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Biosolids management at the Capital Regional District (CRD)

January 2026

CASE STUDY

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This case study was developed by the Municipal Water Consortium, a national network of executive utility leaders from Canada's major cities. Together, they tackle shared challenges and advance innovative solutions.

Key insights

Community-driven innovation: The Capital Regional District's (CRD) biosolids strategy was shaped by strong public engagement and the board's responsiveness to environmental concerns. Its shift from traditional disposal methods toward advanced thermal treatment reflects how municipalities are increasingly expected to align infrastructure decisions with evolving community values, such as environmental sustainability and public health concerns.

Local policy leadership: While municipalities often rely on provincial regulations to shape their decisions, CRD demonstrates that local governments can also lead policy change. Its evolving biosolids strategy underscores the need for municipalities to stay attuned to shifting political and regulatory landscapes at all levels, and to remain flexible in adapting approaches as conditions change.

Strategic partnerships: CRD's approach was developed through meaningful engagement with multiple entities, including local residents, CRD's board, other municipalities, the private sector and local Indigenous communities. The collaborative approach enabled the development of a flexible, multi-tiered strategy that takes advantage of new technological capabilities in biosolids management while reflecting community priorities.

Reclaimed quarry surface

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McLoughlin Point Wastewater Treatment Plant

Background

The Capital Regional District (CRD) provides wastewater treatment services for approximately 460,000 residents across southern Vancouver Island and the Gulf Islands. Until 2000, wastewater and residuals were primarily discharged into the marine environment or used for land reclamation.

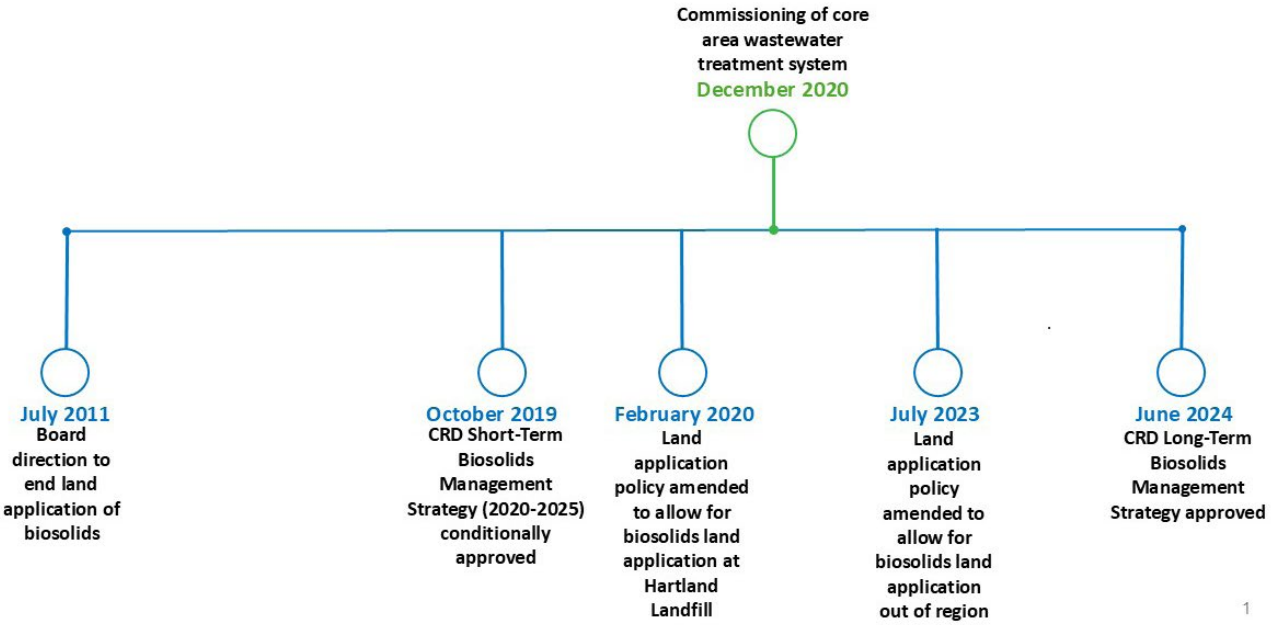
With the Saanich Peninsula Wastewater Treatment Plant coming online in 2000 and later the Core Area Wastewater Treatment Plant in 2020, CRD began exploring new approaches to biosolids management. In the mid-2000s, the possibility of using biosolids as commercial fertilizer sparked growing public concern about environmental contaminants, particularly PFAS.

These concerns coincided with CRD's transition to advanced wastewater treatment, creating an opportunity to reassess how residuals would be managed going forward. Over the next decade, CRD developed an approach to biosolids management that was grounded in the precautionary principle, emphasizing caution in the face of scientific uncertainty and potential risks to human and environmental health.

In 2020, CRD recognized the need for an interim solution while its long-term biosolids strategy was under development. To address this, it introduced a Short-Term Biosolids Contingency Plan. The plan prioritized the use of biosolids as an alternative fuel at cement kilns in the B.C. Lower Mainland, with limited landfilling permitted during kiln maintenance or shutdowns.

A more permanent solution was outlined in CRD's Long-term Biosolids Management Strategy, which was formally approved in June 2024. The planning process was shaped by technical analysis, public engagement, and consultation with Indigenous communities. The result is a flexible, tiered strategy designed to adapt to evolving regulatory, political, and operational conditions while remaining rooted in evidence-based decision-making.

Timeline of CRD Biosolids Policy



Evidence-based recommendations

CRD prioritized evidence-based decision-making throughout the planning process. To support this, the utility regularly conducted scientific assessments of biosolids. In December 2024, CRD commissioned an independent literature review that identified three best practices for biosolids management:

1. Enhanced monitoring of contaminants of emerging concern (CECs) in biosolids.
2. Adoption of advanced thermal treatment technologies.
3. Careful site selection for land application.

The review found contaminants of emerging concern in CRD's biosolids posed a negligible to low risk to human and environmental health. At the same time, the review acknowledged uncertainty due to the widespread presence of PFAS and potential synergistic effects with other environmental contaminants. The CRD continues to go beyond British Columbia Ministry of Environment standards by conducting monthly tests for metals and pathogens, and biannual tests for PFAS.

Public engagement and consultation with Indigenous communities

CRD actively engaged local communities during the development of its Long-Term Biosolids Management Strategy, including consultation on proposed additions to the Residuals Treatment Facility. Indigenous communities were provided an opportunity to review the strategy and share feedback during an engagement window.

Building on this foundation, CRD is intentionally taking a more proactive and relationship-based approach to engagement on the biosolids project going forward. Staff are focused on early, ongoing dialogue to better understand First Nations' interests, priorities, and concerns and to provide multiple, flexible avenues for involvement. CRD is committed to working collaboratively with Nations that wish to engage throughout the project lifecycle, recognizing that meaningful engagement is an ongoing process rather than a single milestone.

Residuals treatment facility

Tiered strategy

CRD's long-term strategy, endorsed by British Columbia's Ministry of Environment, outlines a tiered framework that guides decision-making based on technical feasibility, environmental performance, and operational readiness. Each tier reflects a different management option and specifies the conditions under which it should be used:

- **Tier 1 (Preferred):** Advanced thermal treatment such as pyrolysis or gasification, which can destroy PFAS and other contaminants.
- **Tier 2 (Current):** Out-of-region non-agricultural compliance options, including use as alternative fuel in cement kilns, quarry reclamation, and nursery growing media.
- **Tier 3 (Emergency):** In-region land application, only to be used with explicit Board approval and following consultation with the public and Indigenous communities.

As of November 2025, CRD primarily uses Tier 2 options while actively developing a project under the Tier 1 option. A successful pyrolysis trial that destroyed PFAS to below quantifiable levels has positioned the CRD to move forward with procuring a permanent unit.

To support the beneficial use of biosolids, CRD constructed a Residuals Treatment Facility (RTF) at the Hartland landfill.

The facility treats and dewaters biosolids using mesophilic anaerobic digestion and heat drying, producing Class A biosolids in pellet form.

Pelletization expands opportunities for beneficial use and, by substantially reducing the volume and weight of material, opens up opportunities for transporting the material longer distances to end uses.

The RTF generates approximately 10 tonnes of biosolids pellets per day.

Tier 2 options offer both opportunities and challenges. The Amrize cement kiln remains the most cost-effective outlet but presents logistical challenges, including reliance on ferry transport and periodic shutdowns. CRD's investment in pelletizing facilities has made long-distance transport more viable. Quarry reclamation near Nanaimo offers greater reliability but at the highest cost. These trade-offs highlight the importance of maintaining a diversified strategy that can adapt to market conditions, operational constraints, and evolving community expectations.

Cost considerations for beneficial use strategies

Municipalities pursuing beneficial use strategies for biosolids should anticipate the need for larger and more flexible budgets. CRD's experience demonstrates that some options, such as using biosolids as an alternative fuel, can be relatively cost-effective. However, these options often depend on external market conditions and facility availability. This can require a fair amount of staff time to coordinate and can lead to disruptions and the need for more expensive contingency measures. As seen in CRD's experience, maintaining service continuity and meeting community expectations may require shifting between multiple management options, each with varying cost implications.

Advanced technologies like thermal treatment and biochar production offer promising long-term solutions that align with environmental and public health goals. Although initial investments may be significant, these approaches can become cost-competitive over time, especially when paired with market development for end products like biochar. Municipalities exploring similar strategies should plan for dynamic cost structures and build financial resilience into their biosolids programs to support innovation and adaptability.

Further reading

Capital Regional District (2020). Short-Term Biosolids Contingency Plan. Available from: https://www.crd.ca/media/file/crd-biosolids-short-term-contingency-plan

Capital Regional District (2024). Long-term Biosolids Management Strategy. Available from: https://www.crd.ca/government-administration/data-documents/long-term-biosolids-management-strategy

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