

Best Management Practices (BMP's) for Addressing Pathogenic Water Quality Impairments

“A Manual of Conservation Practices to Reduce Pollution Loads Generated from Nonpoint Sources” by TetraTech is a useful BMP implementation guide for landowners, natural resource managers and technicians. It identifies BMP's that can be used to abate nonpoint source pathogenic pollutants in a watershed. Each BMP has multiple benefits that span beyond controlling pathogenic pollutants. Generally, it is suggested that these practices be implemented in areas immediately adjacent to the stream channel or water body, but also includes those for upland areas. It advises that multiples practices be implemented to maximize the effectiveness of pollution control. Due to water quality data gaps that exist for the lower Rio Grande, specific locations for BMP implementation cannot be recommended at this time. Once more is known about the impairment, BMP's can be recommended and implemented to improve water quality in the river.



Filter Strip

A filter strip is an area of planted herbaceous vegetation that is located between agricultural, grazing, or disturbed lands and environmental sensitive areas. It helps to abate pathogenic contaminants, as well as pesticides or chemicals, from entering bodies of water by interrupting runoff and removing the pollutants before they enter water bodies. Filter strips target the following potential Total Maximum Daily Load (TMDL) sources: animal feeding operations, disturbed areas, stream erosion, and agricultural practices. They have a high load reduction potential that can occur between a few months and two years. They are best utilized on agricultural and developed lands and require a low level of maintenance.

There is a potential for additional benefits with the implementation of filter strips: reduced sedimentation of water bodies, reduced runoff, increased infiltration, groundwater recharge, and improved wildlife habitat. Strategic planning and placement of filter strips is suggested to achieve maximum benefits. For instance, using vegetation that is tolerant to herbicides that are used in proximity will prolong the life and functionality of filter strips. The abatement of other pollutants may be successful using filter strips; contamination by sediment, salinity, pesticides, nutrients & organics, heavy metals, and low dissolved oxygen may also be addressed with filter strips.

Detention Basin

A detention basin is an engineered structure designed to capture and temporarily store water and associated debris and sediment. They are considered a temporary practice aimed at protecting reservoirs and other water bodies by preventing the deposition of sediments, waste products, and other waterborne materials. Detention basins can filter pollutants from the following potential TMDL sources: animal feeding operations, disturbed areas, agricultural, and mining practices. They have a high load reduction potential that can occur immediately following implementation and also provide groundwater recharge. They are best utilized on agricultural and developed lands. Detention basins require a high level of maintenance; regular cleaning of the basin is required for full functionality. If basin construction occurs in a stream channel or wetland, Section 404 and 401 permits are required through the U.S. Army Corps of Engineers.

Constructed Wetland

Constructed wetlands can filter and clean wastewater from domestic or livestock operations and agricultural irrigation returns. Biological processes occur in wetlands that can improve water quality. Once solids and pathogens are removed from water, wetlands can be used as a final cleaning process in wastewater treatment. Constructed wetlands target the following potential TMDL sources: animal feeding operations, industrial sources, and agricultural practices. They have a medium load reduction potential that can occur between a few months and two years following implementation. They are best utilized in streamside areas, and on agricultural and developed lands. Low levels of maintenance are expected.

Planning considerations for constructed wetlands include the choice of appropriate vegetation and the design of flow velocities. Water quality objectives should be developed, water quantity capacity should be considered, and a monitoring program should be established for the engineering of this best management practice. Wetlands can also be used to address pollution from sediment, salinity, nutrients and organics, and water temperature. This practice has the added potential of filtering other pollutants, providing wildlife habitat, possible opportunities for wildlife viewing, and community outreach in the form of a park.

Improvements to Municipal Stormwater Management

The City of Las Cruces has a complex stormwater management strategy described in their MS4 plan (Municipal Separate Storm Sewer System Plan). The City has invested time, expertise, and financial resources into plan development. Future work in the development and implementation of the Lower Rio Grande Watershed Based Plan will include integration of the City's MS4 plan into BMP planning for the rest of the watershed.

Replanting and Seeding of Disturbed Areas

Areas which have been disturbed by stream erosion, land development, agricultural practices, and construction riparian areas can be planted with native vegetation with transplants or seeds. Each site should be evaluated for appropriateness of mulching, broadcast seeding, hydroseeding, pole planting or transplanting. These practices not only reduce erosion and provide for increased filtration, but also address a variety of other pollutants including salinity and nutrients.

Cover Crop

Cover crop provides seasonal protection and soil improvements by growing grasses, small grains, or legumes. Benefits to soil quality are numerous: decreased erosion, increased fertility, addition of organic material, improved soil structure, increased infiltration and aeration. Further, crop covers can reduce the effects of wind, rill, and water erosion. Crop covers target potential TMDL sources such as disturbed areas and agricultural practices and can also address sedimentation, salinity, and pesticide pollution. They have a medium load reduction potential that can occur between a few months and two years following implementation. They are best utilized on agricultural lands and require medium levels of maintenance.

Domestic Pet Waste Management

The City of Las Cruces manages a domestic pet waste program. It includes the installation and stocking of stations that provide pet waste bags. The program targets recreational areas along the river and public parks where dog walking is a common activity. A collaborative outreach program within the watershed could be initiated within the 319(h) activities to educate the public on the problems associated with domestic pet waste, the *E. coli* impairment, and proper waste disposal.

Improved Stormwater Management of Unpermitted Animal Feeding Operations (AFOs)

Many of the smaller AFOs do not have plans to control stormwater from flowing off site. Suggested management practices include providing stormwater basins and protective berms to keep stormwater on-site, removing livestock pens from the active floodplain or channel, and proper waste disposal. Disposal of waste by land application as fertilizers is a common and accepted practice. Waste can also be utilized as part of a composting process to improve compost quality.

Grazing management

Grazing management in the watershed falls into two general categories; upland grazing, and riparian grazing. Poor rangeland conditions and herbaceous cover increase erosion and stormwater flows, decrease infiltration, and can promote livestock and wildlife concentration into areas with adequate forage and water. When these areas are impacted by storm events, the waste from animals is transported downstream. Rest and rotation practices should be utilized to maximize desired forage health to increase productivity and reduce the impacts associated with erosion.

Watering Facility

Upland watering facilities can be provided to reduce utilization of the stream as a water source. This is often used in conjunction with fencing that removes livestock from riparian areas to reduce the impacts from their activities. This can decrease damage to the riparian area, and also has the added benefit of reducing bank erosion and reducing the same pollutants as replanting and seeding treatments.