Appendix

Top 10 most-toxic active industrial air emitters in Allegheny County reporting to TRI, 2019

Rank	Facility Name	RSEI Hazard Based Result
1	ATI Flat Rolled Products Holdings LLC	3,127,721,580
2	Harsco Metals - Natrona	2,402,982,070
3	USS-Clairton Plant	2,331,856,325
4	Universal Stainless & Alloy Products Inc.	1,224,497,500
5	Thermal Transfer Corp.	683,804,300
6	Holtec Manufacturing	223,099,806
7	Cheswick Power Plant	199,080,032
8	USS Mon Valley Works - Edgar Thomson Plant	184,824,666
9	Carpenter Powder Products Inc.	147,699,400
10	PPG Industries Inc-Springdale Complex	112,985,689

Top 10 most toxic active industrial facilities in Allegheny County reporting air pollution to TRI in 2019, by facility and RSEI hazard-based result

Rank	Facility Name	Chemical Name	Total Pounds Released to Air, 2019	RSEI Hazard Based Result
1	ATI Flat Rolled Products Holdings LLC	CHROMIUM COMPOUNDS	911	1,175,190,000
		COBALT COMPOUNDS	77	1,309,000,000
		COPPER COMPOUNDS	186	279,000
		HYDROGEN FLUORIDE	1,627	406,750
		LEAD COMPOUNDS	251	5,773,000
		MANGANESE COMPOUNDS	664	7,968,000
		NICKEL COMPOUNDS	676	628,680,000
		NITRIC ACID	1,199	323,730
		ZINC COMPOUNDS	1,011	101,100
		Total	**6,602**	**3,127,721,580**
2	Harsco Metals - Natrona	CHROMIUM COMPOUNDS	127	2,348,230,000
		LEAD COMPOUNDS	0.1	2,070
		MANGANESE COMPOUNDS	145	1,740,000
		NICKEL COMPOUNDS	57	53,010,000
		Total	**329.1**	**2,402,982,070**
3	USS-Clairton Plant	1,2,4-TRIMETHYLBENZENE	1	58
		ACETONITRILE	354	20,532
		AMMONIA	263,040	1,841,280
		ANTHRACENE	324	1,069
		BENZENE	27,998	783,944,000

		BENZO(G,H,I)PERYLENE	479.9	9,598,200
		BIPHENYL	260	208,000
		CARBON DISULFIDE	30,459	152,295
		CRESOL (MIXED ISOMERS)	2,782	16,136
		CYANIDE COMPOUNDS	9,935	43,714,000
		DIBENZOFURAN	705	0
		DICYCLOPENTADIENE	1	18,000
		ETHYLBENZENE	64	56,960
		ETHYLENE	17,584	9,847
		ETHYLENE GLYCOL	136	1,197
		HYDROCHLORIC ACID	170,682	30,722,760
		HYDROGEN CYANIDE	24,527	107,918,800
		HYDROGEN SULFIDE	218,568	393,422,400
		LEAD COMPOUNDS	50.6	1,163,800
		MERCURY COMPOUNDS	2.6	31,200
		METHANOL	96,734	17,412
		NAPHTHALENE	7,707	92,484,000
		NITRATE COMPOUNDS	1,294	815
		PHENANTHRENE	2,671	0
		PHENOL	34,848	627,264
		POLYCYCLIC AROMATIC COMPOUNDS	2,220.2	865,858,500
		PROPYLENE	2,420	2,904
		PYRIDINE	6	6,000
		STYRENE	246	861
		TOLUENE	7,614	5,330
		XYLENE (MIXED ISOMERS)	363	12,705
		Total	**924,076.3**	**2,331,856,325**
4	Universal Stainless & Alloy Products Inc.	CHROMIUM	252	1,083,600,000
		COPPER	67	100,500
		LEAD	5	115,000
		MANGANESE	331	3,972,000
		NICKEL	147	136,710,000
		Total	**802**	**1,224,497,500**
5	Thermal Transfer Corp.	CHROMIUM	60.2	646,827,500
		NICKEL	39.8	36,976,800
		Total	**99.9**	**683,804,300**
6	Holtec Manufacturing	CHROMIUM	10.1	216,612,500
		LEAD	0.1	1,288
		MANGANESE	34	408,468
		NICKEL	6.5	6,077,550
		Total	**50.7**	**223,099,806**

7	Cheswick Power Plant	AMMONIA	304	2,128
		BARIUM COMPOUNDS	46.1	322,350
		DIOXIN AND DIOXIN-LIKE COMPOUNDS	0.00039	17,409
		HYDROCHLORIC ACID	5,941	1,069,380
		HYDROGEN FLUORIDE	1,900	475,000
		LEAD COMPOUNDS	7.9	182,160
		MERCURY COMPOUNDS	6.3	75,600
		SULFURIC ACID	56,267.4	196,936,005
		Total	**64,472.7**	**199,080,032**
8	USS Mon Valley Works - Edgar Thomson Plant	AMMONIA	38,256	267,792
		BARIUM COMPOUNDS	39	273,000
		BENZENE	122	3,416,000
		CHROMIUM COMPOUNDS	100	129,000,000
		COPPER COMPOUNDS	50	75,000
		ETHYLENE	1,239	694
		LEAD COMPOUNDS	437.8	10,068,710
		MANGANESE COMPOUNDS	2,865	34,380,000
		MERCURY COMPOUNDS	0.6	6,600
		METHANOL	46,500	8,370
		NICKEL COMPOUNDS	7	6,510,000
		VANADIUM COMPOUNDS	50	7,000
		ZINC COMPOUNDS	8,115	811,500
		Total	**97,781.3**	**184,824,666**
9	Carpenter Powder Products Inc.	CHROMIUM	52.3	67,492,800
		COBALT	1.7	29,410,000
		NICKEL	54.6	50,796,600
		Total	**108.7**	**147,699,400**
10	PPG Industries Inc. - Springdale Complex	1,2,4-TRIMETHYLBENZENE	596	34,568
		BUTYL ACRYLATE	20	70,000
		CERTAIN GLYCOL ETHERS	12,875.6	2,317,608
		CHROMIUM COMPOUNDS	6.8	99,416,000
		CYCLOHEXANE	16	9
		DIMETHYL PHTHALATE	4,127.6	0
		ETHYLBENZENE	1,773.2	1,578,148
		METHYL ISOBUTYL KETONE	1,244.6	1,494
		METHYL METHACRYLATE	85.9	429
		NAPHTHALENE	548	6,576,000
		N-BUTYL ALCOHOL	835	8,350
		NICKEL COMPOUNDS	2.9	2,669,100
		STYRENE	373	1,306

		TOLUENE	2,344.4	1,641
		XYLENE (MIXED ISOMERS)	8,860.4	310,114
		ZINC COMPOUNDS	9.2	922
		Total	**33,718.6**	**112,985,689**

Methodology

The listing of the ten facilities with the "most toxic" air emissions is based on the facility's releases to air of toxic substances reported to the EPA's Toxics Release Inventory, adjusted to account for the relative toxicity of those releases using hazard data from the EPA's Risk Screening Environmental Indicators (RSEI) model.

Toxics Release Inventory (TRI)

The data used in this analysis came from the U.S. Environmental Protection Agency (EPA) *TRI Basic Plus* data file for 2019, downloaded from https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-plus-data-files-calendar-years-1987-2019 on 12 November 2020. It was then updated on 4 May 2021 using data downloaded from the EPA's TRI EZ Search at https://enviro.epa.gov/enviro/ez_column_v2.list?database_type=TRI&table_name=V_TRI_FACILITY_EZ which has data revised as of March 2021. This analysis only looked at releases from facilities that were located in Allegheny County, PA, and reported non-zero values for "total air emissions."

Identifying Health Effects of Chemicals

Health effects for chemicals were based on information found in three sources: the EPA's *TRI Search Plus: Potential Health Effects* data file for reporting years 2007-2019, downloaded from https://edap.epa.gov/public/extensions/TRISearchPlus/TRISearchPlus.html#health on 14 April 2020, the Agency for Toxic Substances and Disease Registry (ATSDR), Centers for Disease Control and Prevention, "ToxFAQs," Toxic Substances Portal, accessed at https://wwwn.cdc.gov/TSP/substances/SubstanceAZ.aspx on 14 April 2020, and the state of California's Proposition 65 list of hazardous chemicals, downloaded from https://oehha.ca.gov/proposition-65/chemicals on 14 April 2020. For each chemical, if any one of the three sources included a health effect it was included in the table.

Calculating RSEI Hazard-Based Results

Industrial facilities in Allegheny County pose a range of threats to public health and the environment, including emissions of "criteria pollutants" such as particulates and nitrogen oxides that contribute to regional air pollution problems, as well as the emissions of the toxic air pollutants that are the subject of this analysis.

EPA's Risk-Screening Environmental Indicators (RSEI) system provides information on the relative toxicity of specific chemicals emitted by facilities, allowing comparisons of the toxicity of emissions among varying types of facilities emitting different toxic chemicals. The EPA calculates toxic weighting factors for individual chemicals using information about chronic human health effects of exposure. All the RSEI toxic weighting factors used in our calculations come from the EPA's "RSEI Toxicity Weighting Spreadsheet v2.3.9" downloaded at https://www.epa.gov/rsei/rsei-toxicity-data-and-calculations on 15 November 2020.

The toxicity weighting factors used for each release were chosen following the EPA's "Toxicity Weight Selection, by Result and Media" table.[1] For most chemicals, calculating the RSEI hazard-based result requires multiplying the pounds released by the correct toxicity weight for that chemical.[2] To match the correct toxicity weight to each chemical, we linked the chemicals in the RSEI Toxicity Weighting Spreadsheet with the chemicals released in the 2019 TRI data by CAS number. There were a few types of pollutants for which this calculation involved an extra step:

- Dioxin: TRI presents dioxin and dioxin-like compounds in grams rather than in pounds. Cheswick Power Plant, the only facility emitting dioxin and dioxin-like compounds, emitted 0.175 grams of air releases in 2019. The EPA's EasyRSEI page for Cheswick calculated the number of pounds of dioxin and dioxin-like compounds as .000385875. That number was then multiplied by the inhalation toxicity weight (ITW) for dioxin. Dioxin requires an additional step to calculate the RSEI Hazard based result. The result of pounds of dioxin multiplied by the ITW then needs to be multiplied by the toxic equivalent factor (TEF) for dioxin. The TEF in this case is 0.032226, which can be found by dividing the toxic equivalency (TEQ) for Cheswick, which can be found on the facility's TRI Form R page: https://enviro.epa.gov/enviro/tri_formr_partone_v2.get_thisone?rpt_year=2019&dcn_num=1319218256016&ban_flag=Y by the grams of dioxin for Cheswick, 0.175. After multiplying the TEF by the ITW by the pounds of dioxin emitted for Cheswick, the final RSEI Hazard is 17,409, which is consistent with the EPA's EasyRSEI result for Cheswick.
- Chromium: Facilities that emit chromium typically emit a combination of two types, or valences, of the element: chromium (III), also called trivalent chromium, and chromium (VI), also called hexavalent chromium. Facilities reporting to TRI, however, report under the umbrella category, "chromium and chromium compounds," which includes releases of both valences. Trivalent chromium has "a very low toxicity," according to the EPA's RSEI model methodology documentation, and therefore is assumed to have no toxicity in the RSEI model.[3] Hexavalent chromium is the only valence included in the model; EPA bases each facility's ratio of trivalent to hexavalent chromium emitted on estimates from the 2014 National Emissions Inventory.[4] Estimates of each facility's chromium speciation were available through the EPA's EasyRSEI tool, by navigating to the facility's modeling data page, in the section "Other Data" under "Percent of Chromium Releases Assumed to be Hexavalent."[5] To calculate the RSEI hazard results for chromium releases, the total air emissions of chromium and chromium compounds were multiplied by the speciation ratio for chromium(VI) and then by the toxicity weight.

Ranking the Facilities

For this analysis, we selected the 10 active facilities in Allegheny County that, for 2019 chemical releases reported to TRI, generated the highest RSEI Hazard-Based Result. TRI by its nature is not a comprehensive database of polluters. Reports to TRI are required of facilities with 10 or more full-time-equivalent employees, in certain industries, that emit more than certain threshold amounts of toxic chemicals.[6] As a result, this method of ranking facilities necessarily under-represents or omits releases from four categories of facilities that produce air pollution:

- Facilities that employ fewer than 10 full-time-equivalent employees.
- Facilities in industries that are not required to report to TRI.

- Facilities in industries that are required to report to TRI but whose toxic emissions are below the threshold amount above which reporting would be required.
- Facilities that emit pollutants that are dangerous to human health but for which reporting is not required to TRI, such as fine particulate matter, sulfur oxides, nitrogen oxides and precursors to ozone. These releases are often reported to local and federal authorities through systems other than TRI.

Notes

[1] Environmental Protection Agency, *RSEI Toxicity – Data and Calculations*, accessed on 4 May 2021 at https://www.epa.gov/rsei/rsei-toxicity-data-and-calculations.
[2] Environmental Protection Agency, *EPA's Risk-Screening Environmental Indicators (RSEI) Methodology*, December 2020, https://www.epa.gov/sites/production/files/2020-12/documents/rsei_methodology_v2.3.9.pdf.
[3] Environmental Protection Agency, *Technical Appendix A: Toxicity Weights for TRI Chemicals and Chemical Categories*, https://www.epa.gov/sites/production/files/2015-12/documents/technical_appendix_a-toxicity_v2.3.4.pdf, A-3.
[4] See note 2.
[5] Environmental Protection Agency, *EasyRSEI Dashboard Version 2.3.9*, 14 December 2020, accessed 4 May 2021 at https://edap.epa.gov/public/extensions/EasyRSEI/EasyRSEI.html.
[6] Environmental Protection Agency, *Basics of TRI Reporting*, archived on 18 March 2021 at http://web.archive.org/web/20210318012928/https://www.epa.gov/toxics-release-inventory-tri-program/basics-tri-reporting.