

Cleaner Production Challenge

The Basics

Scott Lamb

Department of Ecology

Toxics Reduction Specialist

425.649.7268

slam461@ecy.wa.gov

Back To The Basics

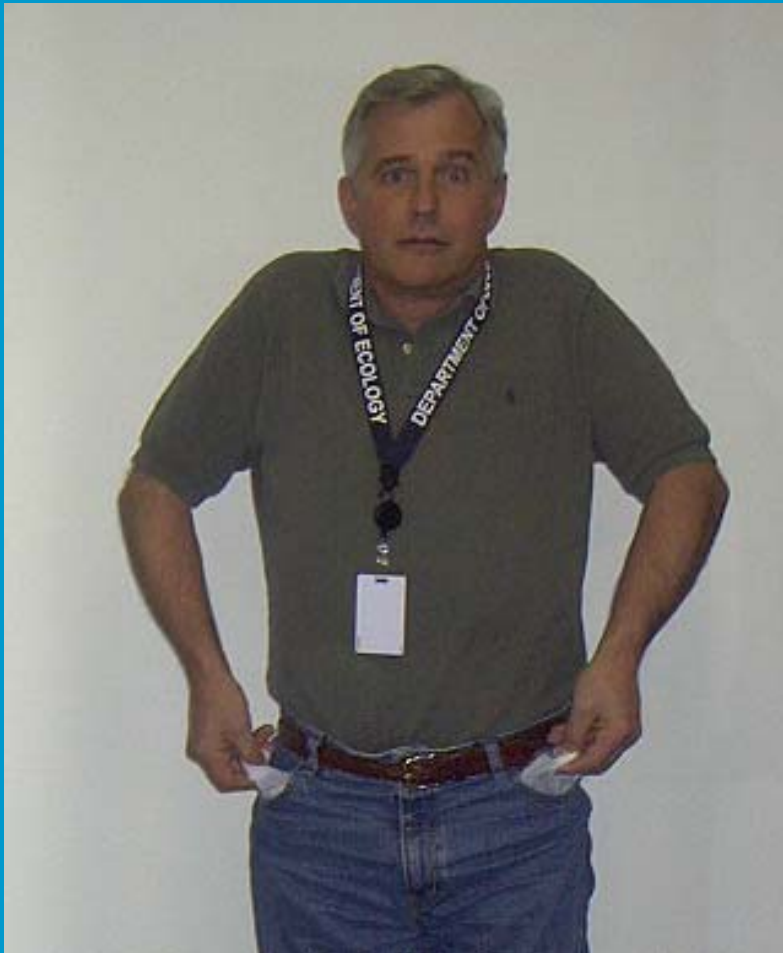
Good technology can not
replace good technique, but...

...good technique can
often eliminate the need for
good technology.



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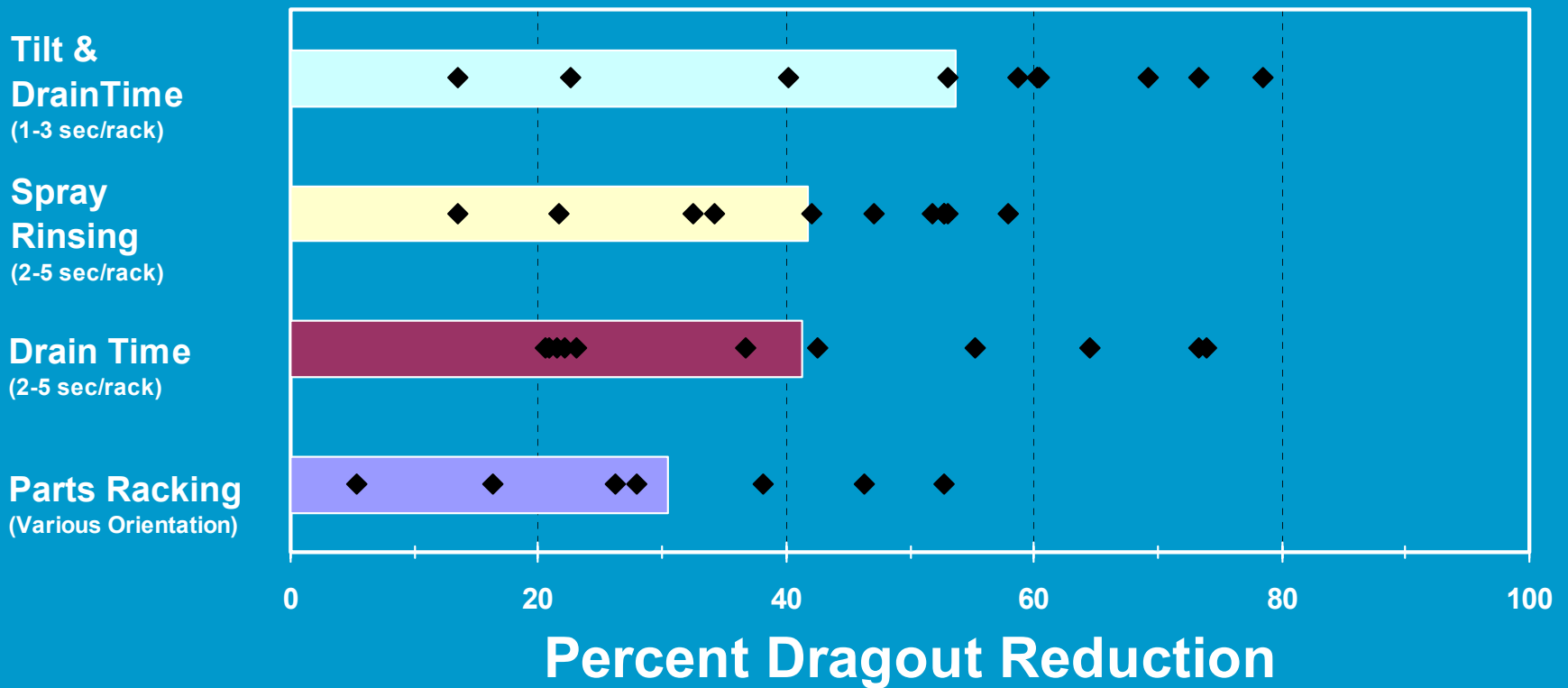
I'm the Cheap Guy!



- Dragout Reduction
- Rinsing Techniques
- Bath Maintenance

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Good Technique Matters!



Source: Tetra Tech EM, Inc.

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Dragout Reduction

- Dragout Increases:
 - Plating Chemical Use
 - Rinse Water Use
 - Treatment Chemical Use
 - Wastewater and Sludge Generation
 - Metals Concentrations in Sludge



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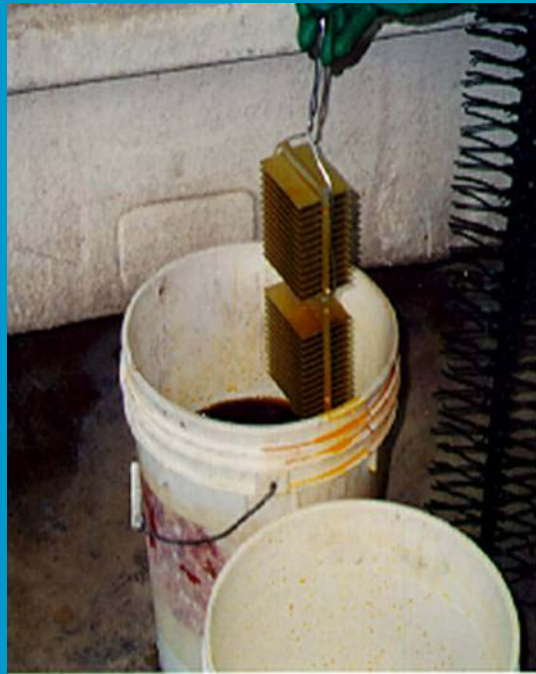
Dragout Reduction

- Techniques to Reduce Dragout:
 - Rack Correctly
 - Maintain Clean Racks
 - Increase Hang Time
 - Reduce Withdrawal Rate



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Racking



Horizontal



Vertical

Proper racking reduced dragout
by 90% for these parts!!!

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Racking

- Maintain Clean Racks

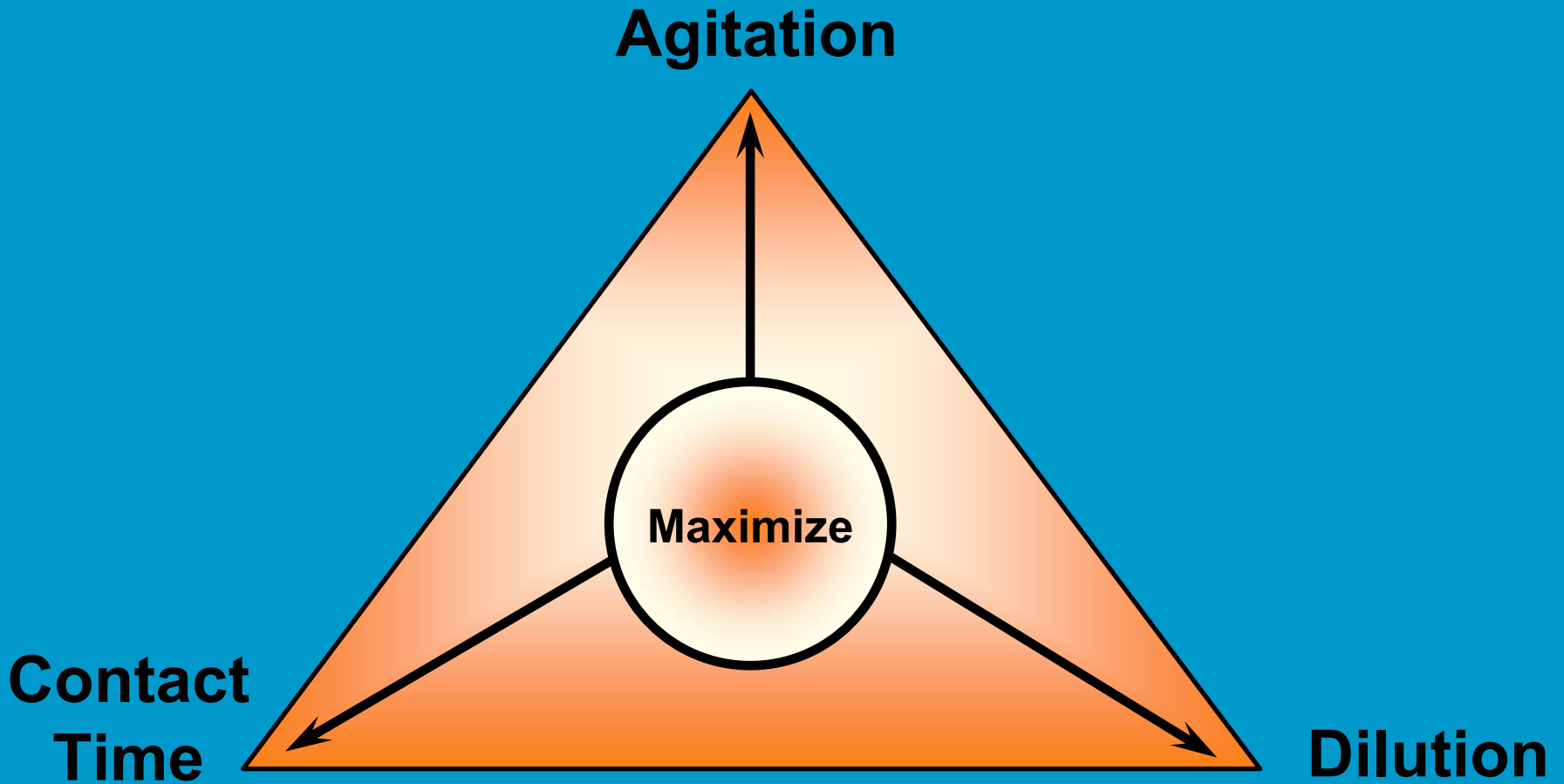


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Primary Goals of Rinsing

- Remove Process Chemicals
- Improve the Finish Quality of Parts
- Minimize Waste
 - Wastewater and sludge
- Reduce Resource Use
 - Labor, chemicals, water and energy
- Reduce Operation and Maintenance Cost

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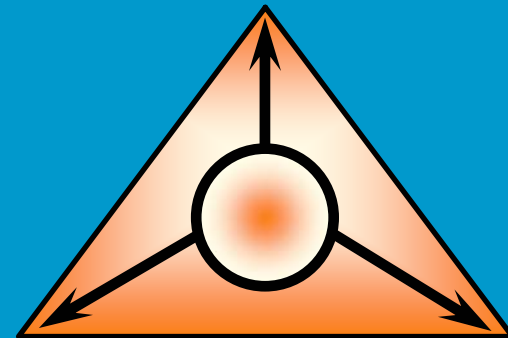


Modified from Tetra Tech EM, Inc.

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Rinsing Techniques

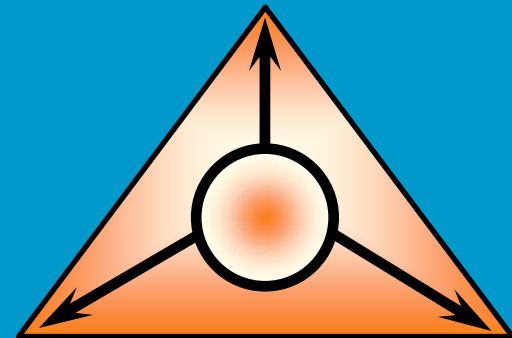
- Dragout Recovery Tank
- Spray Rinsing
- Counter Current Rinsing
 - Double, triple rinses
- Agitation
- Rinse Water Quality & Quantity
 - DI water
 - Flow restrictors
 - Conductivity controls
- Tank Design and Layout



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Spray Rinsing

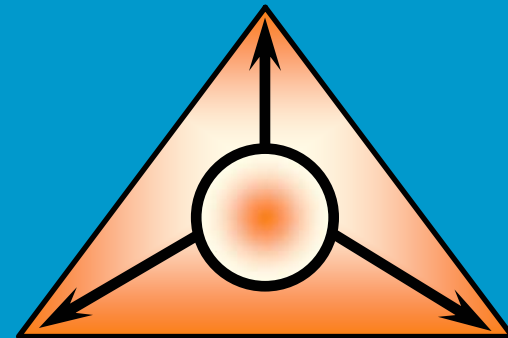
- Uses Substantially Less Water
- Direct Dragout Return
 - Over heated process tank
 - Dragout recovery tank
- Over Rinse Tanks



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Counter Current Rinsing

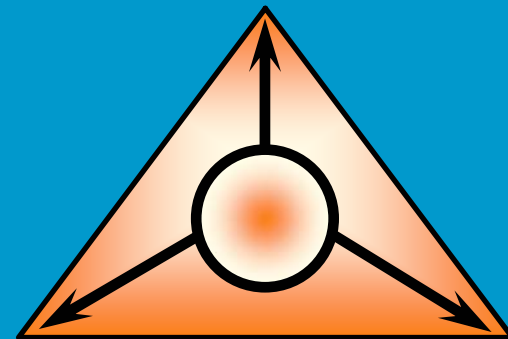
- Parts and Water Move in Opposite Directions
- Only Add Fresh Water to Final (cleanest) Rinse
- Reduces Water Usage by ~50% For Each Additional Tank



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Rinse Water Quality and Quantity

- Measuring Concentration of Contaminants
 - Total Dissolved Solids – TDS
 - Conductivity
 - pH
- Water Additions
 - Flow restrictors
 - Automated flow control



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Rinse Water Quality and Quantity



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Rinse Water Quality and Quantity



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Bath Maintenance

- Why is Bath Maintenance Necessary?
 - Depletion of bath chemicals
 - Chemical breakdown
 - Contamination
 - Buildup of by-products
 - Errors in bath additions



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Bath Maintenance

- Basic Opportunities
 - Remove dropped parts
 - No greasy parts
 - Filter or skim oil
 - Clean contact for solid current density flow
 - Temperature controllers
 - Separate waste streams
 - Chrome/Cyanide



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Bath Maintenance

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



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Training

- What?
 - Basic Techniques
 - Data Collection
 - Tracking
- How?
 - New employees
 - Team meetings
 - Performance assessment

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Tracking

- Collecting “Baseline Data”
- Alternative Technologies
 - Application
 - Selection
 - Sizing

Alternative Technologies

What Next?

- Filtration
- Reverse Osmosis
- Electrowinning
- Ion Exchange

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Summary

- Dragout Reduction
 - Rack Correctly
 - Increase Hang Time
 - Reduce Withdrawal Rate
- Rinsing Techniques
 - Spray Rinsing
 - Counter Current Rinsing
 - Maintain Rinse Water Quality
- Bath Maintenance
 - Basic Opportunities
 - Monitor Chemistry
- Training and Tracking

