

TOWN OF RAYMOND, NEW HAMPSHIRE

Road Water Treatment Plant

Project

Raymond, New Hampshire is a growing community east of Manchester. The town's existing two wells had high levels of iron and manganese, which led to consumer complaints of staining and colored water. In addition, due to a lack of supply capacity, they wanted to add a third well. The consulting firm of Dufresne-Henry was hired to locate a new groundwater supply source and to design and administer the construction of a new treatment plant to eliminate the iron and manganese as well as remove radon gas from the water supply. The town and engineer worked with Tonka Water to design New England's first Dualator® VI treatment plant. The plant successfully opened in 2004.

Process

The treatment process consists of three steps in one compact system—*aeration, detention and filtration*. The aeration step is for radon/CO₂ stripping and iron oxidation. Calcium hypochlorite and potassium permanganate are added after aeration for oxidation of manganese. The detention tank allows full oxidation of both iron and manganese to an insoluble state. The final step is filtration through a four-cell filter system using a dual-media filter bed of manganese greensand and anthracite. The anthracite cap serves to capture the larger iron and manganese precipitates, while the greensand removes the smaller manganese dioxide solids that pass through the anthracite.

Tonka Water customizes each Dualator® VI treatment plant to meet the requirements of each application. During the final stage of design, the state reviewing authority asked if we could modify our design to allow the operation of the system with one filter cell out of service. We responded by customizing the Dualator® VI filter section into an isolated cell design.

APPLICATION

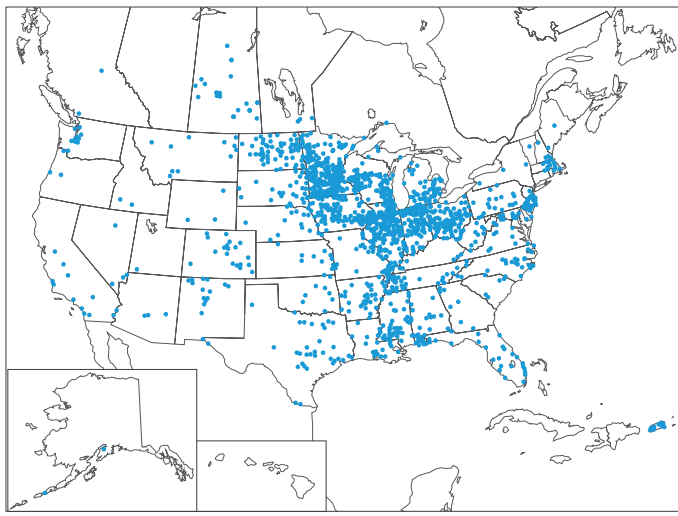
Radon, iron & manganese removal

TREATMENT SYSTEM

Dualator® VI with manganese greensand/anthracite dual media

FEATURES

- Tonka Water's Simul-Wash™ backwash system
- Optimal filter cleaning efficiency
- 50% wastewater reduction
- Integrated control panel



Tonka Water Guarantee

Tonka Water provides the best custom manufactured water treatment systems in the industry. Our people will deliver excellent service and support for your project from conceptual and cost-effective design, to construction and commissioning; and throughout the system warranty and operational life of the project. We guarantee it.

Thousands of quality water treatment installations since 1956.

Performance

The raw water analysis summarized below reflects low concentrations of iron and high concentrations of manganese existing in the water. Since start-up the treatment process has been highly effective in delivering quality water as indicated below.

	Raw Water	Finished Water
Turbidity	0.35 mg/L	0.01 mg/L
Manganese(Mn)	1.3 mg/L	0.03 mg/L



Town of Raymond water treatment plant.

Simul-Wash™ Backwash System

The treatment plant also includes Tonka Water'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 Water'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 percent of backwash wastewater compared to conventional methods.

¹Amirtharajah, 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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