

**The Implementation of a System-wide GIS  
for  
South Dakota's Bon-Homme - Yankton Water District**

A

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by

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## ABSTRACT

The lack of accurate, usable infrastructural data is a major problem hampering the efficient management of the Bon Homme – Yankton Water District (B-Y). The B-Y Water District is the third largest water district in South Dakota and supplies over 5,000 people with potable water. This thesis examines the process of using a Geographic Information System (GIS) to assemble water system information and apply this data to solving operational, managerial, and maintenance problems. The project's data will also serve as foundation for the creation of metadata (the term metadata is used to describe any information on the identification, description, and location of a dataset) standards so that the knowledge gained during this project may be applied to other rural water districts.

Part One of the thesis briefly reviews the literature regarding the use of GIS while investigating South Dakota's water districts as a political entity in the management of water treatment and the distribution of drinking water. Section one will also introduce the particular problems that face the B-Y Water District and why GIS was chosen to address these issues.

Part Two of the thesis describes the methodology and the results of the GIS project conducted by the multi-county planning agency Planning and Development District III in Yankton, South Dakota. The ten-month contract succeeded in creating a system-wide transmission line specifications database as well as the formulation of metadata standards. The project's database was

essential in identifying the attributes necessary to develop metadata elements in repose to a federal Economic Development Agency (EDA) grant received for developing national GIS standards.

The report concludes that with proper database creation and use of correct GIS principals in database design, the implementation of a GIS can convert data to a more usable, efficient format. This format can then be used to convert existing rural water system information in other rural water districts. Application of the project to other water systems throughout South Dakota could be completed via Planning & Development District III's service area. The District serves a 16 county area within Southeastern South Dakota. Within the District's boundary lies the Turner-McCook and Hanson Rural Water Districts. Upon completion of the initial phase of the B-Y contract, submission of the project's proposal will be made to these water districts.