





The WesTech **RapiSand™ Ballasted Flocculation System** is a high rate clarification process combining rapid mixing and multi-stage flocculation, followed by sedimentation. RapiSand™ sedimentation is extremely fast and can be applied in a wide variety of suspended solids removal applications. Typical advantages of the RapiSand™ include expanding plant capacity, minimizing plant footprint, providing fast startup capabilities, as well as providing great performance characteristics. RapiSand™ may be the answer to your suspended solids process needs.

Surface Water Pretreatment

Surface water pretreatment prepares water for use in any type of treatment plant (i.e., power, chemical, petrochemical, etc.) and is needed when the source of water comes from a raw/contaminated source (usually river water) where the total suspended solids (TSS) can range from 50 mg/L – 200 mg/L. This treatment consists of four steps: chemical pretreatment, clarification, filtration, and sludge treatment.

Chemical Pretreatment

Sodium hypochlorite (bleach) is added to kill any living organisms that may be in the raw water. Coagulant helps particles come together to improve clarity and settling. Polymer turns individual particles into larger clusters. The larger particles settle faster and form a more concentrated sludge.

Clarification

RapiSand™ Ballasted Flocculation is a high-rate water clarifying system utilizing both chemical and physical treatments to remove suspended solids and unwanted particles. The process uses the proven flocculation technique of adding a dense ballast sand, allowing for much higher settling rates. Raw water is mixed with a coagulation agent to destabilize and neutralize particles in the water. During the next step of flocculation, sand and polymer are combined with the coagulated flow. The flocculation mixer provides the particles with enough energy to stay suspended and grow in size.

In the sedimentation area, developed floc particles (coagulant, polymer, sand, and solids) are allowed to settle to the bottom. Clarified water may pass through tube settlers or inclined plate settlers before it is drawn off the top of the sedimentation basin.

The settled solids are gathered and pumped from the sedimentation area through a hydrocyclone where the sand is separated for reuse and the solids are processed further.

Filtration

If necessary, the overflow can be treated by filtration. The process starts in an equalization tank that allows for a constant flow into the dual media filters. As the water flows from the RapiSand™ to the dual media filter, polymer may be added to improve filtration. The resulting water is now less than 1mg/L TSS. It may be directly sent to a cooling tower or it can be further filtered depending on the intended use.

If the water is being used for a boiler then it may need to go through reverse osmosis. The AltaFilter™ is a low pressure membrane filtration system that removes small suspended solids from the water to improve the efficiency of the reverse osmosis system.

Sludge Treatment

The underflow of the RapiSand™ is pumped into a thickener. Polymer is added to improve settling and clarity. The thickened underflow is sent to a filter press or other type of vacuum or pressure dewatering filter. The slurry is pumped into the filter press under pressure to force the moisture out. The filter press may require additional polymer to function properly. The cake is then hauled off for disposal and the pressate and wash water is recirculated for further use. The pressate and cloth wash water get pumped to the reclaim water storage sump with the backwash from the filtration systems.