

## Activated Sludge Process Upset Timeline

Day/Time	Observation/Action	Relevance/Notes
8/27/25, 12:25pm	Terminal Street Lift Station down	Challenges with temporary pump caused flows to vary more than normal.
8/29/25	Kruser delivered two loads of Packers Chemical industrial waste	Could this be a cause?
8/30/25	MLSS concentration declined rapidly	First indication of process upset. No changes in wasting. RAS concentration was stable at $\approx 1.0\%$ solids.
8/31/25	Sludge settling rapidly.	
9/1/25	RAS concentration dropped to 0.64%	
9/2/25	RAS concentration dropped to 0.52%	
9/2/25	Reduced wasting from 110,000 to 100,000 gal/day	To increase MLSS concentration
9/3/25	Clumps of sludge showing up in final clarifiers	Clumps readily disperse, and sink, when sprayed with hose.
9/3/25 and 9/4/25	Reduced wasting to zero	To increase MLSS concentration
9/5/25	Raised wasting to 50,000 gal/day	MLSS concentration increasing
9/9/25	Transmittance rapidly declined until 9/13, improved on 14 <sup>th</sup> , then progressively declined, finally stabilizing around	
9/19/25	Raised basin pressure from 2.5" H <sub>2</sub> O to 3.0" h <sub>2</sub> o	Introduce more oxygen into basins
9/22/25	Raised basin pressure from 3.0" h <sub>2</sub> o to 4.0" h <sub>2</sub> o (maximum)	Introduce more oxygen into basins
9/26/25	Started aeration of RAS splitter box with portable air compressor.	Introduce additional oxygen into RAS, and strip off hydrogen

		sulfides and other reduced compounds with chemical oxygen demand. Eric reported H2S concentration in thickener room seems lower, which is likely due to stripping of H2S through aeration.
9/29/25	Testing of mixed liquor oxygen concentration in cell 1 of each train indicates anomalies in Train B (much lower dissolved oxygen than Train A and C)	Possible reasons: Oxygen may not be transferring from head space into liquid phase; pressure transmitter in cell 1 may be providing erroneous reading, leading to insufficient pressure in Train B.
9/29/25, 10:30am	RAS to Train B off	Taking Train B out of service
9/29/25, 1:30pm	Primary effluent to Train B off	Taking Train B out of service
9/29/25, 1:10pm	Placed Primary #1 into service	Will reduce load to aeration basins
10/1/25	Lower pressure in activated sludge basins to 2.5"wc	Increases engagement of upper impeller with mixed liquor
10/1/25	Shut off mixers and closed oxygen valve in Train B	Taking Train B out of service
10/2/25, 2:00pm	Opened large manual vents on stage 9 of Trains A and C, to increase oxygen flow through system	Oxygen demand not satisfied, even with vents 100% open
10/2/25, 5:10pm	Adjusted valves on manual vents to reduce flow and avoid wasting oxygen	Seeing oxygen concentration increase in mixed liquor
10/3/25	Chlorinating RAS in RAS splitter box. Pump set at 25%.	Chlorination of RAS at low dose to tie up H2S and prevent filamentous bacteria from dominating as activated sludge returns to aerobic conditions

10/4/25 – 10/5/25	Continue aeration and chlorination of RAS	
10/6/25	Closed manual vents on stage 9 of Trains A and C	Mixed liquor DO concentration at 9ppm in Train C, and 16ppm in Train A, indicating system is aerobic and now using excessive oxygen.

- Basin mixers use less power when basin pressure setpoint is increased. Does increased pressure lower the water level in basins, thereby reducing the resistance caused by the upper impeller? Could the water level in Train B be lower than in Trains A and C, or the impeller be mounted in a higher position, explaining the lower power demand? If upper impeller is not agitating surface, this could reduce oxygen saturation, and also allow buildup of scum.
- Some initial sludge judging of trains indicated very little sediment on floor of basins.