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An Overview of Operational Characteristics of the Irrigation Districts in the Lower Rio Grande Valley Brownsville Irrigation District

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Title: An Overview of Operational Characteristics of the Irrigation Districts in the Lower Rio Grande Valley: Brownsville Irrigation District

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With the publicity and exposure of the water shortages facing the Lower Rio Grande Valley (LRGV), there are many questions and inquiries related to the characteristics, basic method of operation, and process by which irrigation districts move water among users. An irrigation district that provides water to both urban communities and agricultural interests (which is the case for most districts) adds a huge degree of complexity to the operations of the overall system.

The methods of operation of an individual (or perhaps groupings of) irrigation district's are not well understood yet impact to a large extent the image of the region. There are also related implications on basic efficiency and capability to react to alternative conditions. Through a model evaluation of an individual irrigation district's operation, this study provides a characterization of an irrigation district's operations and draws conclusions as to the effects on image and related ability to react as well as implications for overall efficiency. Though there are some similarities to the operations of other irrigation districts, each district is unique in its makeup and design. Each district is dependent upon the level of technology, infrastructure, past financial decisions, and the district's distinct individual surrounding area. The Brownsville Irrigation District (BID) represents a unique situation with its unusual resaca system and advanced-technology flow control mechanisms. BID is one of the 28 distinctly different irrigation districts in the Valley. This insight into the operations of the BID is to serve as a 'blueprint' to be used in developing corresponding evaluations for several of the other districts.

The Brownsville Irrigation District is located to the east of the city of Brownsville Texas. It is 20,040 acres with a 62 mile border (Border Environment Cooperation Commission). Though this area of the Rio Grande Valley has been populated for centuries, large scale irrigation did not take place until the turn of the turn of the twentieth century (Stubbs et al.). BID had its beginnings with the Indiana Cooperative Canal Company in 1907. After financial hardships brought on by the Great Depression and new water laws passed by the Texas Legislature, BID became a public entity of the State on August 13, 1919 when it held its first official Board of Directors meeting as the Cameron County Water Improvement District No. 5 (Cameron County Water Improvement District No. 5). In May of 2000, the Water District officially changed its name to the Brownsville Irrigation District (Border Environment Cooperation Commission).

The historical perspective of BID is important for understanding its operations today. BID is one of the most technologically advanced irrigation districts in the LRGV. This is due, in part, to the forward thinking of previous Board of Director members. In 1968, BID assumed a substantial debt load of \$5 million for a three-year project with the Bureau of Reclamation. This massive improvement project included putting all of the district's open canals into underground pipeline. In 1996, the Board of Directors approved another large-scale improvement project that

included computerizing the entire district. Through using the software package called Wonderware[®], BID can operate almost the entire district from a centralized location (Barrera 2003a).

The full report details not only the use of technology within the district, but also how the district diverts its allocated water from the Rio Grande, where it stores this water, and how it is allocated. BID is the last diversion point on the U.S. side of the Rio Grande River before it flows into the Gulf of Mexico (Barrera 2003a). Using two 45 cfs pumps and one 90 cfs pump, BID can extract a maximum amount of 190 cfs of water from the Rio Grande at a time (Barrera 2003b). Once the water is pumped out of the river, it flows through a 2.5 mile long main canal before reaching a unique system of resaca holding areas (Holdar-Garcia & Associates). Resacas are unique in this region and provide up to 2,400 acre-feet of reservoir storage for the district (Rister et al.). The resaca system proves a naturally flowing system of water transportation. Water moves through underground pipelines and resacas to reach its final farm gate destinations.

Water rights and the Texas Commission on Environmental Quality's (TCEQ) Watermaster Program are unique to the Valley as compared to the rest of Texas. BID owns 33,949.45 ac-ft of Class A authorized annual water rights, which is roughly 2.42% of the total irrigation water rights in the Valley (Barrera 2003a). The TCEQ Watermaster Program controls how BID receives and uses the water allocated from the Rio Grande (Texas Commission on Environmental Quality).

Though it is evident that each irrigation district is made up of different components that attribute to their individual uniqueness, their operating methods are, to some extent, not well known. Each district is subject to the same set of federal, state, and regional rules and regulations, but their operational procedures vary from district to district. BID operates with only 14 employees. Its advanced state of technology allows for BID to employ only one Canal Rider, whereas other irrigation districts have as many as 7 employees performing this task (White). The TCEQ Watermaster regulates how much water BID is allowed to pump; however, BID allocates the water to farmers, residents, and other customers internally. BID has approximately 1,600 irrigation accounts, 480 lawn watering accounts and 4 out-of-district pumping customers (Border Environmental Cooperative Commission).

Each farmer within the BID boundaries has an account in which they are allocated water for the purpose of irrigation. Beginning January 1 every account is allocated approximately 1 acre foot (ac-ft) of water. Landowners (greater than one acre) are charged a flat rate of \$18 per acre regardless of use in their account. Each farmer may use the water within their account at the time of their choosing. Upon request of the water to be delivered to the farm gate the farmer must pay a variable use fee of \$6.00 for the first 4 inches and \$2.00 an inch for anything over 4 inches. Water is reallocated to these accounts by the Board of Directors throughout the year depending on allocations received by the Watermaster. Lawn watering accounts are charged between \$78 and \$90 depending on their location. Even though BID has no municipalities within its boundaries it is a supplemental supplier to the Public Utilities Board of Brownsville (PUB) that services the City of Brownsville to the west.

Every irrigation district has different procedures for their internally allocated water. As stated above BID allocates each farmer's water into separate accounts for use upon their request. BID does not allow for this water to be sold to any other farmer or irrigation district outside of BID by the account holder. BID, however, does sell residual water to other farmers and irrigation districts outside of its boundaries. The price of the residual water varies depending on the market demand and supply. It is also important to distinguish that the selling of residual water differs from the selling of water rights. The selling of residual water is a one-time transaction; whereas the sell of a water right is permanent.

Pipeline, reduced allocation amounts, and experimentation with other on-farm water conservation activities (e.g., drip, micrometer, and sprinkler systems) have permitted BID to help ensure water availability for its farmers and growers. These conservation efforts have allowed for additional water to be made available for sale to other farmers and irrigation districts (Barrera 2003a).

This brief overview summarizes the full report on the Brownsville Irrigation District. The water issues facing the region include an international dimension, an interstate dimension, and the traditional multiple users' vested interests. The rareness of these irrigation districts causes a need for understanding their operating procedures in an effort to explain their overall institutional effects. Through unlocking some of the mystery associated with these individual irrigation districts, policy makers will have a better perception of the culture and evolution that surrounds these unique districts.

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