

**TUR Continuing Education Conference**  
**November 20, 2008**

# **Sustainable** **EXcellence**

- 1. Who we are and what we do***
- 2. The process we used for Asset Selection***
- 3. Resource Conservation Plan for Water and Expected Change in Facility Wide Usage - Our Goal***
- 4. Results***

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# PHILIPS

***Lightolier is a Philips Group Brand***

**Business Unit :**

**Professional Luminaires North America - Lightolier Group**

**THE LIGHTOLIER GROUP is comprised of Lightolier, Thomas Residential, Forecast, Translite, Ardee, Specialty, Alkco, Hadco, Hanover, Allscape, Bronxelite, Widelite, Quality, Metrolux, Chloride, Highlites, Ledalite and Canlyte brand names.**

**16 locations throughout North America with 3,000 employees**

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*2nd Century*

## *LIGHTOLIER Fall River Manufacturing Plant*

- 311,000 Sq Ft
- 600 Employees
- 3,500 Different SKU's
- Approx. 20,000 Lighting Fixtures / Day
- Produce \$ 230 Million / Yr Product Value
- Specification Recessed Lighting Fixtures

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## ***LIGHTOLIER Fall River Manufacturing Plant***

- **You can't write a Plan without knowing the Process**
- **Let me show you our key operations so you can see how we use utility resources in what we do.**

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3



## Metal Prep/Receiving

In this area, steel sheets and aluminum circles are received and allocated to production work orders. Processes being performed include cutting circles from sheets, reducing the size of purchased aluminum circles and piercing center holes in circles as needed for production requirements.

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2

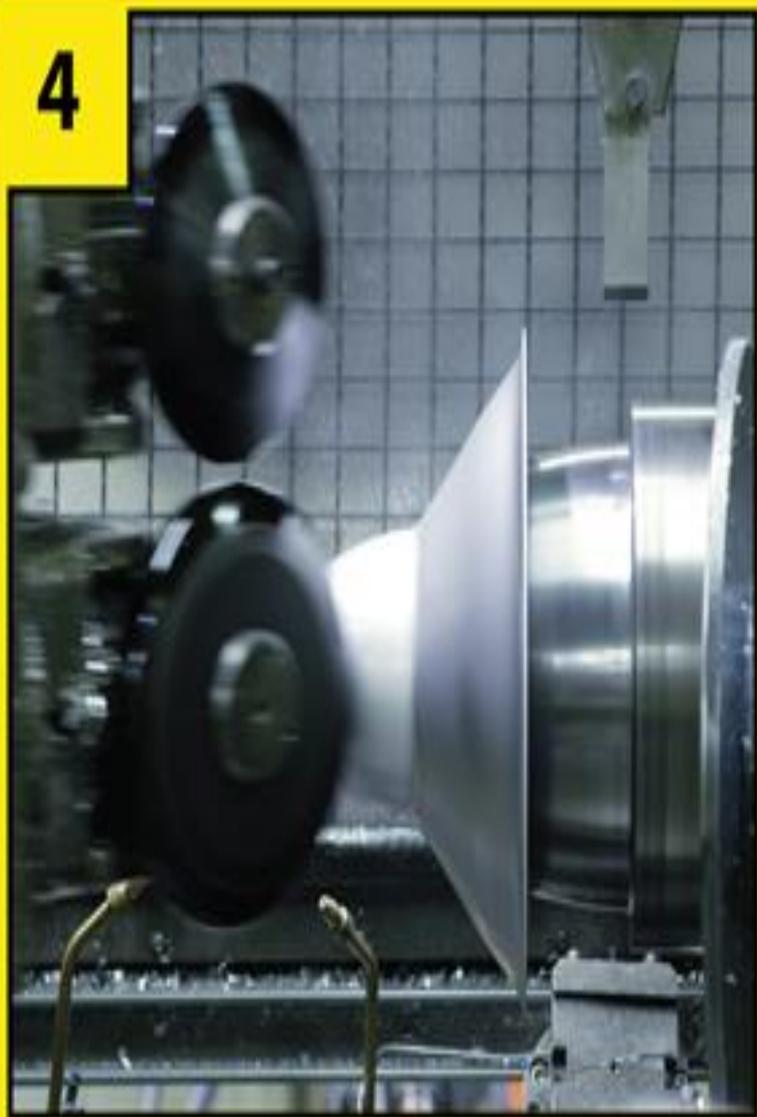


## Hydro Form

Eleven hydro form machines with associated presses, lathes and hydraulic pumps arranged in work cells allow us to control the reflector, cone and housing forming process insuring high quality components and maximum throughput.

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## CNC Spinning

Our in-house spinning capability allows us to efficiently produce high quality reflectors and aperture cones. In instances where the physical shape of the part or very small lot sizes do not permit hydro forming, CNC spinning is the best solution.

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## Aqueous Washer

This unit is used for process cleaning. It utilizes “environmentally friendly” water soluble chemicals to remove process oils and buffing compound from parts. In-house control of this process is of critical importance to the final quality of our painted and anodized finishes.

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## Buffing

Buffing is a surface preparation process that improves the reflector surface by removing any imperfections prior to Anodizing. This highly controlled process insures that our specifications are met for specularity, reflectivity and efficiency. The process is accomplished on cutting edge specialty equipment designed by Lightolier to create the best reflectors available.

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7



## Anodizing

Anodizing of reflectors is accomplished in three state-of-the-art computer controlled lines and provides the clear or tinted anodic finish required to protect the polished aluminum surface from environmental degradation. Stringent quality assurance in this department results in a highly reflective, durable and uniform component finish.

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8



## Powder Coat

Our powder coating line combines an “environmentally friendly” aqueous cleaning system with powder finish application and curing to provide an extremely durable coating. The application efficiency of 98% is achieved by recirculating powder which is not deposited on parts. This insures that the process is extremely cost effective and has no adverse environmental impact.

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9



## Wet Paint

Water based wet paints and lacquers are applied automatically or hand spray processes are used selectively for low volume applications and sensitive non-metallic substrates unsuited to powder finishes. On-site control of this process is critical, especially for reflector flanges and lacquer finishes.

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## Automated Reflector Manufacturing Cell

This state-of-the-art cell integrates the operations to process reflectors from raw aluminum circles through metal forming, piercing, cleaning, powder coating, laser etch and packaging. The high quality finished reflectors from this cell are fully packaged, bar coded and ready for distribution.

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***The Process we used for  
Asset Selection***

**We began with a training session for  
Supervisors, Manufacturing Engineers  
and Operations Management to discuss  
Electricity, Natural Gas and Water**

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## Electricity

Average 850,000 kwh / Month

- \$ 1,477,452 / Year
- 63 % Motors
- 14 % Lighting
- 23 % Misc.

( Computers, Fans, Electric Heaters, AC, Controls, etc. )

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## Cost Examples

Based on 16 hrs / day, 250 days

1000 W HID Light      \$ 636 / Yr

T 12 2 lamp task light   \$ 111 / Yr

10 HP Motor      \$ 4,394 / yr

1000W Heater      \$ 589 / Yr

100 W Light bulb      \$ 59 / yr

Small Compressed Air Leak of  
1 cfm, 1/16 " leak      \$ 250 / yr

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## Natural Gas

Average 80,000 decatherms / Yr

1 decatherm = 1 million BTU's

\$ 901,709 / Year

35 % Process

65 % Heating

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## Water

Average 1,757,000 Gals / Week

91 Million Gallons / Yr

Cost \$ 373,000 / Yr

5 % Sanitary

40 % Cooling water

55 % Rinses

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## Water Cost Examples

Our Combined water /sewer cost  
is \$.0041 / gallon  
( \$ 3.10 / 100 cu ft)

1 GPM @ 24/7 = \$ 2,149 / yr

Reducing a rinse tank from 3  
gpm to 1 gpm @ 2 shifts, 250  
days / yr = \$ 1,968 savings / Yr

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Several Electricity and Gas usage reduction projects including High Efficiency Motor upgrades, VFD installations, Compressed Air System upgrades, Plant Lighting upgrades and Conversion to low temperature cleaners on the Powder Coating and Aqueous Wash lines were already underway we felt that the greatest benefit from the plan would be the focus applied if water were selected.

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We realized that our water budget without both focus and changes in the way we were using water would be depleted by mid-year. For this reason, the decision was made to prepare a Resource Conservation Plan for Water.

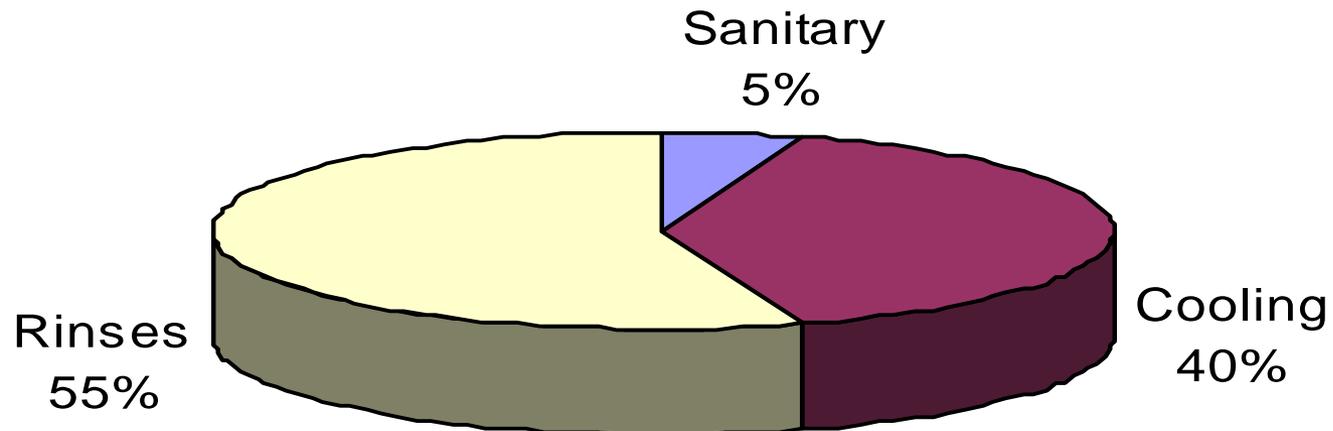
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***Resource Conservation Plan for  
Water and Expected Change in  
Facility Wide Usage - Our Goal***

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# Use of Selected Asset

## USE OF WATER



## Amount of Asset Used

For the period May 2007 through October 2007

282,000 gals / day.

For the period November 3007 through April 2008

225,000 gals / day.

For May and June 2008

241,000 / day.

**This equates to a 14 month average of**

**251,000 gals / day or 90 MGY**

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**OUR GOAL**  
**To Decrease**

**Facility Wide Usage 30 %**

**75,000 gallons / day reduction**

**27 Million Gallons / Year.**

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**The following options were identified:**

- 1) *Reduction of rinse rates at Anodizing, Powder Coating and Aqueous Wash.*
- 2) *Reduction of Plant Booster Pump pressure.*
- 3) *Enhanced re-use of non-contact cooling water.*
- 4) Reduction of Irrigation water used for the lawn.
- 5) Reduction of flush volume for toilets and urinals as well as waterless urinals.

**All options have been implemented**

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## *Reduction of Rinse Rates*

- We found many rinses to be 3-6 GPM overflow*
- We were able to reduce to ½ - 1 GPM*
- We found the product was sufficiently rinsed and verified through conductivity readings.*
- On 1 wash line alone this resulted in > 1 million gallons / yr reduction*

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# Reduction of Rinse Rates

“You can’t manage what you can’t measure”



# Change on Anodize Line # 3 to Use Non-Contact Cooling Water for rinses



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## ***Reduction of Plant Water Pressure***

- We found that shutting off booster pumps resulted in a 34 % reduction in flow***
- This reduced pressure from 80 psi to 37 psi***
- We installed a new pump system with VFD's***
- Currently running at 52 psi***
- \$27,000 investment, \$ 55,000 savings / yr***
- 6 month payback***
- 14,169,000 gallons / yr reduction***

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# Reduction of Plant Water Pressure



## ***Re Use of Non Contact Cooling Water in Critical Anodizing Rinses***

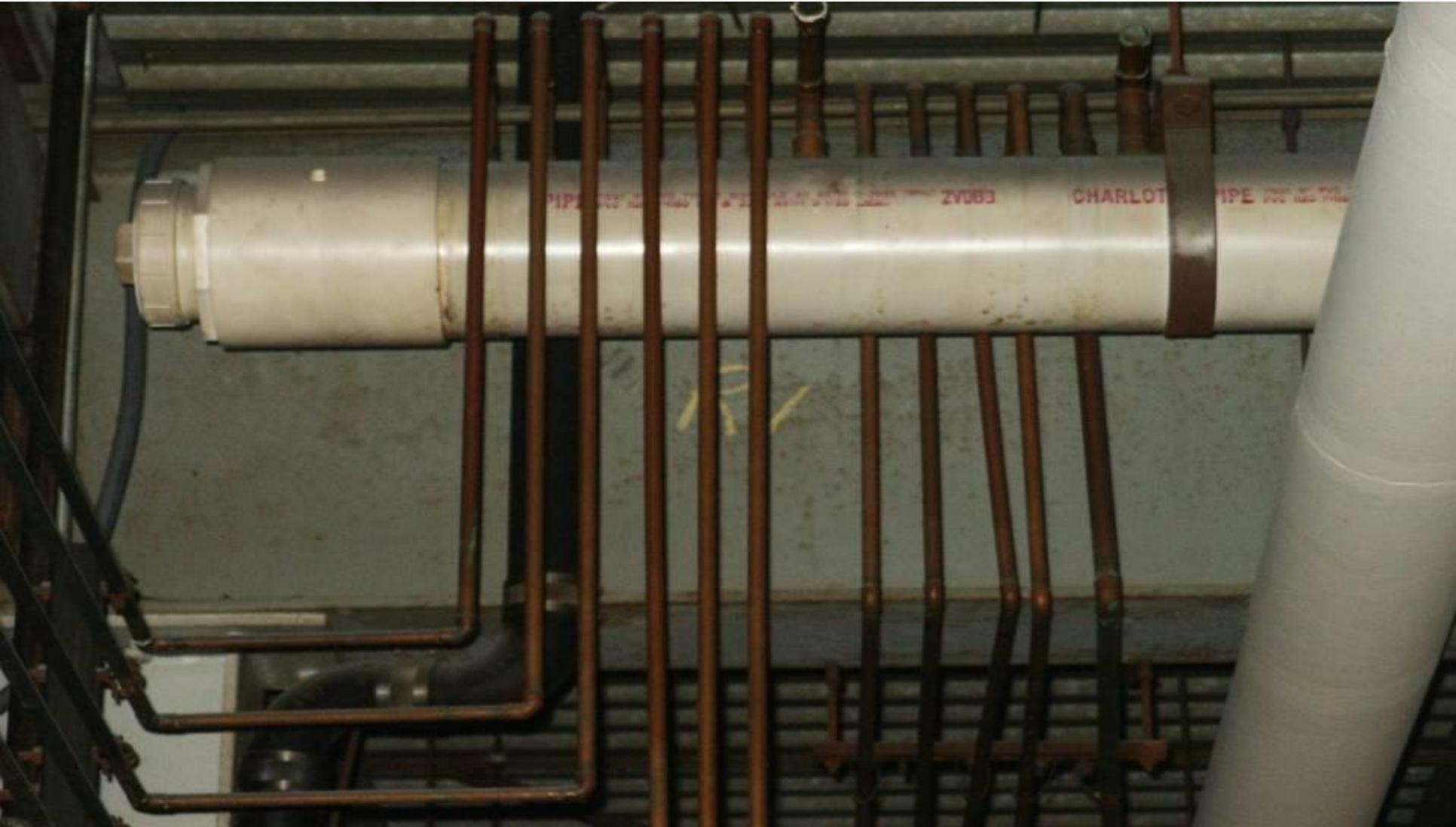
- ***We needed to insure that no oil contamination in critical rinses occurred***
- ***We installed an in line continuous TPH monitor***
- ***\$ 19,000 investment***
- ***5 month payback***
- ***11,121,000 Gallons / Yr Reduction***

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# TPH Continuous Monitor



# The Lightolier Aquaduct

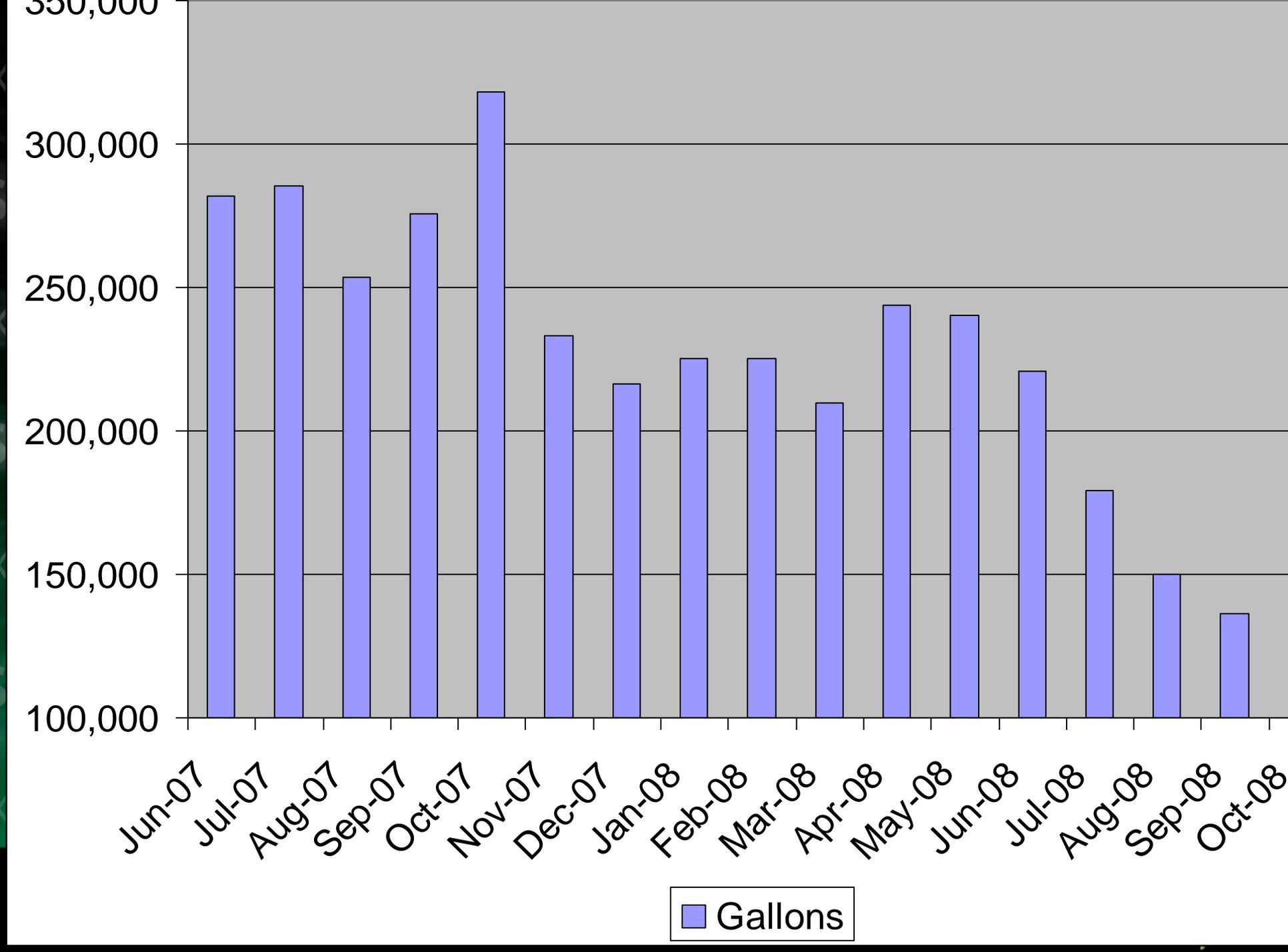


# Temperature Controlled Valve



# Solenoid Valves installed on main Water Feed Lines to Fabrication





## Our Results To Date

- Reduced from an average of 251,000 GPD to 129,573 GPD
- 48 % Reduction surpassed goal of 30 %
- 44 Million Gallons / Year Reduction
- \$ 181,715 / year annualized savings

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**THANK YOU!**

**Have Fun with your Plans!**

**Ron Westgate**

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