

Title: Development and Implementation of Innovative Storm Water Regional Detention Facilities for Urban Water Quality Improvement in the Arroyo Colorado
Water Body: Arroyo Colorado Watershed and Lower Laguna Madre
Location: City of McAllen
Contractor: Texas A&M University Kingsville
Project Period: August 31, 2009 to August 15, 2011

Project Summary

The Lower Rio Grande Valley contains some of the fastest growing communities in the Nation. This rapid urbanization has created challenges for water planners and community leaders in the region, and within the Arroyo Colorado Watershed. As more agricultural land is developed, non point source urban runoff can cause additional water quality degradation in the semiarid region already burdened with periodic water shortages. In one effort to address these concerns, the City of McAllen has developed a plan to construct several Regional Stormwater Detention Facilities (RSDFs) for flood control and is working with the South Texas Environmental Institute at Texas A&M University-Kingsville to incorporate innovative water treatment biotechnologies into the designs. The project outcomes will highlight these activities as demonstration sites for implementation in other communities concerned about water quality impacts in semiarid coastal regions.



Map showing the locations of the new RSDFs designed to treat urban runoff in the Arroyo Colorado and Lower Laguna Madre Watersheds.

Project Description

Project activities will include development and implementation of RSDF designs that allow for treatment of urban runoff during both wet and dry conditions in the semiarid climate. The objective of this project is to design and implement multi-

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purpose RSDf systems that provide adequate drainage control and also serve as a water quality improvement measure that will assist the Arroyo Colorado Watershed Partnership in meeting the planned goals of the Watershed Protection Plan.

Phase I will include the compilation of existing regional storm water runoff quality data and flows, the estimation of potential nutrient and organic loading to the proposed RSDf system locations and identify data gaps for the needed design information. RSDfs under construction at Morris Middle School, McAuliffe Middle School and the McAllen Dog Park near Jackson Elementary have been selected as biotechnology demonstration sites.

Phase II calls for the development of the innovative sequential treatment RSDf design and construction, within and adjacent to the Arroyo Colorado Watershed. Biotechnologies to be considered include a unique sequential treatment system designed for each site focusing on retention ponds, biofilters, treatment wetlands, and/or terraced swales. A significant challenge for the project team is the viability of the treatment biota during both wet and dry seasonal fluctuations. Baseline pre and post construction water quality data will be collected to confirm and help the designers optimize the treatment systems to remove nutrients, sediment and bacteria.

Specific Project Objectives

- Evaluate existing flows and pollutant loading to the current and planned RSDfs for City of McAllen. Establish baseline values for assessment of project water quality goals.
- Design and enhance existing and new RSDfs with wetland planting and other hydraulic channeling modifications and incorporate new modeling results into newly constructed RSDfs to improve water quality in and around the Arroyo Colorado Watershed by reducing loading of sediment, nitrogen, phosphorous and bacteria.
- Verify the effectiveness of sequential treatment by the RSDfs in the City of McAllen and provide supporting information for similar implementation in other areas of the Arroyo Colorado Watershed. Use the RSDf site modeling and pre- and post-monitoring and evaluation findings for outreach to other communities and the Lower Rio Grande Valley Storm Water Task Force interested in urban BMPs to reduce the water quality impacts of storm water.

Project Partners

Project partners include the City of McAllen, the McAllen Parks & Recreation Department, McAllen PUB, the Arroyo Colorado Watershed Protection Partnership, the Lower Rio Grande Valley Stormwater Task Force, and the South Texas College Biology Department.

Last Updated: October 28, 2009

Related website(s): www.stei.org and www.arroyocolorado.org

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