Water conservation at Seacole Specialty Chemicals

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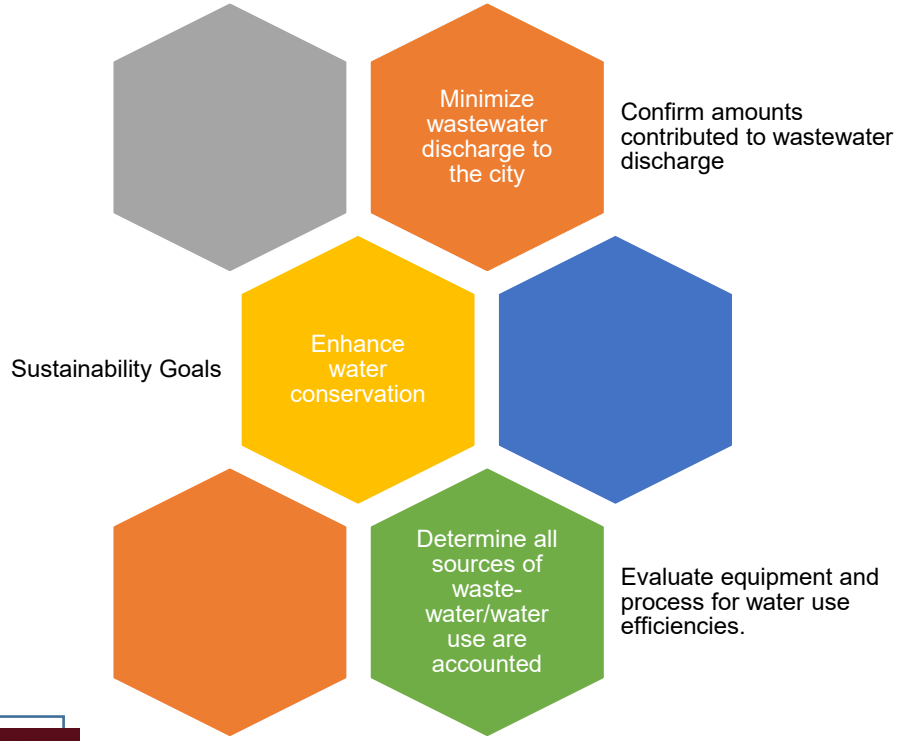
UNIVERSITY OF MINNESOTA

Driven to Discover℠

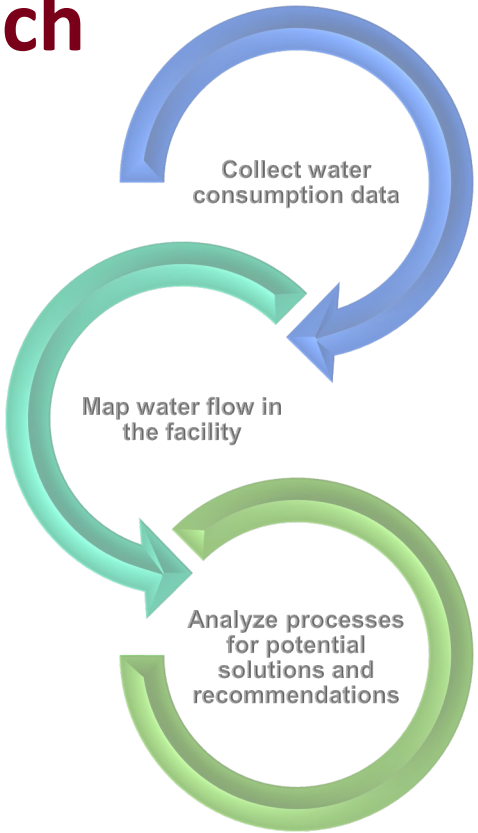
Company Background

- **Industrial Blvd, Plymouth, Minnesota**
- Diversified chemical manufacturing and distribution
- Cleaning Products, Circuit Board Mfg. Products, Metal Finishing Products
- 51 Employees
- Represents DuPont, Kodak, KMG, SurTech

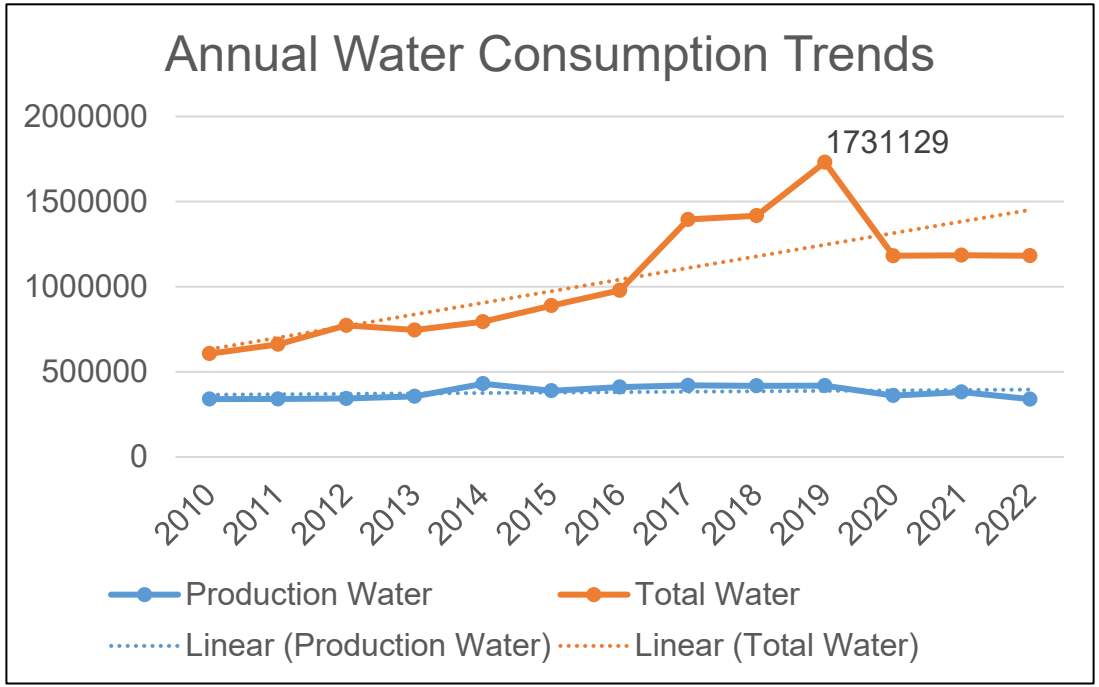
Incentives to Change



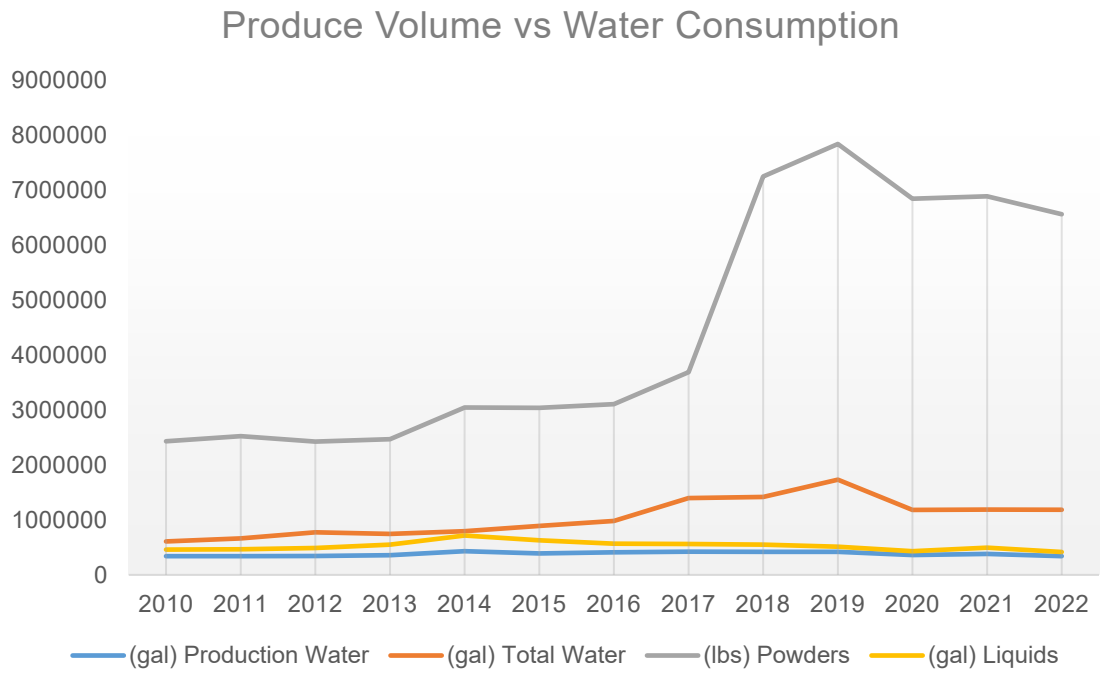
Approach


Collect water consumption data
Map water flow in the facility
Analyze processes for potential solutions and recommendations

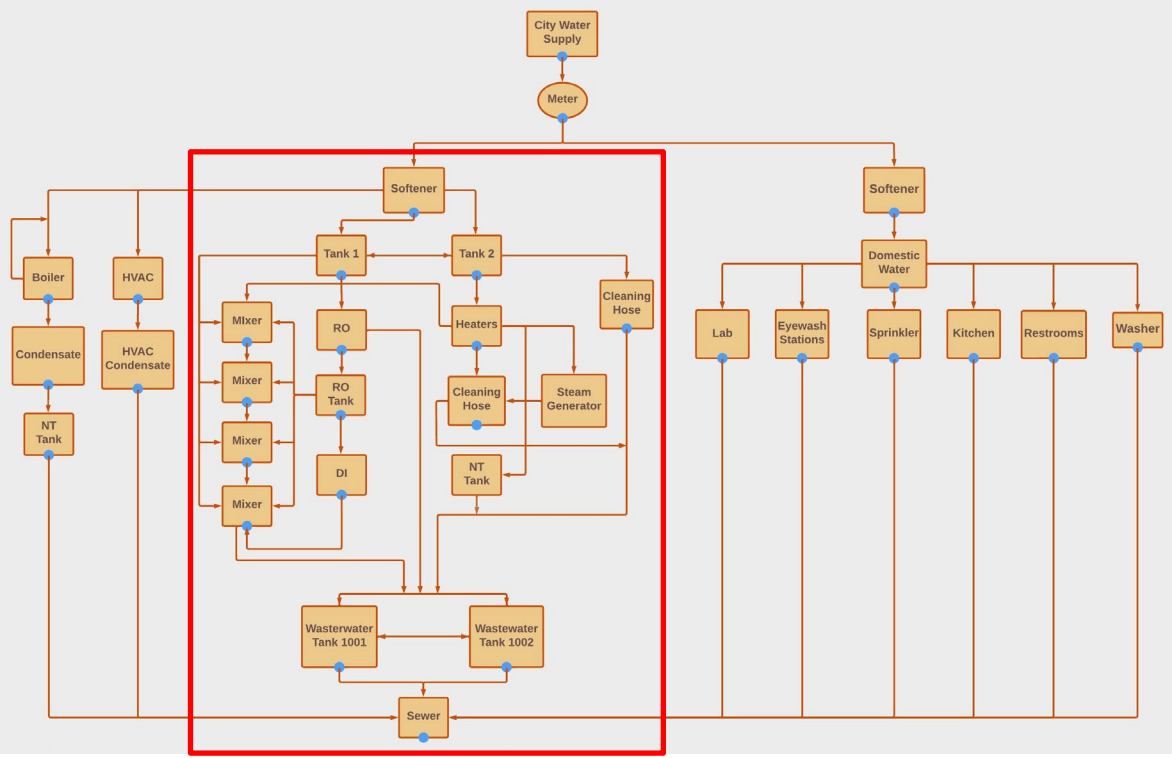
Water Consumption from MCES Reports



Product Production Volume Accounted

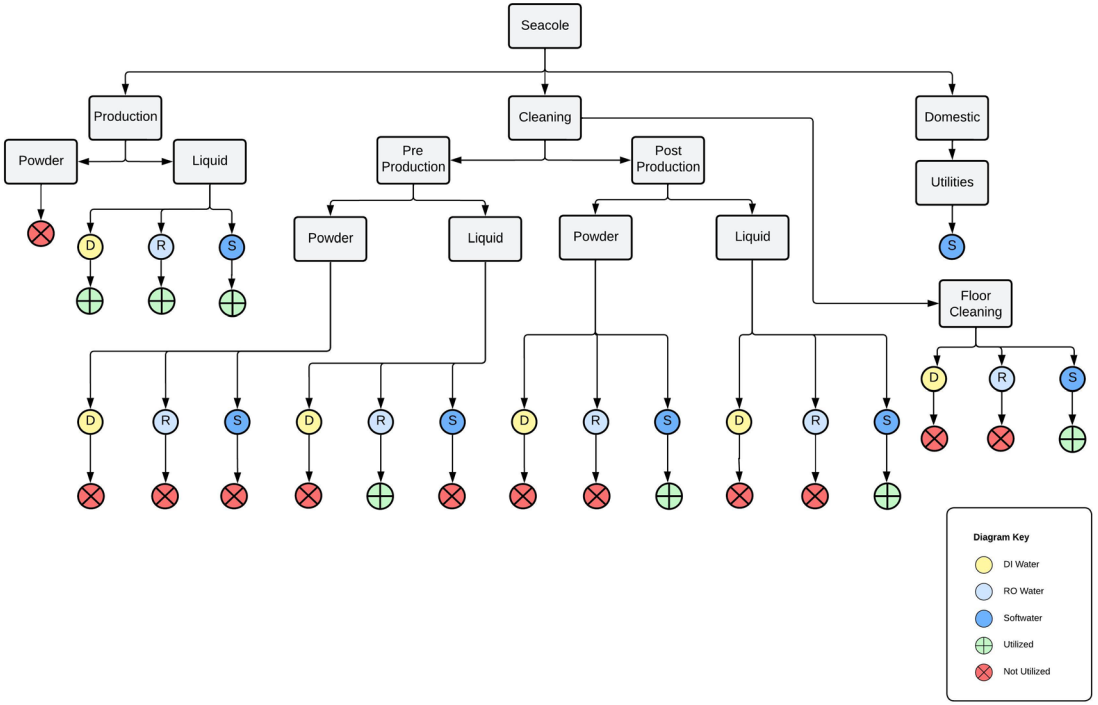


Water Flow Map



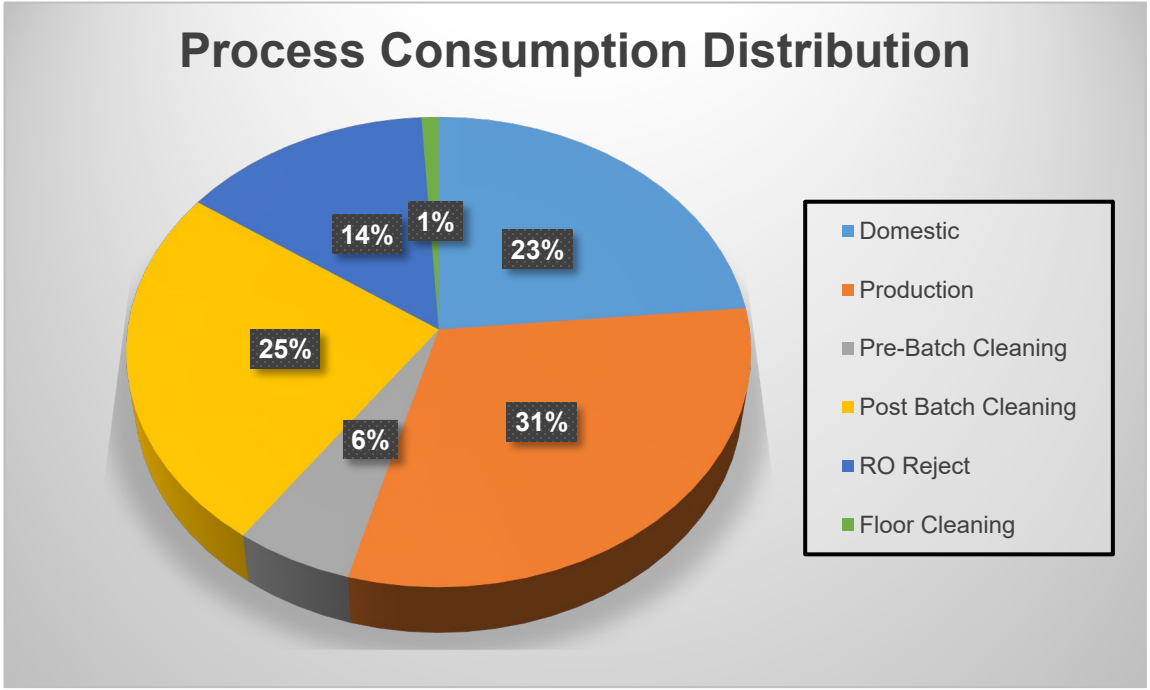
Water Balance and Usage

Process	Soft water (gpy)	RO (gpy)	DI (gpy)	Total (gpy)
Domestic	260,000	0	0	260,000
Production	206,849	132,220	699	339,768
Pre-Batch Cleaning	0	61,700	0	61,700
Post Batch Cleaning	275,550	0	0	275,550
RO Reject	157,485	0	0	157,485
Floor Cleaning	10,800	0	0	10,800
				1,105,303



Analysis

- Production and cleaning consumes the same amount the water
- RO reject contributes a significant value in the usage



Post Batch Cleaning

- Currently uses 10gpm flow rate hand spray nozzle
- Manual operated hand process
- Operator intervention
- Approximately 15 – 20 mins
- 10gpm garden hose

Industrial Nozzle

- 6gpm flow rate with similar exit pressure
- Work with same cleaning techniques
- 75,100 gallons reduced = 40%

	OP1	OP2	OP3	OP4	OP5
Do you find the new nozzle easier to use and handle compared to the old one?	Yes	Yes	Yes	Yes	No
Is the reduced flow rate (GPM) of the new nozzle sufficient for your cleaning tasks?	Yes	Yes	Yes	Yes	No
Has the cleaning time required changed with the new nozzle compared to the old one?	No	No	No	No	No
Have you observed any changes in water consumption with the new nozzle compared to the old one?	No	No	No	No	No
Have you had to adjust your cleaning techniques or processes to accommodate the changes in the new nozzle?	No	No	No	No	No

Siphon Gun

- Type of air atomizing gun
- Externally mixed air nozzle
- Ejects a hollow column of air
- Creates a vacuum around the nozzle and thus draw the liquid up
- 16gph flow rate

Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
New industrial spray nozzle	75,100 gallons	$350	$2,780	2 months	Implementing
Siphon gun for DM mixers	31,100 gallons	$300	$825	5 months	Recommended
RO Membrane Change	28,000 gallons	TBD	$1,030	TBD	Recommended
RO reject recovery for pH adjustments	100,000 gallons	TBD	TBD	TBD	Recommended

Personal Benefits

- Improved critical thinking and decision-making skills
- Different possibilities with water conservation
- Crucial manufacturing industry experience
- Network with various professionals
- Unveiled the art of liberating trapped treats from vending machines, all without resorting to a chaotic dance or turning the poor machine into a percussion instrument.