

**Graver Water**  
Division of Ecodyne

## WR Hydro-Circ® for Reactivators®

**New WR Hydro-Circ® automatically operates at flow rates of 25% to 100% of design capacity and above. Cuts energy consumption in Reactivator® clarifiers**

Conventional reactivator clarifiers recirculate sludge with mechanical pumps—pumps that can wear out. Require significant maintenance. And consume a great deal of energy.

Graver's WR Hydro-Circ® (wide range hydraulic circulation) system recirculates sludge without using mechanical pumps: By converting the kinetic energy of the influent water into hydraulic pumping energy, the system lifts settled solids off the clarifier floor, pumps them up through a draft tube, and mixes them with the water to promote precipitation and flocculation.

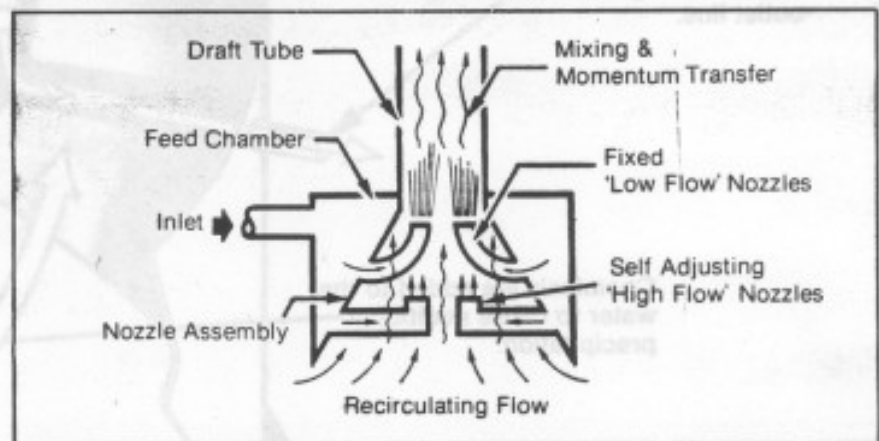
Hydro-Circ recirculates sludge as efficiently as mechanical systems. But since pumping is hydraulic and not mechanical, Hydro-Circ consumes less energy and requires less maintenance than other clarifiers.

And, except for a single sludge scraper arm driven by a fractional horsepower motor, Hydro-Circ has no mechanical drives, bearings, impellers, or other moving parts. So it costs less to install and operate.

Ideal for softening by cold lime process and clarification by coagulation, Hydro-Circ effectively removes suspended solids, organic impurities, and colors from water and wastewater streams. The system is guaranteed to operate efficiently at flow rates as low

as 25 percent of design capacity. A self-regulating nozzle system automatically provides the optimum sludge recirculation rate, reducing carryover and minimizing effluent turbidity.

Hydro-Circ. It's the simple system that works quickly and quietly to produce clear, clean effluent streams. With no mechanical systems. No electrical hook-up. And no moving parts.



### Nozzles Do The Work of Mechanical Pumps More Efficiently and More Economically

Here's how Hydro-Circ works: Water or wastewater enters the system through self-regulating nozzles that automatically set the optimum recirculation rate. Influent water flowing through these nozzles creates a pumping action that lifts precipitates off the clarifier floor and into the bottom segment of the draft tube. Here solids, water, and added chemicals mix to promote precipitation and flocculation.

Water rises through the tube into the recirculation zone of the clarifier, where further solid-

liquid contacting occurs. Then it flows downward and splits into two streams.

One stream of water and suspended solids is recirculated through the system, while the other enters a settling zone. Here precipitates and sludge settle out and fall to the bottom of the tank; they are swept into a sludge pit by the slowly rotating scraper assembly. Sludge collected in the pit is discharged from the system.

Meanwhile, the clear water rises to a collector at the top of the settling zone and is removed from the system through the effluent outlet line. The discharged effluent stream is free of suspended solids.

# Graver WR

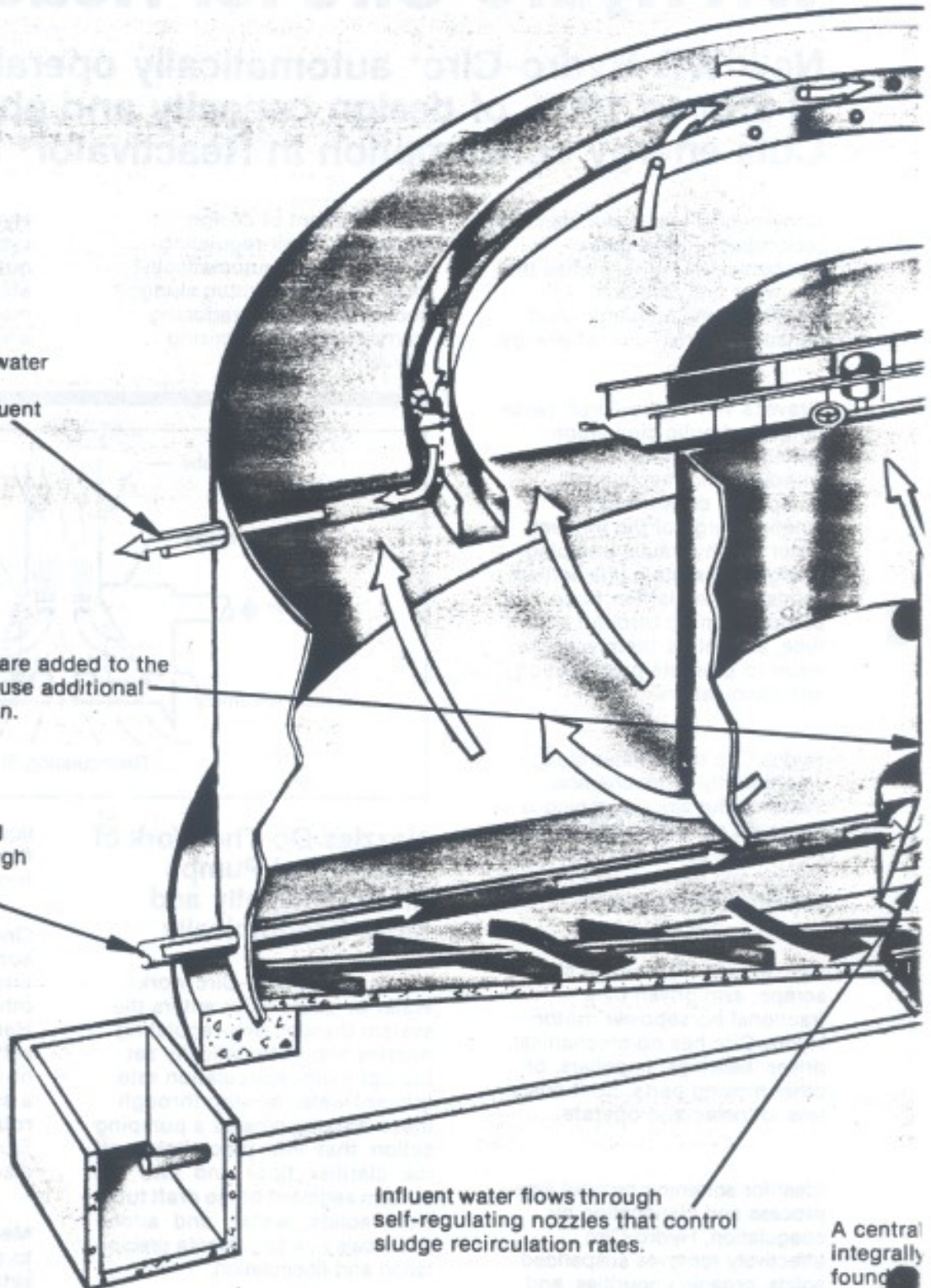
The treated, solid-free water is discharged from the system through the effluent outlet line.

Chemicals are added to the water to cause additional precipitation.

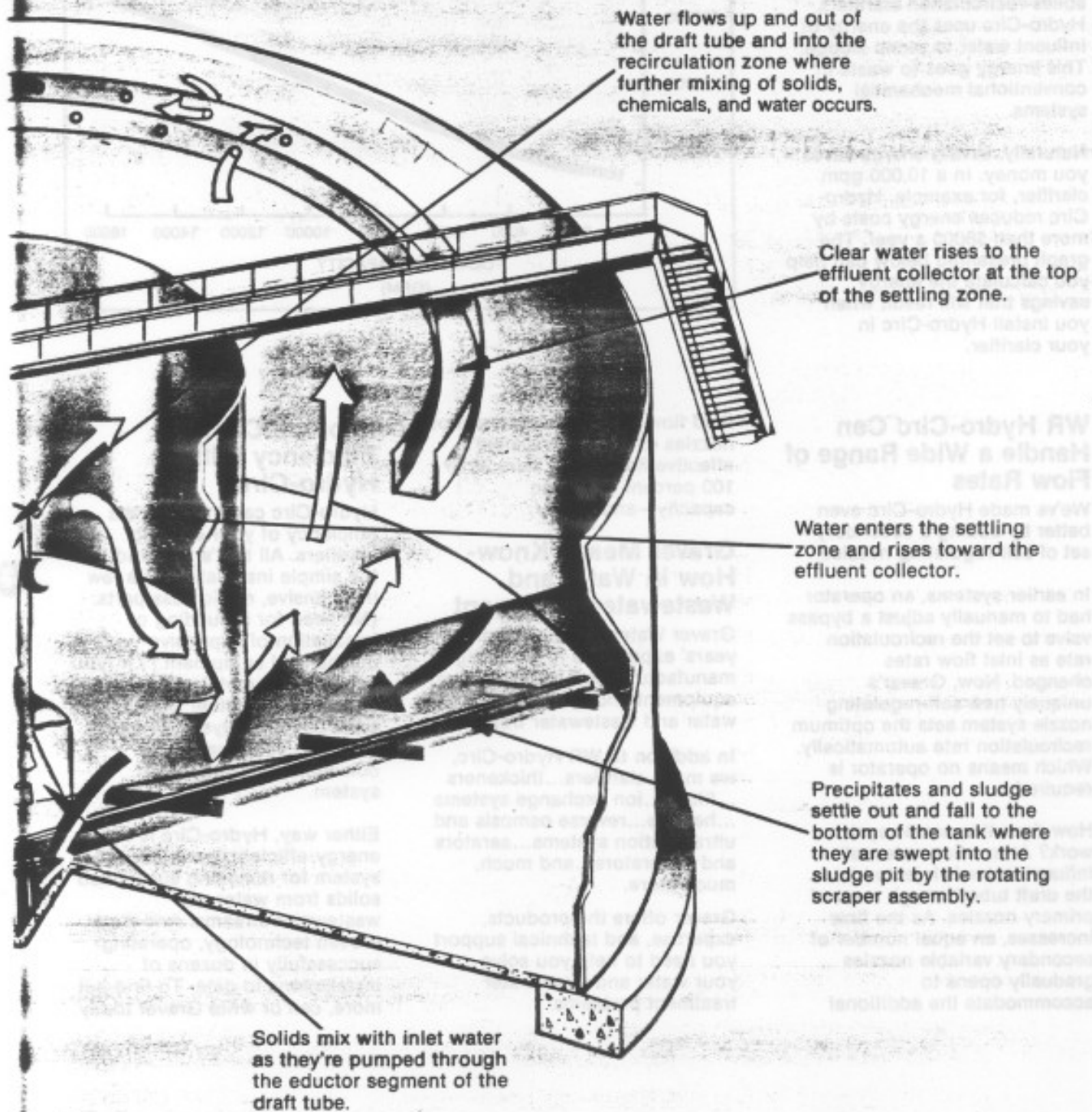
Raw water to be treated enters the system through the inlet pipe.

Influent water flows through self-regulating nozzles that control sludge recirculation rates.

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# Hydro-Circ®



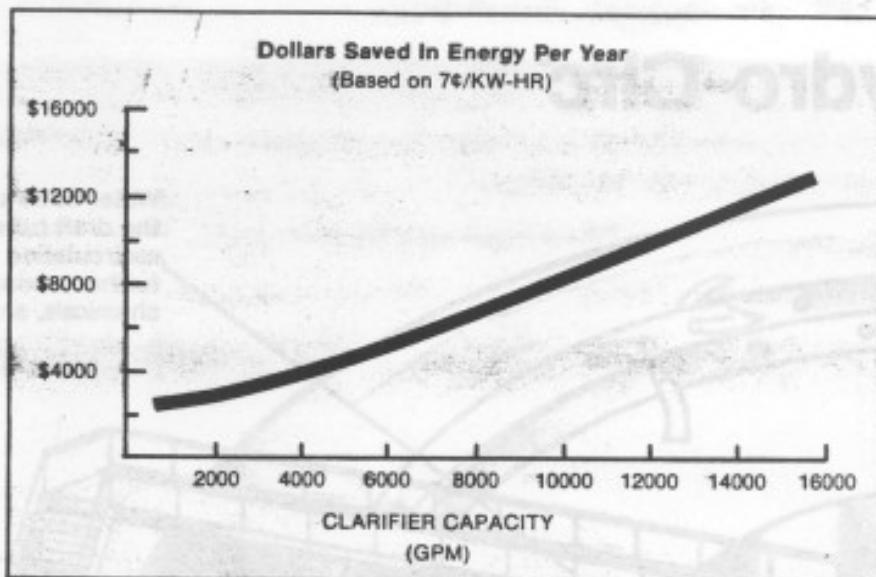
Sludge pit, located in the center of the tank, is swept by the rotating scraper arm.

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## How Hydro-Circ® Can Save You Money

Hydro-Circ replaces energy-consuming mechanical pumps in the Reactivator® and other solids-recirculation clarifiers. Hydro-Circ uses the energy of influent water to pump sludge. This energy goes to waste in conventional mechanical systems.

Naturally, saving energy saves you money. In a 10,000 gpm clarifier, for example, Hydro-Circ reduces energy costs by more than \$8000 a year. The graph presented below can help you calculate the energy savings that will result when you install Hydro-Circ in your clarifier.



## WR Hydro-Circ Can Handle a Wide Range of Flow Rates

We've made Hydro-Circ even better by adding a secondary set of self-regulating nozzles.

In earlier systems, an operator had to manually adjust a bypass valve to set the recirculation rate as inlet flow rates changed. Now, Graver's uniquely new self-regulating nozzle system sets the optimum recirculation rate automatically. Which means no operator is required.

How does this nozzle system work? At low flow rates, all influent water is injected into the draft tube through a set of primary nozzles. As the flow increases, an equal number of secondary variable nozzles gradually opens to accommodate the additional

fluid flow. This secondary set of nozzles extends the system's effective flow range from 25 to 100 percent of design capacity—and higher.

## Graver Means Know- How in Water and Wastewater Treatment

Graver Water has more than 30 years' experience in the design, manufacture, and installation of equipment and systems for water and wastewater treatment.

In addition to WR Hydro-Circ, we make clarifiers...thickeners...filters...ion exchange systems...heaters...reverse osmosis and ultrafiltration systems...aerators and deaerators...and much, much more.

Graver offers the products, expertise, and technical support you need to help you solve your water and wastewater treatment problems.

## Improve Clarifier Efficiency With Hydro-Circ

Hydro-Circ can increase the efficiency of your existing clarifiers. All that's required is the simple installation of a few inexpensive, motionless parts. (No need for rebuilding or installation of expensive mechanical equipment.) Or, you can buy a complete Graver Reactivator Clarifier system equipped with Hydro-Circ for less than you'd pay for a conventional mechanical system.

Either way, Hydro-Circ is the energy-efficient, trouble-free system for removing suspended solids from water and wastewater streams. And it's a proven technology, operating successfully in dozens of installations to date. To find out more, call or write Graver today.

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