Conserve water, save lives at Abbott – Little Canada, MN

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UNIVERSITY OF MINNESOTA

Driven to Discover℠

MnTAP

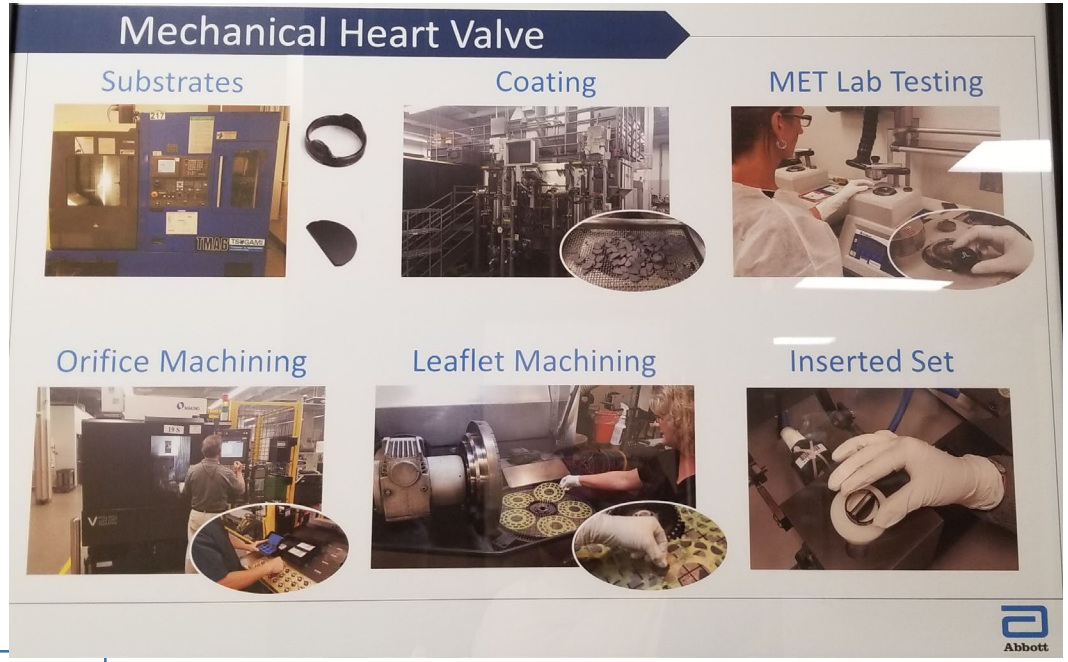
Company Background

- Multinational medical device and health care company
- Founded by physician Wallace C. Abbott
- More than 130 years making people's lives better

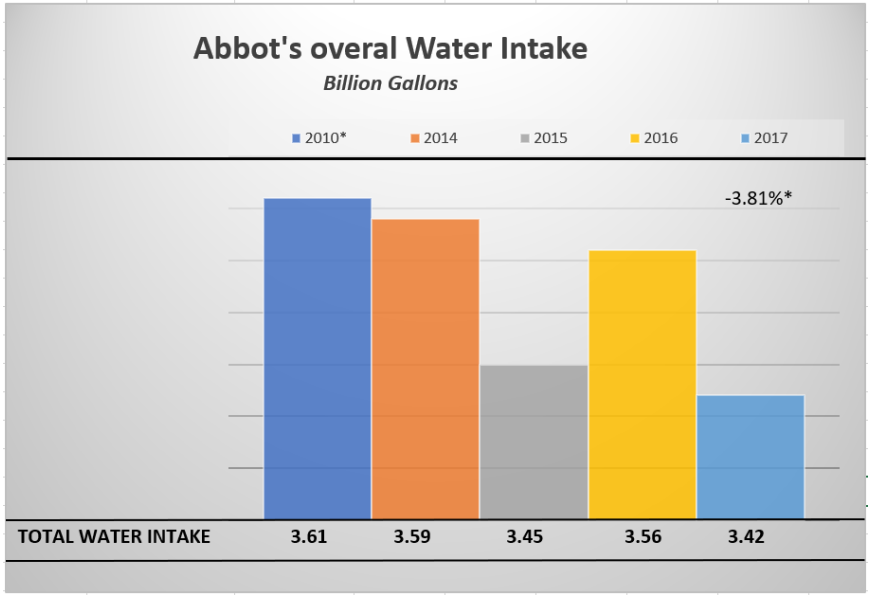
Woodridge Site

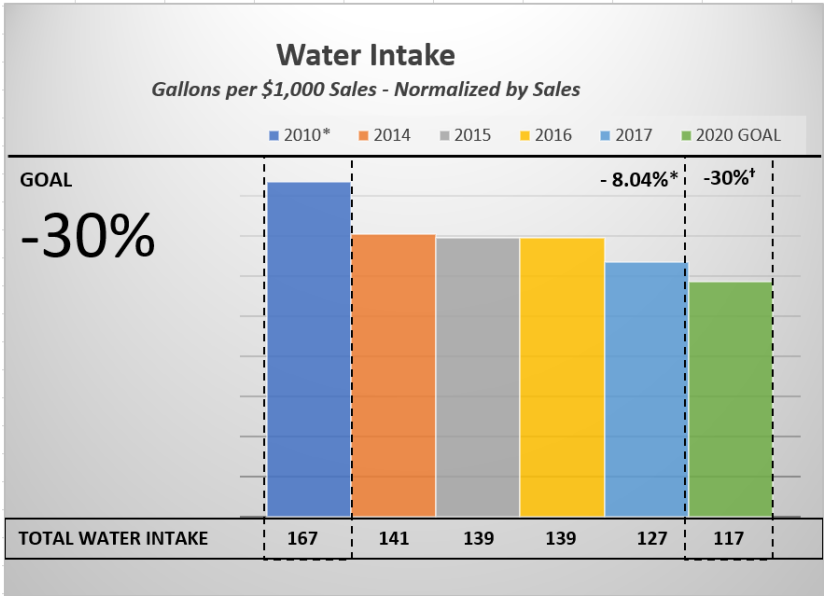
- Part of the Structural Heart division
- Around 450 employees

Main Product



Motivation

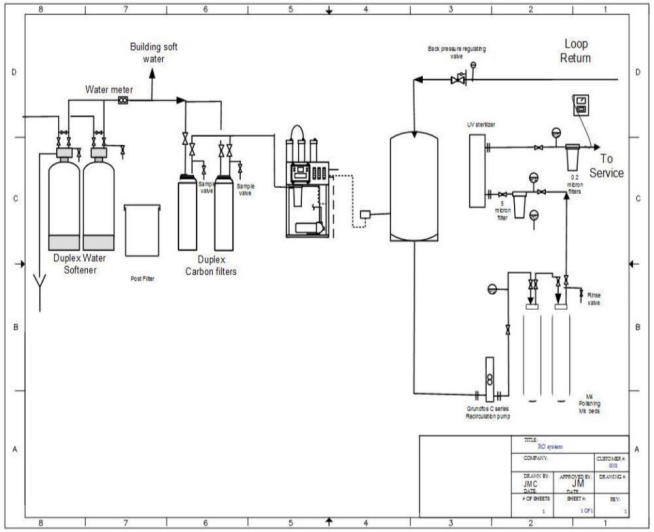




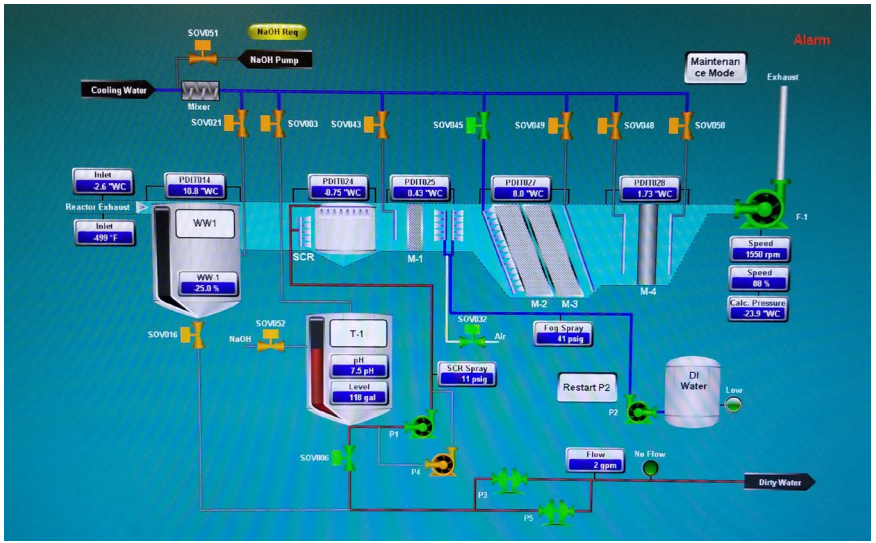
* Baseline year
%* Change from 2016 to 2017
%‡ Change from 2010 (goal)

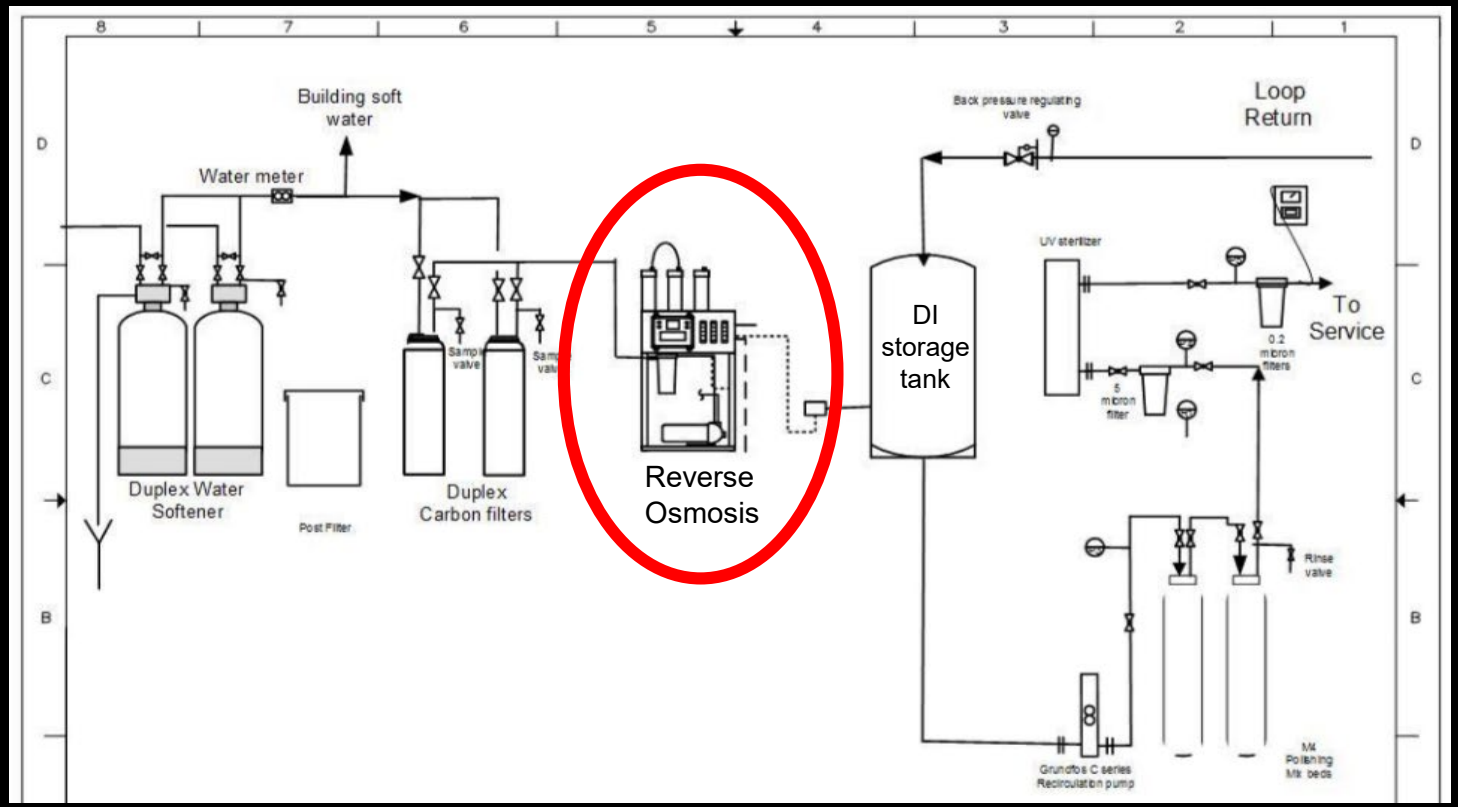
Project Overview

Water purification

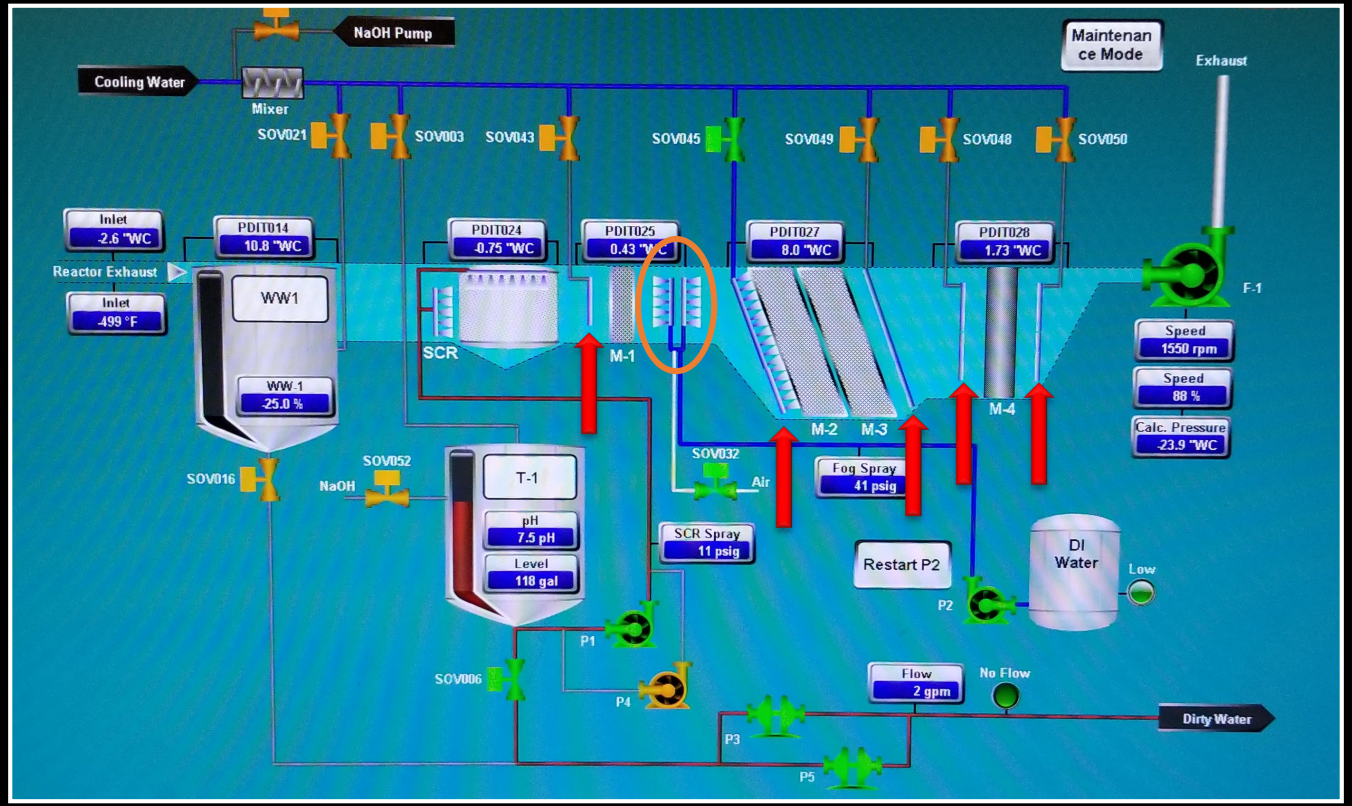


Air purification





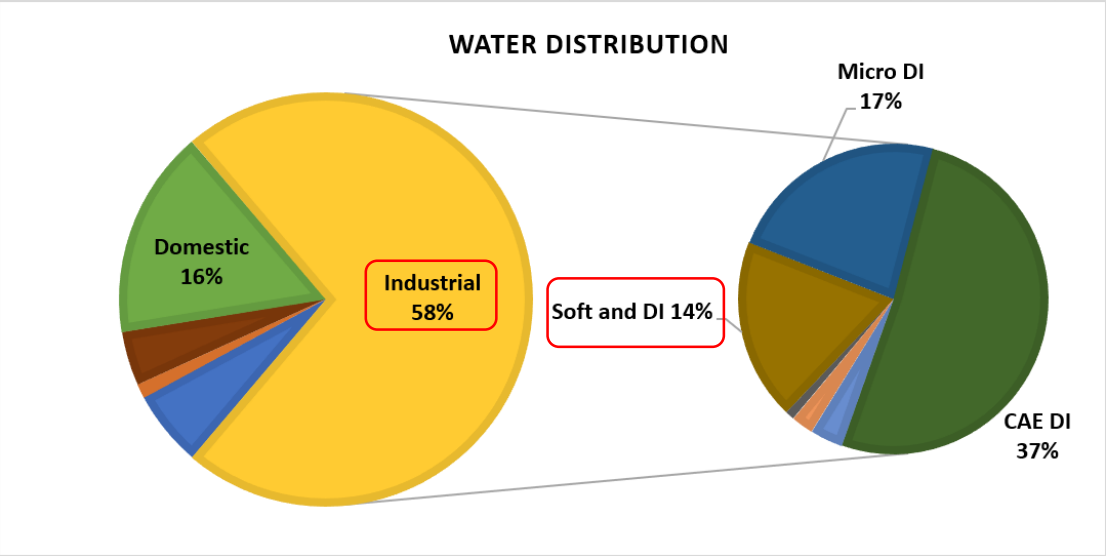
Water purification



Air purification

Approach

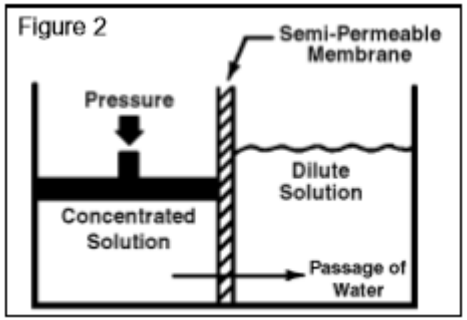
- Mapping and categorizing water use
- Learning water treatment system
- Working with vendors



Reverse Osmosis Optimization

Present Situation

- **Reverse osmosis percent recovery is 48% and there is the opportunity to increase it up to 75%**



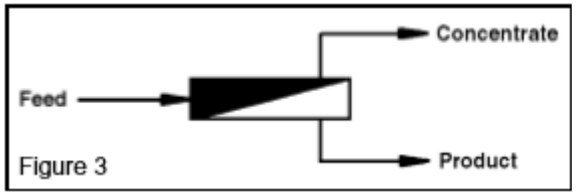


Figure 2 & 3 retrieved from: Aqua-Cleer Installation and Operation Instructions

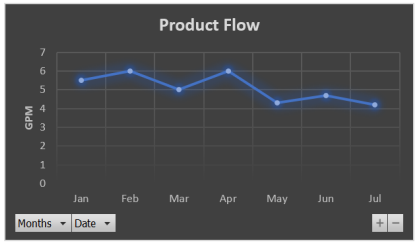
Recommendation

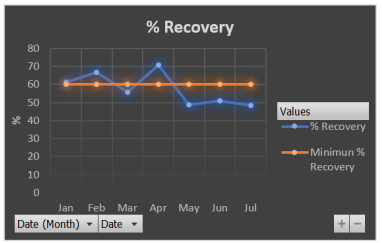
- Replace membranes
- Check system pressure and % recovery regularly

Reverse Osmosis Operating Parameters

Parameters	2011	2020
Feed Temperature (°F)	68	75
Feed Pressure (psi)	56	70
R.O. Pressure (psi)	120	170
Product Flow (gpm)	6	4.2
Waste Flow (gpm)	3	4.5
Product TDS (ppm)	3.6	3
Feed TDS (ppm)	208	212

RO SYSTEM CHECK





Membranes need to be replaced. Call Culligan to check the system

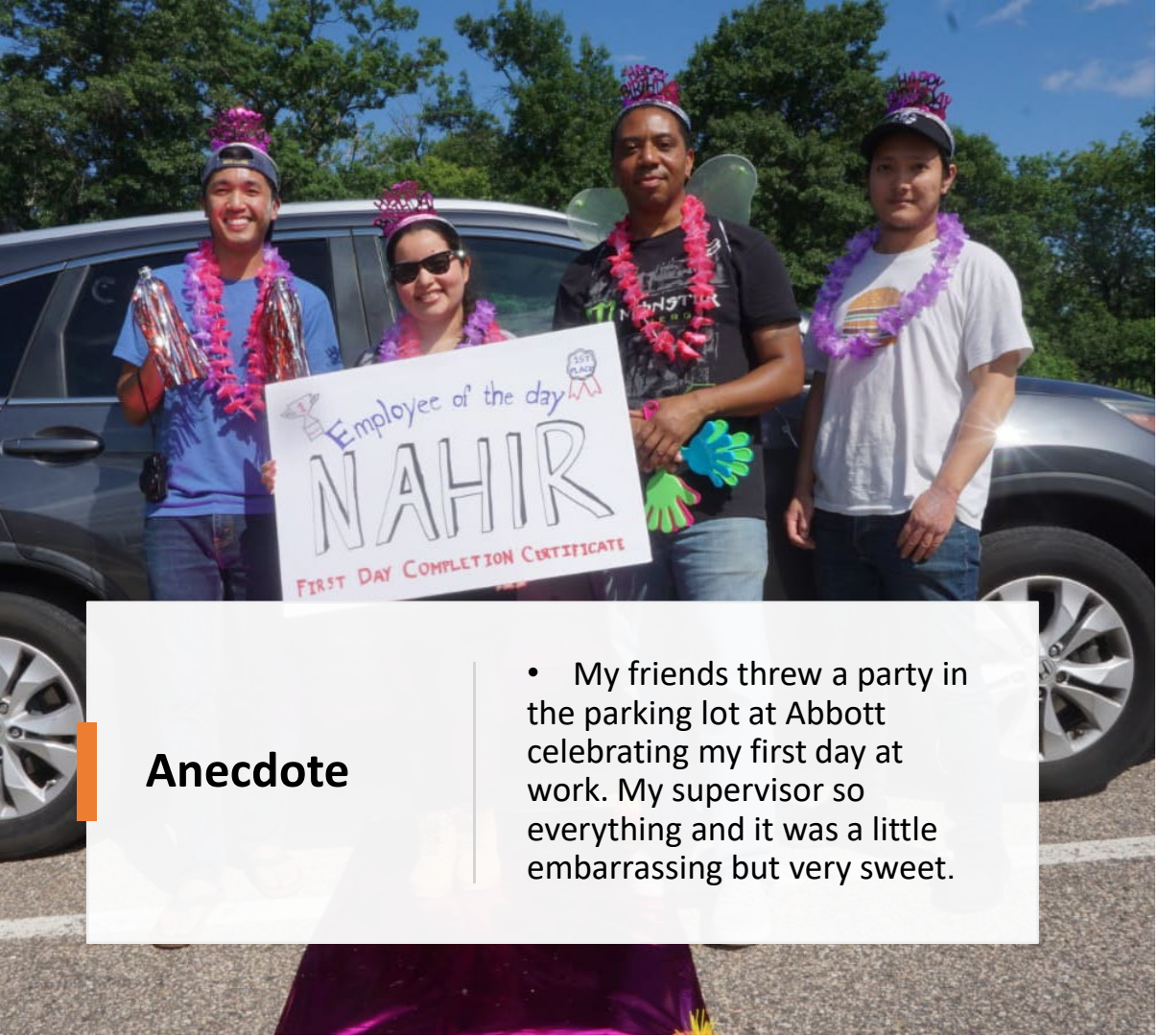
Date	Feed Temperature (°F)	Feed Pressure (psi)	RO Pressure (psi	Prod Flow (gpm	Waste Flow (gpm	Prod TDS (ppm)	Feed TDS (ppm)	Hours	% Rejection	% Recovery
Mar-20	50	66	130	5	4	2.7	212	24174	98.7	55.6
Apr-20	52	64	140	6	2.5	3.9	216	24345	98.2	70.6
May-20	61	55	141	4.3	4.5	3	212	24567	98.6	48.9

Results

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Reverse Osmosis Optimization	560,000 gal water 2,200 kWh	$2,900	$4,420	8 months	Recommended

Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Reverse Osmosis Optimization	560,000 gal water 2,200 kWh	$2,900	$4,420	8 months	Recommended
Reuse wastewater from Reverse Osmosis	250,000 gal water	N/A	$1,850	Immediate	Under review
Fog Chamber Optimization	575,000 gal water 9,800 kWh	Needs further analysis	$5,200	TBD	Under review
Rinsing time for scrubber filter optimization	TBD	TBD	TBD	TBD	Investigating



Anecdote

- My friends threw a party in the parking lot at Abbott celebrating my first day at work. My supervisor so everything and it was a little embarrassing but very sweet.