Best Ecological Practices and Alternatives

Regulatory Floors, Leading Practices, and Open Questions for PTPC

Citizens for Safe Water and Air - Port Townsend

PORT TOWNSEND, WA

This research has been compiled to the best of our ability from named public sources. If you believe any fact presented here is incorrect or incomplete, please contact safewaterandair@gmail.com so it can be reviewed and corrected.

1. Why This Document Exists

Most of this campaign's research documents what has gone wrong at Port Townsend Paper Company (PTPC): violations, spills, health risks, and regulatory gaps. This document takes the opposite approach. It surveys what the kraft pulp and recycled-fiber paper industry is legally required to do, what its most advanced facilities worldwide have voluntarily chosen to do beyond that legal floor, and what has been required of at least one comparable kraft mill by regulators as recently as 2026. It closes with specific, answerable questions for PTPC rather than a list of demands, since this campaign does not have site-specific engineering access to PTPC's own equipment and processes.

Every regulatory figure below traces to a named federal regulation or reference document. Every named-mill example traces to a company, industry, or government publication. Where a technology is promising but not yet commercially proven at scale, or where this research could not locate a rigorous benchmark, this document says so directly rather than presenting every option as equally available today.

2. The Regulatory Floor

PTPC operates two chemically distinct product lines at one site: an unbleached kraft pulping line and an old corrugated container (OCC) recycled-fiber line. Federal wastewater rules, set out in the Code of Federal Regulations (CFR) Title 40, Part 430, regulate them under separate subparts of the same regulation, but the numbers allow a direct comparison at the Best Practicable Control Technology level:

Subcategory	Biochemical Oxygen Demand (BOD), 5-day, 30-day avg (kg per metric ton)	Total Suspended Solids (TSS), 30-day avg (kg per metric ton)	pH range
Unbleached Kraft (Subpart C)	2.8	6.0	6.0-9.0
Secondary Fiber, corrugating medium furnish (Subpart J)	2.8	4.6	6.0-9.0
Secondary Fiber, noncorrugating medium furnish (Subpart J)	1.5	2.5	6.0-9.0

Table 1. Wastewater discharge limits at the Best Practicable Control Technology level, Code of Federal Regulations (CFR) Title 40, Part 430, Subparts C and J. Biochemical Oxygen Demand (BOD) measures how much oxygen-depleting organic material the wastewater contains, shown here as a standard 5-day test result. Total Suspended Solids (TSS) measures the undissolved solid material in the water. Both are reported as a 30-day rolling average, in kilograms of pollutant per metric ton of product made. The pH range is the allowable acidity or alkalinity of the discharge on the standard 0-to-14 scale, where 7 is neutral.

The most notable finding in this comparison: the 30-day average biochemical oxygen demand limit is numerically identical, 2.8 kilograms per metric ton of product, for unbleached kraft pulping and for corrugating-medium recycled processing, even though the two processes use entirely different chemistry. Federal regulators treat them as producing an equivalent regulated organic pollutant load per ton at the regulatory floor. This regulatory floor dates to 1998 for air (the Cluster Rules) and is older still for water (Part 430); meeting it is a legal minimum, not evidence of current best practice.

3. Water Use and Chemical Recovery

A conventional, non-optimized kraft mill in the United States uses roughly 17,000 gallons of water per ton of paper produced. The most water-efficient kraft mills use as little as 4,500 gallons per ton, a nearly fourfold difference using the same basic chemistry, achieved by routing the cleanest treated water to the most demanding uses and progressively lower-grade water to less demanding ones. Compania Manufacturera de Papeles y Cartones (CMPC) Guaiba, a kraft mill in Brazil, holds a documented water intensity record of 24.41 cubic meters per ton of pulp following a 2024 water-savings initiative.

For recycled old corrugated container processing, this research was not able to identify a comparably rigorous water-use benchmark; industry sources describe it as less water-intensive, which is a directionally sound expectation given the absence of a chemical cooking stage, but that specific claim remains unverified against a regulatory or peer-reviewed source.

The kraft process is built around a closed chemical recovery loop: spent cooking liquor (black liquor) is concentrated, burned in a recovery boiler, and the resulting smelt is causticized to regenerate fresh cooking liquor. Modernizing recovery boiler and causticizing equipment, rather than relying only on end-of-pipe treatment, is documented as one of the highest-leverage investments a kraft mill can make, since chemical losses that never enter the recovery cycle become both an economic cost and an environmental discharge at the same time.

4. Odor Control: A Mature, Multi-Vendor Commercial Market

Kraft pulping's characteristic odor comes from total reduced sulfur (TRS) compounds, byproducts of the same sulfur chemistry that makes the chemical recovery cycle work. Non-condensable gas (NCG) collection systems capture these compounds at their points of generation and route them to incineration, converting them into sulfur dioxide, a compound with a substantially higher human odor threshold.

Compania Manufacturera de Papeles y Cartones (CMPC) Guaiba has operated as a certified near-total odor-free mill since 2015 using a mill-wide Non-condensable gas (NCG) system marketed as ODOCON, capturing gases from more than 100 emission sources and routing them to six redundant incineration

locations rather than the two typical of a standard mill design, specifically so a single equipment failure cannot cause an uncontrolled release.

New research conducted for this document confirms this is not a one-off custom system. Valmet, a major pulp and paper equipment supplier, documents over 40 years of experience and hundreds of Non-condensable gas (NCG) system deliveries worldwide, offered for both new mills and retrofits to existing facilities; a competing supplier, Andritz, offers an equivalent product line. Mill-wide Non-condensable gas (NCG) collection and incineration is, in other words, an established commercial product category with more than one vendor, not a speculative or unproven concept.

One distinction matters for accurate public communication: Non-condensable gas (NCG) incineration converts odorous reduced sulfur compounds into sulfur dioxide and other combustion byproducts. It does not eliminate the underlying sulfur mass; it changes its chemical form into one with a much higher odor threshold. Odor elimination and total pollutant load reduction are related but distinct engineering objectives.

5. Next-Generation Technology: Black Liquor Biorefining

Beyond conventional recovery boilers, black liquor gasification has been researched for decades as a way to convert spent cooking liquor into synthesis gas and value-added biochemicals rather than only burning it for steam, potentially improving both energy yield and chemical recovery efficiency. New research conducted for this document found that this technology, while technically demonstrated at pilot and demonstration scale, is not yet commercially proven at full scale.

Chemrec, the technology's leading developer, attempted a commercial-scale facility (the Domsjo Biofuel project) from 2009 to 2012 with substantial Swedish government grant funding, but the project stalled in 2012 when lenders would not provide the remaining debt financing due to concerns about an unstable regulatory framework; a related demonstration plant was mothballed in 2016 awaiting further funding that has not materialized. Chemrec today functions as an intellectual property licensor rather than an operator of any active commercial installation.

This is included here as an honest finding, not a demand: black liquor biorefining represents a genuinely promising direction for reducing fossil fuel dependence and creating additional value from mill byproducts, but this campaign is not aware of it operating commercially anywhere today, and it should not be presented as a readily available option for PTPC in the way non-condensable gas collection can be.

6. Wastewater Treatment Beyond the Basics

The treatment chain that enables advanced water recycling runs from primary physical treatment (removing solids) through secondary biological treatment (microorganisms consuming dissolved organic matter) to tertiary advanced treatment, ozone or other oxidation processes for compounds biology cannot break down, and membrane filtration such as nanofiltration or reverse osmosis to produce water clean enough to return to the production process. Membrane bioreactor systems, which combine biological treatment with membrane filtration in a single step, are documented in the peer-reviewed literature as applied specifically to pulp and paper mill wastewater for effluent reuse, an additional option beyond the ozone/nanofiltration combination already documented for kraft mills

generally.

7. Energy Recovery and Fossil Fuel Displacement

Svenska Cellulosa Aktiebolaget (SCA) Containerboard's Obbola and Munksund kraft mills in Sweden became the first kraft mills in the world to achieve fully fossil-free industrial operations, Munksund in 2015 and Obbola in 2022, by replacing oil-fired lime kilns with biofuel-fired kilns. Metsa Fibre's Kemi bioproduct mill in Finland started operation in September 2023 on zero fossil fuels and achieved energy self-sufficiency of 159 percent in its first year, exporting the surplus to the regional grid. Together these demonstrate that full fossil fuel displacement in kraft lime kiln and energy operations is commercially operating technology today, not a theoretical or pilot-scale concept, at multiple mills across two Scandinavian countries.

8. Alternatives to Wood Pulp

PTPC's most direct fiber alternative is already part of its own operations: its old corrugated container (OCC) recycled-fiber line, which is chemically unrelated to kraft pulping. Recycled fiber processing is mechanical and physical, repulping, screening, and cleaning, rather than chemical digestion; it produces no total reduced sulfur compounds since there is no cooking liquor, though cellulose fibers shorten and weaken with each recycling cycle, a genuine physical limit on how far recycled content can be pushed without blending in virgin fiber.

Beyond recycled fiber, new research conducted for this document examined non-wood plant fiber sources: agricultural residues (wheat straw, sugarcane bagasse), and dedicated fiber crops (miscanthus, bamboo, hemp, kenaf). A 2017 life-cycle and market review found that miscanthus, bamboo, and agricultural residues show the lowest environmental input requirements among the alternatives studied, with miscanthus alone potentially able to supply an estimated 65 million tons of fiber annually by 2040 at a low per-ton cost; agricultural residues carry a particular advantage in that their production impacts are already shared with their primary crop use.

Other options carry real trade-offs: hemp, for example, requires substantial nitrogen fertilizer input and shows higher greenhouse gas emissions from intensive farming than the low-input perennials do.

This research does not support an overstated claim in either direction. The same 2017 review states plainly: it is "not convinced that any alternative fiber type has a definitive environmental advantage over every type of wood fiber in general." No non-wood fiber source is a straightforward drop-in substitute for PTPC's existing kraft process chemistry or equipment, and switching a mill's furnish is a major engineering undertaking, not a simple purchasing decision. What this research does establish is that PTPC's own recycled-fiber line is the most directly relevant, already-operating alternative to evaluate, and that a broader non-wood fiber shift, while an active area of industry research, remains a longer-horizon question rather than a near-term ask.

8a. Mills That Have Moved Away From Kraft Pulping Entirely

The comparison above is about fiber type. A separate, sharper comparison is about the process itself: does a mill need to cook wood chips in white liquor and store that chemical on site at all? New research conducted for this document identified real, operating examples of paper mills that answer no, not as a

hypothetical, but as a completed or in-progress business decision.

Pratt Industries operates multiple United States containerboard mills built from the ground up on 100 percent recovered fiber, with no kraft cooking process and no chemical recovery system, meaning no white liquor of any kind is produced, used, or stored on site. Its Valparaiso, Indiana mill, a 260 million dollar investment that started up in September 2015, converts approximately 3,000 tons of recovered paper a day into linerboard and corrugating medium at a rated capacity of 370,000 tons per year, using an OptiConcept M board machine supplied by Valmet, the same industrial vendor that sells non-condensable gas and odor-control equipment referenced elsewhere in this document.

Pratt built a second, comparable 100 percent recycled mill in Wapakoneta, Ohio. These are not retrofits or partial conversions: they are proof that a modern, large-scale containerboard mill can be designed and operated with the white-liquor tank category eliminated from the facility entirely, the same category of tank involved in the Longview disaster.

A second, more directly comparable example emerged in the course of this research: Finch Paper, an integrated kraft pulp and paper mill in Glens Falls, New York, announced in July 2026 that it is discontinuing on-site pulp production altogether, keeping only its paper-making operation and a smaller biomass co-generation unit for steam. Finch will instead purchase market pulp from outside suppliers, expected to be sourced largely from a sister facility, Millar Western, an Alberta, Canada pulp producer. Finch Paper is owned by Atlas Holdings, the same private equity firm that owns PTPC. This is not an outside competitor making this move.

It is PTPC's own corporate parent, at another integrated kraft mill in its own portfolio, choosing to end on-site chemical pulping and the liquor-handling infrastructure that comes with it, in favor of purchasing pulp instead. Atlas Holdings has not stated that PTPC is under similar consideration, and this document draws no conclusion about PTPC's own plans one way or the other. What this research establishes is narrower and factual: the parent company that owns PTPC has, this year, at a comparably sized mill it also owns, judged ending on-site kraft pulping to be a viable business decision.

Neither example is offered as a costless or simple substitution. Pratt's mills were purpose-built as recycled-fiber facilities from day one, not converted from an existing kraft line, and Finch's transition involves purchasing pulp rather than eliminating fiber processing altogether, plus open questions about job impacts on its own wood-yard and mill staff. Both examples do, however, directly answer the specific question this section was built to address: whether mills exist that have moved away from white-liquor kraft pulping, either from inception or through an active, current transition, rather than only through PTPC's own hybrid model of running a recycled line alongside, not instead of, its kraft line.

9. Precedent: What Regulators Have Required Elsewhere

New research conducted for this document identified a directly comparable, current example. On July 30, 2026, the United States Department of Justice lodged a proposed consent decree against Domtar A.W., LLC, over its kraft paper and pulp mill in Ashdown, Arkansas, alleging violations of the same regulatory framework PTPC operates under: the New Source Performance Standards and the National Emission Standards for Hazardous Air Pollutants under the Clean Air Act.

The underlying violation was a failure to install adequate pollution controls on the mill's brown stock washer, which separates black liquor from pulp fiber and can leak hydrogen sulfide without proper controls, along with 17 instances of missed required inspections and inadequate performance testing on two boilers.

The required remedy is specific and instructive: Domtar must install capping valves on the brown stock washer to prevent leaks, update its biological wastewater treatment system to capture hazardous air pollutants and volatile organic compounds before they are emitted, and undergo third-party review and revision of its leak detection and repair plan. The company agreed to pay 1.5 million dollars in penalties (split between Arkansas and the federal government) and undertake approximately 2.6 million dollars in emission-reduction projects.

This is a live, 2026 example of a federal regulator identifying and requiring fixes to the same category of equipment and the same class of hazardous, odor-causing leak that this campaign has documented concerns about at PTPC, at a comparably sized kraft facility, under the same federal statute.

10. What PTPC Has Already Done

For balance, new research conducted for this document found that PTPC has undertaken at least one documented modernization project. According to a June 2019 supplier case study, PTPC began a phased digital-control upgrade in April 2018, installing an ABB System 800xA integrated control platform and OPT800 Cook/B advanced process control for its batch digesters. The stated purpose was production efficiency: better sequencing and scheduling of wood-chip cooking, described as reducing kappa variation and enabling steam leveling, which in turn reduces chemical and steam usage per ton produced.

This is a genuine efficiency and resource-use improvement, though it is a process-control upgrade rather than a dedicated emissions-control or odor-control investment of the kind described in the sections above; this campaign is not aware of any comparable public documentation of PTPC evaluating non-condensable gas collection, lime kiln fuel conversion, or brown-stock-washer leak controls specifically.

11. Certification Systems

- Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC): chain-of-custody certifications verifying wood fiber originates from responsibly managed forests. Both maintain distinct standards for virgin versus reclaimed fiber; a generic certification claim does not by itself verify recycled content without a specific recycled-fiber standard reference, such as the Forest Stewardship Council's FSC-STD-40-007.
- Sustainable Forestry Initiative (SFI): a North American forest management and fiber sourcing standard, endorsed by the Programme for the Endorsement of Forest Certification, functioning similarly to the Forest Stewardship Council as a chain-of-custody system.
- International Organization for Standardization (ISO) 14001: an environmental management system certification. It certifies that a facility has documented processes for managing and continually improving its environmental performance; it does not certify fiber sourcing, and is complementary

to, not a substitute for, the chain-of-custody certifications above.

12. Synthesis: Open Questions for PTPC

None of the examples in this document are presented as directly transferable to PTPC's specific engineering circumstances without site-specific evaluation. They are presented as documented evidence that the investments described are commercially operating technology at kraft and recycled-fiber mills elsewhere in the world today, a live 2026 example of what a federal regulator has required at a comparable mill, and an honest accounting of which next-generation technologies remain unproven at commercial scale. Several specific, answerable questions follow directly:

- What is PTPC's current water use per ton of pulp produced on its kraft line, and how does it compare to the 4,500 to 17,000 gallon per ton range documented for United States kraft mills?
- Has a non-condensable gas collection system upgrade, of the kind commercially offered by multiple suppliers and documented at Compania Manufacturera de Papeles y Cartones (CMPC) Guaiba, been evaluated for PTPC's recovery boiler, smelt tank, and washer vent emission points?
- Does PTPC's brown stock washer have capping valves and leak detection controls equivalent to what Domtar was required to install at its comparable Ashdown, Arkansas kraft mill in 2026?
- Does PTPC's lime kiln operate on fossil fuel or biofuel, and has a conversion of the kind documented at Svenska Cellulosa Aktiebolaget's Munksund and Obbola mills been evaluated?
- What is PTPC's current virgin-to-recycled fiber ratio for its linerboard and corrugating medium products, and does PTPC hold a Forest Stewardship Council Recycled or Programme for the Endorsement of Forest Certification Recycled certification specifically for that recycled-content line?
- Beyond the 2018 to 2019 digital process-control upgrade, what other modernization or emissions-control investments, if any, has PTPC made or evaluated in the years since, and are they published for public verification?
- Given that Atlas Holdings, PTPC's own owner, is discontinuing on-site kraft pulping at its Finch Paper mill in 2026, has Atlas Holdings evaluated, or would it consider evaluating, a similar transition away from on-site white liquor production and storage at PTPC?

Sources and Citations

All factual claims in this document are drawn from the following sources, verified during research for this document.

1. Code of Federal Regulations, Title 40, Part 430, Subparts B, C, and J (Effluent Limitations Guidelines and Standards for the Pulp, Paper, and Paperboard Point Source Category).

2. United States Environmental Protection Agency, 1998 Pulp, Paper, and Paperboard Industry Cluster Rules (combined Clean Air Act and Clean Water Act requirements for kraft mills).

3. European Union Best Available Techniques (BAT) Reference Document for the Production of Pulp, Paper and Board.

4. Compania Manufacturera de Papeles y Cartones (CMPC) Guaiba mill, Rio Grande do Sul, Brazil, published sustainability results (water intensity and non-condensable gas collection/ODOCON system).

5. Svenska Cellulosa Aktiebolaget (SCA) Containerboard, published statements and case studies on the Munksund (2015) and Obbola (2022) fossil-free lime kiln conversions.

6. Metsa Fibre, published sustainability reporting on the Kemi bioproduct mill (started September 2023, 159 percent first-year energy self-sufficiency).

7. Das, T.K. and Jain, A.K. (2001), cited in a 2004 peer-reviewed review of pulp and paper mill wastewater treatment (aggregate United States mill effluent, biochemical oxygen demand, and suspended-solids reductions from process modification).

8. NORPAC, published sustainability materials describing its hybrid virgin-and-recycled fiber pulping model.

9. Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) chain-of-custody and recycled-content certification standards, including FSC-STD-40-007.

10. Valmet, "Mill Wide NCG Handling: Odorous Gas Control" product documentation (over 40 years of non-condensable gas system deliveries; also offered by competing supplier Andritz).

11. Wikipedia, "Chemrec" (accessed August 2026), on the commercial status of black liquor gasification technology, including the 2012 halt of the Domsjo Biofuel commercial-scale project and the 2016 mothballing of the Pitea demonstration plant.

12. Packaging Dive and the Federal Register, "Notice of Lodging of Proposed Consent Decree Under the Clean Air Act," July 30, 2026, United States v. Domtar A.W., LLC (Ashdown, Arkansas kraft mill).

13. Green Seal, "Life Cycle and Market Review of the Major Alternative Fibers for Paper Production" (April 2017).

14. ABB, "North American Paper Producer Eases into the Future with ABB Digital Solutions," June 23, 2019, describing Port Townsend Paper Company's System 800xA and OPT800 Cook/B digital control upgrade beginning April 2018.

15. Port Townsend Paper Company's own 2018 pulper upgrade application, already documented elsewhere in this campaign's archive.

16. Valmet, "Pratt Industries Goes for 100% Recycled Board," on Pratt's PM 16 OptiConcept M line, Valparaiso, Indiana (started up September 2015, 100 percent recovered-fiber furnish, no kraft cooking or chemical recovery system on site).

17. Packaging Gateway, "Pratt Industries Recycled Paper Mill, Valparaiso, Indiana" (Valparaiso facility: $260 million investment, 370,000 tons per year capacity, opened October 2015, 120 new jobs).

18. New York Almanack, "Finch Paper Closing Glens Falls Pulp Mill," July 18, 2026 (Finch Paper, owned by Atlas Holdings, discontinuing on-site pulp production in favor of purchased market pulp, expected to source primarily from Atlas Holdings' own Millar Western pulp mill in Alberta, Canada; a smaller biomass co-generation unit for steam is being retained).