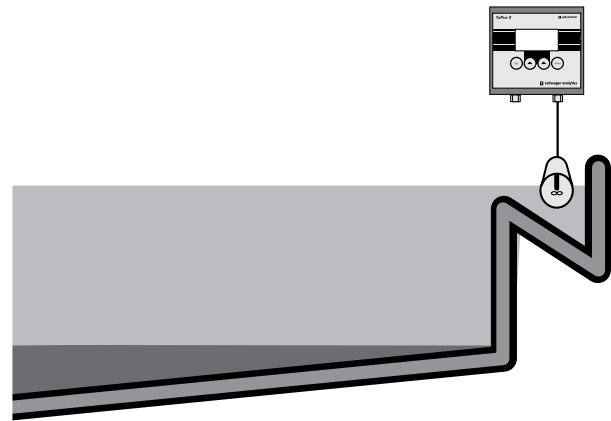


Clarifier supernatant / carryover turbidity and suspended solids

application note



A WP-260 sensor and a TxPro™-2 transmitter monitor turbidity in the effluent channel of a primary clarifier.

Description

Supernatant is the liquid remaining above a sediment or precipitate after sedimentation. From sedimentation basins, thickeners or digesters, the supernatant is piped to succeeding treatment processes or recycled. The clarity / quality (turbidity) of the supernatant must be carefully monitored to prevent excessive amounts of suspended solids from escaping the tank and overloading the next treatment step. Supernatant turbidity is a useful indicator of the relative efficiency of a separation process.

Critical factors

The critical factors include the influent rate, source and composition of the influent, and the surface overflow rate.

Influent

The influent flow must remain within the loading parameters of the tank. An increase in the flow or solids content will result in excessive solids in the supernatant.

Primary clarifier influent comes from raw wastewater, recycled waters from thickeners and digesters and centrate / filtrate from dewatering processes. Recycled digester liquors must be treated first to remove septic materials. Left untreated, septic particles (which resist settling) will increase the turbidity of the supernatant.

Detention time

The detention time must be sufficient to allow for the settling and separation of most suspended solids in the media. If the supernatant quality is substandard, the influent flow rate or solids concentration must be altered.

Effluent

Primary clarifier supernatant (effluent) is piped to aeration basins where it is mixed with return activated sludge. Supernatants from thickeners and digesters are returned to the head of the plant to be mixed with raw wastewater. Digester supernatant should be monitored for high ammonia content.

For primary clarifier carryover, which typically feeds an aeration basin, the acceptable readings are between 100 mg/l and 300 mg/l. If the measured turbidity exceeds the upper figure, operators may need to adjust the clarifier process to maintain the balance of suspended solids to aerobic microbe activity in the aeration basin.

Zellweger Analytics solutions

The WP-260 sensor is designed for low concentration applications like surface water turbidity. In a typical clarifier installation, the sensor is mounted to a PVC pipe and suspended at a depth of about one to two feet in the carryover channel. The sensor is connected to a TxPro-2 transmitter. An industry standard current output loop, proportional to the measured turbidity, is transmitted to remote monitoring and control devices.

This publication is not intended to form the basis of a contract. The company reserves the right to change design and specification of its products without notice.

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