

DISCUSSION PAPER

Capital Regional District Core Area Wastewater Treatment Program

Discussion Paper – Cost Estimates 038-DP-1

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1 Objective

This Discussion Paper contains the detailed cost information for the Distributed Wastewater Management Strategy adopted by the Core Area Liquid Waste Management Committee on June 2, 2009 and described in Discussion Paper 036-DP-4. Capital costs are described in Section 2, with Section 3 discussing the integrated economic life cycle and carbon footprint analyses.

2 Capital Costs

The developed Strategy capital costs are Class D level estimates and include all elements described in Discussion Paper 036-DP-4 and contained in the planning horizon that extends to Year 2065. In addition to the various treatment facilities and outfall system costs, regional conveyance system modifications, site land purchases and all solids processing/biosolids management elements and related resource recovery works are included in the cost estimates.

The capital costs do not include the costs for local sewer systems. The costs also do not include off-site infrastructure costs associated with water reuse and its distribution and, similarly, for recoverable heat, except for limited “across-the-street” (Saanich East WWTF and South Colwood WWTF) and “across-the-harbour” (Macaulay / McLoughlin Point WWTF) pumping and pipeline systems to supply effluent to third party utilities.

The base construction costs were prepared in 2008 dollars, where other direct costs include design (10%) and construction (15%) contingency allowances. Indirect cost allowances include engineering (15%), administration (3%) and miscellaneous costs (2%). Finally, an interim finance allowance (4%) was also included in the estimate. These additional allowances provide a 1.56 multiplier on the base construction costs.

Appendix A contains a detailed capital cost summary for all Strategy capital costs incurred through to Year 2065, along with roll-up summaries for both Stage 1 of the Strategy (i.e. elements constructed by Year 2017) and the ultimate Strategy that extends to Year 2065.

A summary of the estimated Stage 1 capital costs, in 2008 dollars, is shown below.

ITEM	COST (\$ MILLION)
DIRECT COSTS	
Liquid-Stream Treatment Facilities	419
Solids Processing / Biosolids Facilities	137
Treatment Facility Related Conveyance Systems	25
Outfalls	32
Heat Recovery Pumping/Piping	5
Wastewater Conveyance Modifications	45
Subtotal	663
Design and Construction Contingencies	165
Total Direct Cost	828
INDIRECT COSTS	
Engineering	124
Administration	25
Miscellaneous	17
Total Indirect Costs	166
Subtotal	994
Interim Financing	40
Land Purchases	22
Total Capital Cost	1,056

The Stage 1 program budget has been estimated to be \$1.190 million, which reflects an assumed annual inflation allowance of 2.0% per year from 2008 until the expected mid-point of construction of the Stage 1 infrastructure in 2014. The consultant team also investigated approaches to further phasing the implementation to reduce the Stage 1 cost. This phasing is not considered in this Discussion Paper. A discussion on potential phasing is contained in the Summary Report.

3 Life Cycle Costs

Appendix B contains the detailed economic life cycle and carbon footprint analysis worksheets. This analysis included all capital expenditures, operations (e.g. labour, energy, chemicals, administration) and maintenance costs, potential revenue generated from saleable products, and costs of greenhouse gas (GHG) emissions incurred in each year during an analysis horizon that extended from Year 2015 to Year 2065, which was the end of the planning horizon. The costs of all future expenditures were brought back to a present value (i.e. Year 2008 dollars), with the total net present value (TNPV) being the summation of all these present values. The worksheets contain all analysis assumptions. The reader is directed to Discussion Paper 036-DP-2 for further commentary on analysis assumptions.

To provide context related to the \$1.056 million Stage 1 capital cost (2008 dollars), the following values were extracted from the life cycle/carbon footprint analysis worksheets. All values shown are in 2008 dollars and the annual costs/revenues are for the Year 2030.

Total Net Present Value	=	\$1.20 million
Annual Operations and Maintenance Costs	=	\$23.6 million
Annual Greenhouse Gas Costs	=	\$0.16 million
Annual Potential Revenues	=	\$3.4 million