

# Hydro GritCleanse<sup>TM</sup>



**Fluidized Bed Grit  
Washing & Dewatering.**

# Hydro GritCleanse™

## Cut landfill costs and reduce odor issues with cleaner, drier grit.

Hydro GritCleanse™ fluidized bed grit washing significantly reduces volatile solids while retaining 95% of grit  $\geq 75$  micron. Designed to be paired with Oldcastle Infrastructure's industry leading HeadCell® and Grit King® grit separation technologies as well as other conventional grit removal systems to output grit with <5% volatile solids. Hydro GritCleanse™ is complemented by Oldcastle Infrastructure's expertise in supplying whole system solutions.



### Performance

- Removes 95% of particles 75  $\mu\text{m}$  and larger with a specific gravity of 2.65 and larger at the design flow rate
- $\leq 5\%$  volatile solids in grit output,  $\geq 90\%$  total solids in grit output under normal operating conditions

### Capacity

- Multiple sizes available
- Hydraulic capacity up to 800 gpm (50 L/s)

### Applications

- Grit washing where very low volatile solids are required
- Grit washing / dewatering for new, expanding, and upgrading WWTPs
- Replacement for worn out or ineffective grit washing and dewatering systems

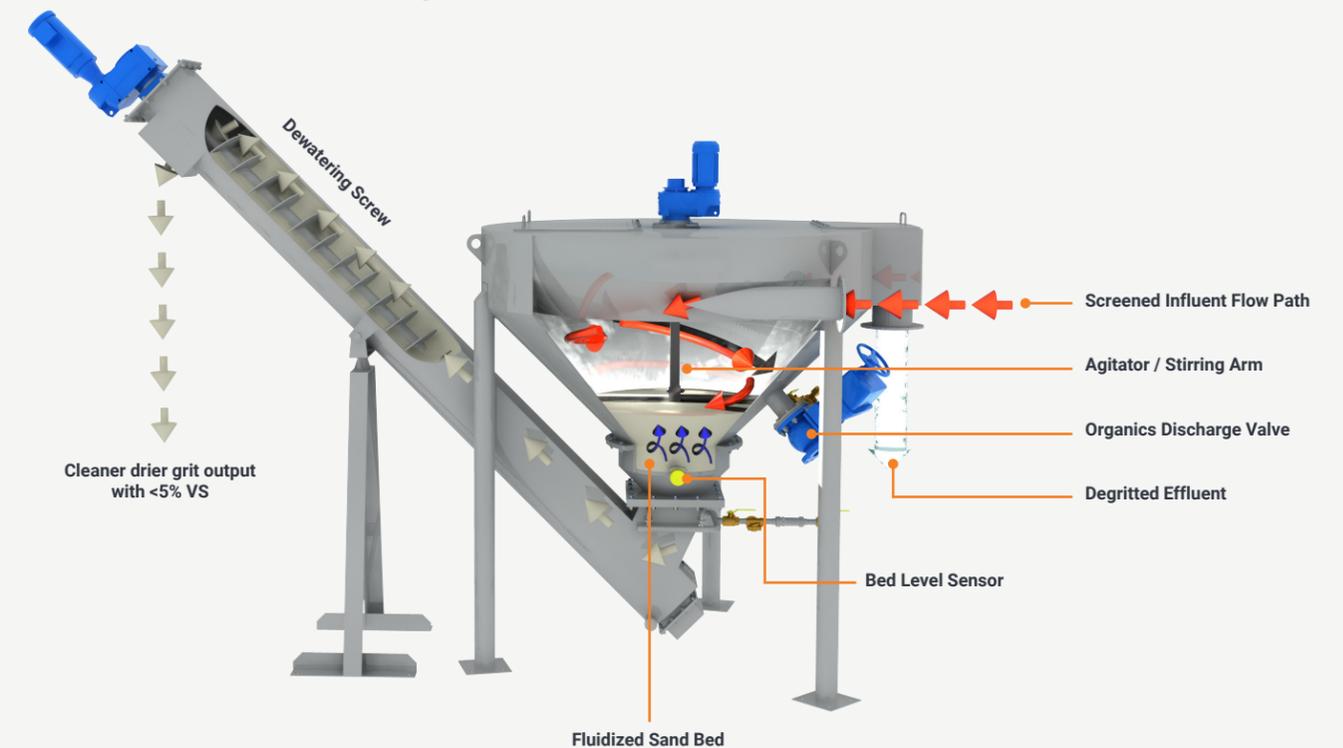
### Benefits

- Reducing organics reduces volume, hauling, and disposal costs
- Optimized to work with HeadCell® or Grit King® and provide single supplier accountability and full system guarantee
- Reduced odor from lower VS and fully enclosed design = happy operators & neighbors
- Designed for easy maintenance and access

### Design Notes

- All Stainless Steel construction and heavy duty design ensures long product life
- Shafted screw design reduces wear and eliminates replacement of wear bars or liners
- System has numerous design features allowing easy maintenance
- Influent is structured so that boundary layer forces augment the unit's ability to capture fine particles

### Hydro GritCleanse™ Flow Path



## How it Works

Flow is introduced tangentially into the conical clarifier forcing grit to contact the vessel walls creating drag forces and establishing a rotary flow pattern. Incoming grit settles into the low velocity boundary layer at the inside wall of the vessel. The structured, laminar flow pattern allows retention of fine and slowly settling grit particles while the interior baffle prevents short-circuiting.

Once in this boundary layer grit is further decelerated and settles to the bottom of the unit into the gently agitated fluidized bed where physical forces separate fixed and volatile solids by density. Grit settles to the bottom of the bed while the lighter organic material carries out with the effluent.

Large organics remain in suspension at the top of the bed and are intermittently discharged via an adjacent port on a timed basis. Washing occurs in the fluidized bed as organic material attached to the grit particles is scrubbed away due to friction between particles and the higher density grit descends to the bottom. Washed grit is discharged intermittently based on bed pressure via the dewatering screw.

Scan the QR Code to watch an informative video on Hydro GritCleanse™



## Cleaner, Drier Grit Costs Less to Landfill

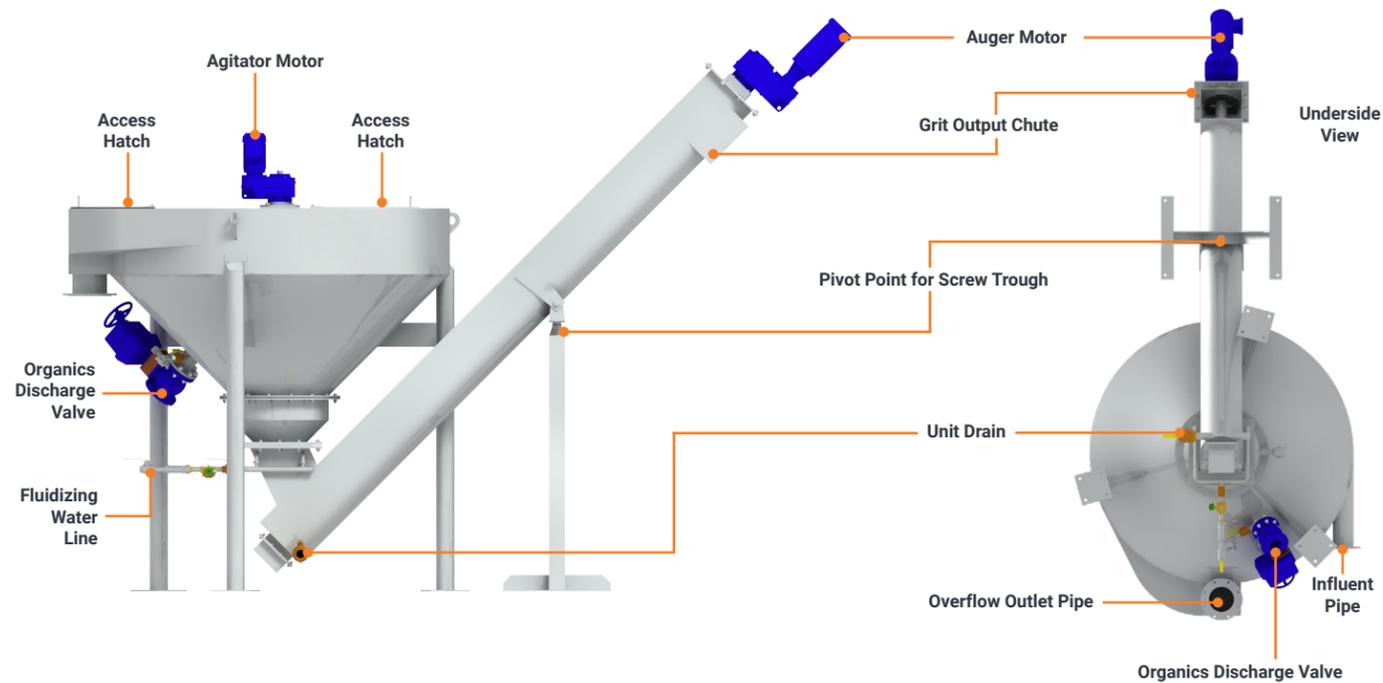
With significantly lower organic and water content than other types of grit systems, the Hydro GritCleanse™ saves your plant money! Field tests have shown final output to contain up to 5X more fixed solids per yd<sup>3</sup> of grit vs. other grit washing technologies.



Conventional Grit Washer  
Output >50% VS



Hydro GritCleanse™  
Output <5% VS



## When it Rains, Grit Pours!

# Hydro GritCleanse Protects a SC WWTP During Heavy Rain Events.

An aging aerated grit basin / chain and bucket system was providing very little protection for this treatment plant in addition to being an ongoing maintenance concern. The plant needed a grit removal system that would protect their plant for years to come, particularly during heavy rain events. A HeadCell® / Hydro GritCleanse™ system provided the protection they needed and quickly demonstrated its merit during South Carolina's wettest May on record.

### Owner

The Gills Creek WWTP

### Plant Flows

8 Mgal/d (30 MLD) Average Flow  
32 Mgal/d (123 MLD) Peak Flow

### Featured Products

One (1) 12' (3.7 m) Diameter 12 Tray  
HeadCell® Grit Separation System

One (1) Hydro GritCleanse™ Fluidized Bed Grit  
Washing and Dewatering System

## Challenge

The greater Columbia, SC metropolitan area is home to the state's capital, the University of South Carolina, and 829,470 residents. Like much of the southeast, the area has mild winters and hot and humid summers. In fact, Columbia's city slogan used to be "Famously Hot". The Columbia region experiences heavy storm events, averaging 15 rain events with an inch or more each year. Tropical thunderstorms during hurricane season frequently bring a high volume of rainfall to the region within a short timeframe.

The Gills Creek WWTP, part of the East Richland County PSD just south of Columbia, sits less than 2 miles (3.2 km) from the Congaree River which feeds into Congaree National Park and the Congaree Swamp. With such an important ecosystem nearby, and frequent heavy storm events, treatment plant protection is of paramount importance.

## Solution

Like many municipalities, East Richland County's collection system is aging with various levels of inflow and infiltration issues. This allows the region's sandy soil to deposit throughout the interceptor lines, with hard rain events rapidly introducing all the deposited grit, sand, and debris into the treatment plant. While the PSD is not a combined storm / sanitary sewer system, these heavy rain events always had potential to impact the Gills Creek treatment plant profoundly.

Gills Creek had aging aerated grit basins with a chain and bucket removal system that had never provided much protection, in addition to having become a maintenance nightmare. As a result, the plant had struggled with grit for years. East Richland PSD wanted a solution that could reduce their maintenance burden and provide surge capacity to protect the plant during storm conditions. In 2016, the plant began the process of selecting a grit removal system that could solve their grit problem.

After evaluating various technologies, they found their ideal solution in a HeadCell / Hydro GritCleanse system which was started up in April 2020. The Hydro GritCleanse uses a fluidized sand bed which is initially created by seed sand which remains inside the clarifier until sufficient endemic grit has been captured to discharge. For the first month of operation, they had seen very little grit discharge and were wondering if the system was even capturing grit.

They did not have to wait long to see dramatic results. Around Memorial Day 2020, Tropical Storm Bertha was brewing off the coast which helped launch a major storm event that began May 19th with a record breaking 2.53" (6.4 cm) of rain in a single day. The weather system lingered throughout Memorial Day (May 25, 2020) when they again were pummeled by another 2.18" (5.5 cm) in a single day. The weather still wasn't letting up, culminating in a 3.51" (8.9 cm) rain event on May 30th. Over this 12-day period the city was subjected to a total of 9.3" (23.6 cm) rain. These storms helped make May 2020 the wettest May on record in South Carolina.

The system was tested again during an extraordinarily heavy winter rain event over New Year's weekend at the beginning of 2021. The Columbia area was pounded by over 3" (7.6 cm) of rain during the weekend causing an extended period of high flows and extreme grit loads.

## Benefit

During these rain events, the city saw first-hand how well their new HeadCell / Hydro GritCleanse was protecting them. With such heavy rains, flooding was happening across the state. During these severe storms, area residents had plenty of things to worry about, but their critical wastewater infrastructure needs was not one of them. During the heaviest parts of the rains their new HeadCell and Hydro GritCleanse system from Hydro International was filling dumpsters with low organic grit ready for landfill, depositing between 25 and 30 tons (23 - 27 t) of grit per event into their dumpsters rather than throughout the treatment plant.





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