DISCUSSION PAPER

Capital Regional District
Core Area Wastewater Management Program

Program Management

Discussion Paper: Program Development and Implementation
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1 Objective

The objective of the discussion paper is to propose an approach for the management of the Program Development and Implementation Phases of the Core Area Wastewater Management Program.

This Discussion Paper is intended to be read in conjunction with the Planning and Program Management Budget Projections.

2 Overview

2.1 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, 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. The CRD complied with this request and entered into a strategy development phase, termed 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.

2.2 The Core Area Wastewater Management Program

The Program adopted by the CRD Board moves 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.

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 is expected to take 10 years to complete, with an estimated cost of $1.2 billion. The CRD has defined the Program in three phases: the Decision Process, Program Development, and Program Implementation. The Decision Phase was complete with the submission to the Minister in June 2007. The Program is currently at the Program Development phase.

3 Program Development Phase

The Program Development Phase consists of two parts – conceptual planning and design basis planning.

The Conceptual Planning work is essentially a refinement of the wastewater management strategy development, started under the Decision Phase. The end point of this work will be a decision by the CRD Board on how many wastewater treatment plants, with the associated infrastructure, will be built and on what time frame.

The Design Basis Planning work will then take this decision and carry out sufficient preliminary engineering of each facility to allow for the preparation of competitive proposals for design, construction and possibly operation and maintenance in the Program Implementation Phase.

These phases are discussed in more detail below.

3.1 Conceptual Planning

The Conceptual Planning work commenced in the fall of 2007. Although this phase was originally slated to be completed by the end of 2008, the complexity of the plant siting process, the decision for a more in-depth review of integrated resource management opportunities and the First Nations / public consultation process led to an extended time line. The conceptual planning decisions are now scheduled to be completed by June 2009, with the formal Amendment to the LWMP submitted to the Minister by the end of 2009.

The Conceptual Planning work is being carried out by a team of CRD staff and external consultants, working with the CALWMC and the TCAC. The engineering planning consultant is a team of Associated Engineering / CH2M Hill / Kerr Wood Leidal / Westland Resources. The business consultant is Ernest & Young. A number of advisors are also working with the CRD on financial, legal and public consultation aspects of the Program.

A series of workshops is planned with the CALWMC in the early spring of 2009 to assist the CRD Board in finalizing the regional wastewater management strategy.

3.2 Design Basis Planning

The wastewater management strategy, adopted by the CRD Board, will likely entail the design and construction of at least four wastewater treatment plants and the associated biosolids management, wastewater transmission and effluent disposal / reuse infrastructure. Design and construction activities will extend from 2010 to 2016, with an overall project cost of $1.2 billion.

The CRD Board has not yet made a decision on the implementation strategy for design, construction and operation and maintenance of the expanded regional wastewater management system. At the current time, the CRD is contemplating continued operation and maintenance (O&M) of the linear infrastructure – the wastewater transmission and effluent disposal systems – with their staff, but may consider out-sourcing the O&M of the new wastewater treatment plants. The CRD is also reviewing the options for design and construction. This includes delivery methods such as design bid build (DBB), design build (DB), and design build operate (DBO). This review also includes the extent of individual contracts, for example, a single contract to design and construct multiple plants or individual contracts for each facility.

As this decision will not be finalized until mid 2009, for the purposes of the budget projections, it has been assumed that the CRD may take a “hybrid approach”. This would see a variety of DBB, DB, DBO and perhaps out-sourced O&M contracts for various facilities.

The Design Basis Planning phase will undertake sufficient preliminary engineering work to allow “packages” to be put together for competitive bidding, based on the final implementation strategy adopted by the CRD Board. This would include finalizing property acquisition and easements, site survey and geotechnical data assembly, environmental assessments to identify any specific design and construction requirement, and definition of facility sizing, phasing and performance requirements.

The amount of preliminary engineering that needs to be completed depends upon the implementation decisions (for example DBB and public operation versus DBO). For the purpose of the budget projections, the completion of design engineering to the 15% level has been assumed. This is believed reflective of the “hybrid” delivery approach noted above.

4 Program Implementation Phase

The Program Implementation Phase consists of two parts – procurement of services and administration of contracts. This phase would extend from 2010 to 2016.

4.1 Procurement of Services

Following the completion of preliminary engineering to the stage required for competitive bidding, the Program will move into the Procurement of Services phase. The actual work under this phase will depend upon the final implementation strategy adopted by the CRD Board.

For example, if the decision is to implement a particular wastewater treatment plant through a design bid build strategy, the Program Management Team would first engage the services of a wastewater treatment plant designer through a proposal competition process. The design of the plant would then be the responsibility of the design firm, with input from the Program Management Team. During the design process, the Program Management Team would put out competitive tenders for major equipment procurement. Following the completion of the design, the Program Management Team would go out to the market for competitive tenders for construction. On a major facility, this would typically entail several construction contracts.

If the decision was to implement a facility using a design build operate (DBO) approach, the Program Management Team’s role would be to put together a competitive process that would obtain both the desired performance and the best value for the CRD. In this case, there would typically be a single contract that would cover all aspects of the contracted service.

4.2 Administration of Contracts

As with the Procurement of Services, the Administration of Contracts will depend on the final implementation decisions. In a DBB approach, the Program Management Team is more "hands on" in terms of decisions on the design and construction contracts. In addition, the Team will assist the CRD to staff up for operation of the wastewater treatment plants.

In a DBO delivery approach, the Program Management Team's role is more in an "audit" function. For example, they will ensure that the DBO contractor is undertaking the contracted quality management functions. This is contrasted to a DBB approach where the Program Management Team would actually do the quality management function.

5 The Program Management Team

The team involved in carrying out the Planning and Program Management will be combination of internal CRD staffing and out-sourced consultants.

In the Decision Phase and the Conceptual Planning part of Program Development, the out-sourced consultants include the Engineering Consultant, the Business Consultant, the Siting and Environmental Assessment Consultant and Other Advisors. These roles will be completed once the Conceptual Planning decisions have been made.

As the Program moves into the Design Basis Planning phase, the Program Management Team will include internal CRD staff, an external Program Manager and other external advisors. The Program Manager will be engaged through a competitive process. The intent is that the Program Manager will be on-board in the spring of 2009 to assist the CRD Board in developing the final concept and implementation strategy. The Program Manager will complete the required engineering for the competitive procurement process, as well as administer and audit the implementation process through to Program completion in 2016.

The Program Management Team will also include the services for peer review and value engineering. Peer Review is typically carried out at the Conceptual Planning phase. Value engineering is a more formal process, carried out during detailed design. The peer review and value engineering expertise will be provided through external consultants.

The actual resources split between internal CRD staff and the external Program Manager will depend upon the final implementation decisions. For example, if the CRD decides to operate and maintain the new wastewater treatment plants with their staff, this will require an expanded role by the CRD on the Program Management Team. On the other hand, if the decision is to our-source operation and maintenance through a DBO approach, fewer internal CRD resources will be required. For the purposes of the cash flow, it is assumed that the cost split is about 1/3 for internal CRD staffing and 2/3 for the external Program Manager.