

Between a Rock and a Hard Place: Inadvertent PCBs (iPCBs) and a Circular Paper Economy

January 10, 2023
12:00 PM – 12:00 PM ET



TOPICS IN
ALTERNATIVES ASSESSMENT

Free Webinar Series Hosted by the Association
for the Advancement of Alternatives Assessment



CHEM
FORWARD
know better chemistry

Today's Webinar



“All materials should be chemically harmless before we consider them recyclable.” Jon Smieja, GreenBiz, Jan 6, 2023

The production of PCBs was banned in 1979 under the Toxics Substance Control Act, but PCBs are still allowed to be inadvertently produced (iPCBs) in certain chemical manufacturing processes that involve chlorine and high temperatures.

In today's webinar, we will dive into our collective journey towards circularity and hear about the challenges faced as a paper manufacturer and recycler, and how a combination of regulatory updates and market alternatives might hold the key to solving the dilemma.

Today's Speakers



Doug Krapas
Environmental Manager
Inland Empire Paper



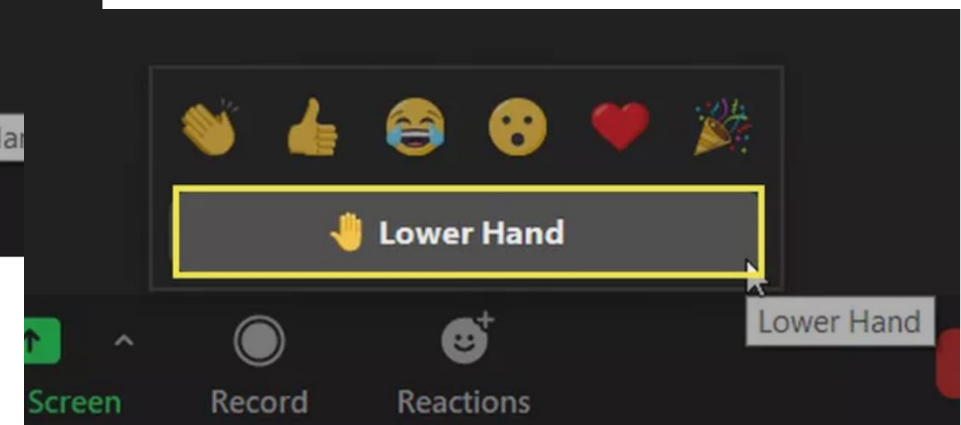
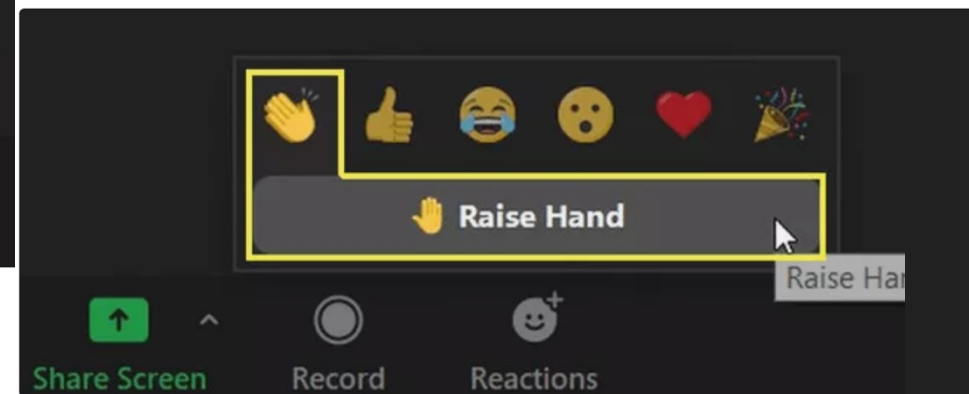
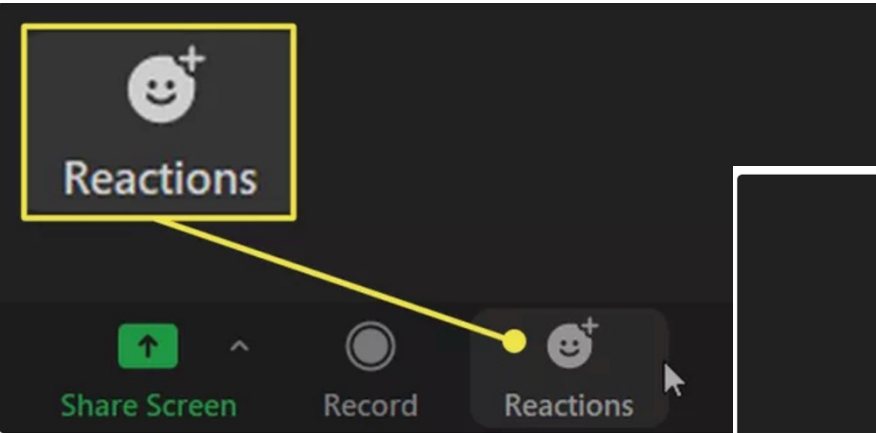
Lauren Heine
Director of Science & Data
Integrity ChemFORWARD
A4, President

Webinar Logistics



- We are using Zoom Meeting. **Please keep your lines muted and your videos off.**
- Use “**speaker view**” in Zoom – it will offer the best viewing experience.
- During the Q&A portion of the session, if you wish to ask a question or offer a comment, **please raise your hand** [we’ll show you how in the next slide]
 - Feel free to unmute your line and turn on your video so engage more voices/faces in the conversation.
 - Also feel free to use the chat.
- This session is being recorded and will be posted with the slide deck on the A4 website: www.saferalternatives.org

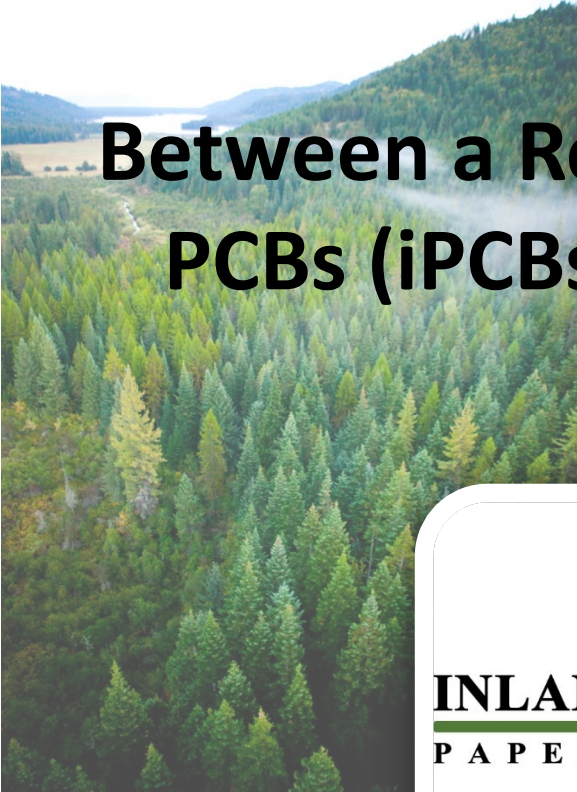
We want to engage you during the Q&A - Please raise your hand in Zoom



To raise your hand

1. Open the “reactions” button
 2. Hit “raise hand” button
 3. Please “lower hand” button afterwards
- ✓ The chat will work too

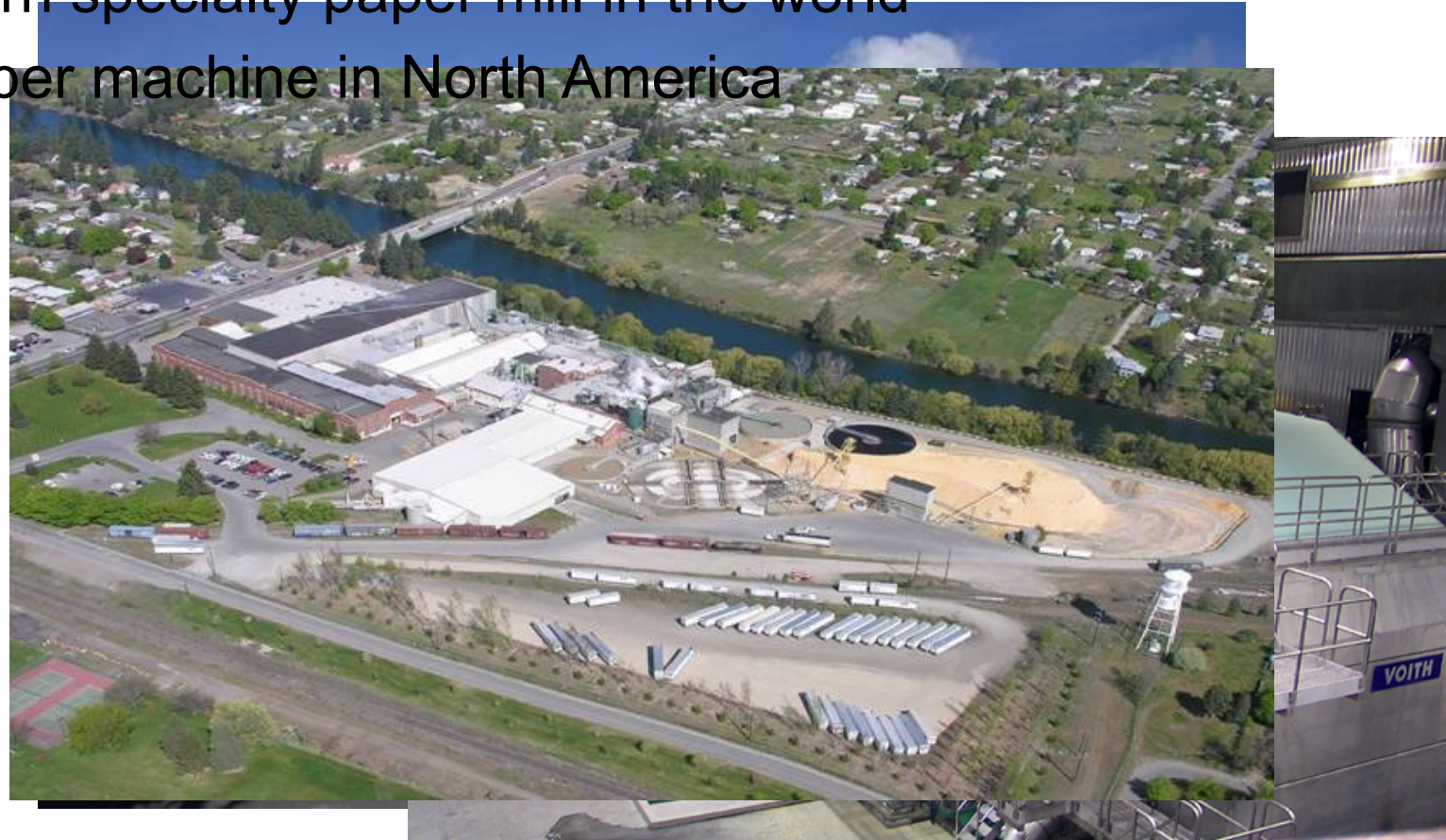
Between a Rock and a Hard Place: Inadvertent PCBs (iPCBs) and a Circular Paper Economy



Association for the Advancement of Alternatives Assessment (A4)

Company Background

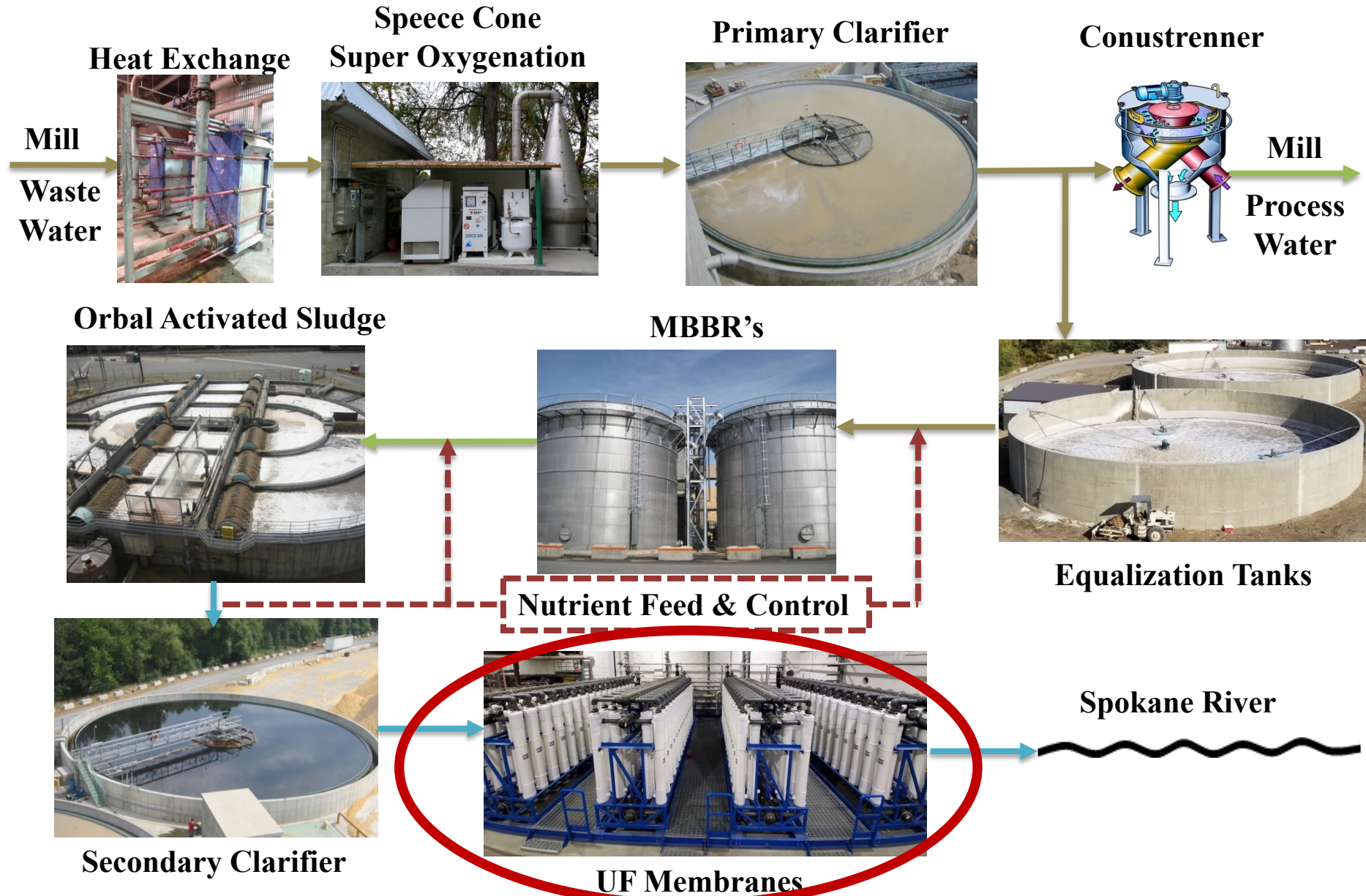
- ❖ Manufacturing paper products in Spokane since 1911
- ❖ Most modern specialty paper mill in the world
- ❖ Newest paper machine in North America



Environmental Stewardship

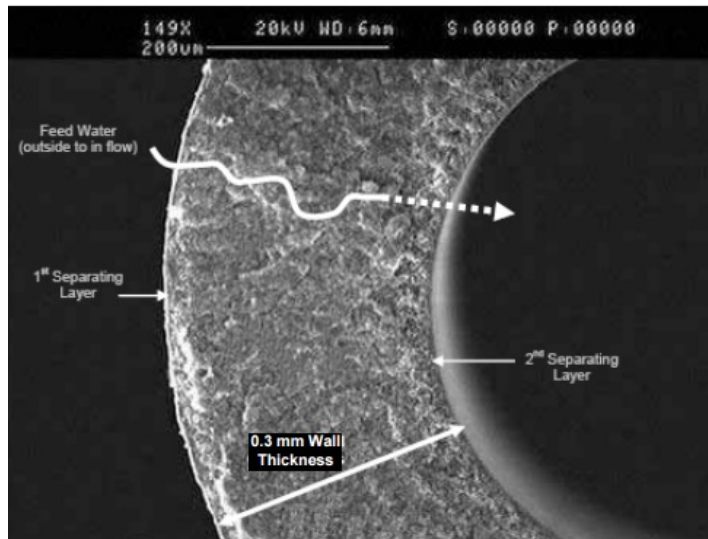
- Use waste & residual products as raw materials
- Use Biomass to produce green energy
- Reduced dependency on Natural Gas by 90%
- Reduced Carbon Footprint by 30,000 TPY
- Minor Source for Air Emissions
- Beneficially use by-products to produce energy, cement, compost and soil amendments
- Reduced water discharge over 50%

Most Advanced WWTS in P & P Industry



UF Modules

- 0.01 micron (μm) Nominal Pore Size
 - (Human Hair = 75, Human Red Blood Cell = 5, Bacteria = 0.2-3)
- Hollow Fiber (~10,000 per Module)
- Absolute Barrier
- Removes 100% TSS



IEP Circles of Sustainability

Own & Manage
121,000 Acres



Plant 750,000
Seedlings/year

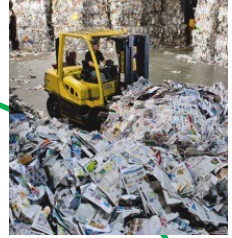
Harvest
32 MMBF/year



Wood
Basket



Process 350
tons/day of
Recycled Paper



Process 475
tons/day of
Wood
Residuals



Produce 525
tons/day & 60
Different
Grades



Paper
Recycling



Recycle ONP,
SOP, OCC,
Magazine

Recycled Paper Products



Consumers



Publishers



Recycled Paper



IEP Paper Mill



Specialty Paper Products



Federal Regulations

SUBCHAPTER R - TOXIC SUBSTANCES CONTROL ACT, PART 761

- Manufacturing and processing of PCBs was banned under TSCA in 1979
- ...pigments that contain 50 ppm or greater PCB may be processed, distributed in commerce, and used in a manner other than a totally enclosed manner until January 1, 1982...*40 C.F.R. § 761.3 (g), Reserved after 1999*
- The concentration of inadvertently generated PCBs in products leaving any manufacturing site or imported into the United States must have an annual average of less than 25 ppm, with a 50 ppm maximum” *40 C.F.R. § 761.3 (1)*

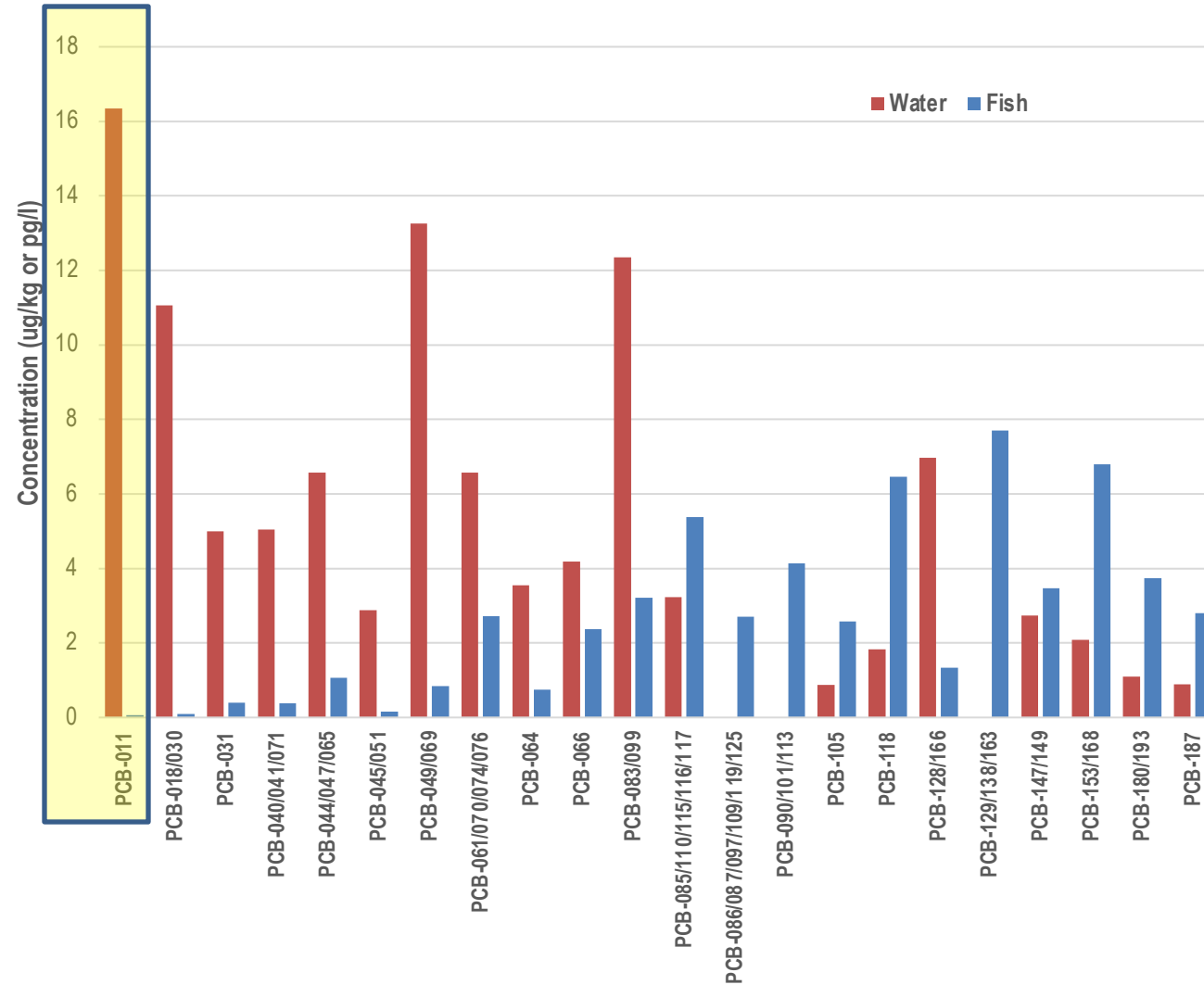
PCB Regulatory Paradox

Reference	PCB Concentration (ppm)	Magnitude Difference
U.S. TSCA Allowance	50 (max.)	----
*WA State WQS (7 ppq)	0.000000007	7,142,857,143
Spokane Tribe WQS (1.37 ppq)	0.00000000137	38,461,538,462

*1 ppq (parts per quadrillion) = 1×10^{-15} = 0.000 000 000 000 007

IEP's Effluent (1,000 pg/L)	0.000 001	99.9% Removal
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PCB Concentrations in Spokane River Fish Tissue & Water Column



PCBs are Nationwide Issue

- Chemical processes may create iPCB byproducts:
 - Pigments
 - Paint
 - Inks
 - Titanium Dioxide
 - Ag chemicals
 - Plastics
 - Cosmetics
 - Soaps
 - Silicone rubber
 - Caulk
- 2010 – 1,084 fish advisories for PCB's in 40 States
- 5,578 water bodies on 303(d) list for PCBs
- Many States are adopting revised Water Quality Standards

IEP PCB

Best Management Practices (BMP's)

– Limited due to primary source from inadvertent generation in inks and pigments:

1. End-of-pipe removal

– IEP has Best Available Technology

– No known technologies to attain WQS

– Prohibitively expensive

2. Elimination of Paper Recycling

Solutions?

■ **Regulatory/Policy:**

- Rulemaking to bring CWA & TSCA regulations on PCBs into conformity
- Perform risk assessment of iPCB related congeners (i.e. PCB-11)
- TSCA reform to reduce or eliminate source of iPCBs

Solutions?

■ **Technical:**

- Use/Develop alternative (non-chlorinated) products
- Encourage End-Users to use non-chlorinated containing products (Publishers, Printers, Packaging, State's, etc.)
- Incentivize competitive marketing advantage with use of non-chlorinated containing products



SAFE + CIRCULAR + JUST
INADVERTENT PCB (IPCB) PIGMENT **RESOURCE**

Home website: <https://www.chemforward.org/ipcb-pigment-resource>

The iPCB Pigment Resource

This database was commissioned by the **Spokane River Regional Toxics Task Force** to help identify possible sources of inadvertent PCBs in pigments. Depending upon the circumstances, some of these pigments may reach water bodies such as the Spokane River.

The purpose of the database is to serve as a resource to help understand which pigments 1) include chlorine in their molecular structure and 2) whether chlorinated solvents are used in the manufacturing process for the pigment.

LINKS:

1. Home website: <https://www.chemforward.org/ipcb-pigment-resource>
2. The iPCB Pigment Resource: <https://www.chemforward.org/ipcb-pigment-resource-tool>

Chem*FORWARD* was commissioned to lead this project. The project involved research, software development, data population and curation, and communication and outreach (via website).

Chem*FORWARD* contracted **Dr. Mark Vincent** and **Grace Manarang-Pena** of **Chroma Specialty Chemicals** to perform the research.

Website Homepage: Background

Polychlorinated biphenyl compounds (PCBs) are a class of chemicals with 209 different congeners depending on the number and location of chlorine atoms on the biphenyl structure. While the deliberate use of PCBs was banned UNDER TSCA in 1976, PCB's that are inadvertently generated during manufacturing are allowed, such as in the production of certain pigments. Selecting pigments that do not contain inadvertently generated PCBs (iPCBs) can improve water quality, the ability to recycle paper and cardboard, and improve a primary food source for tribal communities.

The iPCB Pigment Resource supports those who procure organic pigments for use in coatings, plastics, printing inks and many other products in identifying alternatives that are not manufactured with chlorinated solvents and/or do not have chlorine in their molecular structure, and are therefore unlikely to contain PCBs inadvertently generated during manufacturing.

**GO TO iPCB
PIGMENT
RESOURCE**

Pigments are ubiquitous in consumer products. Manufactured products and the pigments within them inevitably end up in the environment. Some of these iPCB-containing wastes are diverted to recycling and wastewater treatment facilities. Even with the most advanced, state-of-the-art treatment systems, low levels of iPCBs continue to enter waterways above Washington State's water quality standards.

Pigment Resource Landing Page

[About Us](#)[Our Solutions](#)[Our Approach](#)[Our Initiatives](#)[SAFER](#)[News](#)[Login](#)

INADVERTENT PCB (IPCB) PIGMENT RESOURCE

The iPCB Pigments Resource is a free searchable dataset of nearly 400 pigments organized by chemical name, CAS#, color, and presence of chlorine. The tool can be used to find alternatives by avoiding those containing or manufactured with chlorine and thus reducing the likelihood of containing iPCBs.

NOTE: The use or presence of chlorine in a pigment or in the pigment manufacturing process does not definitively determine that inadvertent PCBs are present in a pigment. Manufacturing process changes regularly occur, and current information can be obtained by contacting the pigment manufacturer directly. While it is known that some pigments can contain inadvertent PCBs, such as diarylide yellow, it may not be true for all suppliers of it or other pigments that contain chlorine or could be made with chlorinated solvents.

The iPCB Pigment Resource: <https://www.chemforward.org/ipcb-pigment-resource-tool>

The Pigment Resource: An “Air Table”

Hide fields Filter Sort ...									Q
Pigment Yellow 1									
CAS NO. 2512-29-0	COLOR CLASS Yellow	PIGMENT CLASS Monoazo	COATINGS? Yes	INKS? No	PLASTICS? No	COMMERCIAL AVAILABI... Yes	CONTAINS CHLORINE? No	MANUFACTURED USIN No	
Pigment Yellow 1:1									
CAS NO. 12240-03-8	COLOR CLASS Yellow	PIGMENT CLASS Monoazo	COATINGS? Yes	INKS? Yes	PLASTICS? No	COMMERCIAL AVAILABI... No	CONTAINS CHLORINE? No	MANUFACTURED USIN No	
Pigment Yellow 2									
CAS NO. 6486-26-6	COLOR CLASS Yellow	PIGMENT CLASS Monoazo	COATINGS? Yes	INKS? Yes	PLASTICS? No	COMMERCIAL AVAILABI... No	CONTAINS CHLORINE? Yes	MANUFACTURED USIN No	
Pigment Yellow 3									
CAS NO. 6486-23-3	COLOR CLASS Yellow	PIGMENT CLASS Monoazo	COATINGS? Yes	INKS? No	PLASTICS? No	COMMERCIAL AVAILABI... Yes	CONTAINS CHLORINE? Yes	MANUFACTURED USIN No	
Pigment Yellow 4									
CAS NO. 1657-16-5	COLOR CLASS Yellow	PIGMENT CLASS Monoazo	COATINGS? No	INKS? No	PLASTICS? No	COMMERCIAL AVAILABI... No	CONTAINS CHLORINE? No	MANUFACTURED USIN No	

The information can be filtered, sorted and downloaded

Hide fields Filter Sort

No sorts applied to this view
Pick a field to sort by

Find a field

- Colour Index Number
- CAS No.
- Color Class
- Pigment Class
- Coatings?
- Inks?
- Plastics?

	CAS NO.	PIGMENT CLASS	COATINGS?	INKS?	PLASTICS?	COMMERCIAL AVAILABI...	CONTAINS CHLORINE?	MANUFACTURED USIN
Pigment Yellow 1	2512-29-0		Yes	No	No	Yes	No	No
Pigment Yellow 1:1	12240-03-8		Yes	Yes	No	No	No	No
Pigment Yellow 2	6486-26-6		Yes	Yes	No	No	Yes	No
Pigment Yellow 3	6486-23-3	Yellow	Yes	No	No	Yes	Yes	No
Pigment Yellow 4	1657-16-5	Yellow	No	No	No	No	No	No

The information can be filtered, sorted and downloaded

Hide fields Filter Sort ...

In this view, show records



Where Drag conditions here to add them to this group + 🗑️ ⋮


and ▾ Colour Index ... ▾ contains ▾ Enter a value 🗑️ ⋮


+ Add condition + Add condition group ?

Pigment Yellow						PLASTICS?
CAS NO.						No
2512-29-0						
Pigment Yellow						PLASTICS?
CAS NO.						No
12240-03-8						
Pigment Yellow 2						PLASTICS?
CAS NO.	COLOR CLASS	PIGMENT CLASS	COATINGS?	INKS?		

The information can be filtered, sorted and downloaded

 Hide fields			Filtered by Colour Index Number	 Sort	...
Pigment Yellow 1					
CAS NO.	COLOR CLASS	PIGMENT C			
2512-29-0	Yellow	Monoazc			
Pigment Yellow 1:1					

 Download CSV

 Print view

Questions?

Contact Us:

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360/220-2069

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509/924-1911

Q&A – Comments?



HOW WE MAKE A DIFFERENCE

- Advancing the science, practice, and policy of alternatives assessment and informed substitution
 - Fostering international and interdisciplinary collaboration
 - Supporting a community of practitioners dedicated to the adoption of safer chemicals
-

WHY JOIN A4 OR PARTICIPATE

BECOME A MEMBER

- ✓ Best way to engage with A4
- ✓ Get access to member exclusive content
- ✓ Discounts to A4 events

SIGN UP FOR EMAIL LIST

- ✓ Receive quarterly newsletters
- ✓ Stay up-to-date on webinars, workshops, and events

SHARE A4 CONTENT

- ✓ Follow us on LinkedIn & Twitter
- ✓ Share A4 content with your network
- ✓ Tell a friend about A4

To learn more and join, please visit the A4 website at www.saferalternatives.org .

THANK YOU!

Please complete evaluation poll before
you leave