

# Disclaimer

---

**Notice: This presentation has been provided as part of the U.S. Environmental Protection Agency Resource Conservation Challenge Web Academy Recycling and Solid Waste Management Educational Series. This document does not constitute EPA policy. Mention of trade names or commercial products does not constitute endorsement or recommendation for use. Links to non-EPA web sites do not imply any official EPA endorsement of or a responsibility for the opinions, ideas, data or products presented at those locations or guarantee the validity of the information provided. Links to non-EPA servers are provided solely as a pointer to information that might be useful to EPA staff and the public.**



# Impact of Single Stream Collections on ONP Quality

---

EPA Roundtable

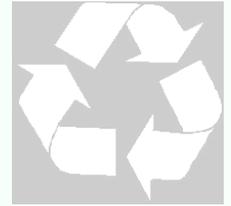
*July 11, 2007*

By

Jay Simmons - (Weyerhaeuser, NORPAC)

# Overview

---

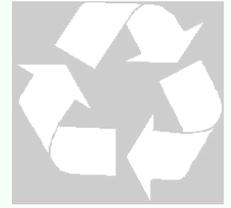


- **NORPAC Joint Venture**
- **What is the challenge we are trying to find a solution to**
- **Why is it a problem and what are the implications**
- **What are the opportunities**
- **What are the constraints**
- **What is the vision of the future**

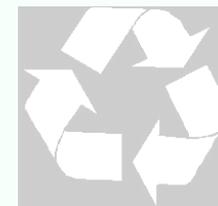


4/14/05 • 4

# NORPAC Background



- **NORPAC is a joint venture between Weyerhaeuser and Nippon Paper that produces over 2000 metric tons of newsprint per day.**
- **450 employees**
- **\$500MM in annual sales**
- **Three world class paper machines.**
- **25% of volume is Export News & Publication grades.**
- **75% of volume is Domestic grades.**
- **Began deinking ONP (#8) as raw material furnish in 1991.**
- **Designed to consume over 250,000 tons per year.**
- **Intense focus on product quality by NORPAC's customers necessitated implementing one of the most intensive raw material sampling and testing programs in North America.**



# ISRI #8 ONP Definition

---

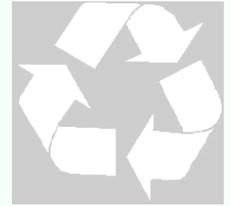
- **NORPAC (like other Old News Paper deinking facilities) was designed to consume ISRI #8 ONP.**

## **Special News, De-ink Quality (#8 ONP)**

Consists of sorted, fresh newspapers, not sunburned, free from magazines, white blank, pressroom over issues, and paper other than news, containing not more than the normal percentage of rotogravure and colored sections. This grade must be tare free.

Prohibitive materials.....None Permitted  
Total Outthrows may not exceed..... $\frac{1}{4}$  of 1%

# ONP Quality Change



What is the problem we are trying to find a solution for?

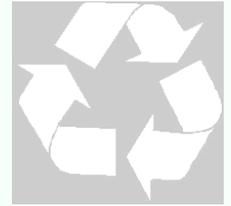
Supplier	NORPAC Supply System	Sold As	% Outthrows	% Prohibitives	% Glass
2001 and Prior Average ALL Suppliers	100% Source Separated	#8	0.25 – 0.5	0.0	0.0
<b>Sep 2006 – Dec 2006 Weighted Average ALL Suppliers</b>	<b>68% Co-mingled</b>	<b>#8, #7</b>	<b>15.0</b>	<b>3.4</b>	<b>0.33</b>

## Effectiveness of Supplier Removal Technology

### Typical Category Changes From Supplier

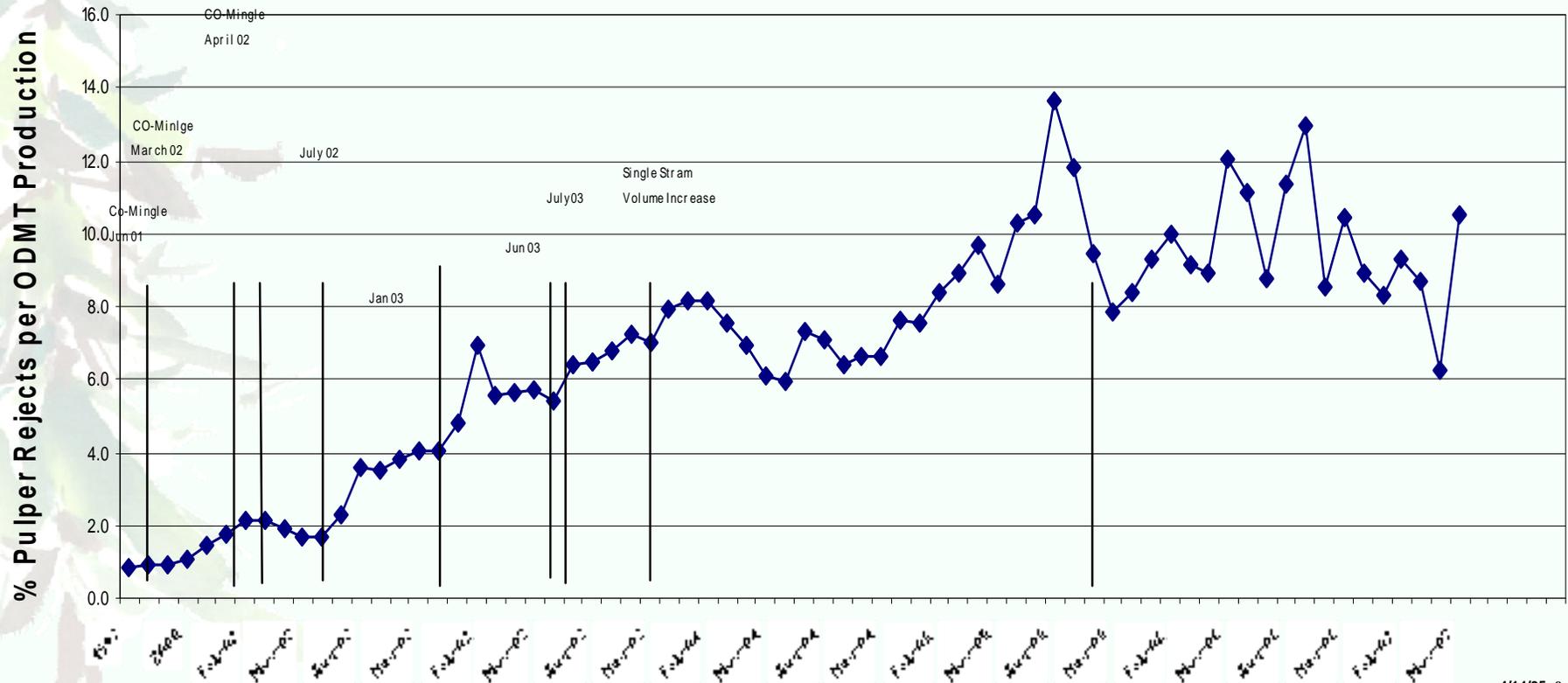
	Before Processing	After Processing
<b>OCC</b>	<b>35.0%</b>	<b>5.0%</b>
<b>Junk Mail</b>	<b>2.0%</b>	<b>2.0%</b>
<b>WL/CL</b>	<b>7.0%</b>	<b>7.0%</b>
<b>Phone Books</b>	<b>1.0%</b>	<b>0.5%</b>
<b>Plastics</b>	<b>5.0%</b>	<b>2.0%</b>
<b>Glass</b>	<b>2.0%</b>	<b>0.2%</b>
<b>Other (Metal, Misc)</b>	<b>6.0%</b>	<b>1.0%</b>
<b>OMG</b>	<b>15.0%</b>	<b>15.0%</b>
<b>ONP</b>	<b>27.0%</b>	<b>67.0%</b>

# Problems & Implications



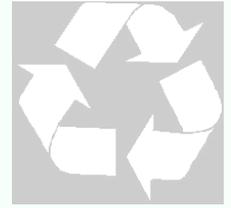
- **Pulper Rejects have increased 9-10 fold in seven years as suppliers have shifted to co-mingled collection.**

% Pulper Rejects per ODMT DI Production



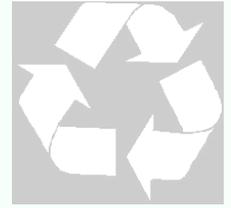
4/14/05 • 9

# Problems & Implications – Typical Pulper Rejects



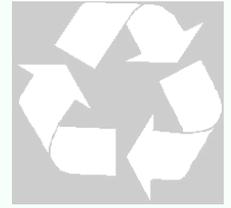
4/14/05 • 10

# Problems & Implications – Glass



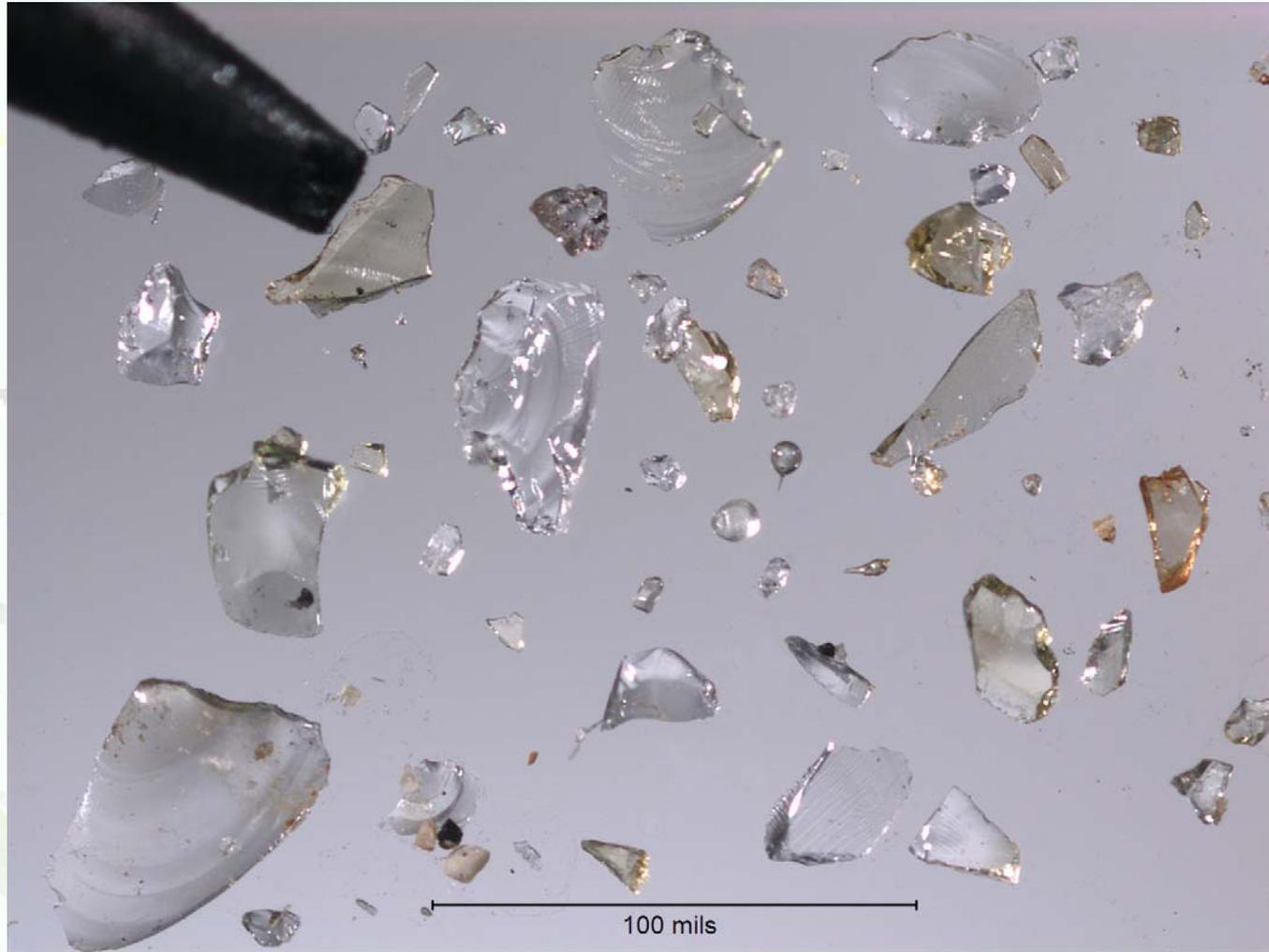
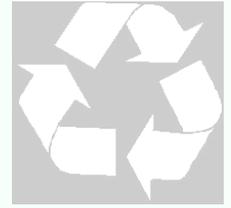
	<b>Scenario 1</b>	<b>Scenario 2</b>
	<b>At Maximum Supplier Glass 0.75% by Weight</b>	<b>At System Average Supplier Glass 0.33% By Weight</b>
<b>Daily ONP Consumption</b>	 700 ADST	700 ADST
<b>Daily Glass Volume Removed from Process</b>	<b>10,500 lbs (5.25 tons)</b>	<b>1,400 lbs (2.31 tons)</b>

# Problems & Implications – Glass



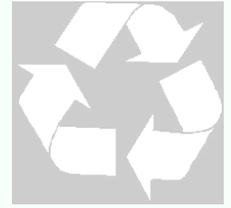
4/14/05 • 12

# Problems & Implications – Glass



4/14/05 • 13

# Problems & Implications – Safety

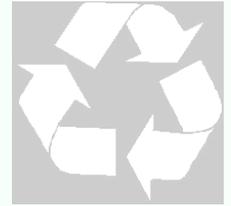


## Increased Impacts to Employee Safety –

As recycling has become easier and more automated, there is a growing trend for households to discard anything & everything into a recycling container.

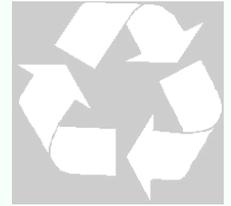
- More personal hygiene products found
  - Diapers, absorbent pads, etc
- Hypodermic needles
- Fine glass particles become airborne through paper handling process & cleanup increasing hazards to eyes
- Rotting food / meat
- Animals

# Overall Deink Changes – Maintenance Costs



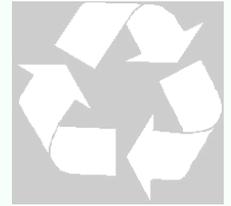
	<b>Pre Co-mingling 1997 - 1999</b>	<b>Post Co-Mingling 2006 YTD</b>
Annual Maintenance	Base	Base x 4
One Time Cost for Improved Material		Currently at \$100 K

# Problems & Implications – Deink Operating Costs



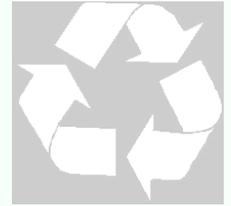
	<b>Pre Co-mingling 1997 - 1999</b>	<b>Post Co-Mingling 2004 YTD</b>
Yield Loss @ Pulper Sent to Landfill	1.0%	9.0%
Additional Fiber Required to Replace Rejects	2500 ADST/Yr	>20,000 ADST/Yr
Annual Additional Cost for Replacement Fiber & Disposal	Base \$	Base + over \$ 2 MM/yr

# Problems & Implications – Deink Quality



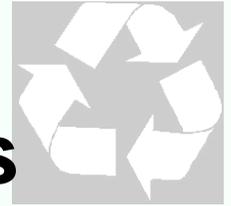
- **Stickies are tacky, insoluble colloidal and suspended contaminants on paper. They are composed primarily of synthetic polymers from hot-melt glues, PSA's, coatings, etc.**
- **Macro-stickies are generally considered to be particles >100 microns**
- **Micro-stickies are those particles <100 microns.**
- **Because of their size, micro-stickies can pass through screens that remove macro-stickies and can form large deposits on paper machines. These deposits can break off causing defects & quality issues at customers.**

# Problems & Implications – Paper Machine Costs & Quality



- As the deink mill has struggled to respond to the decline in ONP quality the paper machines using the deinked pulp were also impacted.
  - Increased stickies in deinked pulp
  - Increased stickies can potentially cause the paper machines to shut down and cleanup to continue making prime quality paper.
- NORPAC has incurred at least \$5/ton additional operating cost to deal with increased stickies level.
- Additional capital improvements in excess of \$1MM

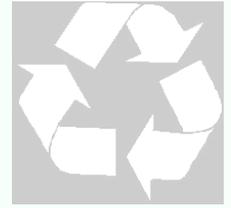
# Summary of Impacts of Contaminants



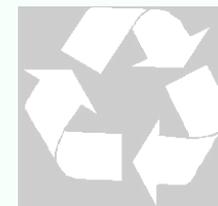
Contaminant Type	Cost	Quality	Process
Tin/Aluminum	Small impact to cost as this is a small percentage of total	No measurable impact to quality	No measurable impact on operation efficiency
Plastic	Significant impact to cost due to large volume and related disposal costs	No measurable impact to quality due to easy removal by process	No measurable impact on operation efficiency
Glass	Impacts operating costs of process by increasing wear rate of process equipment, maintenance, downtime & safety risks	No measurable impact on quality at this time	Will shut our process down within a few days if levels of incoming glass exceed 0.5%
OCC	Rejected by Pulper and need to be replaced with additional fiber purchases. Disposal Costs	Creates hot melt and glue based stickies and deposits on paper machines & finished product	Toner inks have been traced to deposits on paper machines and sheet defects
Junk Mail	Impacts cost by requiring more chemicals to counter macro and micro stickies	Viewed as significant contributor to increased macro and micro stickies	Has now become one of focus areas to reduce micro & macro stickies
WL/CL	Inks can contribute to macro and micro stickies increasing costs to manage contaminants	Inks not easily removed as chemistry & process is designed to separate and remove soy based inks	Toner inks have been traced to deposits on paper machines and sheet defects

4/4/05 • 19

# Problems & Implications – Summary



- **Co-mingled Impacts on Deink Mill**
  - **Safety**
  - Reject rate increase – fiber loss
  - Increased fiber cost – replacement for non fiber components
  - Increased labor cost to handle additional fiber and Pulper Rejects
  - Increased maintenance costs
  - Increased landfill costs
  - Reduced capacity (downtime for maintenance & cleaning)
  - Further increases in contaminants could reduce pulping rate
- **Co-mingled Impacts on Paper Machine**
  - Increased stickies and related machine downtime for cleanup
  - Negative impacts to product quality



# Potential Solutions ???

---

1. **Work with suppliers to improve ONP quality and minimize the negative impact – Example, Portland Metro.**
2. **Develop economically viable sorting equipment that can consistently produce ONP #8.**
3. **Industry(s) wide – Focus on getting each recyclable material to the correct recycling stream. As with other end processors, if the wrong recyclables end up at the pulpmill they will eventually end up in the landfill and increase the cost of operations and producing a finished product.**