



TONKA EQUIPMENT COMPANY

Project Profile

INDEPENDENCE TOWNSHIP, MI WATER SYSTEM IMPROVEMENT PROJECT

INDEPENDENCE WATER DEPT.

Superintendent

Contact: Linda Richardson
248-625-8222

DESIGN ENGINEER

Hubbell, Roth & Clark Inc.

Contact: Kenneth Melchior
248-454-6300

TONKA REPRESENTATIVE

Dubois-Cooper Associates

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GENERAL CONTRACTOR

J.F. Cavanaugh Co., Inc.

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APPLICATION:

Arsenic and Iron Removal

PROJECT:

With imminent changes in arsenic standards, Independence Township found much of its water would soon be out of compliance. With a rapidly growing community, the Township elected to explore treatment possibilities. After conducting evaluations, studies and pilots, the Township sought the help of Hubbell, Roth & Clark Inc. and Tonka Equipment Company. Hubbell, Roth & Clark Inc. designed and administered the construction of four new arsenic and iron co-precipitation treatment plants to help meet the needs of Independence Township. Tonka Equipment Company designed customized solutions for the Deer Valley, Deerwood, Deerwood Manor, and Lake Oakland Woods treatment plants.

PROCESS:

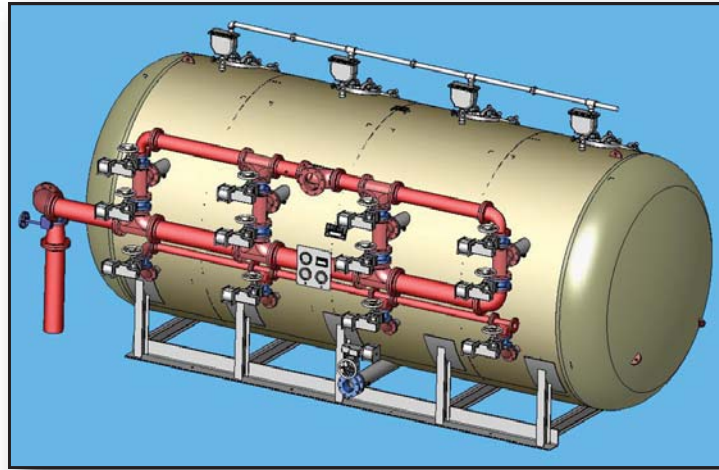
Each horizontal pressure filter is comprised of four cells sharing a common underdrain. Prior to entering the filters, sodium hypochlorite is added to the raw water via an inline static mixer. The chlorine serves to oxidize the iron and change the valence of the arsenic from As₃ to As₅. This arsenate co-precipitates with the iron forming a filterable solid. The water is evenly split between each filter cell where it passes through the dual-media filter bed of silica sand and anthracite.

TONKA PROCESS EQUIPMENT:

Each plant location (4) incorporates:

- 4 Celled – 10' diameter horizontal filters
- Silica sand/anthracite dual media
- Tonka's Simul-Wash™ backwash system

This model shows the Deerwood Manor Horizontal Pressure Filter system supplied by Tonka



Each filter includes the 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 media.¹ 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.

The filter system is controlled by Tonka’s PLC-based automatic control panels which have been customized to automatically backwash the filters by loss of head, time, or operator initiation. The duration of the backwash and other functions are selectable and adjustable by the operator through an Opto 22 color touchscreen.

PERFORMANCE:

The raw water analysis summarized below reflects moderate concentrations of iron and low arsenic concentrations existing in the water. The treatment process has been highly effective in delivering quality water as indicated below.

	Deer Valley		Deerwood		Deerwood Manor		Lake Oakland Woods	
	Raw Water	Finished Water	Raw Water	Finished Water	Raw Water	Finished Water	Raw Water	Finished Water
Arsenic	13 ppb	1.0 ppb	10 ppb	1.0 ppb	10 ppb	1.0 ppb	11 ppb	2.0 ppb
Iron	1.29 ppm	0.01 ppm	1.3 ppm	0.0 ppm	1.6 ppm	0.01 ppm	0.6 ppm	0.01 ppm

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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