



# TONKA EQUIPMENT COMPANY

## Project Profile

### BREMEN WATER TREATMENT PLANT Village of Bremen, Ohio

#### BREMEN WATER TREATMENT PLANT

Contact: Byron Bowersox  
Plant Superintendent  
(740) 569-4535  
Susan Henwood  
Village Administrator  
(740) 569-4788

#### DESIGN ENGINEER

*GGC Engineers*  
Contact: Mike Carder  
(614) 471-7310

#### TONKA REPRESENTATIVE

*Sabatka-Davis & Associates, Inc.*  
Contact: Dave Sabatka  
(614) 447-8989



#### APPLICATION

Iron and manganese removal with softening  
New filtration and softening equipment for better water quality

#### TONKA PROCESS EQUIPMENT:

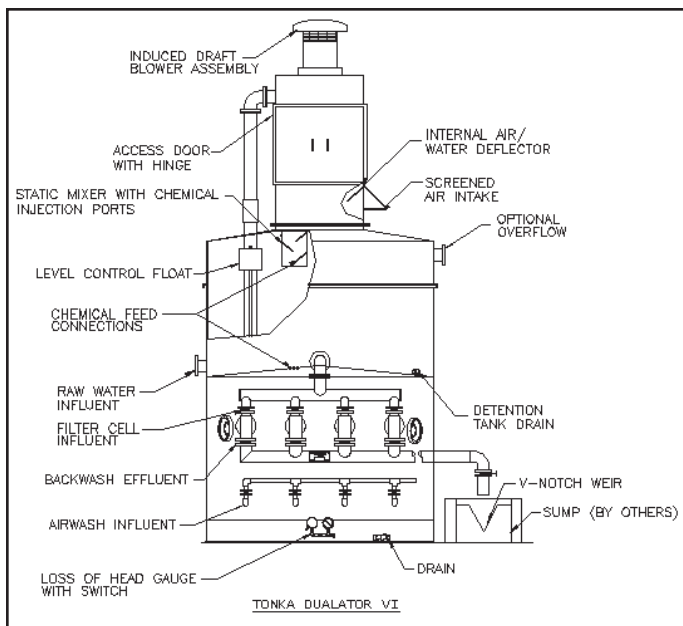
Dualator® VI filter designed with Simul-Wash™ backwashing  
Ion Exchange Softeners (2)

#### PROJECT

Due to continuing problems of iron and water hardness, the Village of Bremen decided to build its own water treatment plant. Byron Bowersox, Plant Superintendent, had previous knowledge of the Tonka Dualator® treatment system. GGC Engineers were hired to evaluate current water usage and design for future expansion demands. After reviewing a number of treatment options, the engineers at GGC Engineers and the Village of Bremen decided to design the plant around Tonka's proposed Dualator® VI and softening system. Raw water entering the plant has iron, manganese and hardness, which need to be reduced prior to distribution. The Village is able to produce an excess of water, which it will be selling to a nearby village. Based on these sales, the equipment will pay for itself in 5 to 6 years.

#### PROCESS

The water treatment facility incorporates a 12' diameter x 28' over all height (OAH) Dualator® VI filter with two 6' diameter x 9'-9" ion exchange softeners. The Dualator® VI has four treatment processes: degassing and aeration; chemical feed of chlorine and potassium permanganate; detention time for chemical disinfection and floc growth; and dual media filtration for iron and manganese removal. The ion exchange vessels are used for hard water softening and were designed to achieve hard water blending. This blending of the softened and hard water is a cost saving feature for the Village of Bremen, with the final hardness effluent blended to 100 mg/l.



The new Dualator® VI filter is designed with the value-added “Simul-Wash™” backwash process. This unique process uses air and water in combination, at sub-fluidization water rates, providing the most effective means of backwashing granular media filters.<sup>1</sup> The Tonka Simul-Wash™ media rejection backwash trough was integrated into the filter design, which enables the air and water backwash cycle to continue for a limitless period of time without media loss. This process features optimal filter cleaning efficiency with approximately 50% reduction in backwash wastewater volume over conventional methods. The Tonka Simul-Wash™ process also provides the longest filter runs possible meeting the highest standards of water filtration. This key process design feature saved the Village of Bremen upfront construction costs as well as considerable savings on each backwash. Filtered water is pumped to the town’s distribution system and then to elevated tanks for storage.

## PERFORMANCE

The raw water analysis summarized below reflects moderate concentrations of iron and calcium hardness. The Tonka treatment process has been highly efficient in delivering high quality water as indicated below.

<b>Treated Flow 300 GPM</b>	<b>Raw Water</b>	<b>Finished Water</b>
<b>Iron (Fe)</b>	<b>2.0 mg/l</b>	<b>0.01 mg/l</b>
<b>Total Hardness</b>	<b>500 mg</b>	<b>100 mg/l</b>

**FOR ADDITIONAL DETAILS, CONTACT:**  
Tonka Equipment Company

<sup>1</sup>Amirtharajah, Appiah, et al. *Optimum Backwash of Dual Media Filters and GAC Filter-Adsorbers With Air Scour*, AWWA Research Foundation and American Water Works Association, 1991.



# TONKA EQUIPMENT COMPANY

**763-55-WATER • 763-559-2837 • FAX: 763-559-1979 • [www.tonkawater.com](http://www.tonkawater.com)**  
P.O. BOX 41126 • PLYMOUTH, MINNESOTA 55441-0126 • 13305 WATERTOWER CIRCLE • PLYMOUTH, MINNESOTA 55441