## **Cumulative impacts**

# What does it mean to experience substantial adverse impacts from pollution? - **DRAFT**

We want your reactions and input on what data will be required for conducting cumulative impacts analyses. Ultimately, these indicators will be available to the public through an online mapping tool that is being developed. Through working sessions, past community input, and consultation with other state and federal experts, MPCA staff have assembled a list of indicators and data.

To prioritize indicators, we have laid out the data in categories of "likely", "potential", and "unlikely" to be included. We need your help to refine these categories before we start building the mapping tool.





## LIKELY to be included in cumulative impact analyses

These data are "likely" to be included based on:

- best practices research connected to public health outcomes
- consistent use in other state or federal mapping tools
- feedback from residents of an environmental justice area susceptible to harm from exposure to pollutants
- high-quality, publicly-available data that can be used in this tool

Please place your five dots on the large posters to show indicators you have concerns about.

Data indicator	Description	Category	Concerns?
Unemployment	Percent of an adult population that is unemployed in census data	Social factors	
Age of residents	Residents under the age of 5 or over the age of 64 in census data	Social factors	
Food insecurity	Households that do not have access to enough food or food of adequate quality to meet basic needs	Social factors	
Educational attainment	Percent of the population over age 25 with less than a GED or complete high school education in census data	Social factors	
Asthma emergency department rates	Proportion of resident population that has visited the emergency department for asthma symptoms over the past five years	Public health measures	
Cancer risk estimates based on air pollution emissions	Total estimated risk of developing cancer based on air pollution data and modelling; health-based benchmarks for multiple air pollutants; and information from permitted facilities, traffic, residential and commercial heating, and other sources	Public health measures	
Childhood elevated lead exposure	Proportion of children with lead above 5 mcg/dL of blood	Public health measures	
Low birth weight births	Proportion of babies born after full term (37 weeks) but at weights under 5 pounds, 8 ounces	Public health measures	
Solid waste activities	Number of solid waste facilities within a community including landfills, incinerators, land disposal sites, transfer/processing stations, and waste tire facilities	Land pollution	
Remediation and redevelopment sites for pollution clean-up	Number of Superfund, brownfield, and other clean- up sites in a community actively being managed by the Minnesota Pollution Control Agency	Land pollution	



## LIKELY to be included in cumulative impact analyses

Data indicator	Description	Category	Concerns?
Impaired waters	Number of lakes, wetlands, streams, and rivers that are categorized and tracked by the MPCA for multiple types of pollution that affect water quality and human health	Water pollution	
Ground level ozone	Number of days per year that have an Air Quality Index above 100 due to ozone levels	Air pollution	
Fine particulate matter	Number of days per year that have an Air Quality Index above 100 due to particulate matter levels	Air pollution	
Reported emissions	Actual emissions of criteria pollutants from permittee inventory reports to the MPCA	Air pollution	
Traffic density	Average volume of total traffic in the most recent year available from MN Department of Transportation.	Transportation pollution	

#### Tell us what you think about these indicators:



The tables below include data indicators that MPCA staff are seeking additional feedback on to decide whether to add them to the tool. Data sources and rationale for inclusion are provided for each indicator.



Please place your five dots on the large posters to vote for **data that should be included**.

#### Built environment

Data indicator	Description	Source	Rationale
Lead paint risk in older homes	Percent of housing built before 1950 in a census tract	Census Bureau's American Community Survey (ACS) 5-year estimates	Lead-based paint was phased out of residential use in 1950 and eventually banned in 1978 in the U.S. Lead-based paint is the most common source of lead exposure in children.
Impervious cover/ surfaces	Percent of hard, paved ground coverings, like roads and parking lots in a census tract	USDA National Land Cover	More impervious surfaces in a community can increase local temperatures, heat stress risk, and also increase ground surface pollution runoff into waterways.
Lack of recreational open space	Proportion of tract area not within 1-mile buffer of a park, recreational area, or public forest	Center for Disease Control's (CDC) Environmental Justice Index (EJI)	Parks and green spaces play a critical role in boosting property values, contribute to quality of life, and help to offset environmental hazards.
Lack of tree canopy	Percent of a census tract with summer tree canopy measured by satellite imagery	USDA Tree Cover	Tree cover provides shade that can improve local air quality and lower temperatures, which is an important protective factor especially during heat waves and air quality alerts.

#### Drinking water quality

Data indicator	Description	Source	Rationale
Private well reliance	Percent of residents who get drinking water from private wells	MN Dept. of Health	Private wells can be more vulnerable to contamination from pollution and they are not regulated or routinely tested, as community water systems are. They can pose risks for those who rely on wells and may not have the ability or access to testing and remediation of contaminated wells.



#### MPCA permitted facilities

Data indicator	Description	Source	Rationale
MPCA permitted sites and other agency interests	The number of facilities with air permits and other agency interests, including contaminated properties, facilities with water and other permits, facilities the MPCA has penalized, and projects under environmental review	What's in My Neighborhood provides datasets for the locations and classifications for a variety of agency interests.	Overburdened communities often coexist with numerous commercial facilities and industrial sites, both large and small. While the potential emission impacts from these sites are captured by other EJ stressors, the mere presence of multiple pollution sources within a block group is itself a stressor.
MPCA compliance and enforcement issues	Minnesota Pollution Control Agency enforcement actions and inspection noncompliance history at regulated facilities in the last five years	The amount of enforcement actions and/ or inspection noncompliance instances weighed by severity.	Not complying with our environmental regulations could lead to increased risk of exposure to pollution. If there are more facilities with compliance and enforcement issues in a community, then that risk is likely to be worse

#### Public health measures

Data indicator	Description	Source	Rationale
Health insurance	Percent of residents without health insurance coverage	Census Bureau's American Community Survey (ACS) 5-year estimates	According to the CDC, people without insurance are less likely to have a primary care provider, and they may not be able to afford needed health care services and medications. In Minnesota, people of Latino heritage, American Indians, African American or Black people, and Asian people are all less likely to have health insurance coverage than white people.
Traffic-related injuries	Annual rate of traffic- related injuries and death	MN Dept. of Health	A livable community is one that provides safe and convenient transportation choices to all resident, whether it's by walking, bicycling, transit, or driving.
Heat stress	Population rate of emergency room visits and hospitalizations due to heat-related illness	MN Dept. of Health	Heat stress encompasses many health problems that occur when the body gets too hot for too long and cannot cool down. Heat stress can also worsen existing health condition, like diabetes, heart disease and respiratory conditions. Heat stress is of concern related to increasing frequency and severity of heat waves linked to climate change.



#### Social factors

Data indicator	Description	Source	Rationale
Income inequality	Areas with a Gini coefficient higher than the state or county index value would be considered "high income inequality"	Census Bureau's ACS 5-year estimates	Minnesota has stark inequalities across a range of issues, like housing, income, educational outcomes, and others, and averages can sometimes obscure inequities within communities. The Gini index is standard indicator of wealth inequality. In 2023, Minnesota's Gini index was 0.47.
Low- to moderate income renters	Percent of rental households with income ranges at 50% of the area median income as well as 50-80% of the area medium income	Census Bureau's ACS 5-year estimates/U.S. Housing and Urban Development (HUD)	This indicator has similar rationale to cost-burdened households, but with a focus on renters. Community specifically asked to look at renters in this data tool.
Cost-burdened households	Percent of households that are spending greater than 30% of total income on housing costs, including mortgage or rent payments.	Census Bureau's American Community Survey (ACS) 5-year estimates.	It directly looks at the relationship between income and people's ability to afford housing where they live.
People with disabilities	Percent of residents with disabilities	Census Bureau's ACS 5-year estimates	According to the CDC, people with disabilities are less likely to get preventive health care and may have trouble finding a job, going to school, or getting around outside their homes. They may also experience daily stress related to these challenges.



#### Transportation pollution

Data indicator	Description	Source	Rationale
Heavy duty truck traffic	Average annual daily traffic-mile per square mile within a block group as an indicator of heavy-duty truck traffic proximity to residences and other institutions	Federal Highway Administration's (FHWA) Highway Performance Monitoring System (HPMS) Average Annual Daily Traffic (AADT)	Heavy truck traffic increases exposure to diesel particulate matter and other toxic air pollutants.
Cars and light- and medium-duty trucks	Average annual daily traffic-mile per square mile within a block group as an indicator of cars and light- and medium-duty truck traffic proximity to residences and other institutions	FHWA HPMS AADT	Residential proximity to traffic is associated with various health impacts, particularly the onset of, or exacerbation of asthma, as well as mortality rates.
Port traffic	The number of ports within a mile of communities	Federal Emergency Management Agency (FEMA)	Ports of entry and intermediary storage for goods are often located in or near low-income communities and communities of color and cause increased exposure to pollutants.
Percent of population living near highways	Proportion of residents in census tracts living within 150 meters of highways	CDC Environmental Public Health Tracking Network	Living near highways can increase exposure to traffic-related pollution and has been shown to contribute to elevated asthma rates and other health conditions. Traffic proximity is also associated with noise.
Percent of public schools near highways	Proportion of public schools within 150 meters of highways	CDC Environmental Public Health Tracking Network	Schools are important community spaces where children and staff spend a lot of time. Schools and school activities closer to highways can have higher exposure to traffic-related air pollution.
Railways	The amount of railway systems within 1 mile of communities	US and MN Department of Transportation and the Minnesota Pollution Control Agency	Railways can cause noise, ground, water, and air pollution
Noise pollution	Proportion of the population exposed to 85 decibels or higher of noise pollution in a given year	US Department of Transportation	Noise pollution has been mentioned by community members as a stressor, and the public health literature shows effects of noise on stress, sleep, and cardiovascular health.



## UNLIKELY to be included in cumulative impact analyses

Below are data indicators that we have considered during this rulemaking process and at this point are unlikely to include in this tool. The primary reasons for not including these indicators include:

- the data does not have a clear connection to public health outcomes
- there is poor data quality for the purpose of this work. Common issues include outdated information, lack of spatial resolution (not 'zoomed-in' enough), and it is not publicly available.
- other indicators capture the issues that are being considered
- the topic is out of scope with the intention of the law
- the content could be included as context and it is not a clear stressor



Data indicator	Description	Category	Include?
Community resilience indicator	FEMA uses this tool to generally measure community resilience to natural disasters, but it only provides data by county and includes information unrelated to cumulative impacts from pollution.	Social factors	
Heart attack hospitalizations	Heart attacks are linked with high air pollution exposure, but are rare enough in the state that it would be hard to meaningfully capture them at a community scale below county.	Public health	
Overdose deaths	Unintentional overdose deaths can be difficult to determine if it was a medication error or if there was an underlying intent. Intentional overdose deaths have a very specific definition to be applicable.	Public health	
Hazardous waste sites	This would look at facilities with a hazardous waste permit in Minnesota. It was determined that Minnesota has fairly small facilities with minimal amounts of hazardous waste that is unlikely to expose people to this pollution. Pollution from landfills and groundwater contamination are more likely to expose people to hazardous pollution.	Land pollution	
Homelessness	Homelessness can clearly impact community health, but there are serious data quality limitations with tracking this issue. Other indicators could capture housing instability and housing issues for this tool.	Social factor	
Agricultural runoff	Pollution like nitrate can be a stressor if people are exposed, but this would be captured in the indicator looking at residents using private wells. Community wells are tested regularly and often while they also remove any contamination quickly from a system. The impaired waters indicator also captures runoff that impacts waterways.	Water pollution	



## UNLIKELY to be included in cumulative impact analyses

Data indicator	Description	Category	Include?
Industrial runoff	There are other indicators like the impaired waters indicator that captures runoff impacting waterways, including pollution from mining, stormwater, or other activities from facilities.	Water pollution	
Debt stress	Amount of debt in an area. The amount of debt can be a stressor, but it does not account for total income in a household to meet its needs.	Social factors	
Community water system contamination	Of Minnesota's water systems, 96% meet drinking water requirements, and for the remaining 4%, pollution issues are addressed quickly once found. Most contaminated wells are also outside of the Twin Cities, Duluth, or Rochester.	Water pollution	

#### Tell us what you think about these indicators:

