

MARCH 2021



From Experience

Wasted Opportunities

Product or byproduct recovery frequently translates into reduced costs and increased profits. The opportunity to reduce costs is greater than it ever has been: Average water and sewer costs are rising 4% per year¹ and industrial water and sewer rates in the 50 largest US cities have doubled between 2005 and 2018². Not only can the Biochemical Oxygen Demand (BOD) and other sewer charges typically be reduced by 5% to 10%, but in some cases annual revenue from the byproduct can range in the \$10,000's to \$100,000's. The technology for these savings can often be purchased "off the shelf," and it can be straightforward to implement. Effective, efficient, cost-saving approaches can include:

- Dry clean up
- Alternative disposal of (or uses for) out-of-spec product
- Clean-in-Place (CIP) and production diverts of high-strength product to recovery tanks
- By-product recovery systems

Surcharge Costs

Wastewater Pollutant	Typical Surcharge(\$/lb BOD or TSS)	Potential Surcharge Reduction (\$/lb BOD or TSS)
BOD	\$0.04 - \$0.61	\$0.001 - \$0.050
TSS	\$0.04 - \$0.44	\$0.001 - \$0.005

Assessing Disposal Alternatives

Alternatives to Wastewater Disposal	Handling Costs (\$/lb - product)	Net Revenue Increase or Savings (\$/lb - product)
Solid Trash to Landfill	\$0.005 - \$0.09	\$0.00 - \$0.10
Animal Feed Byproduct	\$0.0 - \$0.26	\$0.01 - \$0.30
Free Store Donation	\$0.005 - \$0.010	\$0.26 - \$1.00 as tax credit
Recovered Product or Ingredient	N/A	\$0.250 - \$2.00

Continued on next page. >

EXPERIENCE IN BRIEF

BOD Conversions

Product	lb BOD per 100 lb Product
Skim Milk	7.4
Bread	43.6
Sugar	68.6
Ice Cream	31.3
Cheddar Cheese	55.9
Potato Chips	74.9
Beer	4.8

¹ Source: energy.gov
² Source: BV.com

As an example, assume a manufacturing plant producing 50 million lbs/yr of cheese could reduce its BOD discharge with improved process controls, recovery of product, and disposal of solid waste to a landfill. The plant believes it can justify a one-time expense of \$50,000 to reduce ongoing waste treatment expenses. To cover the one-time expense, the investment in capital and operating changes would need to divert about 0.4% of their product away from waste treatment. Assuming a surcharge of \$0.40/lb BOD (see "Surcharge Costs"), and the BOD conversion cited in Experience in Brief, this would equate to 223,614 lbs of cheese not sent to drain! Here is how that is calculated:

$$\begin{aligned} & \$50,000 \text{ in savings} / (\$0.40/\text{lb BOD}) / (55.9 \text{ lbs BOD} / 100 \text{ lbs cheese}) \\ & = 223,614 \text{ lbs of cheese not sent to drain} \end{aligned}$$

This volume of product is just 0.4% of the total volume of the plant (223,614 lbs / 50,000,000 lbs).

CONTINUING EDUCATION

Hixson associates regularly participate in continuing professional education events across the country. To learn more about the events listed below, e-mail Hixson at: info@hixson-inc.com.

- Now Available: "[HVAC Options for a Post-Pandemic Plant](#)." A Hixson **Food Plant of the Future** podcast.
- Coming May 11: Another Hixson webinar in conjunction with IDFA. [Registration coming soon!](#)
- Check out the archive! "Beyond COVID-19: The Future of Food Plants," a Hixson **Food Plant of the Future** webinar. Click to view [here](#).

FREE WEBINAR SERIES!

Go to www.hixson-inc.com/insights/foodplant-of-the-future to register or access archives of Hixson's webinars.



CONTACT US

Direct any comments or questions to:

Warren Green, P.E., Vice President

Process Engineering Manager

wgreen@hixson-inc.com

Phone: 513.241.1230

Fax: 513.241.1287

www.hixson-inc.com