

TR-312

Bosque River Environmental Infrastructure Improvement Plan: Phase I Final Report

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The Bosque River and its associated watershed face a myriad of water quality challenges. Previous attempts made to address these concerns have met with limited success due to a relatively narrow, specific problem approach. The goal of this project is to develop a comprehensive plan that considers all aspects of existing issues for collaborators to implement and assist in planning for improved environmental infrastructure. The project set forth will aid in identifying appropriate management practices and structures for rehabilitating and maintaining watershed health from a landscape scale approach. Implementation of an environmental infrastructure program employing a series of best management practices (BMPs) and efforts is desirable for addressing overall watershed health. This report is the first phase of a project that is focused on developing and employing a strategic approach to identifying priority areas in the watershed where field investigations should begin to investigate the need to reduce pollution and in choosing appropriate BMPs for specific areas that are best suited to meet pollution reduction needs both efficiently and economically. There needs to be more in-depth analysis of cost benefits and economic and environmental alternative analysis need to follow in the next phases of this project before any field implementation is undertaken.

In-depth analysis using applicable Geographic Information Systems (GIS) data generated specifically for this project identified specific areas of need. Sub-watersheds were evaluated using an impact index that assigns a ranking to each sub-watershed based on three pollution quantifying indices: a concentration impact index, a load per unit area index and a load impact index. The sum of the three index rankings yields the overall ranking for each sub-watershed.

A scientific advisory committee developed a list of potential BMPs. The list consists of 22 feasible BMPs that have been assigned a priority index based on potential water quality effects, capital and maintenance costs, and applicability of the practice in the watershed. After establishing the prioritized list, BMPs were evaluated by the Spatial

Sciences Lab (SSL) at Texas A&M University using GIS to identify areas within the watershed where implementing these practices would be most effective. Six spatial criteria and six location-specific criteria were used to determine optimum potential locations within the watershed for each BMP to be implemented.

This document outlines an effective methodology for determining which locations in the watershed should receive focus when field work begins, and which BMPs would be most effective in specific sub-watersheds. Six steps were identified as an effective process to choose the proper BMP for each sub-watershed in the basin. If these steps are followed, the best BMP(s) for each location should be effectively identified.

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