The most dangerous Portland-area stationary industrial air polluters

Health risks are from DEQ Level I Screening data unless otherwise cited.
Cancer risk is expressed as expected cases per million people; noncancer risk is stated as a health benchmark number. Both are calculated as risk to neighbors living 50 meters from the smokestack.

Portland ranking		cancer risk	noncancer chronic risk	noncancer acute risk	prioritization risk estimate
1 *	Owens Brockway	29,796	354	110	1,655
2 *	Precision Cast Parts	31,479	191	127	1,577
3 *	Columbia Steel	15,749	36	44	709
4 **	Union Pacific, Albina	5,996	noncancer data unknown		239
5	Hydro Extrusion	1,560	116	26	204
6	Ecolube	no data, Ecolube failed to provide an Emmissions Inventory to DEQ			
7	ORRCO	882	36	123	194
8	Gunderson	412	51	102	169
9	ESCO	1,206	30	7	85
10	OR National Guard	1,989	<1	1	80
11 **	Union Pacific, Brooklyn	1,998	noncancer data unknown		79
Washington County ranking					
1 **	Hillsboro Airport	unknown	risk is dispersed differently		209
2	Intel	409	65	25	106
3	Stimson	334	34	18	65
4	T5@Portland	343	9	34	56
5	Lam Research	54	14	18	34
6	Jireh Semiconductor	19	26	<1	26

* Owens Brockway, Precision Cast Parts, and Columbia Steel health risks are primarly from chromium. The numbers above assume 100% of the chromium is hexavalent. All three industries are currently source testing to reveal their percentage of hexavalent chromium to trivalent chromium because trivalent chromium is not a carcinogen. On December 30, 2019 Owens Brockway idled its green glass furnace, ending its chromium emissions. In 2020, Precision Cast Parts installed Ulta Low Particulate Air filters to dramatically reduce heavy metal emissions. Columbia Steel heavy metal emissions are still entirely unfiltered.

** For Union Pacific and Hillsboro Airport ranking calculations go to: pdxcleanair.org/files/reports/polluter%20ranking%20method.pdf

Diesel particulate health risk

EPA ranks Multnomah 43rd worst out of 3,278 counties, in the worst 1.3% of counties in the US for diesel particulate. The diesel particulate average for Multnomah County is 0.78 μg/m^3, which will cause 260 cancers per million according to the cancer risk assessment for diesel particulate by the State of California's Office of Environmental Health Hazard Assessment (OEHHA). PCA diesel particulate health risk calculations are here:

pdxcleanair.org/files/reports/diesel%20cancer%20risk%20method.pdf

The worst airborne diesel particulate in Portland is just southeast of Albina Rail Yard according to the 2014 EPA National Air Toxics Assessment released December 2018. EPA modeled an airborne diesel particulate concentration there of 1.25 micrograms per cubic meter, among the worst 4.1% of census tracts nationwide. According to the cancer risk assessment for diesel particulate by OEHHA, this will cause 417 cancers per million people. These risk calculations are misleading because they average the risk for everyone in the census tract. Portland Clean Air's diesel particulate modeling is

based on 2014 EPA NATA data which we correlated with ODOT 24-hour truck counts. We found that diesel particulate concentrations were up to eight times worse than the EPA's tract average in neighborhoods within three blocks of a highway or truck route. This means up to eight times the cancer risk. This means the cancer risk of living by the worst industrial diesel truck routes in Portland is a lifetime risk as high as 3,200 cancers per million. Portland Clean Air's model of diesel particulate concentration for Portland is located here:

portlandcleanair.org/files/reports/Portland%20Stack%20and%20Diesel%20Booklet%20Color.pdf

The most dangerous Portland-area mobile industrial air polluters

Rank	Carrier	total fleet	filtered diesel trucks	unfiltered diesel trucks
1	XPO Logistics	8604	0	8604
2	USF Reddaway	3307	1199	2108
3	Tri-Met	1730	725	1005
4	Safeway	1214	243	971
5	Penske Truck Leasing	936	174	762
6	United Parcel Service (UPS)	693	16	677
7	Portland General Electric	911	278	633

XPO Logistics is owned by Louis DeJoy, the Trump megadonor recently appointed by Trump as Postmaster General. DeJoy is in the news for removing the USPS mail-sorting machines nationwide which are required to process mail-in voting ballots.

Our citations and methods for calculating diesel truck fleets from ODOT and DMV data are here:

portlandcleanair.org/files/reports/Portland%20diesel%2011.pdf

The comprehensive truck fleet dataset is here (note that the truck fleets named above are accurate; some fleet names in the dataset may be incorrect due to recent fleet purchases by new owners):

portlandcleanair.org/files/data/DIESEL_FlEETS_noUHAUL.xlsx

The solution is citizen action

Citizen action is required even in when government is doing a great job. Citizen action is especially needed on this issue as Oregon still doesn't include human health to regulate industrial air pollution.

Citizen action:

- closed the Trojan Nuclear Power Plant outside Portland. The plant never reopened after the nonviolent activists' blockade and a subsequent win by their defense lawyer Greg Kafoury.
- ended Portland sewage dumping in the Willamette due to Northwest Enviromental Advocates who won the $1.4 billion Big Pipe settlement.
- stopped the clearcutting of Opal Creek, the last uncut watershed in Oregon. A citizen political campaign led by George Atiyeh halted the 1981 Forest Service timber sale and won protected wilderness designation for 20,746 acres.

Since the Bullseye Glass scandal, it was citizen action, not routine DEQ enforcement, that won the following air pollution mitigations:

Owens Brockway closed their green glass furnace after they had just rebricked it for another decade of use. This ended their airborne chromium, the principle risk to their neighbors' health.

Precision Cast Parts spent up to $20M on control technologies including HEPA filters that filter heavy metal particles down to .3 microns.

Arclin installed a thermal oxidizer to mitigate airborne Volatile Organic Compounds (VOCs).

Porter Yett, an asphalt plant in Cully, installed a $1M blue smoke machine to control emissions.

Bullseye Glass installed a $70K baghouse, a device which filters 99% of Bullseye's annual emissions of lead, arsenic, cadmium, and chromium. Bullseye settled with their neighbors for $6.5M and claims they spent an additional $2.2M mitigating.

Oroboros Glass left the country.

North Star Glass installed a baghouse similar to Bullseye.

Glass Alchemy installed a baghouse similar to Bullseye.

Intel installed more thermal oxidizers. Neighbors got Intel's permit upgraded to Title V, a more stringent permit.

Ecolube, formerly APES, installed a thermal oxidizer to mitigate massive VOC releases that were caused by illegally removing their thermal oxidizer approximately eight years ago.

Zenith, a tar sands oil terminal in Linnton, was denied an expansion permit.

Citizen action scored these mitigation victories preceding the 2016 Bullseye Glass scandal:

Esco signed a Good Neighbor Agreement requiring them to install a $1M scrubber.

Vigor shut down a $1M waste treatment program after a PSU study by Ted Eckman produced GIS maps of students' reports of odors and found Vigor to be a major source of VOCs.

Pembina, a proposed LNG terminal in North Portland, had their permits denied.

All Portland Clean Air reports can be found at:

portlandcleanair.org/files/pcapubs.html

All datasets cited in this report can be found at:

portlandcleanair.org/files/pcadata.html

By filing six years of government information requests, Portland Clean Air has obtained data from eight agencies that regulate industrial air pollution in the Portland area. We use statistics software, GIS mapping, Google mapping, computer programming, and web design to make this data understandable to everyone.

When we began, Portland was ranked as the worst city in America for respiratory distress from air pollution by the EPA. Currently the EPA ranks Multnomah in the worst 1.3% of counties in the US for diesel particulate, the worst airborne carcinogen according to State of California risk assessments. A diesel filter on a truck removes 90% of particulate. In the Portland area, 3/4 of industry trucks are unfiltered. California requires filters by law and by 2015 virtually every CA truck had a filter.

Air pollution in Portland can be explained by government corruption in Oregon. Oregon allows unlimited corporate donations to politicians – this is illegal in 45 states – making the Oregon Legislature's elections the second most expensive in the nation. Oregon politicians thank corporate donors by opposing industrial air pollution legislation and enforcement. Oregonians will soon get a chance to vote to change this. Senate Joint Resolution 18 on the 2020 November ballot would amend the Oregon Constitution to nullify the 1997 decision of the Oregon Supreme Court that has prevented the implementation of campaign contribution limits.

Although Governor Brown's new Cleaner Air Oregon program has vastly improved reporting, we haven't seen better regulation of industry yet, especially for diesel trucking.

Portland Clean Air is a nonprofit organization working with 39 Neighborhood Association boards, six churches and synagogues, five other local organizations, and over 3,000 individual donors to help neighbors negotiate with industry. We welcome volunteers and donors. Please email with any questions or visit our website:

portlandcleanair.org
greg@portlandcleanair.org

Industrial air pollution and human health risk in Portland, Oregon

This report compares the human health risk of the most dangerous industries in the Portland area. Health risk is reported as the number of cancers per million people. Noncancer health effects are quantified using a scale of risk called a Hazard Index.

A brief background

The Environmental Quality Commission (EQC) is a five-member panel appointed by Governor Brown to serve as the Oregon Department of Environmental Quality's (DEQ) policy and rulemaking board. As a result of the 2016 Bullseye Glass scandal, the EQC approved the Cleaner Air Oregon program in 2018 to begin to include the risk to human health in Oregon's regulation of industrial air pollution. Senate Bill 1541 (SB 1541) became law in 2018, specifying what level of health risk is actionable by DEQ.

In 2018 Pete Shepherd, Interim Director for DEQ, sent a letter to Oregon's 364 largest stationary industrial air polluters, requiring them for the first time to accurately report all chemicals released into the air annually. Our procedures for how we made this data available to the public are here:

pdxcleanair.org/files/procedures/DEQ%20CAO%20Emissions%20Inventories%20method.pdf

In January 2019, DEQ scientists finished a rough calculation of the cancer and noncancer risks of the chemical releases reported in Oregon industries' Emissions Inventories. Although this data was not released to the public, we obtained a copy though an information request and made the DEQ's "Prioritization Risk Values" publicly available here:

portlandcleanair.org/files/portland_clean_air/deq_emissions/output_data/Prioritization%20Risk%20Values.xlsx

The DEQ Prioritization Risk Values are a "level one screening" which can significantly overestimate some risks. DEQ's goal is a relative ranking to prioritize which industries will require "source testing," a more accurate way to determine risk. Source testing is underway at some of the most dangerous Portland industrial air polluters.

How DEQ reports health risk

DEQ scientists assess cancer and noncancer risks differently, which results in two different benchmarks. Cancer risks are reported as the expected number of cancers per million people, while noncancer health risks are stated as an Hazard Index (HI) number. Noncancer risks from industrial air pollution exposure can include breathing problems, heart disease, liver disease, impaired brain development, infertility, premature birth, and birth defects. An HI number of less than one means no health effects are expected. An HI number greater than one means adverse health effects are possible. The higher the HI number, the greater the risk.

As a result of SB 1541, facilities are required to take action to reduce air polution depending on the cancer and/or noncancer health risk the facility poses to the public. Facilities posing a specificied level of health risk are required to keep neighbors informed of the risks as well as take action to mitigate their pollutants. In 2029, when the benchmarks will be reassessed, they can change but cannot be more tolerant of toxic exposure.

New and existing facilities have different benchmarks. New facilities are allowed to emit air contaminants which will result in 5 cancers per million people or have a Hazard Index 1 for noncancer causing contaminants. If a new industry's emissions exceed this, then a community engagement requirement is triggered and the facility must take action to reduce the emissions.

Existing facilities have a different standard which requires community engagement and action to reduce emissions if their air contaminant(s) cause 25 cancers per million or have a Hazard Index 1 for noncancer health effects. However, if an existing facility has the "Best Available Control Technology" in place or is in compliance with a National Emission Standards for Hazardous Air Pollutants order, they are allowed to emit air contaminants which will result in 200 cancers per million people and have a Hazard Index 10.

Understanding health risk

To put the danger of smokestack and diesel truck emissions into perspective, it is helpful to compare them to other known health risks.

The measles vaccine can cause a health risk of anaphylactic shock, which can be fatal, but the risk is very low. More than 70 million doses of Measles, Mumps, Rubella (MMR) vaccine have been distributed in the United States since 1990 but only 33 cases of anaphylactic reactions have been reported. This is a one-time risk of .47, or less than one case of anaphylactic shock per million. According to the Center for Disease Control, before the measles vaccination program started in 1963, the annual risk of getting measles was 15,856 per million which means that nearly all Americans got measles as a child. Each year before the vaccine was introduced, an estimated 400 to 500 people died, 48,000 were hospitalized, and 1,000 people suffered encephalitis (swelling of the brain) from measles. The health risk of measles, including death, is far worse than the risk of the vaccine.

Driving or riding in a car is significantly more dangerous than receiving a vaccine. According to National Safety Council 2018 data, the lifetime risk of dying in a car accident is one out of 106 people. Considering that the 2018 US population was 327,200,000 people, this can be expressed as a lifetime risk of 9,433 deaths per million.

Motorcycles are more dangerous than cars; motorcycles riders incur 15x more fatalities per mile than car drivers. According to the Motorcycle Industry Council, 12,231,000 households in the US had a motorcycle in 2018. The National Center of Health Statistics reported 4,669 motorcycle deaths that year. This is a lifetime risk of 26,721 deaths per million, about three times as dangerous as a car. However, the average number of miles driven per year by car drivers is five times that of motorcycle riders, multiplying motorcycle risk times five.

Smoking tobacco is more dangerous than riding a motorcycle. In 2018, 13.7% of all US adults currently smoked cigarettes which decreased from 42% in the 1960s. However, twenty-five percent of nonsmoking Americans are still exposed to secondhand smoke. According to the Center for Disease Control, cigarette smoking causes about one of every five deaths in the United States each year, more than 480,000 deaths annually. This is a lifetime risk of 102,698 deaths per million people. Smoking is a choice. Exposure to industrial air pollution is not a choice.

pdxcleanair.org/files/reports/health%20risk%20citations.pdf

Ranking Portland area smokestack air polluters by health risk

Although the numbers will change when source testing is completed, we think the DEQ Priorization Risk Values are incredibly revealing. This is the best data currently available to both rank industrial polluters and begin to understand the health risks they pose. To rank facilities, DEQ used the following formula:

(noncancer chronic risk) + (noncancer acute risk) + (cancer risk /25) = normalized risk estimate.

To include industries that the DEQ doesn't regulate, we used the same formula to rank rail yards and airports.

Our **results** ranking Portland's 75 largest industrial smokestack emitters by using Cleaner Air Oregon data are here:

portlandcleanair.org/files/reports/Portland%20Stack%20and%20Diesel%20Booklet%20Color.pdf

Our **results** ranking the 29 largest Washington County largest smokestack emitters are here:

portlandcleanair.org/files/HAW%20ranking.pdf

Our **procedure** for ranking industry based on their risk to human health is here:

pdxcleanair.org/files/procedures/PCA%20ranking%20procedures.pdf