

Air Pollution at Kraft and Paper Mill Communities

Research, Monitoring, and Outcomes

Citizens for Safe Water and Air - Port Townsend

PORT TOWNSEND, WA

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1. Port Townsend Paper Company (PTPC)'s Own Documented Air Pollution History

2006 to 2008: The First Organized Air Quality Fight

In 2006, a Port Townsend resident named Elaine Bailey discovered that the Washington State Department of Ecology had issued PTPC a new air permit valid until 2009, one that relied heavily on the mill to test and monitor its own emissions and to respond to citizen complaints itself, rather than on independent government-run monitoring [1]. The group she led grew to roughly 150 members and became known as Port Townsend Airwatchers [1]. A February 19, 2008 article profiled Cindy Buxton, a Port Townsend resident and geologist who, with her husband, had moved to the town in 2002 [1].

Buxton described waking one night to the smell of rotten eggs while her 10-year-old son violently vomited [1]. She subsequently developed what she described as permanent chemical sensitivity, with headaches and respiratory problems that did not resolve, and sixteen months after the initial exposure, she and her family relocated permanently to Alaska [1]. She filed an appeal of the mill's air permit and discovered through that legal process that the Washington State Department of Ecology had never investigated her original complaint [1].

That same month, the Washington State Pollution Control Board sided with mill critics and ordered the Washington State Department of Ecology to rewrite PTPC's air permit, after federal regulators had accused the state of being too lenient in its air quality monitoring requirements for the mill [1]. No ambient air monitoring existed at that time to independently measure the concentration of contaminants drifting from the mill's stacks [1].

2008: The First Health Consultation

A Washington State Department of Health Health Consultation, dated December 24, 2008, documented community complaints recorded by the mill between January 19, 2004 and July 10, 2007: ten written letters and ten electronic mail messages [2]. The consultation summarized that community complaints described smells of rotten eggs and "pungent acid" odors that irritated eyes, throat, and nose and caused headaches, with some residents reporting that these odors triggered asthma-like reactions and vomiting [2]. The consultation's central finding was that all the information necessary to conduct a full health study was not available to assess the possible health effects associated with air emissions from the mill [2].

2016 to 2021: Continued Odor Complaints

Nearly 2,000 odor complaints were recorded by the Washington State Department of Ecology and PTPC between 2016 and 2021, specifically describing the smell of rotten eggs and “pungent acid” odors coming from the facility [3].

2015 to 2024: The Exposure Investigation

In 2015, the Washington State Department of Health requested that the Agency for Toxic Substances and Disease Registry conduct a formal exposure investigation in Port Townsend to address the ongoing odor complaints [3]. Preliminary air dispersion modeling was completed in 2016 and 2017 [4]. Field air sampling was conducted over approximately ten weeks in fall 2018 [4]. The resulting report was not published until June 24, 2024, nearly six years after sampling concluded [4].

2. Longview, Washington: Air Quality Issues Beyond the Fatal Explosion

Longview is home to several separate mill facilities, including Nippon Dynawave Packaging Corporation (the site of the May 26, 2026 fatal tank implosion), WestRock Longview (acquired by Smurfit in 2024 and now known as Smurfit Westrock), and North Pacific Paper Company [8]. A large wood chip pile at the Nippon Dynawave facility caught fire the evening of July 18, 2023, and burned through at least July 20 [5][6]. The fire created smoke that traveled as far as Portland and Vancouver, Oregon and Washington, producing air quality officially rated “unhealthy” by the Oregon Department of Environmental Quality, and the Southwest Clean Air Agency issued an air pollution advisory for Clark and Cowlitz counties [6].

Residents near the mill were told to shelter in place, and fine particulate pollution was expected to linger for several days [5]. The exact cause of the fire was never determined [8].

A separate fire occurred on the same property in 2025 without injuries [8]. In September 2024, residents across a roughly 60-mile stretch from Longview to Portland reported a mysterious, persistent odor described as similar to burning rubber, garbage, ammonia, or natural gas, with some residents reporting itchy eyes, headaches, and sore throats [9][10]. The Washington State Department of Ecology opened an investigation into WestRock Longview's air quality data [9].

In November 2024, Ecology concluded that operations at the WestRock Longview mill “likely caused an increase in odors” in the area on September 24, 2024, while stating it did not have data proving the mill was the source of odors reported as far away as Vancouver and Portland, and could not rule out other contributing sources [10]. WestRock stated no air permit violations occurred at the facility that day [9][10].

In November 2025, a group of residents filed a class action lawsuit against WestRock Longview over the odor, alleging the company had not used adequate odor mitigation and control technology [11]. The lawsuit noted WestRock was ranked the state's fourth-largest industrial air polluter in 2023 by an analysis of state data, had been fined \$9,500 for air quality violations in 2022, and received an additional notice of violation on October 8, 2024 for exceeding permitted discharge limits [11].

Following the fatal May 2026 implosion, the United States Chemical Safety and Hazard Investigation Board opened its own independent investigation, separate from the Washington State Department of Labor and Industries inspection already documented elsewhere in this campaign's files [8].

3. Peer-Reviewed and Government Air Studies at Other Kraft Mills

Weyerhaeuser Kraft Mill, Plymouth, North Carolina

Following resident odor complaints and elevated county asthma rates, the Agency for Toxic Substances and Disease Registry conducted an exposure investigation at this kraft mill, testing air quality near schools and the community between October 2004 and February 2005 [12]. The investigation found sulfur dioxide levels at points exceeding the United States Environmental Protection Agency's formal 24-hour National Ambient Air Quality Standard of 140 parts per billion, a more consequential regulatory threshold than the screening-level comparisons used in some other exposure investigations [12].

Lewis-Clark Valley, Idaho and Washington

A study measured 50 volatile organic compounds, including benzene, toluene, chloroform, dimethyl sulfide, and dimethyl disulfide, near a kraft paper mill in the Lewiston, Idaho and Clarkston, Washington area [13]. The study used both active and passive sorbent-tube air sampling, analyzed by thermal desorption gas chromatography with mass spectrometry, across 10 monitoring sites and more than 800 samples collected in 2017 and 2018 [13]. Passive samplers were also deployed at three urban comparison locations specifically to establish an independent baseline, a methodological step not taken in PTPC's own 2024 exposure investigation [13].

The study calculated a cumulative excess cancer risk range of 2 to 11 cases per 1,000,000 people, with the primary risk drivers identified as chloroform, benzene, and carbon tetrachloride, a different chemical profile than the aldehyde-driven risk finding at PTPC [13]. The study's overall conclusion characterized the risk as low, while also noting it was above the United States Environmental Protection Agency's baseline comparison level [13].

4. Crofton, British Columbia: A Documented Air Quality Improvement

The Crofton kraft pulp mill in the Cowichan Valley, British Columbia, has documented measurable air quality improvements over time. Daily particulate matter releases declined 95 percent between 1990 and 2019 [14]. Total reduced sulfur emissions dropped 34 percent and greenhouse gas emissions dropped 66 percent over a comparable period [14]. These reductions are attributed to specific capital investments: new recovery boilers, new electrostatic precipitators, and a fuel switch from oil to natural gas [14].

The Province of British Columbia separately conducts its own dedicated Cowichan Valley air study through its Ministry of Environment and Climate Change Strategy, and has found sulfur dioxide levels in the area well below Canadian air quality standards [15]. A community liaison forum exists in which mill officials provide operational updates and report on public complaints. A resident quoted in reporting on

this forum described it as lacking the technical background to examine data closely without the community hiring its own outside consultant [14], a limitation directly comparable to the Local Emergency Planning Committee's own technical capacity gap already documented elsewhere in this campaign's files.

5. National Context: The Paper Industry's Air Pollution Record

The Environmental Integrity Project's May 2025 report, "A Paper Trail of Pollution," examined the 185 largest pulp and paper mills in the United States over more than six months of research, including site visits in three states [16]. Key national findings relevant to air pollution:

- The average industrial boiler among the 185 mills studied is 41 years old [16]. The single oldest boiler of any mill studied, installed in 1928, belongs to the facility now called Nippon Dynawave Packaging in Longview, Washington, the same facility where the fatal May 2026 tank implosion occurred [16]. More than 40 percent of the 185 mills studied (77 of 185) had at least one boiler 50 years old or older [16].
- Pulp and paper mills are among the largest sources of hydrogen sulfide air pollution in the United States. Six of the ten largest single industrial hydrogen sulfide emitters reporting to the United States Environmental Protection Agency in 2023 were paper mills [16]. Ninety plants reported emitting a combined 8 million pounds of hydrogen sulfide that year, with almost half of that total coming from just the top 12 plants [16].
- A third of the 185 mills studied (63 of 185) had at least one air pollution violation in the preceding three years [16]. State and federal agencies brought 267 air pollution enforcement actions against 95 plants over five years, totaling \$7.4 million in penalties nationally [16].
- In 2020, the 185 mills studied reported emitting a combined 46,095 tons of sulfur dioxide [16]. The report noted some mills lack basic pollution control devices, including scrubbers, that could reduce sulfur dioxide and hydrogen sulfide emissions [16].
- The paper industry's reported greenhouse gas emissions substantially undercount its actual climate impact due to a federal reporting exemption for "biogenic" fuels such as wood and black liquor. In 2023, the 185 mills studied reported 33.2 million metric tons of greenhouse gases to the United States Environmental Protection Agency, less than a third of their estimated actual emissions of 115 million metric tons [16].

The Report's Washington State Case Study: PTPC

The report's dedicated Washington State case study states that PTPC's mill has been in violation of the Clean Air Act for 11 of the last 12 quarters, including for releasing hazardous air pollutants, soot, and nitrogen oxides, and has been subject to five air pollution enforcement actions and 23 violation notices over the last five years, resulting in \$63,750 in penalties [16].

The report quotes Don Ehnebuske, identified as a neighbor of PTPC: "Local communities are subjected to noxious combinations of airborne chemicals from paper mills while there are proven strategies to dramatically reduce these odors. The lack of adequate regulation protects profits for these mills while putting the expense to health and quality of life onto the backs of local people." [16]

Comparison Case Studies From the Same Report

Covington, Virginia (Smurfit Westrock): a 126-year-old mill using a boiler installed in 1940, among the worst national air polluters in the industry for nitrogen oxide and methane emissions [16]. The mill reported 970,084 metric tons of greenhouse gas emissions in 2023, the most of any United States paper mill, though the report estimates actual emissions at approximately 2.49 million metric tons once biogenic fuel emissions are included [16].

Catawba, South Carolina (New-Indy Containerboard): a mill with a boiler system dating to the Eisenhower administration [16]. Local residents have filed nearly 50,000 odor complaints since the facility was acquired in 2018 [16]. In 2023, the plant was the worst-ranked polluter in the nation for mercury and zinc air pollution among all 185 mills studied [16].

Rumford, Maine (ND Paper Mill): the same national report ranked this kraft mill the second-largest mercury emitter among all 185 mills studied nationally, one of the last plants in the country still burning both coal and tires as fuel [16][17]. Local residents have referred to the town as “Cancer Valley” due to persistent mill odor and smoke [17]. Skowhegan, Maine (Sappi Somerset Mill): ranked in the national top 20 for hazardous air pollutant emissions in a separate year's data cited in the same report [16].

6. Air Monitoring Equipment and Measurement Technology

Consumer-Grade Total Volatile Organic Compound Sensors

Cost range approximately \$200 to \$300 [18]. These sensors, including AirThings and the PurpleAir Zen (which added a general gas sensor alongside its particulate sensor), use metal oxide sensing technology that registers a combined total volatile organic compound reading and cannot distinguish one compound from another [18]. Readings can be affected by humidity, temperature, and background biogenic sources such as vegetation [18].

Particulate Matter Sensors

Cost range approximately \$140 to \$350 per unit [19]. PurpleAir is the most widely used brand in community monitoring networks and has been found by the South Coast Air Quality Management District's independent testing to have among the highest correlation with reference-grade instruments of 19 low-cost particulate sensors evaluated [19].

Professional Real-Time Compound-Specific Monitors

Cost range approximately \$1,000 to \$2,500 per unit for a base monitor plus one gas-specific sensor head [20]. The Aeroqual Series 500 is one example [20]. Each unit measures one gas at a time, so covering multiple compounds such as sulfur dioxide, hydrogen sulfide, and volatile organic compounds simultaneously requires either swapping sensor heads or running multiple units [20]. The volatile organic compound sensor head on this class of instrument is still an aggregate reading, not true compound identification, the same fundamental limitation as consumer sensors, though more stable and better logged over time [20]. Sensors also drift and typically require replacement every two years [20].

Passive Sampling for Laboratory Compound Identification

Passive thermal desorption tubes collect air samples via diffusion over a set period, commonly one week, without power or pumps, and are analyzed at a laboratory by thermal desorption gas chromatography with mass spectrometry, which identifies and quantifies individual compounds [13][21]. Laboratory analysis costs, confirmed from multiple commercial sources, range from \$160 to \$468 per sample for badge or tube methods [21], and \$650 to \$936 per sample for canister-based methods under United States Environmental Protection Agency Method TO-15 [22].

7. Community-Led Air Monitoring: THRIVEair

THRIVEair is a partnership between the Philadelphia environmental justice organization Philly Thrive and Drexel University public health scientists, conducted June 2023 through June 2024 near a former oil refinery site [23]. The project monitored 37 volatile organic compounds, including benzene, using passive thermal desorption tubes mounted 8 to 10 feet up on utility poles [23]. Nine sites were monitored weekly and 11 additional sites on a rotating seasonal basis [23].

Quality control included field and laboratory blanks every two weeks, a duplicate co-located sample each week, and one site co-located with a government reference monitor [23]. The project was funded through a National Institute of Environmental Health Sciences research grant and Drexel University pilot funding [23]. Average benzene concentration across the project's stationary sites over the full year was 1.32 micrograms per cubic meter, ranging from 0.30 to 9.04 micrograms per cubic meter [23].

When the project's data caught an unexplained one-week spike at a specific site, project members brought the finding directly to the site's redeveloper [23][24]. The redeveloper had no legal obligation to respond, but voluntarily began its own ongoing benzene monitoring at that exact location and has continued sharing that data with the project weekly since [23][24].

8. Washington State Legislative and Regulatory Landscape for Air Pollution

Healthy Environment for All Act

Passed as Senate Bill 5141 in 2021, this is Washington State's first coordinated cross-agency environmental justice law [25]. It requires seven state agencies to conduct environmental justice assessments before certain major decisions and build community engagement plans, and it created the Environmental Health Disparities map used to rank overburdened communities statewide [25]. The law is procedural: it requires agencies to assess and document impacts and engage communities, but it does not itself grant any agency new authority to deny a permit or force a company to change its operations [25].

Climate Commitment Act and the SensWA Air Monitoring Network

Also passed in 2021, this cap-and-invest program for greenhouse gas emissions separately requires the Washington State Department of Ecology to identify overburdened communities, build an air monitoring network in them, and identify the specific facilities responsible for the highest levels of criteria air pollutants in each [26]. That air monitoring network, known as SensWA, currently covers sixteen communities identified using the Environmental Health Disparities map: South King County, South Seattle, Spokane and Spokane Valley, South and East Tacoma, Tri-Cities to Wallula, Vancouver,

Everett, East Yakima, Lower Yakima Valley, North Seattle and Shoreline, Wenatchee and East Wenatchee, Ellensburg, Northeast Puyallup, Moxee Valley, Mattawa, and George and West Grant County [27].

Jefferson County and Port Townsend are not among these sixteen communities [27]. The selection criteria are built primarily from income, race, and historical redlining data, not from whether a documented industrial air pollution source exists nearby [27]. Port Townsend's demographics, an older, whiter, and comparatively higher-income population than the communities this program was designed to prioritize, place it outside the demographic profile the selection criteria were built to identify, regardless of the documented pollution source located there.

Cumulative Risk Burden Pollution Act

Sponsored by Representative Sharlett Mena of Tacoma and supported by the Front and Centered coalition, this bill would have gone further than either of the laws above by allowing the Washington State Department of Ecology to deny air pollution permits based on cumulative pollution burden in overburdened communities [28]. First introduced in 2024 as House Bill 2070, it did not pass [28]. Reintroduced in 2025 as House Bill 1303 and Senate Bill 5380, its substance had already been significantly reduced by that point, no longer including cumulative impact permit-denial authority, and instead limited to adding an environmental justice review step to existing state environmental policy review [28].

It did not pass in 2025 and did not pass in the 2026 session either [28].

9. Synthesis

PTPC's own documented air pollution history spans at least two decades: a 2006 discovery that the mill's air permit relied on self-monitoring, a 2008 case of a named resident relocating permanently after reporting permanent health effects, a 2008 state pollution board order to rewrite the mill's air permit, nearly 2,000 recorded odor complaints between 2016 and 2021, and a federal exposure investigation that took from a 2015 request to a 2024 publication to complete.

This is not an isolated pattern. The same structural issues, self-monitoring, outdated equipment, hydrogen sulfide and sulfur compound emissions, and gaps between community complaints and independent verification, recur across kraft and paper mill communities nationally and internationally, from Longview and Plymouth, North Carolina to Lewiston, Idaho, Crofton, British Columbia, Covington, Virginia, Catawba, South Carolina, and Rumford, Maine.

Real, working equipment and methodology exist to close the specific gap Port Townsend has faced, compound-specific identification rather than aggregate readings, at costs far below the six-figure sums sometimes cited as the only option. Other communities, including Philly Thrive's THRIVEair project, have used exactly this kind of rigor to build credible, defensible data and, in at least one documented case, to prompt voluntary action from a polluting facility.

Washington State has real environmental justice infrastructure, but it was built around demographic disparity criteria that do not currently include Port Townsend, and the one bill that might have added binding enforcement teeth to state air pollution permitting has failed in three consecutive legislative

attempts.

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