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ERM 13-50

REPORT TO ENVIRONMENTAL SERVICES COMMITTEE
MEETING OF WEDNESDAY, NOVEMBER 27, 2013

SUBJECT **SOLID AND LIQUID WASTE LINKAGES AND INTEGRATION OPPORTUNITIES**

ISSUE

To provide a summary of potential integration opportunities associated with integration of solid and liquid waste management, infrastructure and resources.

BACKGROUND

The Board, at its meeting of October 30, 3013, directed staff to bring forward an update report on solid and liquid waste management linkages.

The concept of integrated resource recovery emerged in BC in 2008. Integrated resource recovery seeks opportunities to integrate liquid and solid waste management in order to create energy, reduce greenhouse gas emissions, conserve water and recover nutrients from materials that have been traditionally considered wastes. Capital Regional District (CRD) staff and consultants have reviewed solid and liquid waste integration opportunities a number of times since 2008 and held several joint meetings of the Environmental Services and Core Area Liquid Waste Management committees. Appendix A provides a summary of key documents and recommendations/decisions.

A number of solid waste programs have evolved since 2008. The Board approved the Regional Kitchen Scraps Strategy in 2012, which has resulted in municipal and private sector collection services, with opportunities for co-collection of garbage and kitchen scraps. The collection and processing infrastructure of kitchen scraps is evolving and has yet to be fully implemented within the Region.

Implementation of the Core Area Liquid Waste Management Plan has also progressed with the establishment of the CRD Seaterra program and the identification of Hartland as the declared site for the Resource Recovery Centre (RRC). The Board has also confirmed its decision not to apply biosolids to land and, as a result, the Seaterra program will pursue other beneficial uses of the biosolids, in particular, the market for dewatered and/or dried biosolids as a fuel.

Hartland Landfill Site

There are potential synergies between the CRD Seaterra program and solid waste management, particularly related to processing of kitchen scraps and shared siting and infrastructure at the Hartland landfill site. CRD solid waste staff are working with Seaterra staff, each within their own mandates, to maximize resource recovery. Although Hartland has not been decided upon as a site for a future kitchen scraps processing or a municipal solid waste residuals management facility, such as waste-to-energy (WTE), the landfill property represents the most significant opportunity for integration and is evolving as an important integrated resource recovery centre for the region.

The Hartland landfill is a well-established, large-scale solid waste management facility that has been owned and operated by the CRD since the mid-1980s. The landfill is currently utilized to receive screenings and sludge as controlled waste from various wastewater treatment facilities throughout the region. Environmental monitoring of the site itself is comprehensive and the data collected and analyzed each year represents a significant baseline of information that will benefit the Resource Recovery Centre (RRC) operations and facility management. The landfill site offers buffers to neighbouring properties that will be complementary to siting the RRC on this property. The Hartland landfill also offers direct future integration opportunities of resources and infrastructure:

a) **Landfill Gas**
Fuel: Excess landfill gas from the Hartland landfill gas recovery facility could be supplied to the Seaterra facility to be used as a fuel or included in the biogas recovery system.
Heat: Waste heat recovery from the Hartland power plant could be recovered and supplied to the Seaterra facility for use in their process.

b) **Shared Infrastructure**
The liquid and solid waste facilities will be located on the same site, which allows for efficiencies, including: new pipeline to carry both leachate and filtrate; integrated use of a natural gas line; and use of common weigh scales. In addition, there could be mutual benefits associated with shared administration offices, site security and other site infrastructure.

c) **Residual Management**
Residuals from the RRC process can be disposed in the Hartland landfill.

Resource Recovery Centre – Hartland North

The current Seaterra plan is to establish an anaerobic digestion facility at the Hartland North site, although other technologies may be considered, pending alternate proposals as a result of the RFP process in the spring of 2014. Funding and scheduling commitments associated with the Seaterra mandate do not allow for this RFP to include processing of solid waste streams. There is, however, an opportunity to signal the potential integration opportunities at the Hartland North site such as future kitchen scraps processing.

As outlined in Appendix A, at joint committee meetings in October and November 2010, the Environmental Sustainability and Core Area Liquid Waste Management committees expressed concern about co-digesting sludge with kitchen scraps. At that time, direction was provided not to co-digest sludge with kitchen scraps and that co-digestion of sludge be limited to fats, oil and grease (FOG).

As the Seaterra program develops and the method of stabilizing liquid waste residuals is determined, there are opportunities, under a separate contract and with separate funding, to integrate kitchen scraps processing with liquid waste residuals processing through site layout, shared ancillary infrastructure such as the biogas recovery and odour control equipment, and other shared site services.

The Seaterra RRC can also be integrated with other liquid waste programs in the region, such as the Saanich Peninsula Wastewater Treatment Plant, by receiving and processing these liquid waste residuals.

The results of the Seaterra request for proposals and the chosen Resource Recovery Centre (RRC) processing technology will inform the planning process for long-term kitchen scraps processing options that maximize the integration potential associated with co-location of facilities at Hartland North.

Waste-to-Energy Facility

If the CRD Seaterra project is unable to find a market for dried and/or dewatered biosolids as a fuel, there will be a need to explore other resource recovery options relating to the RRC residual waste stream. As a result, the most likely remaining option for processing the dried biosolids is a WTE facility. There are several types of WTE technologies that are used to process residual waste streams resulting from liquid and/or solid waste processing facilities, including mass burn, plasma/gasification and fluidized bed. As detailed in the Tri-Regional Waste-to-Energy study (AECOM 2010), a WTE facility must be designed for the feedstock supplied:

a) **Sludge/Biosolids WTE**
A facility designed for liquid waste residuals, sludge/biosolids, is able to accept pre-processed kitchen scraps, but is not suited for other types of residual municipal solid waste.

b) **Residual Municipal Solid Waste (MS) Waste to Energy (WTE)**
A facility designed for residual MS residuals can process dried biosolids. Ministry of Environment policy stipulates that a residual MS WTE can only be built after 70% diversion has been reached. The CRD diversion rate is currently at 50%.

There are potential long-term synergies with the integration of energy recovery, from any remaining liquid and solid waste residuals, through a WTE facility at Hartland. Program staff for both solid waste and Seaterra will continue to work together to evaluate potential WTE integration opportunities as CRD liquid and solid waste resource processing technologies are finalized and remaining residual waste streams are better defined.

RECOMMENDATION

That the Environmental Services Committee receive this report for information and forward to the Capital Regional District Board for information.

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APPENDIX A

SUMMARY OF SOLID AND LIQUID WASTE INTEGRATION REPORTS AND RECOMMENDATIONS/DECISIONS

DOCUMENT	SUMMARY	RECOMMENDATION/ DECISION
Investigation of Integrated Resource Management (Fieldtrip to Sweden, 2008) Site visit of three locations	Conclusion that biosolids from any CRD wastewater treatment plants would likely be better kept separate from source-separated organics. Biogas from biosolids digestion could be mixed and upgraded with biogas from a source-separated organics digestion system. It was noted that not all of the Swedish technologies and programs would be directly applicable to the CRD.	Discussion paper received by CALWMC.
Capital Regional District Waste Management – An Integrated Perspective (Staff Report 2009)	Overview of solid and liquid waste management planning initiatives and potential integration opportunities.	Received at joint ESC and CALWMC meeting.
Biosolids Management Plan (Stantec, 2009)	Recommendation to co-digest sludge and organics	Approved by CALWMC. Modified in LWMP Amendment 8, Section 7, which states to "provide some additional capacity in the digesters to accept source separated food waste and/or FOG to enhance the production of bio methane."
Solid and Liquid Waste Integration Opportunities Outline (Staff Report, 2010)	Outline of short-term and long-term integration opportunities. Short-term (to 2017) plan included separate kitchen scraps collection and processing in anticipation of a planned 2012 landfill ban. Long-term (beyond 2017) plan identified opportunities for integration of organics, biosolids and MSW to liquid waste timelines.	Integration outline was endorsed by ESC and received by CALWMC. Short-term plan did not materialize as RFP for co-collection of recyclables and kitchen scraps was cancelled in 2010 and a new kitchen scraps landfill ban date was set for 2015.

CRD Household Organics Management (AECOM, 2010)	Investigated technologies and options. Co-digestion of kitchen scraps and sludge and separate kitchen scraps processing were identified as cost effective and environmentally beneficial. Keeping kitchen scraps in the MSW stream and processing it in a WTE facility was the least preferred option.	Received by ESC and forwarded and received at joint October 2010 ESC and CALWMC committee meeting. Further information presented found that highest triple-bottom-line favours anaerobic co-digestion of biosolids and FOG.
Sludge Processing for the Core Area Wastewater Treatment Program (Staff Report, November 2010)	Review of disposal options, including AD and WTE.	Received at joint November 2010 meeting of ESC and CALWMC. Recommendation changed to proceed with plans for co-digestion of sludge with FOG (not kitchen scraps).
Feasibility Study on the Integration of Liquid Waste and Solid Waste Management Plans (HB Lanarc, 2010)	The study concluded that while the current regulatory structure is not conducive to the development of integrated waste management plans, there are opportunities for integrating the two waste streams at the operational level.	Received by ESC and CALWMC.
Feasibility Study for a Tri-Regional Waste to Energy Facility (AECOM, 2010)	Because the majority of waste is generated in the CRD (rather than RDN or CVRD), the most economical tri-regional option is a mass burn facility in the CRD at a site where district heating opportunities could be realized.	Received for information by ESC and CALWMC.