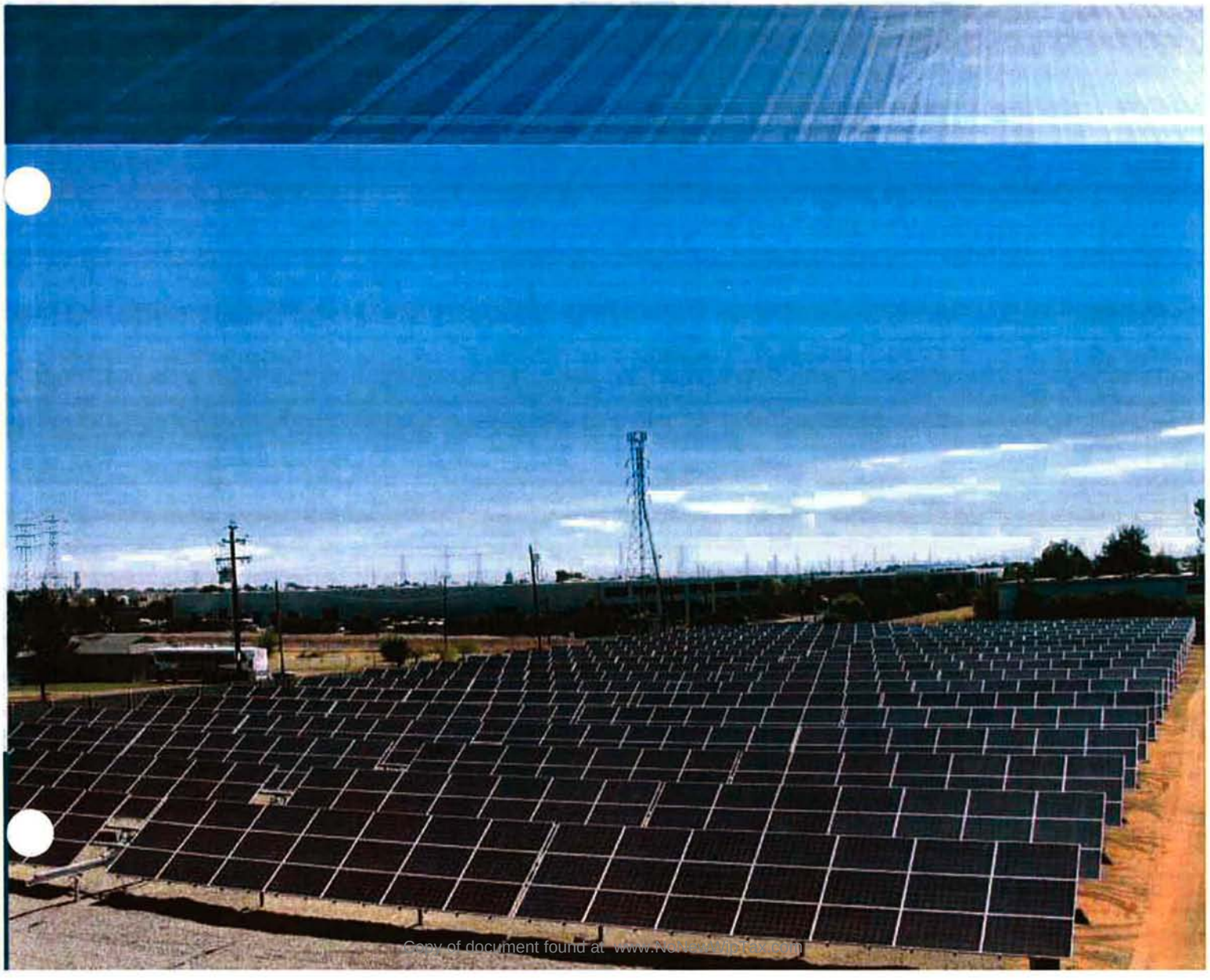
SUNSEEKER™

- *With the TTI Single-Axis Tracker, you can now get significantly greater energy production with the same affordability as a fixed tilt array*
- *The Single Drive Train system supports up to approximately 350kWp*
- *Designed to minimize foundation requirements*
- *Precision automated controls (UL Listed) with remote monitoring to simplify tracker operation*

TTI THOMPSON TECHNOLOGY INDUSTRIES, INC.

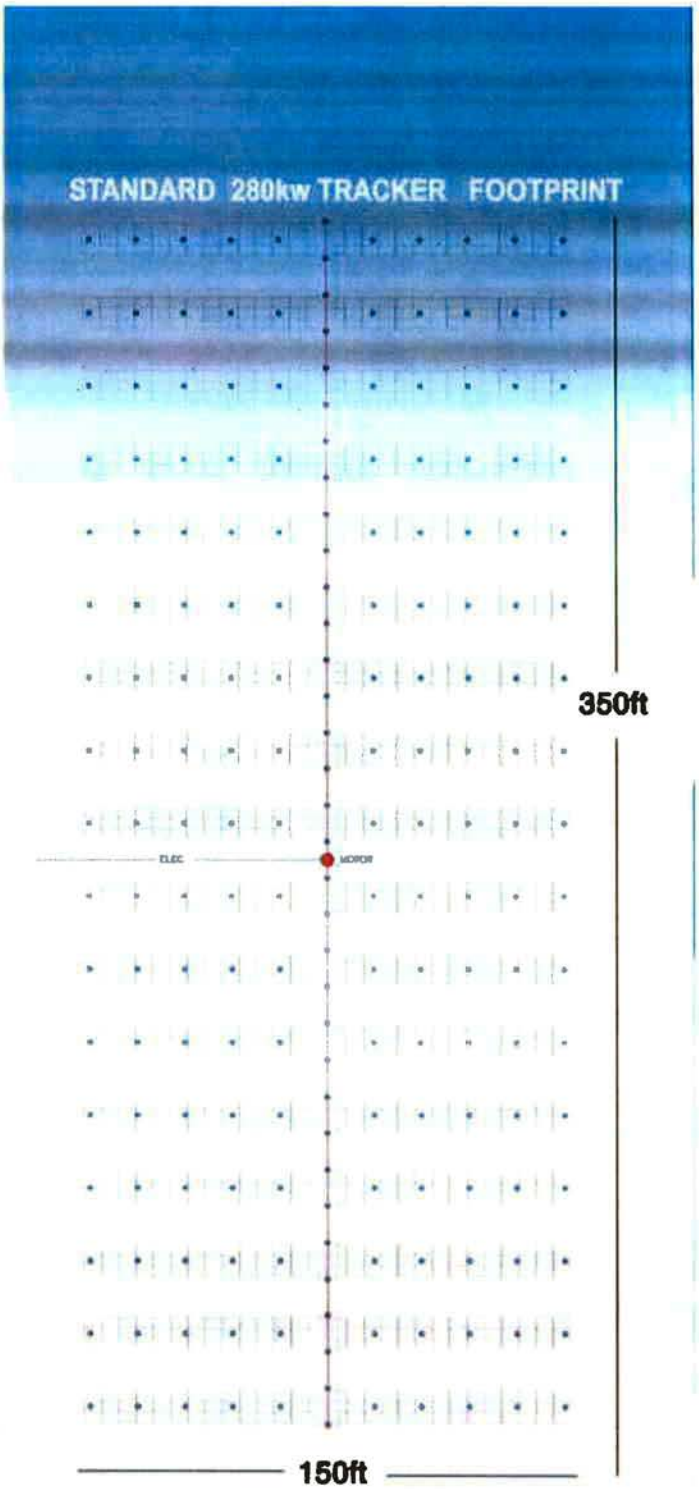
Maximizing PV Performance



PV Tracking System Specifications

SUNSEEKER™ can consist of a number of standard building blocks.
Each building block has the following specifications:

Power Production Capacity:	**Up to 350kW DC Per Building Block**
Dimensions:	50,000 ft²
Modules accepted:	All commercially available modules
Tracking System:	Single-axis automatic tracking
Tracking Style:	Stainless steel ram screw driving a ram shaft and rectangular rotation beams
Tracking Drive Motor:	15-ton motor 1 HP,3-phase
Module Rotation Structure:	Dual rectangular rotation beams
Module Support Structure:	Aluminum rails mounted to rotation beams
Module Attachment Style:	Aluminum T-clips Proprietary C-clips
Allowable Wind Load:	90 mph at all angles (higher in stow position)
Module Wind Hold Capacity:	600 lbs.
Wind Protection Method:	Array flattens at 30 mph wind speed
Row Configuration:	Dual or triple module layout
Array Height:	Maximum 8'
Maximum Angle Displacement:	45°
Assembly Method:	Subsystems are factory-preassembled to reduce field construction time
Electrical Conduit Orientation:	Attached to base beams for flood plane protection; integrated rotational bearing minimizes conduit friction
Control Electronics:	Precision GPS calibrated with optional remote control and string-level monitoring



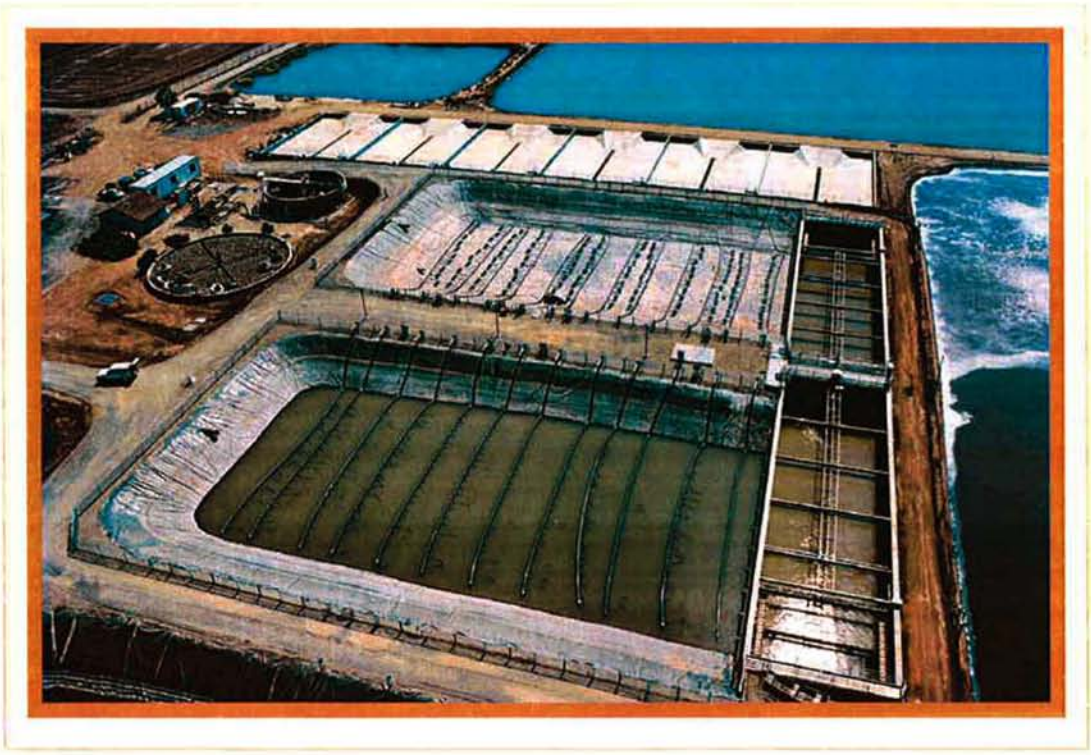
For more information on this product and other available products, please contact us at:

Thompson Technology Industries, Inc.
61 Paul Drive
San Rafael, CA 94903

Tel: 415.446.0103
Fax: 415.507.1759
Email:
info@thompsontec.com
www.thompsontec.com

PARKSON CORPORATION

BIOLAC® WASTEWATER TREATMENT SYSTEM



Biolac® Wastewater Treatment System
Extended sludge age biological technology

This innovative process features

- **Low-loaded activated sludge technology**
- **High oxygen transfer efficiency delivery system**
- **Exceptional mixing energy from controlled aeration chain movement**
- **Simple system construction**

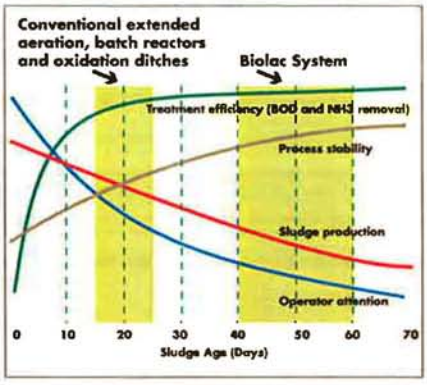
The Biolac System is an innovative activated sludge process using extended retention of biological solids to create an extremely stable, easily operated system.

The capabilities of this unique technology far exceed ordinary extended aeration treatment. The Biolac process maximizes the stability of the operating environment and provides high efficiency treatment. The design ensures the lowest-cost construction and guarantees operational simplicity. Over 500 Biolac Systems are installed throughout North America treating municipal wastewater and many types of industrial wastewater.

The Biolac system utilizes a longer sludge age than other aerobic systems. Sludge age, also known as SRT (solids retention time) or MCRT (mean cell residence time), defines the operating characteristics of any aerobic biological treatment system. A longer sludge age dramatically lowers effluent BOD and ammonia levels. The Biolac long sludge age process produces BOD levels of less than 10 mg/l and complete nitrification (less than 1 mg/l ammonia). Minor modifications to the system will extend its capabilities to denitrification and biological phosphorus removal.

While most extended aeration systems reach their maximum mixing capability at sludge ages of approximately 15-25 days, the Biolac System efficiently and uniformly mixes the aeration volumes associated with 30-70 day sludge age treatment.

The large quantity of biomass treats widely fluctuating loads with very few operational changes. Extreme sludge stability allows sludge wasting to non-aerated sludge ponds or basins and long storage times.



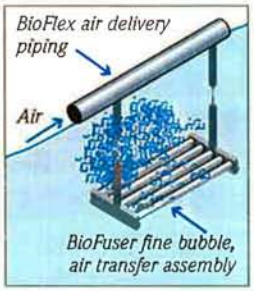
Aeration Components

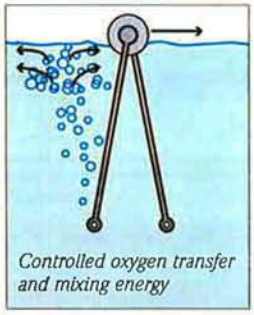
SIMPLE PROCESS CONTROL AND OPERATION

The control and operation of the Biolac® process is similar to that of conventional extended aeration. Parkson provides a very basic system to control both the process and aeration. Additional controls required for denitrification, phosphorus removal, dissolved oxygen control and SCADA communications are also available.

AERATION SYSTEM COMPONENTS

The ability to mix large basin volumes using minimal energy is a function of the unique BioFlex® moving aeration chains and the attached BioFuser® fine bubble diffuser assemblies. The gentle, controlled back and forth motion of the chains and diffusers distributes the oxygen transfer and mixing energy evenly throughout the basin area. No additional airflow is required to maintain mixing.

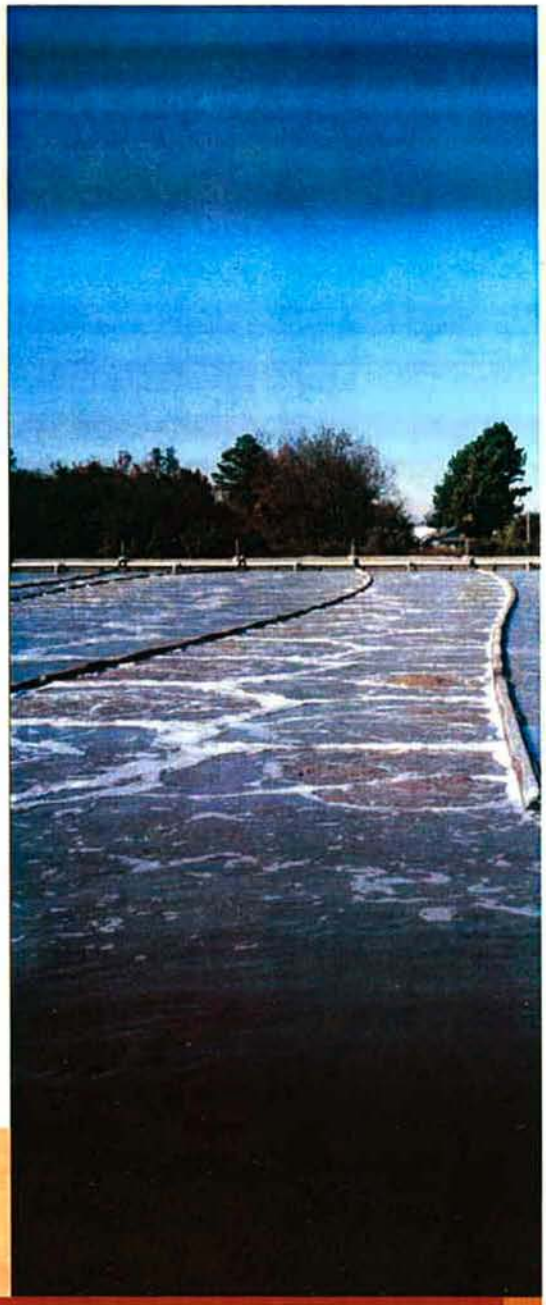




Stationary fine-bubble aeration systems require 8-10 CFM of air per 1000 cu. ft. of aeration basin volume. The Biolac System maintains the required mixing of the activated sludge and suspension of the solids at only 4 CFM per 1000 cu.ft. of aeration basin volume. Mixing of a Biolac basin typically requires 35-50 percent of the energy of the design oxygen requirement. Therefore, air delivery to the basin can be reduced during periods of low loading without the risk of solids settling out of the wastewater.

SYSTEM CONSTRUCTION

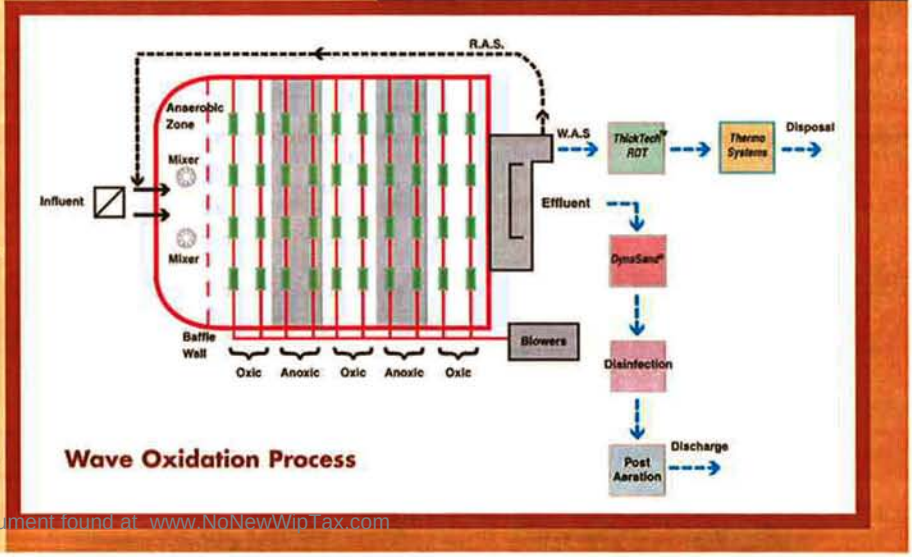
A major advantage of the Biolac system is its low installed cost. Most systems require costly in-ground concrete basins for the activated sludge portion of the process. A Biolac system can be installed in earthen basins, either lined or unlined. The BioFuser fine bubble diffusers require no mounting to basin floors or associated anchors and leveling. These diffusers are suspended from the BioFlex aeration chains above the basin floor. The only concrete structural work required is for the simple internal clarifier(s) and blower/control buildings.



Biological Nutrient Removal

Simple control of the air distribution to the BioFlex chains creates moving waves of oxic and anoxic zones within the basin. This repeated cycling of environments nitrifies and denitrifies the wastewater without recycle pumping or additional external basins. This mode of Biolac operation is known as the Wave Oxidation™ process. No additional in-basin equipment is required and simple timer-operated actuator valves regulate manipulation of the air distribution.

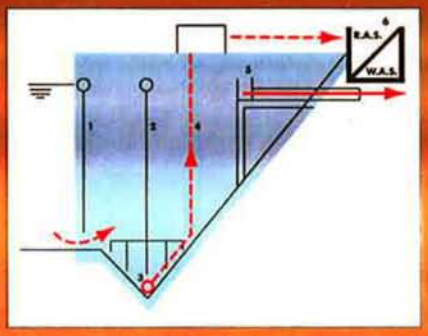
Biological phosphorus removal can also be accomplished by incorporating an anaerobic zone.



Wave Oxidation Process

Type "R" Clarifier

Land space and hydraulic efficiencies are maximized using the type "R" clarifier. The clarifier design incorporates a common wall between the clarifier and aeration basin. The inlet ports in the bottom of the wall create negligible hydraulic headloss and promote efficient solids removal by filtering the flow through the upper layer of the sludge blanket. The hopper-style bottom simplifies sludge concentration and removal, and minimizes clarifier HRT. The sludge return airlift pump provides important flexibility in RAS flows with no moving parts. All maintenance is performed from the surface without dewatering the clarifier.



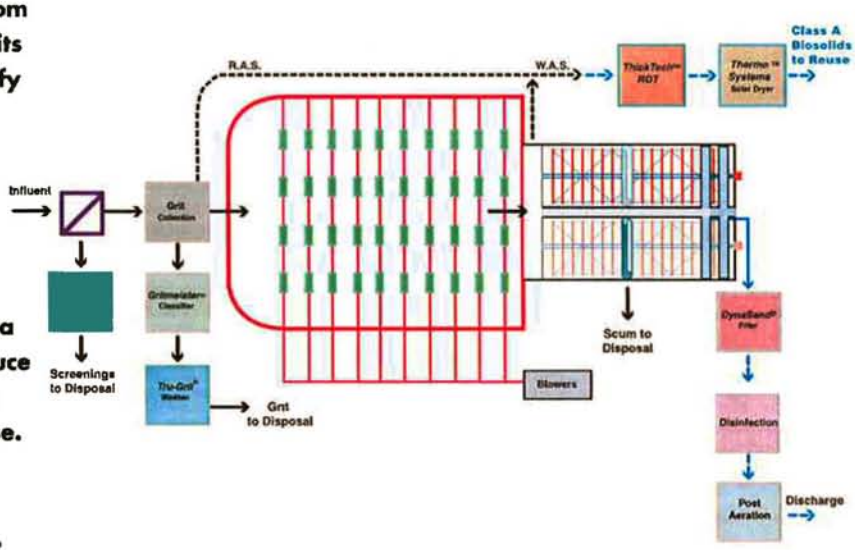
Type "SS" Clarifier

Higher flow systems incorporate a flat-bottom internal clarifier utilizing the Parkson SuperScraper™ sludge removal system. This clarifier design maintains the efficiencies of the common wall layout while providing ample clarification surface area within the footprint of the aeration basin width. The SuperScraper system moves settled solids along the bottom of the clarifier to an integral collection trough. The unique design of the scraper blades and gentle forward movement of the SuperScraper system concentrates the biological solids as they are moved along the bottom of the clarifier without disturbing the sludge blanket.

A Parkson *Complete* Wastewater Treatment System

The Parkson "Complete" system featured here utilizes the Biolac® process with two flat-bottom internal Type SS clarifiers. SuperScraper™ units are installed in the clarifier bottoms to simplify sludge removal. Influent screening with grit removal and appropriate residuals management such as washing, dewatering and conveying are included.

Sludge from the clarifiers is sent to the ThickTech™ rotary drum thickener and on to a THERMO-SYSTEM™ solar sludge dryer to reduce the volume of sludge by 50% and produce a Class "A" product suitable for beneficial reuse. Clarifier effluent is polished by a DynaSand® filter followed by disinfection and post-aeration as the final steps prior to discharge.



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www.parkson.com

Parkson Florida
Corporate
2727 NW 62nd Street
Fort Lauderdale FL
33309-1721
P.O. Box 408399
Fort Lauderdale FL
33340-8399
P 954.974.6610
F 954.974.6182

Parkson Illinois
562 Bunker Court
Vernon Hills IL
60061-1831
P 847.816.3700
F 847.816.3707

Parkson Michigan
2001 Waldorf St. NW
Suite 300
Grand Rapids MI
49544-1437
P 616.791.9100
F 616.453.1832

Parkson Canada
205-1000 St-Jean
Pointe-Claire QC
H9R 5P1
Canada
P 514.636.4618
F 514.636.9718

Parkson do Brasil Ltda.
Calçada dos Mirtilos, 15
Barueri Sao Paulo
CEP 06453-000
Brazil
P/F 55.11.4195.5084
P/F 55.11.4688.0336

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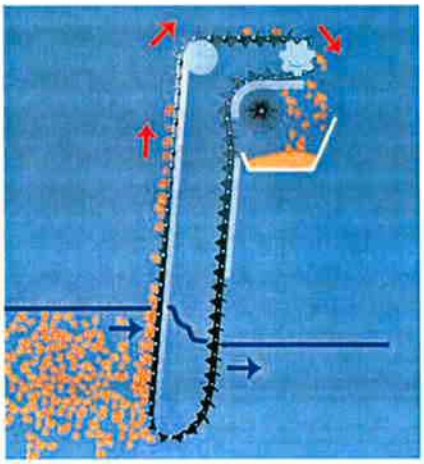
PARKSON CORPORATION

Aqua Guard®

Self-Cleaning Moving Media Channel Screen

The Aqua Guard screen is a self-cleaning, in-channel screening device that utilizes a unique filter element system designed to automatically remove a wide range of floating and suspended solids from wastewater.



A specific configuration of filter elements is mounted on a series of parallel shafts to form an endless moving belt that collects, conveys and discharges solids greater than the element spacing. Spacing from 0.04" (1 mm) to 1.18" (30 mm) is available.

Principle of Operation Solids contained in a wastewater flow are captured on the filter elements and carried upward on the belt assembly to discharge at the rear of the unit. Two-stage screening is achieved which results in minimal headloss. Coarse filtration occurs on the forward screen face and fine filtration on the recessed face.

As the rake tip of one row of filter elements passes between the shank arm of the lower row, the elements automatically clean themselves. The unit is equipped with a rotating brush that provides additional removal of solids.

Features — Benefits

- **Low power consumption (1.0 HP or less)**
- **Self-cleaning • Intermittent operation**
- **No submerged bearings • All moving parts can be accessed and serviced above water level**
- **Screens pivots out of channel**

} **Low Operation Costs & Ease of Maintenance**

- **Coarse and fine screening in one unit**
- **Ability to build precoat**

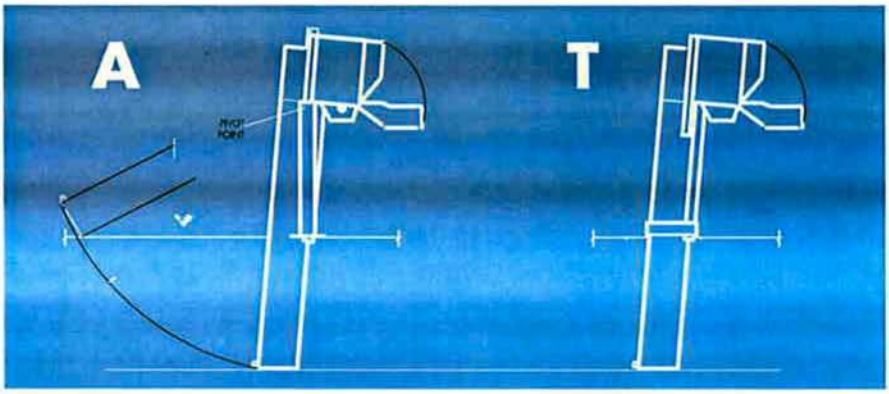
} **High capture rates**

- **Flows to 100 MGD in a single unit**

} **High capacity**

- **Delivered fully assembled**
- **No attachment to sides or bottom of channel**

} **Ease of installation**



The Aqua Guard® Screen styles A and T are available in Standard or Heavy Duty design.

Design Parameters	Model MN (Standard)	Model S (Heavy Duty)
Minimum Channel Width (in.)	12	24
Maximum Screen Width (in.)	66	108
Maximum Design Headloss (in)	10	20
Fine Horizontal Spacing (in/mm.)	1/24 (1mm)	1/24 (1mm)
	1/8 (3mm)	1/8 (3mm)
	1/4 (6mm)	1/4 (6mm)
	5/8 (15mm)	5/8 (15mm)
		1 1/4 (30mm)
Coarse Horizontal Spacing (in/mm)	1/8 (4mm)	1/8 (4mm)
	3/8 (8mm)	3/8 (8mm)
	5/8 (14mm)	5/8 (14mm)
	1 3/8 (34mm)	1 3/8 (34mm)
		2 5/8 (69mm)
Fine Spacing Contact Surface Area (ft)	0.81	0.901
	0.73	0.733
	0.63	0.694
	0.57	0.591
		0.547
*Trash Capacity (yds³/hr)		
60°	0.75	2.32
75°	0.50	1.27
85°	0.28	0.99
Filtration Dual	(Coarse & Fine)	(Coarse & Fine)

**Based on yds³/hr per one foot of effective width*

Design Parameters Standard screen widths are 1.0' to 9.0' depending on the model with flow rates up to 100 MGD with a single unit. Two frame styles are available depending on space and channel depth requirements. Type A is a pivoting design and Type T is a stationary design.

The Aqua Guard screen can be installed at angles of 60°, 75° and 85° depending on the frame and model selected. For maximum efficiency of operation, greater flow rate and higher solids removal, the recommended angle of inclination is 75°.

The screen conveys solids up and out of the channel at a speed of 7ft/min. The maximum amount of debris, in cubic yards per hour, that can be removed from the stream is a function of model and angle.

Movement of the screen can be continuous or intermittent. However, intermittent operation is recommended. This allows a mat of solids to build on the filter-rake elements which increases the solids capture rate.

Performance Parkson has over 5,000 installations in a wide variety of municipal and industrial applications.

Aqua Guard MN 75° 1.5' x 12' in operation

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Parkson Florida
Corporate
2727 NW 62nd Street
Fort Lauderdale FL
33309-1721
P.O. Box 408399
Fort Lauderdale FL
33340-8399
P 954.974.6610
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Parkson do Brasil Ltda.
Calçada dos Mirtilos, 15
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CEP 06453-000
Brazil
P/F 55.11.4195.5084
P/F 55.11.4688.0336

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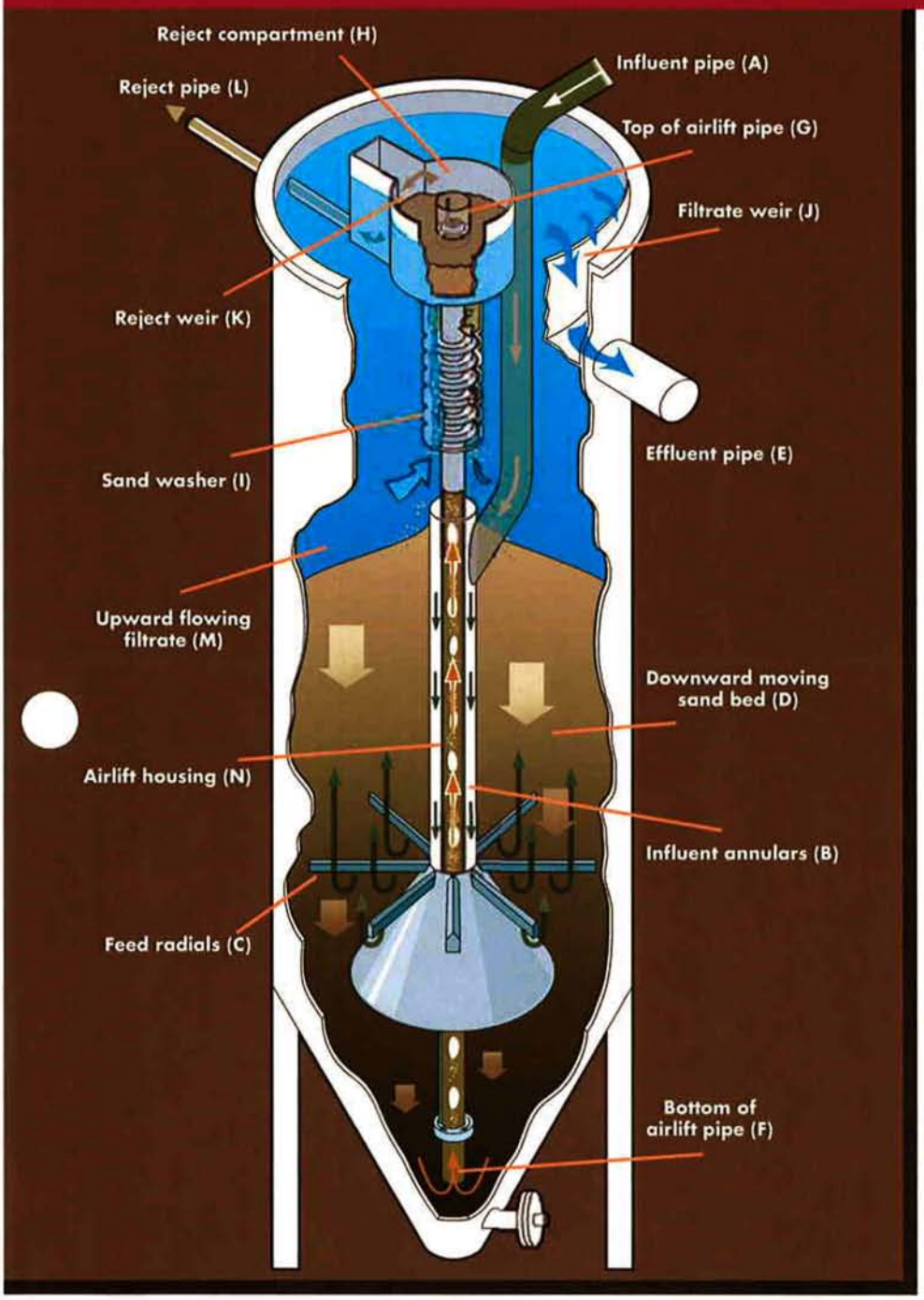
DYNASAND®

CONTINUOUS, UPFLOW, GRANULAR MEDIA FILTER

The DynaSand® Filter

Simplicity, low maintenance, outstanding performance



The DynaSand filter is an upflow, deep bed, granular media filter with continuous backwash. The filter media is cleaned by a simple internal washing system that does not require backwash pumps or storage tanks. The absence of backwash pumps means low energy consumption.

The DynaSand filter's deep media bed allows it to handle high levels of suspended solids. This heavy-duty performance may eliminate the need for pre-sedimentation or flotation steps in the treatment process in some applications.

The DynaSand filter is available in various sizes and configurations. This flexibility allows for customization to fit specific site and application requirements.

DynaSand Principles of Operation

Influent Filtration Influent feed is introduced at the top of the filter (A) and flows downward through an annular section (B) between the influent feed pipe and airlift housing. The feed is introduced into the bottom of the sand bed through a series of feed radials (C) that are open at the bottom. As the influent flows upward (M) through the downward moving sand bed (D), organic and inorganic impurities are captured by the sand. The clean, polished filtrate continues to move upward and exits at the top of the filter over the filtrate weir (J) and out through the effluent pipe (E).

Sand Cleaning The sand bed containing captured impurities is drawn downward into the center of the filter where the airlift pipe (F) is located. A small volume of compressed air is introduced at the bottom of the airlift, drawing the sand into the airlift pipe. The sand is scoured within the airlift pipe at an intensity of 100-150 SCFM/ft². The effectiveness of this scouring process is vastly greater than what can be expected in conventional sand filtration backwash. The scouring dislodges any solid particles attached to the sand grains.

The dirty slurry is pushed to the top of the airlift (G) and into the reject compartment (H). From the reject compartment, the sand falls into the sand washer (I) and the lighter reject solids are carried over the reject weir (K) and out the reject pipe (L). As the sand cascades down through the concentric stages of the washer, it encounters a small amount of polished filtrate moving upward, driven by the difference in water level between the filtrate pool and the reject weir. The heavier, coarser sand grains fall through this small countercurrent flow while the remaining contaminants are carried back up to the reject compartment. The clean, recycled sand is deposited on the top of the sand bed where it once again begins the influent cleaning process and its eventual migration to the bottom of the filter.

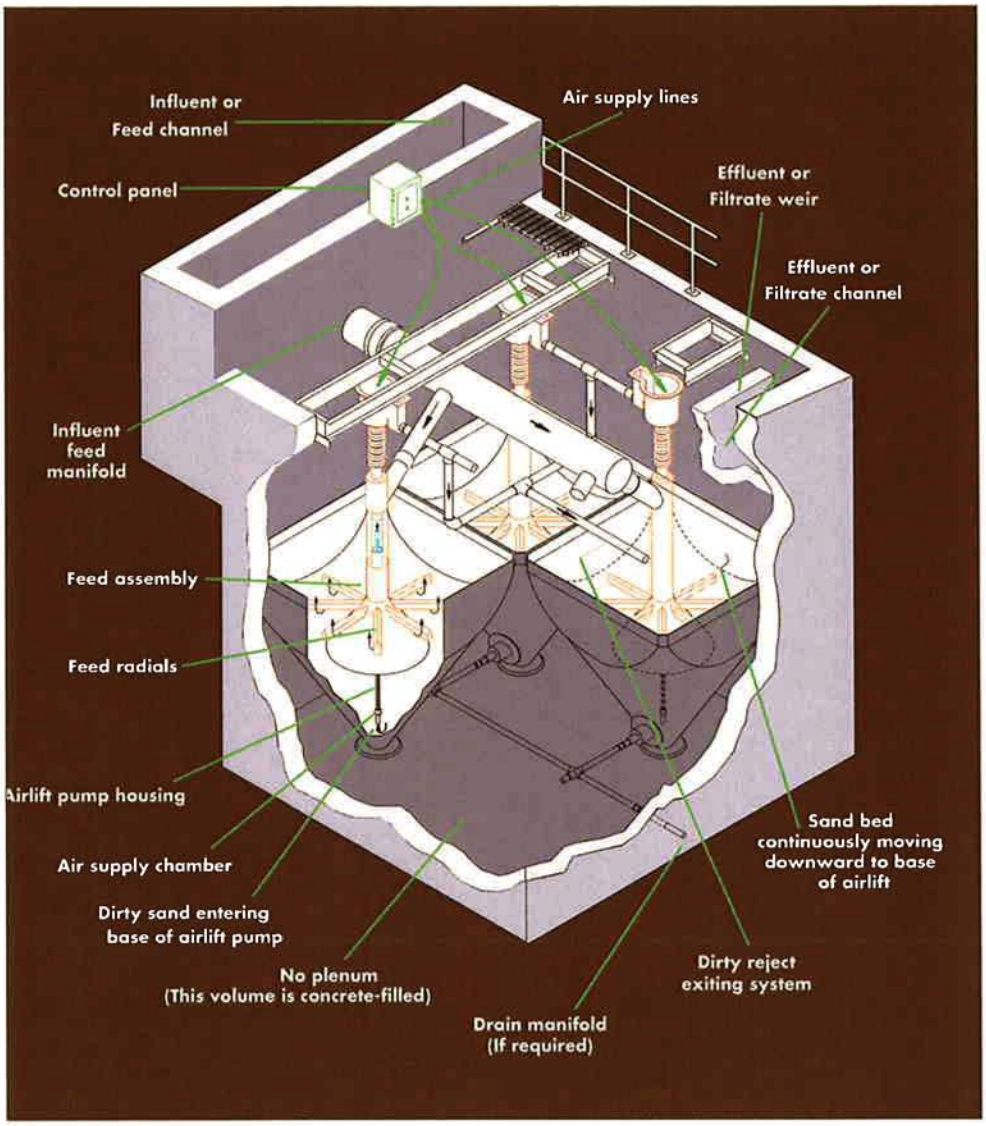
DynaSand® Filter Configurations

The DynaSand filter is available as either stand alone package units or in a modular concrete design. The package units are constructed of either 304 SST or FRP. Materials of construction for the internal components of both package and concrete units are SST and/or FRP. Filters are available in 40" standard bed or 80" deep-bed design depending on the nature of the application. Concrete modules are frequently used for high flow capacity systems by placing multiple modules into a common filter cell. The modules in a filter cell share a common filter bed where cones at the bottom of each module distribute sand to their respective airlifts and sand washers.

DynaSand Filter above ground package units

A concrete DynaSand installation can be designed for any size filter area. This enables the technology to be applied to any size water or wastewater treatment plant. Since all filter beds are being continuously cleaned, the pressure drop remains low and even throughout all the filters. Equal pressure drop ensures even distribution of feed to each filter without the need for splitter boxes or flow controls. Therefore, a typical multiple unit installation can use a common header pipe with feed connections and isolation valves for each filter.

DynaSand Filter modules in concrete basin

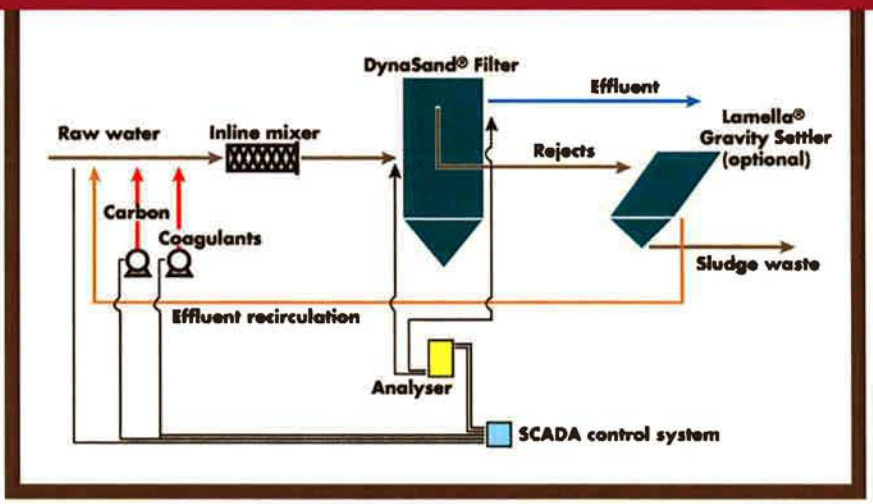


Features	Benefits
Continuously Cleaned Sand Bed	No shutdown for backwash cycles Elimination of ancillary backwash equipment No flow control valves, splitter boxes, or backwash controls
No Underdrains or Screens	No short-circuiting
Sand Washed with Filtrate	Optimum sand-washing efficiency Superior filtrate quality
No Level Control	Reduced operator attention Minimizes overall pressure-drop
Internal, Vertical Airlift	Reduces potential for pluggage Significantly reduces wear/maintenance Can be easily maintained without filter shutdown
Low Power Requirements	Up to 70% less compressed air vs. other self-cleaning filters

DynaSand® Filter Continuous Contact Filtration Process

Water and wastewater treatment in conventional plants typically involves flocculation, clarification and filtration. Direct filtration eliminates clarification but still requires flocculation. The DynaSand filter utilizes a proprietary process known as Continuous Contact Filtration. The DynaSand filter's 80" media bed depth provides greater hydraulic residence times and more opportunity for floc formation and attachment. Thus, coagulation, flocculation and separation can be performed within the sand bed, eliminating the need for external flocculators and clarifiers. Equipment savings can be substantial, up to 85% compared to conventional treatment and 50% compared to direct filtration. The DynaSand Continuous Contact Filtration process is better suited to remove small floc, which can help reduce chemical requirements by 20-30% over conventional treatment.

Applications The DynaSand filter is currently providing exceptional treatment in over 8,000 installations worldwide in a wide variety of applications.



DynaSand Applications – partial list

Tertiary filtration • Algae removal • Potable water (turbidity and color) • Oil removal • Process water • Brine filtration • Metal finishing • Cooling tower blowdown • Steel mill scale • Chemical processing • Phosphorus removal • Product recovery • Denitrification • Cryptosporidium and Giardia removal • Surface water • Ground water • Arsenic removal • Effluent reuse

Typical Data	Loading rate (gpm/ft²)	Influent solids	Filtrate solids
Tertiary Filtration	**3-5**	**20-50 ppm SS**	**5-10 ppm SS**
Potable Water – Turbidity	**4-5**	**10-30 NTU**	**0.1-0.5 NTU**
Potable Water – Color	**4-5**	**10–120 ACU**	**1-5 ACU**
Process Water	**5**	**10-30 NTU**	**0.1-0.5 NTU**
Metal Finishing	**4-6**	**20-50 ppm SS**	**2-5 ppm SS**
Steel Mill Scale	**8-10**	**50-300 ppm SS**	**5-10 ppm SS**
Phosphorus Removal	**3-5**	**<1 ppm Total P**	**<0.1 ppm Total P**
Algae Removal	**2-4**	**100 ppm SS**	**10-20 ppm SS**
Denitrification	**3-4**	**10-15 ppm TN**	**<3 ppm TN**
Oil Removal	**2-6**	**<50 ppm O&G**	**5-10 ppm O&G**

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Parkson Florida
Corporate
2727 NW 62nd Street
Fort Lauderdale FL
33309-1721
P.O. Box 408399
Fort Lauderdale FL
33340-8399
P 954.974.6610
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Parkson Illinois
562 Bunker Court
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P 847.816.3700
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Parkson Michigan
2001 Waldorf St. NW
Suite 300
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205-1000 St-Jean
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Parkson do Brasil Ltda.
Calçada dos Mirtilos, 15
Barueri Sao Paulo
CEP 06453-000
Brazil
P/F 55.11.4195.5084
P/F 55.11.4688.0336

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