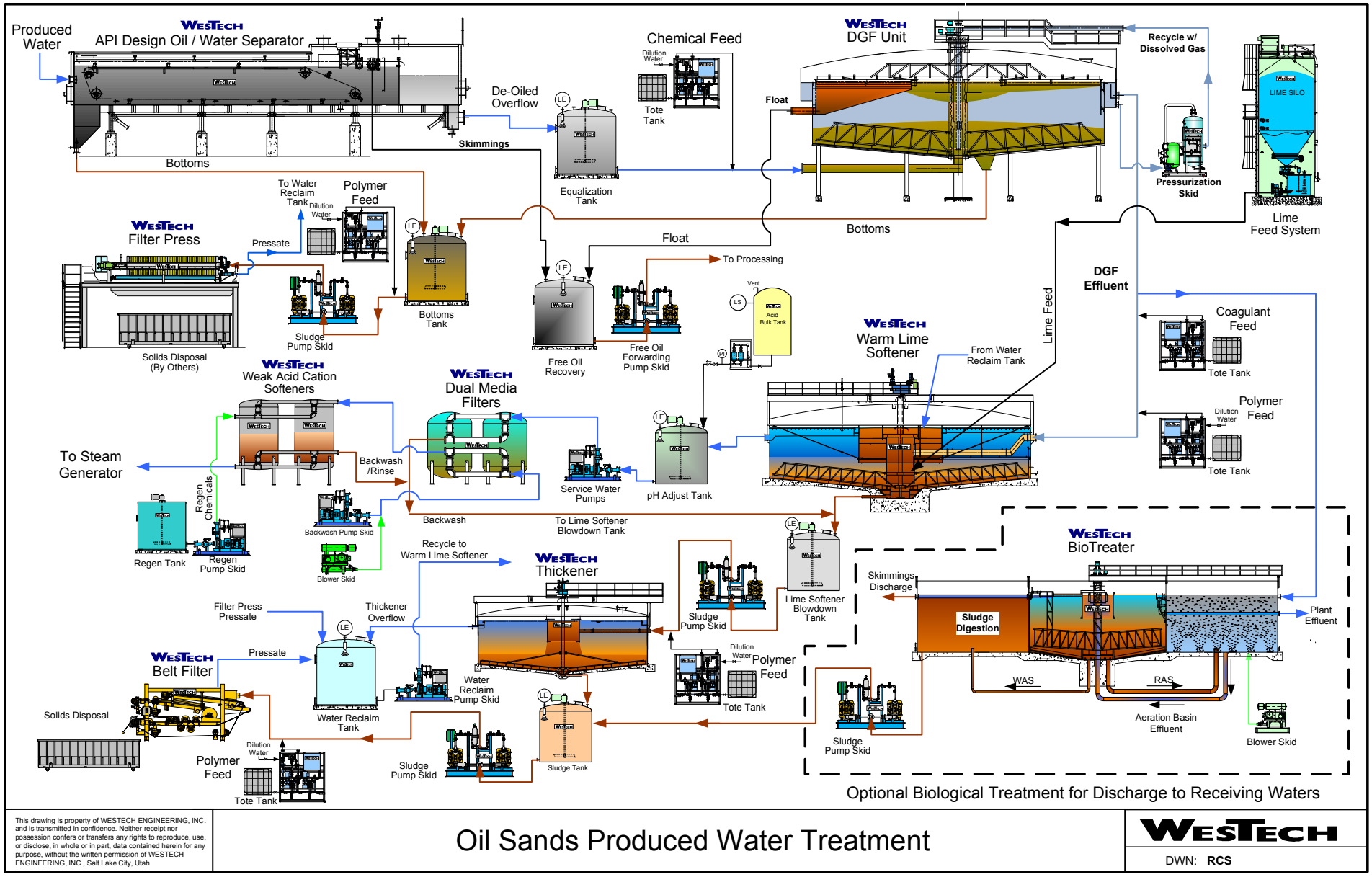

Oil Sands Produced Water Treatment

WesTech

DWN: **RCS**

WesTech's ***Oil/Water Separators*** combine state-of-the-art separation, skimming, and sludge transport technologies into a highly efficient primary oil separation device. Removing the bulk of free oils and greases from plant process water streams yields valuable hydrocarbons. Further processing downstream yields recyclable water for plant operations. We provide new as well as retrofit equipment. We offer traditional rectangular units as well as maintenance friendly, high torque, circular units.

Steam Assisted Gravity Drainage (SAGD)

The term "oil sands" is a bit of a misnomer. The deposits are saturated with a tarlike substance known as bitumen. A great deal of processing is required to separate this bitumen from the associated soil and other debris. The most common way to recover bitumen from oil sands is through the use of steam to heat the bitumen. This reduces the viscosity so that it can be pumped to the surface in much the same way as crude oils. Oil sands deposits which lie deeper than 75 meters are recovered in this manner. This method is used to extract approximately 90% of the oil sands deposits in the major regions of Canada.

Steam Assisted Gravity Drainage

Steam assisted gravity drainage (SAGD) is a technique where two horizontal wells are drilled into the deposit. These horizontal wells may extend for miles in all directions. One well is directly above the other. In the upper horizontal well, steam is injected continuously to heat the bitumen. The lower of the two wells is used to pump the bitumen to the surface.

The bitumen produced via SAGD contains a significant amount of water from the steam condensate. Since the quality of the water required for discharge is high and the availability of raw water is limited, the choice is most often made to recycle this water.

Some of the major differences from conventional water treatment systems are the desire to preserve as much heat as possible and the need to reduce the high amounts of silica which are common in water at SAGD operations. Heat recovery saves energy in cold climates. In addition, silica reduction via warm lime softening requires temperatures of 140° F for best silica reduction.

Oil/Water Separator

Water treatment begins with the separation of free oil. This can be done either in a conventional rectangular oil/water separator or in a circular oil/water separator as manufactured by WesTech. Once the free oil has been removed, the effluent flows to a dissolved gas flotation (DGF) unit where the dispersed oil is floated to the top by means of dissolved gas bubbles. Both these units are gas tight to prevent the release of volatile organic compounds (VOC's) and to preserve as much heat value as possible.

Warm Lime Softener

The effluent of the DGF unit is pumped to a warm lime softener. As the name implies, this unit employs traditional lime softening run at an elevated temperature of 140° F. At this elevated temperature the removal of silica is greatly enhanced. This removal rate can be as high as 80-90%.

In addition, the lime softening reduces any hardness and acts as a final oil removal step to ensure there is no oil contamination of downstream processing. From the warm lime softening, the water is pumped through dual media filters to remove any suspended solids in the lime softening effluent. This water then goes through weak acid cation units for further polishing prior to the steam generators.