



# TONKA EQUIPMENT COMPANY

## Project Profile

### City of Forest Lake, MN Water Treatment Plant

#### CITY OF FOREST LAKE

Contact: George Stockdill  
Utility Superintendent  
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#### DESIGN ENGINEER

*TKDA Engineering*  
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#### GENERAL CONTRACTOR

*Rice Lake Contracting*

Contact: Wade Leonard  
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#### APPLICATION:

Iron Removal & Hardness Reduction  
1000 gpm Plant Capacity

#### TONKA PROCESS EQUIPMENT:

Automatic Dualator® I Package Treatment System, Ion Exchange Softeners (4)

### PROJECT BACKGROUND

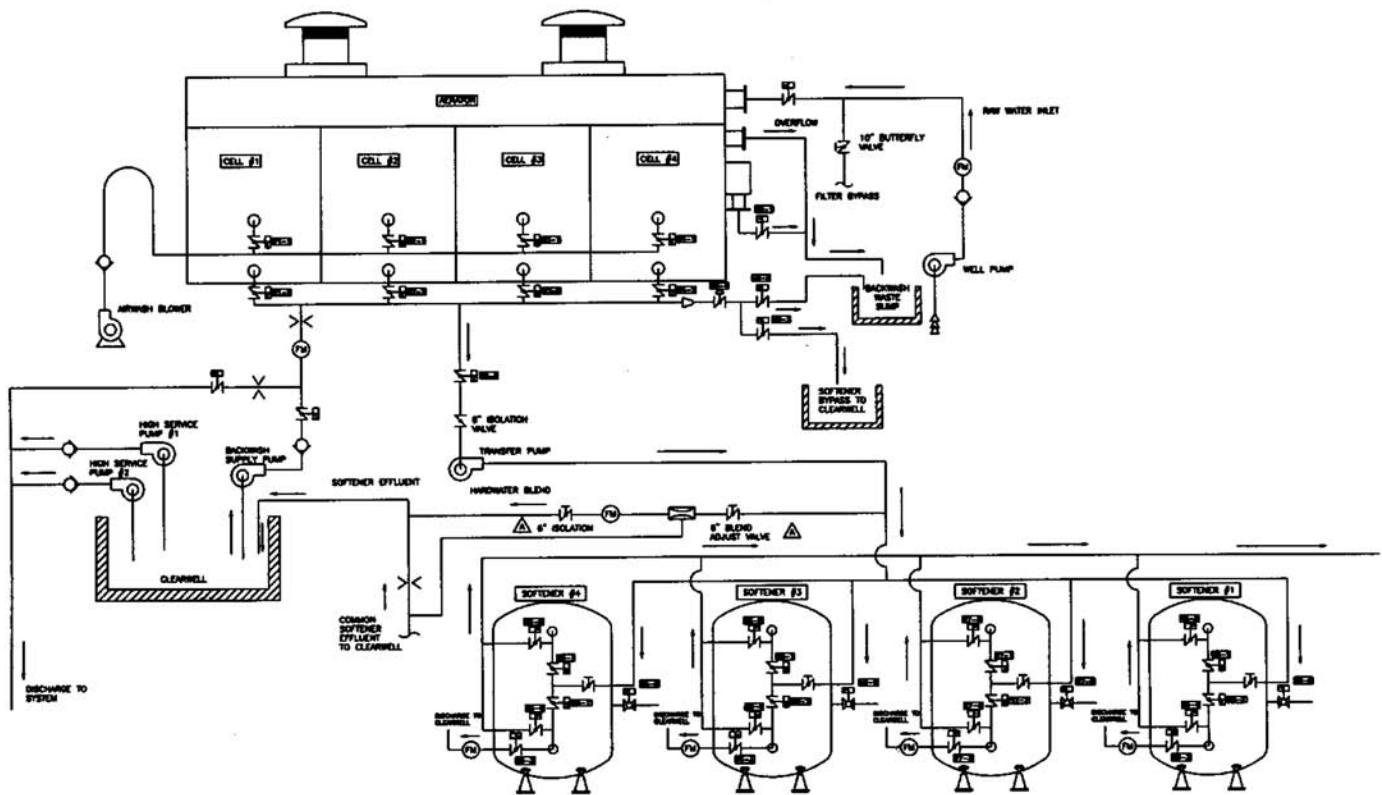
The Forest Lake, MN water treatment plant was constructed to meet the increasing demands of the city. This new treatment plant was designed to supplement the city's existing water treatment facility, which consists of vertical pressure filters for iron removal and ion exchange softeners for hardness reduction.

### PROCESS

The raw water supply is received from a Mount Simon well bearing an iron concentration of 1.1 mg/l and a hardness of 230 mg/l. The raw water flows to a Tonka Dualator® I iron removal filter where aeration and filtration are accomplished in a single vessel. Aeration is provided through an induced draft spray aeration system where iron oxidation is accomplished and hydrogen sulfide is reduced. The aerated water falls directly into a multicell gravity filter where the iron precipitate is removed by filtration through a dual media, sand and anthracite filter bed. A transfer pump is used to draw from the effluent of the Dualator® I gravity filter and pressurize four seven foot diameter ion exchange softeners.

The ion exchange softening system is designed to treat 630 gpm while bypassing an additional 370 gpm to maintain a plant effluent hardness of 85 mg/l. Each ion exchange softener has a capacity to treat 200,000 gallons between regenerations. The ion exchange softeners are automatically regenerated by means of PLC controls, batch counters and pneumatically actuated butterfly valves.

The Dualator® I filter is also automatically controlled through the use of PLC controls, differential pressure switches and pneumatically actuated butterfly valves. The filter also incorporates the Tonka Simul-Wash™ combined air and water backwash system, reducing backwash waste volume, thus lowering the system's annual operating costs.



## PERFORMANCE

The raw water iron exceeds the secondary standards of the Clean Drinking Water Act by a factor of almost 3, and the raw water hardness is considered moderately high. Through the treatment process, iron and hardness are both significantly reduced providing a very high quality water to the community.

## FEATURES OF THE TONKA SYSTEM

- |               |   |
|---------------|---|
| PROVEN        | Dualator® I treatment units have successfully been used in iron removal applications for more than 50 years.                          |
| SIMUL-WASH™   | Maximizes bed cleaning resulting in longer runs and fewer backwashes<br>Minimizes backwash waste, reducing backwash reclaim tank size |
| TROUGH DESIGN | Maximizes media retention without infringing on solids removal<br>True overflow design  |

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



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