

REPORT TO ENVIRONMENTAL SERVICES COMMITTEE MEETING OF WEDNESDAY, FEBRUARY 19, 2025

SUBJECT Biosolids Literature Review Outcomes

ISSUE SUMMARY

To present the Environmental Services Committee with the results of the independent academic literature review on the risks and benefits of biosolids land application.

BACKGROUND

At the August 9, 2023 Capital Regional District (CRD) Board meeting, staff were directed to *report back with a proposal that CRD Environment Service fund University of Victoria or other suitable independent academic institution to prepare a review: a) of available literature, to determine whether there are validated examples and/or peer reviewed papers assessing the risks and benefits of the application of biosolids on environmental and human health, and b) based on this and on The Precautionary Principle, whether CRD may have a legal liability for such application.*

At the October 18, 2023, Environmental Services Committee meeting, staff presented a proposal for an academic institution to conduct a literature review. At that time, the provincial government's Technical Working Group (TWG) was expected to issue a report on its review of the Organic Matter Recycling Regulation in late 2023. Given the upcoming report, the committee passed the following motion: *That the committee postpone discussion on this item until the January 2024 committee meeting.*

After delays to the release of the TWG report, the CRD Board directed staff to reinstitute the process of authorizing the literature review by the following motion at the March 13, 2024 Board meeting: *Given delays to provincial reporting on Organic Matter Recycling Regulation, and the Board's previous direction to initiate an academic analysis, that the Board direct staff to move forward with a third-party academic review of the scientific literature on the uses and impacts of biosolids.*

At the June 19, 2024 Environmental Services Committee meeting, staff presented qualification criteria for a suitable academic researcher. The Committee directed staff to 1. *Secure a tenured professor that fulfills the qualification criteria outlined in this report, to undertake the independent literature review, as per the terms of reference previously approved for this work, with a budget not to exceed \$40,000; and 2. That staff be directed to procure a legal review in alignment with the selection criteria and scope of work presented in this report, with a budget not to exceed \$25,000.*

Dr. Chris Kennedy, a Professor of Aquatic Toxicology at Simon Fraser University was selected to author the literature review. The report (Appendix A), focused on relevant literature published in 2023 and 2024; the work was completed in late 2024.

The law firm Borden Ladner and Gervais is completing the review of legal liability associated with land application of biosolids. The review is in the late stage of drafting, and staff anticipate providing the report to the ESC in March.

The objectives of the literature review were to provide up to date information on the following:

1. The human health and environmental risks of both legacy contaminants and Contaminants of Emerging Concern (COECs), with consideration of environmental conditions typical of the BC south coast.
2. Contaminant concentrations in biosolids relative to levels of exposure in general society.
3. The limitations of extrapolating lab-based toxicity testing to observations in the environment.
4. A summary of the areas of uncertainty in biosolids land application risk, including a summary of relevant techniques for evaluating and addressing uncertainty.
5. A summary of biosolids land application techniques that can reduce risk and/or address uncertainty.
6. A summary of the risks and concerns that have resulted in land application bans elsewhere.
7. An assessment of the overall risks of biosolids land application considering the intent of the Precautionary Principle (Rio Declaration, 1992 and subsequent derivations).

The literature review considered a broad suite of COECs including per and polyfluoroalkyl substances (PFAS), pharmaceuticals and personal care products and microplastics.

IMPLICATIONS

Environmental Implications

The author concluded that the low concentration of COECs in CRD biosolids coupled with existing toxicity data suggests that the COECs in CRD biosolids represent a negligible to low risk to human health and the environment. However, the report also highlighted significant sources of uncertainty in this conclusion, which should be reviewed regularly as the science evolves.

An adaptive management framework is recommended to mitigate uncertainty by regularly reviewing available updates to the scientific literature. Under such a framework, decision makers keep pace with evolving science and regularly weigh the risks and benefits in biosolids management. In the context of biosolids land application, this means enhanced monitoring of COECs in biosolids, careful site selection, and the adoption of advanced treatment technologies as they become available.

Alignment with Existing Plans & Strategies

The conclusions of the literature review align with the CRD's proposed Long-term Biosolids Management Strategy (long-term strategy), as Tier 1 of the long-term strategy includes investigation and development of emerging technology (advanced thermal demonstration facility) for biosolids management. The long-term strategy also exercises a precautionary approach by excluding agricultural land application options. Staff have also begun testing biosolids biannually for a greater range of contaminants, including PFAS and pharmaceuticals, which can inform an adaptive management framework where staff will continue to monitor the evolving science to inform decision-making.

CONCLUSION

A literature review commissioned by the CRD examined the human health and environmental risks and benefits of biosolids land application. Based on recent research, the review concluded

that contaminants of emerging concern (COECs) present in CRD biosolids pose a negligible to low risk to human health and the environment. However, it also identified significant sources of uncertainty in this risk assessment. To address this uncertainty, the review recommended an adaptive management framework that includes exercising caution and exploring emerging technologies. The CRD's proposed long-term strategy aligns with these conclusions by prioritizing the development of an advanced thermal demonstration facility and excluding agricultural land application from consideration. Staff will continue to monitor evolving science and have initiated enhanced monitoring of COECs in biosolids to inform future decision-making.

RECOMMENDATION

There is no recommendation. This report is for information only.

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ATTACHMENT

Appendix A: Biosolids Land Application – An Updated Review of Human Health and Environmental Risks