

By Kirk Oleson, Kyle Booth & Mark Fosshage

Adding a Slice of Treatment



A California cheese production company reduces loads to its city wastewater plant

Rumiano Cheese is one of the oldest dairy processing operations in the western U.S. At one time, the firm totaled 13 processing plants dotted along the Pacific Coast. Notably ahead of its time, Rumiano was the first dairy operation with an ammonia refrigeration system on the West Coast. Currently, all production is centralized in the Crescent City, Calif., facility, but the pioneer spirit still thrives as the firm tackles growing wastewater issues.

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The installation of the MBBR and DAF system has resulted in effluent concentrations that average less than 10 ppm BOD and 10 ppm TSS. Since start-up, Crescent City has issued more than 500 new building permits, and Rumiano Cheese continues to lead the way advancing the cheese and dairy industry.



The cheese operation was contributing more than one-third of the local utility district's biochemical oxygen demand (BOD) load. Also, Crescent City's increasing population demands were outstripping wastewater facility capacity. A moratorium was placed on new building permits and the city began encouraging Rumiano to seek out ways to reduce its waste contribution.

Rumiano researched potential solutions and found World Water Works (WWW). Plant and city officials visited current WWW customers and observed their wastewater systems in action, gauging the level of customer satisfaction. It was clear to both the city and Rumiano that they had found a company that could provide them with the solution then needed.

Funding

Rumiano Cheese is important to Crescent City, and the community did not want to force the company out of town. Through discussions, an agreement was structured where the city would pay the capital cost of a treatment system, Rumiano would install and operate it and WWW would guarantee less than 50 parts per million (ppm) total suspended solids and BOD in the effluent wastewater stream.

The city would offset the capital cost through the sale of new sewer tie-ins for commercial and residential expansion in the community. Rumiano would demonstrate its commitment to the community through environmental stewardship. WWW would provide a state-of-the-art treatment system.

Design

After a detailed wastewater analysis and examination of site limitations was conducted, a detailed design was developed. Challenges included restricted space, close vicinity of residential neighborhoods (odor concerns) and a concentrated waste stream that varied significantly from week to week based on the type of cheese being processed.

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MBBR and DAF System Installation Results

	Monthly	Monthly	Monthly	Flow %	BOD %	TSS %
2005	Flow in gal	BOD lb	TSS lb	Red	Red	Red
March	603,501	205	403	3.6%	97.1%	86.8%
April	613,373	93	99	1.7%	99.0%	96.9%
May	589,597	301	752	7.3%	95.8%	69.5%
June	534,298	132	176	-6.6%	98.0%	92.6%
July	546,212	97	264	28.7%	99.1%	92.8%
August	639,807	167	657	6.0%	98.2%	80.8%
Totals	3,526,788	995	2,351	8.0%	98.0%	87.1%



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WWW presented Rumiano with a unique solution—the WWW moving bed biofilm reactor (MBBR) and dissolved air flotation (DAF) system. This system is compact, simple to operate and efficient. WWW’s proposal brought the technology together in an affordable package.

The total area required for the complete treatment facility was approximately 1,600 sq ft. This space included prescreening; an equalization tank; a two-stage MBBR process; DAF; blowers; chemical feed equipment; transfer pumps; Allen-Bradley controls; testing and monitoring equipment; and the building.

The simplicity of the system is apparent in that it requires no return activated sludge. The basis of the operation is controlled bacteria growth upon suspended polypropylene media. The key to the bacteria’s robustness is biofilm that develops on the media and protects the system from upsets. By maintaining a minimum of 3 ppm dissolved oxygen and a ratio of 100 parts BOD to five parts nitrogen and one part phosphorus, life will respond.

Results

At the end of the day, the system is using only two chemicals—a polymer between 0 and 1 ppm and an antifoam at low dosages during the weekend. The local community has not complained about any odor. **www**

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