

PROPOSED NEW AND UPDATED STANDARDS FOR 15 AIR POLLUTANTS

The McGuinty government plans to consult on new or updated standards for 15 pollutants to be incorporated into Regulation 419/05, the Air Pollution Regulation – Local Air Quality. Ontario is proposing to review the limits for 15 substances based on improved scientific information, updated research on associated health risks and new air dispersion models to provide greater protection of public health and the environment. The standards for these substances will be used primarily to assess and manage local impacts from industries on surrounding neighbourhoods and communities.

No.	Substance	Examples of industrial emitters	Health Effects/Concerns
1	Lead and Lead compounds	<p>Uses: Production of batteries, metal products and devices to shield X-rays.</p> <p>Sources: Paints, dyes, plastic coatings, and metal products, and release during industrial activities such as mining and smelting.</p>	<p>Exposure to lead can adversely affect many organ systems (e.g., nervous, digestive, renal). As well, there is a direct association between increased blood lead level and a decrease in children's neurological function.</p> <p>Elevated blood lead levels have deleterious effects on brain function, including lowered intelligence, behavioural problems, and diminished school performance.</p>
2	Cadmium and Cadmium compounds	<p>Uses: Production of nickel-cadmium batteries, paint pigments, and anti-corrosive coatings; manufacturing of electronic components and select metal alloys.</p> <p>Sources: Mining, metal refining; combustion of fossil fuels.</p>	<p>Breathing air with lower levels of cadmium over long periods of time (for years) results in a build-up of cadmium in the kidney, and if sufficiently high, may result in kidney disease. Other effects that may occur after breathing cadmium for a long time are lung damage and fragile bones.</p>
3	Ethylene oxide	<p>Uses: Disinfectant; sterilizing operations; chemical manufacturing.</p> <p>Sources: Uncontrolled fugitive emissions or venting with other gases related to use as a chemical intermediate; combustion of hydrocarbon fuels; losses during disinfections of hospital equipment.</p>	<p>Ethylene oxide is a direct-acting mutagen and reacts with DNA.</p> <p>Exposure can lead to an increase in the incidence of leukemia, stomach cancer, cancer of the pancreas, and Hodgkin's disease.</p>
4	n-Butanol	<p>Uses: Organic solvent; intermediate in the manufacture of organic chemicals (most importantly: acetates, acrylates and glycol ethers); extractant in the</p>	<p>Animal studies have shown that exposure to n-Butanol can lead to reduced weight gain.</p> <p>Other health effects in humans or animals at</p>

		<p>manufacture of antibiotics, hormones and vitamins.</p> <p>Sources: Majority of releases are from the motor vehicle and metal products industries</p>	<p>elevated concentrations can include central nervous system (CNS) depression, and irritation of the eyes and upper respiratory tract.</p>
5	Chlorine dioxide	<p>Uses: Bleaching agent for wood pulp; disinfection of water; fungicide, bactericide in food industry.</p> <p>Source: Pulp mills</p>	<p>Adverse effects on the respiratory system (i.e. blood vessel congestion and peribronchiolar edema, which is an accumulation of excessive fluid) were identified in a study on rats.</p> <p>A health effect in humans or animals at elevated concentrations is irritation of the respiratory system.</p>
6	Chloroethane	<p>Uses: Manufacture of dyes, chemicals, pharmaceuticals; solvent; refrigerant; topical anaesthetic; production of propellants; formulation of insecticides</p> <p>Sources: Emission during chemical production; burning waste; evaporation from solvents, aerosols and anaesthetic uses</p>	<p>A study with mice found that chloroethane inhalation exposure can lead to the delayed formation of the skull bones. There is some evidence of carcinogenicity in female mice.</p> <p>Other health effects in humans or animals at elevated concentrations can include CNS effects, and respiratory and cardio-vascular damage.</p>
7	1,1-Dichloroethane	<p>Uses: Intermediate in the manufacture of vinyl chloride and 1,1,1-trichloroethane; coupling agent in anti-knocking gasoline; metal degreasing and organic synthesis; solvent in paint, varnish and finish removers</p> <p>Sources: Industrial manufacturing and use processes</p>	<p>The critical effect considered in proposing the standard was based on a study that found that dichloroethane had adverse kidney effects in animals following inhalation exposure.</p> <p>Other health effects in humans or animals at elevated concentrations can include CNS depression, respiratory tract and dermal irritation, anaesthesia and cardiac arrhythmia and possible carcinogenicity.</p>
8	Isobutanol	<p>Uses: Solvent in paint and varnish removers; intermediate in organic synthesis in the pharmaceutical and pesticide industries; manufacture of fragrance essences</p> <p>Sources: Motor vehicle industry</p>	<p>Inhalation of isobutanol caused a decrease in the response to external stimuli and damage to the CNS in rats.</p> <p>Other health effects in humans or animals at elevated concentrations can include gastrointestinal effects, and irritation of the skin, eyes and throat.</p>
9	Methyl chloride	<p>Uses: Production of agricultural chemicals and butyl rubber.</p> <p>Sources: Organic chemical manufacturers, pulp industry</p>	<p>A short-term inhalation study using mice determined that methyl chloride can cause lesions of the brain, accompanied by functional disturbances.</p> <p>Other health effects in humans or animals at elevated concentrations can include CNS depression, and gastrointestinal related effects.</p>
10	Phosphoric Acid	<p>Uses: The manufacture of fertilizers, soaps and detergents, inorganic phosphates and pharmaceuticals.</p>	<p>Respiratory tract effects (bronchiolar fibrosis) were identified in a sub-chronic study with rats.</p>

			Another health effect in animals at elevated concentrations is reproductive effects (shown as reduced body weights).
11	Propylene	<p>Uses: Gasoline additive; manufacture of plastics; chemical intermediate in chemical manufacturing industry.</p> <p>Sources: Emissions from combustion of gasoline, coal, wood, and refuse; petroleum refining sector and chemical manufacturing facilities</p>	<p>Studies have shown that inhalation of propylene can lead to abnormal cell transformation in the nasal cavity in rats.</p> <p>An acute effect in humans or animals at elevated concentrations is simple asphyxiation (can cause unconsciousness or death by suffocation).</p>
12	Sulphuric Acid	<p>Uses: Manufacture of fertilizers, phosphoric and hydrofluoric acids, soaps and detergents, food additives, organic chemicals, explosives, plastics, rubber and storage batteries.</p> <p>Sources: coal and oil-fired power plants (as SO₂), mining and smelting industry, pulp and paper industry</p>	<p>Studies have shown that sulphuric acid produces negative bronchial effects (epithelial hyperplasia, which is thickening of the respiratory bronchiole walls) in animals.</p> <p>Other health effects in humans or animals at elevated concentrations can include irritation of the respiratory tract and altering the ability of the lung to clear particles.</p>
13	Total Reduced Sulphur (TRS) & Compounds: hydrogen sulphide mercaptans (as methyl mercaptan) dimethyl sulphide (DMS) dimethyl disulphide (DMDS)	<p>Major sources of TRS: pulp & kraft mills, iron, steel and ferro-alloy, and petroleum & related products</p> <p><u>Hydrogen sulphide</u> Uses: Reagent and intermediate in chemical production of other reduced sulphur compounds, sulphuric acid and extract of sulphides from metals; metallurgic applications; agricultural disinfectants; production of heavy water</p> <p>Sources: By-product of the refining of oil and petroleum and of the pulping process.</p> <p><u>Methyl mercaptans</u> Uses: Odorant in natural gas; an intermediate in the production of pesticides, jet fuel and in the synthesis of methionine and plastics.</p> <p>Sources: By-product of the degradation of organic matter and of industrial processes.</p> <p><u>Dimethyl sulphide</u> Uses: Intermediate in production of various chemicals; gas odorant; solvent for anhydrous mineral salts</p> <p><u>Dimethyl disulphide</u> Uses: Sulphating agent for certain industrial catalysts; food flavouring</p>	<p>A study on rats showed adverse respiratory system effects (nasal lesions of the olfactory mucous membrane).</p> <p>Other health effects of hydrogen sulphide in humans or animals at elevated concentrations can include eye, nose and respiratory irritations, rhinitis, wheezing; CNS effects such as motor activity, unconsciousness; respiratory paralysis; inflammation of the cornea; pulmonary edema, chest and eye pains; headache and dizziness.</p> <p>Mercaptans, hydrogen sulphide, dimethyl sulphide (DMS) and dimethyl disulphide (DMDS) are chemicals with intense and highly offensive odours.</p>

		agent Sources: Both DMS and DMDS are by-products of various industrial processes	
14	Trimethylbenzene (TMB) isomers 1,2,3-TMB 1,2,4-TMB 1,3,5-TMB	Uses: Gasoline additive; solvent in coatings, pesticides, cleaners, inks; chemical raw materials; paint thinners; the manufacture of perfumes, dyes, pharmaceuticals, resins Sources: Vehicle emissions, motor vehicle industries; petroleum refining plants, nonferrous foundries, plastic products manufacturers	The critical effect considered in proposing the standard was based on CNS effects in animals, which included behavioural effects such as , decreased pain sensitivity and impaired active and passive avoidance in tests A known health effect in humans or animals at elevated concentrations is respiratory irritation.
15	Toluene	Uses: Production of benzene; additive to gasoline; raw material in the manufacture of toluene diisocyanate; solvent in various consumer products. Sources: Gasoline evaporation and auto emissions	Toluene can lead to a deficit in neurological function (neurological and psychomotor functioning, colour vision, hearing) and can also act as a respiratory irritant.

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Contact:
John Steele
Ministry of the Environment
(416) 314-6666

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