



**REPORT TO CAPITAL REGIONAL DISTRICT BOARD
MEETING OF WEDNESDAY, JUNE 12, 2024**

SUBJECT **Long-Term Biosolids Management Strategy**

ISSUE SUMMARY

The Capital Regional District (CRD) is required to submit a long-term biosolids management strategy to the BC Ministry of Environment and Climate Change Strategy (ENV) by June 18, 2024 as a requirement of the CRD's commitments under the Core Area Liquid Waste Management Plan (CALWMP).

BACKGROUND

Regulatory and Technical Considerations

Since the commissioning of the core area wastewater treatment project in 2020, the Capital Regional District (CRD) has been responsible for management of the Class A biosolids produced from the Residuals Treatment Facility (RTF). This new function requires a management plan that demonstrates beneficial use to the provincial regulator. In 2019, the Minister of Environment and Climate Change Strategy approved the short-term CRD Biosolids Beneficial Use Strategy, forming part of the CALWMP (Amendment 11) with the following conditions:

- (a) The CRD must include land application in the options analysis and conduct consultation for the long-term biosolids strategy that is intended to be implemented by January 1, 2025.
- (b) Options considered should include a range of beneficial uses including, but not limited to: forestry (for example: fertilizer/soil conditioner), reclamation (for example: mines), landfill closure and agriculture.
- (c) The consultation process must include citizens, local government and Indigenous communities within the CRD.

In preparation to meet the provincial requirement, the CRD retained a technical consultant who provided a long-term biosolids management options analysis report, which was presented to the Environmental Services Committee in July 2023. In addition to including the options analysis, the report contained an updated review of international biosolids management practices and a summary and evaluation of the advanced thermal (gasification and pyrolysis) pilots procured in 2022.

First Nation Consultation

The CRD undertook a First Nations engagement process that began in February of this year and will continue beyond the submission of the long-term strategy. Nineteen First Nations were included in the established contact list. The engagement sessions were followed up with an invitation to meet directly with individual nations and to continue open dialogue and discussion moving forward at any time. The Board received an update on May 8 and will continue to be updated as these conversations occur.

As directed by the Board, the CRD continues to explore beneficial use opportunities with those Nations that express interest both in-region and out-of-region. The CRD continues to listen to any

concerns Nations may have regarding the beneficial use options and is committed to working with individual Nations to address their concerns.

Public Consultation

The formal public consultation period began January 11, 2024. The process included an interactive website that solicited and posted email questions, media releases, print ads, online and representative surveys, and a Virtual Open House. The CRD also convened a Technical and Community Advisory Committee (TCAC), starting in October 2023, to provide consultation advice and input regarding biosolids management and beneficial use. A detailed account of what we heard was presented at the May 8 Board meeting.

Proposed Strategy

Based on:

- the Minister of Environment and Climate Change Strategy's direction and provincial requirements
- the CRD Board's ban of the land application of biosolids in the CRD
- the feedback received in the various public engagement processes detailed above
- the technical recommendations provided by GHD in order to develop a robust program that is flexible and provides redundancy in order to minimize operational and compliance risks
- the CRD's goal to have a strategy that:
 - utilizes the existing RTF infrastructure and Class A biosolids already being produced but also prioritizes implementing advanced thermal technology infrastructure
 - minimizes negative impacts on the natural environment
 - protects the health and safety of the public and workers involved in biosolids operations
 - is cost effective, while balancing all of the above considerations

the Long Term Biosolids Management Strategy proposes procuring a portfolio of options in alignment with the technical assessment and utilizing each option under a prioritization structure, summarized as follows:

- **Tier 1: Advanced thermal option**
Constitutes the preferred long-term solution and will be pursued concurrently with options in other tiers.
- **Tier 2: Out-of-region compliance options**
Constitute measures that the CRD will utilize to ensure regulatory compliance is continuously achieved while the Tier 1 thermal processing options are being implemented and when options in Tier 1 are unable to process the totality of biosolids produced in the region.
- **Tier 3: In-region contingency options**
Constitute contingency options to ensure compliance with regulatory requirements. The CRD would implement Tier 3 options on a contingency basis, only when options within the Tier 2 portfolio are unavailable.

CONSULTATION UPDATES

Opportunities for feedback on the proposed Long-Term Biosolids Management Strategy were provided to the public, First Nations and the Technical and Community Advisory Committee (TCAC). Results are summarized below.

First Nations Consultation Summary

The CRD reached out to all First Nations from the initial engagement period to invite submissions on the draft Strategy that the Board endorsed on May 8 and that had been referred out for comment. Staff received correspondence from two First Nations, themes included request for more information on the thermal processing project, implications of land application and where the biosolids may be applied under tiers 2 and 3. Staff are working with each nation individually, addressing their concerns and will continue to engage more specifically if land application options under Tier 3 (in-region, contingency options) become feasible.

As directed by the Board on May 8, staff will continue to explore beneficial use opportunities with those Nations that express interest both in-region and out-of-region. The CRD will also listen to any concerns Nations may have regarding the beneficial use options and is committed to working with individual Nations to address their concerns.

Public Consultation Summary

The Draft Long-term Biosolids Management Strategy and portfolio of options were available for public review and comment from May 13 to June 3 on the CRD digital engagement platform [GetInvolved.crd.bc.ca/biosolids](https://getinvolved.crd.bc.ca/biosolids). The CRD used a media release, newsletters and social media to inform the public about the draft strategy and how to share their feedback.

Comments were collected and reviewed to ensure that personal information could be redacted. A total of 232 comments were received and common themes were identified. 18 comments indicated a preference for land application. 190 comments indicated a preference for thermal options or opposition to land application. 101 comments received followed a similar format.

The Engagement Summary Report outlining the process and complete list of comments is attached as Appendix A.

Technical and Community Advisory Committee Consultation Summary

The Technical and Community Advisory Committee (TCAC) met on May 22, 2024 to discuss the draft Long-Term Biosolids Beneficial Use Strategy and resultant Board motions. In general, the TCAC had no significant comments or concerns with the proposed strategy.

Based on the above, staff are not recommending changes to the strategy be made, and that the plan be submitted to province as per the tiered portfolio of options endorsed by the Board on May 8, 2024.

ALTERNATIVES

Alternative 1

That the CRD Board:

1. Approve the Long Term Biosolids Management Strategy as a portfolio of options (in alignment with the Long-Term Biosolids Management Strategy prepared by GHD, April 2024), that utilizes each option under a prioritization structure, as follows:
 - (a) **Tier 1: Advanced thermal option:** Constitutes the preferred long-term solution and will be pursued concurrently with options in other tiers. Current projects include:
 - (i) Develop a demonstration facility for advanced thermal processing, as planned. Outcomes from the demonstration project will serve as the basis for a scaled, long-term solution.

- (b) **Tier 2: Out-of-region compliance options:** Constitute measures that the CRD will utilize to ensure regulatory compliance is continuously achieved while the Tier 1 thermal processing option is being implemented and when options in Tier 1 are unable to process the totality of biosolids produced in the region. These are (in priority order):
- (i) Industrial land reclamation, such as mine and quarry sites (acknowledging that some reclaimed sites may eventually have a pasture land end use)
 - (ii) Forest fertilization
 - (iii) Production of biosolids growing medium and/or feedstock in soil production
 - (iv) Partnerships with established biosolids programs
 - (v) Continue alternative fuel combustion in the cement manufacturing facility in Richmond, BC. Prioritize this option when available.
 - (vi) Explore partnerships with additional industrial partners interested in combustion.
- (c) **Tier 3: In-region contingency options:** Constitute contingency options to ensure compliance with regulatory requirements. The CRD would implement Tier 3 options on a contingency basis, only when options within the Tier 2 portfolio are unavailable and only after receiving explicit consent from the Board and consulting and engaging with any affected First Nations, should the need for Tier 3 arise.

These include (in priority order):

- (i) Industrial land reclamation, such as mine and quarry sites (acknowledging that some reclaimed sites may eventually have a pasture land end use)
 - (ii) Forest fertilization
 - (iii) Maintain the option of biosolids application in engineered cover systems and biocell at Hartland Landfill to act as an emergency support option, subject to space availability and cover needs of the Landfill;
2. Direct staff to submit the Long-Term Biosolids Management Strategy to the BC Ministry of Environment and Climate Change Strategy;
 3. Direct staff to continue to explore biosolids beneficial use opportunities with those First Nations that express interest both in-region and out-of-region, and to address any concerns First Nations may have regarding the beneficial use options; and
 4. Refer the staff report with the Long-Term Biosolids Management Strategy to the Core Area Liquid Waste Management Committee for information.

Alternative 2

That the CRD Board provide alternative direction to staff regarding the Long-Term Biosolids Management Strategy

IMPLICATIONS

Climate Action Implications

All beneficial reuse long-term biosolids management options have potential greenhouse gas (GHG) emission implications. Land application options have higher emissions the further away the land application sites are, due to transportation requirements. However, these could be offset by the enhanced GHG sequestration within the soils following land application. Thermal and advanced thermal options result in direct GHG emissions to the atmosphere, in addition to transportation-related emissions. Advanced thermal options partially mitigate GHG emissions with sequestration in biochar. Respondents to both the Ipsos representative survey and the CRD

survey indicated that “Environmental Impacts (air, water and soil contaminants)” were the most important consideration when planning for the beneficial use of biosolids. Costs, climate/GHG emissions and community impacts (truck traffic, odour and noise emission, dust) were less important.

Environmental Implications

Under the Canadian governance framework, provincial and federal regulators and agencies are responsible to ensure that biosolids reuse options are safe for the intended purposes and protective of human health and the environment when produced and used in accordance with regulations. Agencies assess the risks and benefits associated with specific resources and products and recommend policies that are incorporated into regulatory frameworks, which are evaluated on a regular and ongoing basis. Current regulations support the beneficial use of biosolids, including all of the options considered by the technical consultant.

All options have some level of risks and benefits. Advanced thermal technologies with biosolids feedstock are not yet commercially proven in Canada or the United States. Thermal options have the benefit of reduced (but not eliminated) contaminant levels in end-products. Despite concerns about risks associated with contaminants for land application options, the most significant land application risks are associated with over fertilization (too many nutrients). Both sets of risks can be mitigated by following properly-designed land application plans and complying with the OMRR. Land application options have the benefit of recycling nutrients, enhancing plant growth and offsetting use of commercial GHG-intensive fertilizers.

Community concerns around the land application of biosolids are largely based on the presence, or suspected presence, of unregulated organic chemical compounds, commonly referred to as “contaminants of emerging concern” (CECs). CECs include Volatile and Semi-Volatile Organic Compounds (VOC & SVOC), Per and Polyfluoroalkyl substances (PFAS), Polybrominated flame retardants (PBDE), dioxins, pharmaceuticals and personal care products (PPCP) and microplastics. There is concern that biosolids with detectable levels of unregulated CECs could impact soil quality, surface water or groundwater.

In recent years, there has been an increased interest in PFAS and their effects on human and environmental health. PFAS are a class of over 4,700 substances that do not occur naturally. PFAS make products non-stick, water repellent and fire resistant, and are found in a wide range of consumer and industrial products, including cookware, food packaging, clothing and firefighting foams. PFAS are sometimes referred to as “forever chemicals” because the molecules are characterized by a chain of strong fluorine-carbon bonds, which result in highly stable and long-persisting chemicals. Exposure to sufficient concentrations of PFAS is associated with an increased risk of cancer, increased cholesterol levels, and can affect the immune system.

In June 2022, ENV released the Organic Matter Recycling Regulation Project Update, which contained some discussion of CECs. “Due to advances in analytical chemistry, the ability to measure CECs has generally outpaced the ability to understand the impacts of CECs on human health and the environment. For this reason, the impacts of CECs in biosolids and wastewater treatment discharges is the subject of ongoing scientific research.” The ENV intends to add the authority for a director to require the testing of biosolids for CECs but does not intend to regulate the concentration of CECs in biosolids. ENV advocates for a prevention-first approach to reducing CECs in biosolids by implementing source control measures to discourage the discharge of certain wastes to the system.

On May 19, 2023, the Canadian Food Inspection Agency (CFIA) proposed an interim standard for PFAS in biosolids used in Canada as fertilizers. The CFIA worked with Environment and Climate Change Canada, Health Canada and provincial partners to assess an appropriate standard for PFAS. The proposed standard will protect human health by preventing the small proportion of biosolids products that are heavily impacted by industrial inputs from being applied to agricultural land in Canada. The proposed standard is 50 ppb PFOS (one type of PFAS). The concentration of PFOS in CRD biosolids is under the proposed standard at approximately 6 ppb (ng/g) (based on two samples). For comparison, a 2020 study found that the PFOS concentration in household dust was 100 ppb (100ng/g).

Financial Implications

The proposed portfolio includes options with a range of costs per tonne. Land application and conventional thermal options are approximately the same, at less than \$500 per tonne. Advanced thermal options are more expensive at up to \$4,500 per tonne; there is significant uncertainty regarding capital and operating costs for a permanent advanced thermal facility at this time, as well as the potential for revenue generation from advanced thermal synthetic gas, bio-oil and biochar end-products and a current lack of demonstrated facilities for cost comparisons. However, this information will be ascertained through the development of the demonstration plant initiative.

Service Delivery Implications

A portfolio of options is required to ensure redundancy and resiliency of the biosolids management strategy. Previous experience with the CRD, as well as a jurisdictional review, has indicated that relying on a single or very few options and single contingency is not suitable to maintain service delivery and regulatory compliance. Based on the consultation feedback, as well as concerns raised previously by the Board, a portfolio of beneficial use options that includes reclamation of industrial lands and forest fertilization, but excludes direct application to agricultural lands is considered prudent. Use of biosolids as an alternative fuel in the current short-term plan will also be carried over as an option in the long-term strategy.

Although the long-term strategy is to address biosolids produced by the Core Area wastewater service, the RTF was designed to receive and process residual solids from the Saanich Peninsula, Sooke and Gulf Island wastewater treatment plants. Once the RTF receiving station is operational, staff will work with the Saanich Peninsula Wastewater Commission to update the Saanich Peninsula Liquid Waste Management Plan accordingly.

Alignment with Board and Corporate Priorities

The recommended Long-Term Biosolids Management Strategy aligns with the 2023-2026 CRD Corporate Plan goal of *Management of wastewater and treatment residuals*, and the initiative to *Develop and implement a long-term Biosolids Management Plan*. The Strategy also supports the initiative under this goal to *Update the Liquid Waste Management Plans for the Saanich Peninsula and Core Area* with regards to complying with the commitment to beneficially use the biosolids generated from the wastewater treatment plants.

First Nations Implications

First Nations are seeking a more respectful, reciprocal government-to-government relationship with the CRD related to service delivery and service delivery impacts in their traditional territories.

As described above, First Nations consultation on the Long-Term Biosolids Management Strategy is ongoing. The CRD will continue to explore beneficial use opportunities with those Nations that express interest. The CRD will also listen to any concerns Nations may have regarding the beneficial use options and is committed to working with individual Nations to address their concerns.

Intergovernmental Implications

Due to the nature of some of the beneficial use options and in order to have a portfolio of options that ensures redundancy and flexibility, it is not unusual for local governments to have biosolids management programs that extend beyond the jurisdictional boundaries of the local government in terms of processing and end use, particularly in areas that are more urban and those that produce larger volumes of biosolids.

Social Implications

Based on all public and TCAC engagement, there is majority support for prioritizing a range of beneficial use options, including advanced and conventional thermal options and land application options. Both the representative survey and TCAC recommendations were in close alignment, with industrial land reclamation and forest fertilization having the strongest support. However, the voluntary survey showed more support for advanced thermal options, although some forms of land application still had support. The differences between the representative and voluntary survey results were likely due to the advocacy and efforts of a few special interest groups that are known to be opposed to land application options. Moving forward, additional public and stakeholder consultation, as required by the provincial regulator on a project-by-project basis, will be conducted.

CONCLUSION

The CRD is required to submit a Long-Term Biosolids Management Strategy to the provincial regulator by June 18, 2024, as part of the CRD's commitments under the Core Area Liquid Waste Management Plan.

The Long-Term Biosolids Management Strategy consists of a portfolio of options that seeks to ensure continuous regulatory compliance (that reliably avoids landfilling) while actively seeking innovative solutions to execute the Board's vision of eliminating all forms of land application. The tiered approach considers First Nations and public input and proposes an optimal approach to utilizing options currently available in the biosolids management market.

RECOMMENDATION

That the Capital Regional District Board:

1. Approve the Long Term Biosolids Management Strategy as a portfolio of options (in alignment with the Long-Term Biosolids Management Strategy prepared by GHD, April 2024), that utilizes each option under a prioritization structure, as follows:
 - (a) **Tier 1: Advanced thermal option:** Constitutes the preferred long-term solution and will be pursued concurrently with options in other tiers. Current projects include:

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 4. Refer the staff report with the Long-Term Biosolids Management Strategy to the Core Area Liquid Waste Management Committee for information.

Submitted by:	Luisa Jones, MBA, General Manager, Parks, Recreation & Environmental Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

ATTACHMENT

Appendix A: CRD Engagement Summary – Draft Long-term Biosolids Management Strategy (June 2024)