



Water And Energy Savings at AaCron Anodizing

Osama Samaha

MnTAP Advisor: Kelsey Klucas

AaCron Supervisor: Casey Selle Charging



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Company Background

AaCron Anodizing – Plymouth, MN



- Anodizing aluminum parts
- 70,000 square foot facility
 - 78 employees
 - Anodizes 9,500 loads annually



<https://wdw-magazine.com/8-fun-facts-about-epcots-spaceship-earth/>



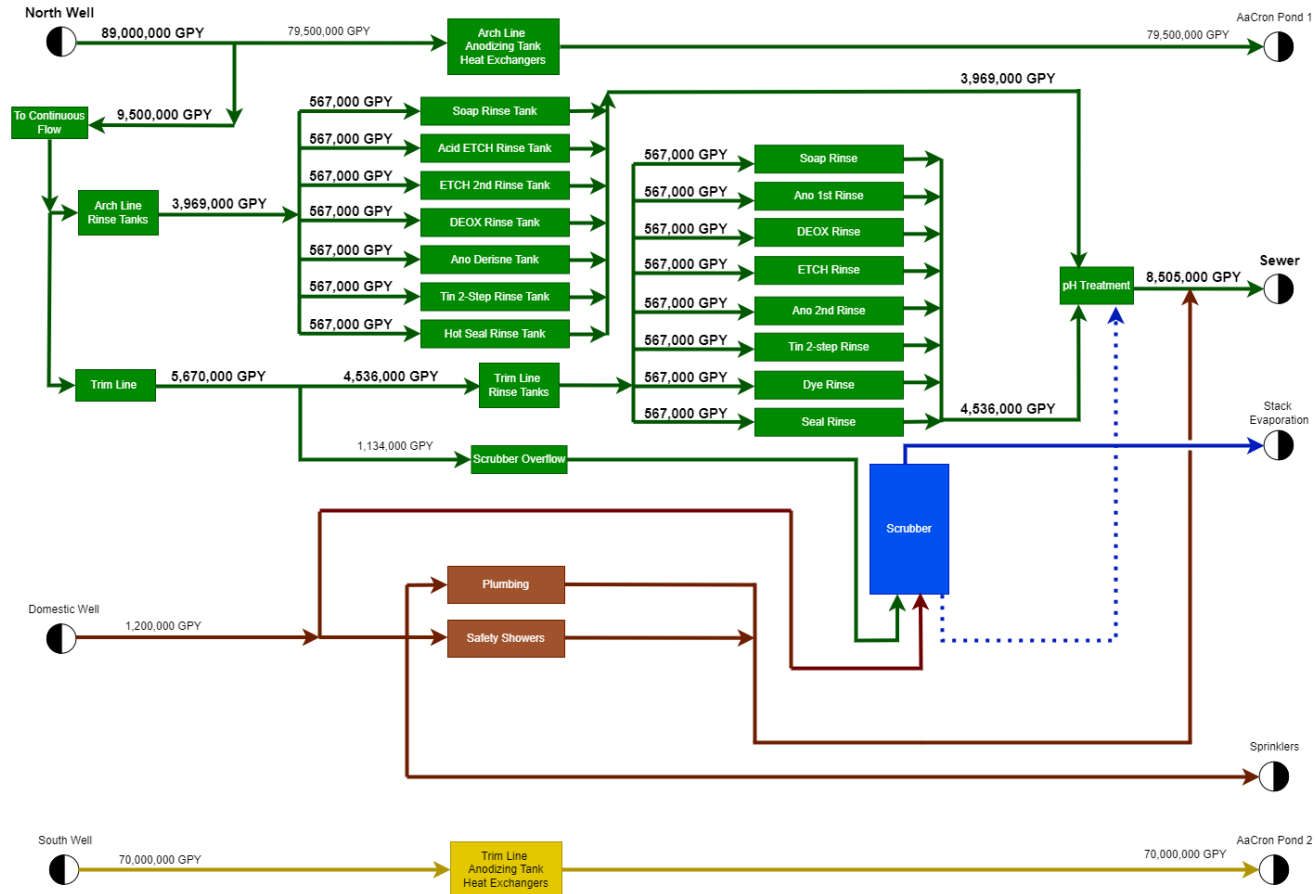
<https://www.turnerconstruction.com/projects/sofi-stadium>

Incentives to Change

Motivated to Conserve Water and Energy

- Optimize well water usage around the facility
- Reduce wastewater strength and loading
- Minimize natural gas/electricity usage







Continuous Flow Pipe Restrictors

Opportunity

- 15 Rinse Tanks
- 2 gallons per minute each
 - 8,500,000 gallons per year
- Water from tank overflow is sent to sewer
 - Annual \$100,000 sewer consumption bill



Continuous Flow Pipe Restrictors

Approach

- **Confirmed flow rate**
 - Bucket and stopwatch method
- **Decided on new appropriate flow rate**
 - Tanks with thicker solution need more water input
 - 1 GPM or 2 GPM restrictors
- **Figured out a proper time frame to install**



Continuous Flow Pipe Restrictors

Recommendation

- Lower and standardize flow rate by installing pipe restrictors
- 3 Day installation
 - Finished 7/03
- Retested Flow Rates
 - 1 GPM → 0.3 GPM
 - 2 GPM → 1 GPM
- Established lower flow rates performed as expected



Continuous Flow Pipe Restrictors

Results

- Decreased 6,600,000 gal/yr of water
 - Reduced equal sewer consumption
- Reduced Sewer Consumption: \$31,700/yr
- Pump savings
 - 9,400 kWh/yr
 - \$1,300/yr
- Implementation Cost: \$720
- Payback period: 2 Weeks



Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Install Continuous Flow Pipe Restrictors	6,600,000 gal water	\$720	\$33,000	2 weeks	Implemented
Enforce Restricted Well Usage	9,800,000 gal water	\$0	\$3,200	Immediate	Implemented
Fix Compressed Air Leaks	25,000 kWh	\$130	\$3,400	2 weeks	Planned
Install Kill Switch Timer For Dryer	3,000 therms	\$900	\$1,400	8 Months	Recommended
Install Air Cooled Chiller for South Well Single Pass Cooling	78,000,000 gal water	\$600,000	\$16,000	36 years	Further Investigation Needed
Install Lid For Dryer	10,500 therms	\$9,000	\$5,000	2 years	Further Investigation Needed

Personal Benefits

- Professional growth
- Better industry understanding
 - Anodizing industry experience
- Project leadership skills
- Documentation and organizing skill
- Interpersonal and soft skills

