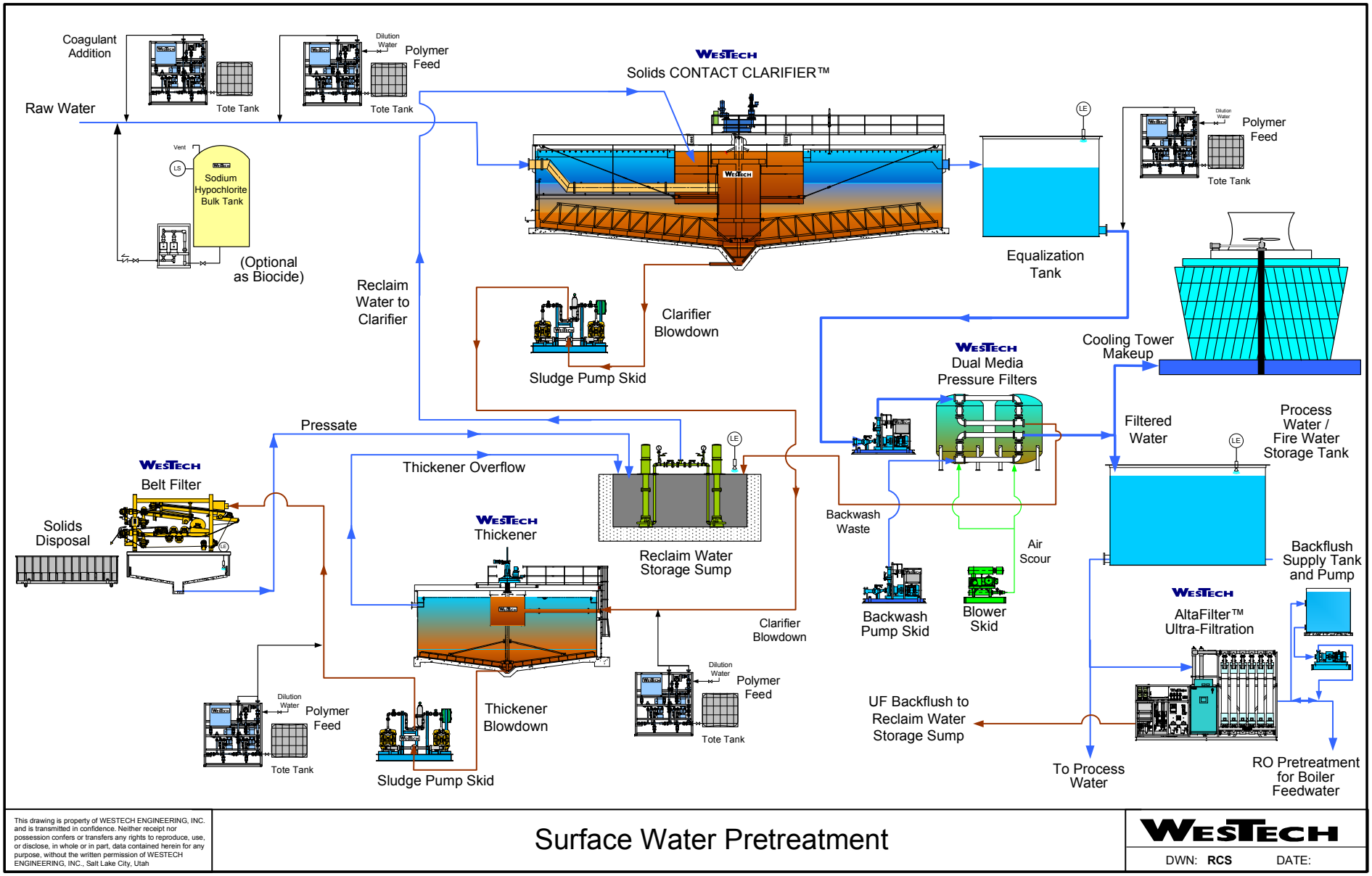

Surface Water Pretreatment

WESTECH

DWN: **RCS** DATE:

The ***AltaFilter™ Ultrafiltration System*** is supplied as a pre-engineered system with integrated piping, valves and controls, and has been successfully applied in potable water treatment, municipal wastewater filtration and industrial applications. Custom-engineered systems are available to meet unique needs.

Surface Water Pretreatment

Surface water pretreatment prepares water for use in any type of treatment plant and is needed when the source of water comes from a raw/contaminated source (usually river water) where the total suspended solids (TSS) could 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

After the chemical pretreatment, the water flows into the Solids CONTACT CLARIFIER™. The Solids CONTACT CLARIFER™ is used when there are not enough solids in the feed water source to flocculate on their own. Settled solids from the bottom of the clarifier are mixed with the feed water. The particles interact and form larger, faster settling particles. The clarified water flows out the top and the solids (sludge) are scraped to the center and removed for dewatering. The overflow typically has less than 10 mg/L of suspended solids.

Filtration

If necessary, the overflow can be treated by filtration. The water starts by going into an equalization tank that allows for a constant flow into the dual media filter. As the water flows from the equalization tank to the dual media filter, polymer may be added to improve filtration. The resulting water TSS is now less than 1mg/L. 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™ Ultrafiltration System 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 Solids CONTACT CLARIFIER™ is pumped into a thickener. Polymer is added to improve settling and clarity. The thickened underflow is sent to a belt press or other type of vacuum or pressure dewatering filter. The belt press places the solids between two belts and squeezes the water out through a series of rolls.

The belt press requires additional polymer to function properly. The cake is then hauled off for disposal and the pressure 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 and then it is recycled back into the Solids CONTACT CLARIFIER™.

* If total suspended solids are <50 mg/L then water should go straight to a filter. If >500 mg/L, the water might go to a standard clarifier. Cold lime softening might be considered for water hardness above 150 mg/L as $CaCO_3$.