

### 6.4.3.1 MLSS Recycle Pump Operation

The MLSS recycle pumps recycle mixed liquor from Zone 6 of the aeration basin to Zone 1A of the basin. These pumps recycle nitrate that was formed during nitrification in the aerobic zones of the aeration basin to the de-ox and anoxic zones for denitrification.

#### MBR Aeration Basin Control Screen

The MLSS recycle pumps are controlled through SCADA from the MBR aeration basin screens. The access to these screens is discussed in the following sections.

#### MLSS Recycle Pump Control Screen

The automatic operation of the MLSS recycle pumps (MLR Pumps) is controlled through the SCADA system from the MBR aeration basin main screen (**Figure 6.4.3.1-1**). The screen is accessed by clicking on the **MBR AER Basin button <1>** on the top of the screen. The MLR Pumps screen is accessed by selecting the **MLR Pumps icon <2>**.

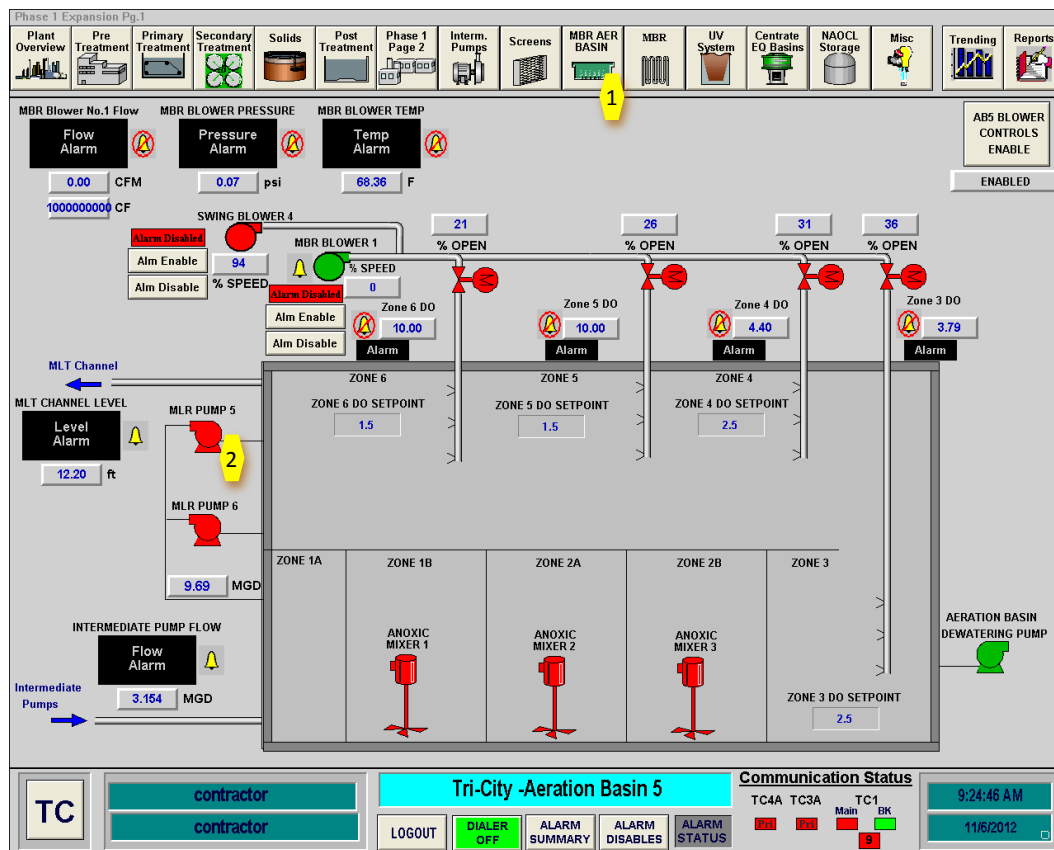
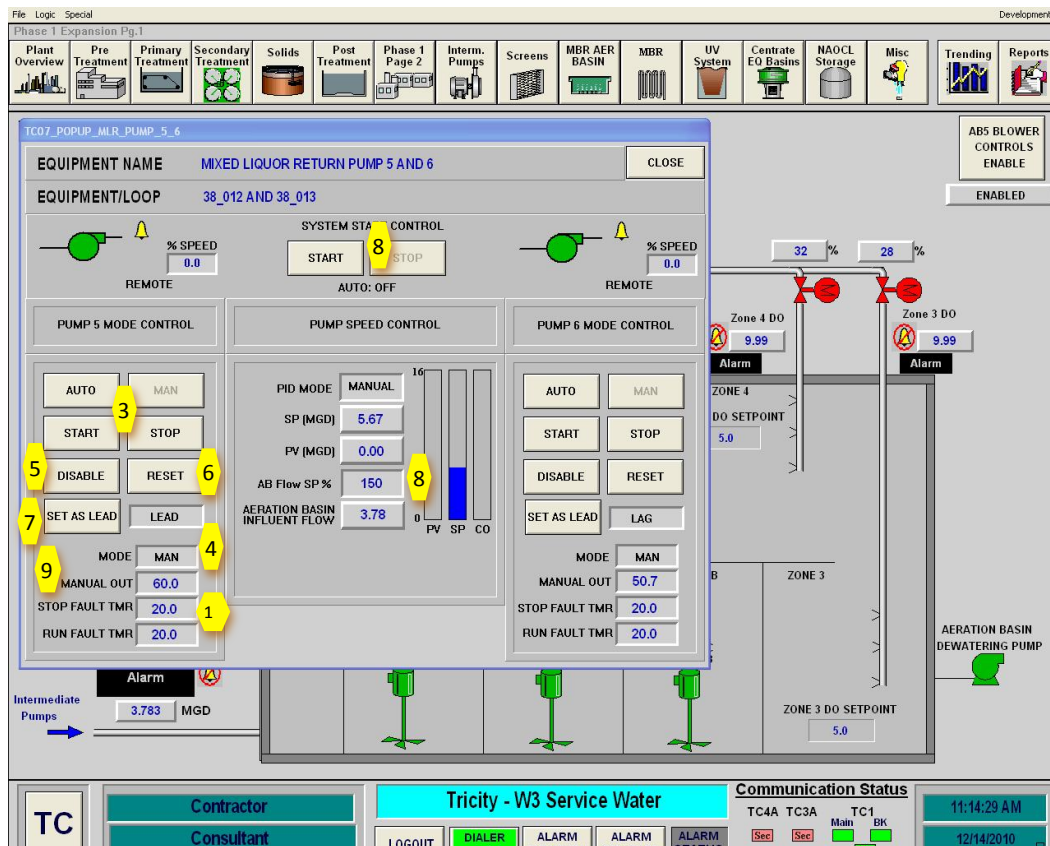


Figure 6.4.3.1-1 – MBR Aeration Basin #5 Main Screen

#### MLSS Recycle Pump Controls

The MLSS recycle pump control screen provides for status and control of the MLSS recycle pumps. The Mixed Liquor Return Pump 5 and 6 popup box is shown in **Figure 6.4.3.1-2**. The pumps flow rate is paced off of the MBR plant flow. If the lead pump is not able to meet the flow set-point, the lag pump will automatically start. To obtain control through SCADA, the pump must be set to REMOTE on the pump's VFD panel.



**Figure 6.4.3.1-2 – Mixed Liquor Return Pump 5 and 6 Control Screen**

The MLSS recycle pump controls are accessed through the popup box. The pump's mode of control is set with the AUTO/MANUAL and START/STOP buttons **<3>**. Use these buttons to set the pump in AUTO. If the pump is in MANUAL, the pump can be started manually with the START/STOP buttons. The mode is shown in the MODE box **<4>**.

The DISABLE button **<5>** will disable the controls and alarms for this pump. The pump will not operated if it is disabled. The RESET button **<6>** resets a pump failure alarm. In most cases, a pump failure must be cleared at the VFD panel first and then reset using this button.

The Set as Lead button **<7>** is used to select the lead pump. When one pump is set as the lead pump the other pump is automatically set as Lag.

The MLTR pump flow is set as the AB Flow SP% **<8>**. Enter the percent of intermediate pump flow that you want for the MLR pumps flow set point. For example if the Intermediate pumps are pumping 4 MGD (FIT-38-015) and you enter 200% here, the MLTR pumps will have a flow set point of 8 MGD.

The Manual Out set-point % **<9>** is for setting the pump flowrate when the pumps are placed in manual. Enter the percent of full speed for the manual mode pump speed.

The Fault Timers <10> are for setting the delays for the pump fault timers. This provides a period of time for the pump to start and stabilize before a fault occurs. Enter the time delay for a start or stop fault timers. Time is in seconds.

### MLSS Recycle Pump Startup Sequence

To start up the MLSS Recycle pumps in Automatic Mode, follow the following sequence. This sequence is for a cold startup of the pumps. 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 MLSS Recycle Pumps are OFF	SCADA Main Screen
2	Confirm MLSS Recycle Pump are in Off Position in SCADA	SCADA Main Screen
3	Confirm MLTR Pumps are in OFF Position at Local Control Panel	MBR Electrical Room
	Ready Equipment	
1	Close Breaker in MCC for MLSS recycle pumps at MCC	MBR Electrical Room MCC
2	Close Breaker on MLSS recycle pump VFD for both MLSS recycle pumps	MBR Electrical Room VFD
3	Place MLTR pumps in Remote at MLSS recycle pump VFD Panel	MBR Electrical Room VFD
4	Confirm MLSS recycle flow rate (AB Flow SP%) set-point on the pump control box in SCADA. Design setpoint is 100 to 400%.	SCADA Membrane System MLR Pump 5 and 6 Control Screen
5	Place MLTR pumps in AUTO on MLR Pump 5 and 6 Control Screen in SCADA	SCADA MLR Pump 5 and 6 Control Screen
6	Click on System Start Control Start button	SCADA MLR Pump 5 and 6 Control Screen
7	Pumps will now operate and pace to MBR plant influent flow	