mapped at a regional scale?

## This talk...

- Present borehole study involving video, packer tests, water chemistry profiles and flowmeter measurements.
- Discuss geologic history of the Prairie du Chien Group and its impact on porosity and permeability.
- Discuss geologic models of the Prairie du Chien Group – past, current and future work at MGS.



























Carbonate component





Coarse clastic component

Carbonate component











— 1400 ft. –



— 1400 ft. -







Figure \_\_\_\_. General model of karst development along a subareally exposed carbonate platform (in Mazzulo and Chilingarian, 1996, modifed from Choquette and James, 1988.

















modified from Horick, P.J., 1989, Water resources of northeast Iowa: Iowa Department of Natural Resources, Geological Survey Bureau Water Atlas 8, 133 p























## Conclusions

- We recognize the importance of high permeability zones and fracture flow in understanding groundwater movement and recharge.
- Geologic models are moving beyond the identification of stratigraphic boundaries.
- Our ability to capture essential hydrogeologic characteristics in a geologic model will improve as computer capacity increases.