Microfiltration (Module Type) Design Considerations

Flux Rate and Number of Modules

1. NYC DEP - Watershed Technical Bulletin No. 1 states that the maximum allowable flex rate is 23.3 GPD / SF.
2. Determine number of modules required by taking the Peak Daily flow (GPD) and dividing it by the Square Foot of a single membrane module.

Number of Units

1. Two microfiltration units are required as a minimum – each capable of 100% Peak Day.
2. If the Average Daily Flow is greater than 50,000 – than a minimum of 3-units must be provided each capable of 50% of the Peak Daily flow.
3. Microfiltration units hold a certain quantity of modules per rack; if more modules are required more racks can be added. WWTPs with larger flows may require multiple units to handle the flow.

Recirculation / Backwash Rate

1. Recirculation rate must be provided and accounted for in the hydraulic profile of the plant.
2. Recirculation must be returned to the head of the WWTP. The rate can be significant and the volume is estimated to be 20% of the forward flow in most cases.

Power, Instrumentation and Emergency Generator

1. Important to have 3-phase power, if possible, because the feed pump Hp can be over 7.5 HP
2. An emergency generator capable of running the entire unit, including pumps, air compressor, and controls is required.
3. Turbidimeters, flow meters, alarm indicators are required.
4. SCADA system is suggested for all plants and is required if the plant capacity is over 100,000 GPD

Feed Tank and Break Tank

1. Diurnal flow patterns of the plant must be considered in designing the feed tank.
2. The microfiltration units will likely have to be pumped to when upgrading an existing WWTP. The Microfiltration transfer pumps will receive their signals from the feed tank level indicators.
3. Volume and timing of backwash cycles is required for proper break tank sizing.

Water Hardness

1. Calcium Hardness should be less than 200 mg/l

Air Compressor Capacity

1. There may be other plant air requirements besides the microfiltration unit. It is good to check and see if one set of air compressors can accommodate the entire

load

Discharge Rate: (GPM @ PSI)

1. Most microfiltration units have a positive discharge pressure. This needs to be considered in the design of downstream equipment, piping, tanks, etc.