

**Water and Environmental Programs
Engineering Success Stories**

State: Vermont

Borrower Name: Village of Derby Center

Engineering Firm: Webster-Martin, Inc., South Burlington, Vermont

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Derby Center, Vermont Water System

DESCRIPTION OF PROBLEM/ISSUE:

The Village of Derby Center used a well for its source. The well had become contaminated with nitrate, probably from a combination of farm runoff and subsurface disposal systems in the recharge area. The community had a moratorium on new connections since 1986. EPA issued a notice of violation in 1991.

The Village borders on a lake, but the lake was also shallow and had high turbidity at certain times of the year or under certain wind conditions.

The Village is in an area of chronically high unemployment and was in what at the time was known as a job zone. The Village is located just a few miles from the Canadian border. Because of the moratorium on new connections, the Village could not take advantage of potential economic growth spurred by the completion of the interstate highway connecting Boston and the industrial centers of Connecticut and New York with those of Montreal and Quebec City. The highway was completed less than a decade before the moratorium was put into effect.

A storage tank was needed to serve the developing area west of the village. In order to be at the correct elevation, the tank needed to be located at a remote site.

The water meters on the system were old. Reading of meters and billing were done manually.

Solution:

The Consulting Engineer recommended retaining the well and building a slow sand filter to treat the water from the lake, after evaluating several alternatives. The project was built in two stages: the storage tank in 1994 and the water treatment facility in 1995-96.

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The high nitrate in the well water is brought within standards by blending about 50/50 with treated water from the lake, so there is no need to treat the well water.

The cost-effective method of treatment for the lake water is a slow sand filter. Because of the turbidity, the filter was subject to uneconomically short run times. The run time was increased by converting the existing open reservoir on the site to a covered pre-settling basin. This reduces the turbidity to a level that the run times of the slow sand filter are long enough to be feasible.

The telemetry for the storage tank is powered by a solar panel with battery supply.

New meters with an electronic meter reading system were installed. The billing system has become automated.

Successful Elements.

The Village now has an adequate supply of potable water for its residents.

The slow sand filter features an innovative pre-settling basin to lower the high natural turbidity. This feature enables a slow sand filter to be used over a wider range of source water quality than one without the pre-settling basin.

The Village can now support additional economic development.

The project was made possible by joint funding (now known as leverage) with the State of Vermont.

Costs of reading meters and issuing bills have been reduced.

The design of the project and the joint funding enabled the ultimate user cost to remain affordable.

Another part of the success story was not realized until after the project was completed. The neighboring City of Newport had a shortage of water. Derby Center has a surplus of capacity in these early years of the design period. A water main has been installed in the short distance between the two systems. Newport is now supplementing its water with surplus purchased from Derby Center.

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