



Simmons Foods, Inc.'s Southwest City, Missouri plant has received accolades for the treatment facility's environmental performance. The award-winning plant achieves extremely stringent permitting requirements prior to discharging into local surface waters, requirements far beyond those of most municipal facilities. Regardless of these achievements, the facility's primary issue is one of reduced treatment capacity during periods of cold weather, potentially constraining the treatment process during winter months.



SITUATION

- Wastewater from the meat processing facility is treated using a sequence batch reactor and an aerobic lagoon that discharges to surface waters following full treatment.
- To enable biological treatment processes, atmospheric oxygen is incorporated into solution using mechanical aeration. Specifically, the wastewater is agitated using four, 100-HP blowers and 15, 75-HP surface aerators—for a total system power usage of 1,525 HP.



COMPLICATION

- Use of mechanical surface aerators in cold weather created low wastewater temperatures – a difficult environment for the beneficial, nitrifying organisms—slowing nitrification.
 - Reduced biological activity.
 - Increased risk to treatment capacity in winter temperature.



RESOLUTION

- Replaced surface aeration equipment with two, 350-HP the “no-splash,” side-stream SDOX® systems retrofitted to the treatment basin. Eliminating the cooling effect of surface aerators maintained a higher winter temperature within the treatment lagoon, enhancing biological function and treatment capacity.



BENEFITS



- Improved treatment efficiency + better removal rates—10% increase in BOD + total nitrogen removal.
- Lower operating costs per pound of loading—net, annual reduction in operating costs of more than \$645,000 after accounting for the cost of oxygen.
 - Reduced annual maintenance costs ~\$300,000.
 - Reduced energy costs ~\$650,000 (50%).



- Conserved 5.4 Gigawatts/year, reducing greenhouse gas emissions.



"IN GENERAL, WE'RE TREATING MORE FLOW WITH BETTER REMOVAL RATES WHILE SEEING LOWER OPERATING COSTS. OVERALL, OUR BOD AND TOTAL NITROGEN REMOVAL HAVE BOTH INCREASED BY ABOUT 10%."

ANDY BRASHEAR
ENVIRONMENTAL MANAGER | SIMMONS FOODS



"WE ARE EXTREMELY PLEASED WITH THE RESULTS OF THE TWO SDOX SYSTEMS. ASIDE FROM MAKING IT EASIER FOR US TO STAY WITHIN TEMPERATURE TARGETS DURING COLD WEATHER, ONCE FULLY OPTIMIZED, THE ENERGY SAVINGS ALONE ARE EXPECTED TO JUSTIFY THE EQUIPMENT."

SETH WALTERS
SENIOR DIRECTOR OF ENVIRONMENTAL QUALITY | SIMMONS FOODS



ECONOMIC/OPERATIONAL

- Increased capacity
- Improved treatment
- Superior process control
- Reduced maintenance costs
- Reduced energy costs
- Retrofit without interrupting operations
- Perform most maintenance outside the basin without heavy equipment



SOCIAL/COMMUNITY

- Reduced energy use and greenhouse gas emissions



ENVIRONMENTAL

- Improved water quality
- Reduced energy use + greenhouse gas emissions



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