

## Closed Loop Cooling Water System for Process Cooling and Casting Quench

Full Scale Implementation    OR     Pilot Scale/Study

### **1. Description of the project: What is the issue and how did you fix it?**

Single pass use of city water was fast becoming cost prohibitive and was subject to increasing regulatory burdens and restrictions. We use it for quenching of large steel castings, cooling of arc & induction furnaces, water cooled air compressors, large bearings, and hydraulic power systems. Now with our closed loop recycle systems, we pump to & from a 400,000-gal reservoir, with spray cooling manifolds covering the surface. More than a dozen large pumps are connected with miles of underground and overhead piping. Other smaller evaporative cooling systems use city water only for makeup, and their bleeds become makeup back to the main reservoir. Condensate from air compressors, via oil-water separators, is now makeup to the main reservoir.

### **2. Environmental Benefits: Conservation of raw materials or energy, reduction or elimination of emissions, wastes, toxics, water discharges, etc.**

Everybody in today's world recognizes water conservation as essential. We now use only about 2% of the water we used to draw from the city meters, for bathrooms, showers, lunch rooms, and makeup for losses in smaller evaporative cooling systems. And there are no issues about permits or reporting for discharge of process water to storm or sanitary sewer.

### **3. Other Benefits: Productivity, health and safety, employee morale, etc.**

This project was done in phases, over a few years. Actual cost figures are hard to compile now. But at each phase, the payback was estimated at less than 3 years. The benefits have been increasing steadily every year, as the city implements rate increases annually. Operating costs are minimal, compared to the water bill savings; electricity costs for running pumps, and occasional maintenance of the pumps.

#### **4. Cost Savings: Capital cost, operating cost, ROI or other pertinent cost information.**

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#### **5. Applicability to other foundries and additional Comments**

Many aspects of what we have done could be implemented at other foundries. Unfortunately, not all sites include enough real estate for a large reservoir like we have. The large size of the reservoir enables large scale evaporative spray cooling, circumventing the need for expensive manufactured cooling towers.

#### **6. Applicable Environmental Categories and Foundry Processes. Select all that apply.**

##### **Environmental Categories**

- Carbon (GHG) Emissions Measurement and Reduction
- Air Quality       Water Use and Discharge       Waste Management
- Beneficial Use     Stormwater       Material and Resource Conservation
- Community Engagement

##### **Foundry Process(es) Impacted**

- Melt       Pour       Mold       Core       sand system/reclaim
- Shakeout     Heat Treat     Quench       Finishing       Shipping
- Maintenance     Pattern Shop     Casting Design
- Management Systems and Metrics
- Other, explain:

# Green Foundry Project

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7. Add photos to enhance your application, if applicable.

