



Advanced Biological Filtration Solution

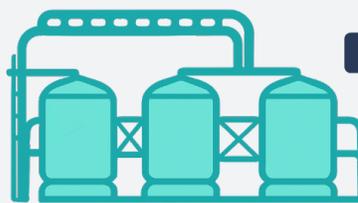
Fluence biological filtration removes iron, manganese, ammonia, methane, and organic compounds naturally—without chemical oxidants. Ideal for well water and groundwater, the process forms a natural manganese oxide layer on quartzite sand for efficient oxidation, low operating costs, and long-term reliability.

How it Works

Groundwater is first saturated with oxygen to stimulate microbial activity. It then flows through a biologically active granular filter, where naturally occurring, non-pathogenic microorganisms oxidize iron, manganese, ammonia, methane, and biodegradable organic compounds. Insoluble solids are trapped within the granular bed, and periodic air and water backwashing restores the filter's performance, ensuring continuous, reliable, and chemical-free water treatment.



Aeration / Oxygen Saturation



Biological Filtration



Air & Water Backwash

Key Advantages

No Chlorine Use: No issues connected to the formation of trihalomethanes

No Chemical Regeneration Required: Naturally forming manganese oxide coating enables oxidation using dissolved oxygen—no chemical regenerants needed

No Activated Carbon Filtration Needed: Unlike breakpoint chlorination or ozonation

Safe & Natural: Avoids hazardous byproducts like trihalomethanes

Energy Efficient: Low operating costs, compatible with sustainability goals

Reliable: Handles variable water quality and fine-sand content

Applications

- Municipal groundwater treatment
- Small/medium drinking water systems
- Industrial groundwater supply
- Food & beverage processing water
- Agricultural water treatment
- Application range of 2500 GPD to 2.5 million GPD

Typical Municipal Performance

Parameter	Typical Influent Range	Effluent Quality
Iron (Fe)	0.5 – 10 mg/L	<0.05 mg/L
Manganese (Mn)	0.1 – 5 mg/L	<0.02 mg/L
Ammonia (NH ₃)	1 – 20 mg/L	Non-detect
Methane (CH ₄)	10 – 100 mg/L	Non-detect
Dissolved Organics	2 – 15 mg/L	<2 mg/L

Biological Oxidation Reactions

Contaminant	Biological Conversion
Ammonia	$\text{NH}_3 \rightarrow \text{NO}_3^-$
Iron	$\text{Fe}^{2+} \rightarrow \text{Fe}_2\text{O}_3$
Manganese	$\text{Mn}^{2+} \rightarrow \text{MnO}_2$
Methane	$\text{CH}_4 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$



Example Installations

Bono & Ditta Winery – Trapani, Italy, 2023

Biological filtration + ultrafiltration

Inalca Meat Processing – Sochocin, Poland, 2020

Biological filtration + decarbonation resins + RO

Conservas Isabel (Fish Processing) – Manta, Ecuador, 2018

Biological filtration + activated carbon + ultrafiltration + RO