MINNESOTA

January 1, 2021

The Honorable Carrie Ruud
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95 University Avenue West
St. Paul, MN 55155

The Honorable Bill Ingebrigtsen
Chair, Senate Environment & Natural Resources Finance Committee
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The Honorable John Persell
Chair, House Environment and Natural Resources Policy Committee
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The Honorable Dale Lueck
Republican Lead, House Environment and Natural Resources Policy Committee
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RE: The Air We Breathe: The State of Minnesota's Air Quality, 2021

Dear Environment and Natural Resources Committee Chairs and Minority Leads:

Attached please find the report titled The Air We Breathe: The State of Minnesota's Air Quality, 2021 as required under Minn. Stat. §§ 115D.15 and 116.925. This report describes progress made in improving air quality since the Minnesota Pollution Control Agency's The Air We Breathe: The State of Minnesota's Air Quality, 2019. This report also fulfills the required air toxics report under Minn. Stat. §§ 115D.15 and 116.925.

If you have any questions about this report, feel free to contact me (651-757-2031 or greta.gauthier@state.mn.us) or Todd Biewen, Division Director, Environmental Analysis and Outcomes (651-757-2228 or todd.biewen@state.mn.us).

Sincerely,

Greta Gauthier
Assistant Commissioner for Legislative and Intergovernmental Relations
Commissioner's Office

GG/MW:cbg

Enclosure

cc: Sen. Foung Hawj, DFL-Lead Elect, Senate Environment & Natural Resources Policy Committee
Sen. Patricia Torres Ray, DFL-Lead Elect, Senate Environment & Natural Resources Finance Committee

REPORT TO THE LEGISLATURE
JANUARY 2021

The air we breathe

The state of Minnesota's air quality in 2021

MINNESOTA POLLUTION CONTROL AGENCY

Legislative charge

The Minnesota Pollution Control Agency (MPCA) has a statutory requirement (Minn. Stat. § 115D.15 and § 116.925) to report to the Minnesota Legislature biennially on the status of toxic air contaminants, mercury emissions, and the MPCA's strategies to reduce the emissions of air pollutants. The MPCA uses this report as an occasion to discuss the most pressing outdoor air quality issues facing Minnesota and to explore the opportunities available for emission reductions.

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Contents

Executive summary

Minnesota's air quality is good overall, but it is not the same in all parts of the state and doesn't affect all Minnesotans equally. Overall pollution levels have been going down and this trend is expected to continue. However, people in some areas experience pollution levels that are high enough to worsen health conditions or are exposed to pollutants that don't have federal or state standards.

The elderly, children, and people with chronic heart and lung conditions are more vulnerable to the effects of air pollution. Air pollution can affect children's development and can lead to cancer, respiratory diseases and other health impacts. These pollutants come from large facilities, but also from vehicles, off-road equipment, and small neighborhood sources like dry cleaners and gas stations. The Minnesota Pollution Control Agency (MPCA) is working to better understand sources of toxic air pollution and how it is distributed across the state.

In addition to health and age characteristics, where people live is a determinant of the quality of the air they breathe. It's well documented that policies designed to segregate Black, Indigenous, people of color, and low-income residents from wealthier, white people, were effective in both urban and rural areas. The MPCA has identified these as areas of concern for environmental justice (EJ) and is dedicated to reducing disparities in air pollution exposure.

The MPCA also forecasts air quality to help Minnesotans who are vulnerable to air pollution protect their health on days when air quality is poor. In recent years, Minnesota has seen more "bad air" days caused by smoke from wildfires outside of the state. This trend is likely to continue as climate change worsens heat and drought in North America. Though we can't control wildfires occurring outside of our state, the MPCA will continue to inform Minnesotans, so they can take steps to protect themselves.

The final section of this report gives an update on statewide efforts to reduce mercury in air pollution through the state's Total Maximum Daily Load (TMDL) goal set in 2009. Mercury air pollution is a state priority because it enters our water supply and affects human health and the ecosystem. It is estimated that electric utilities emitted approximately 121 pounds of mercury in 2019, compared with 1,716 pounds in 2005. Although Minnesota has achieved significant emission reductions from power generation, the MPCA projects that the state will not meet the plan's 2025 statewide reduction goal. To meet Minnesota's 2025 emissions goal, significant reduction of mercury emissions from the taconite mining sector and further reduction from mercury use in various products will be necessary.

Minnesota has been a leader in environmental protection in the past, and that leadership has led to lower average air pollution. However, everyone should have access to the same clean air across the state. The MPCA must continue to lead by making our air pollution reduction efforts more localized, more attentive to neighborhood and community needs, and more focused on tackling air pollution where the risks and impacts are highest.

New greenhouse gas emissions report

Minnesota's climate is changing rapidly, and these changes – driven largely by human-caused emissions of greenhouse gases (GHGs) – are affecting our health, communities, natural resources and our way of life. While Minnesota's GHG emissions are declining relative to 2005 levels, we missed the 15% emissions reduction goal set for 2015 by the Minnesota Legislature under the Next Generation Energy Act and we are not on track to meet the 2025 goal or the 2050 goal. To learn more about GHG emissions in Minnesota, you can explore the MPCA's latest report, Greenhouse Gas Emissions in Minnesota: 1990-2018. And to learn how Minnesota is working to get back on track to achieve its goals you can visit www.climate.state.mn.us

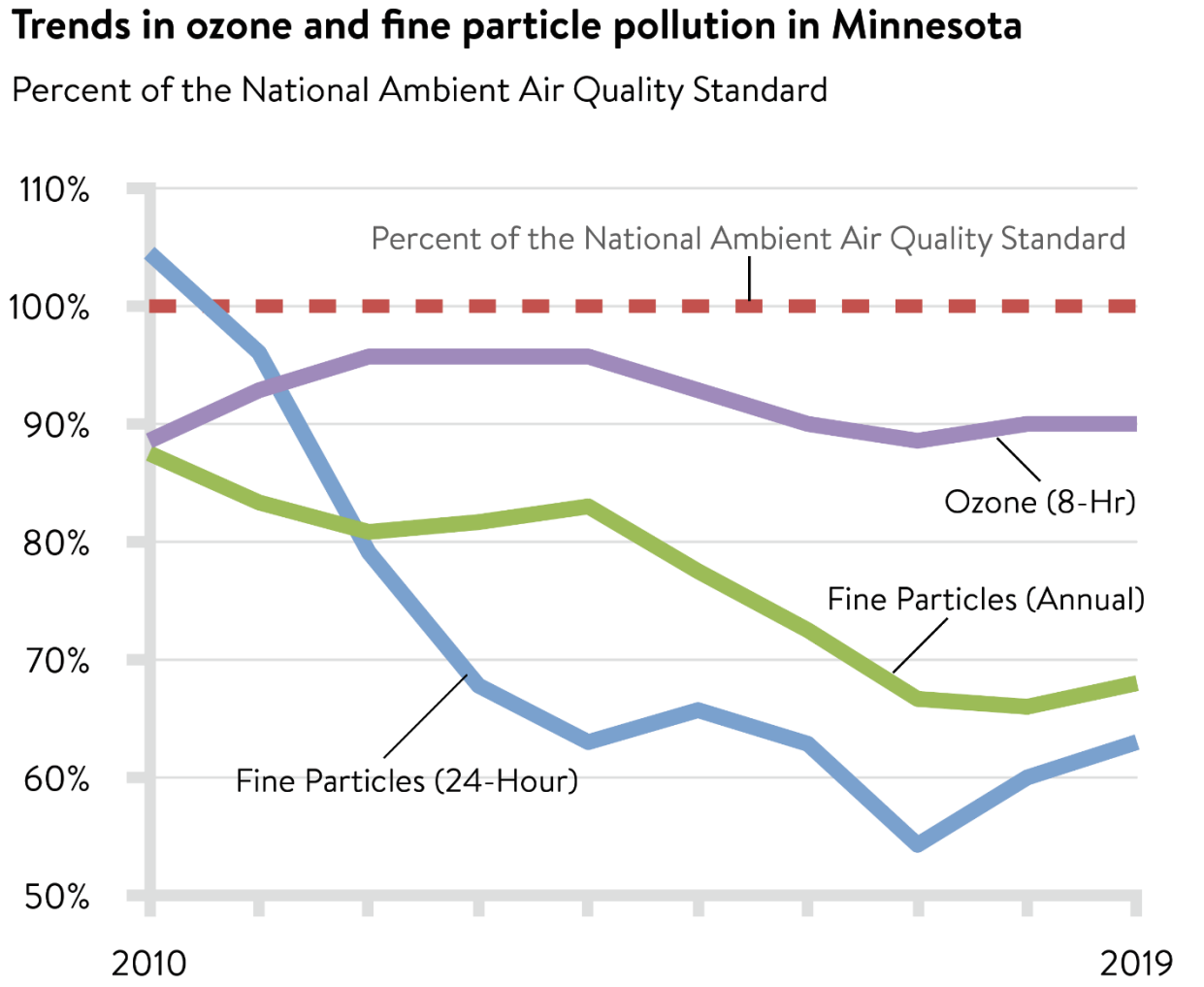
Greenhouse Gas Emissions in Minnesota: 1990-2018 https://www.pca.state.mn.us/air/state-and-regional-initiatives

Air pollution in Minnesota

Exposure to air pollution can affect everyone's health. When we breathe, pollution enters our lungs and can enter our bloodstream. Air pollution can contribute to small annoyances like coughing or itchy eyes. It can also cause or worsen many diseases involving the lungs and breathing, leading to hospitalizations, cancer, or even premature death. Minnesota's air currently meets all federal air quality standards. However, even levels of air pollution below the standards can affect people's health, including levels currently found in parts of Minnesota.

Overall, the air in Minnesota is significantly cleaner than it was before air pollution regulations were implemented. These reductions occurred through federal and state regulations requiring pollution reductions for vehicles and industrial facilities, and through the continuing transition from coal-fired power plants to natural gas and renewable energy. Minnesota is meeting federal standards for air pollution including lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide. Emissions for these pollutants are steady or decreasing, although further reductions may be needed as standards become more protective over time.

Figure 1. Criteria Air Pollution monitored concentration trends in Minnesota, 2010-2019. Learn more at https://www.pca.state.mn.us/air/criteria- pollutant-data-explorer



Air pollution that meets federal standards can still result in health impacts, particularly for vulnerable residents. In a 2019 report, "Life and Breath," the MPCA and the Minnesota Department of Health (MDH) expanded their health impact analysis to better understand the impacts of poor air quality. This report estimates the statewide health impacts of air pollution using the most current outdoor air quality data available (from 2013), matched with available death records, and hospital and emergency department admission data.

"Life and Breath" found that in 2013 across Minnesota:

- 5 to 10% of all residents who died, and up to 5% of all residents who visited the hospital or emergency room for heart and lung problems, did so partly because of fine particles in the air or ground-level ozone.
- This is roughly 2,000 to 4,000 deaths, 500 additional hospital stays, and 800 emergency room visits in 2013.
- Communities and regions with the greatest burden from air pollution include senior populations in the metro, central, and southeast parts of Minnesota.

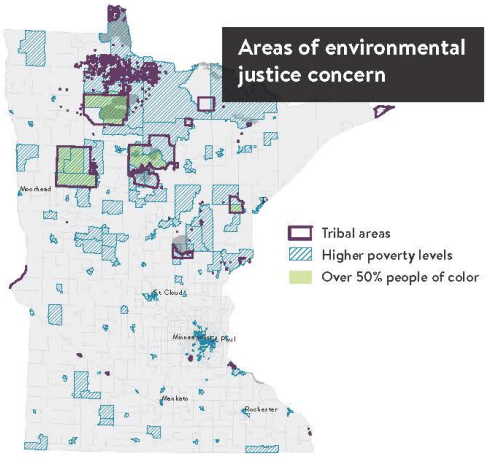
Read the full report and explore the underlying data here: https://www.pca.state.mn.us/air/life-and-breath-report

Despite overall reductions in air pollution, some areas of Minnesota are disproportionately impacted by specific pollutants. The MPCA conducts site-specific monitoring for air toxics at 20 locations around the Metro area.[1] These monitors show that North Minneapolis is exposed to air pollution above health benchmarks for chromium, cobalt and nickel, while other areas of the city and suburbs do not experience air pollution above health benchmarks. The impacts of pollution vary across Minnesota because of past practices and decisions. Historical settlement patterns of low-income workers who lived near the factories where they worked; the routing of roadways and the siting of industry in low-income neighborhoods or within communities of color, created inequities in exposures and health conditions.[2] The MPCA is working to reduce these air pollution disparities, but more work is needed to protect all Minnesotans from harmful air pollution.

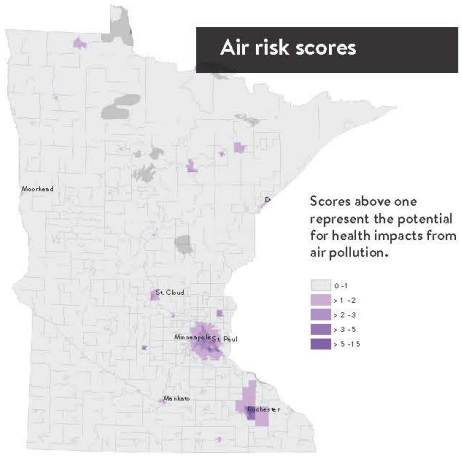
[1] Air toxics are pollutants that cause human health impacts but are not regulated by federal ambient air standards.
[2] Environmental Justice Framework, Minnesota Pollution Control Agency, https://www.pca.state.mn.us/sites/default/files/p-gen5-05.pdf

Air pollution is not evenly distributed across Minnesota

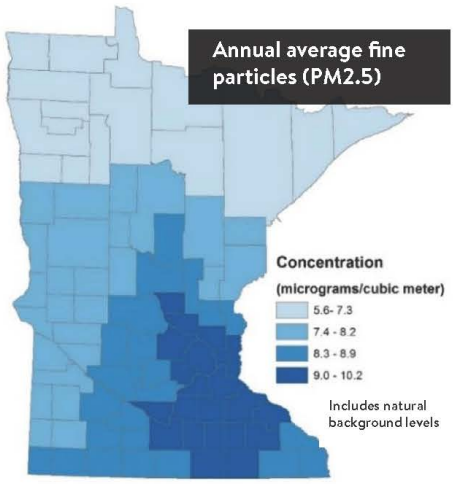
Communities across the state experience disproportionate air pollution which can lead to negative health impacts. Areas of environmental justice concern are particularly vulnerable to air pollution impacts because of existing health and socioeconomic disparities. Understanding local air pollution risk helps tailor pollution prevention and other agency activities necessary to protect human health and the environment.

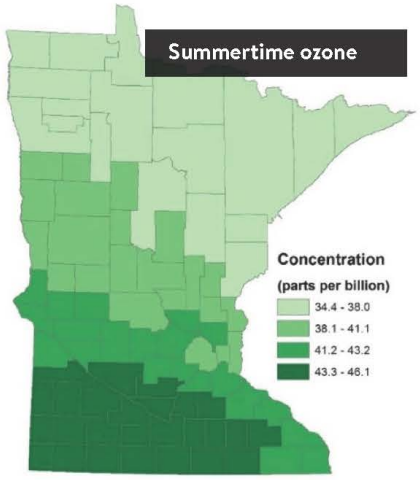


Areas of environmental justice concern are more vulnerable to pollution because of cumulative impacts and existing health disparities.



Air risk scores for cancer and non-cancer impacts from air toxics. A score over 1 means air pollution may contribute to health risks in the area.

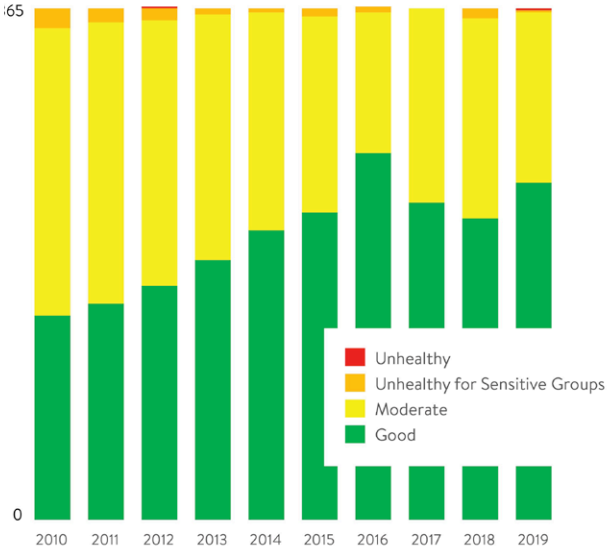




High levels of fine particles and ozone can cause or contribute to premature deaths, respiratory and cardiovascular hospitalizations, and emergency department visits, particularly for the elderly, the very young, and people with respiratory conditions.

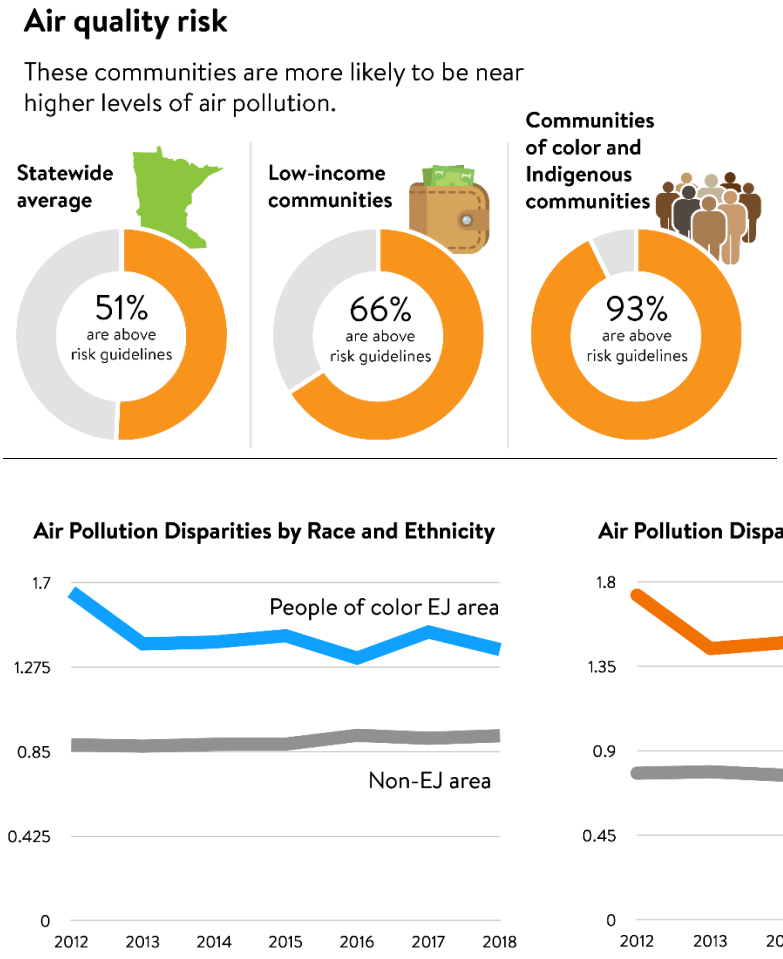
Bad Air Days and the Air Quality Index

On most days, air across Minnesota is healthy to breathe, but on some days pollutants such as ozone and fine particles can reach unhealthy levels. The MPCA uses the Air Quality Index (AQI) to rank daily air quality in terms of good, moderate, unhealthy for sensitive groups, or unhealthy for everyone. The MPCA issues an air quality alert when the AQI is forecast to be unhealthy for sensitive groups, including the elderly, the very young and people with respiratory conditions. The AQI shows air quality has trended better over time. However, the number of days with poor air quality varies from year to year. In 2017, Minnesota experienced no "bad air" days. However, smoke from faraway wildfires is increasingly affecting our air quality. During the summer of 2018, we had nine bad air days; seven of these were caused by smoke from distant wildfires that was transported into Minnesota. 2019 was a very different year, as only three bad air days occurred; however, some of the highest measured numbers for fine particles occurred during a wildfire smoke event over northern Minnesota. For current air quality conditions and forecasts, to download the MN Air app, or to receive alerts, visit ww.pca.state.mn.us/aqi.



Statewide, Black, Indigenous, people of color, and low-income residents are exposed to significantly more air pollution from facilities as well as other sources [Figure 2]. This pollution, along with other socioeconomic factors, contributes to health disparities. Reductions in air pollution from industrial facilities as well as neighborhood sources and transportation, with a particular focus on areas of concern for environmental justice, will be necessary to protect the health of all Minnesotans.

Figure 2. Black, Indigenous, people of color, and low-income residents in Minnesota are more likely to live near industrial facilities and other sources of harmful air pollution. This figure illustrates the real difference in air pollution impacts for people living in areas of environmental justice concern



Prioritizing environmental justice work

For the past 30 years, federal air regulations have focused on reducing the most common pollutants. Federal regulations use averages to track Minnesota's statewide progress over time, and that averaging can obscure the local impacts of air pollution. As a result, even though average air pollution is less, the most polluted places when the Clean Air Act Amendments went into effect in 1990 remain the most polluted places in 2020[3].

In Minnesota, discriminatory housing policies, the placement of freeways in Black neighborhoods[4], and zoning and permitting decisions led to people of color being concentrated together with pollution sources [Figure 3]. The result is air pollution that threatens higher health risks in areas where Black, Indigenous, people of color, and low-income residents live [Figure 2]. The social, economic, and health inequities these groups face make them more vulnerable to the health effects of air pollution, further intensifying the impacts. Air pollution and health are closely linked, and even low levels of air pollution

[3] Science, "Disparities in PM2.5 air pollution in the United States;" Colmer, et al; 31 July 2020
[4] https://www.dot.state.mn.us/I-94minneapolis-stpaul/background.html

can contribute to serious illnesses and early death. The disproportionate impact of COVID-19 on Black, Indigenous, and people of color has brought the necessity of air equity into even sharper focus[5].

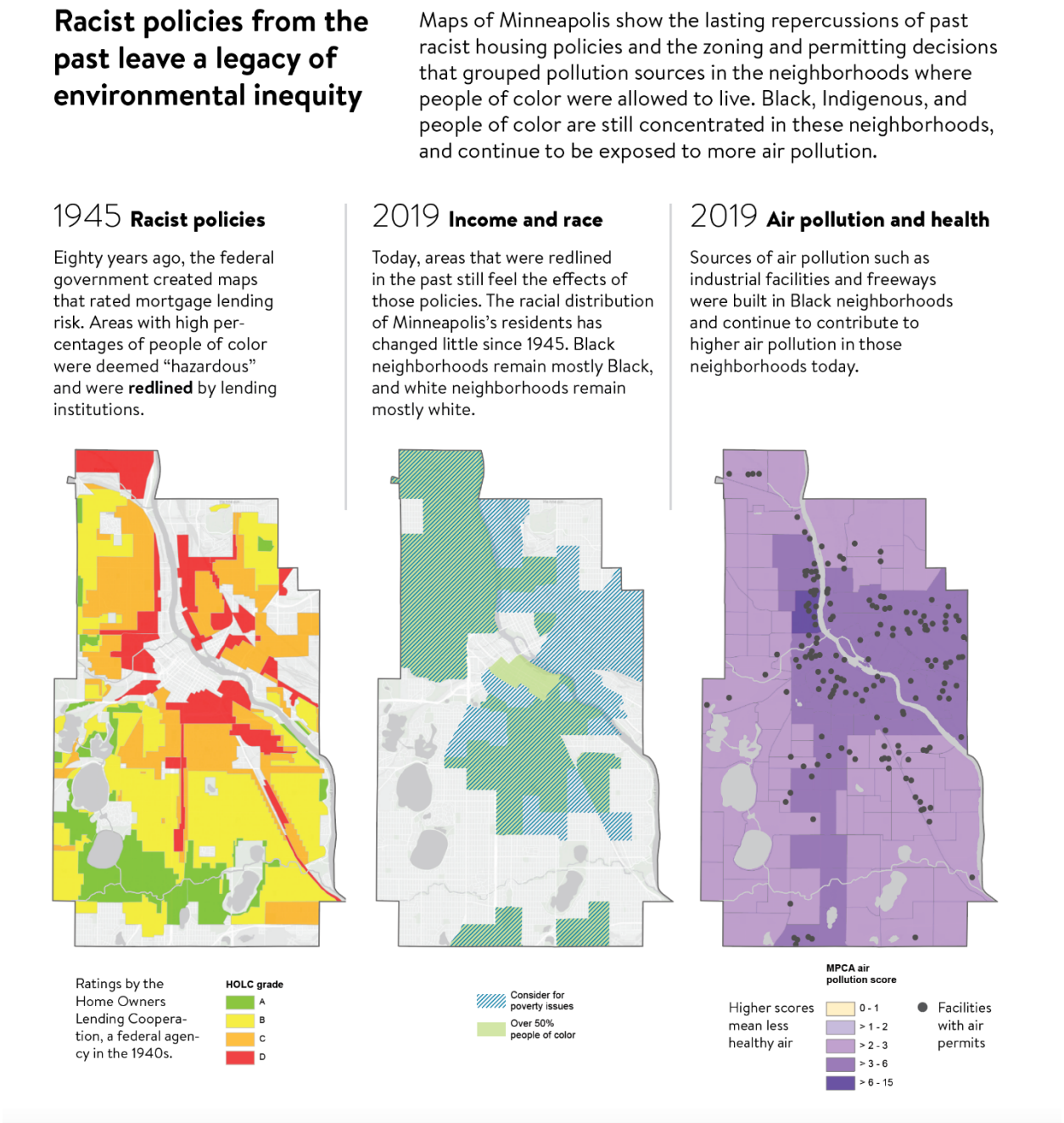
While many parts of Minnesota have benefited from past air pollution reductions, the MPCA believes more work is required to improve air quality in areas where people of color and low-income residents live.

Working together to reduce and prevent pollution disparities in who is exposed to air pollution, what kind of pollution, and how much pollution are long-standing, multifaceted, and entrenched issues. Addressing them will take a sustained effort by the agency in collaboration with partners in community, industry, and government. The MPCA has set a long-term goal to reduce and prevent disproportionate impacts from pollution. More immediately, the MPCA has undertaken a deliberate effort to reduce air pollution in the most polluted places, where the health risks and impacts from air pollution are highest.

5 https://mn.gov/covid19/data/data-by-race-ethnicity/index.jsp

Figure 3. Maps of why

Maps of Minneapolis provide an example of the lasting repercussions of past racist housing policies and the zoning and permitting decisions that grouped pollution sources in the neighborhoods where people of color were allowed to live. Black, Indigenous, and people of color are still concentrated in these neighborhoods, and continue to be exposed to more air pollution. These maps show Minneapolis, but these development and pollution patterns occur across the state and the country.



We use data in the MPCA's interactive environmental justice story map to focus our work. The story map shows which census tracts in Minnesota have higher concentrations of residents who are Black, people of color, or low-income, as well as tribal areas – the same people we know are most vulnerable to the effects of air pollution. Collectively, we consider these census tracts to be areas of concern for environmental justice.

The story map also includes data on air pollution and the risk it poses in each Minnesota census tract. This data is pulled from MPCA's MNrisks model. MNrisks aggregates pollution risks from sources such as industrial facilities, traffic, and residential and commercial heating. Modeling combined risks means the tool takes into account the fact that risks go up when more sources of air pollution are near each other. Taken together, the demographic and risk data in the story map highlights places where vulnerable populations experience elevated risk from air pollution, and we use it to guide program decisions.

Resource you can use: EJ story map

The MPCA uses our story map to identify and prioritize areas where additional consideration and effort are needed to address the impacts of historical, existing, and proposed air pollution. Community groups, organizations, and municipalities can use the story map to prioritize and focus their work. Find the map here:

https://www.pca.state.mn.us/about-mpca/mpca-and-environmental-justice

- The MPCA uses this data to identify which facilities' air emissions pose the most risk to nearby residents. When these facilities apply for new or amended air permits, the MPCA often encourages them to reduce risk by going beyond minimum requirements. Facilities are also encouraged to take on projects that aren't usually captured by the permitting process, such as switching to electric delivery vehicles and changing truck routes to reduce neighborhood exposure to diesel exhaust, planting trees around their facility to reduce windblown dust, and engaging with neighbors.
- MPCA's air compliance and enforcement inspectors prioritize inspections of facilities located in areas of concern for environmental justice, and especially those in areas with the highest risk for health impacts from air pollution.

The MPCA also works to reduce air pollution outside of its permitting and compliance duties. We provide grants to make less-polluting choices more achievable, particularly for small businesses. Decisions about where and which grants are made available and awarded consider the demographics, air pollution risk, and health vulnerability of a project area. A recent grant helped replace gas-powered landscaping and snow removal equipment with less-polluting electric-powered equipment. Schools, small businesses, city departments, and non-profits in areas of concern for environmental justice received an overall investment of $220,000 across three grant rounds, which was 73% of the money available, and a reduction of more than 200 tons of volatile organic compounds (VOCs), a pollutant group that triggers ground-level ozone and asthma.

Volkswagen Settlement Progress

In the first two years of MPCA's Volkswagen settlement grant programs, MPCA distributed $11.75 million across five categories: transit buses and trucks, off-road equipment, school buses, heavy-duty electric vehicles, and EV charging stations. MPCA has awarded approximately 27% of the funding to projects in areas of concern for environmental justice and 57% of funds in Greater Minnesota. These investments in 2018-2019 will significantly reduce air pollution from nitrogen oxides, fine particles, and greenhouse gases. Read more about emissions reductions and how we're working toward our other goals here: https://www.pca.state.mn.us/air/progress-toward-our-goals

Small differences in air pollution can have a big impact on health, so we plan to supplement demographic and risk data with what we learn from the MPCA's Urban Air Quality study (funded by the Legislative-Citizen Commission on Minnesota Resources), which placed air sensors in every zip code in Minneapolis and Saint Paul. Early results from this dense network of sensors shows differences in air pollution between and even within neighborhoods. These small-scale differences reinforce the need to take a localized approach to pollution reduction and consider local sources, impacts, and strategies.

Understanding the nuances of local air pollution requires input from local residents who breathe the air every day. To do this, we are deepening our connections with the most impacted communities, starting with being more present in these areas, listening to their needs, and taking action when and where we can.

- Our first focus for this work has been in Minneapolis. Staff attend Minneapolis Green Zones community meetings to answer their questions. We also attend Open Streets and other community events to talk with people and learn about their concerns.
- We are examining agency processes for opportunities to strengthen community participation, such as in permitting. When facilities in areas of concern for environmental justice request a new or amended air permit, we work to identify and reach out to community members early in the process instead of waiting until the formal public comment period. We push facilities to do more community outreach and engagement than the minimum legal requirements of public notices. We have developed training and collaborative workgroups for facilities and community groups to build their capacity to work together cooperatively.
- In coordination with Clean Air Minnesota, the MPCA has identified and funded woodsmoke reduction strategies for northern Minnesota including community woodsheds for Red Lake Band of Chippewa, Leech Lake Band of Ojibwe, and Fond du Lac Band of Lake Superior Chippewa tribes and wood stove changeouts for tribal members. These programs were developed and implemented in coordination with tribal governments.

We recognize that to address the disproportionate impacts of air pollution we need to be willing to change our approach. The MPCA's air programs are making efforts to work together more

collaboratively across and outside the agency, bring in community knowledge, and make agency processes and data clearer and more visible.

Minnesota has been a leader in environmental protection in the past, and that leadership has led to lower average air pollution. Everyone should have access to the same clean air across the state. The MPCA must now lead by making our air pollution reduction efforts more localized, more attentive to neighborhood and community needs, and more focused on tackling air pollution where the risks and impacts are highest.

Everyone has a role to play in reducing air pollution

The sources of air pollution have become more complex and more diffuse, and we can no longer look only to permitted facilities to make further improvements in air quality. We all must play a role. The MPCA uses data from monitoring, modeling, and the Minnesota Department of Health to better understand air quality and its impacts.

The MPCA regulates large industries and small businesses to reduce their impacts on air quality. Regulated facilities are expected – and required – to comply with permits and follow the rules. But many neighborhood sources of pollution aren't regulated directly, so the MPCA also encourages voluntary actions to improve local air quality. Individuals can help by making simple daily choices that improve air quality, health, and personal exposure. For example:

- Drive electric or more efficient vehicles
- Drive less or use public transportation
- Switch to an electric or person-powered lawn mower
- Let the Air Quality Index help guide daily activities.
- Choose to burn dry wood

Taking action on TCE

Trichloroethylene (TCE) is an industrial solvent used in manufacturing that has been linked to negative health effects. On May 16, 2020, the State Legislature passed legislation that restricts most permitted uses of TCE in Minnesota. The legislation prohibits the use of TCE by permitted facilities after June 1, 2022.

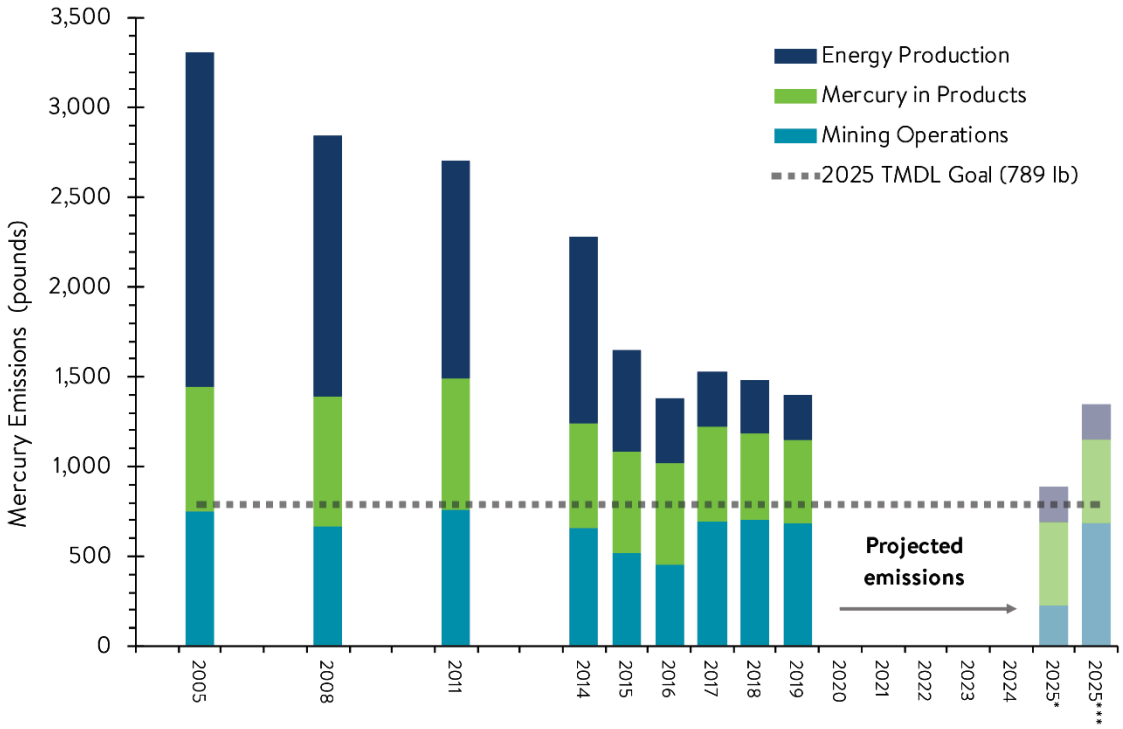
To implement this legislation the MPCA has requested information on TCE use from all facilities with air permits. Thirty-nine facilities reported past or current TCE use. Of those 39 facilities, 22 have already stopped using TCE. The other 17 facilities are identifying TCE replacements or applying for variances under the legislation. For more information, please visit: https://www.pca.state.mn.us/air/taking-action-tce

Reducing mercury in our air and water

This section of the report provides the biannual state update on progress towards Minnesota's 2025 mercury emission goals. Mercury exposure can harm the organs and nervous systems of people and wildlife. Minnesota has led the nation in efforts to reduce mercury air emissions, but challenges remain. Mercury released into the air settles into water and accumulates in fish, making them unsafe for people to eat and damaging the ecosystem. In 2007, the MPCA finalized a statewide mercury Total Maximum Daily Load (TMDL) study that determined the emissions reductions necessary to meet water quality standards and protect people from consuming mercury-contaminated fish. The TMDL establishes a goal of 93% reduction in mercury from all human sources including emissions originating from outside of Minnesota. The MPCA is working to meet the 93% reduction in the state by following the mercury TMDL implementation plan, developed by stakeholders in 2009.

To accomplish the reductions specified in the TMDL and implementation plan, the MPCA proposed and later adopted rules regarding mercury reduction plans in Minn. R. 7007.0502. These rules established mercury emissions reductions for certain sources of mercury air emissions in order to ensure we meet the goals of the 2007 TMDL. In order to evaluate the progress of reducing mercury in our waters, mercury emissions inventories are developed and tracked. The MPCA also conducts fish tissue analysis to understand how mercury levels in fish are changing over time.

Figure 4. Minnesota mercury emissions and projections.



2025* This 2025 projection shows the forecasted mercury emissions based on the ferrous mining/processing facilities in northern MN meeting the required 72% reduction specified in Minn. R. 7007.0502.

2025*** This 2025 projection shows the forecasted mercury emissions based on MPCA's ongoing review of the mercury reduction plans submitted by the ferrous mining/processing facilities in northern MN.

All the waters in the state will benefit from the statewide mercury reduction plan, but not all waters respond the same to reduced emissions. The primary goal is to substantially lower mercury in fish and make them safer to eat. Minnesota's Draft 2020 Impaired Waters List includes 5,774 water quality impairments in 3,416 different bodies of water. Of the waters tested, mercury is the cause of 1,653 impairments in 1,245 different lakes and rivers. About 73% of our waters will reach the goal if the plan is fully implemented. For the remaining 27%, more work is needed to understand why these waters remain high in mercury despite lower emissions.

Sector activities and emissions reductions

A number of efforts are in place to reduce mercury emissions. State statutes and rules, along with national standards for mercury and air toxics emissions from coal-fired utility boilers, have resulted in significant reductions in emissions of mercury and other pollutants in Minnesota. In 2006, Minnesota passed the Mercury Emissions Reduction Act (MERA), which set a schedule for the largest coal-fired utility boilers in the state to reduce mercury emissions by 90% from 2005 levels. As of 2015, all Minnesota utilities have achieved full compliance with MERA. To get there, they retrofitted some coal plants with improved pollution controls, switched some to natural gas, and shut down others. The changes these facilities made to reduce mercury emissions also brought 75-80% reductions in emissions of haze-forming pollutants as well as significant reductions in greenhouse gases. Utilities continue to shut down coal plants in Minnesota as they rely more on renewable energy and natural gas. Several of the remaining coal plants in Minnesota will close in the 2020s. It is estimated that electric utilities emitted approximately 121 pounds of mercury in 2019 and now represent the smallest of the three source categories. This is a decrease from 1,716 pounds emitted by electric utilities in 2005.

Emissions from mercury use in various products also saw a decrease in 2019 as a result of additional research to improve emission estimates from solid waste collection and processing. The previous mass balance study on waste incinerators was updated to include recent years of ash testing data. The inclusion of this new data allowed the MPCA to improve the emissions factor used and resulted in roughly a 75-pound decrease in mercury emissions from the previous estimate. However, it is too early to determine if this is a downward trend or simply variability between years. The MPCA continues to work to improve the confidence of the mercury emissions inventory through partnerships and research.

Conversely, emissions from the taconite mining sector have remained relatively flat, dropping from 750 pounds in 2005 to 688 pounds in 2019. Per Minn. R. 7007.0502, the taconite mining sector submitted mercury reduction plans to the MPCA in December 2018. The MPCA received eight plans, each varying in the amount of mercury reductions proposed. Two facilities submitted plans with proposed reductions meeting the required 72% reduction specified in Minn. R. 7007.0502, two facilities submitted alternative plans with proposed reductions less than the 72%, and four facilities submitted alternative plans with no proposed reductions but further evaluation beginning in mid-2020.

Despite significant reductions from some sectors, the MPCA projects that the state will not meet the plan's 2025 statewide reduction goal. Meeting that goal will require significant reduction of mercury emissions from the taconite mining sector and further reductions from mercury use in various products.

Appendix A: Mercury emissions 2016-2019

In accordance with Minnesota Statute § 116.925, this appendix reports mercury emissions associated with electricity production. In 2007, the MPCA established an emissions reduction goal and is now implementing stakeholder recommendations to meet the goal. The electric utility sector has made changes to reduce mercury and has met the interim mercury emission reduction goals in 2018. More information about Minnesota's mercury emissions and reduction strategies can be found on page 10 of this report and at https://www.pca.state.mn.us/water/mercury.

Mercury emissions from electricity generation

Minnesota Statute § 116.925 requires producers and retailers of electricity to report the amount of mercury emitted through the generation of electricity. This law also requires MPCA to summarize this information in its biennial air toxics report to the Legislature.

Minnesota law exempts certain electric-generation facilities from reporting mercury emissions: (1) those that operate less than 240 hours per year, (2) combustion units that generate fewer than 150 British thermal units (Btu) per hour, (3) generation units with a maximum output of 15 megawatts or less, and (4) combustion facilities that emit less than three pounds of mercury in a given year. Therefore, generation facilities that do not emit any mercury, such as nuclear, wind, and hydroelectric, are not reported here.

Due to variation in operating conditions, some facilities may emit more than three pounds one year and less than three pounds in another. When emissions are less than three pounds, the actual emissions are either given or listed as exempt, depending on the wishes of the facility's management.

The following table shows mercury emissions from electric utilities in years 2016 through 2019. Note that 2019 emissions are considered draft and under quality review by the MPCA.

Mercury emissions from electric utilities, 2016 through 2019

	Mercury emissions (pounds)			
Company	**2016**	**2017**	**2018**	**2019 (draft)**
Blandin Paper Co / MN Power – Rapids Energy Center	5	5	4	0
District Energy St Paul Inc. – Hans O Nyman	4	1	1	1
Great River Energy	6	9	9	0
Hennepin Energy Recovery Center	7	5	1	3
Hibbing Public Utilities Commission	7	9	4	2
Minnesota Power – Boswell Energy Center	34	32	21	11
Minnesota Power – Hibbard Renewable Energy Center	3	3	3	3
Minnesota Power – Laskin Energy Center	0	0	0	0
Minnesota Power – Taconite Harbor Energy Center	4	0	0	0
Northshore Mining – Silver Bay	15	18	23	12
Otter Tail Power Co – Hoot Lake Plant	3	2	4	3
Virginia Department of Public Utilities	6	7	5	2
Xcel Energy – Allen S King Generating Plant	18	21	18	11
Xcel Energy – Black Dog Generating Plant	0	0	0	0
Xcel Energy – Key City/Wilmarth	4	2	8	6
Xcel Energy – Red Wing Generating Plant	10	5	4	4
Xcel Energy – Sherburne Generating Plant	79	91	89	83
Grand total	**205**	**209**	**194**	**142**

Mercury emissions associated with industrial facilities in Minnesota, 2016-2019

The emissions reduction goal that the MPCA established in 2007 also included milestones for industrial facilities:

- Ferrous mining or processing facilities are required to reduce mercury emissions by 72% from 2008/2010 emission levels by January 1, 2025.
- Facilities with large boilers that had individual emissions greater than 5 pounds were required to comply with the applicable federal regulations and ensure that a reduction of at least 70% was achieved by January 1, 2018.
- Iron and steel melters were required to reduce mercury emissions to less than 35 milligrams per ton of iron/steel produced by June 30, 2018.
- Other mercury emission sources with processes that individually emit three or more pounds of mercury per year were required to reduce emission emissions by at least 70% by January 1, 2025.

Mercury emissions from industrial facilities

Minn. R. 7019.3000 requires owners and operators of facilities in Minnesota to report the amount of mercury emitted from their facility annually if the facility emits three pounds or more of mercury in a given year. Facilities that emit less than three pounds of mercury must report every three years.

The following tables shows mercury emissions from ferrous mining and processing facilities and other industrial facilities in years 2016 through 2019. Note that 2019 emissions are considered draft and under quality review by the MPCA. Mercury emissions from products are not included in these tables because their estimates are based the 2017 National Emissions Inventory and cannot be compared to specific facility emission reports. A full table of emission estimates and reports can be found here: https://www.pca.state.mn.us/sites/default/files/wq-iw4-02h7.pdf

Mercury emissions from ferrous mining & processing facilities, 2016 through 2019

	Mercury emissions (pounds)			
Company	**2016**	**2017**	**2018**	**2019 (draft)**
ArcelorMittal Minorca Mine Inc.	75	75	76	73
Hibbing Taconite Company	159	149	150	144
Mesabi Metallics Company LLC	0	0	0	0
Mesabi Nugget Delaware LLC	0	0	0	0
Northshore Mining Company – Silver Bay	3	5	5	5
Northshore Mining Company – Babbitt	0	0	0	0
United Taconite LLC – Fairlane Plant	57	190	199	204
United Taconite LLC – Thunderbird Mine	0	3	0	0
US Steel Corp - Keetac	0	90	103	102
US Steel Corp - Minntac	149	173	163	148
Grand total	**441**	**685**	**696**	**677**

Mercury emissions from other industrial facilities, 2016 through 2019

Company	Mercury emissions (pounds)			
	2016	2017	2018	2019 (draft)
Alliance Pipeline – Albert Lea 25-A	2	3	3	3
American Crystal Sugar – East Grand Forks	20	18	15	15
American Crystal Sugar – Moorhead	12	10	10	10
American Crystal Sugar Co – Crookston	8	8	12	10
Badger Foundry Co	0	2	2	2
Boise Paper LLC	3	3	3	3
Enviro-Chem Inc – Plant 1	0	0	0	1
Gerdau Ameristeel US Inc – Saint Paul Mill	54	59	11	6
Met Council - Seneca WWTP	7	6	7	6
Norbord Minnesota	2	2	2	2
Perham Resource Recovery Facility	1	1	1	1
Prospect Foundry LLC	1	2	3	1
Saint Paul Park Refining Co LLC	2	1	1	1
Sappi Cloquet LLC	3	4	4	4
Southern Minnesota Beet Sugar Coop	6	6	7	6
Grand total	**122**	**126**	**82**	**70**