



**REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE  
MEETING OF WEDNESDAY, 11 JUNE 2008**

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**SUBJECT**      **CORE AREA WASTEWATER MANAGEMENT PROGRAM – PLAN FOR ACHIEVING OBJECTIVES OUTLINED IN THE MINISTER OF ENVIRONMENT’S LETTER DATED 14 DECEMBER 2007**

**PURPOSE**

The purpose of this report is to obtain approval for the attached draft report, entitled *The Core Area Wastewater Management Program – Program Development Phase – Report to Minister of Environment*, by Associated Engineering/CH2MHill/KWL, dated 05 June 2008, and to seek a schedule extension for completion of the proposed amendment to the Core Area Liquid Waste Management Plan (the LWMP).

**BACKGROUND**

The minister of environment responded to the Capital Regional District’s (CRD) proposed amendment to the LWMP, and to the supporting *The Path Forward* report, in a letter dated 14 December 2007. The main points of the minister’s letter are provided in Section 1.4 of the attached draft report.

The first deliverable requested by the minister was that a plan, demonstrating how to achieve the six objectives listed in Section 1.4, be submitted by 30 June 2008. The attached draft report provides the requested plan for meeting these objectives.

The minister also requested that an LWMP amendment be submitted by 31 December 2008, which should include the seven items listed at the end of Section 1.4. However, for the reasons outlined in Section 4 of the report, it is now apparent that it will not be possible to fully respond to all of the items requested by 31 December 2008.

It is proposed instead to provide a progress report at the end of December 2008 and to request in the June 2008 submission that the minister extend by 12 months the deadline for the submission of the proposed amendment to the LWMP.

The progress report to be submitted at the end of 2008 will include an update of potential sewage treatment plant sites, a Stage 1 environmental impact statement on potential outfall locations, an updated proposed system configuration that will optimize opportunities for resource recovery and a summary of First Nations engagement and public consultation in 2008.

**SUMMARY**

The draft interim report requested by the minister of environment by 30 June 2008 is attached.

In Section 4 of this report, the consultant outlines reasons why it will not be possible to respond to all of the items requested by the minister by 31 December 2008 and suggests that a 12-month extension to this deadline be requested.

**RECOMMENDATIONS**

That the Core Area Liquid Waste Management committee recommend to the Board that:

1. the attached draft report, entitled *The Core Area Wastewater Management Program – Program Development Phase – Report to the Minister of Environment*, dated 05 June 2008, be approved; and
2. the minister of environment be requested to extend the deadline for the submission of the proposed amendment to the Core Area Liquid Waste Management Plan to 31 December 2009.

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Concurrence

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Kelly Daniels  
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**COMMENTS**

SM:cl  
Attachment: 1

R E P O R T

# *The Core Area Wastewater Management Program*

## *Program Development Phase*

*Report to Minister of Environment*

**DRAFT**

*June 5, 2008*



Making a difference...together

Capital Regional District



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# 1 Introduction

## 1.1 THE BACKGROUND

The Capital Regional District (CRD) provides wastewater management to residential, commercial, industrial and institutional customers, equivalent to a population of approximately 330,000 persons, distributed throughout the Core Area and West Shore communities. The wastewater system is operated under a Province of British Columbia Liquid Waste Management Plan (LWMP). The LWMP, originally, approved in March 2003, authorizes the CRD to manage the wastewater collection, treatment and disposal system within a set of operating parameters and future environmental goals. Key features of the Plan include a source control program, a program to reduce inflow and infiltration (I/I), preliminary wastewater treatment using fine screening and effluent disposal to the marine environment through two major outfalls.

In July 2006, as a result of continuing environmental studies on the impact of the discharges on the marine environment and a review by an independent scientific review panel, the Provincial Minister of Environment requested that the CRD provide an amendment to the LWMP, detailing a fixed schedule for the provision of wastewater treatment (MOE, 2006). This amendment was to be submitted by June 30, 2007.

The CRD complied with this request and entered into a strategy development phase, termed Phase 1 - The Decision Process. This phase saw the CRD Core Area Liquid Waste Management Committee (CALWMC) work with staff, a consulting team composed of the firms Associated Engineering, CH2M Hill and Kerr Wood Leidal, and an appointed Technical and Community Advisory Committee (TCAC) to develop a strategy for wastewater management over the next 60 years. In June 2007, the CRD submitted proposed wording to amend the existing LWMP (CRD, 2007a) to the Minister, accompanied by a supporting report, entitled *The Core Area Wastewater Management Program – The Path Forward – The Supporting Report to the Response to the Minister of Environment, June 13, 2007* (CRD, 2007b).

## 1.2 THE CORE AREA WASTEWATER MANAGEMENT STRATEGY

The CRD Board has made an innovative move to depart from a traditional centralized approach to wastewater treatment to a more distributed wastewater treatment strategy. This more distributed approach allows the CRD to take best advantage of the existing sewerage infrastructure, while setting the direction for more localized wastewater management with potential water reuse and energy recovery opportunities.

The advantages of this more distributed treatment approach are three fold. First, it reduces the size of the downstream “central” plant, as the upstream water reclamation plants reduce the flows reaching the plant. Second, by strategically locating the upstream water reclamation plants, this approach creates local opportunities for water reuse and heat recovery from the wastewater. Third, by reducing the existing wastewater flows in the lower portions of the sewerage system, capacity is freed up to handle a greater portion of the wet weather wastewater flow – greatly reducing the frequency and volumes of the current sanitary sewer overflows (SSO).

The real innovation of this strategy is the flexibility that it will provide the CRD in the future decades. The CRD will no longer need to build larger and larger pipes in the ground to transport the wastewater long distances to a central treatment plant site. There will also not be the need to continually expand the central plant to handle higher wastewater flows due to growth - the decentralized water reclamation plants will handle growth in the outlying communities. These plants will utilize advanced treatment technologies to take advantage of phasing opportunities and “just in time” construction to accommodate future needs.

The overall Program was expected to take 10 years to complete, with an estimated cost of \$1.2 billion. The Path Forward report identified five phases of the Program: the Decision Process, Program Development, Design, Construction / Commissioning, and Operation. The Decision Phase was complete with the submission to the Minister in June 2007. The Program is currently at the Program Development phase.

### **1.3 THE PROGRAM DEVELOPMENT PHASE**

The objective of this phase is to continue to refine the wastewater management strategy to the point where the design and construction of specific elements can proceed. It has two parts:

- Conceptual Planning
- Design Basis Planning

The Conceptual Planning work essentially takes the strategy, developed as part of the Decision Process phase, to the conceptual planning level. This includes further analysis of future community growth, integrated resource management opportunities and specific sites and locations for the elements of the wastewater management strategy. It includes discussions and consultations with the various stakeholder groups and the public. It also includes the development of a business case that examines how the Program can best be implemented using the resources of the public and private sector. The current status of activities is described in greater detail in Chapter 2.

The Design Basis Planning will start once the conceptual planning has been completed. The objective of this work is to prepare design basis briefs for each of the Program elements to be designed, constructed and operated. This would include the assembly of site information and the establishment of performance specifications and requirements. These briefs will form the basis for the CRD to enter into a competitive proposal or tender process with the private sector to design, build and perhaps operate or finance elements of the Program.

### **1.4 THE MINISTER'S LETTER**

The Minister of Environment responded to the CRD's proposed amendment to the LWMP and to the supporting Path Forward report by letter dated December 14, 2007 (MoE, 2007). The response was supportive of the CRD's wastewater management strategy and in particular noted that the strategies to optimize the beneficial use of reclaimed water, biosolids and other resources are commendable. The Minister encouraged the CRD to ...*explore additional benefits that may be realized by integrating solid and liquid waste resource recovery opportunities...the BC Government will work with you to identify and*

*optimize these benefits.* The Minister further notes ... *there is substantial agreement on the following objectives for moving forward:*

- *Meet the regulatory standard for liquid waste.*
- *Minimize total project cost to the taxpayer by maximizing economic and financial benefits, including beneficial reuse of resources and generation of offsetting revenue.*
- *Optimize the distribution of infrastructure based on Item 2 above.*
- *Aggressively pursue opportunities to minimize and reduce greenhouse gas emissions.*
- *Optimize “smart growth” results.*
- *Examine the opportunity to save money, transfer risk and add value through a public private partnership.*

The Minister requested that a business plan, demonstrating how to achieve the above objectives, be submitted no later than June 30, 2008. The Minister also approved the treatment schedule proposed by the CRD and requested that the CRD ... *submit a Liquid Waste Management Plan amendment on or before December 31, 2008, which shall include, but not be limited to, the following:*

- *Decisions on the selected physical infrastructure model, selected resource recovery options and the P3 approach.*
- *Identifying the site locations for sewage treatment facilities.*
- *The results of environmental impact studies for each sewage facility.*
- *The results of environmental impact studies for each new discharge location.*
- *Draft Operational Certificates for each sewage treatment facility / discharge location.*
- *Class B detailed capital and operating costs to implement the Plan and costs per user, both with and without government funding.*
- *Consultation summary reports (public and First Nations).*

### **1.5 PROVINCIAL INTEGRATED RESOURCE MANAGEMENT (IRM) STUDY**

In the late summer of 2007, the Province, through the Minister of Community Services, undertook a study to investigate the opportunities and benefits of integrated resource management (IRM) for communities in the Province. As part of the commitment, noted above, for the Government to work with the CRD in identifying and optimizing resource from waste opportunities, part of the study was to consider the CRD as a case study. This study was originally to be completed in the fall of 2007. Unfortunately, the project completion was delayed and the final report, entitled *Resources from Waste – Integrated Resource Management Phase I Study Report, February 29, 2008*, was not released until May 20, 2008 (IRM Study Team, 2008).

### **1.6 PURPOSE AND FORMAT OF THIS REPORT**

The purpose of this report is to respond to the request from the Minister of Environment to provide a plan, by June 30, 2008, to demonstrate how the identified objectives are being met.

Chapter 2 provides an overview of the progress that has been made up to June 1, 2008. Chapter 3 responds to the Minister's specific request on provision of a plan to meet the six objectives. Chapter 4 presents a revised schedule for the submission of an amendment to the LWMP. Chapter 5 provides a brief summary.

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## 2 Program Development Phase Activities

### 2.1 GOALS AND STRATEGIES

The CRD began the Program Development Phase in July 2007 with further development of the adopted strategy described in the Path Forward report. In order to keep the Program on track and to assist the decision making as the project moves through development and implementation, the CRD adopted a series of goals and accompanying strategies.

The three goals are:

#### **Goal 1 - Protect Public Health and the Environment**

This is fundamental goal of wastewater management. The CRD is committed to not only meeting the required regulations but also in planning ahead in a proactive manner to ensure that that emerging and future public health and environmental issues can be addressed in the decades to come.

#### **Goal 2 - Manage Wastewater in a Sustainable Manner**

Wastewater has traditionally been considered in the context of “disposal”. The strategy adopted by the CRD has changed this approach. The CRD is committed to moving towards the goal of sustainable wastewater management during the detailed planning and implementation of the Program. A sustainable wastewater management approach will be one that continuously moves the CRD forward in terms of the integration of water, energy, waste and infrastructure management within the social, environmental and economic (the triple bottom line) values of the community.

#### **Goal 3 – Provide Cost Effective Wastewater Management**

Cost effective wastewater management optimizes the existing investment in wastewater infrastructure while incorporating new strategies and infrastructure investments. The CRD will consider the best integration of public and private sector resources to deliver the wastewater management service in a manner that provides the best value to the community.

In order to achieve the goals, it is necessary to develop strategies. Strategies define the approach to be taken to accomplish the desired outcome or goal. A number of strategies may be pertinent to a goal and, in fact, strategies may overlap to achieve more than one goal. At a July 25, 2007 meeting, the CALWMC adopted a series of strategies. These have been put on the CRD web site as part of the public communication process.

## 2.2 PROGRAM DEVELOPMENT PHASE ACTIVITIES

The CRD engaged a business consultant, Ernst & Young Orenda Corporate Finance Inc., to commence preparation of a project business case including the analysis of project delivery alternatives. Their work commenced in the summer of 2007.

Westland Resource Group was engaged to identify and assess potential sites for wastewater treatment facilities. This work started in the summer of 2007.

In January 2008, following the response from the Minister, the CRD authorized the engineering team, Associated Engineering/CH2M Hill/Kerr Wood Leidal to commence work on the conceptual planning for the Program.

Table 2-1 provides a summary of activities undertaken by the CRD on the Program Development Phase since July 1, 2007. It covers activities up to June 1, 2008.

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**Table 2-1  
Core Area Wastewater Management Program  
Program Development Phase Activities**

ACTIVITY	DESCRIPTION	STATUS
Goals and Strategies	Development of goals and strategies to guide decision making as the Program moves through development and implementation.	Completed in July 2007
Conceptual Planning	<p>Conceptual level engineering and environmental planning to further refine the strategy adopted by the Board in June 2007. Specific activities include:</p> <ul style="list-style-type: none"> <li>• <b>Integrated Resource Management Strategy</b> <i>Development of a near term and long term strategy for integrating wastewater management into sustainable water, stormwater, solid waste and energy management for the community. This activity incorporates concepts developed in the Provincial IRM study.</i></li> <li>• <b>Greenhouse Gas Management Strategy</b> <i>Develop a strategy incorporating the principle of carbon neutrality into the Program. Develop a methodology to compare alternative strategies and assess the performance in meeting the defined targets.</i></li> <li>• <b>Wastewater Flow Management Strategy</b> <i>Detailed planning of future wastewater flows based on community development and expected changes due to water conservation, climate change and I/I reduction.</i></li> <li>• <b>Macaulay / McLoughlin Point Wastewater Treatment Plant</b> <i>Develop conceptual level designs and layouts for a WWTP on the Macaulay Point site, the McLaughlin Point site or using both sites. Determine how the sites can be developed to best meet the Program goals.</i></li> <li>• <b>Clover Point Wet Weather Flow Management Plant</b> <i>Develop a conceptual level design and layout and determine how the site can best be developed to meet the Program goals.</i></li> <li>• <b>Distributed Wastewater Management Strategy</b> <i>Refine the distributed wastewater management strategy based on the development of alternative strategies for both near-term and long-term resource recovery opportunities. Carry out a TBL analysis to determine the optimum strategy.</i></li> <li>• <b>Biosolids / Resource Management</b> <i>Develop conceptual level designs and layouts for biosolids / resource management facilities, based on the selected distributed wastewater management strategy.</i></li> <li>• <b>Cost Estimates</b> <i>Refine the capital, annual O&amp;M costs and revenues based on the selected distributed wastewater management strategy.</i></li> </ul>	<p>40% complete</p> <p>20% complete</p> <p>60% complete</p> <p>20% complete</p> <p>5% complete</p> <p>30% complete</p> <p>Not started</p> <p>Not started</p>
Facility Siting	<p>Identification of potential wastewater treatment plant sites in the Saanich East-North Oak Bay area and in the West Shore communities. Criteria have been selected and applied, dealing with land use, environment, geotechnical, archaeology, heritage, energy conservation, resource recovery, and traditional use.</p> <p>The site selection process will be expanded to other parts of the Core Area to identify potential locations of facilities where energy and water recovery and reuse, and integration of liquid and solid waste could be achieved.</p>	<p>Potential sites identified based on GIS attribute mapping. Initial discussions with property owners, municipalities, and First Nations, have been held. These discussions are continuing. 80% complete.</p> <p>Expanded site investigations just beginning. 20% complete.</p>
Business Case Development	Review of procurement options and recommendations on the overall Program implementation strategy.	Market sounding and stakeholder consultation carried out. Summary of responses completed in April 2008.
First Nations Consultation	Development and implementation of an approach to working with First Nations that will create a clear understanding of roles, responsibilities and expectations in order to ensure the potential of a strong working relationship throughout the implementation. Songhees First Nation and Beecher Bay First Nation have been involved in Saanich East-North Oak Bay and West Shore facility siting studies. Traditional use information has been obtained from the First Nations, and reviewed as part of the siting process.	CRD seconded a senior official from the Province in February 2008. Initial discussions underway with First Nations, the Province and the Federal Government.
Public Communication	Develop and undertake a public communication process, consistent with the requirements of the LWMP process.	A public open house and various displays held in the fall of 2007. Meetings and presentations to municipal councils and stakeholder groups. Program web site developed. Meetings with the Technical and Community Advisory Committee (TCAC) on-going.

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## 3 Program Objectives - Progress to Date

The Minister of Environment identified six objectives in his December 2007 letter and requested the CRD provide a plan on how these objectives will be met. The six objectives, with a description on how the CRD proposes to meet them, are discussed below.

### 3.1 OBJECTIVE 1: MEETING REGULATORY STANDARDS

There are a number of facets to meeting the regulatory standards. Our approach to these is as follows:

#### *Water Reuse and Effluent Discharge Criteria*

Our starting point is the approved LWMP that, along with the Operational Certificates, govern the operation of the current wastewater management system. These documents will ultimately be amended to incorporate the adopted distributed wastewater management strategy. In evaluating future performance criteria for water reuse and the return of effluent to the environment, we are utilizing the Provincial Municipal Sewage Regulations (MSR) and intend to work with Province as our innovative approaches to integrated resource management evolve. We are also keeping abreast of the activities to harmonize municipal wastewater discharge regulations across Canada through the activities of the Canadian Council of Ministers of the Environment (CCME) and possible future federal regulations. In areas where regulations are not present or are undergoing change, such as in the area of microconstituents, we are utilizing scientific knowledge or experience elsewhere in the world to ensure our strategies are sufficiently flexible to accommodate future change.

Our wet weather flow strategy is based on the currently approved LWMP that defines allowable sanitary sewer overflows (SSOs) in specific situations, based on a return event frequency. As per the MSR, we recognize this is an interim situation. With the adopted distributed wastewater management strategy, we expect to reduce both the frequency and volume of SSOs over time. At Clover Point and at other locations, we are looking at appropriate treatment technologies for wet weather overflow events.

#### *Wastewater Facility Design*

The Provincial MSR covers limited aspects of facility design. One of the goals adopted by the CRD Board is to manage wastewater in a sustainable manner. As integration of the facilities into neighbourhoods is a key element of this goal, we will be adopting state-of-the-art criteria for the wastewater treatment plant design as it relates to issues such as odour control, noise abatement, LEED™ design elements and reliable process performance. As our strategy is to “blend” the facilities into the surroundings, we will be looking at appropriate architectural design and perhaps multi-use of the sites to meet our goal of sustainability.

#### *Public Communication*

This is a component of the LWMP amendment process, as well as a critical part of CRD decision making. We commenced public communication on the Program during the Decision Process Phase, primarily using web-based communication. We have continued this process and have launched a new web site. In addition, we have held almost 30 meetings with our member municipalities and stakeholder groups (see

List of Public / Stakeholder Meetings). We are currently reviewing our public communication strategy as we continue to move through the development of the Program.

#### *First Nations Consultation*

First Nations consultation is an important and critical element. Our approach to working with First Nations is to create a clear understanding of roles, responsibilities and expectations at the front end of the project to ensure the potential of a strong working relationship through to its completion. As a result, we have taken the initial step of entering into a protocol with the Province to form a partnership on consultation and engagement by outlining issues that are the responsibility of the CRD, and those that ultimately lie with senior governments.

Within this protocol, the Province retains overall responsibility for consultation with First Nations including outlining which First Nations need to be engaged and to what extent. We are taking the “on the ground” responsibility for making sure First Nations are well informed about the project, have real opportunities to provide input, and can see how that input is being used, where practical, in the design and construction of the project. If issues remain, it will then be the provincial or federal government’s responsibility to respond to, and, where appropriate, accommodate assertions concerning potential impacts on a First Nation’s existing aboriginal or treaty rights. In addition to the protocol with the Provincial government, we have taken the following steps to engage First Nations on the project. These are:

- Seconded a senior official from the Province with a strong background in aboriginal relations to help work with First Nations on these issues;
- Made good progress on draft tripartite protocols with both the Songhees and Beecher Bay First Nations laying out a common understanding of the consultation/engagement process;
- Approached the Esquimalt First Nation to build a similar protocol, and where possible, try to address other issues which have the potential to affect progress on a good working relationship on this project;
- Met with the federal government to ensure a common understanding with regard to consultation duties with First Nations if federal decisions are required to complete the project; and
- Met with federal officials to clearly state the expectation that if federal Crown land is needed to complete the project, the federal government will deal fairly with both the CRD and affected First Nations to ensure the project can be achieved on a win-win basis.

### **3.2 OBJECTIVE 2: MINIMIZE TOTAL PROJECT COST TO TAXPAYER**

Providing cost effective wastewater management is one of three goals adopted by the CRD Board. The work in the Decision Process phase of the project has already identified that a more distributed wastewater management approach, that minimizes the investment in new, large pipes in the ground, is the most cost effective strategy from both a capital cost and a life cycle cost point of view. We are now focusing on a refinement of the distributed wastewater management strategy. We see two parts to this cost reduction strategy.

The first is to do a comprehensive analysis on our resource recovery opportunities – now, in 2020 and in 2065. This includes water reuse, heat energy recovery, flow energy optimization and energy from the organic solids. It also considers the potential synergy from the co-management of solid waste. We will then build alternative strategies on how we can capture these opportunities in differing manners. The analysis will conclude with a TBL assessment. We are confident that this approach will define the best distributed wastewater management strategy, from a cost, social and environmental point of view.

The second part of minimizing total project cost will be the phasing of the implementation of works. Our fundamental strategy calls for our “central” downstream plant at Macaulay / McLoughlin Point to be effectively “capped” in terms of future site expansion and the majority of future capacity to be provided in decentralized water reclamation plants. This effectively builds in a phasing strategy that will minimize initial costs and allow “just in time” implementation of wastewater management capacity.

### **3.3 OBJECTIVE 3: OPTIMIZE THE DISTRIBUTION OF INFRASTRUCTURE**

The fundamental nature of our distributed wastewater management strategy addresses this objective. Our challenge is to move from our current sewerage system, whose prime purpose over the last many decades was to move wastewater to the marine environment, to a wastewater management system that focuses on both environmental protection and resource recovery. Our approach to optimizing our infrastructure is to effectively combine our existing interceptor sewers with a future strategy of additional decentralized water reclamation plants throughout the service area. This allows us to both free up interceptor capacity to assist in the management and ultimate reduction of wet weather flow discharges as well locate the facilities at the optimum locations. As noted above, this also allows us a “just in time” expansion capability that will also allow us to optimize the required infrastructure.

Our current conceptual planning activities are allowing us to refine the distributed wastewater management strategy. In addition to the location of water reclamation plants, we are also evaluating alternatives for the location of organic residuals management. Under the Path Forward strategy, the decentralized plants were envisioned to be “liquid stream treatment only” plants, located along the interceptor systems. These plants “mine” the wastewater from the interceptor and reuse or return the effluent to the local environment. Residuals are returned to the interceptor for transport to a central “downstream” plant, again allowing optimization of the existing infrastructure. This approach allows the residuals to be handled at one location, allowing for the benefits of a factor of scale. In addition, we are also looking at whether with the current development of residuals management technologies, we can consider independent residuals handling at a smaller scale at one or more of the decentralized plants.

### **3.4 OBJECTIVE 4: REDUCE GREENHOUSE GAS EMISSIONS**

Sustainable management is one of the goals adopted by the CRD Board and the reduction of greenhouse gas emissions is a key part of a sustainable strategy. The approaches that we are taking are discussed below:

*Flow Energy Management and Recovery*

One of our key initiatives is the siting of facilities and planning the conveyance systems to reduce energy consumption through minimizing the need for the pumping of wastewater. We are also looking at, where we have surplus hydraulic energy head, can we use this potential energy by installing hydro power generation systems. Examples of this are on outfall systems where power can be generated to offset local use in the treatment plant. Clearly, any reduction in electrical consumption will have a direct benefit in GHG management.

*Heat Energy Recovery from the Wastewater*

As described above, this is a major part of our conceptual planning. We are looking at two types of opportunities. One is the recovery of thermal energy for heating or cooling from the effluent of a wastewater treatment plant. An example of this is the potential to utilize heat energy from a plant located at McLaughlin Point in a future centralized district heating system in the James Bay area of the City of Victoria. We are also looking at evolving technologies to extract heat on a smaller scale from the raw wastewater, without the need for a full treatment plant. This has the potential to provide heat energy on a local basis to locations such as hospitals or institutions that have an existing central heating / cooling system. Both of these types of applications have a significant potential to offset natural gas use.

*Organics Residual Energy*

We are well along in developing our evaluation of the best way to integrate the management of residuals from wastewater with solid waste. Staff, politicians and consultant team members have recently returned from a visit to Sweden to view and discuss their experience in waste management integration. Our planning is looking at the concept of “best and highest value” to utilize the energy and residuals potential from the organics. This includes concepts such as anaerobic digestion and biogas generation. The biogas can be used to generate electrical power, to fuel vehicles or added to the natural gas distribution system. We are looking at where facilities can best be located, keeping in mind transportation impacts of the raw residuals and the final products. Lastly, we are looking at the ultimate use of the refined residuals, with the a target of “zero waste”.

*Wastewater Treatment Process Optimization and LEED™ Design*

In the conceptual design of the wastewater treatment / reclamation facilities, we are evaluating technologies and layouts that fit with our goal of sustainable management and GHG reduction. This means that while traditional criteria such as effluent quality are important, energy and chemical use and GHG emissions are also important. All future facilities will incorporate LEED™ design principles. As noted in our Path Forward strategy, we are looking at the blending of technologies at a particular plant to achieve the desired goals. An example of this is the combination of an advanced treatment process such as membrane bioreactors (MBR) on the effluent stream going to reuse and enhanced high-rate primary treatment on the effluent that is being returned to the marine environment. All of these approaches, we allow us to minimize GHG emissions.

### 3.5 OBJECTIVE 5: OPTIMIZE SMART GROWTH STRATEGIES

Our distributed wastewater management strategy fits well with “smart” community growth strategies. Our Path Forward report identified two decentralized water reclamation facilities – one in the Saanich East area and one in the West Shore Communities. Substantial progress has been made on the selection of sites for treatment facilities in the Saanich East-North Oak Bay and West Shore areas. Information has been collected and mapped for:

- present and planned land use,
- environmental features,
- geotechnical characteristics,
- archaeology and heritage,
- energy conservation, and
- potential for reuse of recovered resources.

The selection criteria were developed and revised in response to input from elected representatives, community groups, the public, First Nations, and technical experts.

From a Geographic Information System analysis of the study areas, eight candidate sites were identified for further analysis. The owners of the candidate sites were contacted, as were municipalities in which the sites are located. Dialog is continuing with property owners and municipalities. First Nations have been involved in the site selection process. We contacted all three local First Nations, and discussed the wastewater management project and the siting criteria with Chiefs and Councils of the two Nations that chose to participate. First Nations members were retained to take part in fieldwork associated with the archaeological overview assessment. The draft results of the siting study were presented to the First Nations, laying the groundwork for future involvement in the wastewater project. Aboriginal traditional use information has been gathered and summarized for the study area.

The configuration of treatment facilities described in the Path Forward report is not the final number or location of plants. The conceptual planning work will evaluate the potential for additional decentralized plants. This analysis is currently underway. We are looking at three planning horizons – now, 2020 and 2065. We are particularly focusing on new development areas and areas within the existing community that will redevelop at a higher density. These are the growth situations that provide the best opportunity for resource recovery and decentralized wastewater management.

A critical part of our conceptual planning is to retain flexibility. Our consultant team has identified that resource recovery / wastewater management technologies will be evolving more rapidly than in decades past, given global changes in energy costs and climate change impacts. We believe our distributed wastewater management planning will work well with “smart” growth strategies and nodal community development and that we will have the flexibility to adapt to technology change as it evolves.

### 3.6 OBJECTIVE 6: EXAMINE OPPORTUNITIES FOR PUBLIC PRIVATE PARTNERSHIPS

As noted, we have engaged the consulting firm of Ernst & Young to assist in examining our Program delivery strategy and the use of alternative types of procurement that may lead to better value for money for taxpayers and/or lower risk for the CRD. Their work to date has included a preliminary review of risks facing CRD (through several risk workshops with staff and advisors), completion of a detailed *Market Sounding and Stakeholder Consultation* report (E&Y, 2008), and a review of financial aspects of the Provincial IRM study.

As with other components of the project, the evaluation of value for money and risk transfer has been complicated by the integration of IRM into the scope of analysis. Key inputs from the engineering and siting advisors have been deferred and this in turn has delayed the delivery date of Ernst & Young's analysis.

Ernst & Young continues to work with CRD staff and its engineering advisors during the Program Development and Concept Planning phases to (i) establish CRD's risk transfer goals, (ii) clarify the high level performance targets of the overall project (including IRM goals), (iii) determine feasible procurement implementation options, (iv) establish lifecycle costs for each procurement option, and (v) establish criteria for the evaluation of project implementation options (financial, non-financial social/environmental, and risk). Ernst & Young will then proceed to consolidate this information and analysis into a coherent business case with conclusions on taxpayer value for money, CRD's risk transfer goals, and the recommended approach to procurement.

The first major step in Ernst & Young's analysis was completion of the *Market Sounding and Stakeholder Consultation*. Twenty-nine parties responded to a questionnaire posted on CRD's public website. A broad variety of views were provided by respondents and as noted in the report "*Overall, Ernst & Young was satisfied by the quality and variety of responses received during the consultation process. Responses were generally comprehensive, insightful, covered a broad range of issues, and provided the CRD with valuable feedback that will assist in the development of the business plan for the overall project.*"

While no firm conclusions can be made from the market sounding at this stage, we have the following observations:

- there is significant interest from the private sector in the implementation of the Program;
- there is no clear preferred procurement approach among the respondents (for example, design build operate, design build or design bid build);
- it may be appropriate to package the Program into multiple components, with some components being procured using traditional approaches to contracting while other components use alternative forms of procurement;
- in order to ensure a successful procurement implementation the CRD needs to demonstrate there is a political commitment to completing the selected procurement process (including having political leaders explain the plan to the community);
- several respondents commented that biosolids handling and the level of sustainability integrated into the Program will be one of the more difficult aspects to manage; flexibility in design, planning and operations is important for biosolids management;

- certainty in the regulatory environment is required by the private sector (including discharge permit requirements), and
- CRD will get the best response and the best price if it can clearly define the scope of work and performance targets for the Program in advance of a proposal call, and also clearly define the risks and responsibility CRD wishes to transfer to the private sector.

We are continuing to examine program delivery alternatives with Ernst & Young. We are also examining other facets of the overall Program that could be procured using alternative procurement approaches. Principal among these is the role of the CRD and local government in energy utility systems. Should the CRD simply provide the effluent to another party (institutional or private sector) for their recovery of heat energy? Or should the CRD own and operate central energy systems? Similarly, what is the CRD's role on water reuse distribution? We are also looking at our policies relative to smaller decentralized wastewater management systems, such as Dockside Green, that essentially utilize water recycling and reuse within the development property.

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## 4 Schedule

The Path Forward strategy indicated that the Core Area Wastewater Management Program would take about 10 years to complete. The Minister, in his letter of December 2007, accepted this schedule, subject to a proposed Amendment to the LWMP being submitted by December 31, 2008. The requested content of this Amendment is outlined in Section 1.4 of this report.

A 2017 completion is realistic, though we will not be able to respond with final decisions on all of the elements requested by the Ministry by December 31, 2008. Table 4-1 presents a revised schedule for the activities in the Conceptual Planning part of the Program Development Phase. Table 4-2 shows a summary of the deliverables. Our reasons for proposing this revised schedule are three fold.

### *Integrated Resource Management*

The Provincial *Resources from Waste* report, just released in May 2008, contains information that must be considered by the CRD as we determine how best to move forward. Incorporating solid waste management with the beneficial reuse and recovery initiatives identified in the Path Forward document will require a thorough analysis, consideration of local conditions and concerns, and the building of support in the community. Liquid waste management decisions will have a profound impact on the region for decades to come, and the CRD needs adequate time for the technical analysis and application of the integrated resource management concepts into the project.

### *Facility Siting*

Additional issues need to be considered and resolved as part of the procurement of sites for wastewater treatment and resource recovery. Identification and procurement is related to integrated resource management, discussed previously, and to finalizing the distributed wastewater management strategy. The sites being considered are owned by other levels of government or nongovernmental organizations. Some sites, particularly those owned by the Federal Government, have lengthy procedures that need to be followed for ownership transfer. This time frame will extend beyond the end of 2008. Additional siting criteria have been added to the site selection process since the start of the CRD project. Energy conservation, greenhouse gas reduction, and resource recovery have grown in importance, requiring a review and revision of the siting process. Finally, some property owners desire additional discussion with the CRD about potential benefits of resource recovery and the ability to integrate a wastewater facility with their operations. These discussions could have a beneficial effect on the wastewater management project, and warrant additional time to engage the property owners.

### *First Nations and Public Consultation*

As noted in this report, we have begun work on both First Nations engagement and public consultation. These are both critical elements for the success of our Core Area Wastewater Management Program. As these are both linked to integrated resource management and facility siting, we cannot complete the consultation and dialog until these activities are advanced. In

particular, it is important to recognize that consultation and engagement with First Nations is not an endeavor that can be accomplished by simply setting a deadline. Given the complexities of the wastewater treatment project, the legal requirement and genuine desire to engage and consult with First Nations in a meaningful way, and the number of other important endeavors taxing these First Nation's capacity, this pursuit can be expected to require more effort and possibly more time than was envisioned at the inception of the project. We thus see that the required consultation, with both the public and with First Nations, will extend well into 2009.

We request that the Minister consider the revised schedule, in light of the above reasons.

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**Table 4-1  
Core Area Wastewater Management Program  
Program Development Phase Proposed Schedule**

ACTIVITY	EXPECTED COMPONENT STATUS AS OF DECEMBER 31, 2008	PROPOSED 2009 MILESTONES
Conceptual Planning	<ul style="list-style-type: none"> <li>• <i>Integrated Resource Management Strategy</i> This overview strategy will be completed by September 2008. A series of Discussion Papers will be submitted to MoE staff.</li> <li>• <i>Greenhouse Gas Management Strategy</i> Continue to work with the Climate Change Secretariat to develop the methodology for comparing alternative wastewater management strategies. This will be completed by September 2008. A Discussion Paper will be submitted to MoE staff.</li> <li>• <i>Wastewater Flow Management Strategy</i> A Discussion Paper on this activity will be completed by August 2008 and submitted to MoE staff. Discussions will be held with MoE staff in the early fall of 2008 on the wet weather flow management strategy.</li> <li>• <i>Macaulay / McLoughlin Point Wastewater Treatment Plant</i> Preliminary conceptual alternatives will be completed in July 2008. Meetings with the property owners will continue into the fall of 2008. By December 31, 2008, we would anticipate being able to identify which of the sites is the preferred direction. This will then be built into the decision making on the overall distributed wastewater management strategy.</li> <li>• <i>Clover Point Wet Weather Flow Management Plant</i> Preliminary conceptual alternatives will be completed by September 2009. A Discussion Paper will be submitted to MoE staff. This will form part of the discussions with MoE staff on the wet weather management strategy in the fall of 2008.</li> <li>• <i>Distributed Wastewater Management Strategy</i> Utilize the conclusions in the IRM Strategy discussed above to evaluate and build alternate scenarios for the distributed management strategy. The development of the strategies will be completed by December 2009. A Discussion Paper will be submitted to MoE staff.</li> <li>• <i>Biosolids / Resource Management</i> This activity will commence once the Integrated Resource Management Strategy, discussed above, is near completion. This is scheduled for September 2008. This activity will provide information into the development of the distributed wastewater management strategies.</li> <li>• <i>Cost Estimates</i> Conceptual level costing will be part of the distributed wastewater management alternative strategy development. This part of the activity will be complete by December 2008.</li> </ul>	<p>Completed in 2008.</p> <p>Comparisons will be developed as part of the TBL analysis for evaluation of distributed wastewater management strategies. This is expected to be completed in January 2009.</p> <p>This will form part of the distributed wastewater management strategy alternative scenarios. A decision is expected in April 2009.</p> <p>Confirm the role and function of this plant in the overall distributed wastewater management strategy by April 2009. Continue discussions with the property owner on acquiring the site. Anticipated completion of agreement by September 2009.</p> <p>Confirm the role and function of this plant in the overall strategy by April 2009. Complete site use agreement with the City of Victoria by September 2009.</p> <p>Workshops will be held in February and March 2009 with CRD staff and politicians. A decision on the selected distributed wastewater management strategy is expected in April 2009.</p> <p>Confirm the biosolids and resource management direction as part of the selected distributed wastewater management strategy in April 2009.</p> <p>A final refinement of capital and annual O&amp;M costs will be carried out in May 2009, following adoption of the selected distributed wastewater management strategy.</p>
Facility Siting	Continued identification and evaluation of possible sites will continue through the summer and fall of 2008, as part of the above distributed wastewater management strategy alternative scenario development. Data gathering for environmental impact assessments will continue on components of the Program that are reasonably defined. This includes oceanographic investigations as part of future outfall siting from eastern and western decentralized wastewater treatment plants. No final decisions on specific sites are expected in 2008.	Final selection of sites will occur after the adoption of the selected distributed wastewater management strategy in April 2009. Discussions with property owners will occur in the spring and summer of 2009. Site purchase or use agreements are anticipated to be completed by September 2009.
Business Case Development	Market sounding and stakeholder consultation has been completed. This will formally be submitted to MoE staff in June 2008.	A comprehensive analysis of procurement options will be undertaken following adoption of the selected distributed wastewater management strategy in April 2009. This is expected to be completed by October 2009.
First Nations Consultation	This activity will be on-going through 2008. A report on the status will be provided in the Report to the Minister in December 2008.	Ongoing to support the successful development of the Program.
Public Communication	This activity will be on-going through 2008. A report on the status will be provided in the Report to the Minister in December 2008.	Ongoing to support the decision process and to fulfill the requirements of the Liquid Waste Management requirements.

**Table 4-2**  
**Core Area Wastewater Management Program**  
**Program Development Phase**  
**Summary of Deliverables**

MILESTONE DATE	DELIVERABLE
December 31, 2008	<ul style="list-style-type: none"> <li>• Summary Report on Program Development status. Included or previously submitted documents include: <ul style="list-style-type: none"> <li>• Discussion Papers on various aspects of the Integrated Resource Management Strategy</li> <li>• Discussion Paper on the Greenhouse Gas Management Strategy</li> <li>• Discussion Paper on the Wastewater Flow Management Strategy and outcome of discussions with MoE staff.</li> <li>• Discussion Paper on the conceptual alternatives for the Macaulay/McLoughlin Point Wastewater Treatment Plant</li> <li>• Discussion Paper on the conceptual alternatives for the Clover Point Wet Weather Flow Management Plant</li> <li>• Discussion Paper on the development of alternate scenarios for distributed wastewater management including refinement of biosolids/resource management and cost estimates</li> <li>• Report on the status and results to date on the facility siting process and on the environmental impact assessments.</li> <li>• Reports on the First Nations consultation and public communication activities</li> </ul> </li> </ul>
January 30, 2009	<ul style="list-style-type: none"> <li>• Discussion Paper on the GHG management comparisons of alternative scenarios for distributed wastewater management.</li> </ul>
April 30, 2009	<ul style="list-style-type: none"> <li>• Report on the selection of a distributed wastewater management strategy. Included in this report are: <ul style="list-style-type: none"> <li>• Macaulay / McLoughlin Point WWTP development plan</li> <li>• Clover Point Wet Weather Flow Plant development plan</li> <li>• Decentralized water reclamation / resource recovery plant development defining the number and phasing of plants</li> <li>• Biosolids / Resource Management Facilitie(s) development plan</li> </ul> </li> </ul>
May 31, 2009	<ul style="list-style-type: none"> <li>• Report on the projected capital costs, annual operating and maintenance costs and revenues for the selected distributed wastewater treatment strategy.</li> </ul>
September 30, 2009	<ul style="list-style-type: none"> <li>• Site purchase or use agreements for the facilities.</li> </ul>
October 31, 2009	<ul style="list-style-type: none"> <li>• Report on the procurement strategy and financial planning for the Program.</li> </ul>
December 31, 2009	<ul style="list-style-type: none"> <li>• Summary Report to the Minister and proposed Amendment to the Liquid Waste Management Plan.</li> </ul>

## 5 Summary

The Path Forward strategy has set an innovative direction for wastewater management. Since submitting this strategy to the Minister of Environment in June 2007, we have commenced on the Program Development phase of implementation. The objective of this phase is to continue to refine the wastewater management strategy to the point where the design and construction elements can proceed.

The Minister of Environment responded positively to the Path Forward strategy in his letter of December 2007. In that letter, he stated six objectives and asked the CRD to respond with a plan, by June 30, 2008, on how those six objectives would be met. This report provides this response.

The Minister also asked that an Amendment to the LWMP, covering specific elements, be submitted by December 31, 2008. We are not going to be in a position by that date to respond with final decisions on all of the elements requested. We have developed a revised schedule for completion of the Conceptual Planning part of the Program Development.

The major reason for this request is the additional time required to fully explore and evaluate opportunities for integrated resource management and to examine opportunities for integrating wastewater facilities with existing and planned land uses. As wastewater management decisions will have a profound impact on the region for decades to come, it is important to provide adequate time to complete the conceptual planning process. Integral with successful wastewater planning are the issues of facility siting and First Nations and public involvement. These activities cannot be completed until the decisions have been made on distributed wastewater management and the associated resource recovery strategy.

We request that the Minister consider the revised schedule, in light of the above reasons.

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## References

- 1 CRD, 2007a. *Proposed Amendment to the Core Area Liquid Waste Management Plan*, Capital Regional District, June 13, 2007.
- 2 CRD, 2007b. *The Core Area Wastewater Management Program – The Path Forward – The Supporting Report to the Response to the Minister of Environment*, Capital Regional District, June 13, 2007.
- 3 E&Y, 2008. *Market Sounding and Stakeholder Consultation – Summary of Responses*, Ernst & Young Orenda Corporate Finance Inc., Capital Regional District, April 23, 2008.
- 4 IRMT, 2008. *Resources from Waste – Integrated Resource Management Phase 1 Study Report*, Integrated Resource Management Team, Province of British Columbia, Ministry of Community Services, February 29, 2008.
- 5 MoE, 2006. Letter dated July 21, 2006 to the Capital Regional District from the Minister of Environment.
- 6 MoE, 2007. Letter dated December 14, 2007 to the Capital Regional District from the Minister of Environment.

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# REPORT

## List of Public and Stakeholder Meetings

25 September 2006	Saanich Council
14 November 2006	Sewage Forum – Victoria
16 November 2006	Sewage Forum – Esquimalt
21 November 2006	Sewage Forum – Colwood
21 February 2007	Consulting Engineers of British Columbia, Vancouver Island Chapter
06 March 2007	Radio Show and Sewer Session (Saanich)
07 March 2007	Sewer Session (Colwood)
08 March 2007	Saanich Agricultural Commission Meeting
12 March 2007	Cadboro Bay Residents' Association (Monthly Executive Board)
19 March 2007	Esquimalt Council
23 March 2007	CFAX Radio (with Alan Lowe)
26 April 2007	Cadboro Bay Residents (President of association and small group of residents)
14 May 2007	Cadboro Bay Residents' Association (Annual General Meeting)
28 May 2007	Willis Point Community Association
18 June 2007	Esquimalt Council
10 July 2007	View Royal Council
16 July 2007	Langford Council
30 July 2007	Rotary Club of Saanich
13 August 2007	Oak Bay Council
17 August 2007	Victoria A.M. Association
05 September 2007	Victoria Men's Garden Club
10 December 2007	Esquimalt Committee of the Whole
21 February 2008	Maritime Awards Society of Canada Public Forum, UVic, Re: "Victoria's Wastewater: Land-Based Treatment or Ocean-Based Treatment or Something Better"
01 March 2008	Esquimalt Residents Association Forum
07 March 2008	James Bay New Horizons
02 May 2008	Engineering Institute of Canada, Victoria Chapter
12 May 2008	Cadboro Bay Residents' Association (Annual General Meeting)
13 May 2008	Fairfield Community Association Forum
28 May 2008	Cadboro Bay Sewage Treatment Forum