



# The True Cost of Water

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# Water is important vs. Water is Cheap

- Lean assessment performed at automotive assembly plant in Illinois
- Team included plant personnel, CMS provider, waste management provider & some Tier II suppliers





# Phosphate Line: Cost of Water Assumptions

The cost of water estimate includes city water, DI water, WTP chemicals, process chemicals (book values), heating energy.

This estimate does not include sewer user fees, sewer discharge fees, WTP fixed costs, and phosphate line maintenance.





# Is water really cheap?

## Phosphate Line: True Cost of Water

What is the true cost of water?

~~\$2.25 per 1,000 gallons~~

On average, the true cost of water is...

**\$80 per 1,000 gallons**



# Phosphate Line: Reducing Chemical & Water Consumption

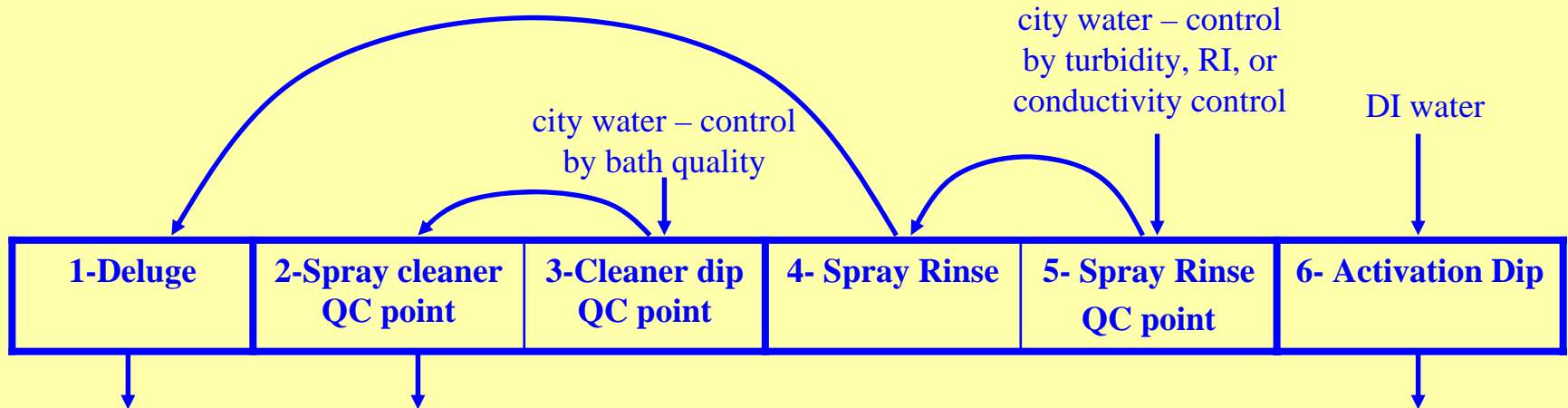
Decouple alkaline side overflows

Three distinct zones:

1. Rinse tanks

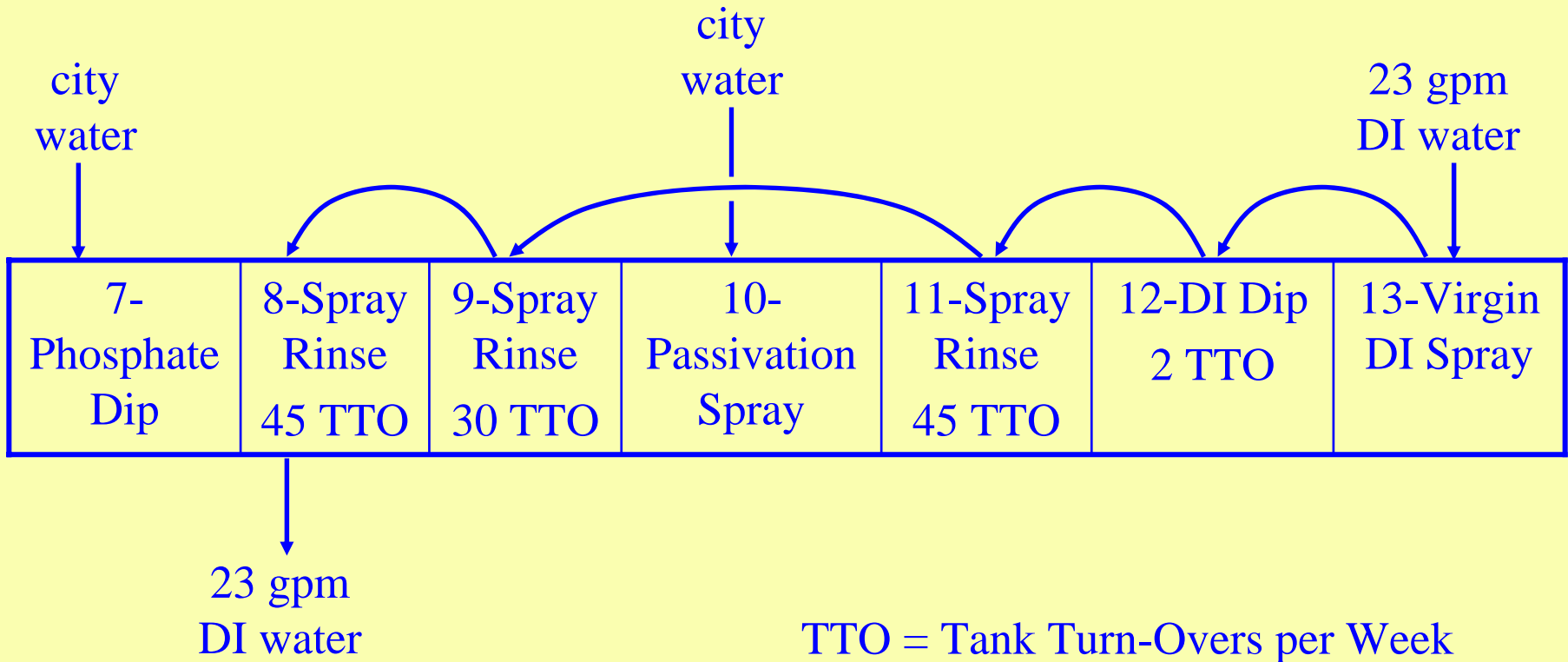
2. Cleaner tanks

3. Activation Dip tank



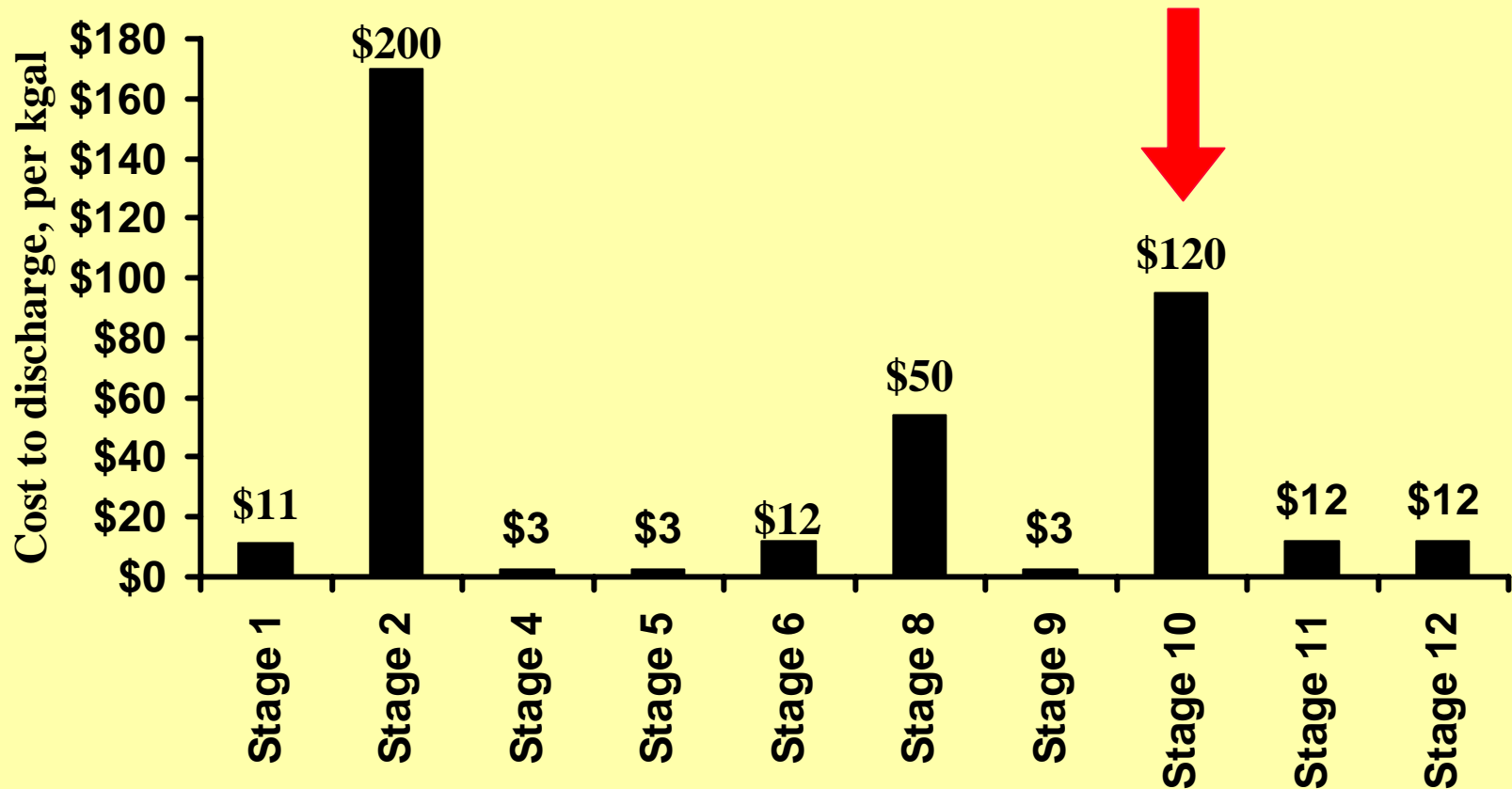


# Phosphate Line: Cost of Water Overflow Assumptions, Acid Side



# Phosphate Line: Cost of Water - Components

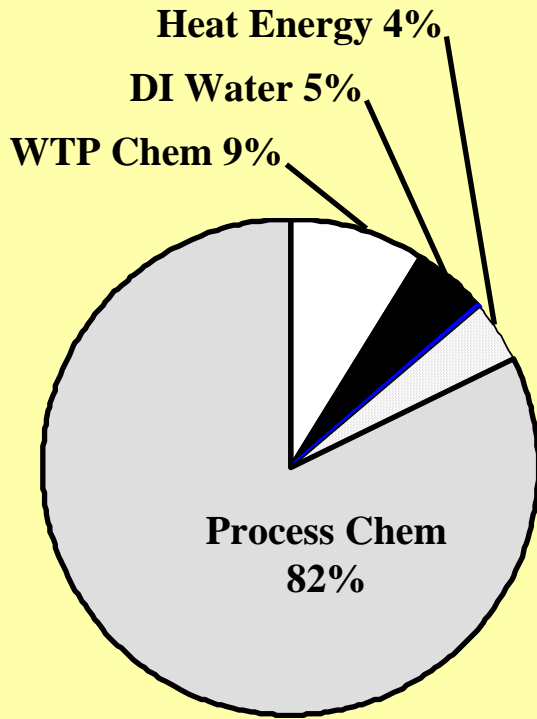
Stage 10 to be  
eliminated



# Phosphate Line: Cost of Water - Components

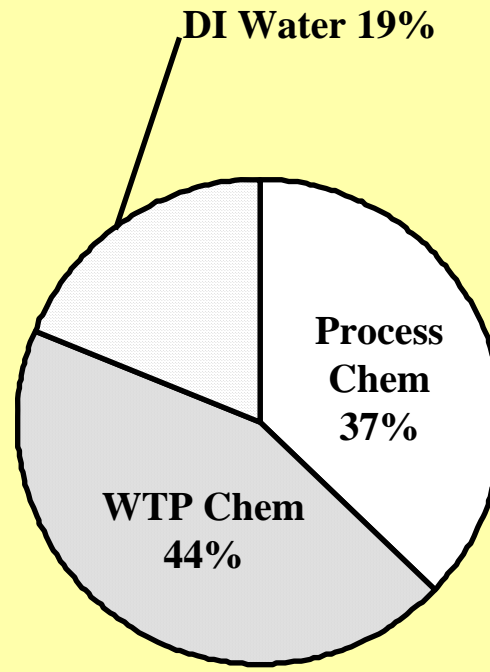
## Stage 2 Cleaner Spray

\$200 per kgal



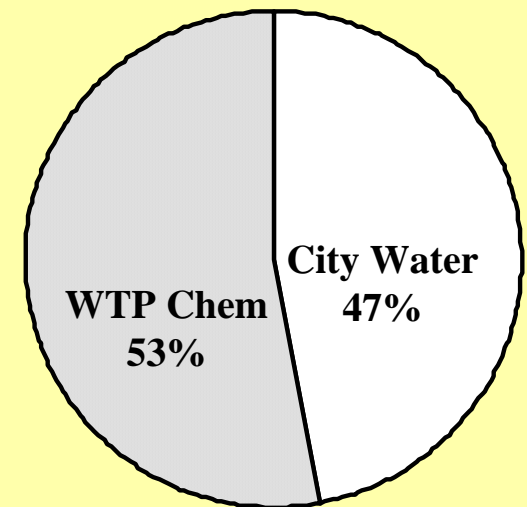
## Stage 8 Phosphate Rinse

\$60 per kgal



## Stage 9 Rinse Spray

\$3 per kgal



# Phosphate Line: Process Variation

*How much CK171ALF is needed at Stages 2 and 3?*

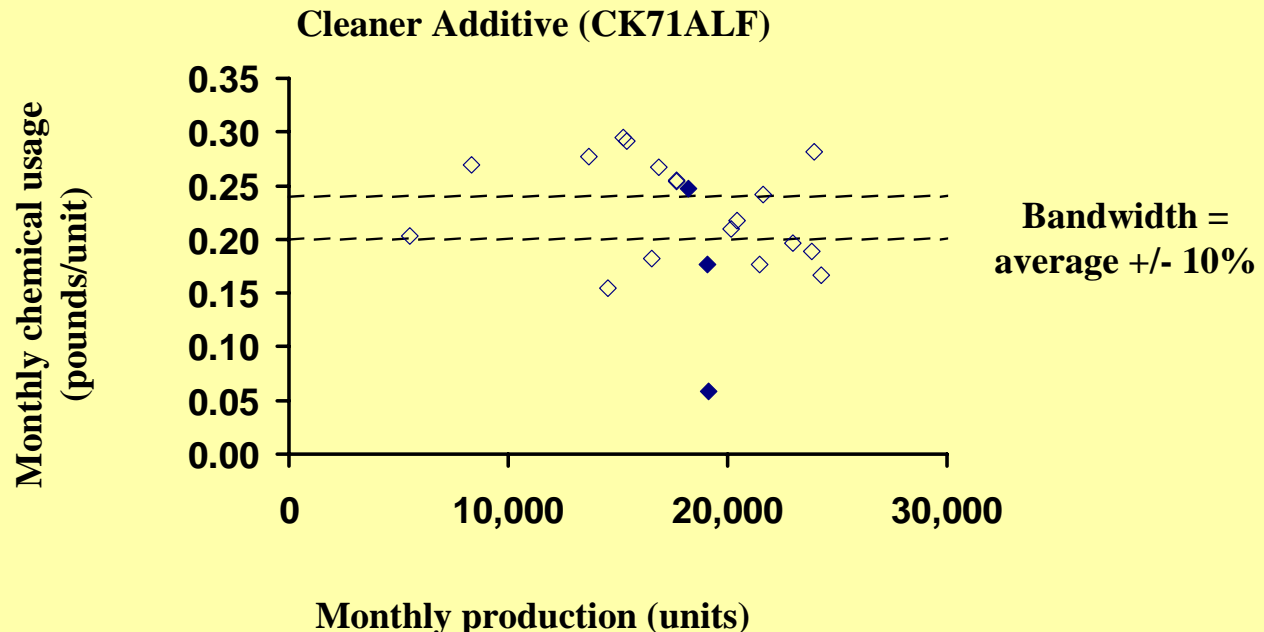
Minimum usage is 0.06 lbs per unit.

Cost is \$20,000 per year.

Average usage is 0.22 lbs per unit.

Cost is \$70,000 per year.

\*based on 200,000 units per year

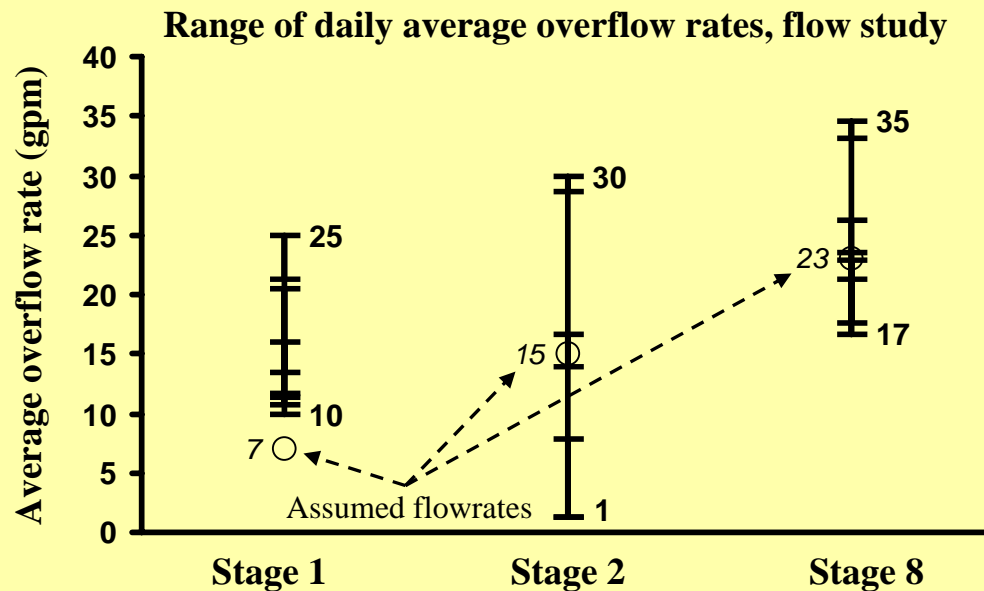


# Phosphate Line: Process Variation

## February 2004 Flow Study Results

### Erratic Flow Control

Average daily flow rates are highly variable, despite near constant production



**Water usage drives the bus on  
chemical usage!!!!**

Chemicals are metered into water  
based on detected levels in the water

**Who pays for the high cost of  
water?**

**CMS provider**

**Who Controls Water Flow?**

**Plant Personnel**

**Should CMS Providers Manage  
Water?**



## Chemical and Water Savings Potential

- Process chemicals savings potential: \$550,000 per year
  - Stages 2 & 3: \$250,000
  - Stage 6: \$100,000
  - Stage 7: \$200,000
- Water savings potential
  - At least 3,000,000 gallons per year
  - At least \$30,000 per year
  - Up to \$60,000 per year in WTP chemicals
- Wasted heat energy: \$15,000 per year





# The Quality Paradox

Plant is reluctant to Test  
process improvements

Might affect product quality

Impact on Quality is unknown

Process data is limited

Data not  
Collected

Available Data  
Not Used

Process quality is not  
improved because it  
might affect product quality



Water is expensive and  
important!!!!