

Comments on Proposed Amendments to New Brunswick's Air Quality Regulations

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Executive Summary

The Conservation Council of New Brunswick and the New Brunswick Chapter of the Canadian Association of Physicians for the Environment support the Province's proposal to strengthen New Brunswick's air quality standards. Expanding the regulation from about five to 60 pollutants and strengthening several existing standards are important steps toward better protecting human health and the environment.

However, some proposed limits are less protective than World Health Organization guidelines or standards and health-based criteria used elsewhere in Canada. Recent research also shows that some pollutants can cause harm at relatively low levels. We recommend that the Province use the best current science when setting these limits and clearly explain how they were chosen.

We also recommend that the Province:

- Develop a policy to consider the cumulative effects of multiple air pollutants and pollution sources.
- Apply the new standards immediately to new industrial developments and major expansions, while using reasonable phased timelines for existing facilities that need time to comply.

- Reconsider several proposed limits, particularly where stronger health-based guidelines or Canadian standards already exist.
- Review the standards at least every five years so they keep pace with new science

Overall, the proposed changes are a significant improvement. With the additional steps we outline below, New Brunswick can put in place stronger, science-based air quality standards that better protect people and the environment

Support for Modernizing the Regulation

The Conservation Council of New Brunswick and the New Brunswick Chapter of the Canadian Association of Physicians for the Environment support the Province's proposal to modernize New Brunswick's maximum permissible ground-level concentrations for air contaminants. The existing regulatory framework addresses a relatively small number of contaminants, while the proposed Schedule D significantly expands the substances subject to enforceable limits.

We particularly welcome the addition of standards for pollutants and toxic contaminants including fine particulate matter (PM_{2.5}), PM₁₀, ozone, benzene, arsenic, cadmium, mercury, lead, hexavalent chromium, ethylene oxide, formaldehyde and vinyl chloride.

We also support significantly strengthening several existing standards, particularly for nitrogen dioxide and sulphur dioxide, as well as introducing longer-term and statistically based standards intended to address chronic exposure.

The Province's consultation¹ results demonstrated strong public support for action to improve air quality. Eighty percent of survey respondents identified health impacts as a reason air quality matters, 80% identified safeguarding future generations, and 75% identified environmental protection. More than four out of five respondents reported concern about air pollution in their community. These findings reinforce the importance of ensuring that the final regulation provides the strongest reasonable protection for human health and the environment.

¹ Government of New Brunswick. (2026). *Clean Air Act Modernization: What We Heard*. Department of Environment and Climate Change.
<https://www.gnb.ca/content/dam/GNB3/gov/cemc/clean-air/docs/Clean-Air-What-We-Heard.pdf>

Recommendation

We recommend that the Province proceed with modernizing and substantially expanding New Brunswick's air-quality standards, while addressing the specific recommendations below to ensure that the final regulation provides the strongest reasonable protection for human health and the environment.

Overarching Comments

1. Use the Most Protective Evidence-Based Standards

Many of the proposed requirements represent significant improvements over the existing regulation and, in some cases, are more protective than comparable requirements in other Canadian jurisdictions.

However, our review also identified proposed standards that are less protective than regulatory standards or health-based criteria already in place elsewhere in Canada. In addition, the proposed regulation does not provide sufficient information to understand how individual concentrations and averaging periods were selected.

We recognize that differences in averaging periods, measurement methods, contaminant definitions and regulatory frameworks can make direct comparisons difficult. We also recognize that the lowest numerical concentration is not necessarily the appropriate standard in every case. Nevertheless, the Province should be able to demonstrate that each proposed requirement is based on the best available scientific evidence and provides a high level of protection for human health and the environment.

This need for a clear, evidence-based rationale is also reflected in the Province's own engagement findings. The *What We Heard*² report found that participants generally supported updating and expanding the air quality objectives to reflect current science, particularly where changes would strengthen health protection. At the same time, many participants said they could not determine whether the proposed numerical limits would result in tangible improvements in local air quality or health.

² Government of New Brunswick. (2026). *Clean Air Act Modernization: What We Heard*. Department of Environment and Climate Change. [https://www.gnb.ca/content/dam/GNB3/gov/cemc/cleaProvince should make the justification for the proposed concentrations n-air/docs/Clean-Air-What-We-Heard.pdf](https://www.gnb.ca/content/dam/GNB3/gov/cemc/cleaProvince%20should%20make%20the%20justification%20for%20the%20proposed%20concentrations%20n-air/docs/Clean-Air-What-We-Heard.pdf)

First Nations participants raised a similar concern. While strongly supporting the expansion from five to 60 air quality objectives, they indicated that insufficient information had been provided to allow them to fully assess whether the proposed objectives were appropriate.

These findings reinforce the need for the Province to clearly demonstrate how it selected the proposed Schedule D concentrations and why they provide an appropriate level of health and environmental protection. The justification for the proposed concentrations should be made public.

Question

What scientific evidence, health-risk assessments and jurisdictional comparisons were used to establish the concentrations and averaging periods proposed in Schedule D? In particular, where another Canadian jurisdiction has adopted a more protective regulatory standard or health-based criterion for the same contaminant and a comparable averaging period, what was the basis for selecting the less protective New Brunswick requirement?

Recommendation: Where another Canadian jurisdiction has established a more protective standard or health-based criterion for the same contaminant and averaging period, we recommend that New Brunswick either adopt that more protective value or publicly provide a clear, evidence-based explanation for selecting a less protective requirement.

The Province should prioritize protection of human health and the environment and base its standards on the best available and most current scientific evidence.

2. Cumulative Exposure and Risk

The proposed Schedule D establishes standards for individual air contaminants. However, people and ecosystems may be exposed to multiple air contaminants at the same time and to emissions from multiple sources. Assessing each contaminant or source independently may therefore underestimate the cumulative health or environmental risks experienced in some communities.

The need to consider cumulative effects is increasingly recognized in Canadian environmental regulation and policy. Health Canada recognizes that co-exposure to multiple chemicals can result in cumulative effects and has developed guidance for considering these risks³. Ontario has also established a Cumulative Effects Assessment in Air Approvals Policy to address the combined contribution of multiple

³ Health Canada (2026). *Consideration of cumulative effects in risk assessment of existing chemicals*. Government of Canada
<https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/consideration-cumulative-effects-risk-assessment-existing-chemicals.html>

air-pollution sources in certain industrial areas, while Alberta uses regional air-quality management frameworks as part of its cumulative-effects management approach.^{4, 5}

Question

How will the Province account for cumulative effects where communities or ecosystems are exposed to multiple air contaminants or emissions from multiple sources?

Recommendation

We recommend that the Province develop a Cumulative Air Quality Effects Policy to guide the application of the Air Quality Regulation where multiple contaminants or emission sources may contribute to cumulative health or environmental risks.

The policy should establish when cumulative-effects assessment is required, how cumulative exposure and risk should be evaluated, and how the results should inform approvals, monitoring requirements and pollution-reduction measures. In developing the policy, the Province should draw on Health Canada's guidance and cumulative air-quality approaches already being applied in other Canadian jurisdictions.

Compliance with individual Schedule D standards should not necessarily be considered sufficient where cumulative air-pollution exposures may create additional risks to human health or the environment.

3. Emerging Science and Effects at Low Concentrations

Recent epidemiological research continues to demonstrate adverse health effects from some air contaminants at concentrations below existing regulatory standards and, in some cases, below current health-based guidelines. This is particularly evident for fine particulate matter and nitrogen dioxide, where large population studies have identified increased morbidity or mortality at relatively low concentrations. Evidence also continues to demonstrate health effects associated with low-level exposure to contaminants such as lead, benzene and cadmium.

The Province committed to ensuring changes to the Clean Air Act reflect current science and community priorities. This approach aligns with New Brunswickers' expectations. The *What We*

⁴ Ontario Ministry of the Environment, Conservation and Parks (2018). *Cumulative Effects Assessment in Air Approvals*. Government of Ontario.
https://ero.ontario.ca/public/2018-04/Cumulative%20Effects%20Assessment%20in%20Air%20Approvals%2020180426_0.pdf

⁵ Government of Alberta (no date). *Air Quality Management*. Alberta Environment and Protected Areas.
<https://www.alberta.ca/air-management-frameworks>

*Heard*⁶ report reports strong public support for updating New Brunswick's air quality objectives to reflect current scientific research and prioritize human health. Applying the most current evidence, including evidence of effects at low concentrations, is therefore an important part of following through on what the Province heard during its consultation.

Recommendation

We recommend that the Province ensure that the final Schedule D values reflect not only existing regulatory standards in other jurisdictions, but also the most current epidemiological and toxicological evidence.

Where recent evidence indicates adverse effects at concentrations below established standards or suggests there is no clear safe threshold, the Province should apply a precautionary approach and select concentrations that minimize exposure to the greatest extent reasonably achievable.

4. Implementation of the New Standards

We recognize that some regulated facilities may require a reasonable transition period to assess their operations and, where necessary, make changes to comply with new requirements.

However, the proposed regulation would allow the existing requirements to remain in effect until December 31, 2031, with the new Schedule D requirements applying beginning January 1, 2032.

This means New Brunswickers would wait more than five years for the protections provided by the new standards, including limits for contaminants that are not currently covered by the existing maximum permissible ground-level concentrations.

We do not believe the same transition period should apply to new industrial developments and facilities already in operation. New developments can be designed, assessed and approved with the new standards in mind and should therefore be required to meet the new Schedule D requirements as soon as the amended regulation comes into force.

We recognize that industry participants raised the need for realistic implementation timelines and flexibility to align implementation with maintenance and capital planning cycles. Those considerations may be relevant to existing facilities, but they provide much less justification for

⁶ Government of New Brunswick. (2026). *Clean Air Act Modernization: What We Heard*. Department of Environment and Climate Change.
<https://www.gnb.ca/content/dam/GNB3/gov/cemc/clean-air/docs/Clean-Air-What-We-Heard.pdf>

allowing new developments to operate under standards the Province has already decided to strengthen.

The *What We Heard*⁷ report also indicates support for a phased approach. The Province subsequently committed to developing a practical, science-based implementation plan that maintains strong safeguards for health and the environment.

A phased approach based on demonstrated compliance needs would better reflect this feedback than applying the same five-year transition to every contaminant and facility, particularly where existing facilities may already be capable of meeting the new standards.

Question

Why was January 1, 2032 selected as the implementation date for all facilities? Has the Province assessed which existing facilities would not currently meet the proposed standards, what changes would be required to achieve compliance, and how much time would reasonably be required to make those changes? Why should the same transition period apply to new industrial developments?

Recommendation

We recommend that the new Schedule D standards apply immediately upon the amended regulation coming into force to new industrial developments and new or significantly expanded facilities.

For facilities already in operation, we recommend a phased approach based on demonstrated compliance needs. Where additional time is necessary to meet a particular standard, the Province should establish the shortest reasonable transition period and require a clear plan and timeline for achieving compliance.

Existing facilities that can already meet the new standards should be required to comply when the amended regulation comes into force rather than automatically receiving the full transition period to 2032.

⁷ Government of New Brunswick. (2026). *Clean Air Act Modernization: What We Heard*. Department of Environment and Climate Change.
<https://www.gnb.ca/content/dam/GNB3/gov/cemc/clean-air/docs/Clean-Air-What-We-Heard.pdf>

Existing Regulated Contaminants

5. Nitrogen Dioxide: Significant Improvement, but Recent Evidence Supports Strong Protection

We strongly support the proposed strengthening of the nitrogen dioxide (NO₂) requirements.

Schedule D proposes an annual concentration of 23 µg/m³, a three-year statistical standard of 80 µg/m³, and a one-hour maximum of 200 µg/m³. These represent significant improvements over the existing annual and one-hour requirements and bring New Brunswick substantially closer to contemporary Canadian air-quality standards.

At the same time, the proposed regulation removes the existing 24-hour NO₂ limit. The World Health Organization's 2021 Global Air Quality Guidelines include a health-based 24-hour NO₂ guideline of 25 µg/m³. It is unclear why the Province proposes removing or improving the 24-hour NO₂ requirement.

More recent scientific evidence reinforces the importance of limiting both long-term and shorter-term exposure to NO₂. A 2024 systematic review⁸ and meta-analysis incorporating 83 studies found that long-term NO₂ exposure was associated with increased mortality from a range of causes. For every 10 µg/m³ increase in long-term NO₂ exposure, the pooled analysis found a 5% increase in all-cause mortality, with associations also identified for circulatory, ischemic heart, respiratory and lung cancer mortality.

This growing body of evidence suggests that strong NO₂ standards remain important even as overall air quality improves.

Recommendation

We support the proposed strengthening of the annual and one-hour NO₂ requirements.

We recommend that the Province review the proposed annual concentration in light of current epidemiological evidence and the WHO annual guideline of 10 µg/m³.

⁸ Huangfu, P. et al. (2024). Long-Term Exposure to Nitrogen Dioxide and Ozone and Mortality: Update of the WHO Air Quality Guidelines Systematic Review and Meta-Analysis. International Journal of Public Health. <https://doi.org/10.3389/ijph.2024.1607676>

We further recommend that the Province retain or introduce a 24-hour NO₂ standard, taking into consideration the WHO 24-hour guideline of 25 µg/m³ and recent evidence regarding the health effects of NO₂ exposure.

6. Sulphur Dioxide: Significant Improvement, but Consider 24-Hour Exposure

We strongly support substantially tightening the sulphur dioxide (SO₂) requirements.

Schedule D proposes an annual concentration of 11 µg/m³, a three-year statistical standard of 173 µg/m³, and a one-hour concentration of 170 µg/m³. These represent substantial improvements over the existing general New Brunswick limits and also strengthen requirements compared with the special SO₂ limits currently applicable in Charlotte, Kings and Saint John counties.

However, the proposed regulation removes the existing 24-hour SO₂ standard. WHO's current health-based guidelines include a 24-hour SO₂ guideline of 40 µg/m³. It is unclear why the Province proposes removing or improving the 24-hour SO₂ requirement.

Recommendation

We support the significant strengthening of New Brunswick's SO₂ requirements.

We recommend that the Province also assess the need for a 24-hour standard to protect against shorter-term exposure, including consideration of the WHO guideline.

7. Hydrogen Sulphide: Addition of Long-Term Protection

The proposed regulation retains the existing 15 µg/m³ one-hour and 5 µg/m³ 24-hour hydrogen sulphide limits and adds an annual concentration of 2 µg/m³.

We support adding an annual requirement because it provides an additional mechanism for considering longer-term exposure rather than focusing exclusively on short-term concentrations.

Recommendation

We support retaining the existing short-term hydrogen sulphide limits and adding the proposed annual standard.

We recommend that the Province confirm that the proposed annual value reflects current health and environmental evidence and best practices in comparable Canadian jurisdictions.

8. Carbon Monoxide: Strengthened Requirements

Schedule D proposes carbon monoxide limits of 30,000 $\mu\text{g}/\text{m}^3$ over one hour and 10,000 $\mu\text{g}/\text{m}^3$ over eight hours. These represent improvements over the existing requirements.

WHO's 2021 guidelines also include a 24-hour carbon monoxide guideline of 4 mg/m^3 , equivalent to 4,000 $\mu\text{g}/\text{m}^3$.

Recommendation

We support the proposed reductions to New Brunswick's one-hour and eight-hour carbon monoxide limits.

We recommend that the Province also assess whether a 24-hour standard should be included, taking into consideration current WHO health guidance.

9. Particulate Matter: Major Improvement, but Evidence Supports Stronger Standards

The addition of explicit PM_{2.5} and PM₁₀ standards is one of the most important improvements in the proposed regulation.

Schedule D proposes PM_{2.5} concentrations including 8 $\mu\text{g}/\text{m}^3$ annually and 23 $\mu\text{g}/\text{m}^3$ over 24 hours. It also proposes PM₁₀ concentrations of 18 $\mu\text{g}/\text{m}^3$ annually and 54 $\mu\text{g}/\text{m}^3$ over 24 hours.

These are substantial improvements over relying primarily on total suspended particulate matter and bring New Brunswick's regulatory framework closer to modern Canadian air-quality management.

However, the proposed concentrations remain above WHO's health-based guidelines of 5 $\mu\text{g}/\text{m}^3$ annual and 15 $\mu\text{g}/\text{m}^3$ 24-hour for PM_{2.5}, and 15 $\mu\text{g}/\text{m}^3$ annual and 45 $\mu\text{g}/\text{m}^3$ 24-hour for PM₁₀.

Recent epidemiological research provides additional reason to consider stronger PM_{2.5} protection. A large 2024 study⁹ involving more than 50 million adults examined hospital and emergency department admissions associated with short-term PM_{2.5} exposure. More than 92%

⁹ Wei Y, Qiu X, Sabath MB, et al. (2024). Short term exposure to low level ambient fine particulate matter and natural cause, cardiovascular, and respiratory morbidity among US adults with health insurance: case time series study. *BMJ* 384:e076322. <https://doi.org/10.1136/bmj-2023-076322>

of the days examined had PM_{2.5} concentrations below the WHO 24-hour guideline of 15 µg/m³. Even when concentrations remained below that guideline, increases in PM_{2.5} were associated with increased hospital admissions.

This is important because it indicates that measurable population-level health effects can occur even at concentrations below current health-based guidelines. It strengthens the case for minimizing PM_{2.5} exposure rather than treating compliance with a particular concentration as a threshold below which there is no health risk.

Recommendation

We strongly support establishing specific PM_{2.5} and PM₁₀ requirements.

Given the growing evidence of health effects at relatively low PM_{2.5} concentrations, we recommend that the Province reconsider whether the proposed annual PM_{2.5} concentration of 8 µg/m³ and 24-hour concentration of 23 µg/m³ provide sufficient protection.

At a minimum, the Province should explain why the more protective WHO guidelines of 5 µg/m³ annually and 15 µg/m³ over 24 hours were not selected.

We further recommend that the Province establish a process and timeline for progressively strengthening particulate-matter standards as scientific evidence evolves.

10. Ozone: Welcome Addition, but Consider the WHO Approach

We support the addition of ozone to Schedule D.

The proposed regulation establishes 119 µg/m³ using a three-year average of the annual fourth-highest daily maximum eight-hour concentrations, as well as a one-hour concentration of 119 µg/m³.

The proposed statistical approach broadly reflects Canada's national approach. WHO uses different health-based benchmarks, including an eight-hour guideline and a peak-season guideline intended to address longer-term seasonal exposure.

Recommendation

We support adding ozone to Schedule D.

We recommend that the Province explain its selection of the proposed concentrations and statistical form and assess whether additional protection for seasonal ozone exposure is warranted in light of WHO guidance.

Contaminant-Specific Concerns

11. Benzene: Annual Concentration

Schedule D proposes an annual benzene concentration of $1.1 \mu\text{g}/\text{m}^3$. Ontario has an annual regulatory standard of approximately $0.45 \mu\text{g}/\text{m}^3$.

This difference warrants particular attention because benzene is a known human carcinogen and long-term exposure is an important consideration in assessing risk.

Recent research continues to reinforce concern about leukemia risk from chronic benzene exposure. A 2024 quantitative risk assessment based on the Chinese Benzene Cohort examined leukemia risk associated with cumulative benzene exposure and modelled risks at low exposure levels¹⁰. This occupational evidence cannot be translated directly into a particular ambient-air concentration for New Brunswick. However, it reinforces the importance of taking a precautionary approach to long-term exposure to a known carcinogen and provides additional reason to question why New Brunswick would select a substantially higher annual concentration than a more protective Canadian regulatory standard.

Question

What cancer-risk level and scientific evidence were used to establish the proposed annual benzene concentration of $1.1 \mu\text{g}/\text{m}^3$? Why was this concentration selected when Ontario applies a substantially more protective annual regulatory standard?

Recommendation

We recommend that the Province reassess the proposed annual benzene concentration against Ontario's regulatory standard and the most current evidence concerning chronic low-level benzene exposure and leukemia risk.

Given benzene's carcinogenicity, the Province should take a precautionary approach and adopt the more protective annual value unless it can demonstrate that the proposed 1.1

¹⁰ Jin K, Zhu F, Wu B, et al. (2024). Leukemia risk assessment of exposure to low-levels of benzene based on the linearized multistage model. *Frontiers in Public Health* 12:1355739. [DOI: 10.3389/fpubh.2024.1355739](https://doi.org/10.3389/fpubh.2024.1355739).

$\mu\text{g}/\text{m}^3$ concentration provides an appropriate level of protection based on current cancer-risk evidence.

12. Benzene: 24-Hour Concentration

New Brunswick proposes a 24-hour benzene concentration of $27 \mu\text{g}/\text{m}^3$. Quebec's Clean Air Regulation uses a lower 24-hour regulatory limit. Ontario also has a considerably lower health-based 24-hour ambient air quality criterion.

We recognize that Ontario's AAQC is a health-based assessment criterion rather than a regulatory value. Nevertheless, the differences among these benchmarks warrant explanation.

Question

What is the scientific basis for the proposed $27 \mu\text{g}/\text{m}^3$ concentration, and why was it selected instead of the more protective regulatory limits or health-based criteria used elsewhere in Canada?

Recommendation

We recommend that the Province reassess the proposed 24-hour benzene concentration against Quebec's regulatory limit, Ontario's health-based criterion and current health evidence, and adopt a more protective value where supported by the evidence.

The Province should provide the risk assessment used to derive the proposed 24-hour concentration and demonstrate that it provides an appropriate level of protection.

13. Mercury

Schedule D proposes $0.03 \mu\text{g}/\text{m}^3$ annually and $0.6 \mu\text{g}/\text{m}^3$ over 24 hours for gaseous elemental mercury.

Quebec has a considerably lower annual regulatory limit for mercury. We recognize, however, that the definitions and forms of mercury covered may differ, so a direct numerical comparison requires caution.

Nevertheless, the difference is sufficiently significant to warrant examination.

Question

What is the scientific and health basis for the proposed annual and 24-hour mercury concentrations, and how did the Province consider regulatory requirements in Quebec and elsewhere in Canada?

Recommendation

We recommend that the Province explain the scientific basis for the proposed mercury requirements, including how differences in mercury speciation affect comparisons with other jurisdictions.

Where requirements are comparable, the Province should adopt the most protective appropriate value supported by current health and environmental evidence.

14. Vinyl Chloride: Annual Concentration

Schedule D proposes an annual vinyl chloride concentration of $0.114 \mu\text{g}/\text{m}^3$. Quebec uses a lower annual regulatory value.

Because vinyl chloride is a known human carcinogen, the rationale for selecting a less protective long-term concentration warrants explanation.

Question

What is the scientific and health-risk basis for the proposed annual concentration, and why was it selected instead of the lower regulatory concentration used in Quebec?

Recommendation

We recommend that the Province reassess the annual vinyl chloride concentration against current cancer-risk evidence and comparable Canadian regulatory standards and health-based criteria.

The Province should adopt the more protective value unless the proposed concentration can be demonstrated to provide an equivalent or better level of health protection.

15. Vinyl Chloride: 24-Hour Concentration

The proposed 24-hour vinyl chloride concentration of $1,300 \mu\text{g}/\text{m}^3$ is particularly noteworthy.

Ontario has a health-based 24-hour Ambient Air Quality Criterion of $1 \mu\text{g}/\text{m}^3$. We recognize that the Ontario AAQC is not a regulatory value and that Ontario indicates this 24-hour value is converted from its annual criterion to allow assessment of 24-hour air-quality data.

Nevertheless, the difference between $1 \mu\text{g}/\text{m}^3$ and the proposed New Brunswick concentration of $1,300 \mu\text{g}/\text{m}^3$ is sufficiently large that the basis for the New Brunswick value should be clearly explained.

Question

What is the health and scientific basis for the proposed $1,300 \mu\text{g}/\text{m}^3$ 24-hour concentration, and how does the Province reconcile this value with substantially lower health-based criteria used elsewhere?

Recommendation

We recommend that the Province publish the derivation and health-risk basis for the proposed $1,300 \mu\text{g}/\text{m}^3$ 24-hour vinyl chloride concentration and reassess the value against current health-based criteria.

The requirement should not be finalized without a clear explanation demonstrating that it provides adequate protection for human health.

16. Lead and its Compounds: Apply a Precautionary Approach

Schedule D proposes $0.15 \mu\text{g}/\text{m}^3$ averaged over three months for lead and its compounds.

Other jurisdictions use different concentrations and averaging periods, including annual requirements. Because the averaging periods differ, these values should not be treated as directly numerically comparable.

However, the scientific evidence concerning lead exposure is particularly important. Public-health authorities, including the World Health Organization, continue to emphasize that there is **no known safe level of lead exposure**, and children are particularly vulnerable to its

neurological effects. Even relatively low levels of lead exposure can affect children's health and development.

Recent scientific literature also continues to identify health concerns associated with chronic low-level exposure to lead and other toxic metals.

Given this evidence, the objective of the regulation should not simply be to identify a concentration below which lead is assumed to be harmless. It should seek to minimize population exposure as far as reasonably achievable, particularly for children, pregnant people and communities experiencing multiple sources of environmental exposure.

Question

What is the health basis for the proposed $0.15 \mu\text{g}/\text{m}^3$ concentration and three-month averaging period, and how does this approach protect against chronic and cumulative exposure? What margin of safety has been incorporated to protect children and other populations particularly vulnerable to lead exposure?

Recommendation

We recommend that the Province apply a precautionary approach to lead and establish a standard designed to minimize exposure to the greatest extent reasonably achievable.

The Province should provide the health-risk basis for both the proposed concentration and three-month averaging period and assess whether a more protective concentration and/or an additional annual standard is warranted to address chronic and cumulative exposure.

17. Uranium and its Compounds

Schedule D proposes an annual concentration of $0.04 \mu\text{g}/\text{m}^3$ for uranium and its compounds.

Ontario has a health-based annual AAQC of $0.03 \mu\text{g}/\text{m}^3$ for uranium in PM₁₀. Ontario also has a different criterion for uranium in suspended particulate matter, demonstrating the importance of ensuring that the contaminant definitions and particle fractions are comparable before drawing conclusions from the numerical values.

Question

What evidence supports the proposed $0.04 \mu\text{g}/\text{m}^3$ annual concentration, and how were comparable Canadian health-based criteria considered?

Recommendation

We recommend that the Province explain the scientific basis for the proposed uranium standard and how comparable Canadian health-based criteria were considered.

Where the requirements and contaminant definitions are directly comparable, the Province should adopt the more protective value or provide an evidence-based explanation for selecting a higher concentration.

18. Cadmium: Strong Annual Standard, but Review the 24-Hour Standard

Schedule D proposes an annual cadmium concentration of $0.0005 \mu\text{g}/\text{m}^3$ and a 24-hour concentration of $0.03 \mu\text{g}/\text{m}^3$.

The proposed annual concentration appears comparatively protective and is a positive feature of Schedule D. We support the Province taking a stringent approach to chronic cadmium exposure.

Recent population research reinforces the importance of doing so. A large U.S. population study examining environmental cadmium exposure¹¹ found associations between relatively low-level cadmium exposure and all-cause, cardiovascular and cancer mortality. Importantly, an association with all-cause mortality was also observed among people who had never smoked, suggesting that environmental sources other than tobacco smoke contribute to cadmium-related health risks.

Recent reviews also continue to identify concerns about chronic low-level lead and cadmium exposure, particularly for people with existing renal disease and other vulnerable populations.

¹¹ Moon, S., Lee, J., Yu, J.M. et al. Association between environmental cadmium exposure and increased mortality in the U.S. National Health and Nutrition Examination Survey (1999–2018). *J Expo Sci Environ Epidemiol* 33, 874–882 (2023). <https://doi.org/10.1038/s41370-023-00556-8>

This evidence supports the Province's precautionary approach to the annual standard, but it also provides reason to ensure that the proposed 24-hour standard is equally protective.

Recommendation

We support the proposed annual cadmium concentration of 0.0005 µg/m³ and recognize it as one of the more protective aspects of Schedule D.

We recommend that the Province review the proposed 24-hour concentration of 0.03 µg/m³ against more protective Canadian regulatory requirements and current evidence concerning health effects associated with low-level cadmium exposure.

Where a more protective 24-hour requirement is scientifically justified, the Province should adopt it.

Ongoing Review

19. Periodic Review of Schedule D

Schedule D should not become static once adopted. Air-pollution science, health-risk assessments, WHO guidelines, Canadian Ambient Air Quality Standards and requirements in other Canadian jurisdictions will continue to evolve.

WHO itself periodically updates its health-based guidelines as scientific evidence develops. Its guidelines are not legally binding standards, but are specifically intended to provide governments with evidence-informed guidance for developing air-quality legislation and policy.

A regular review mechanism is particularly important given that some of the proposed New Brunswick concentrations are already higher than current WHO health-based guidelines.

Recommendation

We recommend that the regulation establish, or the Province formally commit to, a regular review of Schedule D at least every five years.

The review should consider new scientific evidence, updated WHO guidelines, changes to Canadian Ambient Air Quality Standards, and more protective regulatory standards or health-based criteria adopted by other Canadian jurisdictions.

Where new evidence demonstrates that a lower concentration is necessary to protect human health or the environment, the Province should be able to strengthen the applicable standard without waiting for a comprehensive review of the entire Act or regulation.

The review results and the justification for regulated concentrations should be publicly available.