



TONKA EQUIPMENT COMPANY

Project Profile

VILLAGE OF WEST SALEM WATER TREATMENT PLANT West Salem, OH

VILLAGE OF WEST SALEM

Village Administrator

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DESIGN ENGINEER

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TONKA REPRESENTATIVE

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APPLICATION:

Iron & Manganese Removal
TDS, Hardness and Sulfate Reduction
Flow: 200 gpm

TONKA TREATMENT SYSTEM:

- Vertical Pressure Filters
- Simul-Wash™ backwash system
- Nanofiltration Membranes

PROJECT:

Both surface and groundwater sources are limited in the West Salem area. However, a local well driller was able to find a limited aquifer immediately north of the Village, which could produce up to 200 gallons per minute from two wells. The quality of this new source water was less than desirable, having concentrations of iron (1.23 mg/l), manganese (0.07 mg/l), sulfate (385 mg/l) and total dissolved solids (980 mg/l), far in excess of the Ohio Environmental Protection Agency Secondary Contaminant Recommended Maximum Levels. Furthermore, the hardness of 841 mg/l was much higher than the aesthetically pleasing and desirable range of 80 to 100 mg/l.

PROCESS:

The treatment system provided by Tonka consists of two stages. The first stage is iron and manganese oxidation by potassium permanganate followed by greensand filtration (two 8' diameter pressure filters). The second stage consists of two Tonka NF membrane skids for the reduction of dissolved solids, including sulfate and hardness reduction. Final treatment includes fluoridation by sodium fluoride addition; disinfection by sodium hypochlorite addition; and stabilization by caustic soda addition. The capacity of the treatment plant is suitable for expansion by the installation of one additional pressure filter and one additional membrane filtration skid.



The treatment plant also includes Tonka’s value-added Simul-Wash™ backwash system. This unique backwash system uses air and water simultaneously, at sub-fluidized rates, to provide the most effective means of backwashing granular filter media¹. Tonka’s media rejecting Simul-Wash™ trough enables the air and water backwash cycle to continue indefinitely without media loss. This results in optimal filter cleaning efficiency and prolonged filter runs, while saving approximately 50% of backwash wastewater compared to conventional methods.

PERFORMANCE:

The treatment process has been highly effective in delivering quality water as indicated below.

	Raw Water	Finished Water
Iron (Fe)	1.5 mg/L	0.30 mg/L
Manganese (Mn)	0.07 mg/L	0.05 mg/L
Hardness	841 mg/L	Blended to 90 mg/L

FOR ADDITIONAL DETAILS, PLEASE CONTACT:

Tonka Equipment Company

¹ 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.



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