Water Conservation at Twin City Tanning

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Driven to Discover℠

Twin City Tanning (TCT)

- **Located in South Saint Paul**

- **Assumed ownership from True Blue Tannery 1987**

- **Processing raw cattle hides**
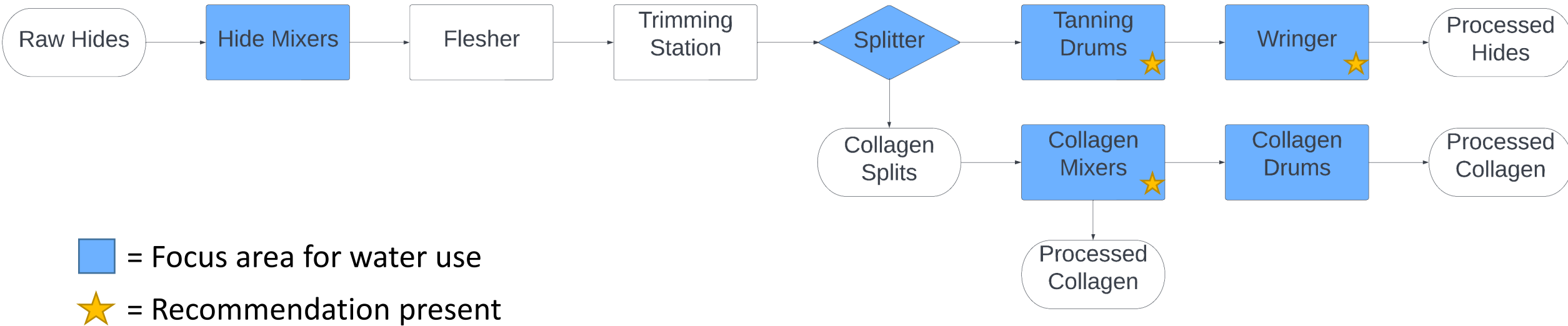
- **Supplies most Red Wing Shoes (in MN)**

Incentives and Approach

- **Water related expenses are high**
  - Water usage
    - 418,000 gpd (112,000,000 gpy)
    - 130,000 to 638,000 gpd range
  - Wastewater strength charge (COD/TSS)

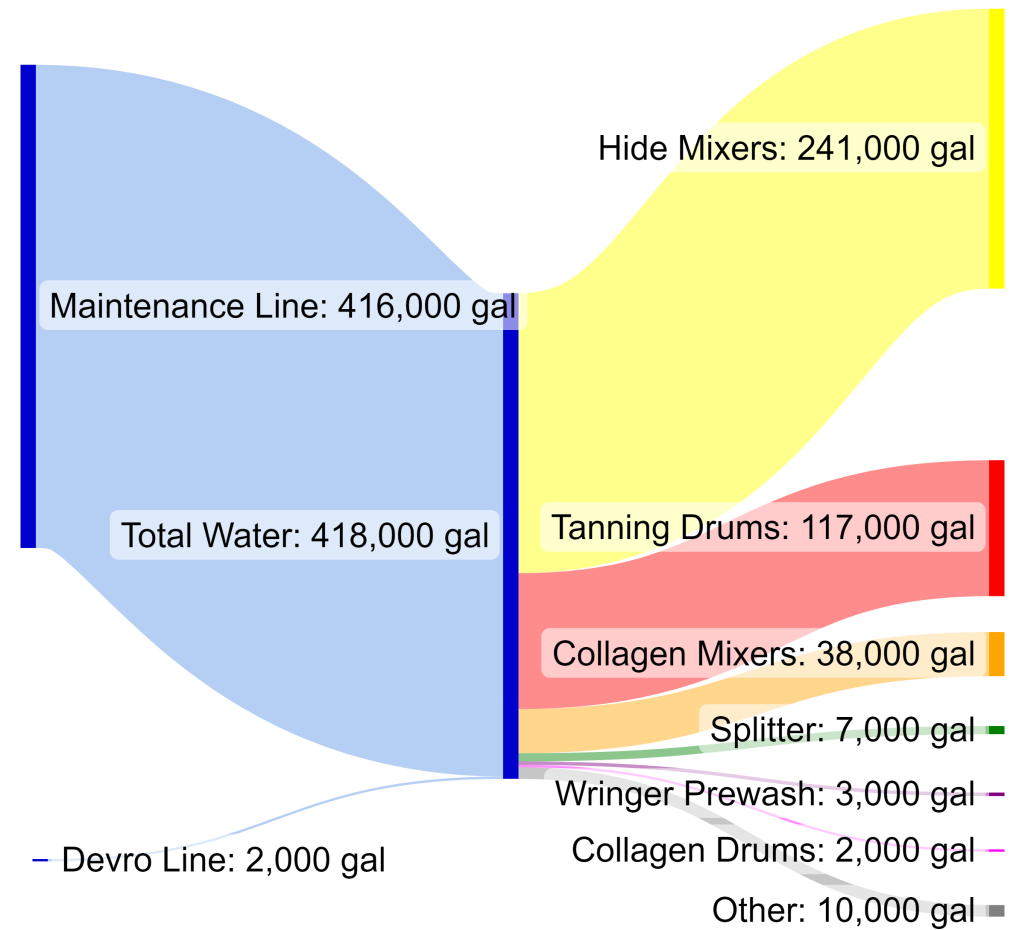- **Water mapping**
- **Reduce, reuse, recycling opportunities**

TCT Process Flowchart

= Focus area for water use

= Recommendation present

Daily Water Accounting

- **Representative of average day**
- **94% top 3 users**
  - 54% Hide Mixers
  - 28% Tanning Drums
  - 9% Collagen Mixers

Maintenance Line: 416,000 gal

Total Water: 418,000 gal

Devro Line: 2,000 gal

Hide Mixers: 241,000 gal

Tanning Drums: 117,000 gal

Collagen Mixers: 38,000 gal

Splitter: 7,000 gal

Wringer Prewash: 3,000 gal

Collagen Drums: 2,000 gal

Other: 10,000 gal

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Focus: Tanning Drum Optimization

- **Operator controlled**
- **Water usage based on weight of load**
- **3 drum sizes with different flow rates**
  - 8 Large (71,000 gal)
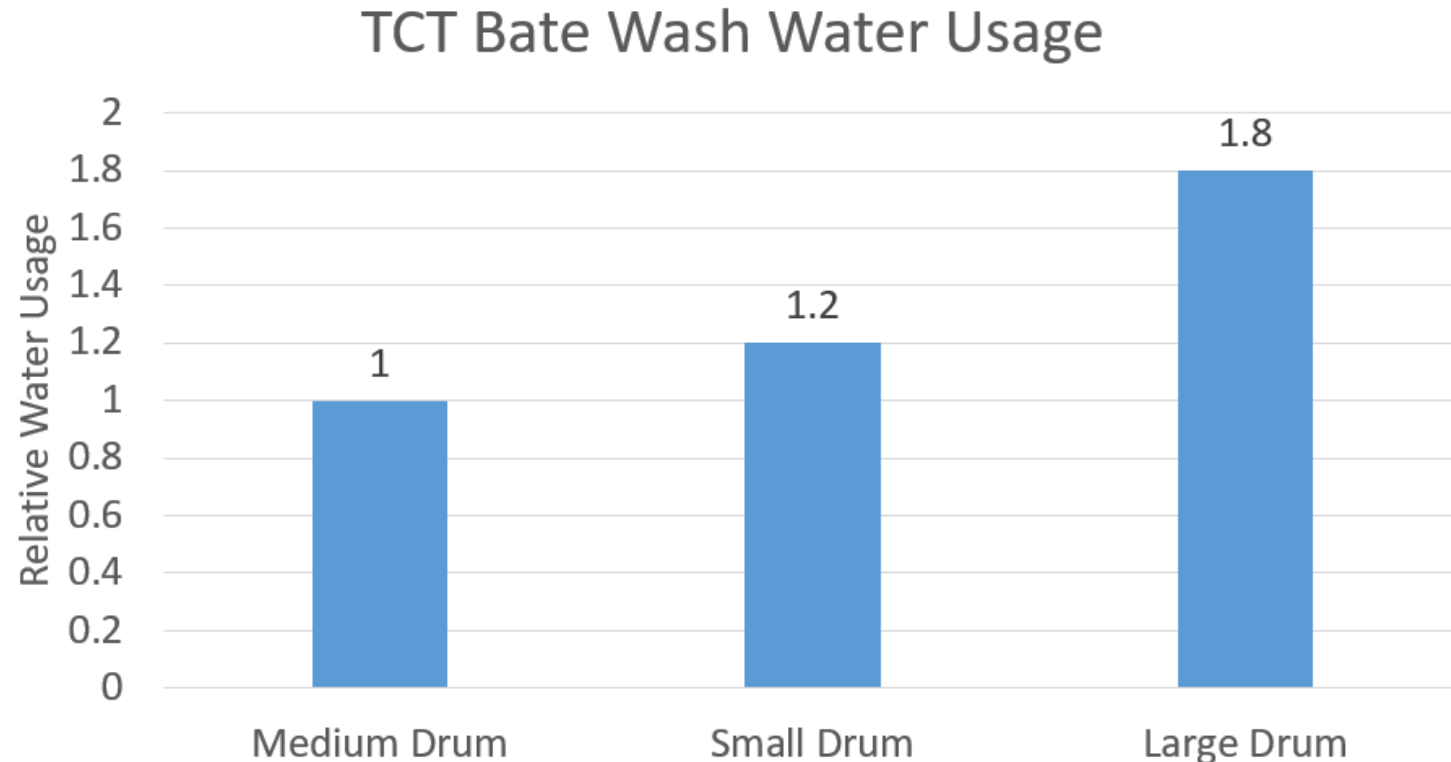 - 2 Medium (53,000 gal)
  - 2 Small (36,000 gal)

Delime/Bate 76%	→	Pickle 5%	→	Tan 19%

Solution: Recycle Tanning Water

- **Reimplementing pre-existing system**
- **24% of tanning drum water is recyclable**
  - 6.7% of daily water use
  - 29,000 gpd (8,000,000 gpy)
- **Can be used in delime/bate process**
- **Cost: maintenance holding tanks**

Solution: Lower Bate Wash Volume

- **30 min. running drain**
  - Lower temperature
  - Rinse hides
- **18% daily water use**
- **76,000 gpd (21,000,000 gpy)**
- **Find optimal drum (gal water/lbs hide)**
- **Cost: chiller required**

TCT Bate Wash Water Usage

Bar chart titled "TCT Bate Wash Water Usage" with y-axis "Relative Water Usage" ranging from 0 to 2. Medium Drum: 1, Small Drum: 1.2, Large Drum: 1.8.

Solutions

Recommendation	Annual reduction (gpy)	Total cost	Annual savings	Payback period	Status
Recycle tanning water	7,900,000	$48,000	$110,000	5.3 months	Recommended
Minimize wringer wash loss	18,000	$1,000	$300 (est)	3.3 years	Investigating
Lower bate wash volume	3,200,000	TBD	$69,000	TBD	Investigating
Improve collagen accounting	NA	0	$3,400	Immediate	Investigating

Personal Benefits

- **Exposure to engineering**

- **Learning practical applications**

- **Promoting sustainability**

- **Connecting and learning from industry professionals**