

# Bath Maintenance

**Rob Reuter**

*Department of Ecology  
Toxics Reduction Engineer  
rreu461@ecy.wa.gov  
425.649.7086*

**Michelle Costenaro**

*Department of Ecology  
Toxics Reduction Engineer  
mcos461@ecy.wa.gov  
425.649.7143*

**Charles Babb**

*Hytek Finishes Co.  
Chemist  
cbabb@hytekfinishes.com  
253.872.7160*

# Bath Maintenance

- What is it?
  - Monitor and maintain process and rinse baths
- Resulting benefits?
  - Reduces water use
  - Reduces bath dump frequency
  - Reduces chemistry use

# Bath Maintenance

- Why is it necessary?
  - Depletion of bath chemicals
  - Chemical breakdown
  - Contamination
  - Buildup of byproducts
  - Errors in bath additions

# Bath Maintenance

*Why isn't everyone already doing it?*

- Employee time, training, knowledge
- Equipment availability
- Cost associated with current practices
- Impact on product quality
- Impact on product throughput
- Worker resistance
- Doubt regarding new technology
- ??????

# Bath Maintenance

- Basic Opportunities
- Monitor Chemistry
  - Onsite Laboratory Analysis
  - Offsite Laboratory Analysis
  - Vendor Analysis
- Bath Additions & Bath Dumping
- Alternative Technologies

# Bath Maintenance

## *Basic Opportunities*

- Remove dropped parts
- No greasy parts
- Filter or skim oil
- Temperature controllers
- Separate mixed waste streams
- Clean contact for solid current density flow

# Bath Maintenance

## *Monitor Chemistry*

- Monitor Chemistry at Regular Intervals
  - Contamination
    - Total Dissolved Solids (TDS)
    - Dragin
    - Metal Degradation
  - Concentration of process chemistry
- Treat Baths Only When Necessary

# Bath Maintenance

## *Monitor Chemistry - Onsite Laboratory Analysis*

- Measure Baths Properties
  - Ampere-hours
  - Handheld conductivity or pH probes
  - Automated chemical additions
- Compare bath contents to specifications using an onsite laboratory
  - Atomic Absorption – metal concentration

# Bath Maintenance

*Monitor Chemistry - Offsite Laboratory Analysis*

- Take bath samples
- Send samples for analytical testing

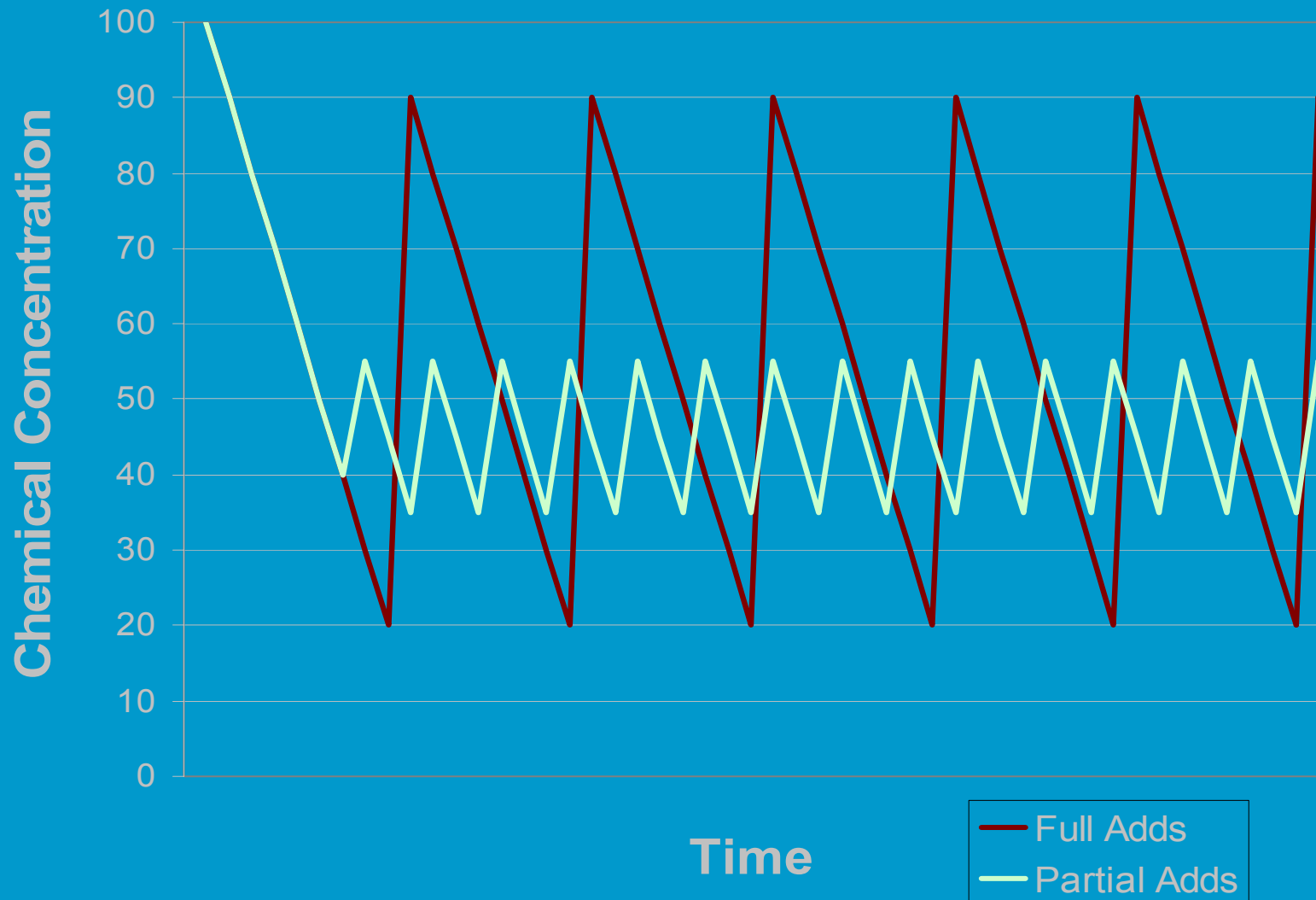
# Bath Maintenance

## *Monitor Chemistry - Vendor Analysis*

- Perform analytical measurements
- Provide:
  - software
  - addition schedule
  - change-out frequency
  - onsite testing

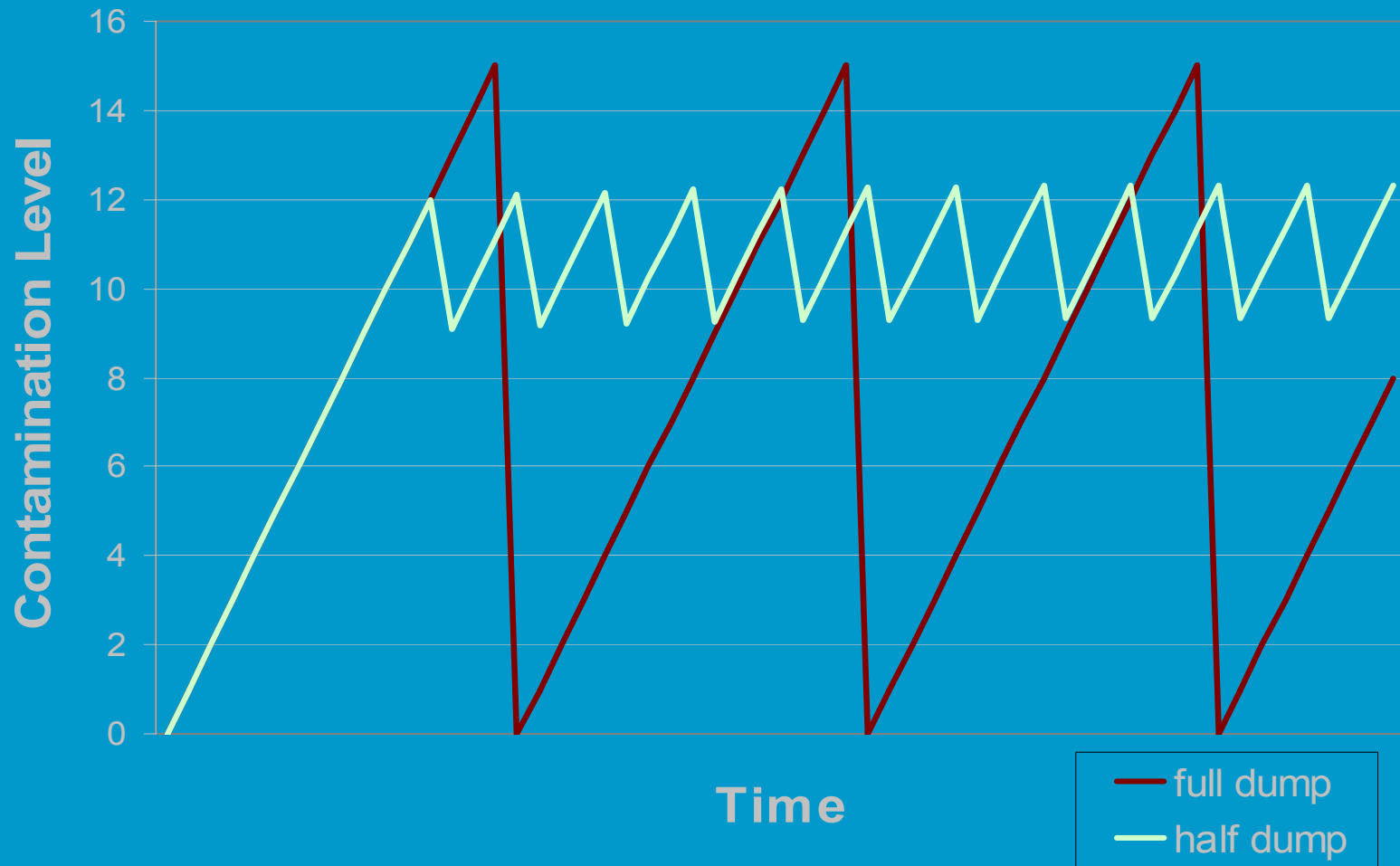
# Bath Maintenance

*Process Bath Additions*



# Bath Maintenance

*Rinse Bath Dumping*



# Bath Maintenance

## *Alternative Technologies*

- Acid Sorption
- Agitate Rinse Tanks
- Bath Concentration
- Bath Dumping
- Carbon Treatment
- Carbonate Freezing
- Diffusion Dialysis
- Electrowinning
- Filtration
- Freeze Crystallization
- Heat Baths
- Ion Exchange
- Membrane Electrolysis
- Reverse Osmosis
- Wetting Agents

# Bath Maintenance

## *Electrowinning*

- Recovers metals for recycling
- Reduces metal concentration in rinse tanks
- Reduces water use

*See Toolkit for more information*

# Bath Maintenance

- Basic Opportunities
- Testing Methods
- Bath Additions and Bath Dumps
- Alternative Technologies

# Bath Maintenance

Chuck Babb  
Hytek Finishes Co.

# Bath Maintenance

## *Question & Answer Time*

- Basic Opportunities
  - Testing Methods
  - Bath Additions and Bath Dumps
  - Alternative Technologies
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