TONKA EQUIPMENT COMPANY

Project Profile

PURCELLVILLE WATER TREATMENT PLANT

Purcellville, VA

TOWN OF PURCELLVILLE
Superintendent
Contact: Alex Vanegas
540-338-2513

DESIGN ENGINEER
Engineering Concepts, Inc.
Contact: Gary Rookstool, P.E.
540-473-1253

GENERAL CONTRACTOR
East Coast Utlility Contractors, Ltd.
Contact: Chris Link
757-564-7098

TONKA REPRESENTATIVE
The Vaden Company
Contact: John Hunt
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APPLICATION:

Iron and Manganese Removal

TONKA PROCESS EQUIPMENT:

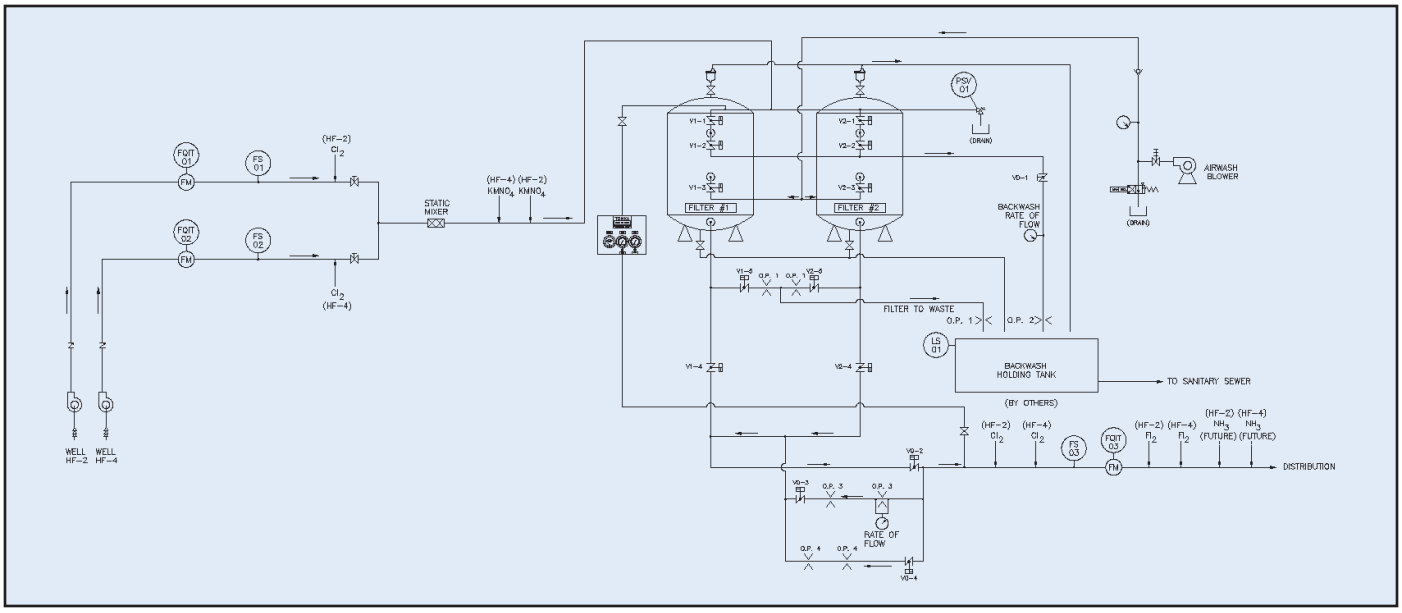
Two 6'-6" diameter vertical pressure filters
Manganese greensand/anthracite dual media
Tonka's Simul-Wash™ backwash system

PROJECT

Purcellville, Virginia, a short commute from Washington, D.C., is located in the northern Virginia county of Loudoun, one of the fastest growing counties in the nation. To accommodate this explosive growth, the City of Purcellville needed to increase its water production. Engineering Concepts, Inc. was hired to design a new groundwater treatment plant to supplement the town's existing system. After reviewing several treatment options, the City and Engineer chose to work with Tonka Equipment Company to customize a design for a 200-gpm plant. The technology selected included vertical pressure filters and a PLC control system. The new plant was commissioned in 2002.

PROCESS

The treatment processes consist of chlorine and potassium permanganate addition for chemical oxidation of iron and manganese, followed by filtration using a dual-media filter bed of manganese greensand and anthracite. The anthracite removes the larger iron and manganese precipitates while the greensand removes the smaller manganese dioxide solids that slip through the anthracite.



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™ troughs enable 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, as compared to conventional backwash methods.

The treatment system is controlled by one Tonka PLC-based NEMA 4 automatic control panel which automatically backwashes the filters upon loss of head, timer, or operator initiation. The duration of the backwash is adjustable by the operator through an Allen-Bradley PanelView 1000 color touchscreen OIT. Instrumentation includes pressure gauges and switches, flow meters, loss of head gauges, and chart recorders.

PERFORMANCE

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

	Raw Water	Finished Water
Iron (Fe)	**0.15 mg/l**	**0.01 mg/l**
Manganese (Mn)	**0.25 mg/l**	**0.002 mg/l**

FOR ADDITIONAL DETAILS, 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.

TONKA WATER TREATMENT SYSTEMS

TONKA EQUIPMENT COMPANY

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