



Publications

TR-412

Evaluation of Canal Lining Projects in the Lower Rio Grande Valley of Texas - 2011 Ratings and Analysis

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Since 1999, nine (9) irrigation districts in the Hidalgo, Cameron, Willacy and Maverick Counties have installed nine (9) different types of synthetic canal lining materials, totaling approximately 26 miles. In 2005, we began a program to track the long-term effectiveness and durability of these lining projects and to document the damage caused by such factors as weather, animals, intentional and unintentional vandalism, and normal irrigation district operation and maintenance activities. We visually inspected each project and documented any changes using a lining evaluation form which we developed.

For analysis purposes, we grouped all the projects into two general categories: liners with a protective barrier, and liners without a protective barrier. The projects with a protective barrier performed very well. The synthetic liner significantly reduces seepage, while the shotcrete layer protects the liner from damage. This lining system needs little to no maintenance. There were two types of liners used: PVC and polyester. Each performed equally as well.

The performance of synthetic liners without a protective barrier varied dramatically. One important factor was the location of the project. Liners located in high traffic areas (people and animals) showed significantly more damage than those installed in remote areas. Damage caused by mowing and canal cleaning operations was common. Liners carelessly or improperly installed were more susceptible to damage. For example, the smoothness and stability of the material underneath the liner, and the shrinking properties of some liners must be taken into consideration.

The PVC Alloy is the toughest material, is more difficult to cut and less likely to be damaged by unintentional vandalism. Nevertheless, its high shrinking tendency needs to be taken into consideration at installation. The reinforced rubber liners installed in 2009 have performed very well over the past two years.

Additional details are provided in this report, along with considerations when planning a lining project. A summary of the factors that appear to have highest impact on the liner performance is given in Table A-5.

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