



**HERON INNOVATORS**  
*The Clear Advantage*

# SAF<sup>®</sup>

**Case Study:**  
**Anaerobic Digestate**  
Large Brewery

Presentation by  
**DeLaval**  
Cleaning Solutions



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## Mobile Session: Food & Beverage

### Case Study:

## Heron SAF®, DeLaval Waste Water Program Saves Brewery Money & Ensures Compliance

**Background:** A large brewery located in N. California brews canned and bottled beer for both private and owned labels. The plant, located in an environmentally sensitive area, reduces loading to a local POTW by incorporating an extensive pre-treatment system; including an anaerobic digester. The Brewery was incurring significant loading charges due to biomass (essentially) being discharged from the digester at ~1500 ppm total suspended solids (TSS); 700 gpm flow. The average plant discharge was 600,000 gpd.

**Problem:** The treated waste process stream contained a high level of TSS and insoluble BOD (biomass) at the anaerobic digester outlet. TSS and BOD surcharges levied by the city were prohibitively expensive; Municipal TSS loading charges alone are \$.40/lb totaling ~ \$3000 per day. However, the capital and operating costs to remove TSS via Dissolved Air Flotation/DAF (the traditional technology utilized for this application) were anticipated to be high and the site was concerned that DAF performance across its N. America install based was sub optimal; citing a 72% removal rate as best performance.

**Solution:** A Heron Innovators, Inc Suspended Air® Flotation (SAF®) system was installed at the brewery in order to remove the TSS (and associated BOD) in the digester effluent. The SAF® footprint was approximately 20% that required by DAF (35 ft<sup>2</sup> vs 250 ft<sup>2</sup>) and the capital cost approximately 2/3 that of a DAF. WWT C95 Plus a liquid flocculent provided by DeLaval Cleaning Solutions, was injected into the digester effluent just prior to the SAF®. Despite high solids loading in the digester (avg 1500 ppm), and a very low dose of the flocculent (35 ppm), the WWT C95 Plus in combination with the SAF® technology, produced water of much lower BOD and TSS (see chart 1) thus insuring discharge compliance and lowering surcharges. After two years of operation, TSS removal rate averaged 97% (see chart 2)

Bio-solids skimmed from the top of the SAF™ were sent to a holding tank, then treated with a dewatering flocculent, WWT C70, before being pumped into a rotary fan press. The fan presses increased the bio-solids from 5% solids to 18% solids thus lowering the bio-solids volume by 3x.

DeLaval Cleaning Solutions  
a division of DeLaval Inc.  
11100 North Congress Avenue  
Kansas City, MO 64153-1296  
Phone: (816) 891-7700  
Fax: (816) 891-1505  
[www.DeLavalCleaningSolutions.com](http://www.DeLavalCleaningSolutions.com)





## Economics:

The Heron/DeLaval program helped the plant to save on operating costs three different ways:

**1) Reduced Capital Cost:** The cost associated with the purchase and installation of a DAF did not meet the plant requirement for less than a 3 year pay back. Capital costs associated with purchase of the SAF and its installation met the site's ROI requirement

**2) Reduced Surcharges:** By capturing more of the solids, the SAF program reduced suspended solids by 97% resulting in a surcharge cost savings of \$2900 per day. (associated BOD surcharges were realized as well, although not quantified in this case study) The SAF removed approximately 25% more solids than other DAFs performing in North America; providing a theoretical additional savings against DAF performance of an estimated \$740/day or \$192,000 per year.

**3) Reduced O&M Costs:** The SAF required only 1/10th the HP of a DAF Pressurization System (3 HP vs 30-60 HP) and used only 2/3 of the budgeted flocculent (35 ppm vs 52 ppm) resulting in an energy savings of \$31,000 per year and a flocculent savings of \$60,000 per year.

**Summary:** The brewery was looking for ways to reduce its waste water TSS discharge costs of \$780,000 per year. An economic analysis utilizing conventional DAF had a pay back of >3 years. An economic analysis of SAF® technology, however, had a payback of less.

**Cost comparisons detailed below:**

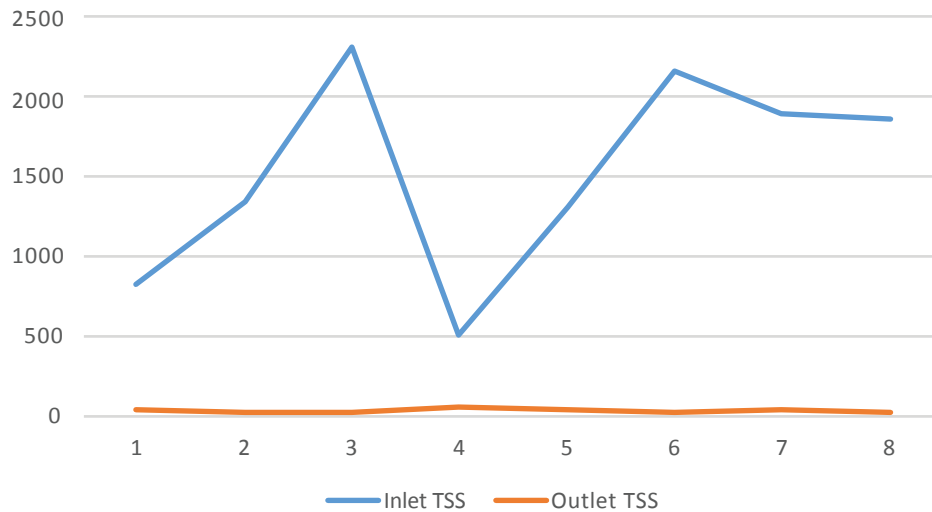
Parameter	SAF®	DAF
Capital Cost	2/3 DAF	1.3 x SAF®
TSS Surcharges / yr	\$23,400	\$218,000
Flocculent Cost / yr	\$115,000	\$170,000
Electrical Cost / yr	\$5,000	\$36,000
Annual Operating Cost	\$143,000	\$424,000

DAF data from client based on install base and bid results

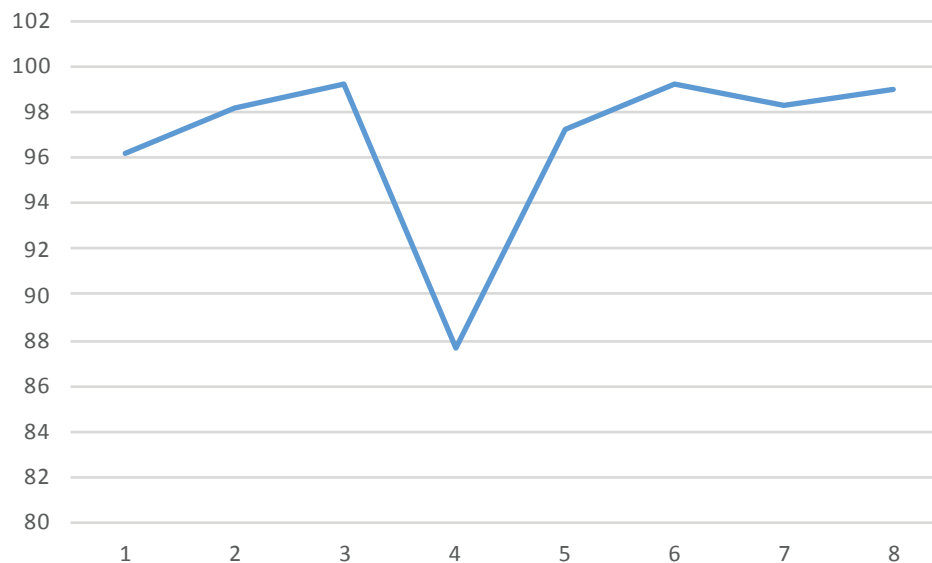


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**Chart 1: SAF TSS influent vs effluent showing excellent TSS removal**  
SAF inlet vs outlet TSS at Brewery



**Chart 2: TSS removal % showing very high TSS removal %**  
SAF % TSS reduction



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www.heroninnovators.com  
info@heroninnovators.com

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## *We'll Prove It!*



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