



Phillips Distilling Company



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Company Background

Phillips Distilling Company is one of the oldest family-owned alcohol manufacturers in America. Starting as a candy and newspaper wholesaler in 1912 and is now 106 years old. The company produces over 2,000 SKUs, but its most popular brands are UV Vodka, Prairie Organic Spirits, and Revel Stoke Whiskey. All product blending and processing take place at its headquarters in Princeton, MN; a one million square foot facility with about 250 employees.



“During my time at MnTAP, I got to experience working in a manufacturing industry. It was great to see how everything and everyone works together; the Phillips Distilling Company really feels like a family-owned company. In addition to technical skills, I was able to learn more about critical thinking, problem solving, and asking questions.” ~ EG

Project Background

At Phillips, the most important use for water is to create products. However, the production processes use large amounts of water for cleaning, as water is used for washing and rinsing after nearly every step. Disposal of this wastewater is challenging, due to its high chemical oxygen demand (COD) caused by sugar and alcohol from products. This project focused on identifying where all the water is being used and ways to use it more efficiently.

Incentives To Change

Since the inception of One Team G.R.E.E.N. (Growing Responsibly, Ethically, and Environmentally Now), Phillips Distilling’s sustainability team, efforts have increased to reduce wastewater, energy use, and solid waste. The team’s mission is to have a positive impact on the environment by working together with employees, partners, and the community. They have implemented systems to reduce energy consumption and landfill waste and have started programs to increase employee awareness of sustainability. MnTAP was brought in to assist with wastewater tracking, as water use and discharge are very high at Phillips. Reducing wastewater at their facility will help One Team G.R.E.E.N. with their mission and help make the company more sustainable.



“This is our 2nd year in a row using MnTAP to help us reduce costs and our impact on the environment. We tackled energy last year. This year we focused on reducing water usage and reducing or reusing wastewater. MnTAP once again helped find significant savings while helping us to reach our sustainability program goals. We hope to continue using this program for future initiatives.”

*~ Larry Jurik
Manufacturing Technical Manager, Phillips Distillery*

Solutions

Shorten Storage Tank Washouts

After a product is blended together from its ingredients, it is kept in a storage tank until ready for bottling. In one year, there are about 3,000 storage tank washouts. Most of the storage tanks are washed out using attached spray balls. The current procedure indicates that 30-second rinses should be repeated 3-4 times until the water draining out is clean. However, the actual length and number of rinses varies by operator and product; some products are more difficult to wash out than others, and many rinses are over 40 seconds long. Testing indicates that 20 second rinses will clean out a tank sufficiently with the same number of rinses. Training operators with this updated procedure can result in significant water savings.

Install Aerators on Sinks

Employees working on the production floor wash their hands about four times a shift; once at the start, after two breaks, and lunch. There are three main handwashing stations located around the production floor with 2.2 gallons per minute faucets. Installing 1.0 gpm aerators will reduce the amount of water used by 54% with minimal costs. Further water savings will come from installing 1.0 gpm aerators on all 20 bathroom sinks throughout the facility.

Fix RO Drop Leaks

Several of the reverse osmosis (RO) drops around the facility have leaks. Over one year, 16,400 gallons of RO water are lost to these leaks. Either cleaning out or replacing the current valves to fix these leaks is

recommended. The cost of this process is still being investigated, as the RO system may have to be shut down.

Add Sprayers to Open-ended Hoses

Hoses used for cleaning in the blending areas of the facility have sprayers on the end to reduce flow and increase pressure. However, several hoses used for cleaning by the production lines are open-ended. These hoses are often used to rinse off product from the outside of bottle fillers and the floor. Replacing these hoses and adding sprayers on the end could reduce the water used by 60% and save time, as a higher pressure will wash more efficiently.

Reuse RO Reject for Irrigation

In 2017, over 1 million gallons of water each was used for irrigation and the RO system reject and rinses. Reusing wastewater from the RO system for irrigation will prevent about 1 million gallons of water from going down the drain. The viability of this solution is currently being tested.

Beneficial Reuse for Cream Byproducts

Unsalable cream product is poured out and stored in large plastic totes to keep separate from wastewater; the chemical oxygen demand is too high for normal disposal methods. This byproduct stream can be sent to the Saint Cloud WWTF for beneficial reuse. The high COD of these products make them a great feed for their anaerobic digesters to produce electricity. Transportation for the stored totes is being coordinated.

Recommendation	Annual Reduction	Annual Savings	Status
Storage tank washouts	157,000 gallons	\$19,700	Recommended
Production sink aerators	22,200 gallons 3,300 kWh	\$3,200	Recommended
Bathroom sink aerators	24,100 gallons 3,300 kWh	\$740	Recommended
RO drop leaks	16,400 gallons	\$1,800	Planned
Open-ended hoses	8,400 gallons 50 therms	\$1,100	Recommended
RO reject reuse	1,000,000 gallons	\$5,000	Planned
Cream by-product to Saint Cloud	4,000 lbs COD	\$1,800	Implementing

MnTAP Advisor: Michelle Gage, Engineer