

DATE: October 30, 2009

FILE: 5340-03

TO: Chair and Members
Committee of the Whole

FROM: Leigh Carter
Acting Chief Administrative Officer

RE: Sanitary Sewerage Master Plan Status

PURPOSE/PROBLEM

To provide the committee members with information on the current status and proposed next steps required for completion of the Comox Valley Regional District (CVRD) sanitary sewerage master plan.

EXECUTIVE SUMMARY

As recommended by the sewage commission, a sanitary sewerage master plan was commissioned in September of 2007. A "Request for Proposal" process was used to retain McElhanney Consulting Services Ltd. to conduct the sanitary sewerage master plan.

To date, three memos and a draft sewerage master plan have been prepared by the consulting team for this project. The draft sewerage master plan summarizes the work to date, presents details on the recommended options and work required immediately including updates to the DCC bylaw and short-term maintenance and upgrades. The consultants recommend that the report remain at the draft stage until 2010 to ensure population projections and settlement patterns from the regional growth strategy (RGS) are aligned with the sewerage master plan once the RGS has received acceptance at the political level.

The draft sewerage master plan has been reviewed by an ad hoc technical committee with representatives from the municipalities of Comox, Cumberland and Courtenay and CVRD technical staff. The master plan was then presented to the Sewage Commission for review and comments. This report incorporates the findings of the master plan process and the comments received during the review process.

Recommendations from the acting chief administrative officer to the committee of the whole:

1. THAT the sanitary sewerage master plan be finalized after the receipt of the regional growth strategy information;
2. AND FURTHER THAT the approval in principle be given to pursuing Option 3A as presented in the draft report being the 'main treatment plant in the core area remain the Comox Valley Water Pollution Control Centre with required expansions and connection of the Kitty Coleman area, a separate treatment plant for areas south of the core be built to service Cumberland, Royston, Union Bay, Ships Point and Area A, and a treatment plant be built for the Saratoga Beach Area;
3. AND FURTHER THAT an analysis of integrated resource management, being various methods available for the re-use of effluent, energy and solids from the sewage treatment train, be commissioned in 2010 and will include the capacity of a compost facility to process all sludge on a regional basis.

4. AND FURTHER THAT “Comox Valley Sewerage System Development Cost Charges Bylaw No. 2445,” 2002, be immediately updated for implementation in the 2010 work plan;
5. AND FURTHER THAT following the completion of the sewer master plan, the 2011 work plan be updated to include projects from the DCC capital project list.

Respectfully:

L. Carter

Leigh Carter
Acting Chief Administrative Officer

HISTORY/BACKGROUND FACTORS

The consulting team of McElhanney and Dayton & Knight were selected through the use of a Request for Proposal process that closed in October of 2007. The initial scope for the sanitary sewerage master plan was to focus on the established core service area, determine eventual service area population based on current growth projections and prepare options for cost effectively servicing the area based on current projected growth.

INCREASE IN SCOPE OF PROJECT

In May of 2008, the consulting team's scope was expanded to examine the issues with respect to providing sanitary sewerage servicing beyond the current "core area". Options were to be developed for providing service to all areas in the CVRD where it was realistic and practical to do so. Review of on-site systems and current in-stream major developments was also an added requirement.

MEMO NO. 1 – ISSUED OCTOBER 8, 2008

This first report prepared by the consulting team included the following:

- review of past reports
- review of flow records and development of a computer model of the existing sanitary sewage system
- population projections and settlement patterns (included coordination with water system planning team to coordinate population projections and per-capita flows)
- analysis of outlying areas including existing systems, plans and on-site sewerage systems
- review of water conservation effects on sewage systems over a 50 year period
- analysis of inflow and infiltration effects and peak flows on the sewerage system
- capacity shortfalls and approximate timing for replacements and upgrades of existing system components with a 50 year planning horizon

MEMO NO. 2 – ISSUED DECEMBER 23, 2008

This second report built in the data and assumptions developed in the first memo and presents options for core-area conveyance including pump station options and gravity sewer options. Specifically, the following is included:

- Review of further relevant reports
- Review of past CVRD liquid waste management plans for Royston Improvement District, Union Bay Improvement District and Saratoga Beach Estates
- Consideration of gravity diversion options to avoid pumping
- Timeline for Willemar Bluffs sewer decommissioning
- Trunk mains and pump station option analysis
- Nocturnal pumping options
- Infiltration and inflow impacts – existing and longer term including plans for cost effective reduction
- Assess potential for outlying satellite treatment facilities
- Assess/compare cost of capital and O&M for new satellite plants as compared to pumping and longer distance conveyance of sewage
- Municipal sewage regulation discussion

MEMO NO. 3 (REVISED) ISSUED MAY 29, 2009

Initially presented to the CVRD in March of this year, the intent of Memo No. 3 was to present a “90%” version of a final report detailing all options developed in Memo No.2, compare and contrast the options in terms of costs, technical feasibility and other factors, present the most viable option based on current knowledge and discuss the requirements for additional input from the CVRD. An initial review of this memo was performed, and it was determined that some re-organization and refinement was desirable prior to issuing the final “interim” report. In detail, Memo No. 3 presents the following:

- Review of options developed for future sewer servicing.
- Option analysis
- Commentary on integrated resource management
- Short term operational requirements
- Interim conclusions and recommendations
- Appendices with commentary on governance and funding issues.

Of note, an additional “hybrid” option 3A has been developed by the consulting team which combines some de-centralized treatment systems with the more cost-effective centralized treatment components for areas adjacent to the current service area. This Option 3 will require careful consideration with respect to the regional growth strategy when it is complete.

DRAFT SANITARY SEWERAGE MASTER PLAN – ISSUED JUNE 23, 2009

The Draft Sanitary Sewerage Master Plan was presented to the CVRD on June 23rd of this year. It was distributed to the project manager and to members of the Comox Valley sewerage master plan review panel for feedback. The plan presents the findings of the three technical memos, and details the proposed master plan option including costs and timing of upgrades and new facilities. Several key issues and items were purposefully left unaddressed in anticipation of receiving information on growth and population projections from the RGS.

The Draft Sanitary Sewerage Master Plan also includes further details on the recommended option – the Hybrid Option 3 noted as Option 3A, will involve a new treatment plant for the Saratoga Beach area, conveying flows from core areas and Kitty Coleman to the existing CVWPCC and construction a new treatment plant in the southern portion of the CVRD for Cumberland, Royston and Union Bay is the recommended option. Under this option, Ships Point would not be connected to a centralized system.

Comments have been received and collated by the project manager from CVRD staff and members of the Comox Valley sewerage master plan review panel (included as an appendix to this report). Pending conclusion of the regional growth strategy (RGS), the work prepared to date will provide foundation for completion of the sanitary sewerage master plan. The options presented, while not an exhaustive list of possibilities, cover an adequate range of solutions on which to base a strategy.

SELECTION OF OPTION 3A

The initial technical memos presented four main options for sewer servicing, however later in the process a “hybrid” option emerged that better solved the problems associated with servicing for the CVRD based on the following factors:

- sequential cash flow needed to fund the system construction, and later operation and maintenance
- relative potential to exploit integrated resource management concepts
- accommodation of in-stream development and potential funding (DCC’s)
- avoid short term capital outlays for treatment and disposal works to be rendered redundant over the long term

Per the draft master plan, Option 3A is specifically recommended for the following reasons:

- long pumping distances are minimized from the Ships Point area
- a preferential cash flow requirement, which more closely parallels the number of new system users over time. i.e. the need to front end construction costs is reduced with this option.
- allows technically feasible servicing to Ships Point area
- a greater potential to incorporate integrated resource management concepts, due to the addition of a large treatment facility south of Courtenay
- a treatment plant in the RID/UBID area would potentially allow elimination of need for the Docliddle Pump Station, i.e. more flexibility in final core area service routing would result
- initial construction is more easily funded by large land developers due to the reduced front end cash requirement in areas south of Courtenay and Cumberland
- infrastructure installed in order to service areas beyond the existing commission mandate will largely benefit only these lands

Thus, while Option 3A is estimated to have a slightly higher net present value when compared to Option 3, the other factors listed outweigh this difference in costs.

NEXT STEPS

As such, the following steps should be followed to complete the sanitary sewerage master plan:

- collection and collation of all feedback by project manager
- collection of RGS information
- forward all comments and RGS information to McElhanney
- have final sanitary sewerage master plan prepared and submitted to CVRD for review
- review of the final plan by the staff of the municipalities of Courtenay, Comox and Cumberland
- Update the final report with feedback received from the staff level reviews
- Staff report on the impacts of the Draft Master Plan on the existing core area and specifically upgrades to the Greenwood Trunk Sewer currently being pursued
- forward final sewerage master plan to steering committee and subsequently committee of the whole
- present final sanitary sewerage master plan to the CVRD board

IMPLEMENTATION OF THE SEWERAGE MASTER PLAN

Upon completion of the Sewerage Master Plan, there are several actions that must begin immediately:

- develop a detailed five year capital plan for sewerage infrastructure in consultation with all municipalities involved
- pre-design of recommended infrastructure upgrade and replacement projects
- review of governance structure specifically regarding the incorporation of new areas into the sewer servicing boundary for the CVRD
- all municipalities preparing to conduct major sanitary sewerage projects should include review of the master plan as a component of the preliminary design of the upgrade
- Updates to DCC bylaws for all areas to ensure rationalization of DCC's collected when compared to planned upgrades and new facilities as proposed by the sewerage master plan

ALTERNATIVES

1. The first option is to hold the plan in draft form until the RGS outcomes have been released, and update/adjust the plan as required.
2. The second option is to approve the plan in principle with option 3A as the recommended option and to finalize the draft sewerage master plan once the RGS outcomes have been released.

FINANCIAL IMPLICATIONS

The table below presents a summary of the various options and both capital and O&M costs.

Note – there are also several conveyance options, and the table below only lists the version of each treatment option with the most advantageous core area conveyance option (millions of dollars):

Option	Description	Treatment			Conveyance (core routing option)	Total
		Capital Costs	O&M	50 year NPV		
1	All sewerage flows directed to the existing CVWPCC	\$103.7	\$5.9	\$217	\$134.9 (R1)	\$352
1A	Same as 1, except a new pump station in Royston and submarine crossing of the Comox Harbour	\$103.7	\$5.9	\$217	\$133.6 (R1)	\$351
2	Decentralized treatment with a new Southern area treatment plant to serve Cumberland, UBID/RID and two smaller plants – one at Saratoga and one at Kitty Coleman.	\$140.4	\$8.3	\$300	\$80.3 (R4)	\$380
2A	Further treatment plants when compared to option 2 – adding separate plants for Cumberland, Royston, Union Bay and Ships Point	\$195.2	\$13.9	\$461	\$50.5 (R4)	\$512
3	New treatment plant for Saratoga beach area only – pump station to direct south area flows to CVWPCC	\$108.6	Not detailed in draft master plan – included in total.		\$100.9 (R1)	\$242.8
3A	Per option 3, except a treatment plant is provided for south areas of the RD	\$134.6			\$64.8 (R1)	\$253.9

What hasn't been considered in detail in the current plan is the methodology for adding new users to existing systems and how new users would offset the current investment in existing systems.

LEGAL IMPLICATIONS

Each option will require specific legal analysis relating to service establishment, latecomer fees, etc.

INTERGOVERNMENTAL/REGIONAL IMPLICATIONS

The Comox Valley Sewerage System currently only includes Courtenay and Comox. However, the expanded plan, as presented in the Draft Sanitary Sewerage Master Plan includes areas the length of the CVRD. As such, agreement between all jurisdictions as to the final form and governance of the sanitary sewer system will be required.

A specific issue for Cumberland is the current investment in the existing sewage treatment facilities, and short term planned upgrades. It will be necessary, when new facilities are to be designed, that the incorporation of existing facilities be considered in order to ensure redundancies are avoided and capital investments are not lost.

Approvals for expansions and new treatment facilities will be required from the Provincial Ministry of the Environment (MOE). Marine outfalls will also require MOE approvals, and referral to the Department of Fisheries and Oceans, First Nations and shellfish growing organizations can be expected.

CITIZEN/PUBLIC RELATIONS IMPLICATIONS

The capital costs involved with maintaining and expanding the sanitary sewerage system are relatively large. Furthermore, the recommended marine outfalls, while the most affordable option, are almost certain to cause public opposition. Co-ordination between the sewer study, the water strategy and the growth strategy is being pursued; however public relations planning for presentation of the sewer master plan are still required.

Integrated Resource Management (IRM) studies and climate change impacts require further analysis to understand emerging trends to consider treatment options and liquid disposal versus marine outfall disposal.

INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS

The sanitary sewerage master plan is primarily being managed by the property services branch. However, implications of the preferred servicing option will have effects on the activities of the financial services areas of the CVRD. Impacts on public affairs and information systems branch are also anticipated when dealing with public feedback and possible media relations tasks.

Submitted by:

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Project Manager

Concurrence:

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GM of Property Services

Prepared by: A. Gower, P.Eng., PE, Wedler Engineering LLP, project manager

Appendix to Staff Report - CVRD – Draft Master Sewerage Plan – Comments

- It would appear that the main issue is that the final report again presents too much of the back ground analysis from Memo's 1, 2 and 3 without providing clearer detail on the recommended option. From the original terms of reference:

“Provide a draft report that presents a master plan for upgrading and expansion of the Comox Valley sewerage system, complete with conceptual alignment and system drawings, sizing, scheduling, and cost estimates considering capital and annual operation and maintenance costs.”
- I&I reduction strategies (task 3.6), while included in the various tech memos are not in master plan and given that they represents approx. 50% of CV sewage flow, the final cover document should include this information. MCSL will also be reminded of the requirement from the TOR to “Review the impact of infiltration and inflow on system peak flows (which they have done), and provide a cost benefit assessment for a realistic program to reduce I&I (which needs some work)”.
- The need for clear thresholds (population/effluent volume etc.) which would dictate what/when system extension/upgrades get completed...('go/no-go' as discussed in task 4.3a). While this is covered in brief on page 17 – section 2.1.6 ,the information could be clarified and refined and presented in a more coherent manner.
- Please clarify why the pursuit of a joint treatment plant servicing Saratoga Beach and the SRD's Area D is not feasible.
- Please clarify the apparent differences in remaining capacity at the CVWPCC when comparing the current flows and amount of plant in use to the capacities and current use as stated in the report. For example, the report states that the report states that the Aeration Basins are currently at 90% of capacity, yet it would appear that the third aeration basin at the plant is not currently in use.
- Furthermore, the assumed capacity of a population of 40,000 for the CVWPCC is less than that reported for the plant after the completed phase 2 expansions which is, per the 2005 Earthtec report was 52,260.
- The DCC project list (table 28) appears to contain completed projects, and thus should be reviewed and updated prior to finalizing the report. Furthermore, additional comments as to “modifying” the bylaw will be required for the final report (per the original Terms of Reference).
- Add a table listing proposed I&I by municipality – while this information is contained in Appendices to memo #2, it is an important issue and having the information summarized in the final report would help to emphasize it.
- Some of the capacity analysis (e.g pg 12) is not clear...CFB gravity 'may' not (may not if what)...CFB forcemain design flow is...(but what is current status). WWTP capacity needs to be put in context (e.g. according to MSR) and confirmed (differences with our understanding of capacity).
- Further detail is needed on the MSR discussion, specifically what steps are required for registration of the CVWPCC and what impacts meeting the MSR will have on the capacity of the plant and what changes to processes and operations will be required.