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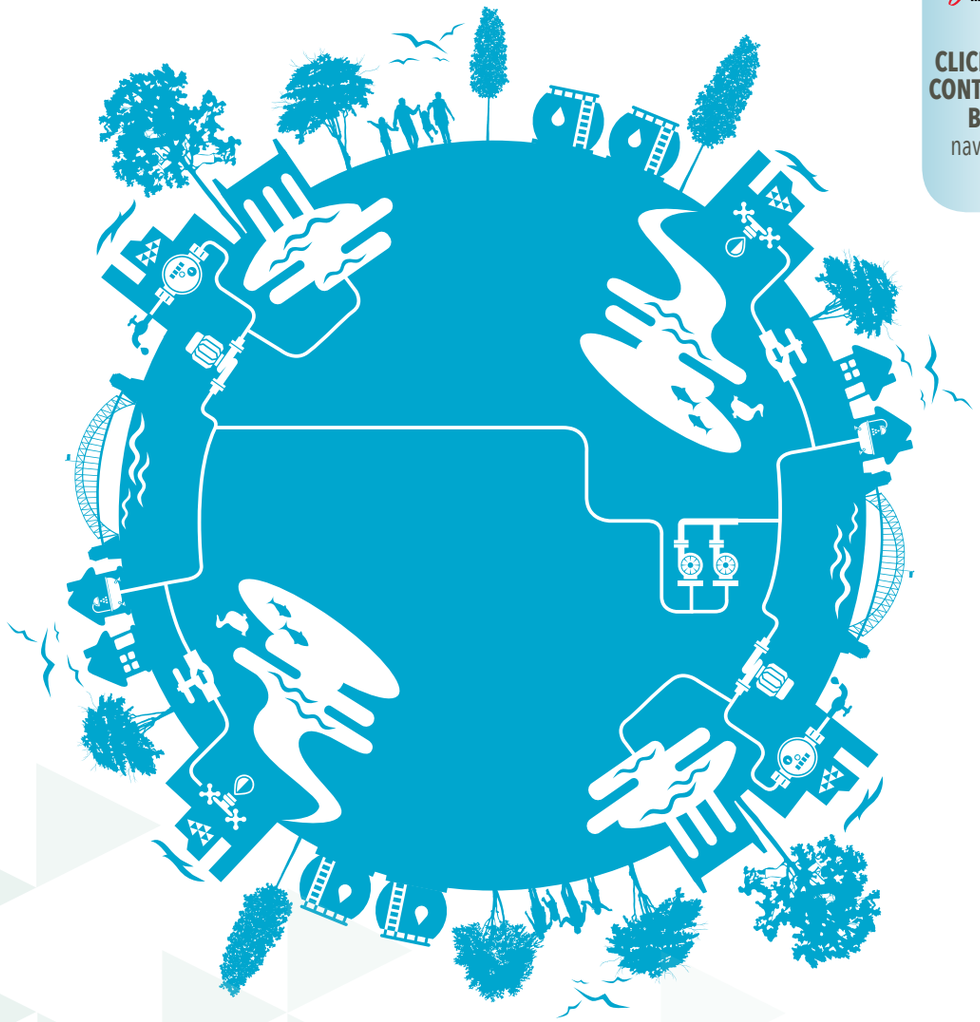
Water Working Group Report **2016**



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NEXT: Our Focus

OUR FOCUS

WORKING TOGETHER TO REDUCE WATER

Water reduction is important to Schreiber Foods and is a key component of our sustainability program. Our customers expect us to set water reduction goals and work to meet or exceed our objectives. That's why we've recently joined forces with our suppliers and industry leaders to reduce water usage on a continuous basis.

"We never know the worth of water till the well is dry."

-Thomas Fuller

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Schreiber's formal sustainability journey started in 2006. The initial focus of the program was to analyze, set goals and reduce our carbon footprint at each of our locations around the globe. Since then, we've learned our suppliers play a significant role in the life cycle of the food we provide.

We believe integrating sustainable practices throughout the supplier network requires a collaborative approach. As a result, Schreiber is developing and refining a comprehensive and sustainable supplier program, which includes supplier working groups. Working groups are agile teams of suppliers and industry leaders who face challenges to reduce costs and ecological impacts while sharing best practices.

Members of a working group look for innovative solutions with measurable results within a specific period of time. Previous working groups have focused on transportation and zero-waste initiatives. Most recently, the Water Supplier Working Group explored opportunities to reduce water usage, an important sustainability initiative for all of us.

To identify water reduction opportunities, it's important to:

- Assess water usage by conducting a study to determine how and where water is used in facilities.
- Track actual water flow and usage by day and month to get a complete picture of water usage in facilities.
- Evaluate times and areas of high usage and develop water savings projects that can be put in place to reduce overall water usage.
- Evaluate each project's capital investment and cost savings to determine its feasibility before ranking for implementation.

WATER WASTE WORKING GROUP

HYDRITE CHEMICAL CO.

Foremost FARMS · USA

NALCO Water An Ecolab Company

AGRANA FRUIT

Hilmar CHEESE COMPANY

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Members of the Water Supplier Working Group included Schreiber Foods partners (employees) from our home office and two facilities, along with representatives from five suppliers that provide us with everything from ingredients to sanitation chemicals. Project deliverables included:

1. Identifying tools and best practices for water measurement/metering.
2. Listing best practices (feasible and non-feasible) for reducing water use at a facility.
3. Conducting a case study at one or more plant locations to identify potential water reduction opportunities that could be implemented across facilities.

Tools and best practices for water measurement/metering:

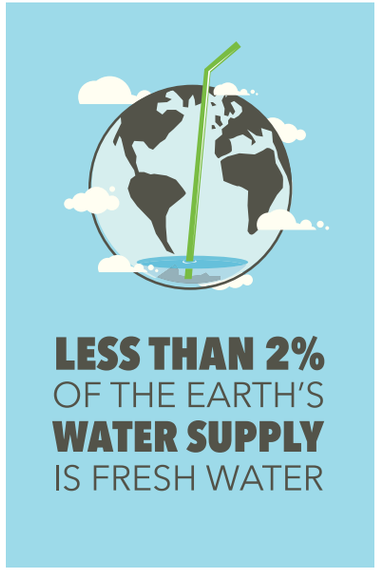
The first step in any case study is to accurately measure and/or estimate water usage in different areas of a plant. At minimum, a plant that purchases water should be able to obtain incoming water usage from water supply meters. A plant with a wastewater treatment system also will commonly measure effluent flow. Having accurate flow measurement is essential in mapping water usage at a plant.

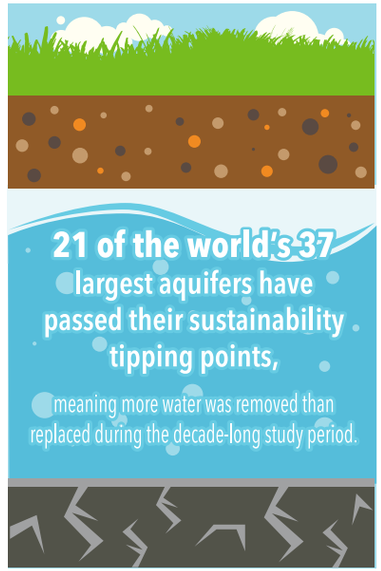
Water use measurement varied at facilities represented by members of the Water Supplier Working Group. Several suppliers relied on basic monitoring, like an incoming water meter. Other suppliers installed meters on water softeners, boilers, production areas and departments, for example, to measure water usage during various stages of production. One supplier had a custom modeling system that closely estimated each facility's water usage.

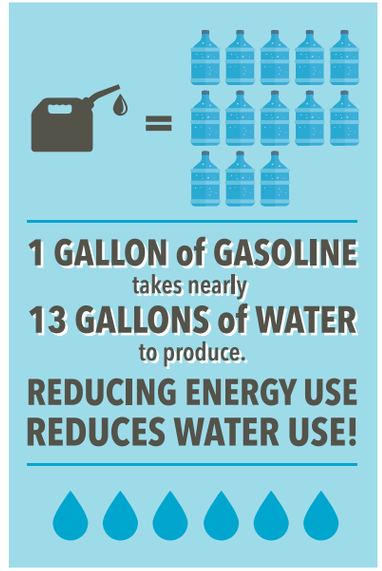
The group concurred that regularly checking a plant's metrics is crucial to making progress on water reduction. Real-time monitoring can help reduce water usage and pinpoint areas of concern faster, but it is expensive to implement.

Best Water Reduction Practices:

The group discussed the idea of developing a best practices guide, but decided it would be better to conduct a case study and instead focus on steps facilities can take to identify and implement water savings practices.







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Case Study

The group conducted a case study for a plant in California that checked some water meters weekly and others on a monthly basis. The plant measured wastewater flow daily. As part of the case study, the plant was asked to reduce its water usage by 28 percent from 2014.

Members of the working group visited the plant to conduct water mapping and identify water reduction projects. The team also enlisted the help of the plant's chemical provider to help identify water savings projects. In addition, the group evaluated a water and energy savings study performed by the plant's utilities provider.

The first step was to develop a water map of the facility to determine:

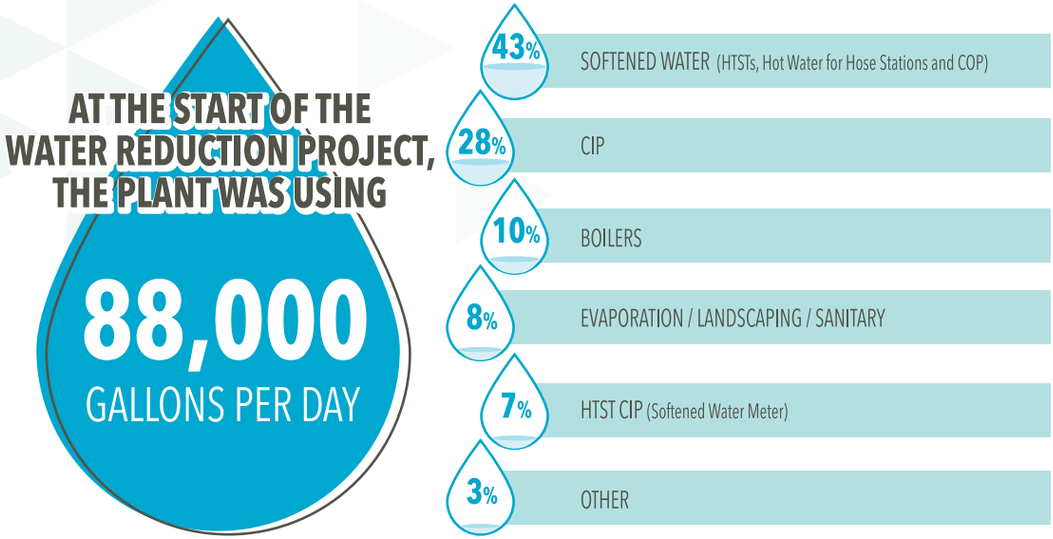
- Where water is used at the plant.
- Where water is measured, including meter locations.
- The estimated amount of water used in processes where water usage is not measured.

    A. Clean-in-place circuits – Worked with the chemical vendor to determine the amount of water used for each circuit, based on the system's programming and how often the circuits are run.

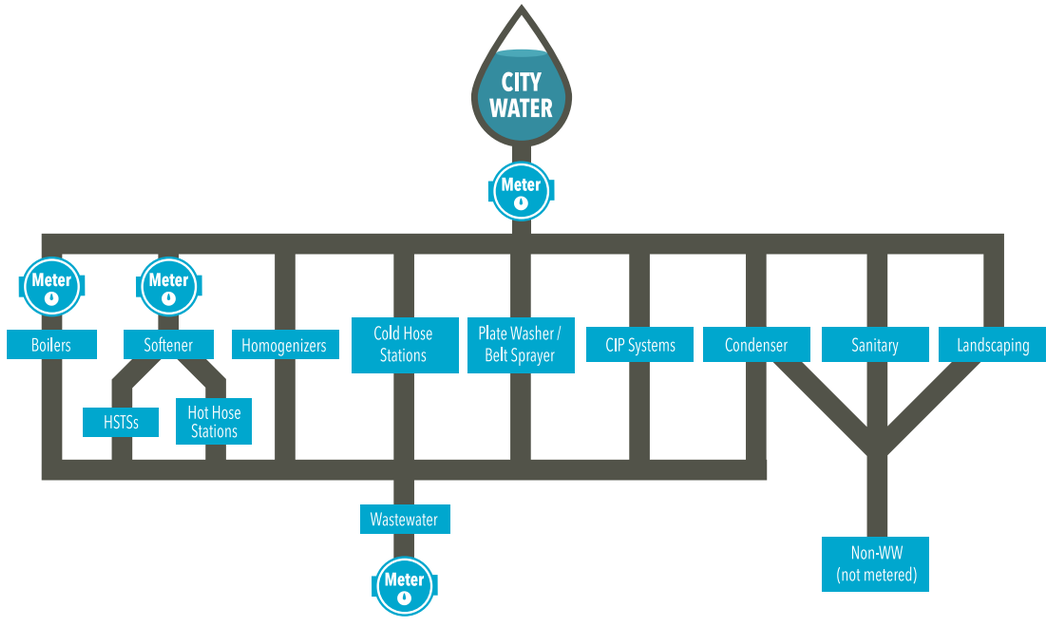
    B. Other water uses without meters – Using a known-size container and a watch or timer, find a place to measure water being used or lost. Estimate the water flow rate and number of hours a day the equipment is running to get an approximate total. Hose stations and leaks on process equipment are two examples of places that could benefit from this method to estimate water use.

    C. After calculating the measured and estimated water data to fill in the water mapping, make estimates on other items left that can be subtracted from the meters or estimates to determine a final amount.

TO THE RIGHT is the water map for our case study facility.



WATER MAP- PLANT CASE STUDY



NEXT: Our Recommendation

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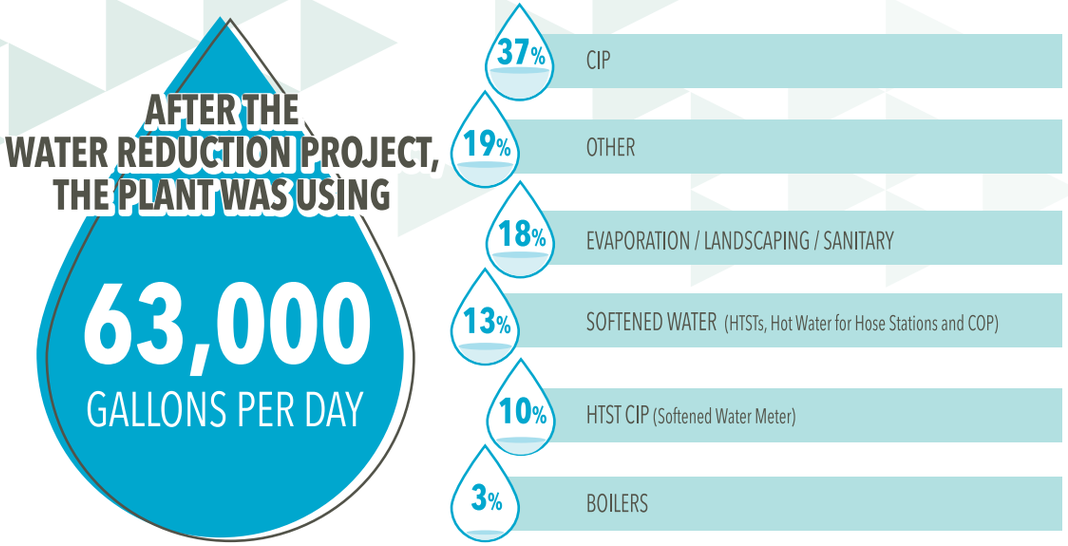

Common definitions and abbreviations

CIP	**Clean-in-place (CIP)** is a method of cleaning the interior surfaces of pipes, vessels, process equipment, filters and associated fittings, without disassembly
COP	**Clean Out of Place (COP)** is a method of cleaning parts, pipes and process equipment in tanks or tubs where disassembly is required.
RO	**Reverse osmosis (RO)** is a water purification technology that uses a semipermeable membrane to remove ions, molecules, and larger particles from water.
Silo	Dairy word for an enclosed tank used to store dairy products like milk or cream.
GPD	**Gallons per day**
GPY	**Gallons per year**
Partner	Schreiber employee
HTST	**High-temperature, short-time (HTST)** pasteurized milk typically has a refrigerated shelf life of two to three weeks, whereas ultra-pasteurized milk can last much longer, sometimes two to three months.

As of March 2016, the facility has reduced its total water usage by 25,000 gallons per day – or 28 percent – while increasing production at the same time. We have achieved our goal of 28 percent water reduction.

How did we do it?

Through our site visit, along with recommendations by our chemical manufacturer and utility study, we identified and prioritized water savings projects. Projects were ranked based on water savings, ease of implementation and capital required.

EXPECTED GALLONS PER YEAR SAVED
FOR IMPLEMENTED PROJECTS

6 MILLION

*EST. BASED ON 5 DAYS PER WEEK / 52 WEEKS PER YEAR.

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water map category: softened water

Steam condensate conservation and replacement of one-pass heat exchangers with closed loop heat exchangers

The steam system at this facility is old and in need of repairs. HTST heat exchangers are one-pass steam injected heat exchangers. A steam and condensate system audit was performed by the utility and identified energy and water savings opportunities at the facility. Failed steam traps were replaced; Heat Exchangers were replaced with more efficient closed loop heat exchangers; Pump traps to return condensate to the steam system from all heat exchangers were installed; Exposed steam and condensate lines were insulated; And all shut-off valves and pressure reducing valves were insulated.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
1,900,000	7,400	COMPLEX	$$$$	COMPLETE

water map category: other

Conveyer Belt Water Rinse Nozzles (Turn off when not in use)

Repiped tubing to rinse nozzles on plate washers so the plate washers shut down when the line is down. By teeing into line after solenoid valve, the nozzles will shut off when the line shuts down.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
28,000	80	EASY	$	COMPLETE

Awareness training

Awareness training for plant partners - establish goals and recognized good ideas award program, daily communications of water use.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
-	-	EASY	$	COMPLETE

* Estimated based on 5 days per week / 52 weeks per year

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water map category: softened water

Filler Line Wash Water Optimization (Tub Rinse)

Install water flow regulators to control and optimize water usage for tub rinse area on filler line. Estimated cost water flow regulator is $250/regulator.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
78,000	200	EASY	$	IN PROGRESS

water map category: CIP

CIP Optimization

Implement recommendations from vendor CIP optimization report.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
850,000	3,300	INTERMEDIATE	$$	IN PROGRESS

Low Flow, Low Pressure Hose Station Nozzles

1.25 gpm savings per hose station (or 25% of water used at hose stations).

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
-	-	EASY	$	IN PROGRESS

* Estimated based on 5 days per week / 52 weeks per year

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water map category: softened water

COP Tub Continuous Overflow

Currently, supply water to the COP tanks is 3/4" hard piped that chokes down to 1/2". This causes a lot of splashing when the COP tank is filled. Water coming out of the supply line is hot (up to 170F). The splashing and hot water create a hazard for the employees so they improvise by filling the COP tanks with hoses. The hoses have been found running continuously, which causes the COP tanks to overflow. We recommend increasing diameter of the outlet on the supply line to the COP tank. This may cut down on splashing and operators might be more willing to use the supply line to fill COP tanks rather than hoses.

WATER SAVED ANNUALLY (GALLONS)	GALLONS PER DAY	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
156,000	600	INTERMEDIATE	$	IN PROGRESS

water map category: boilers

Automate Boiler Blowdown

Add conductivity probes and controllers to individual boilers to control TDS and eliminate continuous blowdown that leads to decycling of the boiler in low load times.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
256,000	700	INTERMEDIATE	$$	TO BE EVALUATED

Homogenizer Lube Water - RO System

Install RO, and utilize homogenizer water for boiler feedwater, replace soft water with RO water (Do a pilot project to see how clean the water could be and decide how to use it), condensers would be another place you could possibly reuse the water.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
2,700,000	9,000	COMPLEX	$$$$	TO BE EVALUATED

* Estimated based on 5 days per week / 52 weeks per year

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Replace Missing CIP boots/doors on silos

Take measurement of silo doors and get prefab CIP boots for use during silo cleaning cycle.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
624,000	2,400	EASY	$$$	TO BE EVALUATED

water map category: other

Homogenizer once through piston lubrication water reuse in evaporative condensers.

Istall a small tank, piping and pump to reuse the homogenizer piston lubrication water in the evaporative condensers without treatment.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
2,700,000	9,000	INTERMEDIATE	$$	TO BE EVALUATED

water map category: softened water

HTST Post Rinse Recovery (Investment)

Ecolab believes a conservative estimate of recovery water from the HTST post rinse is 500,000 gallons per year. This can only be recovered and recycled if the plant invests in a tank and pumps. Water could be reused for 2nd burst rinse on all tank and silo circuits.

WATER SAVED ANNUALLY * (GALLONS)	GALLONS PER DAY *	EASE OF REPLICATION	INVESTMENT REQUIRED	STATUS
500,000	1,400	INTERMEDIATE	$$$	TO BE EVALUATED

* Estimated based on 5 days per week / 52 weeks per year

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SHARE THE GOOD NEWS

Our Sustainability Working Group is dedicated to assisting suppliers and industry leaders in communicating the potential positive impacts of this case study. Contact us for additional documentation, presentations and analysis to guide you as we continue to strengthen our sustainability partnership together.

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