



PARTNERING WITH MUNICIPALITIES AND
INDUSTRY TO IMPROVE THE QUALITY OF
OUR WATER RESOURCES SINCE 1928



Cleaner Water for a Brighter Future®





Experts in Treatment Equipment and Process Solutions since 1928

Lakeside Equipment Corporation is a proven provider of reliable, efficient, cost-effective equipment for the treatment of municipal and industrial wastewater. With a wide range of systems and products for virtually all stages of wastewater treatment, from influent to discharge, Lakeside offers consulting engineers and plant operators the assurance of the highest quality performance. When Lakeside equipment is specified for their projects they know they will receive the correct equipment to meet their plant's requirements in all phases of water treatment.

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Screw Pumps

Bearing design and trouble-free operation are hallmarks of Lakeside screw pumps. The built-in variable capacity automatically adjusts the pumping rate and power consumption while operating at a constant speed to match the incoming flow. Lakeside's screw pumps have a high rate of acceptance by engineers for their ability to efficiently lift large quantities of wastewater at low heads at any stage of the treatment process in a wide variety of applications.

- Wastewater plant lift stations
- Return activated sludge
- Stormwater pumping
- Land drainage
- Industrial applications

Effective Operation and Greater Savings

- Lower operating costs
- Reduced maintenance and repair
- Non-clogging operation
- No piping friction losses
- Elimination of variable-speed electrical controls

Patterned after the Archimedean screw, the pump's assembly consists of a simply designed screw, upper bearing, lower bearing and drive arrangement. Because bearing construction is critical to the life of the screw pump, we have developed the best bearing assemblies available for long life and reduced costs. By determining the maximum flow, the maximum lift, the inclination and screw speed required, our engineers can design a screw pump to meet every need.

Type C Screw Pumps



Type S Screw Pumps



Open Screw Pumps



Raptor® Screening Products

Highly efficient Lakeside screening systems offer multiple functions in each product. It's no wonder that our equipment is preferred among plant operators for its simple operation and minimal maintenance. Our innovative screen solutions and technology are designed to serve a wide range of applications:

- Wastewater
- Septage, FOG, sludge and scum screening
- Screenings washing and compaction
- Package headworks

Our Raptor® products meet and exceed the varying needs of municipalities and industries in installations around the globe.

- Maximum removal efficiency
- Minimal head loss
- Screen, wash, compact and dewater in one operational unit
- Controls included
- Minimal maintenance
- All stainless steel construction
- Long service life



Raptor® Fine Screen

*Raptor®
Micro Strainer*

*Raptor® Rotating
Drum Screen*

*Raptor® Multi-Rake
Bar Screen*

Raptor® FalconRake® Bar Screen

Raptor® Fine Screen

Handles wastewater, septage, FOG, sludge and scum screening reliably and effectively. Is equipped with a cylindrical bar screen and a rotating, full penetrating rake assembly.

Raptor® Micro Strainer

Often installed in small treatment plants and industrial facilities and is equipped with a perforated basket and spiral screw.

Raptor® Rotating Drum Screen

Its high removal efficiency meets the needs of MBR designs and is an excellent screening solution for applications requiring removal of small particles.



Raptor® Fine Screen

Raptor® Micro Strainer

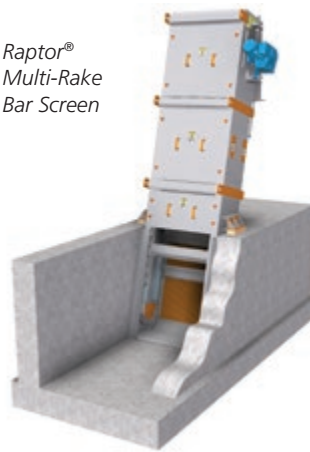
Raptor® Multi-Rake Bar Screen

Provides an all stainless steel heavy-duty bar screen design with durable stainless steel roller chain, lower Polystone return guides or stainless steel sprockets with ceramic bearings, standard rectangular or optional trapezoidal bars, and heavy-duty drive assembly.

Raptor® FalconRake® Bar Screen

Provides an all stainless steel heavy-duty bar screen design with self-supporting durable cast stainless steel chain links, no lower return guides or sprockets/bearings, standard rectangular or optional trapezoidal bars, and heavy-duty drive assembly.

*Raptor®
Multi-Rake
Bar Screen*



*Raptor®
FalconRake®
Bar Screen*



Raptor® Rotary Strainer Screen



Raptor® Wash Press



Raptor® Septage Acceptance Plant



Raptor® Septage Complete Plant

Raptor® Rotary Strainer Screen

As an externally-fed rotating fine screen in a self-contained tank, screening is provided using wedge wire with spacings ranging from 0.010-inch (0.25 mm) to 0.10-inch (2.54 mm) to provide a high degree of material removal.

Raptor® Wash Press

Cleans and compacts screenings, combining a two-stage process into one step that reduces volume and weight of the screenings to lower disposal costs.

Raptor® Septage Acceptance Plant

Removes debris and inorganic solids from municipal, industrial and septic tank sludges. This heavy-duty machine incorporates the *Raptor* Fine Screen for screening, dewatering and compaction. Accessories include grit and rock removal as well as security access and automated accounting systems.

Raptor® Septage Complete Plant

The Septage Acceptance Plant is offered as the *Raptor* Septage Complete Plant with screening and aerated grit removal in one unit. Optional grease removal system is available (a slight variation of the *Raptor* Complete Plant).

Trash and Screen Rakes

A line of trash and screen rakes from Muhr, complements Lakeside Equipment's water and wastewater technology for a complete solution.

Hydronic Series Trash Rakes

Hydraulically operated, the Hydronic T Series Rake's telescoping boom and rake mechanism cleans coarse and fine bar screens, trash racks and intake screens. Its telescoping design requires less headroom, resulting in savings for indoor headworks with deep channels or when retrofitting existing screens. And because the

Hydronic T Screen does not require guides, sprockets or chains, all moving parts can be accessed from above the channel for ease of operation and maintenance in screening wastewater, stormwater and water intakes.

Whether choosing the stationary or traversing rake, the Hydronic T can withstand the toughest applications plants have to offer.

Hydronic T Screen

Monorail Trash Rake

HY-TEC Screen



Monorail Series Trash Rakes

The Monorail system is designed specifically for wastewater treatment plants, stormwater facilities and water intake structures. It combines screening and transporting into one unit with an overhead monorail, traversing trolley, hydraulically operated grabber rake and control system.

HY-TEC Stormwater Screen

The proven technology of Lakeside's HY-TEC Screen features combs with uniquely shaped teeth to clean the horizontal bar rack while retaining solids in the main flow stream. Mounted on a hydraulically driven frame, the combs move back and forth during a cleaning cycle that is initiated at a preselected liquid level or head differential. HY-TEC CSO Screens are ideal for a number of applications, including wastewater bypass, combined sewer overflow and storm sewer overflow.

Package Headworks Systems



Lakeside offers a number of plant systems that combine two or more operations, i.e., screening and grit removal, into one self-contained fully automated unit. This equipment offers economy of scale and ensures that all the components function together effectively, resulting in initial cost savings in design as well as reduced maintenance costs through the years.

Raptor® Complete Plant

The Complete Plant screens inorganic solids from municipal wastewater and removes grit as well. The Complete Plant can be installed either above or below ground in its fabricated stainless steel tank. As an option, the grit chamber can be equipped with a grease trap operated manually or with a motorized skimmer.

- Simple design and operation minimize maintenance costs
- Stainless steel resists corrosion and increases service life
- Major components are pre-assembled, minimizing construction costs
- An enclosed transport conveyor and optional bagging attachments reduce odors and keep a clean work environment
- The single operational unit provides low head loss and increased treatment efficiency



The Raptor® Complete Plant combines screening and grit removal into one self-contained, fully automated unit.



Package Headworks Systems

Headworks Packaged System – H-PAC®

Lakeside's H-PAC® combines its *Raptor* Screening product line with its *SpiraGrit*® Vortex Grit Removal System into an elevated pre-engineered headworks system for screenings and grit removal in one unit. The H-PAC is a self-contained system in a fabricated stainless steel tank. It handles flows as high as 20 mgd and can be installed above or below ground. Its compact design requires less space and costs less than other packaged screen/grit systems.

- Reduced engineering costs
- Money saving integrated design eliminates need for concrete forming, added piping and valves
- Reduced operating costs
- Low headloss
- Superior corrosion resistance
- Easy access for maintenance

H-PAC®

Raptor® Screening Line

Tank-Mounted SpiraGrit®

SpiraGrit® Vortex Grit Removal System



H-PAC®

Grit Collection

Abrasive grit is the enemy of all mechanical equipment, reducing digester and/or aeration tank volume, clogging piping and treatment units and increasing wear on pumps and valves. Lakeside offers simple, low cost methods to remove grit effectively and enhance plant performance, reducing overall operating costs.

SpiraGrit® Vortex Grit Removal System

The Lakeside SpiraGrit® Vortex Grit Removal System effectively removes inorganic grit from treatment plant influent in a mechanically induced vortex environment. It operates efficiently over a wide range of daily flow rates. Rotating paddles maintain the flow velocity in the vortex chamber, keeping organics in suspension while allowing heavier grit to settle at the chamber floor. The settled grit moves through the center opening and into the lower grit hopper, where it is removed by either an air lift pump, a recessed impeller or a self-priming grit pump and sent on to the Grit Classifier.

- Space-saving compact design
- Highly efficient
- Performs in all flow conditions
- Simultaneous separation and dewatering
- Easy to maintain

Aeroductor Grit Removal System

With the Lakeside Aeroductor Grit Removal System, air is injected into an eductor tube located in the center of the basin, creating a vertical pumping action. The resulting circulation keeps organics in suspension and allows the heavier grit to settle at the bottom where it is scoured, washed and collected in a central hopper.

- No submerged moving parts
- Simultaneous grit washing and separation
- Low head loss requirements
- Low cost straight wall construction



*SpiraGrit® and Type
"W" Grit Classifier*



Aeroductor



Aeroductor



SpiraGrit®

Grit Collection

In-line Grit Collector

Because it provides a low-cost method for removing grit, the In-line Grit Collector is ideal for smaller installations in plants with a peak flow less than 2.0 mgd. Water flows in one end of the settling hopper, under a baffle, up and over an adjustable weir and out to the next unit in the treatment process. The grit settles into the screw trough and is conveyed from the system and free water drains out.

Grit Classifiers

Our Grit Classifiers are designed to provide long life with minimal maintenance. Featuring a heavy-duty grit screw with hardened leading edges, it is used with most of our grit removal systems for grit dewatering. The standard Type "L" Grit Classifier is designed to receive grit slurry up to a peak flow rate of 190 gallons per minute. The standard Type "W" Grit Classifier with Cyclone can handle flow rates up to 250 gallons per minute.

Dry Grit Washer

Raptor® Grit Washer

Type "L" Grit Classifier

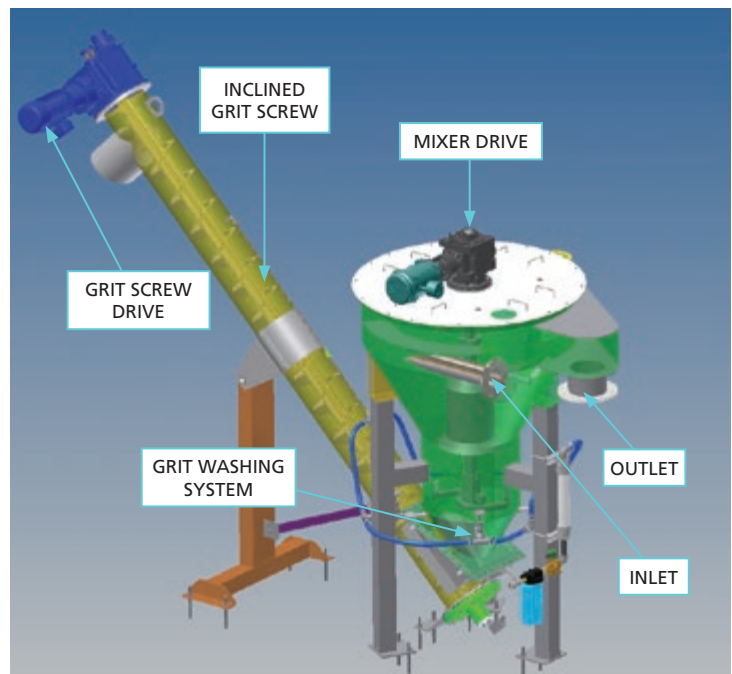
*Type "W" Grit
Cyclone-Classifier*



Raptor® Grit Washer

The *Raptor®* Grit Washer combines natural gravity forces with a circular and conical design to provide the highest cleaning efficiency for various flow rates. Discharge is typically 90% dry weight or greater and organics are less than 5%.

- Highest grit discharge quality
- Vortex grit and organic separation
- Gentle grit agitation and washing
- Two-stage organic separation
- Compact footprint
- Operates over a wide flow range
- Stainless steel construction



Biological Treatment Systems

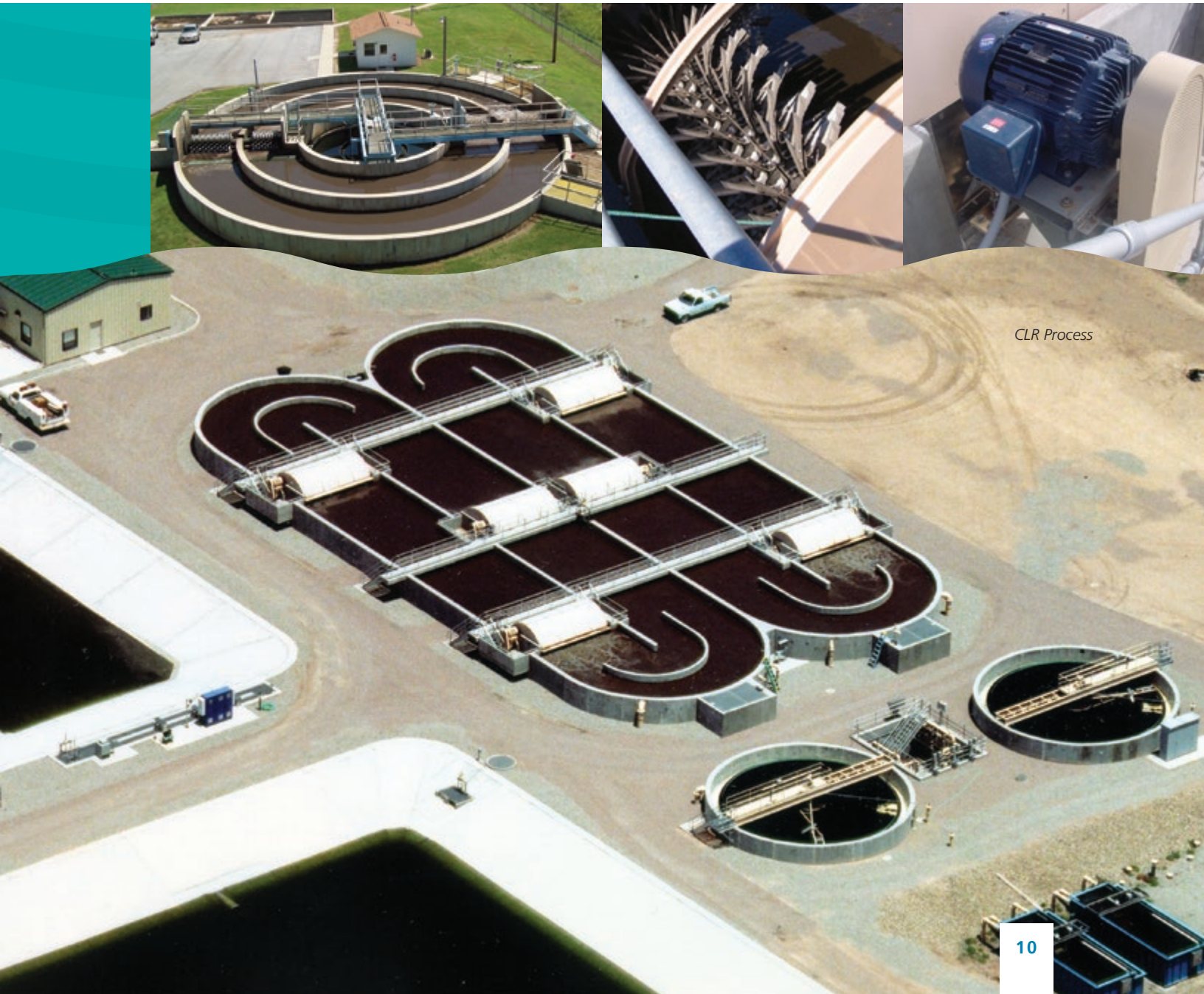
CLR Process

The Closed Loop Reactor (CLR) process, a modified form of the extended aeration complete mix process, provides biological nutrient removal using nonproprietary designs. CLR processes produce removal efficiencies that meet and exceed those of advanced tertiary treatment processes. Biological Nutrient Removal (BNR) configurations are available with in-basin designs for nitrification and denitrification, as well as external selector configurations for Bio-P and Total N Removal.

CLR Process

Magna Rotors

*Magna Rotor Shaft
Mounted Drive*



CLR Process

Biological Treatment Systems

Magna Rotor Aerators

A vital component of the CLR process is the horizontal, bladed rotor aerator. Lakeside's Magna Rotor Aerator provides oxygen and mixing to the basin with reliable operation and high efficiency.

- Complete mixing for aeration basins
- Greater O_2 transfer than any other mechanical surface aerator
- Shaft mounted drives allow flexibility for speed changes and easy access for maintenance and operator convenience

Rotor Covers



Rotor Baffles, Covers and Level Control Weirs

Lakeside Rotor Covers extend over the baffles to contain mist and spray, improving the safety and appearance of the plant. Velocity Control Baffles direct flow downward creating a rolling motion to ensure uniform distribution of oxygen throughout the basin. By adjusting the Effluent Weir, the operator can control the oxygen input into the basin to optimize treatment and save energy costs.

E.A. Aerotor Plant

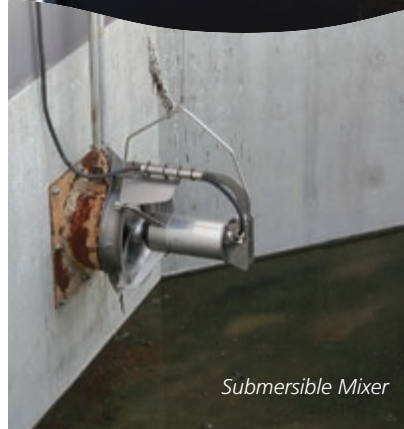


E.A. Aerotor Plant

The E.A. Aerotor combines the CLR process with the Spiraflo Clarifier for a complete treatment system. Its common wall design creates a small footprint, which lowers construction costs. This package system is capable of providing the same treatment results as stand-alone CLR processes.

Submersible Products

Lakeside's submersible products are an excellent complement to the CLR process for BNR applications or energy conservation. Mixers are available at slow and medium speed, and the recirculation pumps can move large quantities of liquid at low head in wastewater treatment plants and in industrial applications.



"The process is very stable. The plant takes the storm surges and goes right on producing a great effluent."

Plant Superintendent



Sequencing Batch Reactors

Lakeside Equipment Corporation offers a unique selection of Sequencing Batch Reactor processes. Lakeside can provide a true batch process [Sequencing Batch Reactor (SBR)] as well as a continuous feed process [Continuous Sequencing Batch Reactor (CSBR)]. The SBR systems provide flexible options for meeting general treatment requirements as well as nutrient removal requirements for nitrogen and phosphorus. These fully automated systems successfully provide treatment from the introduction of raw influent to fully treated effluent in a single basin.

Major Advantages of the Lakeside SBR Treatment Systems

- High level treatment capability including nutrient removal (Nitrogen and Phosphorus)
- Eliminates external clarifiers and RAS pumping
- Reduced footprint required for treatment plant
- Provides hydraulic flow and organic loading equalization
- Modular system design accommodates future expansion
- Integrated control and instrumentation system for process optimization

Pre-engineered CSBR



SBR



SBR



Easy and Flexible SBR Treatment

The Lakeside SBR is a true batch system best suited for installation in concrete or field erected steel tankage. The SBR incorporates diffused aeration and blower packages for supplying the required oxygen for the aerobic biology. Floating or submersible mixers are used to provide mixing during the unaerated cycles. Decanters are available as mechanical or floating designs. The Lakeside SBR offers flexible equipment options to best fit the applications requirements.

Continuous Flow Sequencing Batch Reactor (CSBR)

The Lakeside CSBR process modifies and enhances the superior technology of the conventional SBR. The CSBR system allows continuous uninterrupted inflow of wastewater into the basin during the treatment cycles including settling and decanting.

The CSBR basin is divided by a baffle wall into two zones designated as the pre-react zone in the front followed by the main react zone. The influent flows continuously into the pre-react zone (roughly 12 to 15% of the total basin volume) and is directed through the engineered orifice openings of the baffle wall into the main react zone. The baffle wall prevents short circuiting of the incoming flow while equally distributing the flow. CSBR systems can be supplied in pre-engineered steel tankage for small systems or installed in field erected steel tankage as well as concrete basins.

Blowers are provided to supply aeration through either coarse, medium, or fine bubble diffusers depending on the application. Submersible mixers are provided to supply mixing in the react zone for nutrient removal or for supplemental mixing. Submersible waste sludge pumps are also provided for controlling solids inventory.

Clarification

Spiraflo Clarifier

The Lakeside Spiraflo Clarifier's peripheral-feed design provides the best hydraulic flow pattern and minimizes many problems associated with centerfeed hydraulics. Both full-scale and model testing conducted by independent laboratories have confirmed that the Spiraflo Clarifier performs two to four times better hydraulically than centerfeed clarifiers.

- Produces highest quality effluent
- Improves sludge collection and removal
- Promotes full utilization of tank volume
- Eliminates short-circuiting
- Handles peak flows effectively
- Retains suspended solids in the sludge blanket
- Eliminates sludge wall creep that is created by the waterfall effect in centerfeed clarifiers

Spiraflo Clarifier



Spiraflo Clarifier



Spiravac Clarifier

In addition to providing all of the benefits of the Spiraflo, Lakeside's Spiravac Clarifier removes solids from the tank floor hydraulically. Sludge removal is offered in two designs: an adjustable riser pipe in a revolving sludge well and suction header.

Full Surface Skimming

Lakeside's Motorized Full Surface Skimmer and Full Surface Ducking Skimmer provide positive skimming by removing floating material from the entire surface of the main settling area.

Individual sludge removal pipes in the controlled removal (CR) design



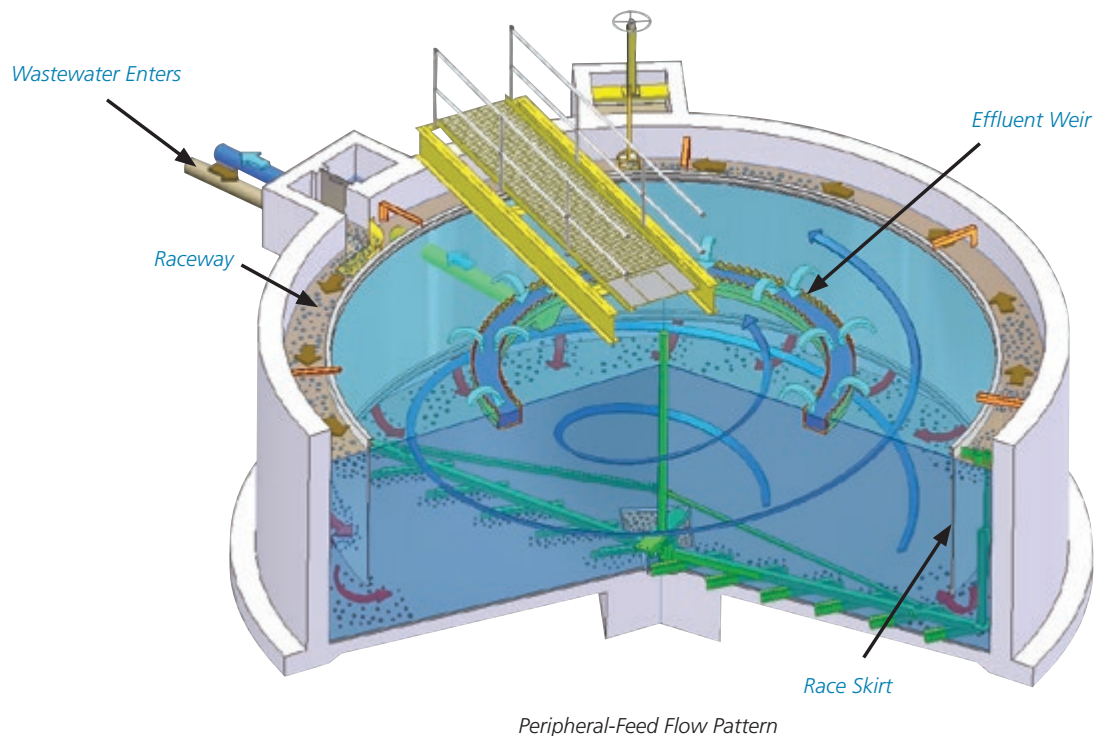
Common header pipe in the direct removal (DR) design



Full Surface Skimming



Ducking Skimmer



Treatment equipment and process solutions from Lakeside Equipment Corporation

Lakeside offers a wide range of equipment and systems for virtually all stages of wastewater treatment from influent through final discharge. Each process and equipment item that we supply is manufactured with one goal: to reliably improve the quality of our water resources in the most cost-effective way. We have been doing just that since 1928.

Screw Pumps

- Open Screw Pumps
- Enclosed Screw Pumps

***Raptor*® Screening**

- Fine Screen
- Micro Strainer
- Rotating Drum Screen
- Septage Acceptance Plant
- Septage Complete Plant
- Complete Plant
- Multi-Rake Bar Screen
- FalconRake® Bar Screen
- Rotary Strainer Screen
- Wash Press

Trash and Screen Rakes

- Hydronic T Series
- Monorail Series
- HY-TEC Screen

Grit Collection

- SpiraGrit® Vortex Grit Removal System
- Aeroductor Grit Removal System
- In-Line Grit Collector
- Raptor*® Grit Washer
- Grit Classifier
- H-PAC®

Clarification

- Spiraflo Clarifier
- Spiravac Clarifier
- Full Surface Skimming

Biological Treatment

- CLR Process
- Magna Rotor Aerators & Accessories
- Sequencing Batch Reactors
- Continuous Flow Sequencing Batch Reactors
- Package Treatment Plants
- Submersible Mixers & Recirculation Pumps

Hauled Waste Receiving Systems

- Raptor*® Septage Acceptance Plant
- Raptor*® Septage Complete Plant
- Raptor*® FOG Acceptance Plant

Package Headworks Systems

- Raptor*® Complete Plant
- H-PAC®

Biological Treatment Systems

- CLR Process
- E.A. Aerotor Plant
- Sequencing Batch Reactors
- Continuous Flow Sequencing Batch Reactors



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