# North Diversion Channel Reconnaissance Study

**Albuquerque, New Mexico**

## Client

**Albuquerque Metropolitan Arroyo Flood Control Authority**

## Highlights

- Investigated water quality issues associated with stormwater discharge
- Coordinated and reviewed two-dimensional hydraulic modeling
- Designing monitoring plan to quantify improvements

Recent studies had identified rapid declines in dissolved oxygen (DO) concentrations in the Rio Grande during stormflow runoff events from the North Diversion Channel (NDC). This was a significant water quality concern prompting discussion of establishing a Total Maximum Daily Load (TMDL) for DO. Under contract to AMAFCA, DBS&A conducted a water quality investigation using existing data to identify causes of the DO declines, and performed quality assurance and analysis of data collected by the U.S. Geological Survey at multiple locations within the NDC and the receiving body, the Rio Grande.

Results of DBS&A's study indicated that (1) the low DO events in the river were caused by stagnant, low DO water swept from the NDC embayment, located at the confluence of the NDC and the river, into the river and (2) that redesign of the NDC outfall to reduce the embayment volume and eliminate stagnant conditions would prevent future DO decreases during stormflow events. DBS&A coordinated and reviewed numerical hydraulic modeling of the affected area to evaluate the surface water profile and velocities, and ensure that a redesigned channel and confluence could effectively handle design flows from the NDC into the Rio Grande. Eventually, a physical model was required because of instabilities in the 1-, 2- and 3-dimensional models at high flows.

Results from the numerical and physical models allowed the project team to redesign the NDC outfall, which facilitated changes in management practices that improved water quality of the river during stormflow events. In 2011-12, the embayment was eliminated from the confluence of the NDC and the Rio Grande. Water is no longer discharged to the river except for storm events where the total volume exceeds 72 acre feet. Jerry Lovato, Executive Director of AMAFCA, said "The DBS&A report was fundamental to the Biological Opinion issues by U.S. Fish and Wildlife Department that allowed AMAFCA to fill in the embayment."

DBS&'s investigation was fundamental to the redesign of the North diversion Channel outfall, and to meeting water quality standards in the Rio Grande during storm flow events.

DBS&A then worked with AMAFCA to evaluate options for additional water quality improvement features in within the NDC watershed to assist with NPDES permit compliance. DBS&A also designed a monitoring plan to quantify improvements from existing and proposed water quality control features within the NDC drainage basin.

This study led to an evaluation of parameters and conducting studies to determine the actual water

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quality impact of various previously designed and implemented structural BMPs. This information will be used to select the most appropriate BMPs under the new watershed-based permit. Bernalillo County, Sandoval County, Rio Rancho, federal facilities, pueblos and others added to the original seven co-permittees will be responsible for the quality of storm water discharged from the Albuquerque metropolitan area. AMAFCA was one of the original permittees and is the major storm water agency in the watershed.