



Oregon Department of Environmental Quality

2018 Toxics Release Inventory Summary for Oregon

December 2020

Executive summary

This summary describes 323 Toxics Release Inventory facilities emitting 145 TRI pollutants in 2018 statewide in Oregon, and is useful for Oregon Department of Environmental Quality Air Quality staff and members of the general public who want a broad picture of which TRI facilities are emitting which pollutants. The TRI program is under the purview of the U.S. Environmental Protection Agency. Again, TRI emissions estimates are just that: estimates. Therefore, any information in this summary may be used by DEQ to identify emissions from facilities that suggest the need for further evaluation. TRI data does not describe any potential risks to human health.

The DEQ's Air Quality division has provided this summary of Oregon TRI data in order to make relevant data easily accessible to users. However, the data originated with EPA, and any detailed questions regarding how EPA created the data should be directed back to EPA.

Translation or other formats

[Español](#) | [한국어](#) | [繁體中文](#) | [Русский](#) | [Tiếng Việt](#) | [العربية](#)

800-452-4011 | TTY: 711 | deqinfo@deq.oregon.gov

1.0 2018 Toxics Release Inventory data for Oregon

1.1 Source of Toxics Release Inventory data

The 2018 TRI data discussed in this report was pulled from [EPA's Envirofacts System Data Search](#) website. The TRI is developed via data reported by facilities directly to the EPA by July of each year. This TRI was developed by U.S. EPA TRI staff using inventory methods and estimation procedures, quality assurance and quality control protocols and then imported into the EIS database.

Thus, in some cases, data reported by facilities directly to the EPA may not match the Toxic Release Inventory pulled from the Envirofacts system. Some facilities may report inaccurate data to the TRI program and corrections of the data occur between August and October of the same year. Therefore, the inventory developed by U.S. EPA TRI staff insures that the TRI emissions data is correct before releasing the inventory to the public. The TRI data discussed in this report also was compared against the Oregon Department of Environmental Quality air toxics reporting, which should match the data from the Toxic Release Inventory.

1.2 Forty-one percent decrease in total TRI emissions over past 12 years in Oregon

Comparison of the total emissions in 2018 (6,031,743 pounds per year, or lbs/yr) to the highest emissions which occurred in 2007 (10,233,545 lbs/yr) reveals a 41 percent reduction overall in emissions of TRI pollutants in Oregon statewide over the past 12 years. TRI pollutant emissions for the past eight years (2011 through 2018) are presented in [Table 1](#), which also allows the reader to see the trends in emission masses for each chemical over those most-recent eight years. Total TRI annual emissions for each of the eight years are presented as sums in the last row of Table 1. Statewide TRI emissions which occurred in 2007 were obtained from the TRI website in October 2020.

In EPA's current TRI National Analysis 2018 (EPA 2020), it states that a 56% decrease in TRI emissions for the U.S. as a whole occurred based on TRI emissions documented in 2007 and in 2018. TRI emissions dropped significantly during the years 2007 and 2008.

The Oregon decrease of 41% is smaller than the national TRI decrease of 56%, but can be explained in part if not entirely by the fact that the national TRI report states that the 56% decrease in emissions nationally is due to three factors ([TRI National Analysis, 2020](#)):

1. The decrease was driven by electric utilities due to: decreased emissions of Hazardous Air Pollutants such as hydrochloric acid; a shift from coal to other fuel sources (e.g., natural gas); and the installation of control technologies at coal-fired power plants.
2. Hydrochloric acid, sulfuric acid, hydrogen fluoride, methanol, toluene, and styrene were the chemicals with the greatest reductions in air releases since 2007.
3. Electric utilities accounted for 93% of nationwide reductions in air releases of hydrochloric acid and sulfuric acid from 2007 to 2018.

Unlike in other parts of the country, Oregon has had very little in the way of emissions from coal-burning facilities at any time in the recent past. The last remaining operational source in Oregon, Portland General Electric's Boardman Generating Station in eastern Oregon's Morrow County, was permanently shuttered on Oct. 15, 2020. Therefore, it is highly unlikely that Oregon's decrease in TRI emissions over that 12-year period would be expected to be as high as the national decrease over that same time period, based on the lack of coal-burning facilities in Oregon. To go a bit further, it could be said that Oregon has been more successful than the U.S. as a whole in decreasing TRI emissions over the period from 2007 through 2018, as Oregon's 41% reduction had little to do with a decreasing use of coal, while the national decrease of 56% was due almost entirely (93%) to a decreasing use of coal.

1.3 Permitted facilities that emitted majority of risk-weighted TRI pollutants in 2018 in Oregon

Important conclusions about 2018 TRI data in Oregon can be drawn from [Table 2](#), which presents the facilities estimated to emit the highest percentages of the 30 top TRI pollutants identified from the cancer risk-weighted and the noncancer risk-weighted pollutant rankings. These facilities are referred to here as Majority Emitters. A rough ranking system was used that divided the mass (in pounds) of an emitted chemical by its toxicity reference value; details can be found in Section 2.1. In some cases, facilities contributing only a small percentage of the emissions for a chemical are also included in order to provide some context in addition to the majority emissions of that chemical. Facilities that appear for more than one chemical are presented in the same color font, to make them more easily discernable. In addition, brief summaries of the health effects related to each of the 30 pollutants in Table 2 are provided.

Emissions of each chemical emitted vary widely. For example, ammonia was estimated to be emitted by more than six facilities for a total of 1,309,155 lbs. released statewide in 2018, while dioxins and dioxin-like compounds were only emitted at a total of 3.79 lbs. statewide in 2018. The amount of dioxins and dioxin-like compounds appears to be comparatively very small, but these compounds are known to be dramatically more toxic than ammonia. This is why the mass of an emitted chemical is not the only parameter to consider when looking at TRI data.

Some facilities may at first appear more concerning due to either emissions of a high number of chemicals, or high amounts of emissions of a few chemicals. Chemical Waste Management of the Northwest, located in Arlington, Oregon is a facility that emits significant amounts of 11 of the 30 chemicals in Table 2; however, this is not unexpected, as this facility is a hazardous waste landfill. Most of the emission numbers shown in Table 2 are a function of the kinds of operations that are occurring at the facilities that emit these pollutants.

2.0 Additional information for Oregon TRI data

The Executive Summary provides the most important TRI information. But there is some additional information presented below which may help determine which next steps might need to be considered.

2.1 How 2018 TRI chemicals can be ranked

Although TRI data is not used to estimate human health risks, DEQ weighted the Oregon TRI data by comparing emissions amounts to chemical-specific risk-based concentrations. Risk-based concentrations indicate the potency of carcinogenic chemicals and noncarcinogenic chemicals (refer to Table 4-Risk-Based Concentrations available in Cleaner Air Oregon program rules, OAR 340-245-8040). DEQ did this in order to consider the amount of a chemical being emitted as compared to how toxic the chemical being emitted is. For example, a highly toxic chemical emitted in small amounts could theoretically be of more concern than a less toxic chemical emitted in large amounts.

To make a comparison possible, chemical-specific emission amounts were divided by the risk-based value for that chemical. The result of each such division is a very rough indicator that allows DEQ to rank which TRI chemicals reported for Oregon are likely to be of the most concern. The rough indicator results can allow DEQ to rank TRI chemicals based on both their amounts of emissions and on chemical toxic potency.

In order to streamline the process of further evaluation of TRI emissions to those of most concern, the 20 top-ranked chemicals in each of three categories are shown in the tabled list below, as follows:

- A ranked list based on highest-to lowest weighted cancer potency as compared to mass (or amounts) of emissions.
- A ranked list based on highest to lowest weighted noncancer potency as compared to mass of emissions.
- A list arranged based only on masses of pollutants emitted, ranked highest to lowest.

Ranked Categories of Oregon 2018 Toxics Release Inventory Data

Rank	Weighted by cancer potency and amount	Weighted by noncancer potency and amount	Amounts only
1.	Dioxins and dioxin-like compounds	Dioxins and dioxin-like compounds	Methanol
2.	Chromium	Chromium	Ammonia
3.	Polycyclic aromatic hydrocarbons	Hydrogen sulfide	Methyl isobutyl ketone
4.	Formaldehyde	Chlorine dioxide	Formaldehyde
5.	Acetaldehyde	Nickel	Hydrogen sulfide
6.	Arsenic	Manganese	Hydrochloric acid
7.	Nickel (if all insoluble forms)	Chlorine	Acetaldehyde
8.	Trichloroethylene	Arsenic	Styrene
9.	Epichlorohydrin	Formaldehyde	Xylene (mixed isomers)
10.	Ethylbenzene	Trichloroethylene	Toluene
11.	Benzene	Hydrogen fluoride	n-Butyl alcohol
12.	1,4-Dichlorobenzene	Hydrochloric acid	Phenol
13.	Naphthalene	Lead	Chlorine dioxide
14.	Tetrachloroethylene	Toluene diisocyanate	Trichloroethylene
15.	1,3-Butadiene	Cobalt	Nitric acid
16.	Benzo(g,h,i)perylene	Ammonia	Hydrogen fluoride
17.	Toluene diisocyanate	Phosgene	Cresol (mixed isomers)
18.	Methyl tert-butyl ether (MTBE)	Epichlorohydrin	Ethylbenzene
19.	Di(2-ethyl hexyl)phthalate	Acetaldehyde	Certain glycol ethers
20.	Vinyl chloride	Acrolein	Copper

Dioxins and dioxin-like compounds have the Number 1 ranking as related to both cancer and noncancer potency per amount emitted. Dioxins and dioxin-like compounds, as is true for many chemicals or chemical

groups, are known to have both cancer and noncancer effects, and consequently ended up being the chemical of most concern in both the cancer and noncancer risk-weighted categories in regard to Oregon 2018 TRI data. The chemical which is emitted in highest amounts is methanol; but because this toxic air contaminant has relatively low toxic potency, it does not appear in the two ranked lists that are based jointly on chemical toxic potency and amount emitted. Only the top 20 chemicals from the cancer risk-weighted list and the top 20 chemicals from the noncancer risk-weighted list were evaluated further, and there was some overlap between these two lists. As a result, 30 chemicals in total are further described in Table 2.

2.2 Emissions from majority emitters that might need further evaluation

Table 2 lists the 30 TRI pollutants of most concern based on the ranking system described earlier, as well as the facilities that emitted the majority of each of those pollutants in Oregon in 2018. Many of the facilities in Table 2 are being or will be called in by the Cleaner Air Oregon program to assess potential human health risks that may be associated with their emissions.

There are a number of majority emitters that are responsible for large percentages of pollutant emissions. These facility emissions need to be considered by DEQ air quality staff to determine if further evaluation is appropriate. Examples of such emissions include:

- **Acrolein** (300 lbs.) was emitted entirely by Pacific Ethanol Columbia, LLC, located in Boardman, Oregon.
- **1,3-Butadiene** (52 lbs.) was emitted entirely by Shell Portland Distribution Terminal located in Portland, Oregon.
- **Di(2-ethylhexyl)phthalate** (60 lbs.) was emitted entirely by Loxscreen Co., Inc., located in Woodburn, Oregon. This facility does not have a DEQ air quality permit.
- **Epichlorohydrin** (4,765 lbs.) was emitted entirely by two facilities: Solenis LLC located in Portland, Oregon (71 percent) and Georgia Pacific Chemicals, LLC located in Eugene, Oregon (29%).
- Thirty-one (31) percent of the **hydrogen fluoride** (8,467 lbs.) emitted in Oregon in 2018 came from Quantumclean, located in Hillsboro, Oregon. Forty-one (41) percent came from the Intel Corporation located in Hillsboro, Oregon – but this facility will be called in by Cleaner Air Oregon.
- Fifty-seven (57) percent (954.7 lbs.) of the **lead** emitted in Oregon in 2018 came from Georgia Pacific LLC, located in Toledo, Oregon (35 percent); and from Georgia Pacific Consumer Operations LLC, located in Clatskanie, Oregon (22 percent).
- **Methyl tert-butyl ether**, or MTBE (3,968 lbs.) was emitted entirely by two facilities: W.R. Grace & Co., located in Albany, Oregon (73 percent) and Suterra LLC, located in Bend, Oregon (27 percent).
- Seventy-nine (79) percent of the **naphthalene** (80 lbs.) emitted in Oregon in 2018 came from Chevron Willbridge Terminal located in Portland, Oregon (51 percent) and from Phillips 66 Portland Terminal located in Portland, Oregon (28 percent).
- Fifty-six (56) percent of the **polycyclic aromatic hydrocarbons** (152 lbs.) emitted in Oregon in 2018 came from Georgia Pacific Toledo, LLC, located in Toledo, Oregon.
- **Toluene diisocyanates** (101 lbs.) were emitted entirely by FXI, Inc., located in Portland, Oregon.
- Although Chemical Waste Management of the Northwest, Inc. (in Arlington) is known to emit chemicals based on the types of operations at that location, it should be noted that this facility is responsible for 100 percent of the 2018 TRI emissions in Oregon of **arsenic**, **benzo(g,h,i)perylene**, **1,4-dichlorobenzene**, and **vinyl chloride**.

2.3 2018 TRI emissions in Oregon from non-permitted facilities

There are 78 facilities in Oregon that reported TRI estimates, but that are not under permit by Oregon DEQ's Air Quality division, as shown in [Table 3](#). This table presents names of and emissions from facilities located in Oregon that do not hold an Oregon air permit. Pollutants emitted from these facilities at high levels were taken into account in Table 2, if the pollutant was among the list of 30 chemicals in Table 2.

Some of these non-permitted facilities were estimated to emit amounts of a particular chemical that may need further consideration, as shown below. Di(2-ethylhexyl)phthalate and hydrogen fluoride are among the 30 chemicals presented in Table 2. Dicyclopentadiene and diisocyanates are two emitted chemicals with additional issues. Note that the highest emitted amount of a chemical from the unpermitted facilities in Oregon in 2018 was 8,706 lbs. (4.4 tons) of styrene from Orenco Systems, Inc. in Roseburg. This level of air emissions is below the regulatory level for a source to need a permit from DEQ.

- **Di(2-ethylhexyl)phthalate** aka Bis(2-ethylhexyl)phthalate – 60 lbs were emitted in 2018 by Loxscreen Co. Inc., located in Woodburn, Oregon.
- **Hydrogen fluoride** – 841 lbs. were emitted in 2018 by Cascade Columbia Distribution, located in Sherwood, Oregon.
- **Dicyclopentadiene** – 77 lbs. were emitted in 2018 by Orenco Systems, Inc., which is already mentioned in the bulleted list above in regard to styrene emissions. Dicyclopentadiene is a TRI pollutant, but is not included as a toxic air contaminant in Table 2 of the Cleaner Air Oregon rules, OAR 340-245-8020. Therefore, dicyclopentadiene was not evaluated further under the CAO rule to determine whether published toxicity information was available for it, which would allow the calculation of toxicity reference values and risk-based concentrations for this chemical, including being able to rank it in terms of risk versus amount emitted. However, dicyclopentadiene does have EPA provisional peer-reviewed toxicity values, or PPRTVs, available for it. But the applicability of these PPRTVs is something that needs to be evaluated using protocols set under the Cleaner Air Oregon program, which includes the first triennial review of existing and new toxicity reference values for toxic air contaminants in 2021.
- **Diisocyanates** -- Ultimate RB, located in McMinnville, Oregon, emitted 937 lbs. of diisocyanates in 2018. Toluene diisocyanates (TDI) were added to the TRI list of chemicals in 1990. In 1995, the Diisocyanates group was added to the TRI list of chemicals; the group includes 20 different diisocyanates, with the exception of TDI. This implies that facilities that emit Diisocyanates do not have to differentiate between the 20 chemicals under that group heading, and so only have to report those emissions as Diisocyanates. However, to allow evaluation of risk-weighted values for this chemical, risk-based concentrations are needed. There are CAO risk-based concentrations (Table 4, OAR 340-245-8040) available for three kinds of diisocyanates: TDI; hexamethylene-1,6-diisocyanate (HDI), and methylene diphenyl diisocyanate (MDI) – but not for chemicals identified simply as Diisocyanates by the TRI program. Therefore, DEQ staff may want to consider obtaining information on specific types of diisocyanates emitted by this facility, and could then evaluate the data accordingly. For example, if MDI or HDI are included in the facility's TRI emissions, then the emitted amounts can be risk-weighted, which may alter the ranking of TRI pollutants in the tabled list shown above and as a result may alter the list of TRI pollutants shown in Table 2.
- **Styrene** -- Orenco Systems, Inc., located in Roseburg, Oregon emitted 8,706 lbs. of styrene in 2018, equivalent to 4.4 tons. Although styrene was not one of the 30 chemicals identified by risk weighting, it was among the 10 chemicals emitted at the highest levels in Oregon in 2018.

2.4 Air pollutants emitted in 2018 by at least one Oregon TRI facility, but which do not have toxicity information

A number of TRI pollutants were emitted by Oregon facilities in 2018 that do not have available toxicity information, and so do not appear in Cleaner Air Oregon Table 3 – Toxicity Reference Values, OAR 340-245-8030. This means their potential health risks cannot be evaluated unless new toxicity information becomes available for these chemicals in the future. These include:

1. Barium
2. Boron trichloride
3. Butyl acrylate
4. n- Butyl alcohol
5. Catechol

6. Creosote
7. Dicyclopentadiene
8. Dimethyl phthalate
9. Ethylene
10. Formic acid
11. 4,4-Isopropylidenediphenol
12. Methyl acrylate
13. N-methyl-2-pyrrolidone
14. Molybdenum trioxide
15. Pyridine
16. Zinc compounds

It is likely that a portion of the chemicals listed above now have available toxicity information that will allow DEQ to assign them Toxicity Reference Values at the completion of the Cleaner Air Oregon Triennial TRV Review rulemaking in 2025.

Contact

If you have specific questions for DEQ or would like this data in another format, please contact Sue MacMillan, Air Toxics Science and Policy Analyst, at (503) 875-7741 or susan.macmillan@deq.oregon.gov

Non-discrimination statement

DEQ does not discriminate on the basis of race, color, national origin, disability, age or sex in administration of its programs or activities. Visit DEQ's [Civil Rights and Environmental Justice page](#).