

**Water and Environmental Programs
Engineering Success Stories**

State: Oklahoma

Borrower Name and Case No.: Hughes County RWD #2, Stuart, OK

Engineering Firm: Holloway, Updike and Bellen, Inc.

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Congressional Information: Rep. Wes Watkins

County: Hughes and Pittsburg

Keywords: Package Plant

Modified Package Water Treatment Plant

Description of Problem/Issue:

Hughes County RWD #2 is a small rural water district in southeast Oklahoma. The District serves 434 rural users. Prior to their recently constructed project the District was dependent on well water for their water source. The well water over time had become highly corrosive and was cited by the Oklahoma Department of Environmental Quality for violations in regard to quantity and quality. The District is in an extremely rural area and too far away from a potential purchase water source which made purchasing water cost prohibitive. The problem was twofold. First an alternate water source was required. Second, an affordable and effective solution to treating the water was needed.

Solution:

The District in consultation with their engineer, Joe Reid of Holloway, Updike and Bellen, Inc. and Rural Development personnel developed a project that utilized a small, 102 acre, SCS flood control lake for their water source. The water quality of the lake had elevated levels of iron and manganese. The turbidity of the raw water fluctuated considerably, with high levels after significant rainfall events.

The land use around the lake site was also a problem in that it was used for agricultural purposes and significant amounts of rainfall led to runoff which would deposit sediment into the lake. Also cattle grazed the area and were a source of contamination. As a part of the project the District purchased much of the land adjacent to the lake to control the land use to minimize impacts to the raw water source.

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The engineer proposed the construction of a 280 gpm package water treatment plant. RD in Oklahoma has previously funded projects similar to this with varying degrees of success. Most package plants with a clean and consistent quality of raw water operate fine, while others when dependent on water sources with fluctuating turbidities were having problems operating and meeting acceptable EPA limits. The problem was that the basic ingredients for water treatment, time and gravity, were often missing in the package treatment process. Water was pushed through the plants so fast that the addition of chemicals was not effective in that there was not enough time for the particles in the water to coagulate and settle. The project engineer in consultation with RD Engineers determined that a large pre-sedimentation basin ahead of the plant should be constructed to allow the raw water time to mix with the chemicals and to settle. This would also alleviate the large number of backwash cycles that some package plants were experiencing due to the filter constantly plugging with unsettled solids.

As a result of this type of plant being constructed, the District is treating water from their new raw water source effectively and economically.
