



**MONROE**  
**ENVIRONMENTAL**

Water & Wastewater Treatment | Air Pollution Control

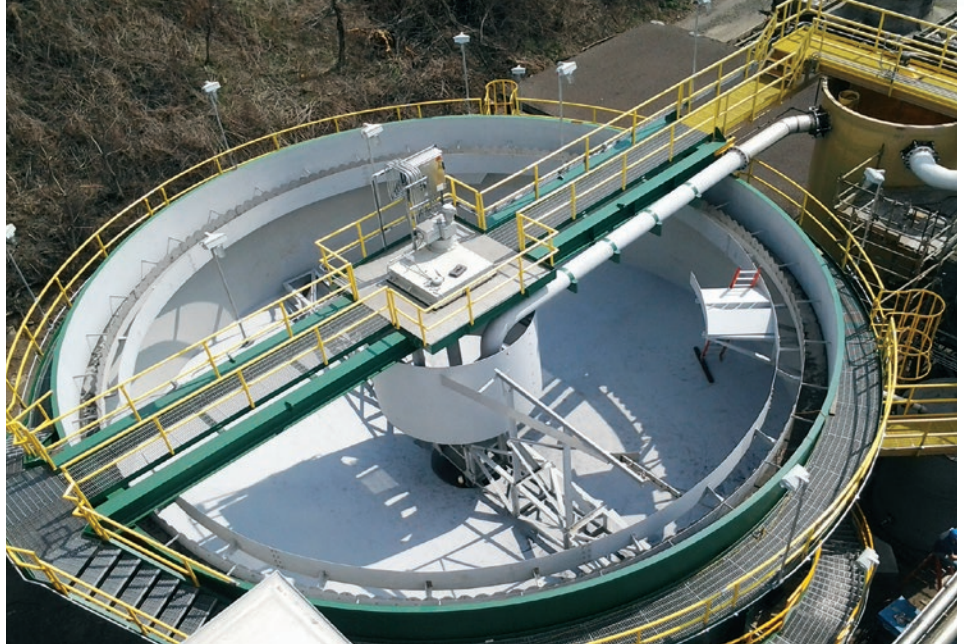
# CIRCULAR CLARIFIERS & THICKENERS

**Monroe Environmental®** offers nearly every circular clarifier design preferred by engineers and plant operators for municipal and industrial applications. We will evaluate existing clarifiers and recommend improvements to influent and effluent geometry, feedwell/EDI design, weir and launder geometry, skimming and scum baffles, sludge removal systems, and drive equipment, as well as a variety of site-specific design requirements.

## Clarifier Designs & Services

Monroe Circular Clarifiers use widely accepted settling technology based on the density difference between water and suspended solids. The Monroe Clarifier is designed to give you the performance you require with long-term reliability. Our experienced staff will provide high efficiency, low maintenance systems that will provide the highest return on investment.

- Customized designs for municipal and industrial applications
- Tank diameter 5 to 250 feet and larger
- Full and half-bridge designs
- Steel or concrete tanks
- Chemical feed system available
- Flocculator available when required
- Energy Dissipating Inlet (EDI) designs available
- Thickener mechanism available
- Sludge removal configurations
- Skimmer mechanisms
- Corrosion resistant materials and coatings
  - Epoxy coated steel
  - Stainless steel
  - Galvanization
  - And many others
- Custom built replacement parts for all manufacturers
- Clarifier rebuilds



*Above ground Circular Clarifier on legs for wastewater treatment at a steel mill*



*In ground Circular Clarifier at a beverage manufacturing plant prior to start up*

## Applications

- Steel processing
- Oil refineries
- Food processing
- Mining wastewater
- Plastics manufacturing
- Chemical and petrochemical processing
- Automotive plant wastewater
- Municipal treatment plants
- Power plant wastewater
- General water and wastewater treatment
- And many others

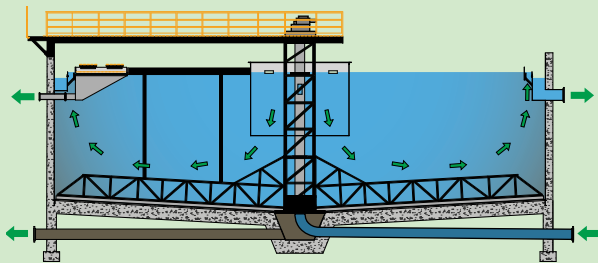


# CIRCULAR CLARIFIER & THICKENER DESIGNS

## Primary Clarifier

Monroe Environmental's primary Circular Clarifiers are designed to receive raw wastewater after it has been pre-screened to remove large objects and grit.

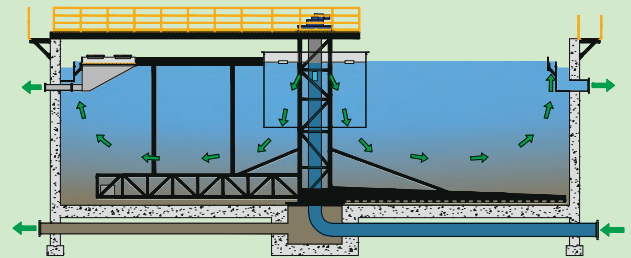
This primary sedimentation tank will produce a homogeneous liquid capable of being treated biologically and a sludge that can be separately treated or processed.



## Secondary (Final) Clarifier

Monroe Environmental's secondary Circular Clarifiers for wastewater are designed to provide a high quality effluent suitable for discharge to the environment or further treatment.

The Monroe Environmental secondary clarifier effectively separates the biological floc and colloidal solids to produce wastewater with very low levels of organic material and suspended matter.

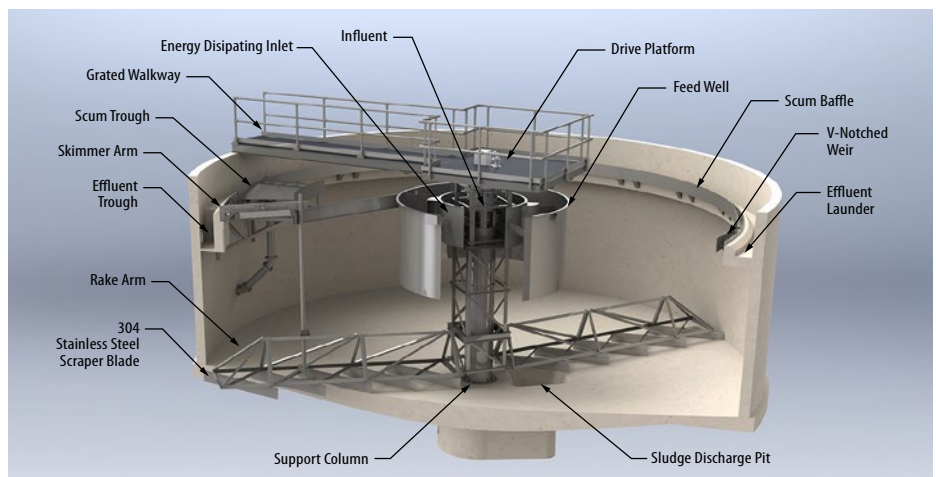


## Sludge Removal Designs

### Scraper

Scraper type clarifiers are the most common and widely used for wastewater applications. These units are straightforward and simple, utilizing a series of adjustable, angled scraper plows to draw the settled sludge toward the center of the unit and into the sludge collection pit.

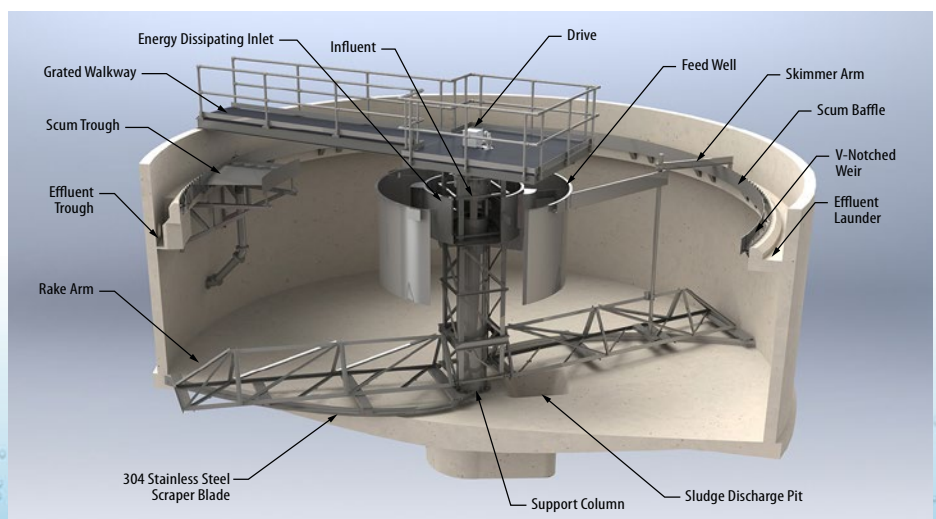
This design is most commonly used for primary treatment, thickening, and general use industrial clarifiers, however, they can be used for secondary (biological) treatment and/or flocculated solids collection.



### Spiral Scraper

Spiral scraper type clarifiers utilize long-sweeping, curved scraper blades to move solids across a basin floor. They are similar to scraper-type clarifiers in that they drag settled solids to the collection area, however, they can more quickly remove these solids and thus maintain lower sludge blankets in some applications.

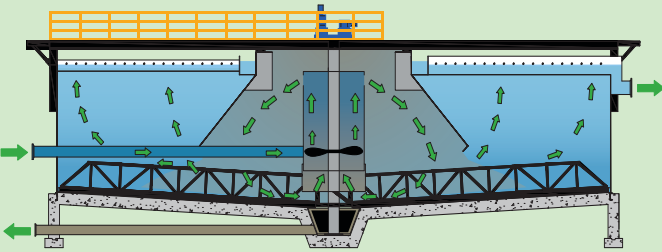
This design can be utilized in primary, secondary, and industrial wastewater applications.



## Solids Contact, Flocculating, and Water Treatment Clarifiers

Monroe Environmental manufactures several types of water treatment clarifiers that combine chemical treatment, flocculation, and sedimentation.

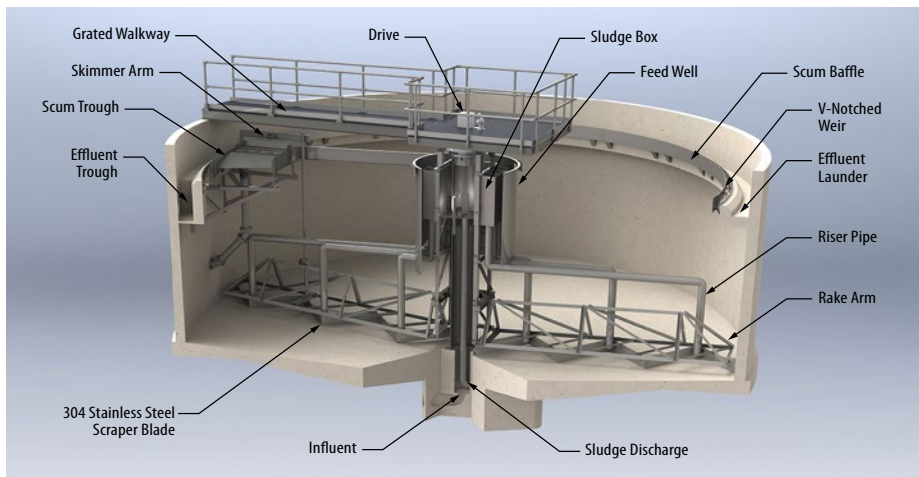
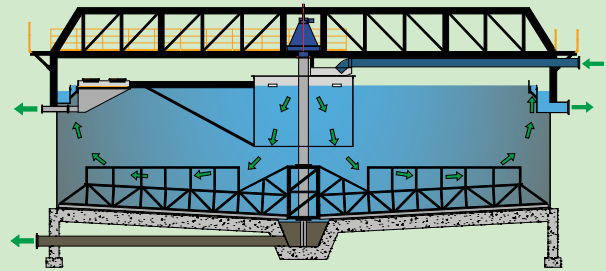
Designs include Flocculating Clarifiers and Solids Contact Clarifiers, and these units are heavily utilized in both industrial and municipal processes for treating groundwater, surface water, and process water.



## Thickeners

Circular Thickeners are a crucial step between upstream process clarifiers/separators and downstream de-watering and sludge conditioning processes. A well designed thickener provides storage and equalization, and reduces the costs associated with de-watering.

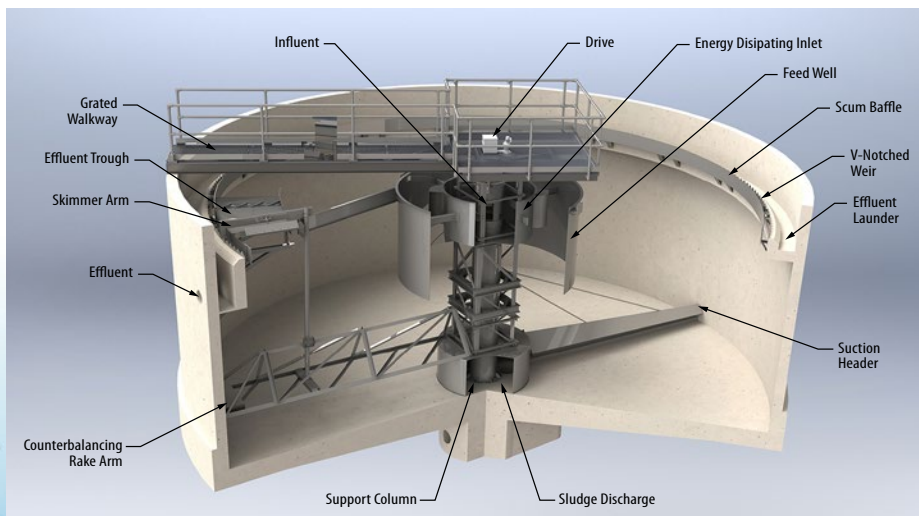
Thickeners are similar to other circular clarifiers in appearance and operation, but typically require higher operating torque and alternate sludge collection designs for optimal performance.



## Riser Pipe

Riser pipe clarifiers rely on differential head pressure to collect settled solids from the tank floor. Each riser pipe is situated at the intersection of a v-plow and receives a continuous feed of sludge that returns to a sludge collection box near the center of the clarifier.

This design is intended for secondary, biological, or flocculated solids which are more fluidized and have lower densities than primary wastewater and heavy industrial sludge.



## Suction Header

Suction header clarifiers rely on differential head pressure to collect settled solids from the tank floor. These units have a long, tapered collection arm with multiple orifices sized to stabilize and maintain optimum sludge transfer velocities through the header.

This design is intended for secondary, biological, or flocculated solids which are more fluidized and have lower densities than primary wastewater and heavy industrial sludge.



## Clarifier Features

**Mechanism Support** — Bridge supported or center column supported clarifiers and thickeners are available.

**Influent** — Center feed or peripheral feed, energy-dissipating inlet and flocculating feed well are available.

### Sludge Removal Systems

- Standard scraper
- Spiral scraper
- Hydraulic suction tube header
- Hydraulic suction riser pipes

**Skimming Systems** — Floating scum and other material can be removed by a traditional rotating skimmer arm and scum removal box or by a ducking skimmer that feeds a radial scum trough. A scum baffle prevents floating matter from entering the effluent launder.

**Launder** — Inboard, outboard, or radial launders available for effluent collection.

**Weirs** — A V-notch adjustable weir will be designed to ensure steady overflow rates, even in windy conditions. FRP, stainless steel, and other materials can be used for weir construction.

**Walkways, Railing, & Stairways** — Designed and built according to OSHA and API standards.

**Drives** — Monroe Environmental uses only the highest quality drives that are conservatively selected to handle even the most demanding loads.

- Fabricated steel precision gear
- Cast iron worm gear
- Lift mechanisms available



*50 ft. diameter Circular Clarifier during final assembly in Monroe shop*



*Above: 250 ft. diameter spiral scraper type Circular Clarifier at a municipal WWTP*

*Left: Solids Contact Circular Clarifier for lime softening at potable water plant*



*High rate Solids Contact Clarifier*

