6.5.3.5 MBR Backpulse Pumps Operation

The MBR backpulse pumps take high quality filtrate from the Reuse Wetwell and pumps it back through the membrane fibers to clean the membranes. These pumps are utilized in each of the three cleaning operations: backpulse, maintenance clean and recovery clean. The cleaning modes are adjusted for each MBR basin on the Mode of Controls screen.

MBR Process Control Screens

The MBR backpulse pumps are controlled through SCADA from the MBR plant control screens. The access to these screens is discussed in the following sections.

MBR Process Main Screen

The automatic operation of the MBR process is controlled through the SCADA system on the membrane main screen ***(Figure 6.5.3.5-1).*** The screen is accessed by clicking on the **MBR button <1>** on the top of the screen. The MBR backpulse pump control screen is accessed by selecting the **Backpulse Pumps icon <2>**.

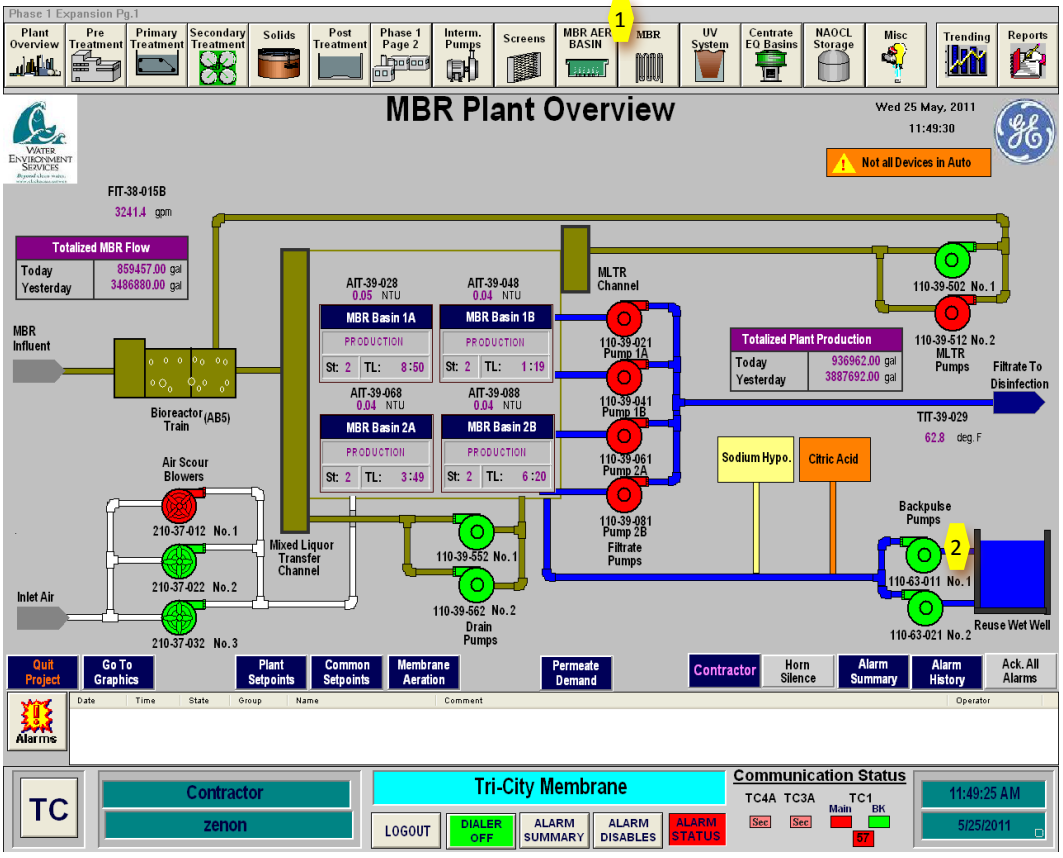

Figure 6.5.3.5-1 – Membrane System Control Panel

MBR Backpulse Pump Controls

The backpulse pump pumping rate is controlled automatically by the MBR control system. The inputs to the backpulse pump controls are on the Reuse Wetwell and Backpulse Pumps control screen. The controls for the backpulse pumps allow the capability to place the pump in AUTO or start and stop the pump manually. To allow control of the backpulse pumps, they must first be put in REMOTE on their respective

VFD panel located in the UV Building electrical room. The backpulse pump controls can be selected by clicking on the **backpulse pump icon <3>** as shown on ***Figure 6.5.3.5-2***. This backpulse pump control popup box **<4>** will then come up for control of the pump as shown in ***Figure 6.5.3.5-3***. Clicking on the AUTO button will place the pump in AUTO and allow for the control system to control the operation of the pump. The START and STOP buttons provide the capability to operate the pumps manually. Normal operating mode for the pump is the AUTO.

The backpulse pump control popup box also has the runtime meter for the pump. Clicking on the RESET button will reset the runtime to zero.

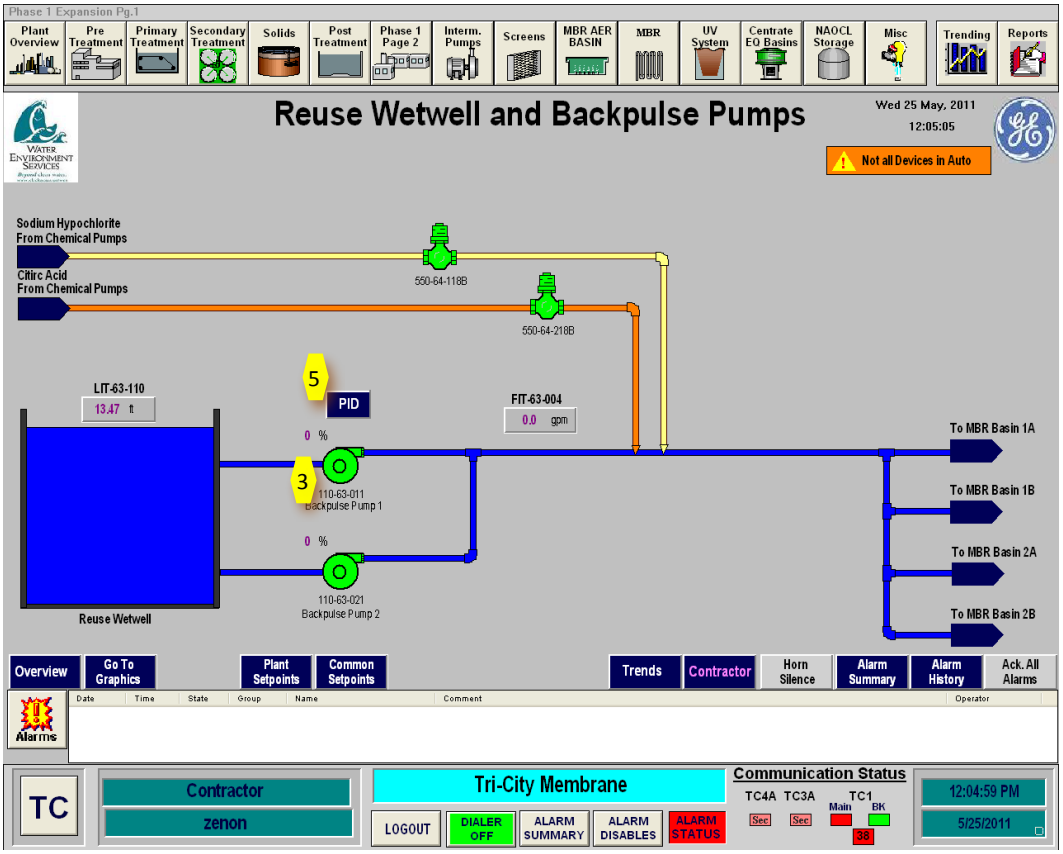

Figure 6.5.3.5-2 – MBR Backpulse Pump Control Screen

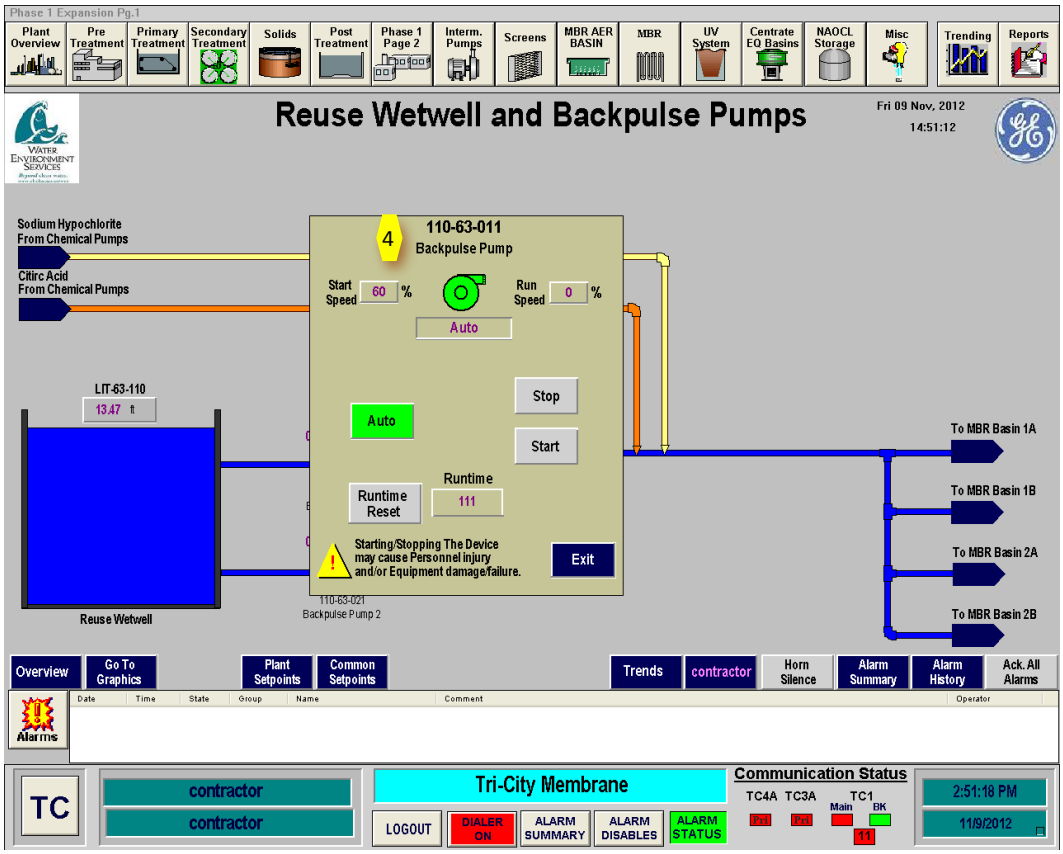

Figure 6.5.3.5-3 – MBR Backpulse Pump Control Popup Box

Clicking on the **PID button <5>** (***Figure 6.5.3.5-2***) will give a popup box with the PID controller **<6>** for the backpulse pump as shown in ***Figure 6.5.3.5-4***. This box provides a trend plot of the process variable for the pump as well as the PID control variables to tune the pump. These values have been set by the GE Technician and should not be changed without confirmation from GE.

In addition to the PID controller, the PID popup box has the flow rate setpoints **<6>** for the backpuse pumps as shown in ***Figure 6.5.3.5-4***. There are three flow rate setpoints for the pumps:

- **Backpulse Flowrate (BP SP)** – This is the rate of flow when the membranes are set to backpuse during their production cycle.
- **Maintenance Clean Flowrate (MC SP)** – This is the rate of flow that the membranes are backwashed during the maintenance clean cyle.
- **Recovery Clean Flowrate (RC SP)** – This is the rate of flow that the basins are filled during the recovery clean cycle.

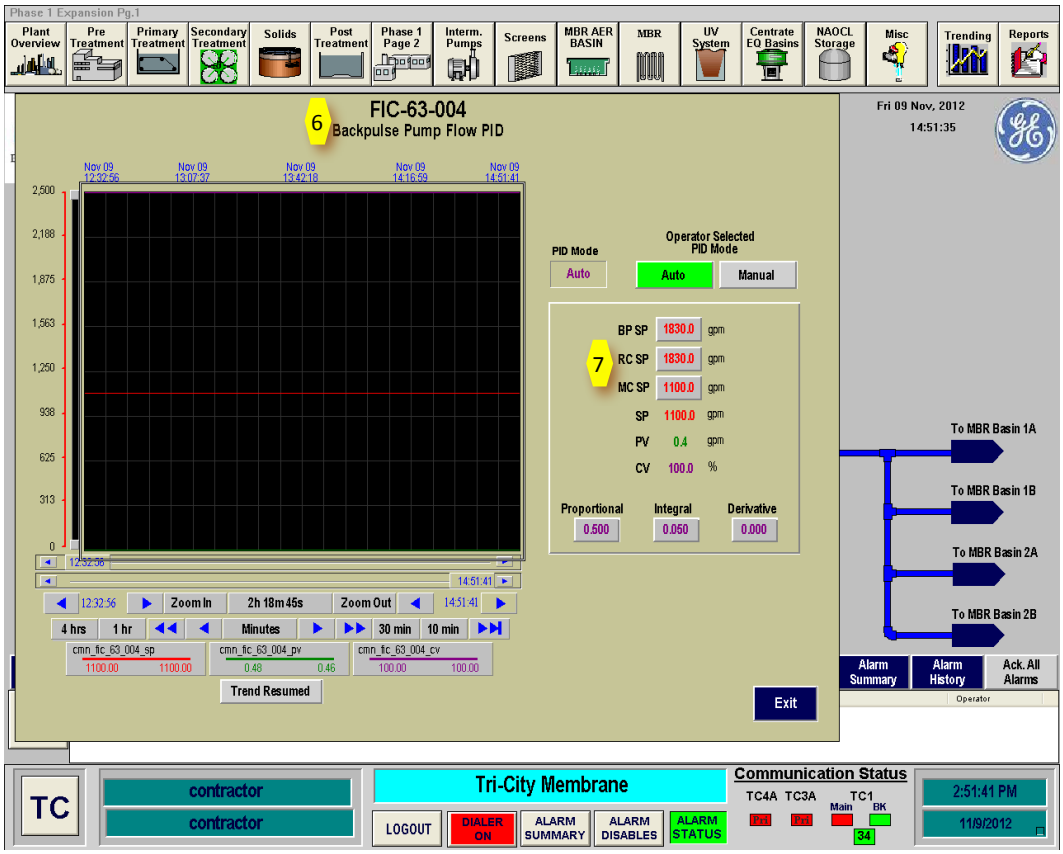

Figure 6.5.3.5-4 – MBR Backpulse Pump PID Popup Box

Backpulse Pump Flow Transmitter

The backpulse pump flow transmitter alarm setpoints can be selected by clicking on the **backpulse flow box <8>** (FIT-63-004) as shown on ***Figure 6.5.3.5-5***. These setpoints are for the high and low flow alarms for the backpulse pumps. These should not be changed as they are set to protect the membrane lumens.

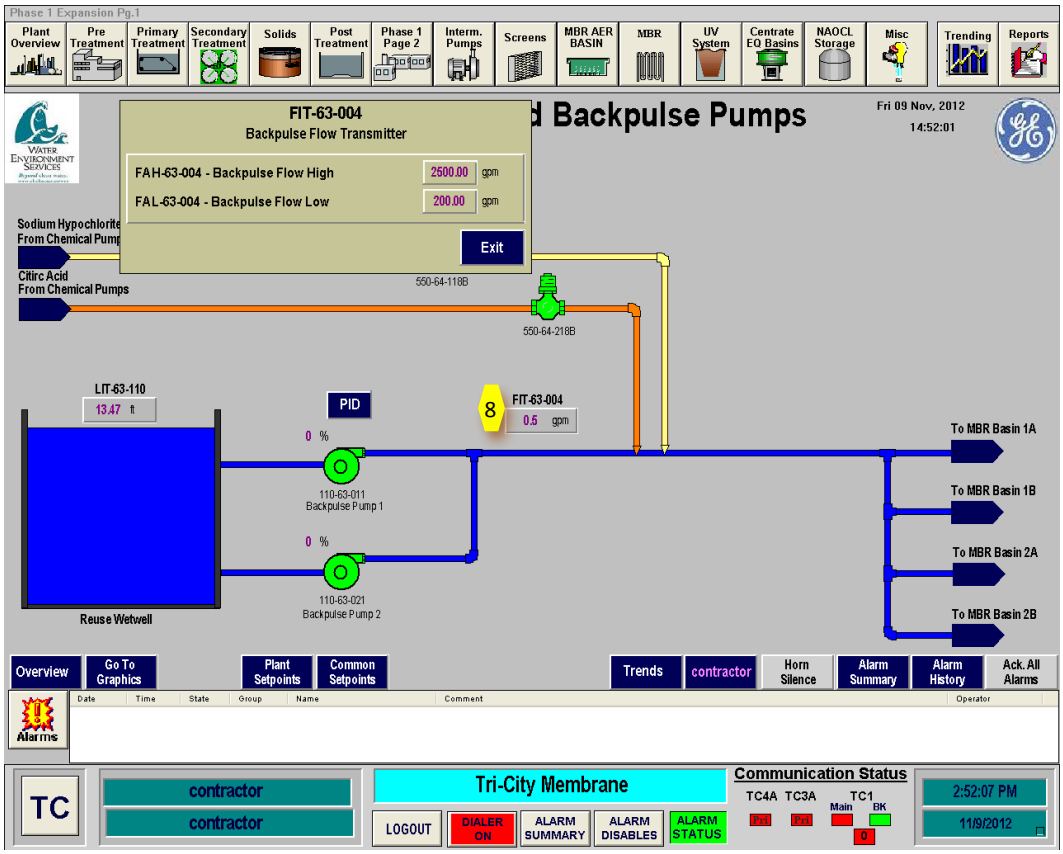

Figure 6.5.3.5-5 – MBR Backpulse Flow Transmitter Alarm Setpoint Popup Box

Backpulse Tank Level Alarms

The alarm setpoints for the backpulse tank level are located on the Reuse Wetwell and Backpulse Pumps control screen. They are accessed by clicking on the Reuse Wetwell level indicator (LIT-63-110) **<9>**. This will give a popup box with the alarm setpoints as shown in ***Figure 6.5.3.3-6***.

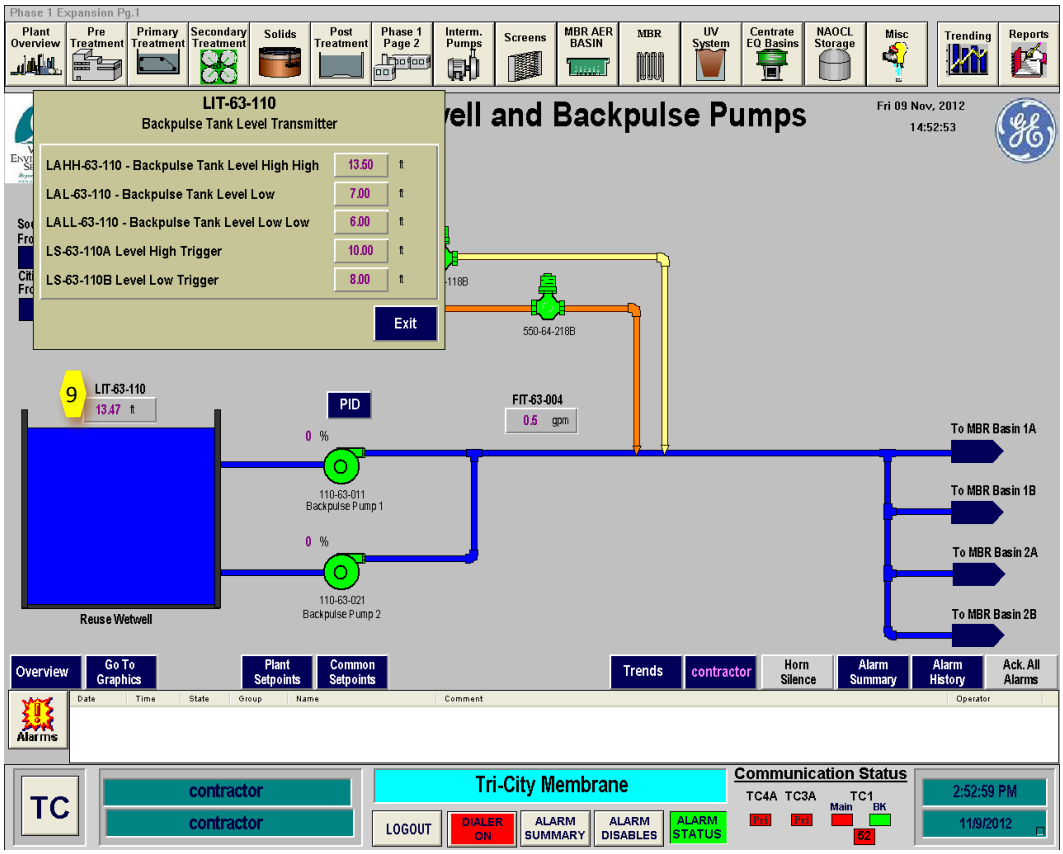

Figure 6.5.3.5-6 – MBR Backpulse Tank Level Transmitter Alarm Setpoint Popup Box

MBR Backpulse Pump Startup Sequence

To start up an MBR backpulse pumps in Automatic Mode, follow the following sequence. This sequence is for a cold startup of the system. If the system is operating, confirmation that the equipment is off may not be necessary.

Step	Action	Location
	Confirm Equipment is in Off	
1	Confirm backpulse pumps are in Off Position in SCADA	SCADA Main Screen
2	Confirm backpulse pumps are in OFF Position at VFD Control Panel	UV Building Electrical Room
3	Confirm backpulse pumps breaker is OPEN at the MCC panel	UV Building Electrical Room
	Ready Equipment	
NOTE		
1	Confirm there is adequate CLEAN water in Reuse Wet Well	UV Building/SCADA Screen
2	Confirm backpulse pump suction and discharge valves are Open	UV Building Lower Level
3	CLOSE backpulse pumps breaker at the MCC panel	UV Building Electrical Room
4	Set backpulse pump to REMOTE at VFD Control Panel	UV Building Electrical Room
5	Place backpulse pump into AUTO on SCADA screen	SCADA Reuse Wet Well and Backpulse Pump Screen