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Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Notice of Meeting and Meeting Agenda
Core Area Liquid Waste Management Committee

Wednesday, January 13, 2016 | **9:00 AM** | **6th Floor Boardroom**

L. Helps (Chair), S. Brice (Vice-Chair), M. Alto, R. Atwell, D. Blackwell, J. Brownoff, V. Derman, B. Desjardins, C. Hamilton, B. Isitt, N. Jensen, C. Plant, Chief R. Sam, D. Screech, L. Seaton, Chief A. Thomas, G. Young

1. Approval of Agenda

2. Motion to Close the Meeting

2.1. **16-51** Motion to Close the Meeting

Recommendation: That the meeting be closed in accordance with the Community Charter Part 4, Division 3, 90 (1) (i) the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose.

3. Adoption of Minutes

3.1. **16-48** Adoption of the Core Area Liquid Waste Management Committee Minutes of December 2 and December 9, 2015

Recommendation: That the minutes of the following Core Area Liquid Waste Management Committee meetings be adopted:
a) December 2, 2015
b) December 9, 2015

Attachments: 2015-12-02 Minutes CALWMC

2015-12-09 Minutes CALWMC

4. Chair's Remarks

5. Presentations/Delegations

16-58 Delegation: John Knappett, P. Eng., Knappet Projects Inc., Capital Clear, re item 7.3

Attachments: Delegation Request: Knappett

16-59 Delegation: David Langley, re item 6.1

Attachments: Delegation Request: Langley

16-60 Delegation: Dr. Shaun Peck, re agenda items 6.2 and 9.1

Attachments: Delegation Request: Peck

16-61 Delegation: Oscar Regier, re item 6.2

Attachments: Delegation Request: Regier

16-62 Delegation: John Farquharson, re item 6.2

Attachments: Delegation Request: Farquharson

16-63 Delegation: Bryan Gilbert, re 6.2, 6.4, 8.2, 9.1, etc.

Attachments: Delegation Request: Gilbert

16-64 Delegation: Diane Carr, Sewage Treatment Action Group, re item 6.2

Attachments: Delegation Reguest: Carr

6. Committee Business

6.1. 16-14 Core Area Sewage and Resource Recovery System Cost Sharing

Recommendation: The Eastside Wastewater Treatment and Resource Recovery Select Committee at their meeting on January 6, 2016, and the Westside Wastewater Treatment and Resource Recovery Select Committee at their meeting on January 8, 2016, each separately made the following same recommendation to the Core Area Liquid Waste Management Committee:

That it be recommended to the Capital Regional District Board:
That the current cost sharing under Bylaw No. 2312 "Liquid Waste Management Core Area and Western Communities Service Establishment Bylaw No. 1, 1995", as amended, and based on design capacity benefit, be retained.

Attachments: Staff Report: Core Area Sewage and Resource Recovery System Cost Sharing

Appendix A: Core Area Sewage Treatment Capital Costs - All Options

6.2. 16-44 Follow Up to Technical and Financial Information Requests

Recommendation: 1. That staff be directed to proceed with public consultation on the financial and environmental analysis of the five option sets as presented in Draft Technical Memo #3 - Cost and Feasibility Analysis by Urban Systems/Carollo Engineers, in addition to the new option set as recommended by the Westside Select Committee; and
2. That it be recommended to the Board to amend the Workplan Overlay according to the Workplan presented in Appendix I.
(WP - Colwood, Esquimalt, Langford, Oak Bay, Saanich, Victoria, View Royal)

Attachments:
- Staff Report: Follow Up to Technical & Financial Information Requests
- Appendix A: Technical Memo #3
- Appendix B: Technical Memo Supplement - Option 5 - Preliminary Costing
- Appendix C: Memo - Resident's Distributed Tertiary Treatment
- Appendix D: Life Cycle Costing Data for Options 1a, 1b, 2, 3 and 4
- Appendix E: Cost Comparison - Previous LWMP and Current
- Appendix F: Memo re Design Flows
- Appendix G: Staff Report to Eastside and Westside Select Committees
- Appendix H: Projected Capital Cost by Option (Jan 8)
- Appendix I: Revised Work Plan Overlay (Jan 2016)
- Staff Report COPY: Follow Up TechFinancial Info Requests

6.3. 16-41 Technical Oversight Panel Report #7

Recommendation: That TOP recommends:
1. That the CRD begin immediately to develop a schedule for the project out to 2020 with TOP support per the motion CALWMC passed November 25, 2015.
2. That the CRD begin immediately to develop an organization chart for the project out to 2020 with TOP support per the motion CALWMC passed November 25, 2015.

Attachments:
- Staff Report: Technical Oversight Panel Report #7

6.4. 16-43 Urban Systems Contract 15-1834 - Scope Change No. 3

Recommendation: That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:
That the Request for Scope Change No. 3, as outlined in Urban Systems' letter of submittal dated January 5, 2016, in the amount of up to $86,700 (excluding GST) be approved.
(WA)

Attachments:
- Staff Report: Urban Systems Contract 15-1834 - Scope Change No. 3
- Appendix A: Technical Oversight Panel TOR
- Appendix B: Urban Systems Scope Change No. 3 Memo

6.5. **15-1314** Fairness and Transparency Advisory Reports, November and December 2015

Recommendation: That the following Fairness and Transparency Advisory reports be received for information:
a) November 2015
b) December 2015

Attachments: November 2015 Report from the Fairness and Transparency Advisor

December 2015 Report from the Fairness and Transparency Advisor

6.6. **16-42** Core Area Sewage and Resource Recovery System 2.0 - Budget Update No. 3

Recommendation: That the Core Area Liquid Waste Management Committee receive this budget update for information.

Attachments: Staff Report: Budget Update No. 3

Appendix A: Budget Update Table

6.7. **16-19** Amendment to Section 7.0 of the Eastside Public Advisory Committee Terms of Reference

Recommendation: The Eastside Wastewater Treatment and Resource Recovery Select Committee recommends to the Core Area Liquid Waste Management Committee to recommend to the Capital Regional District Board:
That section 7.0 of the terms of reference for the Eastside Public Advisory Committee be amended to add the words "or designated members", as follows: "The Chair and Vice Chair or designated members of the Eastside Select Committee will also Chair and Vice Chair the Eastside Public Advisory Committee."
(WP - Colwood, Esquimalt, Langford, Oak Bay, Saanich, Victoria, View Royal)

Attachments: Revised Terms of Reference Eastside Public Advisory Committee

6.8. **15-1312** Westside Wastewater Treatment and Resource Recovery Select Committee Agenda Packages for Information

Recommendation: That the following Westside Wastewater Treatment and Resource Recovery Select Committee agenda packages be received for information:
a) November 24, 2015
b) January 08, 2016

Attachments: 2015-11-24 Agenda Westside WTRR Select Committee

2016-01-08 Agenda Westside WTRR Select Committee

6.9. **16-45** Eastside Wastewater Treatment and Resource Recovery Select Committee Agenda Package for Information

Recommendation: That the Eastside Wastewater Treatment and Resource Recovery Select Committee Agenda Package of 6 January 2016 be received for information.

Attachments: 2016-01-06 Agenda Eastside WTRR Select Committee

7. Correspondence

7.1. **16-52** Correspondence: City of Victoria re Sewage Treatment (Dec. 24, 2015)

Attachments: Correspondence: City of Victoria re Sewage Treatment

7.2. **16-53** Correspondence: Harbour Resource Partners re Affordable and Bylaw Compliant Solution for the CRD CALWMP Liquid Treatment Plant

Recommendation: That this item of correspondence be received for information.

Attachments: Correspondence: Harbour Resource Partners (Dec. 29, 2015)

7.3. **16-46** Correspondence: Dragados Canada Inc. and Knappett Projects Inc. re Deep Shaft, Small Footprint Solution at Clover Point and Elsewhere

Recommendation: That this item of correspondence be received for information.

Attachments: Correspondence: Dragados/Knappett re Clover Point and Elsewhere

8. Motion with Notice

8.1. **15-311** Referral of Motion with Notice: Options for Wastewater Treatment (Director Hamilton)

Recommendation: That the Motion with Notice on Options for Wastewater Treatment be referred to the Westside Wastewater Treatment and Resource Recovery Select Committee.

Attachments: Notice of Motion: Options for Wastwater Treatment (Director Hamilton)

8.2. **15-1315** Motion from Technical and Community Advisory Committee to Support Director Derman's Motion (for information)

Recommendation: That the Core Area Liquid Waste Management Committee receive the motion for information.

Attachments: Technical and Community Advisory Committee Motion to Support

8.3. **16-49** Motion with Notice: Accountability and Representation in Governance of Components of Eastside and Westside Sub-systems

Recommendation: MOTION BE IT RESOLVED THAT the Core Area Liquid Waste Management Committee directs staff to report back at the next meeting on procedural changes and/or governance enhancements that will ensure that each participant who is anticipated to use or pay for a component of the eastside or westside wastewater treatment sub-systems is included in the governance system directing the design and eventual operation of that component of the system.

Attachments: Motion with Notice: Background (Accountability/Representation)

9. Notice of Motion

9.1. **16-50** Notice of Motion: Examine Feasibility of Single Facility at McLoughlin Point or Macaulay Point (Director Jensen)

Recommendation: 1. That the Technical Oversight Panel (TOP) working with CRD staff and CRD consultants be requested to examine the feasibility of locating a single facility at either McLoughlin Point or Macaulay Point within the current zoning.
2. That in the event TOP concludes that the CRD property at Macaulay Point requires more land to be a feasibly sized site, that CRD staff be directed to renew inquiries with the new Minister of National Defence with a view to partnering with First Nations to acquire adjoining land at Macaulay Point.

Attachments: Motion with Notice: Background (Feasibility McLoughlin/Macaulay)

10. New Business

11. Adjournment

11.1. **15-1112** Reference: Core Area Liquid Waste Management Committee Project Charter

Attachments: Project Charter

Attachment 1: Planning Process - Roles, Input & Relationships

Attachment 2: Proposed Work Plan Overlay - 3P Canada

Attachment 3: Proposed Feasibility & Costing Analysis Schedule

Next Meeting: January 27, 2016

To ensure quorum, please advise Nancy More (250-360-3024) if you or your alternate CANNOT attend.

Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Meeting Minutes
Core Area Liquid Waste Management Committee

Wednesday, December 2, 2015 | **9:00 AM** | **6th Floor Boardroom**

PRESENT

DIRECTORS: L. Helps (Chair), L. Wergeland (for S. Brice), M. Alto (9:03), R. Atwell, D. Blackwell, V. Derman, B. Desjardins, C. Hamilton, B. Isitt (9:06), N. Jensen, C. Plant, L. Seaton, D. Screech, G. Young
ABSENT: J. Brownoff, Chief R. Sam, Chief A. Thomas
ALSO PRESENT: C. Day, Alternate Director; C. Smith, Vice Chair, Core Area Wastewater Treatment Plant Commission; R. Atkins, Technical Oversight Panel; C. Houghton, Westside Solutions; A. Gibbs, Public Assembly; E. Lee, Urban Systems
STAFF: R. Lapham, Chief Administrative Officer; L. Hutcheson, General Manager, Parks and Environmental Services; D. Lokken, General Manager, Finance and Technology; T. Robbins, General Manager, Integrated Water Services; S. Santarossa, Corporate Officer; A. Genero, Manager, Accounting Services; A. Orr, Senior Manager Corporate Communications; S. Hallatt, Manager, Aboriginal Initiatives; A. Boyd, Committee Clerk (recorder)

The meeting was called to order at 9:00 a.m.

1. Approval of the Agenda

On the motion, Director Derman noted because this is a continued agenda from the previous meeting, this agenda should reflect consideration of his notice of motion (item 7.4), after 5.11, as previously amended.

MOVED by Director Atwell, SECONDED by Director Young,
That the agenda be approved.

MOVED by Director Derman, SECONDED by Director Atwell,
That item 7.4 be considered after item 5.11 and the agenda be approved as amended.
CARRIED

2. Chair's Remarks

Chair Helps noted that she had just returned from Ottawa where she met with the funders, both the CEO of 3P Canada and Minister Sohi, Minister of Infrastructure and Communities. The feeling in Ottawa is that of optimism that the deadlines can be met.

Director Alto entered the meeting at 9:03 a.m.

5. Committee Business

5.2. 15-1274 Final Technical Memo No 2 - Urban Systems and Carollo Engineers - Review and Refine Option Sets - Wastewater Treatment

L Hutcheson noted that Technical Memo #2 was presented by Urban Systems last month. The Technical Oversight Panel (T.O.P.) has reviewed it and has recommended that Technical Memo #2 be adopted as presented.

Director Isitt arrived at 9:06 a.m.

Discussion ensued regarding:
- technology with the current site options sets
- regular meetings with the regulators, the Ministry of Environment and Technical Community Advisory Committee to share the options as they are developed.
- preliminary information from the Ministry indicates a full environmental study is required to determine if an outfall in the inner harbour is feasible
- pros and cons of a centralized solids facility at Rock Bay or Harland outlined in Technical Memo #3
- timeframe for a new outfall location is two years
- TCAC recommends adding a tertiary option

Staff was requested to clarify the decrease in 10 megalitres as noted in table 5.1 of Technical Memo #2.

MOVED by Director Alto, SECONDED by Director Screech,
That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:
That Technical Memorandum #2, Wastewater Treatment System Feasibility and Costing Analysis - Review and Refine Option Sets, be approved.
CARRIED

5.3. 15-1276 Urban Systems - Presentation on Solids Recovery Feasibility

MOVED by Director Blackwell, SECONDED by Director Screech,
That the presentation be received for information.
CARRIED
OPPOSED Atwell

The postponed motion from November 25th meeting was now before the Committee for consideration. On the main motion, discussion ensued regarding expanding the scope to include residual municipal solid waste, to reduce the costs to taxpayers. L. Hutcheson noted that broadening the scope would necessitate another phase, but that it could be part of the Request for Statements of Interest (RFSI).

MOVED by Director Atwell, SECONDED by Director Seaton,
That the consultants be directed to provide information regarding solids recovery feasibility that includes capital and lifecycle costs for anaerobic digestion and gasification that also includes residual municipal solid waste.

MOVED by Director Derman, SECONDED by Director Seaton,
That the motion be amended to delete "that the consultants be directed to provide information regarding solids", and add the phrase "That the Request for Statements of Interest that goes to the private market include" before the words "solids recovery" and by adding the following phrase at the end "including opportunities for a pilot project."
CARRIED
OPPOSED Atwell

L. Hutcheson noted that this addition is something that could be incorporated in the next phase of planning, after March 2016.

Discussion continued regarding:
- the complexity of the additional scope and impact on deadlines
- as more processes get added, the public consultation process will become more complicated
- RFSI workplan will be in the next phase, spring of 2016
- a conditional change to the Liquid Waste Management Plan will be submitted to the Ministry early 2016, after this committee has approved the technical work

Question was called on the main motion as amended,
That the Request for Statements of Interest that goes to the private market include solids recovery feasibility that includes capital and lifecycle costs for anaerobic digestion and gasification that also includes residual municipal solid waste, including opportunities for a pilot project.
CARRIED
OPPOSED Jensen, Young

5.4. 15-1265 Core Area Sewage and Resource Recovery System 2.0 - Budget Update No. 2

L. Hutcheson noted that this is a monthly Budget Update for the work of Core Area Liquid Waste Management Committee supported by the Project Charter, and includes commitments to date. She also noted that the Eastside and Westside Select Committee budgets are also included.

MOVED by Director Dejardins, SECONDED by Director Derman
That the Core Area Liquid Waste Management Committee receive this budget update for information.
CARRIED

5.5. **15-1269** Full-Time Project Scheduler

MOVED by Director Blackwell, SECONDED by Director Screech,
That the Core Area Liquid Waste Management Committee receive this report for information.
CARRIED

5.6. **15-1270** Core Area Wastewater Treatment Program and Budget Update No. 30

MOVED by Director Derman, SECONDED by Director Alto,
That the Core Area Liquid Waste Management Committee receives this report and recommends to the Capital Regional District Board:
That Core Area Wastewater Treatment Program and Budget Update No. 30 be received for information.
CARRIED

5.7. **15-1217** Westside Wastewater Treatment and Resource recovery Select Committee Agenda Packages and Minutes of October 27 and November 2, 2015 for information.

MOVED by Director Desjardins, SECONDED by Director Seaton,
That the Westside Wastewater Treatment and Resource recovery Select Committee Agenda Packages and Minutes of October 27 and November 2, 2015 be received for information.
CARRIED

5.8. **15-1218** Eastside Wastewater Treatment and Resource recovery Select Committee Agenda Package and Draft Minutes of October 21, 2015 for information.

MOVED by Director Derman, SECONDED by Director Alto,
That the Eastside Wastewater Treatment and Resource recovery Select Committee Agenda Package and Draft Minutes of October 21, 2015 be received for information.
CARRIED

5.9. 15-1263 Core Area Liquid Waste Management Plan - 2014 Annual Programs Report

L. Hutcheson provided an overview noting that the capital projects and operating components of the Core Area Liquid Waste Management Plan have been compiled into one annual report.

MOVED by DIrector Desjardins, SECONDED by Director Blackwell,
That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:
1. That the following draft annual reports be approved:
a) Core Area Liquid Waste Management Plan 2014 Annual Programs Report;
b) Macaulay and Clover Points Wastewater and Marine Environmental Program 2014 Annual Report;
c) Regional Source Control Program 2014 Annual Report;
d) Esquimalt Lagoon Stewardship Initiative 2014 Annual Report;
e) Gorge Waterway Initiative 2014 Annual Report;
f) Core Area Stormwater Quality Program 2014 Annual Report;
g) Inflow and Infiltration Program 2014 Annual Report;
h) Trucked Liquid Waste Program 2014 Annual Report;
i) Onsite Wastewater Management Program 2014 Annual Summary; and

2. That staff be directed to forward the final annual reports to the BC Ministry of Environment and all participating stakeholders as applicable, and post all reports on the Capital Regional District website.
CARRIED

5.10. 15-1271 Westside Select Technical Analysis for Further Comprehensive Evaluation of Potential Sites, Scenarios and Technologies

Director Desjardins noted that this information is coming at the request of the Westside Wastewater Treatment and Resource Recovery Select Committee to highlight the involvement of the technical staff in the process. Technical Staff expressed concern about the short timeline to comment.

MOVED by Director Desjardins, SECONDED by Director Seaton,
That this report be received for information.
CARRIED

5.11. 15-1282 Framework for Costing Assumptions

D. Lokken provided an overview of the report.

Discussion ensued regarding:
- how the costing allocations were arrived at
- significant increase for some communities depending on the option
- costs broken into treatment and conveyance
- application of grants to certain sites
- figures need validation and confirmation

MOVED by Director Atwell, SECONDED by Director Desjardins,
That the Core Area Liquid Waste Management Committee postpone consideration of this report until further costing information can be provided.
CARRIED

L. Hutcheson noted that the draft Technical Memo #3, to be available on the public agenda Friday, will include preliminary costing information.

7.4. 15-1255 Motion for Which Notice Has Been Given (Director Derman)

Director Derman noted that his motion recommends a Request for Expressions of Interest for the entire project, including where things are located as well and technology for liquids and solids.

Discussion ensued regarding:
- Technical and Community Advisory Committee recommends supporting the motion
- effect on the timelines
- this addition can be achieved in the procurement stage

Board Chair Jensen left the meeting at 10:34 a.m.

MOVED by Director Derman, SECONDED by Director Atwell,
a. That the Core Area Liquid Waste Committee initiate a high level Request for Expressions of Interest designed to fully canvas the private sector and allow integrated waste approaches and other innovative solution sets to come forward.
b. That the Core Area Liquid Waste Committee insure means are established to fully and independently evaluate the viability of integrated waste approaches and other innovative solution sets in a manner that does not compromise the interests of applicants.
DEFEATED
OPPOSED Alto, Atwell, Blackwell, Hamilton, Helps, Isitt, Plant, Screech, Seaton, Wergeland, Young

6. Correspondence

6.1. 15-1210 Correspondence: Township of Esquimalt, October 15, 2015 re: Potential Sites for Wastewater Treatment Plants in Township of Esquimalt

MOVED by Director Desjardins, SECONDED by Director Screech,
That the correspondence be received for information.
CARRIED

7. Motion with Notice

7.1. 15-311 Motion with Notice: Options for Wastewater Treatment (Director Hamilton)

MOVED by Director Hamilton, SECONDED by Director Desjardins,
That consideration of the following motion be postponed to the next meeting:
"WHEREAS: It is critical that there be positive action taken to meet funding deadlines and regulatory requirements for waste water treatment for the Capital Regional District;
BE IT RESOLVED that: Capital Regional District (CRD) staff be directed to support municipalities and First Nations who want to explore options for waste water treatment that are economically responsible, technically feasible, environmentally sound and meet current provincial and federal deadlines;
AND THAT funding be provided from the sewage treatment budget to support an independent assessment of alternative locations to McLoughlin and Hartland, with full and regular engagement of staff and elected representatives from participating municipalities, First Nations and the public;
AND THAT any decisions taken to amend the Liquid Waste Management Plan be done in an open and transparent public process;
AND THAT any further money spent be recoverable under the funding arrangement with the Provincial and Federal Governments and that clarity be sought that the funding arrangement with Provincial and Federal governments be able to support the communities to the extent it supported the CRD driven process."
CARRIED

7.2. 15-1208 Notice of Motion: Accountability and representation in governance of components of Eastside and Westside sub-systems (Director Brice, Director Brownoff, Director Isitt, Director Young)

Discussion ensued regarding:
- is the motion still relevant
- not all the Directors are present for discussion
- the motion allows process to move forward

MOVED by Director Young, SECONDED by Director Isitt,
BE IT RESOLVED THAT the Core Area Liquid Waste Management Committee directs staff to report back at the next meeting on procedural changes and/or governance enhancements that will ensure that each participant who is anticipated to use and pay for a component of the eastside or westside wastewater treatment sub-systems is included in the governance for the design and eventual operation of that component of the system.

MOVED by Director Isitt, SECONDED by Director Plant,
That consideration of the motion be postponed pending any change to the option sets that would contemplate any Victoria, Saanich and Oak Bay flows going to Westside.
CARRIED
OPPOSED Wergeland

7.3. 15-1219 Motion from CRD Committee of the Whole Meeting (October 23, 2015)

Director Desjardins noted that this motion came through the Committee of the Whole with regards to water, and that Committee consider postponing the motion until an understanding of water reclamation within the Core Area has been determined.

MOVED by Director Desjardins, SECONDED by Director Hamilton,
That the Core Area Liquid Waste Management Committee postpone the motion until an understanding of water reclamation within the Core Area has been determined.
CARRIED

8. New Business

No new business.

9. Adjournment

MOVED by Director Seaton, SECONDED by Director Atwell,
That the meeting adjourn at 10:59 a.m.
CARRIED

CHAIR

RECORDER

Making a difference...together

Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Meeting Minutes
Core Area Liquid Waste Management Committee

Wednesday, December 9, 2015 | **9:00 AM** | **6th Floor Boardroom**

PRESENT:

DIRECTORS: L. Helps (Chair), S. Brice (Vice-Chair), M. Alto, R. Atwell, D. Blackwell (9:01), J. Brownoff, V. Derman, B. Desjardins, C. Hamilton, B. Isitt (10:42), N. Jensen, C. Plant, Chief R. Sam, L. Seaton (9:14), D. Screech, G. Young
ABSENT: Chief A. Thomas
ALSO PRESENT: C. Day, Alternate Director, Colwood; R. Atkins, Technical Oversight Panel; C. Houghton, Westside Solutions; A. Gibbs, Public Assembly; E. Lee, Urban Systems
STAFF: R. Lapham, Chief Administrative Officer; L. Hutcheson, General Manager, Parks and Environmental Services; D. Lokken, General Manager, Finance and Technology; T. Robbins, General Manager, Integrated Water Services; S. Santarossa, Corporate Officer; D. Telford, Senior Manager Environmental Engineering; L. Taylor, Communications Coordinator; S. Henderson, Manager, Real Estate & Risk; A. Genero, Manager, Accounting Services; A. Orr, Senior Manager Corporate Communications; S. Hallatt, Manager, Aboriginal Initiatives; A. Boyd, Committee Clerk (recorder)

The meeting was called to order at 9:00 a.m.

1. Approval of Agenda

MOVED by Director Plant, SECONDED by Director Screech,
That the agenda be approved.
CARRIED

2. Chair's Remarks

Chair Helps provided a brief update from her trip to Ottawa and meeting with the CEO of P3 Canada, John McBride and Minister Sohi, who are the funding partners for this project. She noted that although the Minister had received letters requesting the authorization to treat be moved from 2020 to 2040, he stressed that it was important to complete the project.

3. Presentations/Delegations

3.1. **15-1320** Delegation: T. Benjamin re: Item 4.1) technical Oversight Panel Report #6

T. Benjamin provided a written submission, on file at Legislative and Information Services. Mr. Benjamin introduced himself as a resident of the region and Vice President of CUPE Local 1978 representing workers of the Capital Regional District. He stressed the importance of the new wastewater treatment project being a public service and that the public has indicated through the Eastside and Westside surveys that it should be publicly owned and operated.

This Delegation was presented.

3.2. **15-1321** Delegation: Dr. S. Peck re Item: 4.1) Technical Oversight Panel Report #6 and 4.2) Draft Technical Memorandum #3 - Costing and Financial Analysis

Dr. S. Peck provided a written submission, on file at Legislative and Information Services. Dr. Peck noted that costs reported are in excess of the previous McLoughlin project's costs. He also noted that there are no cost benefits, value for money or evidence to show the need for water reuse and requested the Committee reconsider the added water reuse infrastructure as it is an additional cost to the taxpayers.

Director Seaton arrived at 9:14 a.m.

This Delegation was presented.

3.3. **15-1330** Delegation: B. Grover re Items: 4.1) Technical Oversight Panel Report #6 and 4.2) Draft Technical Memorandum #3 - Costing and Financial Analysis

B. Grover provided a written submission, on file at Legislative and Information Services. Mr. Grover highlighted in his PowerPoint presentation the difference in sewage flows, projected water consumption, and water demand. He also expressed concern that the project schedule is impossible and that more time is needed.

This Delegation was presented.

3.4. **15-1322** Delegation: B. Gilbert re: Item 4.2) Draft Technical Memorandum #3 - Costing and Financial Analysis

B. Gilbert provided a written submission, on file at Legislative and Information Services. Mr. Gilbert noted in his PowerPoint presentation that the Committee should reconsider the $250m option that was already presented as well he stressed the importance of the promises already made to the public regarding the secondary treatment baseline and public engagement process.

This Delegation was presented.

3.5. **15-1323** Delegation: J. Farquharson re: item 4.1) Technical Oversight Panel (TOP) Report #6

J. Farquharson provided a written submission, on file at Legislative and Information Services. He noted concern about the public engagement process for site selection. He requested that the Committee let the Technical Oversight Panel have time to complete its analysis and costing on all potentially viable options sets and that the public have time to consider them.

This Delegation was presented.

Delegation Request:

R. Drew requested to speak to the Committee as a late delegation.

MOVED by Director Desjardins, SECONDED by Director Plant,
That the delegation request be approved.
CARRIED UNANIMOUSLY

3.6 **15-1338** Delegation: R. Drew re: Item 4.2) Draft Technical Memorandum #3 - Costing and Financial Analysis

R. Drew provided a written submission, on file at Legislative and Information Services. Mr. Drew requested the Committee to be cognizant of the Rock Bay site, noting the harbour is a brand to Victoria and an important part of the tourist industry. He also requested that CRD conduct open meetings allowing those directly affected by nearby sites selections to provide direct feedback.

This Delegation was presented.

4. Committee Business

4.1. 15-1308 Technical Oversight Panel (TOP) Report #6

T. Coady provided an overview of Technical Oversight Panel Report #6 by telephone, accompanied by committee members, S. Aurora and B. Jank.

Discussion ensued regarding:
- T.O.P. being comfortable with the information provided in Technical Memo #3, as it relates to the treatment capacity included in the costing and flow volume
- all information, including latest flows, to be sent to T.O.P.
- in the next report, assurance that T.O.P. are satisfied with the water consumption numbers
- deep shaft technology being an innovative operating system

MOVED by Director Desjardins, SECONDED by Director Screech,
1. That the Core Area Liquid Waste Management Committee receive the draft TM#3R1 for information and for use in the public consultation process.
2. That the Core Area Liquid Waste Management Committee direct TOP to work with Noram to determine the potential viability of the deep shaft small footprint solution as the existing outfall(s).

MOVED by Director Desjardins, SECONDED by Director Alto
That Item 2. be amended to include the phrase "and the consultants" after "direct TOP"
CARRIED

The Chair divided the motion to consider items 1. and 2. separately and called the question on item 2.

2. That the Core Area Liquid Waste Management Committee direct TOP and the consultants to work with Noram to determine the potential viability of the deep shaft small footprint solution as the existing outfall(s).
CARRIED

MOVED by Director Desjardins, SECONDED by Director Plant,
That consideration of Item 1. be postponed until after the committee has heard from Urban Systems in Item 4.2.
CARRIED

The committee took a recess at 10:27 a.m.
The committee reconvened at 10:35 a.m. with all present except Director Isitt and Director Atwell.

4.2. 15-1310 Draft Technical Memorandum #3 - Costing and Financial Analysis

Mr. Lee of Urban Systems and Mr. Town of Carollo presented a summary of Draft Technical Memo #3, outlining some of the costing highlights.

They also highlighted:
- looking at all five option sets in detail to present and provide to the public for input
- looking at levels of treatments and service plans for future use
- criteria performance
- operating costs and integrating waste streams

Director Isitt arrived at 10:42 a.m.

Discussion ensued regarding:
- costing, regulations, local reuse and discharge
- Hartland site pros and cons
- Langford-Colwood outfall, part of the 7 plant option
- flow estimates based on dry weather, not wet weather events and difficulty in projecting out the flow estimates
- Rock Bay site included in all option sets based on previous Committee discussion

L. Hutcheson presented the design capacity benefit. She noted that grants do not apply to land but to conveyancing and grants have been applied to where they had been previously approved for specific infrastructure.

MOVED by Director Brice, SECONDED by Director Desjardins,
That the meeting continue beyond three hours.
CARRIED

The committee took a recess at 12:05 p.m.
The committee meeting reconvened at 12:14 p.m.

Discussion ensued regarding:
- costing allocations
- the previous grants being allocated according to the old project, need to be reviewed
- conveyancing costs for the option sets
- Appendix F: footnote based on assumption of growth to 2030

Staff was requested to provide a graph showing the per household cost without a grant.

The postponed motion from Item 4.1, was now before the Committee for consideration.

Discussion ensued regarding postponing the public consultation until more definitive numbers and information is available and the implications of not proceeding with the public consultation as scheduled.

MOVED by Director Desjardins, SECONDED by Director Screech,
That the Core Area liquid Waste Management Committee receive the draft Technical Memo #3R1 for information and for use in the public consultation process.
DEFEATED
OPPOSED Atwell, Blackwell, Derman, Desjardins, Hamilton, Plant, Sam, Screech, Seaton

Board Chair Jensen left the meeting at 1:08 p.m.

MOVED by Director Alto, SECONDED by Director Blackwell,
That the Core Area Liquid Waste Management Committee receive the draft Technical Memo #3R1 for information.
CARRIED

Given the delay in the public consultation process, the Chair noted that further consideration of the staff recommendation was no longer necessary at this time.

MOVED by Director Plant, SECONDED by Director Derman,
That the Core Area Liquid Waste Management Committee direct staff and consultants to:
- provide lifecycle costs for the various options
- provide accurate projection of greenhouse gases (GHG) mitigation as accomplished by the various options
- rationale of the costing allocation and description of the options with regard to costing allocations
- provide accurate wastewater costing based on the previous bid
- solids recovery costing based on previous reports and from the industry before going to a RFSI
- provide various options of trucking and piping at site locations for solids recovery
- that the consultant team and the T.O.P. connect to the industry, and reconcile the data base being used to come up with these figures
- hear from T.O.P. on their concern around costs and flows with the further discussion on water reuse; further clarification on flows and water use
- discuss and clarify the grants with the Province
CARRIED

MOVED by Director Blackwell, SECONDED by Director Seaton,
That a Colwood and Langford solution set with secondary and tertiary outfall be added to the option sets for consideration.

L. Hutcheson noted that the Colwood-Langford option is in addition to the scope and that it is a new option.

MOVED by Director Desjardins, SECONDED by Director Blackwell,
That the motion be referred to the Westside Wastewater Treatment and Resource Recovery Select Committee for consideration.
CARRIED

4.3. 15-1314 Fairness and Transparency Advisory Reports, November and December 2015

This item was postponed due to time constraints.

4.4. 15-1312 Westside Wastewater Treatment and Resource Recovery Select Committee Agenda Packages for Information

This item was postponed due to time constraints.

5. Notice of Motion

5.1. 15-1315 Motion from Technical and Community Advisory Committee to Support Director Derman's Motion (for information)

This item was postponed due to time constraints.

5.2. 15-311 Motion with Notice: Options for Wastewater Treatment (Director Hamilton)

This item was postponed due to time constraints.

6. New Business

There was no New Business.

7. Motion to Close the Meeting

7.1. 15-1318 Motion to Close the Meeting

B. Lapham noted that the closed items can be postponed to the first meeting in the new year, and the item regarding the Fairness and Transparency Advisor can be considered at the Capital Regional District Board meeting on December 9, 2015.

8. Adjournment

MOVED by Director Brice, SECONDED by Director Alto,
That the meeting adjourn at 1:22 p.m.
CARRIED

_____
CHAIR

_____
RECORDER

Nancy More

From: Legserv
Subject: FW: Addressing the Board - Submission

Sent: Thursday, January 07, 2016 1:55 PM
To: Legserv <Legserv@crd.bc.ca>
Subject: Addressing the Board - Submission

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
John Knappett, P.Eng., Knappett Projects Inc.

I represent::
Capital Clear

Municipality/Electoral Area in which you reside::
Saanich

I wish to address::
Core Area Liquid Waste Management Committee

Meeting Date::
January 13th 2016

Agenda Item::
Public Input

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
To address the viability of the VerTreat Vertical Shaft Technology for a Waste Water Treatment Plant located at Clover Point.

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
No

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Submitted at:1/7/2016 1:55:25 PM
Submitted via:https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees

Nancy More

From: Legserv
Subject: FW: Addressing the Board - Submission

Sent: Saturday, January 09, 2016 9:06 PM
To: Legserv <Legserv@crd.bc.ca>
Subject: Addressing the Board - Submission

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
David Langley

I represent::

Municipality/Electoral Area in which you reside::
Saanich

I wish to address::
Core Area Liquid Waste Management Committee

Meeting Date::
January 13 2016

Agenda Item::
Item 5.1

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
Comments regarding System Cost Sharing

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
No

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Submitted at:1/9/2016 9:05:44 PM
Submitted via:https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees

Nancy More

From: Legserv
Subject: FW: Addressing the Board - Submission

Sent: Sunday, January 10, 2016 1:11 PM
To: Legserv <Legserv@crd.bc.ca>
Subject: Addressing the Board - Submission

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
Dr Shaun Peck

I represent::
Public Health Consultant

Municipality/Electoral Area in which you reside::
Victoria

I wish to address::
Core Area Liquid Waste Management Committee

Meeting Date::
January 13th 2016

Agenda Item::
5.2 and 7.4

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
To provide commentary on issues before you to-day

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
No

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Submitted at:1/10/2016 1:11:08 PM
Submitted via:https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees

Nancy More

From: Legserv
Subject: FW: Addressing the Board - Submission

Sent: Sunday, January 10, 2016 10:19 PM
To: Legserv <Legserv@crd.bc.ca>
Subject: Addressing the Board - Submission

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
Oscar Regier

I represent::

Municipality/Electoral Area in which you reside::
Victoria

I wish to address::
Core Area Liquid Waste Management Committee

Meeting Date::
January 13, 2016

Agenda Item::
5.2

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
To provide comments relevant to the staff report and Appendix C that refer to information prepared by me.

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
Yes

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Submitted at:1/10/2016 10:18:53 PM
Submitted via:https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees

Nancy More

From: Legserv
Subject: FW: Addressing the Board - Submission

Sent: Monday, January 11, 2016 3:07 PM
To: Legserv <Legserv@crd.bc.ca>
Subject: Addressing the Board - Submission

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
john farquharson

I represent::
Sewage treatment action group

Municipality/Electoral Area in which you reside::
Victoria

I wish to address::
Core Area Liquid Waste Management Committee

Meeting Date::
jan13

Agenda Item::
5.2

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
Provide ideas for public consultation

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
No

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Submitted at:1/11/2016 3:06:48 PM
Submitted via:https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees

Nancy More

From: Legserv
Subject: FW: Addressing the Board - Submission

Sent: Monday, January 11, 2016 3:31 PM
To: Legserv <Legserv@crd.bc.ca>
Subject: Addressing the Board - Submission

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
Bryan Gilbert

I represent::

Municipality/Electoral Area in which you reside::
Victoria

I wish to address::
Core Area Liquid Waste Management Committee

Meeting Date::
Jan 13th

Agenda Item::
5.2, 5.4 7.2, 7.4 etc.

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
How does this process allow for detailed public engagement from citizens who have expertise?

4 minutes to cover so many topics is not feasible.

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
No

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Submitted at:1/11/2016 3:30:39 PM
Submitted via:https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees

Nancy More

From: Legserv
Subject: FW: Addressing the Board - Submission

Sent: Monday, January 11, 2016 3:40 PM
To: Legserv <Legserv@crd.bc.ca>
Subject: Addressing the Board - Submission

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
Diane Carr

I represent::
STAG

Municipality/Electoral Area in which you reside::
Victoria

I wish to address::
Core Area Liquid Waste Management Committee

Meeting Date::
Jan 13, 2016

Agenda Item::
5.2

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
re: Public consultation

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
No

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Submitted at:1/11/2016 3:40:15 PM
Submitted via:https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees

Making a difference...together

REPORT TO THE EASTSIDE AND WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE MEETINGS OF WEDNESDAY, JANUARY 6 AND 8, 2016 RESPECTIVELY

SUBJECT Core Area Sewage and Resource Recovery System Cost Sharing

ISSUE

To provide the Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees with cost sharing impacts for the various sewer option sets, comparing "design capacity benefit" allocations with two possible options for unitized cost sharing.

BACKGROUND

The current cost sharing under Bylaw No 2312 "Liquid Waste Management Core Area and Western Communities Service Establishment Bylaw No. 1, 1995", as amended, is based on design capacity benefit.

A description of this allocation was included in the December 9th, 2015 report to the Core Area Liquid Waste Management Committee "Draft Technical Memorandum #3 – Costing and Financial Analysis". Subsequent to that meeting, discussion has transpired regarding alternative costing on an "all for one basis" across the entire system and an "all for one basis" Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees.

During discussions on capital cost sharing for the previous wastewater treatment system, the program configuration was such that all participants had a vested interest in the capital infrastructure as a whole, thus, the design capacity benefit for each participant was a share in the entire system, rather than by component sets.

Attached are summary schedules comparing the total capital cost for the five option sets presented in December, and estimated 2020 operating costs and 2030 operating cost projections. Additionally included are summary option comparisons for the annual estimated cost per participant household, after grant, at 2030. Also included are individual schedules for each participant comparing total the annual cost per option set and comparing Household costs by option set and cost sharing methodology.

The summary schedules were previously distributed to the participant administrators for review on December 18th, 2015.

ALTERNATIVES

1. That the Select Committees review the documentation and make a recommendation to the Core Area Committee meeting scheduled for January 13, 2016.

2. That the Select Committees receive this report for information.

FINANCIAL IMPLICATIONS

The various cost sharing alternatives result a range of differences per participant household. The cost sharing is defined within the Establishment Bylaw and a change to that Bylaw would require the approval of 2/3rds of the participating municipalities, the Board, and the Inspector of Municipalities. The First Nations participate under the original Letters Patent, so are not part of the statutory approval process for Bylaw No 2313.

CONCLUSION

The method of cost sharing is defined within the current Establishment Bylaw. Two options for cost sharing have been calculated for information purposes.

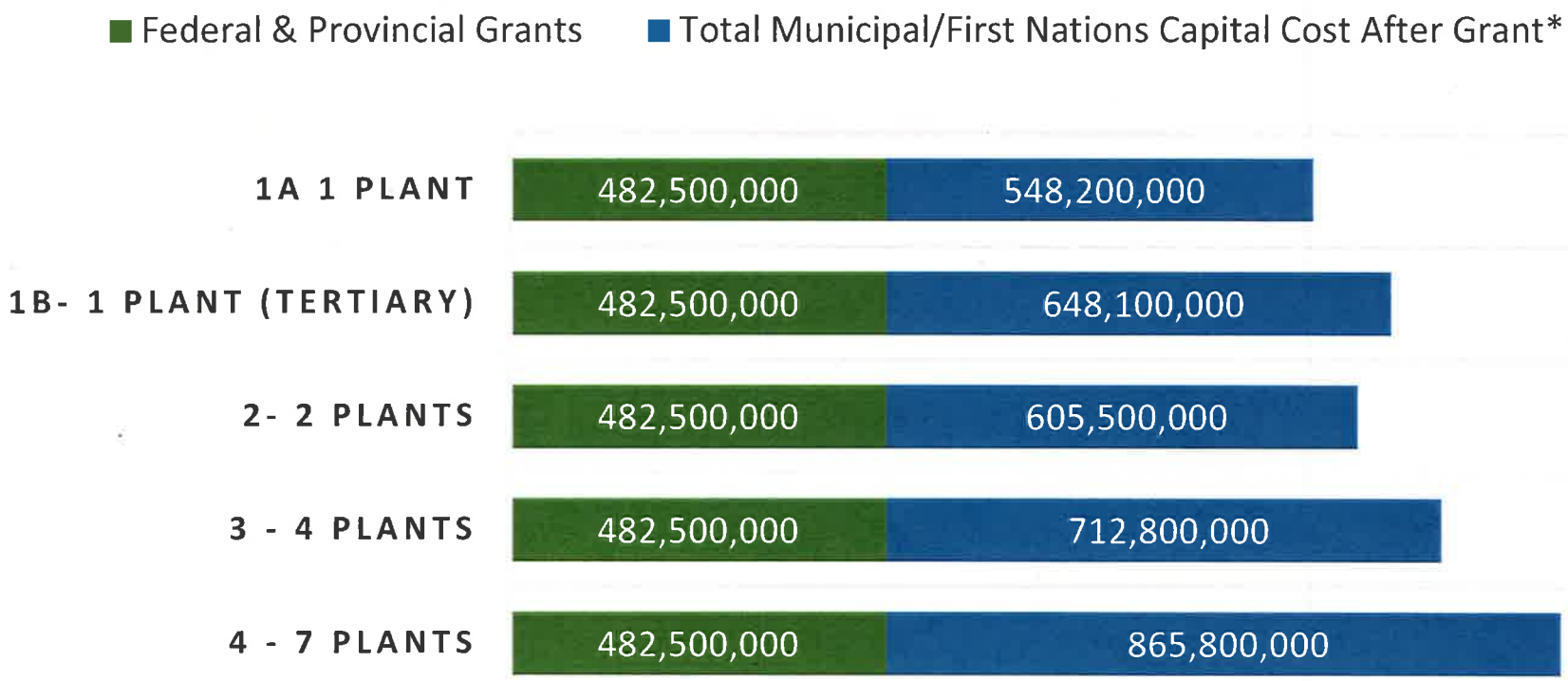
RECOMMENDATION(S)

That the Select Committees review the documentation and make a recommendation to the Core Area Liquid Waste Management Committee meeting scheduled for January 13, 2016.

Prepared by:	Diana E. Lokken, CPA, CMA, General Manager, Finance & Technology
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

Attachments: Appendix A: Core Area Sewage Treatment Capital Costs – All Options

CORE AREA SEWAGE TREATMENT CAPITAL COSTS - ALL OPTIONS



Core Area Waste Water Treatment Program Options - Costing

Option	Capital Cost	Federal & Provincial Grants	Total Municipal/First Nations Capital Cost After Grant*	Operating Costs (at 2020)	Operating Costs (at 2030)
1a 1 plant	1,030,700,000	482,500,000	548,200,000	16,895,000	21,765,000
1b- 1 plant (Tertiary)	1,130,600,000	482,500,000	648,100,000	21,631,667	26,435,000
2- 2 plants	1,088,000,000	482,500,000	605,500,000	17,736,667	22,810,000
3 - 4 plants	1,195,300,000	482,500,000	712,800,000	19,481,667	25,345,000
4 - 7 plants	1,348,300,000	482,500,000	865,800,000	20,513,333	26,630,000

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		Total Annual Cost	63,847,080
Annual Debt	42,082,080	Annual Operating	21,765,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	591	582	(10)
Saanich	365	372	8
Victoria	513	509	(4)
Esquimalt	455	471	16
View Royal	430	417	(13)
Colwood	254	248	(5)
Langford	415	406	(9)

OPTION 1b - 1 PLANT TERTIARY		Total Annual Cost	76,214,460
Annual Debt	49,779,460	Annual Operating	26,435,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	705	695	(10)
Saanich	437	444	8
Victoria	611	608	(4)
Esquimalt	546	562	16
View Royal	511	498	(13)
Colwood	302	296	(5)
Langford	493	484	(9)

OPTION 2 - 2 PLANTS		Total Annual Cost	69,331,955
Annual Debt	46,521,955	Annual Operating	22,810,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	590	630	40
Saanich	364	404	40
Victoria	512	552	41
Esquimalt	454	511	57
View Royal	429	454	24
Colwood	767	270	(497)
Langford	414	441	27

OPTION 3 - 4 PLANTS		Total Annual Cost	80,220,524
Annual Debt	54,875,524	Annual Operating	25,345,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	573	728	156
Saanich	437	468	30
Victoria	504	639	135
Esquimalt	724	591	(133)
View Royal	593	526	(67)
Colwood	864	313	(552)
Langford	572	511	(61)

OPTION 4 - 7 PLANTS		Total Annual Cost	93,452,382
Annual Debt	66,822,382	Annual Operating	26,630,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	590	845	254
Saanich	509	545	36
Victoria	519	743	224
Esquimalt	1,075	689	(386)
View Royal	987	615	(372)
Colwood	711	365	(345)
Langford	793	598	(195)

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		Total Annual Cost	63,847,080
Annual Debt	42,082,080	Annual Operating	21,765,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	591	598	7
Saanich	365	383	18
Victoria	513	523	11
Esquimalt	455	436	(19)
View Royal	430	389	(41)
Colwood	254	229	(24)
Langford	415	375	(40)

OPTION 1b - 1 PLANT TERTIARY		Total Annual Cost	76,214,460
Annual Debt	49,779,460	Annual Operating	26,435,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	705	712	7
Saanich	437	455	18
Victoria	611	622	11
Esquimalt	546	527	(19)
View Royal	511	470	(41)
Colwood	302	277	(24)
Langford	493	453	(40)

OPTION 2 - 2 PLANTS		Total Annual Cost	69,331,955
Annual Debt	46,521,955	Annual Operating	22,810,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	590	598	7
Saanich	364	382	18
Victoria	512	522	11
Esquimalt	454	584	130
View Royal	429	524	94
Colwood	767	309	(458)
Langford	414	505	91

OPTION 3 - 4 PLANTS		Total Annual Cost	80,220,524
Annual Debt	54,875,524	Annual Operating	25,345,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	573	651	78
Saanich	437	415	(23)
Victoria	504	568	64
Esquimalt	724	761	37
View Royal	593	689	96
Colwood	864	405	(459)
Langford	572	665	93

OPTION 4 - 7 PLANTS		Total Annual Cost	93,452,382
Annual Debt	66,822,382	Annual Operating	26,630,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	590	692	102
Saanich	509	442	(68)
Victoria	519	604	85
Esquimalt	1,075	1,022	(53)
View Royal	987	930	(57)
Colwood	711	547	(164)
Langford	793	899	105

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

OAK BAY - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,639,130	1,518,845	4,157,975
Option 1b - 1 plant tertiary	3,110,767	1,844,571	4,955,339
Option 2 - 2 plants	2,633,312	1,518,845	4,152,158
Option 3 - 4 plants	2,483,697	1,543,919	4,027,616
Option 4 - 7 plants	2,609,910	1,542,697	4,152,607

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,675,460	1,533,526	4,208,986
3,147,119	1,859,252	5,006,371
2,669,675	1,533,526	4,203,201
2,790,030	1,789,476	4,579,506
3,021,909	1,846,277	4,868,186

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,571,683	1,518,078	4,089,761
3,042,078	1,843,804	4,885,882
2,843,008	1,590,965	4,433,973
3,353,504	1,767,778	5,121,282
4,083,590	1,857,405	5,940,995

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	591
Option 1a - 1 plant tertiary	705
Option 2 - 2 plants	590
Option 3 - 4 plants	573
Option 4 - 7 plants	590

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
591	598	7
705	712	7
590	598	7
573	651	78
590	692	102

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
591	582	(10)
705	695	(10)
590	630	40
573	728	156
590	845	254

SAANICH - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	12,424,952	6,565,431	18,990,383
Option 1b - 1 plant tertiary	14,767,783	7,974,385	22,742,167
Option 2 - 2 plants	12,395,439	6,565,431	18,960,870
Option 3 - 4 plants	15,733,702	7,045,131	22,778,833
Option 4 - 7 plants	18,862,549	7,656,080	26,518,629

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
13,292,430	6,633,392	19,925,822
15,635,761	8,042,346	23,678,107
13,263,689	6,633,392	19,897,081
13,861,645	7,740,524	21,602,169
15,013,682	7,986,223	22,999,904

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
12,819,448	6,566,569	19,386,018
15,164,299	7,975,523	23,139,822
14,171,966	6,881,849	21,053,815
16,716,711	7,646,667	24,363,377
20,356,078	8,034,355	28,390,433

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	365
Option 1a - 1 plant tertiary	437
Option 2 - 2 plants	364
Option 3 - 4 plants	437
Option 4 - 7 plants	509

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
365	383	18
437	455	18
364	382	18
437	415	(23)
509	442	(68)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
365	372	8
437	444	8
364	404	40
437	468	30
509	545	36

VICTORIA - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	15,083,168	8,087,462	23,170,629
Option 1b - 1 plant tertiary	17,811,719	9,822,141	27,633,861
Option 2 - 2 plants	15,049,347	8,087,462	23,136,808
Option 3 - 4 plants	14,575,991	8,208,501	22,784,492
Option 4 - 7 plants	15,249,488	8,203,773	23,453,261

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
15,478,872	8,166,918	23,645,790
18,207,651	9,901,598	28,109,249
15,445,402	8,166,918	23,612,320
16,141,715	9,530,000	25,671,715
17,483,248	9,832,500	27,315,748

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
14,923,552	8,084,647	23,008,200
17,653,272	9,819,327	27,472,598
16,498,064	8,472,814	24,970,878
19,460,487	9,414,444	28,874,931
23,697,197	9,891,760	33,588,957

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	513
Option 1a - 1 plant tertiary	611
Option 2 - 2 plants	512
Option 3 - 4 plants	504
Option 4 - 7 plants	519

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
513	523	11
611	622	11
512	522	11
504	568	64
519	604	85

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
513	509	(4)
611	608	(4)
512	552	41
504	639	135
519	743	224

ESQUIMALT - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,624,683	1,446,838	4,071,520
Option 1b - 1 plant tertiary	3,130,399	1,757,413	4,887,813
Option 2 - 2 plants	2,618,261	1,446,838	4,065,099
Option 3 - 4 plants	4,435,635	2,044,482	6,480,117
Option 4 - 7 plants	7,084,597	2,537,323	9,621,920

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,497,049	1,404,907	3,901,956
3,002,692	1,715,483	4,718,174
3,555,445	1,675,222	5,230,667
5,184,628	1,625,773	6,810,401
7,349,708	1,801,672	9,151,380

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,766,507	1,447,470	4,213,977
3,272,539	1,758,045	5,030,584
3,058,388	1,516,967	4,575,355
3,607,558	1,685,556	5,293,113
4,392,953	1,771,014	6,163,967

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	455
Option 1a - 1 plant tertiary	546
Option 2 - 2 plants	454
Option 3 - 4 plants	724
Option 4 - 7 plants	1,075

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
455	436	(19)
546	527	(19)
454	584	130
724	761	37
1,075	1,022	(53)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
455	471	16
546	562	16
454	511	57
724	591	(133)
1,075	689	(386)

VIEW ROYAL - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,424,284	635,197	2,059,481
Option 1b - 1 plant tertiary	1,676,496	771,547	2,448,043
Option 2 - 2 plants	1,421,184	635,197	2,056,381
Option 3 - 4 plants	2,004,725	836,114	2,840,839
Option 4 - 7 plants	3,679,504	1,047,314	4,726,818

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
1,245,007	616,788	1,861,796
1,497,117	753,139	2,250,255
1,772,715	735,463	2,508,178
2,585,012	713,754	3,298,766
3,664,502	790,978	4,455,480

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,363,771	635,474	1,999,246
1,613,223	771,825	2,385,048
1,507,656	665,985	2,173,641
1,778,373	740,000	2,518,373
2,165,540	777,518	2,943,058

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	430
Option 1a - 1 plant tertiary	511
Option 2 - 2 plants	429
Option 3 - 4 plants	593
Option 4 - 7 plants	987

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
430	389	(41)
511	470	(41)
429	524	94
593	689	96
987	930	(57)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
430	417	(13)
511	498	(13)
429	454	24
593	526	(67)
987	615	(372)

COLWOOD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,890,998	864,574	2,755,572
Option 1b - 1 plant tertiary	2,225,856	1,050,162	3,276,018
Option 2 - 2 plants	6,422,590	1,909,574	8,332,163
Option 3 - 4 plants	7,203,807	2,183,044	9,386,851
Option 4 - 7 plants	6,184,109	1,533,756	7,717,865

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
1,652,976	839,517	2,492,493
1,987,697	1,025,105	3,012,803
2,353,604	1,001,047	3,354,652
3,432,078	971,498	4,403,576
4,865,300	1,076,609	5,941,908

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,831,350	864,951	2,696,301
2,166,328	1,050,539	3,216,868
2,024,567	906,480	2,931,047
2,388,102	1,007,222	3,395,324
2,908,011	1,058,289	3,966,300

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	254
Option 1a - 1 plant tertiary	302
Option 2 - 2 plants	767
Option 3 - 4 plants	864
Option 4 - 7 plants	711

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
254	229	(24)
302	277	(24)
767	309	(458)
864	405	(459)
711	547	(164)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
254	248	(5)
302	296	(5)
767	270	(497)
864	313	(552)
711	365	(345)

LANGFORD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	5,713,228	2,523,143	8,236,372
Option 1b - 1 plant tertiary	6,724,928	3,064,757	9,789,685
Option 2 - 2 plants	5,700,796	2,523,143	8,223,940
Option 3 - 4 plants	8,041,552	3,321,231	11,362,784
Option 4 - 7 plants	11,988,259	3,763,543	15,751,802

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
4,994,098	2,450,020	7,444,118
6,005,383	2,991,634	8,997,018
7,110,889	2,921,424	10,032,313
10,369,256	2,835,189	13,204,445
14,699,416	3,141,940	17,841,356

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
5,533,014	2,524,246	8,057,260
6,545,077	3,065,860	9,610,937
6,116,776	2,645,442	8,762,218
7,215,115	2,939,444	10,154,560
8,785,906	3,088,475	11,874,381

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	415
Option 1a - 1 plant tertiary	493
Option 2 - 2 plants	414
Option 3 - 4 plants	572
Option 4 - 7 plants	793

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
415	375	(40)
493	453	(40)
414	505	91
572	665	93
793	899	105

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
415	406	(9)
493	484	(9)
414	441	27
572	511	(61)
793	598	(195)

SONGHEES NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	241,404	105,866	347,270
Option 1b - 1 plant tertiary	284,152	128,591	412,743
Option 2 - 2 plants	240,879	105,866	346,745
Option 3 - 4 plants	339,784	139,352	479,136
Option 4 - 7 plants	1,025,339	298,640	1,323,979

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
211,018	102,798	313,816
253,749	125,523	379,272
300,460	122,577	423,037
438,138	118,959	557,097
621,102	131,830	752,932

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
233,789	105,912	339,702
276,553	128,637	405,190
258,455	110,998	369,453
304,864	123,333	428,197
371,235	129,586	500,822

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

ESQUIMALT NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	40,234	17,644	57,878
Option 1b - 1 plant tertiary	47,359	21,432	68,791
Option 2 - 2 plants	40,146	17,644	57,791
Option 3 - 4 plants	56,631	23,225	79,856
Option 4 - 7 plants	138,627	46,874	185,501

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
35,170	17,133	52,303
42,291	20,921	63,212
50,077	20,430	70,506
73,023	19,826	92,849
103,517	21,972	125,489

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
38,965	17,652	56,617
46,092	21,440	67,532
43,076	18,500	61,575
50,811	20,556	71,366
61,873	21,598	83,470

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

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EHQ 16-07

REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, JANUARY 13, 2016

SUBJECT **Follow Up to Technical and Financial Information Requests**

ISSUE

To present additional technical and financial information as requested by the Core Area Liquid Waste Management Committee at its last meeting held December 9, 2015.

BACKGROUND

The Core Area Liquid Waste Management Committee (CALWMC), in collaboration with the Westside and Eastside Select committees, municipal and First Nations councils and staff, have been working through the Options Development Phase of the Core Area Sewage and Resource Recovery System 2.0 project.

The Capital Regional District (CRD) Board retained Urban Systems, partnered with Carollo Engineers, in August 2015 to conduct a costing and feasibility analysis of option sets for the conceptual configuration of sewage treatment and resource recovery for the Core Area.

Urban Systems/Carollo submitted *Technical Memo #1 – Background and Technical Foundation* to the CALWMC in October, which was approved in final form at its meeting on November 4, 2015.

Technical Memo #2 (Final) – Review and Refine Option Sets, providing four siting options sets, along with preliminary site feasibility, technology needs and considerations, resource recovery opportunities and methodology for comprehensive costing and financial analysis, was initially submitted to the committee in draft form on November 4, 2015. At that time, the CALWMC directed the consultants to include a fifth option, namely a full tertiary centralized option 1b, as recommended by the Technical and Community Advisory Committee.

Draft Technical Memo #3 – Costing and Financial Analysis was presented to the CALWMC on December 9, 2015, attached as Appendix A. The memo provides costing analysis, environmental impact and the resource recovery analysis for the five options sets. CRD staff further analyzed the apportionment of capital and operating costs to each participant in the service according to the establishment bylaw and the project charter by design capacity benefit and provided estimated costs per household for each option by participant.

At the December 9 meeting, Directors deferred moving to public consultation on the Option Sets and directed staff, Urban Systems/Carollo and the Technical Oversight Panel to report back to committee on additional technical and financial information.

Urban Systems has worked directly with Westside municipal staff to provide costing on an additional Option 5a and 5b. The option set includes a three plant option whereby wastewater is treated at a plant in Colwood, serving Colwood and Langford, at Esquimalt Nation, serving the remainder of the Westside participants, and at Rock Bay, serving the Eastside participants. The option set is costed for the plant at Colwood with secondary treatment, 5a, and tertiary treatment,

5b. A technical brief on this additional option is attached as Appendix B. This information will also be presented to the Westside Select Committee at its meeting on January 8, along with capital and operating costs and cost apportionment under three scenarios, as detailed further in this report.

Urban Systems also met with Mr. Oscar Regier, a member of the public who proposed an alternative distributed option to the Technical Oversight Panel in November. A feasibility assessment of the proposal by Urban Systems is attached as Appendix C. Based on the assessment conducted, it is not feasible to advance the distributed option for a number of reasons, including failure to meet the requirements of the Municipal Wastewater regulations.

Urban Systems/Carollo have provided additional detail in regards to the life cycle costing for the option sets, provided in Appendix D.

CRD staff have conducted a global comparison of the budget envelope for the previous Liquid Waste Management Plan capital program with the cost estimates prepared by Urban Systems/Carollo, attached in Appendix E. This information also includes summary information on comparisons to previous studies conducted for the CRD for solid waste processing.

CRD staff, in collaboration with Urban Systems, have provided additional information regarding design flows, how design flows were established and follow-up information regarding the impact of water consumption in Appendix F.

CRD staff have apportioned costs for the option sets under three scenarios: design capacity benefit as laid out in the establishment bylaw, an "all-for-one basis" across the entire service area (this cost sharing option was applied for the previous Plan) and an "all-for-one basis" Westside and Eastside. A staff report providing the outcomes of the financial analysis for the three cost sharing scenarios and the process for amending the establishment bylaw, if desired, by the participants was presented to both Eastside and Westside Select committees the first week of January and is attached as Appendix G. The financial data was also shared with Chief Administrative Officers prior to the winter holidays to ensure municipalities and First Nations had sufficient time to consider the implications of the various cost sharing options. In addition, costing was prepared for the additional 2 options as presented to the Westside Select Committee on January 8, 2016 (see Appendix H).

A conference call with officials from all senior government granting agencies is scheduled for January 14, 2016. At that time, staff will raise the assumptions on how the grants have been applied to each of the option sets and report back through the committee Chair if any adjustments are necessary to the financial information to be shared during the public consultation process.

A series of additional information requests was made by committee that could not be accommodated within the timeframe. These requests relate to further detail to be provided in Technical Memo #3 and include such items as expansion of sections 3.0 Solids Management to provide further detail on the comparison of Rock Bay versus Hartland as a site for solids processing, and information regarding trucking versus piping. The Committee also requested expansion of Section 3.6 regarding greenhouse gas mitigation. Once all additional new options are considered by the Committee as laid out in this report and the scope of Technical Memo #3 is finalized, the consultants will make a final suite of edits to the document and review this final

version with the Technical Oversight Panel.

The Technical Oversight Panel will report independently on this agenda on their task assignments coming out of the December 9 meeting, specifically, a feasibility assessment of the deep shaft, small footprint alternative, outstanding costing reconciliation with the consultants, clarification on how private vendor proposals would be dealt with as part of the procurement process and comment on design flows for the purposes of the current costing and public consultation exercise.

ALTERNATIVES

Alternative 1

1. That staff be directed to proceed with public consultation on the financial and environmental analysis of the five option sets as presented in *Draft Technical Memo #3 – Cost and Feasibility Analysis* by Urban Systems/Carollo Engineers, in addition to the new option set as recommended by the Westside Select Committee; and

2. That it be recommended to the Board to amend the Workplan Overlay according to the Workplan presented in Appendix I.

Alternative 2

That staff be directed to proceed with public consultation based on the decisions of the Committee following the consideration of the option sets presented in *Draft Technical Memo #3 – Costing and Feasibility Analysis* by Urban Systems/Carollo Engineers, in addition to consideration of the follow-up information provided in this staff report.

FINANCIAL IMPLICATIONS

Additional financial analysis has been conducted according to the three cost sharing options as laid out in Appendix G for the additional Colwood/Langford Options 5a and 5b. Costs for these additional options have been added to the cost tables presented in Appendix H.

TIMELINES IMPLICATIONS

A revised Workplan Overlay schedule based on the shifted timelines for public consultation is presented in Appendix I. If the Committee determines it is appropriate to move to the public consultation phase, it is anticipated that consultation will run from mid-January to mid-February. Public consultation activities and events have been reported in detail to both Eastside and Westside Select Committees. An interim report on public consultation will be presented to Committee at its February 10 meeting, with a final report presented on February 24. At this time, a preferred option, forming the basis of a LWMP amendment and revised grant funding application, will be determined by Committee and the CRD Board on February 24. An extension to the Option Development Phase of the Workplan, currently scheduled to complete by March 31, 2015, will be discussed with the funding agencies and staff will report back to Committee at its next meeting.

CONCLUSION

Additional information has been provided in response to information requests made by the Committee at its last meeting held December 9, 2015.

RECOMMENDATION

1. That staff be directed to proceed with public consultation on the financial and environmental analysis of the five option sets as presented in *Draft Technical Memo #3 – Cost and Feasibility Analysis* by Urban Systems/Carollo Engineers, in addition to the new option set as recommended by the Westside Select Committee; and

2. That it be recommended to the Board to amend the Workplan Overlay according to the Workplan presented in Appendix I.

Submitted by:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

LH:cl

Attachments:
- Appendix A – Technical Memorandum #3 – Costing and Financial Analysis – Urban Systems/Carollo Engineers (December 4, 2015)
- Appendix B – Technical Memorandum Supplement – Option 5 Preliminary Costing – Urban Systems/Carollo Engineers (January 7, 2016)
- Appendix C – Memorandum from Urban Systems re Resident's Distributed Tertiary Treatment (January 4, 2016)
- Appendix D – Urban Systems/Carollo Engineers Life Cycle Costing Data for Options 1a, 1b, 2, 3 and 4
- Appendix E – Cost Comparison – Previous LWMP Capital Program with Urban Systems/Carollo Cost Estimate (January 8, 2016)
- Appendix F – Memorandum from Urban Systems re Design Flows (December 23, 2015)
- Appendix G – Staff Report to Eastside and Westside Select Committees re Core Area Sewage and Resource Recovery System Cost Sharing (January 6 and 8, 2016)
- Appendix H – Core Area Sewage Treatment – Projected Capital Cost by Option, Including Household Projections (as presented to Westside Select Committee on January 8, 2016)
- Appendix I – Revised Proposed Work Plan Overlay (January 2016)

APPENDIX A

December 4, 2015

Capital Regional District

Core Area Liquid Waste Management Plan

Phase 2: Wastewater Treatment System Feasibility and Costing Analysis

Technical Memorandum #3 - Costing and Financial Analysis

Project: 1692.0037.01
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carollo
Engineers...Working Wonders With Water™

URBAN systems

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Appendices

1.0 REPORT SUMMARY & OVERVIEW

Life-cycle costing analysis provides the Core Area Liquid Waste Management Committee (Committee) with financial information on five wastewater option sets for treatment and resource recovery. Each option set provides notable differences with respect to locations of treatment, levels of service for treated effluent, new piping and conveyance infrastructure, and opportunities for water reuse and heat recovery at select locations across the Core Area. While the option sets adhere to engineering and regulatory standards, they are suited to the local context by way of design consideration to public consultation results, Committee resolutions and direct references to the Project Charter which guides, the Phase 2 work to date.

Technical Memorandum #3 presents the life cycle costing results and includes the relative performance of each option set against the Project Charter and Committee aspirations. While costing results frame part of the feasibility for a given option set, illustrating the performance of an option set in light of the project criteria supports the Committee's need to provide direction on a system of upgrades and services. Results of this memo are presented to the Committee for potential direction regarding public consultation for each option set and to uncover public sentiment for levels of service and cost. Input provided by the Technical and Community Advisory Committee, technical and administrative staff of each of the Core Area municipalities and First Nations frames the presentation to the Committee and continues to be an important resource for this evaluation and decision-making process.

Cost estimates for the five option sets are based on factors outlined in Technical Memorandum #1 and comply with the terms of reference. Cost estimates in Technical Memorandum #3 differ from the previous liquid waste management plan because the five proposed option sets reflect a markedly different suite of conditions and factors, such as:

- The terms of reference for Phase 2 clarify that the primary project objective is to characterize the performance of new option sets against revised goals and criteria;
- Cost estimate contingencies for Phase 2 (2015) are 35%, whereas previous liquid waste management plans included contingencies of 14% and 20% for treatment and conveyance, respectively;
- Phase 2 cost estimates include piping and pumping infrastructure (not treatment) sized for a potential 2045 flow scenario rather than the 2030 flow scenario (to avoid the unnecessary and costly impact of upgrading systems within 10 years after construction);
- Cost estimate unit rates for Phase 2 are derived from separate databases and project experiences and do not directly align with estimates of the previous plan; and
- Option sets reflect different sites which have been brought forward by member municipalities.

Cost estimates for Phase 2 reflect a new direction in liquid waste management as outlined in the five option sets. It is common for cost estimates to be conservative at the conceptual stage and they include multiple factors with varying levels of uncertainty. Indeed, it is common that cost estimates tend to improve and often decrease as more investigation and optimization is complete on the preferred option

set. Technical Memorandum #3 provides the results of life cycle costing analysis and includes criteria performance as it relates to the Project Charter.

1.1 Technical Process Update

Engineering and financial feasibility studies are iterative. Each issue or design element undergoes scoping, testing, refinement and costing. Typically, the iterative process repeats itself to stimulate ideas, strengthen the foundation of solutions and often to reduce project scope and cost. While most engineering and feasibility studies include iterative analysis, Phase 2 for the Core Area has been aided by multiple teams and committees, each looking to significantly contribute towards option sets: collaboration with the Technical Oversight Panel, Westside Technical Staff, Eastside Technical Committee and the Technical and Community Advisory Committee has improved the option sets. Key innovations and technical updates related to Phase 2 include:

- **Efficient Pumping:** Option set configurations in Technical Memorandum #2 included a pump station at Gorge Road to capitalize on redirecting flows to Rock Bay over a shorter distance and reduced pumping needs. Costing for TM#3 reveals that constructing one pump station at Macaulay Point to Rock Bay will be more efficient and as a result, reduces capital and operating costs.

- **Wet-Weather Treatment Facilities:** **O**ption set configurations in Technical Memorandum #2 identified the potential for a primary treatment facility at Clover Point for flows in excess of 2x average dry weather flow. The driver for this strategy was to reduce the size of pipes and pumps from/to Clover Point to Rock Bay. Costing for TM #3 reveals that centralizing wet-weather treatment at Rock Bay will reduce capital costs.

- **Sidestream Treatment and Water Reuse:** Each option set includes the provision for water reuse. Providing sidestream tertiary plants allows for reuse systems that treat only enough *supply* to meet potential *demands.* A facility in Colwood, if approved by the Ministry of Environment, would be a leading-edge water reuse system utilizing aquifer recharge and soil irrigation for up to 100% of flows. There are few facilities in Canada capable of achieving this standard and as a concept, provides for interesting public input on choices for water reuse. Overall, while treating to tertiary levels has some appeal, it does come with higher capital and operating costs. Pursuing sidestream water reuse at all facilities in the 1, 2, 4 and 7 plant option sets illustrates the relationship of increased levels of service for water and the associated cost.

- **Harbour Outfall Concept Check:** There is a significant cost to convey treated effluent from Rock Bay back to Clover Point Outfall such that some interest emerged into the feasibility of reducing the outfall and relocating it to the Harbour. An environmental impact study is ultimately needed to assess the potential for this approach; however costing for Technical Memorandum #3 reveals that the extra treatment costs would outweigh potential outfall cost savings by a factor of roughly 2 to 1.

- **Integration with Solid Waste for Expanded Resource Recovery:** Incorporating resource recovery for both wastewater solids and municipal solid waste is growing in feasibility and application. Phase 2 uncovers key tactics for integration and provides information to allow the CRD to build a road-map to consider integrated resource recovery.
- **Phasing-in Enhanced Treatment:** Making the jump from preliminary treatment (e.g. screens) to secondary treatment (and beyond) will mark a significant advancement in wastewater and environmental performance for the Core Area. Regardless of the level of treatment selected, the CRD will have ample opportunity to collect and report on real-time data for effluent and water quality, and quantity. This type of data can lead to local, real information regarding the need, if any, to phase-in enhanced treatment and increase levels of treatment over time.
- **Treatment Levels of Service:** Wastewater utilities typically design levels of service to meet the regulations. Implementing tertiary levels of treatment where it is not required would demonstrate environmental stewardship including additional removal of some emerging contaminants of concern.
- **Reduced Infrastructure:** Small-scale water reuse plants that *scalp* flows to suit supply-demand for reuse, reconfiguring existing pump stations, selecting sites adjacent to existing infrastructure and many other design elements have led to 5 option sets with a reduced amount of new infrastructure. Further innovation is needed to optimize pipe routing and disruption to local residents and businesses in the preferred option set.
- **Request for Statements of Interest (RFSI):** Based on the analysis of solids alternatives and option sets, there are two viable and comparable solids recovery options in anaerobic digestion and gasification. Each option is defined and costed for public input. There are however other technologies that may be more cost effective but have not been vetted as viable for the CRD. The CRD can use the RFSI approach to tell the market that it will either choose between its current choices, or, consider a more innovative or cost-effective market-based solution that out performs the defined choices based on suite of goals and criteria. Myriad solids recovery options and technologies provides for more innovation and market competitiveness: the RFSI positions the Core Area for maximizing what the market can do for solids recovery.
- **Technology Innovation:** Engineering feasibility and costing is based on representative design whereby select technologies are costed on a provisional basis to support the comparison of the option sets. Representative design gives the private sector ample opportunity to provide innovative solutions to meet the performance targets of the preferred option set because technologies have not been prescribed. Smaller footprint technologies may emerge through canvassing the private sector.

- **Regulatory Innovation:** Regulations often dictate the location and scope of infrastructure. Phase 2 discussions with the Ministry has opened the door to further innovations in technologies to meet the regulations, for example, by considering less expensive primary treatment options.
- **Construction Phasing:** The Core Area wastewater system will evolve due to dynamic conditions of flow quality and quantity. Incrementally upgrading the system over time will allow for the results of water conservation and inflow and infiltration management to offset the need to increase capacity.

Innovation will continue and the preferred option set(s) will evolve as needed during subsequent design phases to optimize the Charter goals and to meet local needs. Option set summaries illustrate their relative performance including costing, characterization and criteria results.

1.2 Charter Elements and Summary Outcomes

The Project Charter provides guidance to the technical analysis herein and was foundational to establishing the five option sets. Technical Memorandum #3 characterizes each option set in light of the Charter and provides key results and differentiators to enable all readers the opportunity to weigh the tradeoffs for service, benefits and costs. Project criteria stemming from the Charter were developed in Technical Memo #1 which is provided in Appendix A to this report. Section 4 summarizes the performance of each option set under a common framework including life-cycle costing results, criteria performance and overall characterization of each option. Table 1-1 below provides an executive summary of the option sets.

Table 1-1: Option Set Summary

OPTION SET	SUMMARY CHARACTERIZATION	2030 CAPITAL AND NET-OPERATING COST	
Rock Bay Central Secondary	The 1 Plant secondary treatment (1a) option set centralizes all flows at Rock Bay, including up to 10MLD for local reuse. This option set addresses the need to meet pending regulations and provides for the base level of service.	**Capital 2030** $1,031 M	
		2030 Operating $21.8 M	**Est. Resource Income** Up to $0.9 M
Rock Bay Central – Tertiary	The 1 Plant full tertiary treatment (1b) option set centralizes all flows at Rock Bay, including up to 10MLD for local reuse. This option set represents a clear sentiment towards water stewardship by raising levels of service for treated effluent quality.	**Capital 2030** $1,131 M	
		2030 Operating $26.4M	**Est. Resource Income** Up to $0.9 M
2 Plant: Rock Bay + Colwood	The 2 Plant option set treats over 80% of flows to secondary levels, on top of up to 20% tertiary quality effluent. This option set represents a notable increase in water reuse from the 1-plant option with minimal extra conveyance infrastructure.	**Capital 2030** $1,088 M	
		2030 Operating $22.8 M	**Est. Resource Income** Up to $2.4 M

<table>
<tr><th>OPTION SET</th><th>SUMMARY CHARACTERIZATION</th><th colspan="2">2030 CAPITAL AND NET-OPERATING COST</th></tr>
<tr><td rowspan="2">4 Plant: Rock Bay, Colwood, East Saanich and Esquimalt Nation</td><td rowspan="2">The 4 Plant option set is a sub-regional system treating over 75% of flows to secondary levels, on top of up to 25% tertiary quality effluent. This option set represents the middle ground for distributed facilities and includes water reuse systems in four major growth centers.</td><td colspan="2">Capital 2030
$1,195 M</td></tr>
<tr><td>2030 Operating
$25.3 M</td><td>Est. Resource Income
Up to $3.8M</td></tr>
<tr><td rowspan="2">7 Plant: Rock Bay, Colwood, East Saanich, Esquimalt Township, View Royal, Langford and Core Saanich</td><td rowspan="2">The 7 Plant option set is a sub-regional system treating up to 45% of flows to tertiary quality, including tertiary treatment for all flows on the Westside. This option set represents a distributed system which maximizes the potential for water reuse and situates facilities in 7 growth areas.</td><td colspan="2">Capital 2030
$1,348 M</td></tr>
<tr><td>2030 Operating
$26.6 M</td><td>Est. Resource Income
Up to $4 M</td></tr>
</table>

While resource recovery provides for some cost-offsets by way of new incomes, water and heat recovery systems demonstrate an overall increase in costs associated with higher levels of service. Risks related to securing customers and revenues warrants due diligence in expanding the scope of service. The drivers for resource recovery ultimately go beyond financial, in terms of environmental stewardship and water innovation: public sentiment for increased levels of service and their costs is an important outcome of upcoming public consultation. Further public input can shape the direction for services in the Core Area beyond the base expectations of meeting the regulations.

2.0 TECHNICAL CRITERIA OVERVIEW

The Project Charter outlines 10 goals and commitments for option set performance and overall system evaluation. Phase 2 includes technical criteria which relate directly to the goals and commitments. These criteria guide representative design elements, and shape the approach to option sets, technologies, levels of service and resource recovery approaches. These criteria also help to characterize the performance of each option set for further consideration by political and public audiences. Technical criteria within the Project Charter provide a robust framework consistent with a goal-oriented, evaluative process to effectively illustrate and screen multiple options.

Each option set provides various levels of performance: there is no perfect technical answer to a multiple-accounts characterization of the options. Each option set is a choice and the engineering feasibility and financial analysis provides figures and statistics to allow for informed input and decision-making based on best available information.

While Appendix B provides the full list of technical criteria and their direct relation to Charter goals and commitments, the following summary provides the framework for much of this memorandum. The criteria relate to these performance topics:

- Wastewater treated above regulations
- Ability to reduce operating costs
- Carbon footprint and energy balance
- Ability to enhance treatment levels over time
- Extent of new infrastructure
- Amount of income/cost-offsets through resource recovery
- Integration of other waste streams
- Facility location, land use and relative interruptions

Sections 3 and 4 provide for coverage of the performance of the technical criteria. Two specific technical criteria are not evaluated in detail in the memo due to their inability to provide for meaningful differentiation of the option sets. In the case of 'extent of alternatives to bring in costs less than original estimate', no option set can meet this goal in part due to cost escalations from the previous LWMP amendment, because cost contingencies are different than the previous option, but also due to changing conditions such as facility location and levels of service. The 1 plant option with secondary treatment presents the lowest option of the available sites. In the case of 'ability of an alternative to meet the preliminary criteria', all option sets meet this criterion in that all system configurations are guided by all criteria and perform to some degree against each commitment. All remaining criteria provide for a broad characterization of the performance of any option set. Section 4 provides for a dashboard type presentation of the option sets in light of their performance against technical criteria.

2.1 Key Areas for Policy Direction and Public Input

Key focus areas for future policy direction and public input provide a lens on the multiple-account nature of this assignment. Dialogue with public, political and technical stakeholders continues to reinforce the importance of the following focus areas:

- **Integration with Solid Waste and Location of Solids-Energy Recovery:** the reduction of landfill emissions appears to be the primary driver for integration with solid waste materials. Direction by the Committee to substantively integrate solid waste may lead to gasification of wastewater solids located at Hartland Landfill, as an alternative to anaerobic digestion. Public input on the integration of solid waste and their preferences on location can support the Committee's decision for solids-energy recovery.
- **Water Reuse:** water reuse requires increase in effluent quality (a form of environmental stewardship) and demonstrates water innovation, but it will also increase operating and capital costs. Committee direction to pursue higher levels of service to include water reuse can be achieved on every option set, to varying degrees. Water reuse feasibility may be presented in tandem with long-term potable supply plans to allow for a fulsome water security dialogue. Phasing-in water reuse can occur in all option sets. Public input on elevated levels of service and water stewardship is key.
- **Heat Recovery:** key conditions must be present for financially viable heat recovery systems. In particular, the small energy-price differential between electricity and natural gas at this time greatly reduces the financial viability of heat recovery from wastewater. All option sets provide for one or more heat recovery system opportunities. Committee direction for heat recovery may be to a) include the concept of heat recovery systems for future implementation (beyond 2030), or to b) include heat recovery costs in the option set summaries, or to c) not include heat recovery in the liquid waste management plan. Public input on the *concept* of heat recovery will be beneficial for future decisions.
- **Centralized or Distributed Facilities:** a key driver for distributed facilities is to recover resources in strategic locations and typically to recover resources where they are first generated. Distributed heat recovery, water reuse and solids-energy facilities all result in increased levels of service and costs (albeit some revenues emerge to offset a portion of the costs). Pursuing heat recovery and water reuse at this time would be driven by social, and partly environmental, outcomes. Public input on the benefits and drawbacks of centralized and distributed facilities can support Committee decision making.
- **Effluent quality:** meeting the regulations is a significant advancement in effluent quality from the current practice of preliminary treatment. Going further to achieve tertiary effluent quality allows for water reuse, may allow for reduced outfall lengths and could result in removal of greater emerging contaminants of concern (for some contaminants only, as secondary

treatment removes a large portion of many contaminants already). Committee direction to treat to tertiary levels beyond water reuse demands would demonstrate water stewardship.

- **Procurement and Ownership:** public interest in ownership, operation and liabilities can support the Committee in providing direction in subsequent design phases toward how to package option set for proposals and bids by capable firms.

3.0 RESOURCE RECOVERY FEASIBILITY ANALYSIS

3.1 Solids Management

The Project Charter indicates that any option set must incorporate sustainable practices into the design and consideration of the solids management alternatives. Anaerobic digestion and gasification provide two energy positive processes that strongly align with the terms of reference and the goals and commitments of Phase 2.

- **Anaerobic Digestion** is a process that maintains the wastewater solids at near body temperatures (35-39 degrees C) without the presence of air. Under these mesophilic[1] conditions the bacteria consume themselves and produce an energy rich material byproduct (methane). Typically, anaerobic digestion can reduce the organic content of the solids by 35-50% and the overall mass of the solids by 30%. Anaerobic digestion is the industry standard for stabilization and energy recovery in the wastewater industry. Anaerobic digestion produces a 'wet dirt' material at concentrations from 3% to 5% dry solids. The 'wet dirt' can be dewatered to produce a *cake* with a 20% to 25% dry solids concentration, which contains the residual nutrients and carbon. This material must then be managed or disposed of as the end product of anaerobic digestion. Anaerobic digestion typically produces 150 kg of wet cake at 20% dry solids per ML of treated wastewater.

- **Gasification** is a thermal process that converts the organic carbon in the wastewater solids into a synthetic gas that offers energy recovery potential but also may be processed into higher value items like plastics or as feedstock for biodiesel production. The process has a challenging requirement to maintain materials at elevated temperatures (>400 degrees) for a period of time. As this process is thermally based, it is critical that the energy content of the feed stocks be sufficient to maintain the high temperatures and derive energy out of the process. Gasification has been used in the municipal solid waste market as the energy content of these materials is typically sufficient for an efficient and energy positive operation. Gasification proponents claim to process 70% to 90% of the carbon content of the liquid waste solids feed; leaving mostly inorganic ash. The disposal or management of this material is significantly easier since there is only about 5% of the solids that remain as ash. Gasification will typically produce 14-30 kg of ash per ML of water treated.

Wastewater solids typically contain large amounts of energy in the form of reduced carbon. Through the two selected processes, part or all of the energy contained in the reduced carbon is extracted in the form of heat and syngas (low grade gasification gas) or methane (in the case of anaerobic digestion).

[1] Thermophillic digestion is an alternative to mesophilic which can reduce the time required for digestion but also requires greater heat/energy needs.

Energy extracted from the wastewater solids can be converted to electricity through steam turbines (preferred alternative for syngas) or through internal combustion engines to obtain both heat and power.

Figure 3-1 shows the energy content of the municipal solid waste and wastewater solids; Figure 3-2 shows the relative moisture content of Municipal Solid Waste and Wastewater Solids

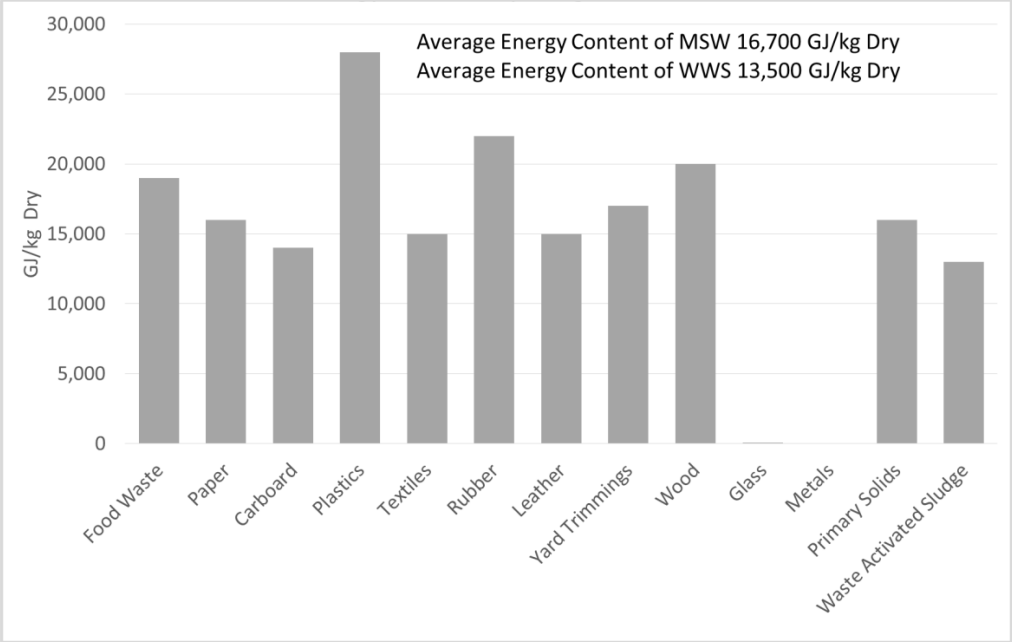


Figure 3-1: Energy Content by Weight Fraction

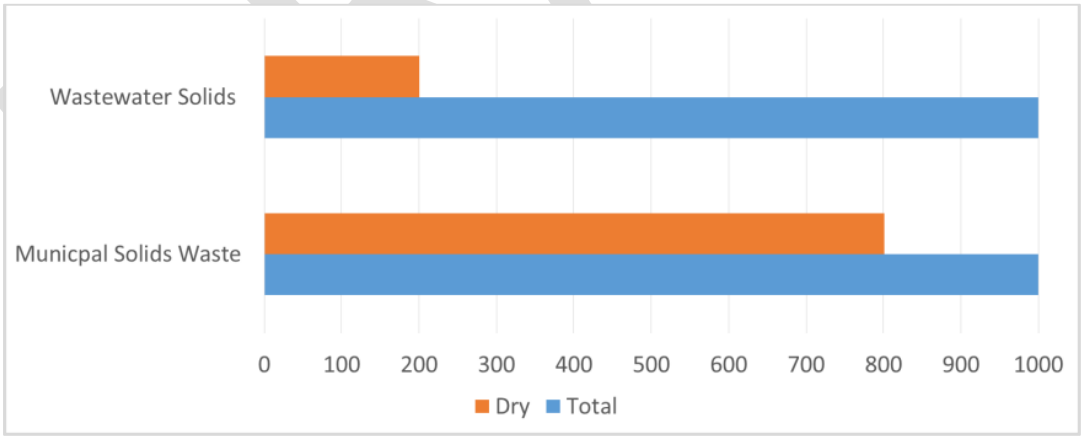


Figure 3-2: Moisture Content of MSW and WWS

Figures 3-1 and 3-2 illustrate that wastewater solids contain roughly the same amount of energy as the MSW, however the moisture content (water) in the solids limits the application of thermal technologies.

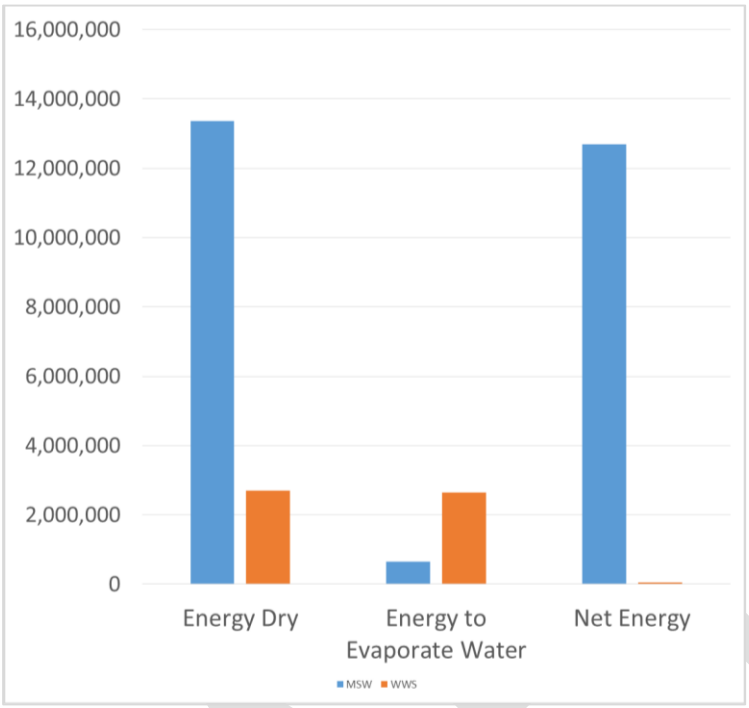


Figure 3-3: Available Energy from MSW and WWS

Figure 3-3 shows the Energy content of municipal solid waste (MSW) and wastewater solids (WWS) on a wet basis assuming the energy required to evaporate water is 3.3 GJ/ton of water evaporated.

Anaerobic Digestion: The solids produced from the wastewater treatment facilities will be trucked or piped (in the case of 4 or 7 plant option sets) to the solids processing site (either Rock bay or Harland; discussion to follow) and introduced into the stabilization process. The separated kitchen scraps (10,000 tons per year) could be received at this station[2], screened and pulped and then introduced into the digesters for conversion to energy. The solids receiving station will be enclosed and odour controlled to avoid any fugitive odours from escaping the site as well as to minimize the visual impact to the neighborhoods. The solids will then be introduced into the digesters and held in enclosed vessels for a period of no less than 18 days. Once the solids are stabilized, they will be conveyed through pumps to the dewatering operation. High speed centrifuges will dewater the solids to a moisture content of less than 80 percent. The solids will then be held in an enclosed cake storage facility to control any odours and then loaded into the disposal trucks under an enclosed environment to control odours.

The methane gas from the digestion process will be cleaned of hydrogen sulfide and siloxanes and diverted to the *combined heat and power* units for the generation of power and heat. The heat generated in the engines will be used to provide the necessary heat for the digestion process and the electricity used to offset the electrical use of the mechanical equipment at the plant.

[2] Costing in TM #3 focuses on solids-energy recovery of wastewater solids and does not present overall costs for inclusion of other solid wastes.

Given the policy which prevents land application of biosolids, an alternative to anaerobic digestion would be to dry wastewater sludge to create fuel pellets. These costs are not currently included in the option sets to allow the private sector to propose other alternatives and maintain an open, competitive process of beneficial reuse between the two technologies.

Daily truck traffic for dewatered, stabilized solids would amount to about five trucks per day in 2023.

Gasification: As part of the gasification alternative, the solids produced from the wastewater treatment facilities will be conveyed (in the case of 4 or 7 plant option sets) to the solids processing site (either Rock bay or Hartland; discussion to follow) and introduced into the gasification process. The separated kitchen scraps (10,000 tons per year) could also be received at this station, screened and pulped and then introduced into a holding vessel, the yard waste (1,000 tons per year) will be received and stored onsite and then dosed to the gasifier along with the kitchen waste pulp to the gasifier for energy. The wastewater solids will be sent from the holding tank to a solids dryer to reduce their moisture content and then into the gasifier. The solids receiving station will be enclosed and odour controlled to avoid any fugitive odours from escaping the site as well as to minimize the visual impact to the neighborhoods. Once the solids are gasified, the remaining ash will be collected as well along with the material from the exhaust odour control. The remaining solids will be loaded into a truck and sent for disposal to Hartland as inert materials. Daily truck traffic would be almost negligible aside from any additional feedstocks required to drive the gasification process. Consideration to service governance of solids waste (e.g. service boundaries for regional versus Core Area) and liquid wastes can further inform the feasibility of integration.

The syngas generated from the gasification process will be used as fuel on a steam boiler and the steam will power a steam turbine to generate power. It is expected that with the addition of municipal solid waste, the process will yield significant amounts of excess thermal energy.

Combined Heat and Power

The use of either gasification or anaerobic digestion will yield excess energy that can be converted to electricity or other form of usable energy. Currently the project as envisioned is to generate power to offset the mechanical equipment power use in the case of anaerobic digestion the selected technology is internal combustion engines. In the case of gasification, the selected technology is a steam turbine.

Costing Summary

The process descriptions above provide the overall scope of treatment, energy recovery and solids management that will be defined for the proposed Request for Statements of Interest. Overall, net present value analysis at this time strongly suggests that the overall capital and operating costs of anaerobic digestion and gasification can be considered comparable at a conceptual level of analysis. Key process components for solids recovery of either anaerobic digestion or gasification include:

- Control buildings
- Residuals storage/loadout
- Dewatering facilities
- Energy generation unit(s)
- Gas conditioning/upgrader
- Dryer units and controls
- Receiving stations
- Process units: either gasifier or digester

Operations costs include:

- Labour and waste processing
- Maintenance
- Solids disposal (landfill fees encourage market sector innovation)
- Gas conditioning media
- Revenues from landfill avoidance
- Natural gas
- Power
- Polymer

Key results of the capital, operating and life cycle costing analysis include:

- Capital costs for anaerobic digestion may be less than gasification by a notable margin however the limited number of successful gasification (of wastewater solids) facilities complicates reliable cost estimating therefore a range for gasification is shown

ANAEROBIC DIGESTION – CAPITAL 2030	GASIFICATION – CAPITAL 2030
$258M	$263M to $416M

- Operational costs for gasification may be less than anaerobic digestion by a notable margin; this is primarily related to the mass of solids still present in the digested sludge and the potential cost of its disposal/reuse; market innovation on the reuse of biochar and biosolids will have a significant effect on the operating costs for either technology
- Operational costs (including cost-offsets or revenues) for gasification could be up to 40% less than anaerobic digestion for the 2030 scenario
- Operational costs for gasification decrease further (relative to anaerobic digestion) because more energy offsets emerge, as other municipal solid waste materials are added

- Net present value results between anaerobic digestion and gasification can be considered roughly equal at this conceptual level (the capital cost uncertainty for gasification prevents a clear conclusion on net present value); statements of interest by the wastewater solids market will determine whether better net present value scenarios exist
- Capital costs for anaerobic digestion are included in the option set summaries because they are lower; presenting costs in this way will have little effect on public consultation because either process will require debt amortization coupled with operating costs which yield a comparable financial impact to residents on an annual basis
- Discussions with 3P Canada and senior government funding partners must occur to determine eligibility of gasification and the integration with municipal solid waste, recognizing that a key driver for eligibility is achieving *value for money*

Emissions avoidance and carbon credits are not considered in the financial analysis due to the uncertainty of eligibility of either wastewater process in BC (there is no wastewater protocol); including carbon credits from non-wastewater solids could be considered in future phases however the analysis would be highly speculative until substantive discussions can occur with the province.

Two financially comparable solids-energy recovery options positions the CRD to canvass the private sector to determine the most cost-effective and environmentally-beneficial alternative.

3.2 RFSI Considerations

A request for statements of interest (RFSI) details the aspirational and obligatory (e.g. risk management, financial assurance) objectives of the CRD in solids recovery, and also serves to identify and assess all of the potential market opportunities to improve upon the alternatives identified in Phase 2. The RFSI provides the CRD the option of evaluating the best technologies in a single, formal process and further provides guidance to the manufacturers on the goals of the CRD for the processing and disposal of the solids generated through the process.

The RFSI can identify goals like:

1. Proposed process must recover and export energy
2. Proposed process should integrate municipal solid waste and wastewater solids
3. Proposed Process must recover and export ammonia
4. Proposed process must minimize carbon emissions
5. Proposed process must not rely on land application or landfilling of solids processed

The comprehensive list of requirements would be detailed to suit political and technical needs, for alignment with senior government funding opportunities (committed or not) and reflect key input received by the public through upcoming public consultation.

3.3 Hartland Landfill and Rock Bay

Locating solids-energy treatment and recovery at either Hartland Landfill or Rock Bay is driven by five key factors as outlined in Table 3-1.

Table 3-1: Key Factors and Considerations

FACTOR	CONSIDERATIONS
1. Neighborhood interest in gasification or anaerobic digestion at Rock Bay or Hartland Landfill	» *Local industrial land uses presently experience noise, vibration, aesthetic, air and odour concerns* » *Solids-energy recovery would not significantly affect current conditions except if additional municipal solids are received, stockpiled and sorted at Rock Bay; odour management equipment is accounted for at all facilities* » *Neighborhood input (with consideration to the local context for land use) will further influence the suitability of siting solids-energy recovery in Rock Bay.*
2. Cost of land	» *Prime industrial land in Rock Bay is about five times more costly (per hectare) than land at Hartland Landfill.*
3. Costs of trucking and pumping wastewater solids to Hartland Landfill	» *Processing all solids at Rock Bay could eliminate most of the costs of trucking pumping" since there will be some residuals to convey off the site* » *Trucking solids (20% solids) or pumping solids (at 1 to 2% solids) from Rock Bay to Hartland present a similar net present value at approximately $35M+; trucking net present value includes a lower capital cost than pumping (a liquid return line to Rock Bay is still required for trucking) but the higher operational costs of trucking, including potential carbon taxes, results in a comparable net present value.*
4. Integration of solid waste	» *Hartland landfill already includes receiving and sorting of different solid wastes which provides distinct advantages. Duplicating this function in Rock Bay would increase costs, noise and traffic.* » *Integrating some of these solid wastes into the gasification or anaerobic digestion processes would be more efficient at Hartland (which also allows for greater expansion opportunities).* » *Excess heat from the landfill methane cogeneration facility would reduce the cost and emissions of drying wastewater solids for either anaerobic digestion or gasification.*
5. Final destination of residuals	» *The market response to residuals is unknown however the ability to provide excess land for temporary storage until suitable customers exist provides an advantage to Hartland.*

In summary, the cost of land at Rock Bay and the cost of transporting to Hartland (either trucking or pumping to Hartland) offset themselves yielding no clear advantage for two of the five factors. However, Hartland Landfill provides for the opportunity to more easily integrate solid waste, to utilize excess heat resources from the methane cogeneration facility, to provide greater flexibility for storage facilities and expansion. Overall, if integration with solid waste is pursued then Hartland Landfill provides distinct advantages including strong engineering and financial feasibility on top of improved resource recovery

considerations. Rock Bay is still a viable solids-energy recovery location but is not conducive to integration with municipal solids. Costs for transporting solids to Hartland can be added to the Option Sets on direction from the Committee.

3.4 Heat Recovery

Charter goals and commitments related to heat recovery comes from public interest in the economic and environmental feasibility of beneficial heating systems from wastewater throughout the Core Area. Analysis for Phase 2 is desktop oriented and spans methodology, supply and demand, heating economics, service infrastructure, costs and income possibilities.

Heat recovery typically occurs via district heating systems (DHS) in select locations which are highly suited for heat distribution. While heat can be extracted from raw wastewater throughout the conveyance system, the efficiencies of low-grade heat extraction are low and strongly encourage heat recovery from treated effluent (after the plant). Three primary factors influence the efficient distribution of excess heat energy from a wastewater facility:

- **Supply:** Heat pumps convert thermal heat in wastewater and concentrate the supply for extraction for use in nearby buildings. Heat availability is a function of the ability to extract heat from the wastewater by dropping the temperature.
- **Demand:** New developments provide for the lowest-barrier demands because it negates the retrofit costs of existing buildings and their current heating systems. Treatment plants situated adjacent growth centers allow for heat distribution systems to be incrementally installed to suit actual development. This approach eliminates the uncertainty of partnerships with existing/different heat strategies and allows for capital investments to occur when they're needed.
- **Infrastructure Requirements:** Heat distribution systems originate at or near the plant or any treated effluent conveyance line. The further the development is from the source, the higher the infrastructure costs and the lower the feasibility of heat recovery.

All option sets provide treatment facilities near growth centers. Typically, the most feasible scenario arises where infrastructure costs are lowest and amount of demand is greatest. Key economic factors that drive the financial viability of heat recovery include value of the heat supplied (e.g. $/GJ) relative to the cost of infrastructure and operations.

Cost-Income Analysis

Local and regional planning documents outline growth projections for use at the DHS conceptual stage. Growth rates, densities, timing and building heights can be adjusted to illustrate the demand potential across the Core Area. Planning figures are converted into heating demand estimates for 2030 and 2045

scenarios. Five locations demonstrate highest potential for heat recovery systems including Rock Bay, Langford, Esquimalt, Colwood and View Royal (in descending order of demand). Potential revenues relate to cost offsets from purchasing natural gas at a flat rate of $14.00 per gigajoule (GJ) which includes basic charges, delivery charges, carbon tax savings and storage and transport costs.

Current record lows in natural gas prices combined with increasing electricity prices is narrowing the economic advantage that heat pump technology offers. For example, one unit of natural gas heat currently has a value of $14 per GJ, while a unit of heat pump heat at current electricity prices has a value of $11.67 per GJ. When infrastructure and utility operations costs are included the price differential is largely eliminated which means district heating systems struggle to yield a positive return. If the price of natural gas were to increase by 50% to 100% (some historical evidence) then the feasibility would increase dramatically. Price negotiations, either reduced electricity rates or premium heating charges based on renewable sources, would also affect financial viability of DHS in the short term.

Capital and operations costs are critical to service financing. Operating costs require detailed analysis once the system configuration and the ownership / governance model are known. Table 3-2 outlines two capital and operating cost scenarios, as an example, for two heat recovery systems.

Table 3-2: Capital and Operating Cost Scenarios

SCENARIO	2030 CAPITAL COST	2030 OPERATING COST	2030 INCOME
Rock Bay DHS	$21.3M	$2.15M/year	$2.15M/year
6 DHS under 7 Plant Scenario	$71.3M	$5.15M/year	$5.875M/year

Current energy prices coupled with the cost of DHS infrastructures results in insufficient revenues that may cover operating investments but do not payback capital investments in a reasonable time period.

Ingredients for Successful Heat Recovery

Overall, while a significant heat resource exists in treated effluent, current energy pricing for both electricity and natural gas pose significant challenges to achieve a positive business case. Further, partnerships for DHS face multiple barriers and conditions, such as proximity-to-source needs and retrofit costs of existing buildings, which further encourages greater emphasis on heat recovery potential in the future. Yet, heat recovery from wastewater has serious potential in broader district heating systems when the ingredients in Table 3-3 are applied:

Table 3-3: Ingredients for Successful Heat Recovery

INGREDIENT	APPLICATION
Secure partnerships with reliable building owners who are ready to invest in heating system infrastructure	*New development; preference to single-owner buildings; public agencies*
Low-infrastructure district heating systems	*New buildings situated 'on top' of effluent pipes or adjacent treatment plants*

INGREDIENT	APPLICATION
Natural gas prices significantly exceed electricity pricing	*Future conditions may present this opportunity*
Lens on cost-effective heat recovery utilities	*Business cases based on reinvesting incomes into the utility; unlikely to offset other wastewater costs*
Public support inherent in triple-bottom line business case	*Seek out public input on the concept noting that implementation likely to occur when these ingredients for success can be met (likely in the future)*

Heat recovery from treated effluent is an attractive energy off-set strategy. Each option set provides for a DHS however current energy prices indicate the capital and operating costs will only increase with more, distributed systems. Heat recovery options should be pursued based on the preferred option set as wiling customers come forward and energy prices create a viable servicing strategy. Capital and operating costs for heat recovery are not included in base costs but would be added on direction by the Committee.

3.5 Water Recovery

When treated to a high enough standard, treated effluent can be reused instead of potable water. A target market framework helps to navigate the multiple possibilities for reuse to augment the potable water supply. Conceptual supply-demand estimates focus on water applications that require less than potable-quality water and also demands that are situated in clusters which can reduce the cost of additional pipes to convey flows. Water recovery target markets should deliver on the following key themes:

- Demonstrate reliable long-term demands and incomes
- Reduce the scope of infrastructure needs
- Service large tracts of irrigable land such as parks and green spaces
- Support community amenities including augmenting environmental flows
- Pursue future partnerships with industry
- Demonstrate synergy with conventional public utility services
- Service growth centers where new developments can be encouraged to include additional plumbing systems for toilet flushing or irrigation

A servicing approach that meets these themes typically presents the lowest capital cost for system set up, provides long-term demands, supports community amenities such as parks and growth and generally conforms to public utility service delivery. The cost of retrofitting (re-plumbing) existing buildings to allow for treated effluent reuse is prohibitive; it is more feasible to include non-potable

water lines in new construction and to phase in non-potable sources over time. Combined, land application and regional growth centers provide for lower-barrier methods for reuse.

Summary of Water Reuse across the Core Area

Technical Memorandum #2 outlines the land application (irrigation), toilet flushing and aquifer recharge possibilities across the Core Area based on the applied target-market framework. All reuse systems could be phased in, with the exception of Colwood which is presented as a full-time water reuse facility employing aquifer recharge until established potable-substitution customers are confirmed. Life cycle costing is based on reuse income for treated effluent phased-in over time: if aquifer recharge is the preferred reuse strategy then life cycle costing would notably change. Overall, establishing five reuse systems provides coverage of most of the major outdoor uses in the Core Area, including growth centers, without the need for extensive reuse infrastructure.

Treated effluent systems require their own, separate infrastructure for distribution. Each facility would include a pumping station which raises system pressures to cover the range of elevations and flows and also includes pipes based on conceptual routes. The capacity of each water reuse system is based on the 2030 flows with consideration to long-term flow increases.

- **Colwood-Langford**: approximately 19.5 km of reuse pipe and a pumping system equivalent to 10 MLD.
- **Esquimalt:** approximately 17 km of reuse pipe and pumping system equivalent to the proposed demand of roughly 5 MLD for irrigation and toilet flushing
- **East Saanich:** approximately 10 km of reuse pipe and pump system equivalent to the proposed demand, or roughly 3 MLD during peak demand periods
- **Core Saanich:** approximately 10 km of reuse pipe and pumping system equivalent to the proposed demand of roughly 5 MLD for irrigation and toilet flushing
- **Rock Bay:** approximately 18.5 km of reuse pipe and pump system equivalent to the proposed demand, or roughly 10 MLD during peak demand periods; additional water reuse may occur along the treated effluent line toward Clover Point however these estimates have not yet been included.

Life-cycle costing includes capital allowances for reuse systems including distribution pipes and pump facilities. Pricing for reclaimed water is proposed at 80% of potable water retail rates for toilet substitution and 80% of wholesale CRD potable rate for land application. Reuse by aquifer recharge will not result in revenue.

Cost-Income Summary

Table 3-4 outlines the capital and operating costs plus revenues for two reuse scenarios (however, life cycle costing for water reuse was conducted for all five option sets). Treatment capital and operating costs are included given the intention to achieve tertiary effluent for water reuse.

Table 3-4: Cost-Income Summary

SCENARIO	2030 CAPITAL COST	2030 OPERATING COST	2030 Revenues
1 Plant Sidestream Reuse	$24.2M	$300K to $400K/year	Up to $800K/year
7 Plant Option Set with 5 Water Reuse Systems	$205M[3]	$2.5M to $3.0M/year	Up to $4M+/year

Results of the cost-revenue and feasibility analysis for water reuse include five key outcomes:

- Revenues for water reuse are set to be phased in as customers confirm partnerships with CRD or the municipality for service, gradually over a 20 year period. Detailed studies must engage with the individual customer and determine their affordability limits for water service. Questions emerge, such as; *will municipalities pay for the additional cost of park irrigation? Can golf courses afford the proposed rates?*
- Water reclamation provides for innovative uses of treated effluent however it is unlikely to present a positive business case until (if) potable supplies become unreliable. Revenues from water re-use will be challenged to cover both the operating and capital financing costs of their delivery systems, and will likely create an overall operating deficit.
- Further study is needed to discern which revenues are actual new incomes that do not result in a loss in income to the potable water utility. Generally however, installing two sets of pipes providing a similar level of service in the same area can lead to some level of redundancy and added cost to be borne by the taxpayer.
- While the seven plant option set would provide a higher level of service and boost enhanced tertiary water quality, it may not provide greater reuse opportunities beyond the four plant option for a long time: this is because supply would likely exceed demand. Pursuing full tertiary treatment for all flows would be driven partly for water reuse but largely to achieve enhanced water quality that is ultimately returned to the environment.

3.6 Carbon and Energy Footprint Discussion

Carbon footprint and offset credits can be a powerful lens for evaluating the feasibility of projects that achieve significant reductions in greenhouse gas (GHG) emissions. The GHG profiles differ significantly between solids-energy recovery and wastewater (liquids) treatment, and therefore are discussed separately below.

[3] Includes the treatment capacity costs for exceeding secondary effluent.

Carbon Footprint and Offsets for Solids-Energy Recovery

Solids-energy recovery by either anaerobic digestion or gasification will both create and reduce GHG emissions. The relative performance between these two technologies from an emissions perspective, including the introduction of other wastes, provides helpful direction for the Committee and the region in pursuing either technology.

For context, electricity is considered carbon neutral in BC; therefore, its offset or increased use does not result in any change to the overall GHG footprint. If the business case for either technology is to consider carbon credits, then significantly more analysis is needed to complete the business case and make a fully informed investment decision. For example, there are limits to the amount and types of offsets that the province of BC will coordinate each year. At minimum, responses to the Request for Statements of Interest should dictate a regulatory compliant carbon footprint and offset scorecard.

At a conceptual level, considerations for either gasification or anaerobic digestion from a GHG emissions perspective include:

- Both anaerobic digestion and gasification create biogas (methane or syngas) which can be captured and reused to fuel/heat the treatment process. Being renewable fuels that are fully consumed, neither gas would be subject to the BC Carbon Tax, nor create significant liabilities under the Climate Action Charter.
- Anaerobic digestion of wastewater solids combined with land application of biosolids (if considered) likely presents the lowest overall carbon footprint strategy.
- Both anaerobic digestion (if solids drying were also included) and gasification require input gas to fuel the treatment operation. Gases created by both technologies lessen the amount of import carbon-based fuels (i.e. natural gas) for heating and drying. For solids-energy recovery of only wastewater solids, the amount of gas that is created and imported is likely to be similar between the two recovery processes.
- Gasification of dried wastewater solids (on their own) is not a notable energy generator therefore other feedstocks typically drive the gasification process. This introduces biomass-to-energy considerations which are essentially considered emissions neutral in BC, in that carbon penalties are not applied to renewable fuels.
- Hartland Landfill currently utilizes methane capture for decayed materials to generate electricity to sell to the grid, albeit landfill-methane capture still sees emissions of methane released as the gas capture rate is approximately 63% (with intentions to meet 75% in 2016). Yard, garden and kitchen organics are already diverted from the landfill and reportedly beneficially reused therefore there would be limited, if any at all, carbon emissions reductions in their gasification. Emissions reductions from gasification would likely come from other materials that produce elevated emissions, either by their decay or further processing activities, such as scrap wood.

- Importing materials (yard, garden and kitchen organics) that are currently managed by private sector solid waste management companies could reduce GHG emissions through the avoidance of unmanaged decomposing of organic material; however, the carbon footprint reduction would be limited to any inefficiencies of the activities of the private sector companies, which is likely marginal overall. While introducing materials not managed by CRD would increase biogas production (gasifier), it may not yield a positive net environmental benefit because these materials are already beneficially reused.

- Regulations limit the CRD's ability to control the flow of materials to Hartland Landfill for gasification. A comprehensive regional service led by CRD for municipal solid waste could increase the amount of material available for recovery, including the potential benefits and drawbacks of more material going to Hartland and the impacts to the existing management approach including private sector solid management companies.

- Utilizing paper, plastics and scrap wood (examples) already managed by CRD for use in the gasifier could be justified by the improved efficiency of gasification over the less efficient landfill-gas capture. Materials already recycled are unlikely to yield an improved carbon footprint.

- Food scraps are already sent from Hartland Landfill to Harvest Power in the Vancouver area for resource recovery via anaerobic digestion. The current carbon footprint would be reduced by eliminating the transport costs and their associated emissions; additional emissions reductions could occur if gasification is considered a more efficient process for resource recovery of yard and kitchen scraps. Unfortunately, the efficiency of gasifiers including wastewater solids and food scraps is difficult to determine due to the lack of operating facilities.

Takeaways from these considerations include:

- Anaerobic digestion of wastewater solids including drying the wet cake appears to show a similar carbon footprint to gasification of wastewater solids alone.

- Gasifying yard and garden waste would not likely present a strong carbon footprint reduction strategy because these materials are already diverted from the landfill and beneficially reused. Carbon footprint reductions at the landfill could focus on sending high-energy content materials that would otherwise decay as part of the less-efficient landfill methane capture into a gasifier, particularly for those materials that are difficult to divert (e.g. some paper, some plastics and scrap wood), because it is reported to be a more efficient recovery process.

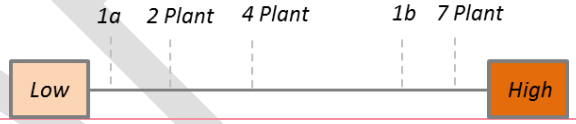
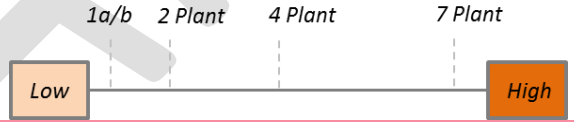
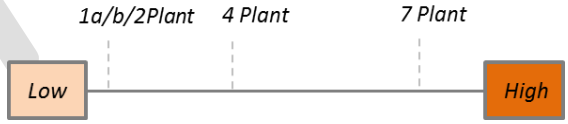
- Anaerobic digestion of wastewater solids and food scraps and gasification of dried wastewater sludge and food scraps likely presents a similar carbon footprint. Whichever process can reliably demonstrate greater efficiency over the other would likely yield a lower carbon footprint.

Direction by the Committee to fully integrate wastewater solids with municipal solids for gasification would likely yield an overall reduced carbon footprint, over anaerobic digestion and drying of wastewater solids on its own, because of the potential avoidance of emissions at the landfill, and not necessarily as a function of wastewater process emissions.

Carbon Footprint for Wastewater (Liquids) Treatment

Key factors for carbon and energy footprint in wastewater treatment and conveyance relate to extent of construction, energy use for treatment, energy use for conveyance and trucking to distribute solids to a solids-energy recovery facility. Table 3-5 outlines the factors and their considerations with respect to how the option sets qualitatively perform against each other for low to high carbon footprint.

Table 3-5: Carbon Footprint for Option Sets

FACTOR	CONSIDERATION	RELATIVE CARBON FOOTPRINT
Extent of Construction	Scope of new infrastructure, total building footprint, redundant facilities.	
Energy use for treatment	Level of treatment	
Energy use for conveyance	Pumping distance, pressure for raw, treated and reclaimed effluent; overall efficiency	
Trucking to distribute solids to a recovery facility	Distance for trucking and number of trips per day	

Qualitative performance of the criteria reveals the overall carbon and energy ranking of the option sets from a wastewater treatment (liquids) including, in order of smallest to largest footprint: Rock Bay – Secondary; 2 Plant, Rock Bay – Tertiary, 4 Plant, and 7 Plant.

OPTION SET >>
1A Rock Bay - Secondary

Description

- Rock Bay is a central facility for all flows up to 4xADWF including secondary and disinfection plus sidestream tertiary for local reuse in the Rock Bay-North Downtown areas.
- Solids-energy recovery can be centralized at Rock Bay or Hartland Landfill. Truck traffic is estimated at ~5 trucks per day in 2030.
- Macaulay catchment flows are directed to Rock Bay for treatment. Any flows not reused are routed through the Clover Point outfall. All flows meet or exceed the regulations.
- Heat recovery systems can be considered around Rock Bay and along the effluent line to Clover.
- Available site(s) are suitable from a technical perspective and align well with public input to date.
- Life cycle costs are reflective of the economies of scale made available by a central plant.

Scenario	2030 Capital	2030 Operating	Est. Resource Income
Rock Bay Secondary	$1,031 M	$21.8 M*	Up to $0.9 M

Total $1,031M -

Life Cycle Costing Analysis | Highlights

- A central plant at Rock Bay demonstrates the lowest capital, operating and life cycle costs
- Resource incomes at Rock Bay water reuse includes gradual, small-scale irrigation demands initially, with phased-in toilet flushing demands over 20+ years
- Sensitivity analysis related to resource incomes and discount rates had minimal effect on the net present value**.

**Operating costs account for asset depreciation as per factors outlined in TM #1 but should be refined to complete detailed cash flow analysis.*

***Sensitivity analysis related to energy and commodity prices would have a greater effect on net*

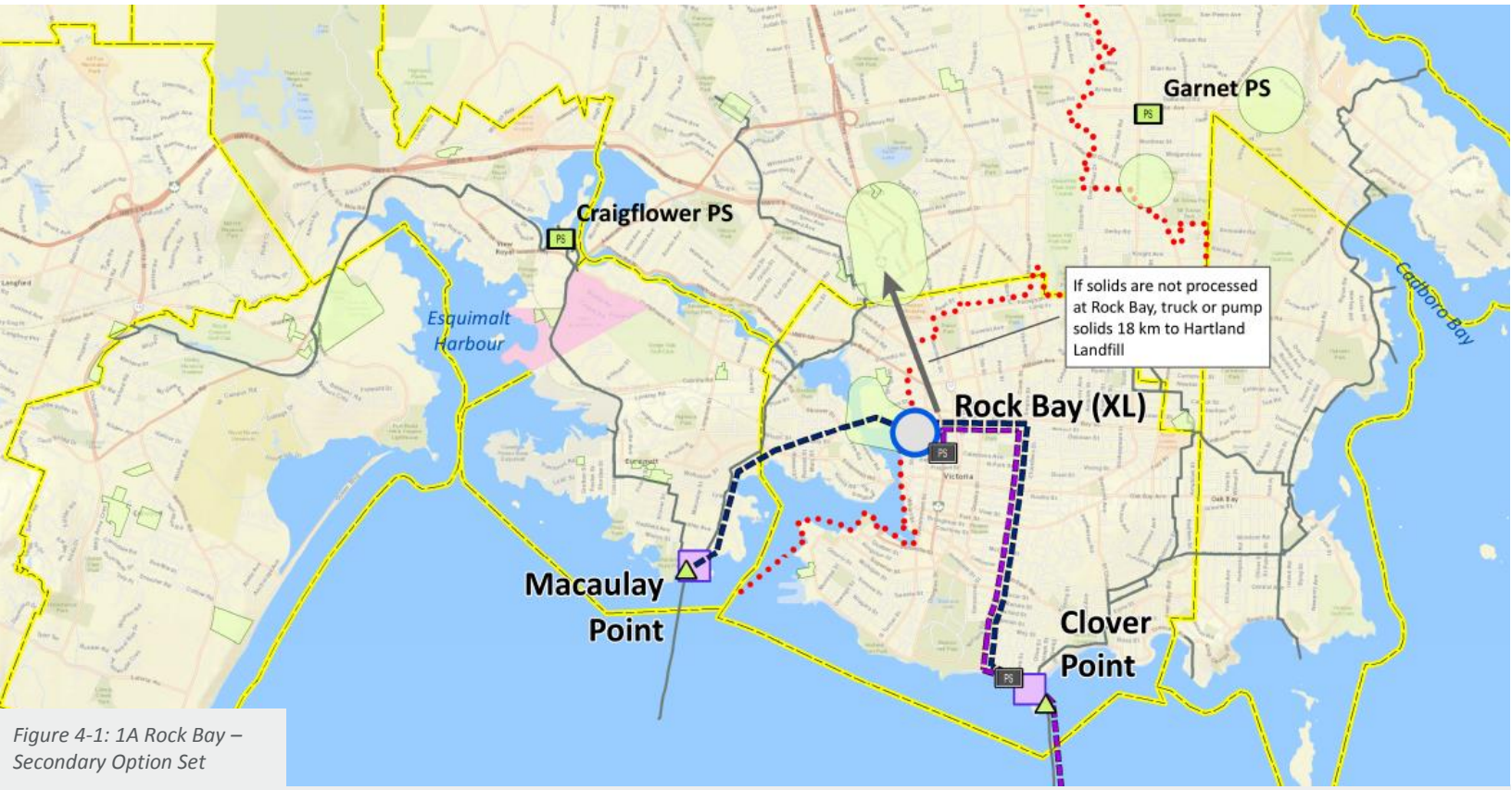


Figure 4-1: 1A Rock Bay – Secondary Option Set

CRITERIA RESULTS >>

» Length of New Conveyance Pipe

16.7 km

» % of Effluent @ Tertiary Quality

10%

» Rank: Carbon and Energy Footprint

1st

» Rank: Low Operating Costs

1st

» Ratio of Income to Costs for Water Reuse

0.45

» Ratio of Income to Costs for Heat Recovery

0.60

Option Set Characterization

» *Neighborhood-Land Use: A central plant at Rock Bay appears to align best of all locations given public sentiment to date. The industrial, mixed-use designation supports the site activities and other routine treatment processes. Capital works at Rock Bay should consider local planning objectives and provide for positive public interaction.*

» *Overall: The 1 Plant secondary treatment (1a) option set centralizes all flows at Rock Bay, including up to 10MLD for local reuse. This option set addresses the need to meet pending regulations and provides for the base level of service.*

Option set >>
1B Rock Bay -Tertiary

Description

- Rock Bay is a central facility for all flows up to 4xADWF including full tertiary treatment plus disinfection. Water reuse can be implemented in the Gorge-Rock Bay-North Downtown areas, or other areas as needed over time. Full tertiary treatment opens up the possibility of a harbour outfall.
- Solids-energy recovery can be centralized at Rock Bay or Hartland Landfill. Truck traffic is estimated at ~5 trucks per day in 2030.
- Macaulay catchment flows are directed to Rock Bay for treatment. Any flows not reused are routed through the Clover Point outfall. All flows will exceed the regulations.
- Heat recovery systems can be considered around Rock Bay and along the effluent line to Clover.
- Available site(s) are suitable from a technical perspective and align well with public input to date.
- Life cycle costs reflective of the economies of scale presented by a central plant however with the added cost of additional energy, operations and treatment processes for tertiary quality.

Scenario	2030 Capital	2030 Operating	Est. Resource Income
Rock Bay Tertiary	$1,131 M	$26.4M	Up to $0.9 M

Life Cycle Costing Analysis | Highlights

- A central plant at Rock Bay with tertiary treatment demonstrates the 4th highest capital costs and 3rd highest operating costs;
- Net present value for Option 1b is approximately 15% higher than for Option 1a
- Resource incomes reflect the proposed reuse system near Rock Bay as in Option 1a
- Sensitivity analysis related to resource incomes and discount rates did not change the relative financial performance of Option 1b

Total $1,131M -

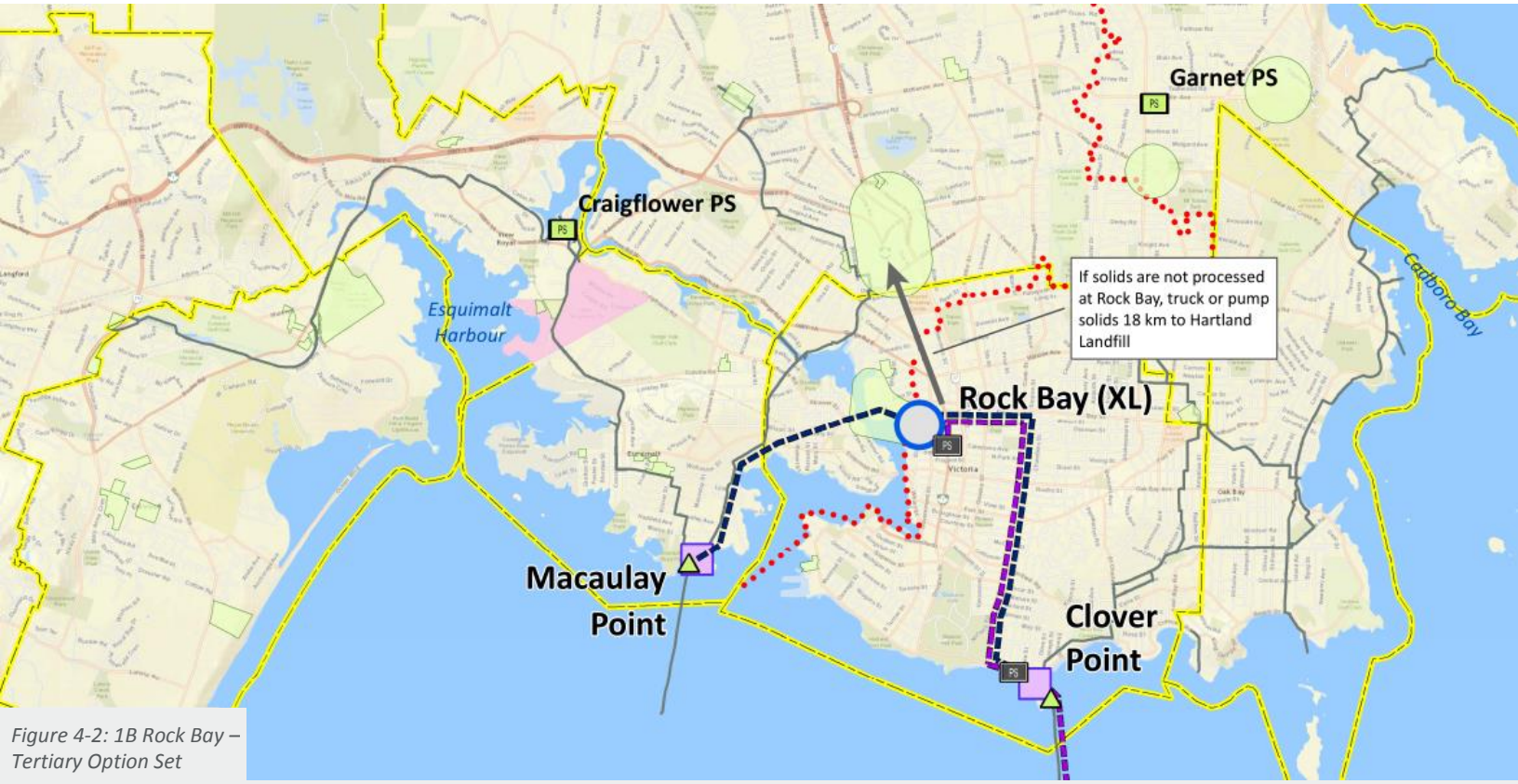


Figure 4-2: 1B Rock Bay – Tertiary Option Set

CRITERIA RESULTS >>

» Length of New Conveyance Pipe 16.7 km	» % of Effluent @ Tertiary Quality Up to 100%	» Rank: Carbon and Energy Footprint 3rd
» Rank: Low Operating Cost 3rd	» Ratio of Income to Costs for Water Reuse 0.45	» Ratio of Income to Costs for Heat Recovery 0.60

Option Set Characterization

» *Neighborhood-Land Use: A central plant at Rock Bay appears to align best of all locations given public sentiment to date. The industrial, mixed-use designation supports the site activities including and other routine treatment processes. Capital works at Rock Bay should consider local planning objectives and provide for positive public interaction.*

» *Overall: The 1 Plant full tertiary treatment (1b) option set centralizes all flows at Rock Bay, including up to 10MLD for local reuse. This option set represents a clear sentiment towards water stewardship by raising levels of service for treated effluent quality.*

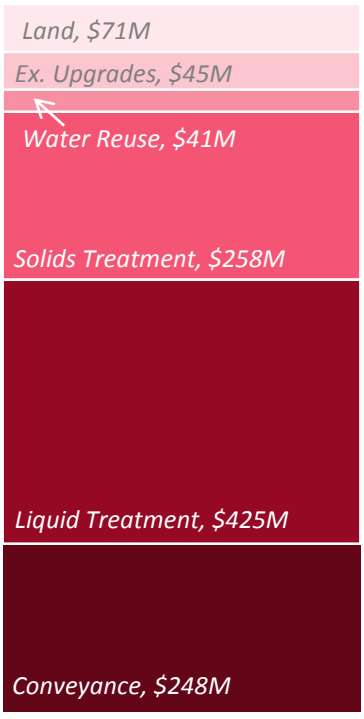
Option set >>
2-Plant Rock Bay and Colwood

Description

- Rock Bay provides treatment for up to 100% of all flows but accounts for additional capacity at Colwood to treat up to 10MLD at tertiary quality. Sidestream tertiary provided at Rock Bay for local reuse.
- The Colwood plant requires minimal new conveyance infrastructure but requires redundant capacity at Rock Bay to avoid a second outfall. Reuse systems provided at both Rock Bay and Colwood.
- Solids-energy recovery can be centralized at Rock Bay or Hartland Landfill. Truck traffic is estimated at ~5 trucks per day in 2030.
- Flows from the rest of Macaulay catchment (except Colwood) are directed to Rock Bay for treatment. Any flows not reused are routed through the Clover Point outfall.
- Heat recovery systems possible in Colwood (e.g. civic recreational facilities) and adjacent to the treated effluent outfall route from Rock Bay to Clover point.
- Available sites are suitable from a technical perspective and align well with public input to date.
- Life cycle costs illustrate the effect of increased levels of service for tertiary reuse at Colwood.

Scenario	2030 Capital	2030 Operating	Est. Resource Income
2 Plant	$1,088 M	$22.8 M	Up to $2.4 M

Total $1,088M -



Life Cycle Costing Analysis | Highlights

- A central plant at Rock plus tertiary plant in Colwood increases capital and operating costs for expanded water reuse; capital and operating costs both rank 2nd among the option sets
- Net present value for the 2 Plant option is approximately 4% higher than for Option 1a
- Resource incomes for the 2 plant option demonstrate the most cost-effective water reuse approach
- Sensitivity analysis related to discount rates did not change the relative financial performance of the 2 plant option

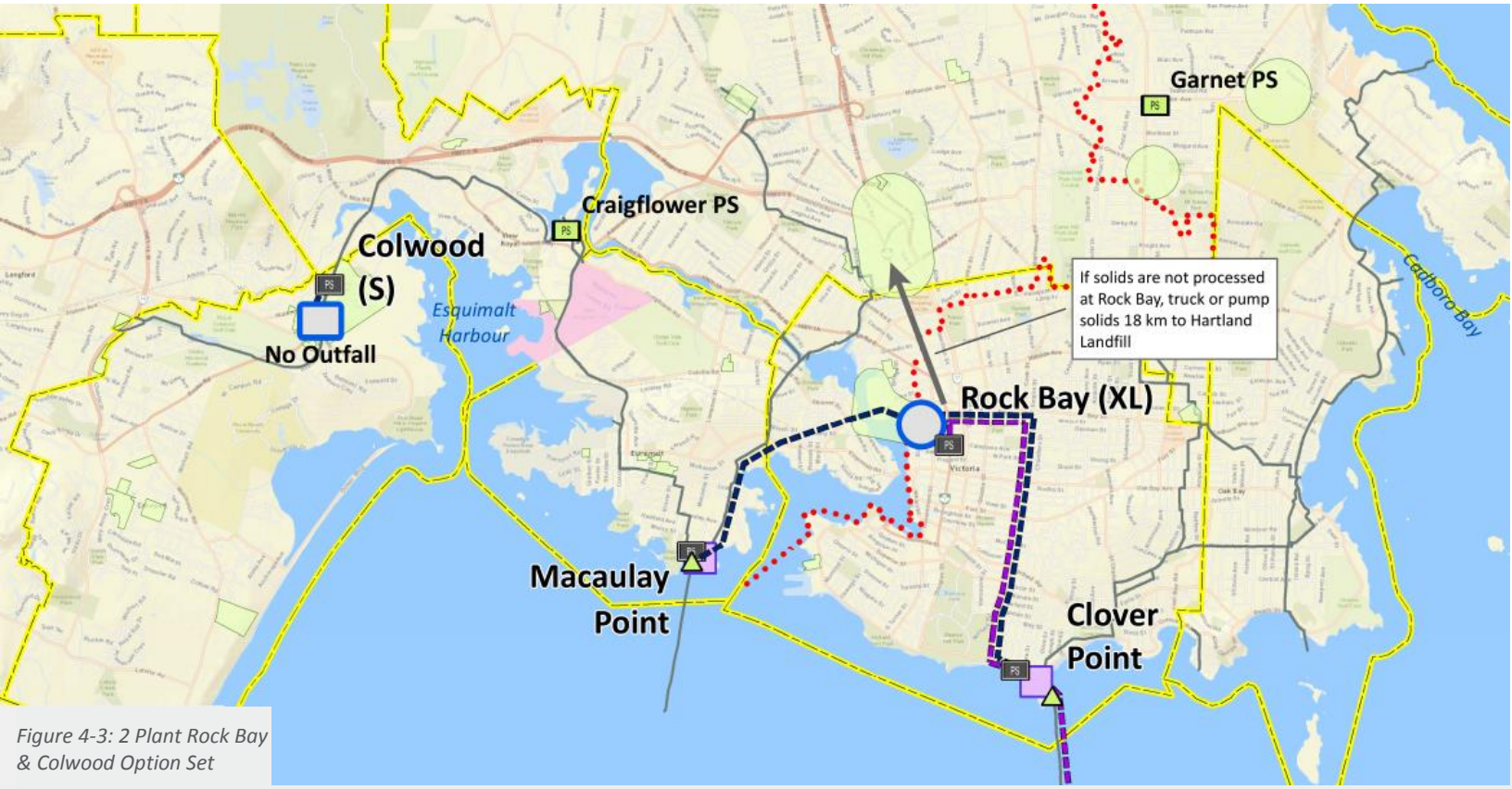


Figure 4-3: 2 Plant Rock Bay & Colwood Option Set

CRITERIA RESULTS >>

» Length of New Conveyance Pipe (incl. Colwood reuse)

36.2 km

» % Of Effluent @ Tertiary Quality

Up to 20%

» Rank: Low Operating Cost

2nd

» Rank: Carbon and Energy Footprint

2nd

» Ratio of Income to Costs for Water Reuse

0.40

» Ratio of Income to Costs for Heat Recovery

0.60

Option Set Characterization

» *Neighborhood-Land Use: Rock Bay and Colwood are both situated in growth centers, one mixed-use and the other primarily industrial. Odour will be minimized to unnoticeable levels; noise and trucking will be mitigated and not dissimilar from local land uses. Both facilities should include features that align with local planning objectives and provide for public interaction with the facility and neighboring features e.g. harborrfront, local parks.*

» *Overall: The 2 Plant option set treats over 80% of flows to secondary levels, on top of up to 20% tertiary quality effluent. This option set represents a notable increase in water reuse from the 1-plant option with minimal extra conveyance infrastructure.*

Option Set >>
4 Plant

Description

- Flows are collected, treated and recovered on a sub-regional basis. Flows from west Saanich and west Victoria are pumped to Rock Bay for all flows up to 2xADWF. Flows up to 4xADWF from the Westside are pumped from Macaulay back to Esquimalt Nation for advanced secondary (includes disinfection) plus sidestream tertiary for local reuse in both the Rock Bay and Esquimalt areas.
- The Colwood and East Saanich plants require minimal new conveyance infrastructure but require redundant capacity at Esquimalt Nation and Rock Bay (respectively) to avoid additional outfalls. Reuse systems at proposed for all four plants. The East Saanich facility may only be in use during the irrigation season (initially).
- Solids-energy recovery can be centralized at Rock Bay or Hartland Landfill. Truck traffic is estimated at ~5 trucks per day in 2030. Solids from Colwood are piped (uses regular collection trunk) to Esquimalt Nation where they are dewatered and combined for trucking to Rock Bay or Hartland (< 5 trucks per day).
- Any flows not reused by any of the four plants are routed through the Macaulay and Clover Point outfalls. All flows meet or exceed the regulations, including up to 25% reuse.
- Available sites are technically suitable to host a treatment facility.
- Life cycle costs are reflective of the infrastructure needs to accommodate sub-regional flows and increased treatment levels for reuse.

Scenario	2030 Capital	2030 Operating	Est. Resource Income
4 Plant	$1,195 M	$25.3 M	Up to $3.8M

Total: $1,195 M

Life Cycle Costing Analysis | Highlights

- Two secondary plants plus an additional two tertiary facilities reflects the 3rd highest capital and 4th highest operating costs;
- Net present value for the 4 plant option is approximately 12% higher than for Option 1a
- Resource incomes for the four plant option are second highest and demonstrate the 2nd most cost-effective water reuse approach
- Sensitivity analysis related to discount rates did not change the relative financial performance

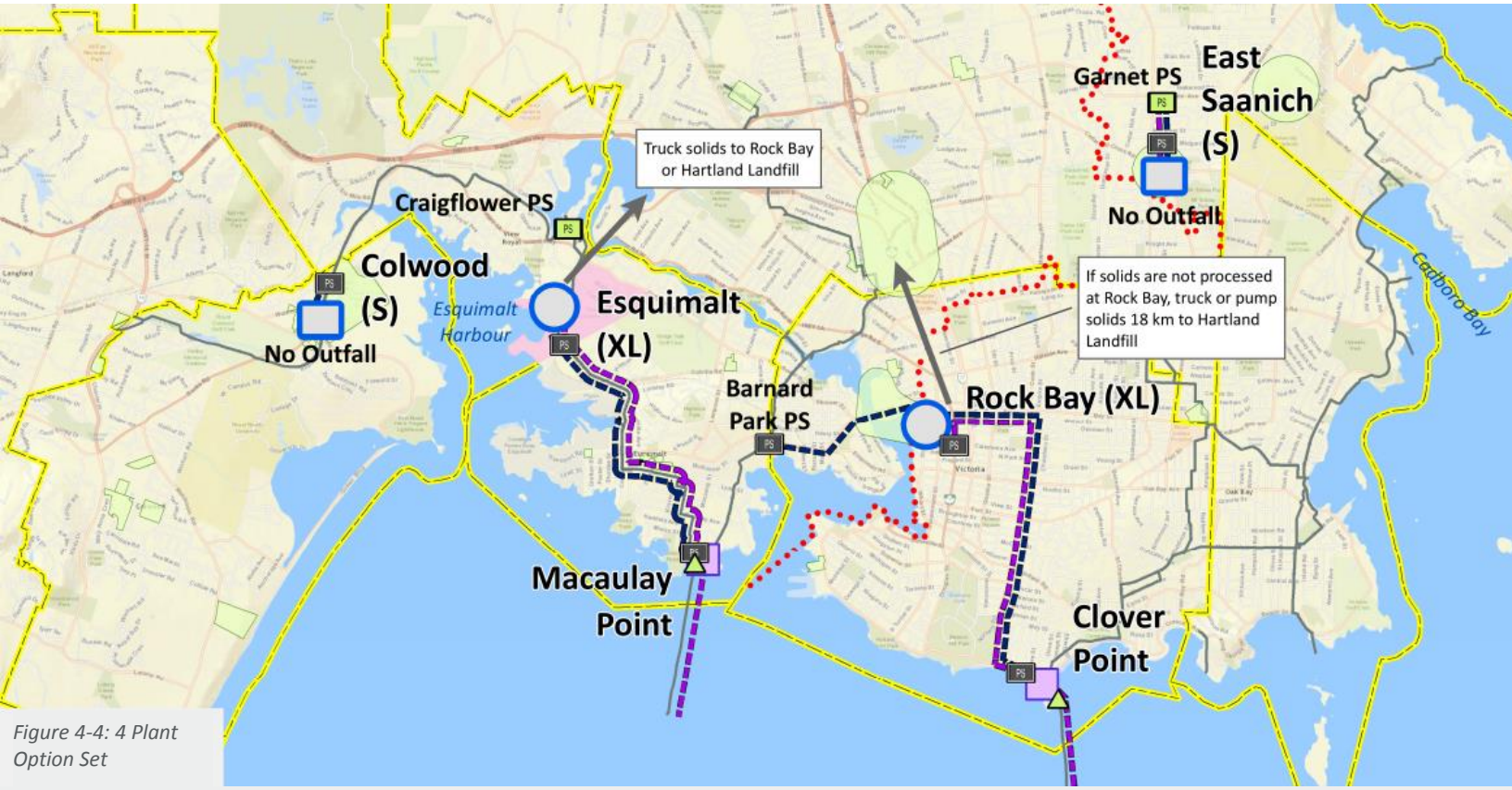


Figure 4-4: 4 Plant Option Set

CRITERIA RESULTS >>

» Length of New Conveyance Pipe

66.8 km

» % of Effluent @ Tertiary Quality

Up to 25%

» Rank: Low Operating Cost

4th

» Rank: Carbon and Energy Footprint

4th

» Ratio of Income to Costs for Water Reuse

0.39

» Ratio of Income to Costs for Heat Recovery

0.60

Option Set Characterization

» *Neighborhood-Land Use:* Rock Bay, Esquimalt Nation and Colwood are both situated in mixed-use, growth centers. Odour will be minimized to unnoticeable levels; noise and trucking will be mitigated and not dissimilar from local land uses. Both facilities should include features that align with local planning objectives and provide for public interaction with the facility and neighboring features e.g. harbor front.

» *Overall:* The 4 Plant option set is *a sub*-regional system treating over 75% of flows to secondary levels, on top of up to 25% tertiary quality effluent. This option set represents the middle ground for distributed facilities and includes water reuse systems in four major growth centers.

Option set >>
7 Plant

Description

- Flows are collected, treated and recovered on a sub-regional basis. Flows from west Saanich are partly directed to the Core Saanich Plant, while remaining flows combine with west Victoria flows for pumping to Rock Bay. Westside flows for 0-2x ADWF are treated on a municipal-by-municipal basis with interconnecting piping systems for outfall at either Royal Bay or Macaulay point.Wet-weather flows for the Westside are accommodated at Esquimalt (Town) plant. Almost all flows for Eastside are treated at Rock Bay, except reuse tertiary treatment at East and Core Saanich.
- The Core Saanich and East Saanich plants require minimal new conveyance infrastructure but require redundant capacity at Rock Bay to avoid additional outfalls.
- Solids-energy recovery can be centralized at Rock Bay or Hartland Landfill. Truck traffic is estimated at ~1 truck per day for Colwood and Langford, and ~2 trucks per day for Esquimalt in 2030, with solids heading to either Rock Bay or Hartland Landfill. Solids at East Saanich and Core Saanich are piped through existing sewers to Rock Bay.
- Any flows not reused by any of the seven plants are routed through the Macaulay, Clover Point or Royal Bay outfalls. All flows meet or exceed the regulations.
- Available sites are technically suitable to host a treatment facility.
- Life cycle costs are reflective of the infrastructure and capacity needs to treat flows to higher levels of service for the Westside as well as the costs related to additional conveyance, outfalls and water reuse systems.

Scenario	2030 Capital	2030 Operating	Est. Resource Income
7 Plant	$1,348 M	$26.6 M	Up to $4 M

Life Cycle Costing Analysis | Highlights

- 6 tertiary treatment plants coupled with a large secondary treatment plant at Rock Bay reflect the highest capital and operating costs
- Net present value for the 7 plant option is approximately 25% higher than for Option 1a
- Resource incomes are only slightly higher than the 4 plant due to lack of demand relative to supply;
- Sensitivity analysis related to discount rates did not change the relative financial performance

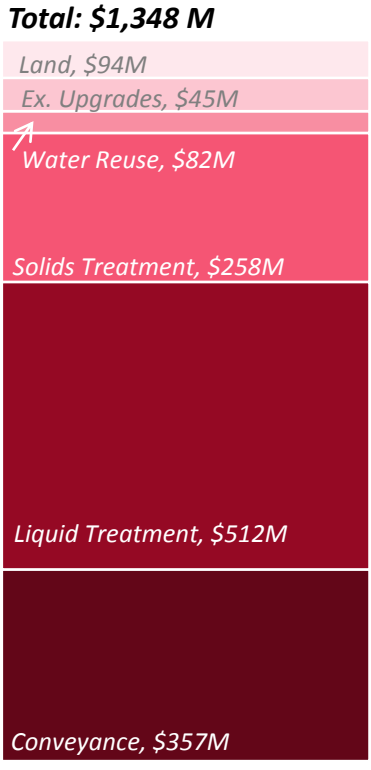


Figure 4-5: 7 Plant Option Set

CRITERIA RESULTS >>

» Length of New Conveyance Pipe 86.7 km	» % of Effluent @ Tertiary Quality Up to 45%
» Rank: Low Operating Costs 5th	
» Rank: Carbon and Energy Footprint 5th	» Ratio of Income to Costs for Water Reuse 0.35
» Ratio of Income to Costs for Heat Recovery 0.55	

Option Set Characterization

» *Neighborhood-Land Use: Rock Bay, Esquimalt Nation and Colwood are both situated in mixed-use, growth centers. Odour will be minimized to unnoticeable levels; noise and trucking will be mitigated and not dissimilar from local land uses. All facilities should include features that align with local planning objectives and provide for public interaction include contribute to local building form.*

» *Overall: The 7 Plant option set is a sub-regional system treating less than 60% of flows to secondary levels, on top of up to 45% tertiary quality effluent (including all flows on the Westside). This option set represents a fully distributed system which maximizes the potential for water reuse and situates facilities in 7 growth areas.*

4.6 Criteria Results: Remaining Focus Areas

Technical criteria stemming from the Project Charter frame the overall performance characteristics of each option set. Sections 3 and 4 of this memo have covered performance results of most of the technical criteria, except for the criteria outlined in Table 7. Performance considerations and results illustrate the application of the criteria to the five option sets and solids-energy technologies.

Table 4-1: Criteria Considerations and Results

Criteria	Performance Considerations	Result
Certainty of long-term demands and revenues (resource recovery)	*Heat recovery and water reuse customers likely to emerge over time based on need (for water) and energy pricing + new development (for heat)*	*Option set 1a and 2 demonstrate the highest income:cost ratios and likely warrant greatest attention*
Extent of support for community building	*Facilities that suit local land use and enhance the existing site use present the highest performance*	*All option sets include sites in growth nodes or industrial-commercial centers allowing for public investment to enhance community building; sites in Esquimalt (Town) and Core Saanich may pose slightly lower performance (Option Set 7) because these are located in parks;*
Ability to produce high-quality air-emissions	*Very little air quality concerns arise from liquid treatment (aside from odours and all option sets include provision of extensive odour control equipment) however emissions for solids-energy recovery are indicative of option set performance*	*Unlike anaerobic digestion, gasification facilities must undergo air quality permitting (Ministry of Environment), however, gasification can lead to reduced carbon emissions via integration with solid wastes which likely outweighs the air quality concerns*
Ability to improve effluent quality over the life of facility	*Changing regulations or environmental conditions may warrant increased levels of treatment; treatment technologies in the representative design allow for additional processes as required*	*This criteria is likely best suited to evaluating private sector proposals for meeting the performance criteria of the LWMP*
Extent to provide for positive public interaction	*Modern wastewater facilities should be designed and operated to suit local aspirations*	*This criteria is likely best suited to evaluating private sector proposals for meeting the performance criteria of the LWMP; public input can inform local objectives for public interaction*

Criteria	Performance Considerations	Result
Reduction of risk/interruption to neighborhoods from facility failure	*Wastewater facilities can experience unplanned maintenance; while typically rare, consideration should be given to the consequences of these events*	*Option set 1a/1b and perhaps 4 plant demonstrate lower interruption risks; Sites in industrial areas likely pose least risk; anaerobic digestion is considered a reliable technology; there are very limited gasifiers of wastewater solids and reliability performance is not well known* *Option set 1a/1b and 2 provide for lowest trucking configurations in particular if solids are pumped and processed at Hartland Landfill*
Site/design resiliency for seismic and sea level rise	*Reliable, ongoing operation of wastewater facilities post-disaster provides for public health and environmental protection*	*Seismic risks exist throughout the Core Area and no site is unexposed; sea level rise resiliency at Rock Bay and Esquimalt Nation can be accommodated site with site grading and strategic equipment placement*

4.7 Future Feasibility Considerations

Phase 2 analyses, including results presented in Technical Memorandum #3, outline the financial and engineering feasibility of the five proposed option sets. Preferred option set(s) will require additional engineering analysis typical of preliminary design phases, including:

- Pipe route optimization
- The cost benefit of phosphorous removal (treatment) and recovery if a harbour outall is pursued
- Site specific land improvement costs such as rock, dewatering, seismic design and other geotechnical considerations
- Site area and building footprint optimization
- Architectural requirements and off site development
- Additional procurements analysis, cost risks, liabilities and implementation planning (procurement considerations are located in Appendix E)

Considerations like these are best studied and refined in concept or preliminary design exercises once a preferred option has been selected.

APPENDIX A – TECHNICAL MEMORANDUM #1 (EXCERPT)

Capital Regional District

Core Area Liquid Waste Management Plan

Wastewater Treatment System Feasibility and Costing Analysis

Technical Memorandum #1

Background and Technical Foundation

carollo
Engineers...Working Wonders With Water™

URBAN systems

402 – 645 Fort Street
Victoria, BC, V8W 1G2

urbansystems.ca

October 22, 2015

Project: 1692.0037.01

Table of Contents

Appendices

1.0 Introduction and Methodology

1.1 Project Background

Phase 2 analysis is an important chapter in an ongoing decision making process. Phase 1 included a constructive engagement process to characterize sites and option sets and collect public input on their values for wastewater treatment. Future phases, Phase 3 and beyond, allow the Core Area Committee and the Regional Board to confirm detailed performance criteria that ultimately becomes an owners' statement of requirements, or similar, for responses by the treatment and resource recovery market(s) to price, build and commission and potentially operate a core area wastewater solution. It is critical that the Phase 2 methodology respect the multi-phase sequence of this project and deliver on specified milestones, such as to assess systems and technologies, however not to select ultimate products and or technologies but rather to help the Core Area Committee define the required characteristics of the future system and provide a characterization of the option sets. All option sets may proceed to Phase 3 or it may become apparent that a subset of the option sets achieve the desired objectives and move forward to subsequent phases. Overall, the three phase analysis is summarized below.

Process Summary	
Phase 1:	Identify Sites and Option Sets and Collect Public Input on Values
Phase 2:	Confirm Performance Criteria and Characterize Financial/Environmental/Social Aspects of Option Sets
Phase 3+:	Finalize/Narrow Options, Determine Preferred Method to Engage with Private Sector, Confirm Funding Approach, Amend LWMP, Select Partners, Deliver Project(s), Operate Systems

.

In effect, Phase 2 technical and costing analysis includes assessments and calculations that enable preliminary performance criteria to be tested and refined. The results of the process and analysis will enable the Committee to decide and direct on future performance criteria and infrastructure siting locations based in part on industry best practice, regional context and long-term service delivery excellence. Phase 2 significantly advances the Committee to confirming its requirements for a Core Area wastewater solution and serves to screen the options based on project criteria.

A process for establishing performance criteria typically involves key ingredients as outlined below.

- **Preliminary Design Criteria:** A project charter frames the project and provides guidance for analysis and outcomes. Preliminary criteria should be derived from the charter goals and commitments and later, the criteria can instruct the engineering and costing analysis.
- **Representative Design:** Employing the preliminary design criteria against technical options and technologies begins to frame up the market possibilities (e.g. technologies, resource recovery pathways, pipe alignments, etc.) for a Core Area system. Representative design includes provisionally selecting technologies and system configurations to characterize the relative value of available options and encourage deeper dialogue on the particulars of any commissioned facilities. While analysis and reporting will refer to specific solutions these are

not recommended outcomes; instead, the results of the representative design allow the criteria to come to life for a deeper understanding including life-cycle costing.

- **Life-Cycle Costing:** Potential ratepayer impacts based on proposed levels of service are crucial to performance criteria. Each option set will be assessed using capital, operating and revenue characteristics which will uncover the trade-offs in Core Area alternatives and likely lead to further iterations in future phases. For Phase 2, these costs are Class D only for the purpose of comparing options with significant contingencies due to the nature of the unknowns.
- **Presentation of Alternatives:** Option sets analysis will convey the ability of multiple solutions to meet the criteria and aspirations of the Core Area. While no single alternative will be able to fully address the criteria, it is the presentation of the alternatives and the ensuing debate that will help to clarify the refined set of technical criteria.
- **Refined Criteria:** Final reporting will center on the evolution and rationale for the stated, refined technical criteria. Future phases will test these criteria further so as to confirm the Committee's final statement of requirements (for one or more contracts) for responses by the wastewater treatment and resource recovery market.

Our work plan and methodology follow these ingredients explicitly. We endeavour to translate the project charter into preliminary design criteria, undertake technical analysis and present alternatives so as to provide information for direction by the Committee on their refined performance criteria. Technology and option set evaluations are provisional for deeper understanding of the criteria.

1.2 Preliminary Criteria

There is a need to focus the broad range of treatment and engineering solutions to arrive at a representative design that can be used to develop Class D life-cycle financial scenarios. While private sector submissions will help to finalize the ultimate system design based on prescribed owner's requirements, establishing criteria based on the Project Charter will guide representative design parameters. These parameters will become a key step in setting performance criteria for the project and ultimately guide the technical analysis through Fall 2015 to support Committee direction on preferred system configurations and outcomes.

These criteria are preliminary but suitable for carrying out Phase 2 and stem from the Committee's Charter. Input from the Technical Oversight Panel and direction by the Committee will enhance these criteria and ensure that design parameters align with Core Area expectations and public input to date. Criteria are used to assess alternatives and arrive at potential options that suit the multiple needs and goals of the project. The Charter's Goals and Commitments (left column) frame the criteria.

The preliminary criteria outlined in this Technical Memo provide the basis for detailed technical criteria to develop a representative design and also allow for a comprehensive presentation of the option sets toward the end of Phase 2. Direction from the Committee in December 2015 will allow the CRD to take further steps to refine the performance criteria for a market response to a Core Area solution.

Technical Memorandum #2 will apply the initial steps of our methodology and the preliminary criteria against the defined option sets for further analysis. Additional feedback from the Technical Oversight Panel and ultimately, direction by the Committee, will finalize the option set analysis through Fall 2015.

1.3 Proposed Option Sets Evaluation: Considerations for Decision Making

Phase 2 feasibility and technical analysis provides for an evaluation of 4 option sets across the Core Area. Each option set includes different extents of infrastructure, facilities, services, risks and operations. Life-cycle costing is a core element of the option set evaluation.

Committee direction from June 2015 centers on life-cycle costing analysis which includes design and construction contingencies, administration costs, escalation, inflation, environmental costs as well as capital, operating and maintenance costs. This type of analysis is consistent with comparisons of major capital projects to screen options and further, supports staff and consultants in determining potential allocations per municipality.

In addition to financial analysis, each option set will be further assessed based on its performance against the preliminary criteria stemming from the Charter and from public values from previous phases. While the assessment will be primarily qualitative in nature, the characterization of social benefits, environmental values, risks and service governance will be supportive for Committee direction. Neither the financial analysis nor the qualitative assessment are enough on their own to confirm direction, but instead, it's the balance of needs and aspirations reflected across the entire suite of criteria from which reasonable direction can be made.

1.4 Option Set Evaluation Methodology

Evaluating option sets is led by the Project Goals and Commitments and the established technical criteria. Whether centralized or distributed, it is the ability of any one option set to best meet the goals of the project that warrants even further optimization by the Committee in future phases. Designing the option sets must consider the evaluation method, hence why both methods are included.

Option Set Design Consideration

- Confirm flows by catchment area and site node.
- Inventory supply and demand projections for water and heat recovery reuse across site nodes in the Core Area. Locate potential customers and define their product needs including barriers and pricing considerations.
- Locate treatment facilities (liquids and or solids) among available sites with consideration to existing infrastructure, land uses, road access and synergies with neighboring site nodes.

- Apply regulatory requirements and overlay with existing infrastructure to meet reliability needs without excess infrastructure.
- Develop conceptual resource recovery infrastructure systems to convey resources to their demands. Look for synergies with neighboring site nodes to reduce unnecessary infrastructure.
- Incorporate various processes and technologies to meet the resource recovery, regulatory and neighborhood considerations. Each option set should look to address a different level of service (in line with the criteria) to allow for lateral comparison of all option sets.
- Optimize resource recovery infrastructure to suit the supply demand balance e.g. focus toward the size of treatment facility to suit actual reuse needs and look for phasing to support growth.
- Confirm regulatory and risk-management needs including ultimate disposal of water as required. Confirm limitations and service governance considerations for implementation and operation.
- Iterate design considerations for 2030 and 2045 scenarios.

Evaluation

- Summarize the technical and engineering elements and characterize their relative levels of service.
- Create aggregate resource recovery summary (qualitative and quantitative) for comparative and communication purposes including overall benefits to community, climate change considerations, others.
- Inventory life-cycle costing elements including construction, operation, maintenance and revenues.
- Present life-cycle costing results including sensitivity analysis for various risk, revenue and contingency factors.
- Characterize operations and service governance needs, risk considerations, preliminary economic factors (e.g. supply and demand, pricing), qualitative elements such as social-benefits stemming from the ability to deliver on community aspirations such as water reuse, advanced treatment and other returns on investment that aren't readily quantifiable.
- Assess distributed option sets against technical criteria (Section 1.2).
- Discuss option sets against all project goals of the Charter.
- Reflect on criteria, project goals, and financial results and develop balanced scorecard approach to presenting the option sets.
- Consider recommendations for Committee consideration which may include further refinements of the option sets to best suit the needs of the Core Area.

Technical Memorandum #2 will provide extensive inventories of the option set designs whereas Technical Memorandum #3 will present the evaluation of each option set.

2.0 Design Criteria

2.1 Design Horizon

Most of the work undertaken to date targets meeting the population/flow requirements to the year 2030, with preliminary consideration to flows in 2045 and 2065. These design horizons are consistent with funding applications and businesses cases and therefore could be adopted for Phase 2. Phase 2 feasibility and technical analysis will address infrastructure and life cycle costing for both the 2030 and 2045 design years.

2.2 Design Populations

Previous phases of analysis researched and collated residential populations in each of the seven (7) municipalities and two (2) First Nations, as well as developed equivalent populations for the industrial, commercial and institutional sectors within each area. Population and flow projections are a considerable resource for Phase 2 and we propose to utilize available information following a preliminary screening on their suitability at this time.

Growth rates have been estimated a low rate (at 1.3%/year) and a high rate (at 2.1%/year). Aggregate populations provide a scale of growth for the Core Area however Phase 2 design and analysis will consider municipal by municipal growth to account for locally-specific design capacities. Overall, growth rates to 2030 and 2045 are tabulated below and include population equivalent contributions from industrial, commercial, and institutional sources

	@ 1.3%/year growth	@ 2.1%/year growth
Core Area Population (eq.) 2030	436,000	494,000
Core Area Population (eq.) 2045	570,000 (1)	669,000

(1) Derived from Discussion Paper 033-DP-1

Actual flow projections are based on municipal expectations as communicated to the CRD which are outlined in the following section.

2.3 Flows

Table 2.3.1 summarizes the design flows for 2030 and 2045. While there are nuances and potential discrepancies for flow estimates, Table 2.3.1 appears to reflect the most current CRD estimates with general agreement by the municipalities. We intend to move forward for Phase 2 relying upon the flow estimates in column 1, which we note are different than the flow estimates as provided by the Westside Technical Committee.

The flows noted are based on average dry weather flows (ADWF which aligns directly with the regulatory requirements of the Municipal Wastewater Regulation, as outlined in Section 2.5.1.

Recent direction from the Westside Select Committee is that engineering analysis for Westside Option Sets should account for the flows from west Saanich and west Victoria currently destined for the Macaulay outfall. Flows from the Eastside that travel to the Macaulay outfall are represented in Table 2.3.1.

To account for ongoing water conservation programs and demand management initiatives, the projected per capita flow rates decrease around the Core area from 225 to 250 litres per capita per day now to 195 in 2030 and 2045. Flows are presented in megaliters per day (MLD) which is a summation of the population equivalents per catchment area based on the per capita estimates.

Table 2.3.1 - Core Area 2030 and 2045 Design Flow Allocations

Location		ADWF (MLD)		
		2030 (1)	2030 (2)	2045 (3)
A.	**Clover Outfall**			
	- Oak Bay	6.6	-	6.6
	- East Saanich	9.2	-	12.8
	- East Victoria	31.9	-	34.0
	Sub-Total	**47.7**	**-**	**53.4**
B.	**Macaulay Outfall**			
	- Langford	14.1	14.1	23.1
	- Colwood	4.7	4.7	13.1
	- View Royal	3.5	3.5	7.9
	- Esquimalt First Nation	0.3	0.7	0.4
	- Songhees First Nation	0.4	0.7	0.5
	- Esquimalt	7.1	6.2	7.9
	- West Victoria	6.4	1.0	6.8
	- West Saanich	23.7	16.5	32.9
	Sub-Total	**60.2**	**47.4**	**92.6**
	Totals	**107.9**		**146.0**

(1) Core Area LWMP Committee Presentation by CRD Staff, October 14, 2015

(2) Flows assumed by Westside

(3) Derived from CRD 2030 projections (first column). Refer to Appendix A for derivations

2.4 Influent Wastewater Quality and Loads

The CRD collects 24 hour composite samples and tests the influent effluent for numerous parameters. A summary of the 2014 data is included in Appendix B. The most relevant influent sewage concentration data from 2014 are summarized in Table 2.4.1. This data is consistent with historical reports prepared for the Core Area LWMP, the latest being the January 23, 2013 Technical Memo "Indicative/Detailed Design/Wastewater Characterization and Design Loads". Table 2.4.1 also includes a summary of the 2030 maximum month loads, which are used to size the biological components of the plants. To account for flow and load variability, design factors account for the maximum load that the facility will experience in any 30 consecutive days which typically represents the 92 percentile of the data set analyzed for 2014. The proposed flow-load variability factor is set at 1.25 times the average loading.

Table 2.4.1 – Average Influent Quality Concentrations and Maximum Month Loads for 2030 Flows (1)

Parameter	Macaulay		Clover	
	Average (mg/L)	Max Month (kg/d)	Average (mg/L)	Max Month (kg/d)
Carbonaceous BOD_5	226	17,010	192	11,450
Total BOD_5	275	20,700	238	14,190
Total Suspended Solids	270	20,320	238	14,190
Chemical Oxygen Demand (COD)	632	47,560	530	31,600
Ammonia	42	3,160	27	1,610
Alkalinity	217	16,330	168	10,020
Total Kjeldal Nitrogen	54	4,060	40	2,385

(1) Note influent pH ranges from 7.3 to 7.7 typically

2.5 Liquid Effluent Criteria

2.5.1 Introduction

Two regulations currently govern effluent discharges in BC – The Federal Wastewater Systems Effluent Regulation (WSER) and the BC Municipal Wastewater Regulation (MWR). The WSER deals only with discharges to surface waters and has marginally different criteria than the MWR. The MWR addresses discharges to surface water, ground, wet weather flows and for reclaimed water. Both provincial and federal governments intend to harmonize the regulations which will affect the effluent criteria.

There is a strong sentiment within the Core Area to reuse reclaimed water as much as possible. To facilitate this sentiment, it is proposed that effluent destined for reuse meet the *Greater Exposure Potential Category* for reclaimed water as defined in the BC Municipal Wastewater Regulation. This level of quality is similar to the

requirements of the Canadian Guidelines for Domestic Reclaimed Water for Use in Toilet and Urinal Flushing and the California Title 22 Regulation and would permit all reclaimed uses except indirect and direct potable reuse applications. It is our understanding that this would also be acceptable for aquifer recharge based on work currently being undertaken by the City of Colwood. If the CRD was to limit the reuse to irrigation on restricted public access sites only, then the standard of effluent quality could be reduced to *Moderate Exposure Potential Category* which is basically equivalent to secondary treatment as defined in Section 2.5.4. Also, secondary treatment is suitable for discharge to most marine environments but the outfall depth must be positioned at 30 m or more which effectively rules out any discharge to the inner harbour.

Stream augmentation is cited in the regulations whereby treatment must be greater than secondary (tertiary) with effluent criteria to suit the receiving environment. However, MWR requires an alternate disposal or storage for reclaimed water (stream augmentation or reuse) as follows:

"Alternate Disposal or Storage

114 (1) A person must not provide or use reclaimed water unless all of the following requirements are met:

(a) There is an alternate method of disposing of the reclaimed water that meets the requirements of this regulation or is authorized by a director.

(b) Treatment processes are built with the minimum number of components specified in the applicable reliability category for the alternate method of disposal, as described in section 35 *[general component and reliability requirements]*;

(c) If there is no immediate means of conveyance of the municipal effluent or reclaimed water to the alternate disposal method, the wastewater facility has 48 hours' emergency storage outside the treatment system.

(2) Despite subsection (1) (a), a director may waive the requirement for an alternate method of disposal for reclaimed water that is not generated from residential development or institutional settings if an alternate method is not required to protect public health or the receiving environment and the wastewater facility has

(a) 48 hours' emergency storage outside the treatment system and the ability to shut down generation of municipal wastewater within 24 hours, or

(b) A dedicated storage system that is designed to accommodate:

i. At least 20 days of design average daily municipal effluent flow at any time,

ii. The maximum anticipated volume of surplus reclaimed water, and

iii. Storm or snowmelt events with a less than 5-year return period.

(3) Despite subsections (1) (a) and (2), if reclaimed water is discharged from a wastewater facility directly into a wetland, a director may waive the requirement for an alternate method of disposal if an alternate method of disposal is not required to protect public health or the receiving environment.

Failure to meet municipal effluent quality requirements

115 (1) If municipal effluent does not meet municipal effluent quality requirements, a provider of reclaimed water must ensure that the municipal effluent is diverted immediately to

(a) An alternate method of disposal, as provided for in section 114 (1) (a) *[alternate disposal or storage]*, or

(b) Emergency storage or a dedicated storage system, as described in section 115 (1) (c) or (2),

Until municipal effluent quality requirements are met and reclaimed water uses may continue.**"**

These regulatory requirements strongly suggest that an alternate ocean outfall is required if stream augmentation is pursued.

A discharge to a wetland may be possible without requiring an alternate method of disposal, but this would require a specific environmental impact study and a waiver from the Director of the Ministry of Environment. A discharge to a wetland has not been considered in our analyses at this time however may be considered at the direction of the Committee.

The MWR and previous liquid waste management plan amendments further regulate the quality of effluent with respect to wet weather flows, as tabulated below:

Effluent Criteria	Macaulay Outfall	Clover Outfall
Secondary	0 – 2 x ADWF	0 – 2 x ADWF
Primary	2 – 4 x ADWF	2 – 3 x ADWF
Screening (6 mm Ø)	> 4 x ADWF	> 3 x ADWF

ADWF = Average Dry Weather Flow

2.5.2 Ammonia and Toxicity

Ammonia and toxicity in wastewater effluent is a complicated topic which is discussed in detail in Appendix C. In summary, the Federal and BC governments have criteria that regulate the amount of ammonia in the effluent, in particular to the un-ionized ammonia concentrations. Our research and analysis concludes (Appendix C) that it is not necessary to reduce ammonia in the wastewater treatment plants to comply with both the federal and provincial regulations before discharging out the Clover and Macaulay outfalls. Enhanced treatment would be required however for any option that contemplates stream augmentation and/or wetland discharges.

2.5.3 Primary Liquid Effluent

The MWR requires primary effluent to meet:

$CBOD_5$ ≤ 130 mg/L

TSS ≤ 130 mg/L

2.5.4 Secondary Liquid Effluent plus Disinfection

Ocean outfall effluent criteria should best address both the federal and provincial regulations, as proposed in the table below, and based on the requirement of outfall diffusers at a minimum depth of 30 m below the surface.

Parameter	Units	Average Concentration	Maximum Concentration
$CBOD_5$	mg/L	≤ 25	≤ 45
TSS	mg/L	≤ 25	≤ 45
Un-ionized Ammonia in Effluent	mg/L	NA	≤ 1.25 (1)
Un-Ionized Ammonia at End of Dilution Zone	mg/L	NA	≤ 0.016 (1)
Total Residual Chlorine	mg/L	NA	≤ 0.02
Faecal Coliforms	cfu/100 mL	NA	≤ 200 (2)

(1) Only one of these parameters need to be met.

(2) It is our understanding that disinfection will be required. This is the standard concentration for discharge to recreational waters.

The frequency of testing and the averaging period is dependent on flow rates as shown below for continuous flow systems.

Flow Range	Testing Frequency	Averaging Period
≤ 2,500 m³/d	Monthly	Quarterly
> 2,500 but ≤ 17,500 m³/d	Every 2 Weeks	Quarterly
> 17,500 but ≤ 50,000 m³/d	Weekly	Monthly
> 50,000 m³/d	3 Days/Week	Monthly

2.5.5 Enhanced Tertiary Liquid Effluent

In order to provide the ability for reuse we have identified enhanced tertiary treatment targets.

The proposed enhanced tertiary level of treatment is designed to satisfy most reclaimed water applications in the *Greater Exposure Potential* category as defined in the Municipal Wastewater Regulation. Colwood has noted that

the BC MoE has confirmed that Indirect Potable Reuse effluent is necessary for aquifer recharge in Colwood, as noted below:

Parameter	Greater Exposure Potential	Indirect Potable Reuse	Monitoring Requirements
pH	6.5 to 9	6.5 to 9	Weekly
$CBOD_5$	≤ 10 mg/L	≤ 5 mg/L	Weekly
TSS	≤ 10 mg/L	≤ 5 mg/L	Weekly
Turbidity	Average 2 NTU Maximum 5 NTU	Maximum 1 NTU	Continuous Monitoring
Faecal Coliform (1)	Median 1 cfu/100 mL Maximum 14 cfu/100 mL	Median 1 cfu/100 ml	Daily

(1) Median is based on the last 5 results.

2.5.6 Emerging Contaminants

In the terms of reference for Phase 2 the base case treatment standard is secondary treatment with advanced oxidation. Advanced oxidation is a chemical treatment process designed to remove organic and sometimes inorganic matter in waste water by oxidation with hydroxyl radicals. Practically in wastewater treatment this is achieved through the use of ozone, hydrogen peroxide and/or ultraviolet light.

Unfortunately, we have not been able to determine what parameters and effluent criteria this system was intended to meet. There are in the order of 1,700 pharmaceuticals and personal care products (PPCPs) alone. At the present time, there are no published standards in Canada for the discharge of emerging contaminants to marine waters. The CRD has prepared a fact sheet on emerging contaminants which can be found in Appendix D. From this fact sheet it is interesting to note the data collected by the CRD on their Ganges MBR plant and Saanich Peninsula secondary plant (conventional activated sludge) for removal efficiencies. Approximately 80% of the contaminants (211 of 266) had removal efficiencies > 90% for the MBR plant. Approximately 45% of the monitored contaminants (145 of 324) had removal efficiencies > 90% for the activated sludge plant.

Urban Systems and Carollo Engineers are of the opinion that treatment targets for emerging contaminants be approached in the following manner:

- That treatment processes and technologies for emerging contaminants be assessed in the future once effluent criteria for emerging contaminants of concern have been identified by the regulators; thorough analysis of options can be conducted for the addition of further treatment works at that time;
- That further monitoring and research be conducted in the early years of operation of the new Core Area system to assess the level of reduction of emerging contaminants already occurring in the effluent; and
- That future proposals by market proponents indicate the level of reduction of emerging contaminants in their proposed system and that proposals are evaluated, in part, by the level of reduction achieved.

Space could be left in the plant(s) if it was desired for emerging contaminant treatment in the future once the specific effluent criteria are known.

2.5.7 Liquid Treatment Summary

In summary it has been assumed for the remainder of Phase 2 that secondary treatment plus disinfection will be provided for all ocean discharges up to 2x ADWF with primary treatment to 3 x at the Clover Outfall and 4 x ADWF at the Macaulay Outfall and any other new outfalls. Water for reclaimed purposes will be treated to Greater Exposure Potential Tertiary Standards given the water quality requirements for anticipated uses. No specific treatment will be added at this time for additional treatment of emerging contaminants of concern beyond what the secondary or tertiary process will achieve.

2.6 Solids Criteria

Solids management is an integral component of wastewater treatment and the processing and disposal of the solids generated during the treatment of the wastewater must be addressed. Unlike the water, the solids management has additional requirements both from a public perception and the acceptability of the materials produced. As such, defining the goals and metrics that the solids management must achieve is critical for the technology evaluation.

Sludge is defined as untreated residual solids, whereas biosolids are treated to an extent defined in the BC Organic Matter Recycling Regulation.

Solids criteria are dependent on end uses, some of the typical criteria and end uses are summarized below:

Table 2.6.1 - Solids Criteria

Criteria	End Use	Comments
Class B Biosolids	Land Application	Stringent regulatory constraints
Class A Biosolids	Land Application	Option to donate or sell to public
Dewatered Sludge (12 – 20% dry solids)	Landfill	Could be quite odourous; occupies large volume
Dried Sludge (60 – 85% dry solids)	Landfill	Less concern with odours, occupies much less volume
Dried Sludge (60 – 85% dry solids)	Biofuel for Incinerators	Minor quantities of ash to dispose
Dried Sludge (60 – 85% dry solids)	Biofuel for Gasification	Biochar and ash to be disposed

In terms of the application of these criteria the following aspects will be considered:

- CRD has a current policy that does not allow the land application of biosolids, within its boundaries.
- CRD strongly discourages solids being discharged to their landfill e.g. residual solids disposal should be minimized.

2.7 Resource Recovery Markets: Design and Evaluation Methodology

Wastewater provides for multiple resources that can be recovered for a variety of beneficial uses. Previous studies served to narrow the broad list of possibilities toward a reasonable list of potential applications, including: water reclamation, heat recovery, solids recovery including potential energy conversion, and fertilizer supplements (i.e. struvite). While each application requires its own unique infrastructure and service-operation requirements, there are common attributes that apply universally to suit the charter and preliminary criteria. Throughout Phase 2, possibilities for resource recovery will be initially examined through a lens for:

- Long-term revenues and demands
- Minimized processing-technology footprint
- Cost of service
- Energy balance
- Complexity of customer agreements or partnerships
- Ability to support other community amenities
- Synergy with public utility services
- Regulatory feasibility

This list of attributes will frame the scan for market opportunities for resource recovery and help to identify target markets where there is greatest potential for applications to meet the project goals. Further, distributed option sets are designed to situate multiple plants throughout the Core Area to capitalize on resource recovery demands. Heat recovery and water reuse demands are distributed in particular and instruct the proposed methodology for identifying target markets, including:

- Review the broad inventory of water reuse and heat recovery possibilities including existing customers and future development.
- Inventory supply and demand projections for water and heat recovery reuse across site nodes in the Core Area. Locate potential customers and define their product needs including barriers and pricing considerations.
- Scan the broad list of recovery possibilities against the list of criteria above:
- Narrow the recovery options based on the results of the scan.
- Develop conceptual resource recovery infrastructure systems to convey resources to their demands. Look for synergies with neighboring site nodes to reduce unnecessary infrastructure.
- Optimize resource recovery infrastructure to suit the supply demand balance e.g. focus toward the size of treatment facility to suit actual reuse needs and look for phasing to support growth.
- Confirm regulatory and risk-management considerations. Confirm limitations and service governance considerations for risks and opportunities related to implementation and operation.

- Confirm cost and revenue projections for life cycle costing analysis.

Table 2.7.1 outlines the preliminary considerations for resource recovery target markets.

Table 2.7.1 Preliminary Resource Recovery Opportunities

Reclaimed Water	• Large parcels, clustered in areas within a few kilometres of site nodes, for irrigation supply at parks and local green spaces • Potable substitution for toilet flushing (only) in new (future flows) town center developments including commercial uses • Aquifer recharge
Heat Recovery	• Opportunities to support local development and sustainability goals by providing hydronic heat opportunities (e.g. low grade heat recovery systems) from pump stations or treatment facilities at various institutional and commercial buildings • Opportunities to integrate with any imminent district energy systems • Heat capture at major treatment facilities to offset heating costs and other fuel costs
Solids Recovery	• Market possibilities whereby treated biosolids are mixed into a beneficial topsoil product and sold for land application elsewhere • Market possibilities for biochar or dried solids which remain after energy recovery processes
Energy Recovery	• Recovery of methane gas from decomposed organic materials to produce electricity, natural gas, bioplastics, diesel fuels, others. • Thermal conversion opportunities of carbon via gasification, incineration or pyrolysis.
Struvite	• Recovery of ammonia and phosphorous as nutrients for use in fertilizers • Confirmation that market possibilities previously identified remain and that they are congruent with solids recovery processes

Each of these applications presents opportunities to recover resources from wastewater. Further consideration to service governance, responsibilities, risks, investment needs and long-term operation will be presented to the Committee and the public as part of the analysis results.

3.0 Facility Characterization Criteria

Technical criteria from Section 2 inform the facility design, or *facility characterization criteria*, which is a significant step toward establishing a representative design for each site (Section 4.0).

The following tables summarize the proposed Facility Characterization Criteria and how they align with the Preliminary Charter Criteria outlined in Section 1.0.

Table 3.1 - Liquid Discharge Requirements

Facility Characterization Criteria	Preliminary Charter Criteria	Comments
Flow Requirements	Meet Regulations (1a)	System must work as a whole but each site in a solution set may play a different part (i.e. Where we treat the flows over 2x average dry weather flow)
Receiving Environment – Regulatory Limits	Meet Regulations (1a)	Tied to discharge location
Receiving Environment – Emerging Contaminants	Improve Effluent Quality (4c)	As outlined earlier this one requires further dialogue and definition if it is to be included
Reuse Requirements	Support Resource Recovery (2c, 3c)	Highly tied to market demand

Table 3.2 - Solids Discharge Requirements

Facility Characterization Criteria	Preliminary Charter Criteria	Comments
Disposal/Reuse Requirements	Support Resource Recovery (2c, 3c)	Consider scale, synergies with energy and solids resource recovery and integration with other regional waste streams.

Table 3.3 - Site Constraints

Facility Characterization Criteria	Preliminary Charter Criteria	Comments
Adjacent Land Use	Safe Solutions (6b, 6c) Community Support (3b)	Certain technologies and solutions integrate better into residential settings than others.
Livability of Neighbourhood	Positive Public Interaction (6b) Community Support (3b) Reduction of Carbon Footprint (5a) Balance Energy Needs (5c)	Certain technologies and solutions integrate better into residential settings than others

Table 3.4 - Risks

Facility Characterization Criteria	Preliminary Charter Criteria	Comments
Certainty for Demand/Revenue	Certainty of Long-Term Demand and Revenue (3a) Ability to Phase with Growth (4a)	Certain technologies and solutions are more resilient to variations in demand/revenues.
Climate Variability Impacts	Site/Design Resiliency (4b)	Location specific
Seismic	Site/Design Resiliency (4b)	Location specific
Neighborhood Impacts	Reduction to Risks to Neighbourhoods from Facility Failure (6b) Reduction of Normal Interruption to Neighbourhood (6c) Ability to Produce High-Quality Air Emissions (5b)	Acceptable levels of risk beyond regulation vary by land use.
Process Risks – Liquids	Safe Solutions (6b, 6c) Reduction to Risks to Neighbourhoods from Facility Failure (6b)	Acceptable levels of risk beyond regulatory requirements vary by land use.
Process Risks – Solids	Safe Solutions (6b, 6c) Reduction to Risks to Neighbourhoods from Facility Failure (6b) Ability to Produce High-Quality Air Emissions (5b)	Acceptable levels of risk beyond regulatory requirements vary by land use.
Process Risks – Energy Recovery	Safe Solutions (6b, 6c) Reduction to Risks to Neighbourhoods from Facility Failure (6b) Ability to Produce High-Quality Air Emissions (5b)	Acceptable levels of risk beyond regulatory requirements vary by land use.

4.0 Methodology to Select Representative WWTP Technology

As outlined in Section 1, the criteria outlined in Section 2 and 3 will be used to arrive at representative designs for the various facility locations within the option sets. We have proposed that four sample site characterizations be used in order to inform the representative design process. These site characterizations will be used to consider facility design requirements, siting considerations and to review indicative technologies. Once the site locations and option sets are confirmed they can be refined prior to costing analysis. The proposed site characterizations are summarized in the table below:

Table 4.1 - Site Characterization Summary

Site Characterization	Neighbouring Land Use	Flow Range (Average Dry Weather Flow)	Anticipated Plant Purpose – Liquid Train
Small Distributed	Residential	< 5 ML/day	Tertiary treatment for local reuse
Medium Distributed	Residential	6-15 ML/day	Tertiary treatment for local reuse
Large Distributed	Residential	16 – 25 ML/day	Tertiary treatment for local reuse
Extra Large Distributed or Central	Non-Residential	26 + ML/day	Primary & Secondary treatment for outfall and tertiary treatment for local reuse

Representative design and analysis for solids treatment and recovery will adhere to the criteria outlined in section 3.0 and be considered in synergy with the liquid treatment and energy recovery needs/opportunities for the site.

5.0 Costing Factors

5.1 Introduction

As outlined in the Treasury Board guide on the Public Works and Government Services website cost estimates for projects fall into a number of defined categories. For this project the CRD terms of reference requested that costs be provided with the accuracy of -15% to +25%. This range is consistent with cost estimates which are suitable for budget planning purposes in the early stages of concept development of a project.

Costs will be presented in 2015 Canadian dollars. It is important to recognize that since 2010, and from 2015 until the systems are constructed, prices of all cost elements can be significantly affected by time and typically, cost escalations. For example, the Engineering News Record (ENR) is an industry guide to the construction industry. The ENR states that the construction cost index for Toronto (BC is currently not represented in the ENR) has increased from 9,434 (2010) to 10,515 (2015). This is equivalent to a construction cost increase of 11.5% over the 5 year period. A review of data available from Stats Canada for the Victoria area indicates that their construction price index has risen from 111.5 (2010) to 122.8 (2014; no 2015 data yet available), using a base index of 100 (2007). This is equivalent to a 10.1 % increase over this 4 year period. This would appear to correlate fairly closely with the 11.5 % increase over 5 years for the ENR index. We have used the Stats Canada index for the purposes of calculating all cost escalations.

The impact of the exchange rate between the Euro, the US and Canadian dollars is also relevant, since a portion of the equipment may be manufactured in the USA or Europe.

Some costing considerations are difficult to predict, like the supply and demand and productivity of skilled labour in the Greater Victoria area, especially if other large scale projects in the province were to occur, such as liquefied natural gas and the Metro Vancouver Lion's Gate WWTP. It is also widely known that construction on Vancouver Island carries a premium compared to the mainland.

We will be using all of the recent construction related projects that Urban Systems and Carollo have completed to inform the estimates we provide, including local estimate considerations provided by municipal staff. Previous cost estimating from other consultants on this project have also been reviewed and have been considered in our evaluations.

5.2 Capital Cost Breakdown

Capital cost estimates include multiple factors and contingencies. For Class D cost estimates we have included *general requirements*, *contractor profit and overhead*, *construction and project contingencies, engineering, administration, interim financing and escalation.* Table 5.1 illustrates these cost factors for an example project with a base construction cost estimate of $1,000,000. For comparative purposes the percentages used in this study are the same as those used in previous studies. We have assumed the mid-point of construction is four years or 2019.

Table 5.1 - Capital Cost Breakdown

Description	Total
Construction Cost	$ 1,000,000
General Requirements (Mobilization, Demobilization, Bonds, Insurance, etc.) – 10%	$ 100,000
Contractor Profit/Overhead – 10%	$ 100,000
Construction/Project Contingency – 35%	$ 350,000
Subtotal of Direct Costs	**$ 1,550,000**
Engineering – 15%	$ 233,000
CRD Administration and Project Management and Miscellaneous – 8%	$ 124,000
Interim Financing– 4%	$ 62,000
Escalation to Mid-Point of Construction – 2%/year (4 years)	$ 124,000
Total Capital Project Cost	**$ 2,093,000**

5.3 Pump Stations

The pump stations that will be used to pump effluent from the existing CRD collection system to the proposed treatment plants are typically designed to be low-lift, high-volume facilities. Because of the unique nature of each pump station (siting, access, pump capacity, proximity to major utilities and sensitive areas, geotechnical considerations, etc.), costs for such facilities can vary widely.

Class D cost estimates are commonly derived from cost curves which are based on extensive cost data gathered from the combination of a wide range of pump stations throughout the industry. These curves typically plot station costs against the size of the stations in L/s. Typical curves are shown in Appendix E.

These particular curves were developed by an extensive study undertaken 11 years ago for the Ministry of Public Infrastructure Renewal in Ontario. In conducting our estimates we assessed the application of estimates from Ontario against our experience in the BC market. The unit rates have been multiplied by 1.6 with consideration of the following:

a. 20% - for temporary and permanent site work.

b. 20% - for standby power and SCADA

c. 20% - inflation from 2004 to 2015.

Where possible, the unit rates have been compared to cost data available from recently designed and constructed projects, to confirm general data conformance. These facilities typically comprise a concrete below grade wet well,

in which the sewage is collected and from which the sewage is pumped using submersible pumps. An at-grade superstructure (usually concrete block or similar durable material) is located on top of the wet well (typically poured in place concrete), to house mechanical and electrical equipment, including MCCs, PLCs and standby power.

Where pump stations will be included in the design and construction of a wastewater treatment plant, i.e., are not stand alone facilities, experience informs that a 30% cost deduct should be applied to the unit costs rates to account for common infrastructure and other facility synergies.

Below is a summary of a few examples of anticipated pump station costs, based upon the curves in Appendix E and including the 1.6 multiplier. All rates are in 2015 dollars and pertain only to the Construction Cost portion as outlined in Section 5.2, which would be factored up as per Table 5.1.

Pump Station Size	Construction Cost (CDN$)
350 L/s	$ 3,400,000
750 L/s	$ 6,400,000
925 L/s	$ 8,000,000

Estimates and market pricing (historic) for the Craigflower Pump Station upgrade will be examined further in an effort to further refine these estimates, once the tender information is made available.

5.4 Piping

The piping systems that will be used to service the Core Area option sets will comprise PVC pipe installed in existing rights-of-ways, typically existing road allowances. As such, the unit cost rates allow for pavement and any existing surface improvement restoration. In addition, an allowance has been included for temporary site works, traffic control and associated above ground work.

In general, these pipes will provide the connectivity between the existing CRD sewer trunk mains, proposed pump stations, proposed wastewater treatment plants and proposed outfalls. Typically sanitary collection systems are designed for minimum flow velocities of 0.8 m/sec to ensure that material does not build up within the piping systems. From a capital cost and energy perspective, ideally flows should be near 2.5 m/sec. Given the wide range in flows within the CRD system (0 to 4 x ADWF), detailed analysis is required for any pumped and piped system to ensure that the optimum life cycle range of costs are achieved.

For the purposes of this costing exercise, we have sized our pipes such that the resultant velocities are in the 1.5 to 2.5 m/sec range, based upon 2 x ADWF.

The unit cost rates developed are based upon meeting or exceeding accepted industry design standards, such as those detailed by AWWA.

The following is a summary of the unit cost rates developed by Urban Systems as part of the ongoing work with the CRD. All rates are in 2015 CDN dollars and pertain only to the Construction Cost portion outlined in Section 5.2.

Pipe Diameter (mm)	Construction Unit Cost $/m
300	$ 700
350	$ 740
400	$ 780
450	$ 820
500	$ 870
600	$ 950
750	$ 1,130
900	$ 1,350
1050	$ 1,620
1200	$ 1,850
1350	$ 2,100
1575	$ 2,450

5.5 Outfalls

Developing unit cost rates for outfalls into a marine environment proved to be the most challenging task, given the wide range of unknowns and variabilities. Not too dissimilar from pump stations and their unique features, the unit cost rates for outfalls also vary widely. In particular, geotechnical considerations and seabed profiles will have significant impacts on these costs. However, unlike, pump stations, there is not a large data base on which to draw upon and develop cost curves.

Outfalls are anticipated using steel pipes, installed with concrete collars anchored to the sea floor. Based upon the data available, 2015 costs for these sizes were developed as summarized below and pertain only to the Construction Cost portion outlined in Section 5.2.

Pipe Diameter (mm)	Construction Unit Cost $/m
600	$ 6,150
750	$ 7,000
900	$ 7,800
1050	$ 8,600
1200	$ 9,600
1350	$ 10,800

5.6 Methodology to Provide WWTP Cost Estimates

For Wastewater Treatment Plants the costing methodology is more complicated since each plant includes both liquids and solids treatment processes and costs are largely dependent on the technology selected. For this project we will use the experience database developed by Carollo and Urban Systems in order to determine appropriate costs for the representative facilities. Only the representative technology will be costed in order to arrive at comparative cost estimates between the option sets.

5.7 Revenue Sources

Revenue sources will cover the range of incomes based on exchange of goods or services and also monies that offset costs including potential development contributions or potential partnerships which minimize the extent and impact of new works. Examples of revenues include:

- Utility billings, requisitions, transfers and interest gains
- Retail rates for resource recovery systems including water rates, gas/fuel rates (solids recovery) and incomes collected for any sales related to solids residuals
- Development cost charges and other potential private sector development contributions available to local governments
- Municipal cost-shares for example where infrastructure upgrades are needed for both local and regional benefit
- Grants in terms of secured monies available to CRD
- Other offsetting costs for example, homeowner cost savings that may arise through waste diversion as part of integrated solids recovery

This list of preliminary revenue resources will be refined through high-level feasibility analysis in collaboration with CRD and municipal staff.

5.8 Life Cycle Costing

Life-cycle costs will be prepared for each of the option sets, which will be detailed in Technical Memo #2. Life cycle costing includes capital, as well as operating costs and later, consideration to revenues as part of the aggregate financial scenarios. Operating costs will consider typical cost elements as well as revenue (outlined in Section 5.7) which can reasonably be assumed to accrue given the resource recovery opportunities available. The operating and life cycle costing will be completed in Technical Memo #3.

Below is a summary of the inputs into our life cycle costing model. As this is a constant dollar analysis, all costs will be in $2015. The only escalation that will be included will be 2% per year for initial capital projects for the time from today until midway through construction which is assumed to be 2019.

We propose to conduct sensitivity analysis on the discount rate, escalation factors and revenue projections to monetize the risks inherent in long-term capital financing and service delivery. As a base case, our life cycle analysis will be guided by previous analysis and in particular, will suit treasury board guidelines to suit the funding partners.

Life Cycle:	30 years (2015-2045)
Interest Rate:	to be confirmed with funding partners (as needed) e.g. 5%
Inflation Rate:	to confirmed with funding partners (as needed) e.g. 2%
Discount Rate:	to be confirmed with funding partners (as needed) e.g. 3%
Water Cost:	Distribution cost from distribution supplier (i.e., CRD for Westshore & Sooke) is $1.81/m^3
Electricity Cost:	Average rate $0.08/kwh
Chemical Costs;	Current market prices

Labour Rates:

Labour Type	2015 Annual Salary [1]
Plant Manager	$ 158,000
Chief Plant Operators	$ 135,000
Chief Area Operator	$ 113,000
Plant Operator	$ 90,000
Labourer	$ 56,000

[1] Refer to Appendix F for derivation

Vehicle Rates:	$40,000/yr./vehicle
Trucking Rates:	Current market prices
Disposal Rates:	Current tipping charges to CRD Landfill (i.e. $157 per tonne for screenings and pumpings from Sewage Treatment Plants)

Maintenance/Repairs Pump Stations:	1% of Capital/yr.
Equipment Replacement Reserve for Treatment Facilities:	2% of Capital
Operation & Maintenance Contingency:	15%

While there are multiple financial scenarios to consider, it is important that Phase 2 results remain consistent with previous analysis but also reflect a shift in project outcomes and criteria. Further, qualitative evaluation of various social and environmental factors will support the financial analysis and allow the Committee to review the merits of option sets across a balanced scorecard. Phase 2 evaluations should support the committee in screening away option sets that don't effectively meet the goals and commitments of the project in order to refine the project criteria for ultimate design parameters for a Core Area solution. Additional public investment analysis beyond Phase 2 may be needed (e.g. value for money) to suit the needs of the funding partners.

APPENDIX B – TECHNICAL CRITERIA AND PROJECT CHARTER

Charter Goal/Commitment	Preliminary Charter Criteria
1. Meet or exceed federal regulations for secondary treatment by December 31, 2020.	a. Refer to Section 2.5.4. b. Extent of liquids or solids produced in excess of regulations.
2. Minimize costs to residents and businesses (life cycle cost) and provide value for money.	a. Extent of leveraging of existing infrastructure assets; b. Reduction of consumable and operations costs; c. Extent of revenues from resource recovery;
3. Produce an innovative project that brings in costs at less than original estimates.	a. Extent of alternative to bring in costs less than original estimate.
4. Optimize opportunities for resource recovery to accomplish substantial net environmental benefit and reduce operating costs.	a. Certainty of long-term demand and revenue; b. Extent of support for community building; c. Extent of new infrastructure/services to support resource recovery; d. Extent of integration of other regional waste streams
5. Optimize greenhouse gas reduction through the development, construction and operation phases and ensure best practice for climate change mitigation.	a. Reduction of carbon footprint (buildings, treatment, transportation); b. Ability to produce high-quality air emissions; c. Ability to balance energy needs;
6. Develop and implement the project in a transparent manner and engage the public throughout the process.	a. Ability of an alternative to meet the preliminary criteria
7. Develop innovative solutions that account for and respond to future challenges, demands and opportunities, including being open to investigation integration of other parts of the waste stream if doing so offers the opportunities to optimize other goals and commitments in the future.	a. Ability to phase capacity/expansion with growth; b. Ability to improve effluent quality over life of facility; c. Extent of integration of other regional waste streams (above)
8. Optimize opportunities for climate change mitigation	a. Reduction of carbon footprint (buildings, treatment, transportation); b. Ability to produce high-quality air emissions; c. Ability to balance energy needs;
9. Deliver a solution that adds value to the surrounding community and enhances the livability of neighborhoods.	a. Extent to provide for positive public interaction; b. Reduction of risk to neighborhoods from facility failure; c. Reduction of interruption to neighborhood during normal operation;
10. Deliver solutions that are safe and resilient to earthquakes, tsunamis, sea level rise and storm surges.	a. Site/design resiliency for seismic and sea level rise;

CORE AREA SEWAGE AND RESOURCE RECOVERY SYSTEM 2.0

Phase 2: Analysis, Options Costing and Public Engagement

Project Charter - FINAL

October 2, 2015

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1. VISION

In partnership with the public, the Core Area Liquid Waste Management Committee (CALWMC) will deliver a sewage treatment and resource recovery system that is proven, innovative and maximizes the benefits for people and the planet – economic, social, and environmental – for the long term.

2. BACKGROUND

In 2006, an environmental report commissioned by the Ministry of Environment noted the contamination of seabed sites close to Capital Regional District (CRD) outfalls where the region's wastewater is discharged. As a result, the Province mandated that the CRD plan for and initiate secondary sewage treatment for the region.

In 2007, the CRD received a letter from the Ministry of Environment giving six directives for the Core Area Liquid Waste Management Plan (LWMP). These six directives continue to inform the goals and commitments of this project.

Minister's Requirements:

1. Meet the regulatory standard for liquid waste
2. Minimize total project cost to the taxpayer by maximizing economic and financial benefits, including beneficial reuse of resources and generation of offsetting revenue
3. Optimize the distribution of infrastructure based on number 2 above
4. Aggressively pursue opportunities to minimize and reduce greenhouse gas emissions (e.g., reduced requirement of energy for pumping purposes and beneficial reuse of energy)
5. Optimize 'smart growth' results (e.g., district services, density, Dockside Green-like innovation)
6. Examine the opportunity to save money, transfer risk and add value through a public private partnership

In 2012, the federal government passed a law requiring all high-risk Canadian cities to provide secondary sewage treatment by 2020 at the latest. The CRD's core area was considered to be in the high-risk category.

Between 2009 and 2014, the CALWMC, CRD staff and consultants, and the Core Area Wastewater Program Commission (the Commission) worked to create and implement a publicly acceptable sewage treatment and resource recovery system for the Core Area.

While the approved CALWMP continues to identify McLoughlin Point as the location for the wastewater treatment facility, in April 2014, the CRD's revised McLoughlin Point rezoning application did not meet the zoning requirements for Esquimalt. In June 2014, the plan to build one regional plant at McLoughlin Point was put on hold by the CRD Board, in response to public input.

In June 2014, Langford, Colwood, View Royal, Esquimalt and the Songhees Nation formed the Westside Select Committee to begin planning for a new project to treat sewage and recover resources in those municipalities and the Nation. In September 2015, Esquimalt Nation joined the Westside Select Committee. In January 2015, a similar body – the Eastside Select

Committee, comprised of Saanich, Oak Bay and Victoria – was formed to develop a similar plan for the Eastside municipalities.

Since June 2014 and January 2015, respectively, both Select Committees have been engaged in in-depth public engagement activities to share information with the public, build trust, and seek public input on a range of factors including, but not limited to, level of treatment, treatment technologies, siting of treatment plants, costs, risks and long-term social, economic and environmental benefits.

In July 2015, both select committees presented their work and recommendations to the CALWMC. The CALWMC approved the solution sets and recommendations from the Eastside Select Committee, including potential sites and direction with regard to investigating secondary and tertiary treatment, anaerobic digestion and gasification, and resource recovery and revenue generation. The CALWMC received a presentation from the Westside Select Committee outlining five technically preferred sites and two scenarios, detailing its technical work to date. The Committee accepted the Westside Select Committee's proposal to carry on with further public engagement and more detailed costing and engineering analysis as per its terms of reference to be presented to the CALWMC as more fully-developed solutions in fall 2015.

The work of the Eastside and Westside Select Committees, the CALWMC and the public between June 2014 and July 2015 lays the groundwork for the current project, *Core Area Sewage and Resource Recovery System 2.0.*

3. GOALS AND COMMITMENTS

The *Core Area Sewage and Resource Recovery System 2.0* project will deliver the following goals and meet the following commitments. *NB goals should be measurable. Each of these goals needs a corresponding metric so at project completion, the CALWMC can determine whether it achieved its goals.*

Goals

a) Meet or exceed federal regulations for secondary treatment by December 31, 2020

b) Minimize costs to residents and businesses (life cycle cost) and provide value for money

c) Produce an innovative project that brings in costs at less than original estimates

d) Optimize opportunities for resource recovery to accomplish substantial net environmental benefit and reduce operating costs

e) Optimize greenhouse gas reduction through the development, construction and operation phases and ensure best practice for climate change mitigation

Commitments

a) Develop and implement the project in a transparent manner and engage the public throughout the process

b) Deliver a solution that adds value to the surrounding community and enhances the livability of neighbourhoods

c) Deliver solutions that are safe and resilient to earthquakes, tsunamis, sea level rise and storm surges

d) Develop innovative solutions that account for and respond to future challenges, demands and opportunities, including being open to investigating integration of other parts of the waste stream if doing so offers the opportunities to optimize other goals and commitments in the future

e) Optimize greenhouse gas reduction through the development, construction and operation phases and ensure best practice for climate change mitigation

4. SCOPE

The scope of this phase of the *Core Area Sewage and Resource Recovery System 2.0* project, is to complete the Options Development Phase, by submitting an amendment to the Liquid Waste Management Plan and receiving conditional approval from the Minister of Environment of an Amendment for the Core Area. This Plan amendment will be approved by the provincial and federal funding agencies. Completion of this phase includes securing sites for all facilities (wastewater treatment and resource recovery).

The scope of this phase does not include detailed site assessments such as Environmental and Social Reviews, submission of detailed business cases (as may be required by funding agencies), indicative design, finalized cost sharing agreements or the procurement of infrastructure.

5. KEY STAKEHOLDERS

The graphic illustration (see Attachment 1) outlines all of the *Core Area Sewage and Resource Recovery 2.0* project stakeholders and displays the relationships between them. For a description of the roles and responsibilities of each stakeholder, please see Section 6.

6. ROLES AND RESPONSIBILITIES

Project Lead (TBD)

Federal Government – In 2012, the federal government passed a law requiring all high-risk Canadian cities to provide secondary sewage treatment by 2020 at the latest. The CRD's Core Area was considered to be in the high-risk category. The federal government agreed to contribute up to $253 million towards the project out of three different funding programs: Building Canada Fund ($120 million), Green Infrastructure Fund ($50 million) and 3P Canada ($83.4 million).

- Secondary treatment mandated by 2020
- Funding up to $253 million

Provincial Government – In 2006, an environmental report commissioned by the Ministry of Environment noted the contamination of seabed sites close to CRD outfalls where wastewater is discharged. As a result, the CRD was mandated by the province to plan for and initiate secondary wastewater treatment for the region. Provincial funding agreements provide a maximum of $248 million towards the project.

- Funding up to $248 million
- Approval of LWMP amendment and regulatory requirements

Capital Regional District Board (CRD Board) – The CRD Board is responsible for selecting final site locations and securing lands for wastewater treatment facilities, obtaining the rezoning of lands, approving the architectural design for facilities, and approving funding agreements and the budget. The CRD Board is responsible for delivering the project outlined in the Vision.

- Final approving body for funding, budget and major decisions
- Collect and disburse the local portion of the funding of $287 million

Core Area Liquid Waste Management Committee (CALWMC) – A standing committee of the CRD Board, the CALWMC consists of Directors from municipalities and First Nations participating in the Core Area Liquid Waste Management Plan (CALWMP). The committee is responsible for overseeing the CALWMP and making recommendations to the CRD Board about the CALWMP and certain aspects of the Core Area Wastewater Treatment Program.

- Standing Committee of CRD Board
- Responsible for overseeing CALWMP

Core Area Liquid Waste Management Committee (CALWMC) Chair – The CALWMC Chair is selected by the Chair of the CRD Board annually. The CALWMC Chair is responsible for participating in CALWMC agenda meetings and chairing CALWMC meetings. The Chair is also responsible for building and maintaining relationships, and liaising with the Chair of the Core Area Wastewater Program Commission and the Chair of the Technical Oversight Panel. The CALWMC Chair is the public face of the project and is responsible for communicating with other public bodies at the political level, as well as with the media.

Core Area Liquid Waste Management Committee (CALWMC) Vice Chair – The CALWMC Vice Chair is responsible for fulfilling the roles and responsibilities of the CALWMC Chair in the Chair's absence.

Westside Wastewater Treatment and Resource Recovery Select Committee – In June 2014, Westside participants (Colwood, Esquimalt, Langford, View Royal, and Songhees Nation) formed the Westside Wastewater and Resource Recovery Select Committee to evaluate Westside treatment options and develop a sub-regional wastewater treatment and resource recovery plan. The member municipalities' role is to provide political input and take feedback from the public and report to the Westside Select Committee. The participating municipalities also have zoning authority. In September 2015, the Esquimalt Nation joined the Westside Select Committee. The Songhees and Esquimalt Nation representatives provide political input to the Westside Select Committee. The Committee reports to the CALWMC and is supported by CRD staff, Westside staff, consultants and a technical working group.

The Westside Select Committee participants initiated the Westside Solutions Project as a way to engage residents to work collectively to identify solutions for wastewater treatment and resource recovery that meet the unique needs of the Westside communities. The Westside option sets consider flow scenarios that include Eastside flows from Vic West and Saanich West. This work, along with the work from the Eastside Select Committee, will inform the *Core Area Sewage and Resource Recovery 2.0* project and the amendment to the Liquid Waste Management Plan.

- Representatives from Colwood, Esquimalt, Langford, View Royal and Songhees Nation
- Reports to CALWMC
- Evaluates options to develop a sub-regional wastewater treatment plan
- Supported by CRD staff, Westside municipal staff, consultants and a technical working group

Eastside Wastewater Treatment and Resource Recovery Select Committee – In January 2015, Oak Bay, Saanich and Victoria formed the Eastside Wastewater and Resource Recovery Select Committee to engage with their communities and develop wastewater treatment options that meet the needs of the Eastside municipalities. The role of the participating municipalities is to provide political input and take feedback from the public and report to the Eastside Select Committee. The participating municipalities also have zoning authority. The Eastside Select Committee reports to the CALWMC and is supported by CRD staff, participating municipal staff and consultants.

The Eastside option sets consider a regional option, which includes all flows from Eastside and Westside, as well as a sub-regional and distributed option that includes flows from Eastside municipalities only and Eastside Clover Point outfall catchment flows. The Eastside Select Committee's plan, in combination with the work from the Westside Select Committee, will inform the *Core Area Sewage and Resource Recovery 2.0* project and could form the basis for an amendment to the CALWMP.

- Representatives from Oak Bay, Saanich and Victoria
- Reports to CALWMC
- Working to develop wastewater treatment options for Eastside municipalities
- Supported by CRD staff, participating municipal staff, and consultants

CRD Chief Administrative Officer – The CAO oversees all administrative operations and staff, ensures CRD Board policies are implemented, oversees the operations and functions of the CRD, and aligns the organization to achieve strategic priorities set by the Board. This includes working with federal and provincial staff to coordinate funding agreements and providing advice to the CRD Board regarding potential risks and opportunities for the CRD Board.

- Oversees CRD operations and staff
- Works with partners and stakeholders
- Provides advice to the CRD Board

General Manager of Parks & Environmental Services – The GM of Parks & Environmental Services provides general direction and leadership to CRD staff and advises the CALWMC and the Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees regarding the technical and legal aspects of the CALWMP and the wastewater treatment

planning process. The General Manager's role is also to provide information to the Core Area Municipalities' CAOs and First Nations Administrators.

- Provides general direction and leadership to CRD staff
- Advises on technical and legal aspects of the CALWMP
- Informs Core Area Municipal CAOs and First Nation Administrators about the project

General Manager of Finance & Technology – The GM of Finance & Technology is the Chief Financial Officer for the CRD. The GM of Finance and Technology is responsible for the budget and all financial services, information technology and geographic information services (IT & GIS), property and real estate services, insurance and risk management, facilities management, and arts development for the Capital Region.

Corporate Officer – The CRD Corporate Officer provides support and procedural advice to the CRD Board and the CALWMC, and is responsible for maintaining the official records of these bodies. The officer also processes requests for records in accordance with the Freedom of Information and Protection of Privacy Act.

First Nations Liaison – The First Nations Liaison serves as a point of contact for First Nations communities involved with the project and provides departmental support and assistance in the areas of service delivery, referral processes, outreach, engagement and relationship building.

Manager, Corporate Communications – The Senior Manager of Corporate Communications provides professional expertise and leads the CRD Corporate Communications team, which works with the General Manager of Parks & Environmental Services and the CAO on overall communications for the CRD Board. There is a communications coordinator dedicated to working on the CALWMP.

Technical Oversight Panel (ToP) – The role of the Technical Oversight Panel is to review the costing and feasibility studies developed by the Engineering Team during the planning phase of the project and to ensure that the studies for the wastewater treatment options include the necessary due diligence. The Technical Oversight Panel will also advise on how to best engage the private sector in this phase of the project. Fundamental to providing independent technical oversight and confirming due diligence is to ensure that the engagement of the private sector in this phase of the project and the innovative solutions that may come forward is informed by, not necessarily bound by (as per the ToP Terms of Reference), decisions to date regarding sites, option sets, timelines, definitions of treatment and other potential limitations on analysis and costing.

The role of the ToP does not include public consultation, media interaction, land acquisition and rezoning, contract management or direction of the Engineering Team The ToP receives information from and liaises with the Engineering Team (Urban Systems and Carollo Associates), and provides feedback and recommendations to the CALWMC. The Chair of the ToP reports to the CALWMC biweekly. The ToP liaises with the Eastside and Westside Select Committee.

- Independent Technical Oversight Panel
- Reviews costing and feasibility studies

- Reports findings to the CALWMC

Independent Engineering Resources – The Independent Engineering Team's role is to conduct the Feasibility and Costing Analysis (Urban Systems partnered with Carollo) for the CALWMP Wastewater Treatment System. The Engineering Team is also working with the Westside Select Committee to do a more detailed analysis on the Westside flows. The team provides information to and liaises with the ToP, and reports to and receives direction from the CALWMC. Additional external resources may be required for staff to prepare the LWMP amendment. The team is assessing the feasibility of a regional and sub-regional system in the Core. The team is also looking at a distributed system option based on the potential sites put forward from the Eastside Select Committee and Westside Select Committee.

- Conducts feasibility and costing analysis
- Assesses feasibility of regional and sub-regional systems in the Core Area
- Assists with preparation of LWMP amendment

Fairness and Transparency Advisor (FTA) – The FTA's role is to act as a point of contact for the public to submit complaints regarding the process of costing the options, working with the host jurisdiction(s) and preparing an amendment to the LWMP and to ensure that the process is fair, transparent, impartial and objective. The FTA is independent of the CRD. The FTA's role is to investigate appropriate complaints and report to the Board, through the CALWMC, the results of an investigation, to help strengthen the fairness, transparency or objectiveness of the process followed. The FTA is to provide monthly status reports to the CALWMC. The role of the FTA does not restrict the public from going to other sources for complaints and requests to review processes, such as the office of the Ombudsperson.

- Independent of the CRD
- Investigates public complaints regarding process
- Ensures process is fair, transparent, impartial and objective

Core Area Wastewater Treatment Program Commission (the Commission) – As part of the funding negotiations with the Province, the CRD was required to establish an independent non-political governance body to manage, implement and commission the Core Area Wastewater Treatment Program. The Commission governs the implementation and operation of the Wastewater Treatment Program and oversees the procurement process for all components of the Program. The Commission operates autonomously of the CALWMC and Regional Board; however, the Commission is required to seek CRD Board and funder approval on predetermined items as detailed in the CRD Commission bylaw. Several steps have been taken to scale back operations and reduce costs as the CRD continues its planning work to find a new solution to wastewater treatment. The Commission remains in place waiting to implement whatever system of wastewater projects the CRD Board decides upon, and is approved by the Province.

- Independent Commission required by Province
- Manages implementation and operations of the Wastewater Treatment Program
- Oversees procurement process

Technical and Community Advisory Committee (TCAC) – The Technical and Community Advisory Committee is an LWMP requirement of the province, and provides technical and

community consultation advice and input to the CALWMC. The TCAC assists the CALWMC in making appropriate recommendations to the CRD Board in the following areas: (a) plant design criteria and treatment technology, including opportunities for resource recovery, sludge management, odour control and general plant design criteria, (b) number and location of treatment plants, and (c) timing/scheduling of treatment.

- Provides technical and community consultation advice
- Makes recommendations regarding design criteria, treatment technology, number and location of treatment plants, and schedule for treatment

Eastside Public Advisory Committee (EPAC) – The Eastside Public Advisory Committee takes input from the public and provides guidance to the Eastside Wastewater and Resource Recovery Select Committee on the public consultation process.

- Takes input from the public
- Provides Eastside Select Committee on the public consultation process

Core Area CAOs + First Nation Administrators – The Core Area CAOs and First Nations Administrators are the principle policy advisors to councils, and provide support to the Eastside and Westside Select Committees. The Core Area CAOs and First Nations Administrators receive project-specific information and updates from the CRD's General Manager of Parks & Environmental Services regarding the progress of the CALWMC and the Eastside and Westside Select Committees.

- Principle policy advisors
- Receive project information
- Provide recommendations from municipal staff perspective

Municipal Councils – The role of municipal councils is to make land-use decisions for facility siting and to negotiate development agreements with the CRD.

Westside Communications Team – The Westside Communications Team is made up of Communications Coordinators from Colwood, Esquimalt, CRD and Aurora Consultants. The Team provides communication and public consultation support to the Westside Select Committee.

Eastside Communications Team – The Eastside Communications Team consists of a consultant from Public Assembly and the CRD Communications Manager and CRD CALWMP Communications Coordinator. The Eastside Communications Team provides communication and public consultation support to the Eastside Select Committee.

Westside Technical Team – The Westside Technical Team consists of municipal staff, supported by Urban Systems. The technical team provides technical information and input to the Westside Select Committee.

- Comprised of municipal staff and supported by Urban Systems and Aurora Innovations for facilitation and coordination support
- Provides technical advice to the Westside Select Committee

Eastside Technical Team – The Eastside Technical Team is comprised of municipal staff and supported by Urban Systems and CRD Staff. The Technical Team provides support and input to the Eastside Select Committee.

- Comprised of municipal staff; provides support and information to the Eastside Select Committee

7. MILESTONES

The Proposed Work Plan Overlay, which was adopted and submitted to 3P Canada in March 2014, provides the overarching timelines and milestones through the completion of the project (Attachment 2). A draft schedule identifying key tasks and milestones of the feasibility and costing exercise to be achieved by the end of 2015 during Phase 2 of the Core Area Sewage and Resource Recovery System 2.0 project is included for discussion (Attachment 3). The scheduling and implementation of the public consultation on the preferred solution sets (after the costing analysis) is anticipated to occur in early December, but is dependent on all of the deadlines being met up until that point.

A detailed schedule is under development and will be circulated for comment.

8. BUDGET

Funding for the project will be drawn from the Core Area Liquid Waste Management Plan operating reserve, funded by all participants in the service based on projected design capacity for 2030. A total budget of $1,250,000 has been identified to support this phase of the project, including engineering and public consultation consulting fees, Technical Oversight Panel honorarium and disbursements, Fairness and Transparency Advisor, public consultation process delivery and CRD staff time.

Phase 2 Budget

Item	Cost
Project Oversight (FTA & ToP)	$280,000
Public Consultation	$240,000
Feasibility and Costing Analysis	$450,000
Property and Zoning	$75,000
LWMP Amendment No. 10	$75,000
Staff and Wages	$300,000
Miscellaneous and Legal	$30,000
TOTAL	$1,450,000

9. CONSTRAINTS, ASSUMPTIONS, RISKS AND DEPENDENCIES

a) Constraints

- The timelines for this phase of the project are extremely aggressive with no buffer
- The schedule is dependent on multiple parties and governance bodies meeting their sub-project schedules

b) Assumptions

- The Minister of Environment will provide direct *conditional* approval of the Liquid Waste Management Plan upon submission to the Province

c) Risks

- The costing analysis and public consultation processes will be subject to criticism due to time constraints
- The governance model of the project is complex, leading to miscommunication or contradictory decision making
- Municipal councils do not endorse siting preferences of the CRD Board
- Potential loss of senior government funding if timelines are not met

d) Risk Mitigation

- Ensure regular, open reporting of all parties to the Core Area Liquid Waste Management Committee to ensure "no surprises" when public consultation is formally conducted
- Engage in close municipal council and staff involvement as preferred sites emerge and municipal planning/siting processes are initiated
- Ensure ongoing and open discussions with the funding agencies to ensure "no surprises" when the LWMP amendment is submitted for approval and the project is submitted for funding
- Ensure transparent and deep engagement with the community
- Ensure there is enough time required to rezone and that there is public support for rezoning

Attachments:	Attachment 1:	Planning Process – Core Area Liquid Waste Management Plan – Roles, Input & Relationships
	Attachment 2:	Proposed Work Plan Overlay – 3P Canada Funding Considerations
	Attachment 3:	Proposed Feasibility and Costing Analysis Schedule (Urban Systems) – August 31, 2015

APPENDIX C – COST TABLES

Cost Components for Option 1a - One Secondary Plant (x 1,000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]			Resource Income		Net Operating Cost	
	2015	2030	at 2015	at 2030	at 2045	2030	2045	2030	2045
1. Conveyance									
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 540	$ 640	$ 730				
(b) Macaulay Pt PS and Forcemain to Rock Bay	$ 65,400	N/A	$ 620	$ 730	$ 840				
(c) Effluent PS and Forcemain to Clover Point	$ 83,900	N/A	$ 1,000	$ 1,190	$ 1,400				
(d) Replace Clover Outfall	$ 32,500	N/A	incl. in (c)		incl. in (c)				
(e) Reline Macaulay Outfall	$ 11,100	N/A	incl. in (b)		incl. in (b)				
Conveyance Subtotal:	$ 244,300	$ -	$ 2,160	$ 2,560	$ 2,970	$ -	$ -	$ -	$ -
2. Liquid Treatment (Secondary)	$ 392,000	$ 162,000	$ 7,000	$ 10,100	$ 12,650				
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300				
4. Reuse									
(a) Tertiary Slipstream	$ 8,100	N/A	$ 230	$ 230	$ 230				
(b) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80				
Reuse Subtotal:	$ 24,200	$ -	$ 300	$ 305	$ 310	$ -	$ -	$ -	$ -
5. Existing System Capacity Upgrades									
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A				
(b) Arbutus Attenuation Tank - incl land	$ 20,000	N/A	N/A	N/A	N/A				
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A				
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A				
(e) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A				
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7. Land Costs	$ 67,200								
Total:	**$ 1,030,700**	**$ 252,600**	**$ 14,460**	**$ 21,765**	**$ 26,230**	**$ -**	**$ -**	**$ -**	**$ -**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

Cost Components for Option 1b - One Tertiary Plant (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]			Resource Income		Net Operating Cost	
	2015	2030	at 2015	at 2030	at 2045	2030	2045	2030	2045
1. Conveyance									
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 540	$ 640	$ 730				
(b) Macaulay Pt PS and Forcemain to Rock Bay	$ 65,400	N/A	$ 620	$ 730	$ 840				
(c) Effluent PS and Forcemain to Clover Point	$ 83,900	N/A	$ 1,000	$ 1,190	$ 1,400				
(d) Replace Clover Outfall	$ 32,500	N/A	incl. in (c)		incl. in (c)				
(e) Reline Macaulay Outfall	$ 11,100	N/A	incl. in (b)		incl. in (b)				
Conveyance Subtotal:	$ 244,300	$ -	$ 2,160	$ 2,560	$ 2,970	$ -	$ -	$ -	$ -
2. Liquid Treatment (Tertiary)	$ 500,000	$ 220,000	$ 12,000	$ 15,000	$ 19,300				
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300				
4. Reuse									
(a) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80				
5. Existing System Capacity Upgrades									
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A				
(b) Arbutus Attenuation Tank- incl land	$ 20,000	N/A	N/A	N/A	N/A				
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A				
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A				
(f) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A				
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7. Land Costs	$ 67,200								
Total:	**$ 1,130,600**	**$ 310,600**	**$ 19,230**	**$ 26,435**	**$ 32,650**	**$ -**	**$ -**	**$ -**	**$ -**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

Cost Components for Option 2 - Two Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]			Resource Income		Net Operating Cost	
	2015	2030	at 2015	at 2030	at 2045	2030	2045	2030	2045
1. Conveyance - Rock Bay									
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 540	$ 640	$ 730				
(b) Macaulay Pt PS and Forcemain to Rock Bay	$ 65,400	N/A	$ 620	$ 730	$ 840				
(c) Effluent PS and Forcemain to Clover Point	$ 83,900	N/A	$ 1,000	$ 1,190	$ 1,400				
(d) Replace Clover Outfall	$ 32,500	N/A	incl. in (c)		incl. in (c)				
(e) Reline Macaulay Outfall	$ 11,100	N/A	incl. in (b)		incl. in (b)				
Conveyance - Rock Bay Subtotal:	$ 244,300	$ -	$ 2,160	$ 2,560	$ 2,970	$ -	$ -	$ -	$ -
2. Liquid Treatment - Rock Bay - Secondary	$ 392,000	$ 162,000	$ 7,000	$ 10,100	$ 12,650				
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300				
4. Reuse - Rock Bay									
(a) Tertiary Slipstream	$ 8,100	N/A	$ 230	$ 230	$ 230				
(b) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80				
Reuse - Rock Bay Subtotal:	$ 24,200	$ -	$ 300	$ 305	$ 310	$ -	$ -	$ -	$ -
6. Existing System Capacity Upgrades									
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A				
(b) Arbutus Attenuation Tank - incl land	$ 20,000	N/A	N/A	N/A	N/A				
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A				
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A				
(f) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A				
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7. Conveyance - Colwood									
(a) Galloping Goose Trail PS/Forcemain To/From	$ 4,400	N/A	$ 70	$ 70	$ 75				
8. Liquid Treatment - Colwood - Tertiary	$ 32,500	N/A	$ 600	$ 900	$ 900				
9. Reuse - Colwood									
(a) Effluent Pumping/Piping/Controls	$ 16,600	N/A	$ 70	$ 75	$ 80				
11. Land Costs	$ 71,000								
Total:	**$ 1,088,000**	**$ 252,600**	**$ 15,200**	**$ 22,810**	**$ 27,285**	**$ -**	**$ -**	**$ -**	**$ -**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

Cost Components for Option 3 - Four Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]			Resource Income		Net Operating Cost	
	2015	2030	at 2015	at 2030	at 2045	2030	2045	2030	2045
1. Conveyance - Rock Bay									
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 560	$ 650	$ 730				
(b) Barnhard Park PS and Forcemain to Rock Bay	$ 39,600	N/A	$ 320	$ 330	$ 340				
(c) Effluent PS and Forcemain to Clover Point	$ 53,700	N/A	$ 710	$ 760	$ 800				
(d) Replace Clover Outfall	$ 23,500	N/A	in ©		in ©				
Conveyance - Rock Bay Subtotal:	$ 168,200	$ -	$ 1,590	$ 1,740	$ 1,870	$ -	$ -	$ -	$ -
2. Liquid Treatment - Rock Bay (Secondary)	$ 282,000	$ 70,000	$ 5,000	$ 7,800	$ 9,900				
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300				
4. Reuse - Rock Bay									
(a) Tertiary Slipstream	$ 8,100	N/A	$ 230	$ 230	$ 230				
(b) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80				
Reuse - Rock Bay Subtotal:	$ 24,200	$ -	$ 300	$ 305	$ 310	$ -	$ -	$ -	$ -
5. Existing System Capacity Upgrades									
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A				
(b) Arbutus Attenuation Tank- incl land	$ 20,000	N/A	N/A	N/A	N/A				
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A				
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A				
(e) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A				
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6. Conveyance - Colwood									
(a) Galloping Goose Trail PS/Forcemain To/From	$ 4,400	N/A	$ 70	$ 70	$ 75				
7. Liquid Treatment - Colwood (Tertiary)	$ 32,500	N/A	$ 600	$ 900	$ 900				
8. Reuse - Colwood									
(a) Effluent Pumping/Piping/Controls	$ 16,600	N/A	$ 70	$ 75	$ 80				
9. Conveyance - Esquimalt FN									
(a) Admirals Rd Trunk Tie-in and FM to Plant	$ 4,600	N/A	N/A		N/A				
(b) Macaulay Pt PS and Forcemain to WWTP	$ 16,600	N/A	$ 130	$ 140	$ 150				
(c) Effluent PS and Forcemain to Macaulay	$ 42,600	N/A	$ 320	$ 420	$ 530				

Cost Components for Option 3 - Four Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]			Resource Income		Net Operating Cost	
	2015	2030	at 2015	at 2030	at 2045	2030	2045	2030	2045
(d) Replace Macaulay Outfall	$ 34,200	N/A	in ©		in ©				
Conveyance - Esquimalt FN Subtotal:	$ 98,000	$ -	$ 450	$ 560	$ 680	$ -	$ -	$ -	$ -
10. Liquid Treatment - Esquimalt (Secondary)	$ 141,000	$ 87,000	$ 3,000	$ 4,500	$ 6,000				
11. Reuse - Esquimalt									
(a) Tertiary Slipstream	$ 4,100	N/A	$ 120	$ 120	$ 120				
(b) Effluent Pumping/Piping/Controls	$ 14,000	N/A	$ 50	$ 60	$ 70				
Reuse Esquimalt FN Subtotal:	$ 18,100	$ -	$ 170	$ 180	$ 190	$ -	$ -	$ -	$ -
12. Conveyance - East Saanich									
(a) Garnet PS Upgrade and Forcemain To/From	$ 4,000	N/A	$ 50	$ 60	$ 70				
13. Liquid Treatment - East Saanich (Tertiary)	$ 10,000	$ 6,500	$ 200	$ 300	$ 500				
14. Reuse - East Saanich									
(a) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 50	$ 55	$ 60				
16. Land Costs	$ 77,200	N/A							
Total:	**$ 1,195,300**	**$ 254,100**	**$ 16,550**	**$ 25,345**	**$ 30,935**	**$ -**	**$ -**	**$ -**	**$ -**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

Cost Components for Option 4 - Seven Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]			Resource Income		Net Operating Cost	
	2015	2030	at 2015	at 2030	at 2045	2030	2045	2030	2045
1. Conveyance - Rock Bay									
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 560	$ 645	$ 730				
(b) Barnhard Pk PS and Forcemain to Rock Bay	$ 39,600	N/A	$ 320	$ 335	$ 350				
(c) Effluent PS and Forcemain to Clover	$ 53,700	N/A	$ 710	$ 755	$ 800				
(d) Replace Clover Outfall	$ 23,500	N/A	in ©		in ©				
Conveyance - Rock Bay Subtotal:	$ 168,200	$ -	$ 1,590	$ 1,735	$ 1,880	$ -	$ -	$ -	$ -
2. Liquid Treatment - Rock Bay (Secondary)	$ 282,000	$ 70,000	$ 5,000	$ 7,800	$ 9,900				
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300				
4. Reuse - Rock Bay									
(a) Tertiary Slipstream	$ 8,100	N/A	$ 230	$ 230	$ 230				
(b) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80				
Reuse - Rock Bay Subtotal:	$ 24,200	$ -	$ 300	$ 305	$ 310	$ -	$ -	$ -	$ -
5. Existing System Capacity Upgrades									
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A				
(b) Arbutus Attenuation Tank- incl land	$ 20,000	N/A	N/A	N/A	N/A				
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A				
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A				
(e) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A				
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6. Conveyance - Esquimalt									
(a) Lyall St PS and Forcemain to WWTP	$ 24,100	N/A	$ 230	$ 235	$ 240				
(b) Macaulay Pt PS and Forcemain to WWTP	$ 10,100	N/A	$ 120	$ 120	$ 120				
(c) Effluent PS and Forcemain to Macaulay Point	$ 19,900	N/A	$ 230	$ 275	$ 320				
(d) Replace Macaulay Outfall	$ 34,200	N/A	in ©		in ©				
Conveyance - Esquimalt Subtotal:	$ 88,300	$ -	$ 580	$ 630	$ 680	$ -	$ -	$ -	$ -
7. Liquid Treatment - Esquimalt (Tertiary)	$ 67,000	$ 12,000	$ 1,200	$ 1,900	$ 2,200				
8. Reuse - Esquimalt									
(a) Effluent Pumping/Piping/Controls	$ 14,000	N/A	$ 50	$ 50	$ 50				
9. Conveyance - View Royal									
(a) Retrofit Craigflower PS and all conveyance to Colwood	$ 14,700	N/A	$ 130	$ 145	$ 160				

Cost Components for Option 4 - Seven Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]			Resource Income		Net Operating Cost	
	2015	2030	at 2015	at 2030	at 2045	2030	2045	2030	2045
10. Liquid Treatment - View Royal (Tertiary)	$ 23,000	$ 22,000	$ 400	$ 700	$ 1,300				
11. Conveyance - Colwood									
(a) PS at Colwood Border/Forcemain To WWTP	$ 9,900	N/A	$ 80	$ 95	$ 110				
(b) View Royal and Colwood Effluent to Junction with Langford	$ 1,100	N/A	$ 5	$ 5	$ 5				
Conveyance - Colwood Subtotal:	$ 11,000	$ -	$ 85	$ 100	$ 115	$ -	$ -	$ -	$ -
12. Liquid Treatment - Colwood (Tertiary)	$ 32,500	$ 42,000	$ 600	$ 900	$ 900				
13. Reuse - Colwood									
(a) Effluent Pumping/Piping/Controls (high peak flows)	$ 19,100	N/A	$ 70	$ 75	$ 80				
14. Conveyance - Langford									
(a) Raw Sewage PS and Forcemain to WWTP	$ 11,800	N/A	$ 130	$ 135	$ 140				
(b) Effluent Pumping and Forcemain to Junction with Colwood/Langford	$ 10,300	N/A	$ 80	$ 85	$ 90				
(c) Junction to Marine Shore	$ 12,000	N/A	$ 30	$ 45	$ 60				
(d) New Outfall	$ 33,800	N/A	in ©		in ©				
Conveyance - Langford Subtotal:	$ 67,900	$ -	$ 240	$ 265	$ 290	$ -	$ -	$ -	$ -
15. Liquid Treatment - Langford (Tertiary)	$ 82,000	$ 54,000	$ 1,500	$ 2,200	$ 3,700				
16. Conveyance - East Saanich									
(a) Garnet PS Upgrade and Forcemain To/From	$ 4,000	N/A	$ 50	$ 55	$ 60				
17. Liquid Treatment - East Saanich (Tertiary)	$ 10,000	$ 7,000	$ 200	$ 300	$ 500				
18. Reuse - East Saanich									
(a) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 50	$ 55	$ 60				
19. Conveyance - Saanich Core									
(a) Galloping Goose Trail PS and Forcemain To/From	$ 3,100	N/A	$ 60	$ 65	$ 70				
20. Liquid Treatment - Saanich Core (Tertiary)	$ 16,000	N/A	$ 300	$ 500	$ 500				
21. Reuse - Saanich Core									
(a) Effluent Pumping/Piping/Controls	$ 8,800	N/A	$ 50	$ 50	$ 50				
23. Land Costs	$ 93,400	N/A							
Total:	**$ 1,348,300**	**$ 297,600**	**$ 17,455**	**$ 26,630**	**$ 33,105**	**$ -**	**$ -**	**$ -**	**$ -**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

APPENDIX D - PROCUREMENT CONSIDERATIONS

PROCUREMENT CONSIDERATIONS

Each infrastructure project includes five elements: design, build, finance, operate and maintain. Different combinations of these elements are used to create the procurement models currently found. The two most common models used in Canada for municipal sewer infrastructure projects are Design-Bid-Build (DBB) and Design-Build (DB). Financing, operations and maintenance are typically provided by the local government. Public Private Partnerships (P3) are gaining popularity in Canada with additional funding support being provided by P3 Canada. Common P3 models include: Design-Build-Finance (DBF), Design-Build-Operate-Maintain (DBOM), Design-Build-Finance-Maintain (DBFM), and Design-Build-Finance-Operate-Maintain (DBFOM). There are many other models however for the purpose of this analysis we will focus on three potential options DBB, DBF, and DBFOM as they present the greatest range of options available. All of these models are eligible for current federal-provincial infrastructure funding programs with the exception of the P3 Canada funding which cannot be accessed for DBB and may or may not be available for DBF. It should be noted however that the maximum amount of funding from P3 Canada is capped at 25% of the project's direct construction costs including any other federal government assistance.

Table 1: Procurement Models Key Elements Summary (Typical)

	DBB	DBF	DBFOM
Project Management	By Owner	Contract with Consultant	Contract with Consultant
Design Lead	Contract with Consultant	Contract with Contractor	Contract with Contractor
Build Lead	Contract with Contractor	Contract with Contractor	
Operate/Maintain Lead	By Owner	By Owner	
Finance Lead	By Owner	Contract with Contractor	
Owner Risk Carried	High	Medium	Low
Contractor Innovation	Low - Limited to Interpretation of Design	Medium - Limited to Owners Statement of Requirements for Design and Construction	High - Limited to Owners Statement of Requirements for Design, Construction and Operation
Procurement Costs	Low	Medium	High

As illustrated the amount of risk that is transferred to the Contractor increases from DBB to DBF and further to DBFOM. With risk transfer comes a cost therefore the benefits associated with the risk transfer need to outweigh the additional costs.

The DBB model is most commonly used when the local government has the skills and resources to manage the project internally, operate the infrastructure after construction completion, and when innovation from the private sector will likely not produce significant benefits. The risk to the contractor

is limited to construction. The consultant and contractor capacity within BC for this model of procurement are greatest due to the extensive history of its use.

Movement to the DBF occurs typically when innovation from the private sector will produce significant benefit including project financing. The risk to the contractor now includes financing and design as well as construction. Consultant and contractor capacity within BC are not as great as the DBB model however there is still significant capacity and it can be supplemented by other North American companies.

Finally progression to DBFOM typically also occurs when the owner does not have the resources or desire to operate and maintain the infrastructure or wants to see greater innovation from the private sector to capture not only capital but operating and maintenance costs as well. The contractor risk is now expanded to include operations and maintenance and can also include revenue recovery. The greatest limitation to capacity for this model is the operations and maintenance skillset. There are only a few companies in Canada that are set up to provide long term operations and maintenance support.

P3 Canada in their P3 Screen Suitability Assessment use twelve criteria to determine if a public private partnership is worth considering as part of a procurement option analysis. The criteria are summarized in the table below:

Table 0-1: Criteria Summary

CRITERION	HIGH SCORE	LOW SCORE	COMMENTS
1. Asset Life	+ 25 Years	< 10 Years	Longer asset lives typically give greater flexibility for longer contract terms
2. Asset Complexity	3 or more asset classes	1 asset class	Complex projects generally perform better than simple projects as a P3
3. Output and Performance Specifications (Construction)	Construction specifications exist and are readily available	New specifications are required as this hasn't been delivered in a P3 model before	Choosing projects with a proven track record in P3 are best
4. Stability of Operations and Maintenance Requirements	Predicable and stable	Unpredictable and unstable	Predictable and stable O&M requirements are best for a P3

CRITERION	HIGH SCORE	LOW SCORE	COMMENTS
5. Performance Specifications and Indicators (Operations Period)	Specifications and indicators exist and are readily available	New specifications and indicators are required as this hasn't been delivered in a P3 model before	Choosing projects with a proven track record in P3 are best
6. Life Cycle Costs	Understood and accurate	Not well understood and not able to be accurately determined	Predictable life cycle costs are best for a P3
7. Revenue Generation	Revenues are certain and private sector willing to assume revenue risk	Revenues are unlikely	Certainty of revenue is key for private sector interest to assume risk
8. Private Sector Expertise	5 or more private firms who can lead a submission	Fewer than 3 private sector firms who can lead a submission	Lack of private sector expertise is a risk to a P3 project success
9. Market Precedents	Similar size and type of projects have been delivered in Canada	Similar size and type of projects have not been delivered as P3s anywhere in the world	Proven success generates private sector interest
10. Nature of Development Site	Undeveloped Site	Refurbishment of an existing facility	P3s are most successful on sites where the contractor has full flexibility and control
11. Scope of Private Sector Innovation Gains	Specifications are limited to outputs only	Specifications specify significant input requirements	Private sector innovation is greatest when the public sector does not prescribe inputs rather only outputs.
12. Potential for Contract Integration	All elements of P3 can be integrated into one contract.	Only two elements can be integrated into a single contract.	The greater the integration the greater the P3 value.

Each of the above criteria have a maximum score of 5 which totals 60 points. These are then weighted and normalized to provide a total score out of 100. P3 Canada only recommends moving forward with a procurement option analysis if 75% of the total maximum points are achieved in the evaluation. At 51-75% they recommend a conversation with P3 Canada before proceeding.

The following tables summarize the option set components and the potential procurement methods that are recommended to be reviewed and considered in subsequent phases. It is recommended that a

formal business case be prepared with the preferred option set to support the procurement method selection process.

Option Set Components

Criterion	Pipelines	Pump Stations	Outfalls	Liquid Treatment	Solids Treatment	Water Reuse Distribution	Energy Recovery Collection System
Potential Procurement Method	DBB, DBF	DBB, DBF	DBB, DBF	DBB, DBF, DBFOM	DBB, DBF, DBFOM	DBB, DBF, DBFOM	DBB, DBF, DBFOM
1. Asset Life	☑	☑	☑	☑	☑	☑	☑
2. Asset Complexity	☒		☒	☑	☑	☒	☑
3. Output and Performance Specifications (Construction)	☑	☑	☑	☑	☑	☑	
4. Stability of Operations and Maintenance Requirements	☑	☑	☑	☑			☒
5. Performance Specifications and Indicators (Operations Period)	☒	☒		☑	☒	☒	☒
6. Life Cycle Costs	☑	☑	☑	☑	☒	☒	☒
7. Revenue Generation	☑	☑	☑	☑	☒	☒	☒
8. Private Sector Expertise	☑	☑	☑	☑	☒	☑	☒
9. Market Precedents					☒	☒	☒
10. Nature of Development Site							
11. Scope of Private Sector Innovation Gains	☒	☒					
12. Potential for Contract Integration	☒	☒	☒	☑	☑	☑	☑

Conveyance Upgrades – Pipelines

Conveyance upgrades are most strongly suited to a design-bid-build approach or design-build-finance if rolled in with other works such as pump station upgrades. The CRD already operates the collection

system and so there is not likely any value in transferring the operating risks over to a contractor. Pipelines don't require the same level of attention and effort unless something goes wrong. They are ideal to be added to the responsibility for a crew that looks after other assets. The pipelines will require close collaboration with the communities where they are installed and so the communication and coordination element should be considered in the selection of the procurement method.

Conveyance Upgrades – Pump Stations

Pump station upgrades may be more attractive to consider for a design-build-finance approach or just a design-build approach. They involve multiple disciplines and the collaboration between the contractor and consulting engineering company can result in innovative designs that can increase value and potentially reduce cost.

Conveyance Upgrades – Outfalls

The outfalls are a specialized piece of work which rely very heavily on the construction method and result in a high level of risk. These are most strongly suited to a design-bid-build approach or design-build-finance if rolled in with other works such as a treatment plant or pump station upgrade. The only risk with rolling these into other projects is that the specialist contractor will become a subcontractor to the prime contractor.

Treatment Liquids

Treatment plants for the liquids could be delivered under any of the three models but likely will score the highest in the greatest number of P3 categories. They are complex facilities that can benefit from technology and design/construction innovation, have been delivered in these procurement methods in Canada (including Metro Vancouver who is in the process of delivering the Lions Gate plant this way), are able to be managed with output performance requirements, and have certainty of revenue and costs. The biggest risks are the preexisting site conditions. For the DBFOM model the greatest uncertainty is whether or not the public will support contracting out the operating role and if a contractor will be willing to set up an operational arm in Victoria. Given the location and proximity to other operations it would be idea that if multiple plants are considered that they be delivered as a single package so that the operational efficiencies can be realized. Even if DBFOM is not pursued the Design Build Finance or Design Build approach may allow for greater private sector innovation.

Treatment Solids

The solids treatment facilities may at first glance appear to be most attractive for P3 delivery: especially due to the desire to allow the private sector to propose innovative markets and technologies. However, based on P3 Canada's guide the limited number of similar operating facilities in Canada or the US coupled with the lack of a proven market for the product makes this a project that requires further consideration and review. The CRD did successfully obtain funding for the solids facility at Hartland previously and so the feedback from P3 Canada during that process will be valuable in confirming the similar approach moving forward. The CRD's current policy to ban land application of biosolids and also discourage the dumping of residual products at the landfill poses challenges for moving forward with

this under P3 model. If this is rolled into a broader solid waste management facility as was done previously then the chances for success under the P3 approach will likely increase.

Water Reuse Conveyance

Conveyance infrastructure for water reuse applications are likely best delivered by DBB or DBF. Operational efficiencies will be possible with current water supply and distribution system operations. Further, given the lack of certainty of market and revenue as well as a lack of similar operating facilities could prove this to be a challenge to deliver under P3 approaches.

Heat Recovery – Collection Systems

Heat recovery infrastructure for collection systems may also be considered to be attractive for procurement by P3. However, in order to improve the likelihood of revenue and market this may be best evaluated in conjunction with a district energy utility that is for areas beyond the locations of treatment facilities.

In summary the procurement options available to the CRD can provide for opportunities to engage with the private sector to achieve innovative and cost effective solutions. In our opinion the greatest opportunity for innovation exists within the liquids and solids treatment process and so these are two areas that should be considered further for some form of either design-build or public private partnership. It would be good to confirm with the public the level of support for various forms of procurement including public versus private asset ownership and operation and to what degree the private sector should be relied upon to absorb risks.

APPENDIX B

January 7, 2016

Capital Regional District

Core Area Liquid Waste Management Plan

Phase 2: Wastewater Treatment System Feasibility and Costing Analysis

Technical Memorandum Supplement – Option 5 Preliminary Costing

Project: 1692.0037.01

urbansystems.ca
402 – 645 Fort Street
Victoria, BC, V8W 1G2

carollo
Engineers...Working Wonders With Water™

URBAN systems

Table of Contents

1.0 OPTION SET 5 – THREE PLANTS

1.1 General Description

As requested by the Core Area Committee an additional option set has been created for preliminary review. Figure 1 illustrates the three plant option set. Wastewater (liquids) would be treated at a plant in Colwood serving Colwood/Langford, at Esquimalt Nation and at Rock Bay. The plant at Colwood is costed with secondary treatment (5a) and with tertiary treatment (5b). Option 5b includes reuse around the Colwood plant. The plants at Rock Bay and Esquimalt Nation are designed to provide a secondary level of treatment to meet the federal and provincial regulations, but they would also be equipped with disinfection for increased water quality. Sidestream tertiary treatment would be included in the costing for local reuse, for 10 MLD and 5 MLD at Rock Bay and Esquimalt Nation, respectively consistent with the previous options sets. In addition to the aforementioned water reuse opportunities, the treated effluent forcemain between Rock Bay and Clover Point, between Esquimalt Nation and Macaulay Point and between Colwood and the Royal Bay outfall could be accessed for heat recovery or other water reuse applications.

It is noted that if the Rock Bay, Esquimalt Nation and Colwood plants were all increased to tertiary treatment, there is a possibility that reduced piping and outfalls could ensue. However, this would have to be approved by the Ministry of Environment through a specific environmental impact study for the receiving environments.

Solids treatment and recovery would occur at either Rock Bay or Hartland Landfill consistent with Technical Memo 3. In other words, the solids at Esquimalt and Colwood would be dewatered and trucked to the central solids treatment facility.

As noted in Technical Memo #2 the City of Colwood has completed some feasibility work that shows the possibility of reusing 100% of the effluent via irrigation and aquifer recharge with a capacity estimated at 10 MLD.

It is currently assumed that a pump station will be required in Colwood in order to pump flows to the Colwood treatment plant. The CRD trunk main presently runs next to the proposed treatment plant site and there may be the ability to divert a portion of the flows via gravity to the treatment plant depending on what elevation the plant is located at. However, the amount of flows able to be diverted is not known at this time. There is also the Wilfret Pump Station that is municipally owned that may be able to be upgraded to provide the function for the Colwood Pump Station. However we have not had sufficient time to review the capacity of this station in order to determine what upgrading would be required. As

such for the purpose of this memo, and consistent with Technical Memo #3 all flows from Colwood to the new WWTP have been assumed to be conveyed from a new pump station and force main.

The plant at Colwood/Langford will treat all flows up to 4 x ADWF, and would discharge out its own outfall into Royal Bay. This outfall will serve as the alternate discharge for any reuse that is undertaken as well. It should be noted that specific approval will need to be obtained as part of the Liquid Waste Management Plan to match the treatment requirements of the Macauley outfall (i.e. only screening beyond 4XADWF). In addition an EIS will be required. If peak wet weather flow requirements for Colwood and Langford are able to be confirmed and committed to be less than 4xADWF, to the satisfaction of the CRD and the Ministry, then the conveyance and primary treatment components sizing and costs may be able to be reduced.

Rock Bay flows will include wastewater from all Eastside communities including flows currently directed to Macaulay from west Saanich and west Victoria by way of a pump station near Barnard Park. All other eastside flows would be pumped from Clover Point, or other strategic locations along the eastside to reduce the scope of new infrastructure.

The Esquimalt Nation plant will include a connection to the Craigflower lift station forcemain to collect flows that originate upstream of the proposed plant (to avoid having to pump all of the upstream flows from Macaulay Point) and a pump station for all other flows that converge at Macaulay (downstream of the plant). It will be possible to utilize the existing screens at Macaulay, so that only screened raw sewage needs to be pumped back to Esquimalt Nation. All treated effluent that is not reused, is pumped back to Macaulay Point for discharge out a new outfall. This plant will treat all flows from View Royal, Esquimalt and Songhees First nations and Esquimalt Township. The current, 2030 and 2045 ADWF design flows for Rock Bay, Colwood/Langford and Esquimalt Nation plants are summarized in Table 1 below. These are consistent with the values presented in Technical Memo #1.

Table 1 – Current 2030 and 2045 ADWF Design Flows

Plant	Current (MLD)	2030 (MLD)	2045 (MLD)
Esquimalt Nation	7.0	11.3	16.7
Rock Bay	56.1 (1)	77.8 (1)	93.1 (1)
Colwood/Langford	7.4	18.8	36.2
Total	**70.5**	**107.9**	**146.0**

(1) *Including West Saanich and West Victoria*

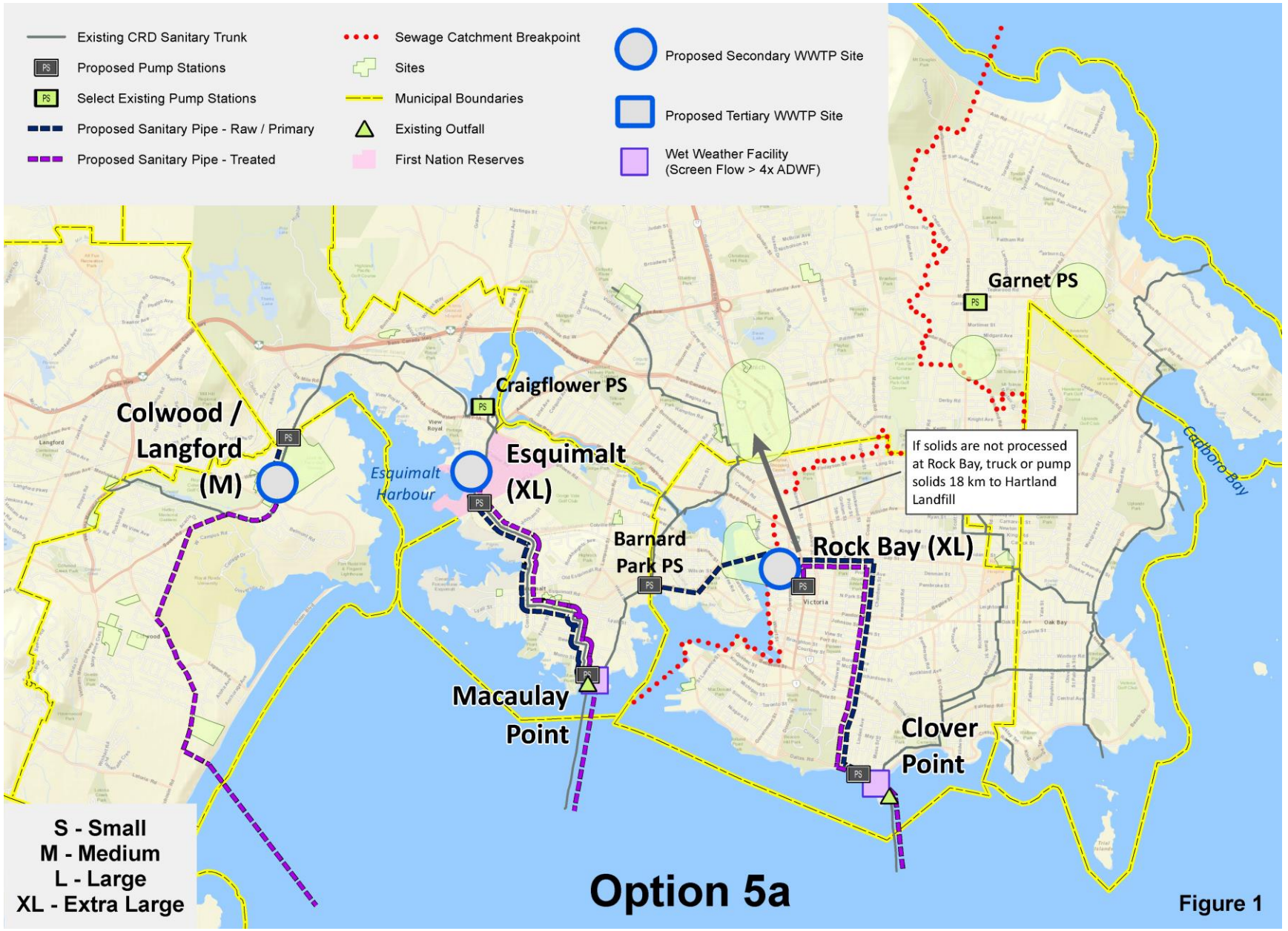
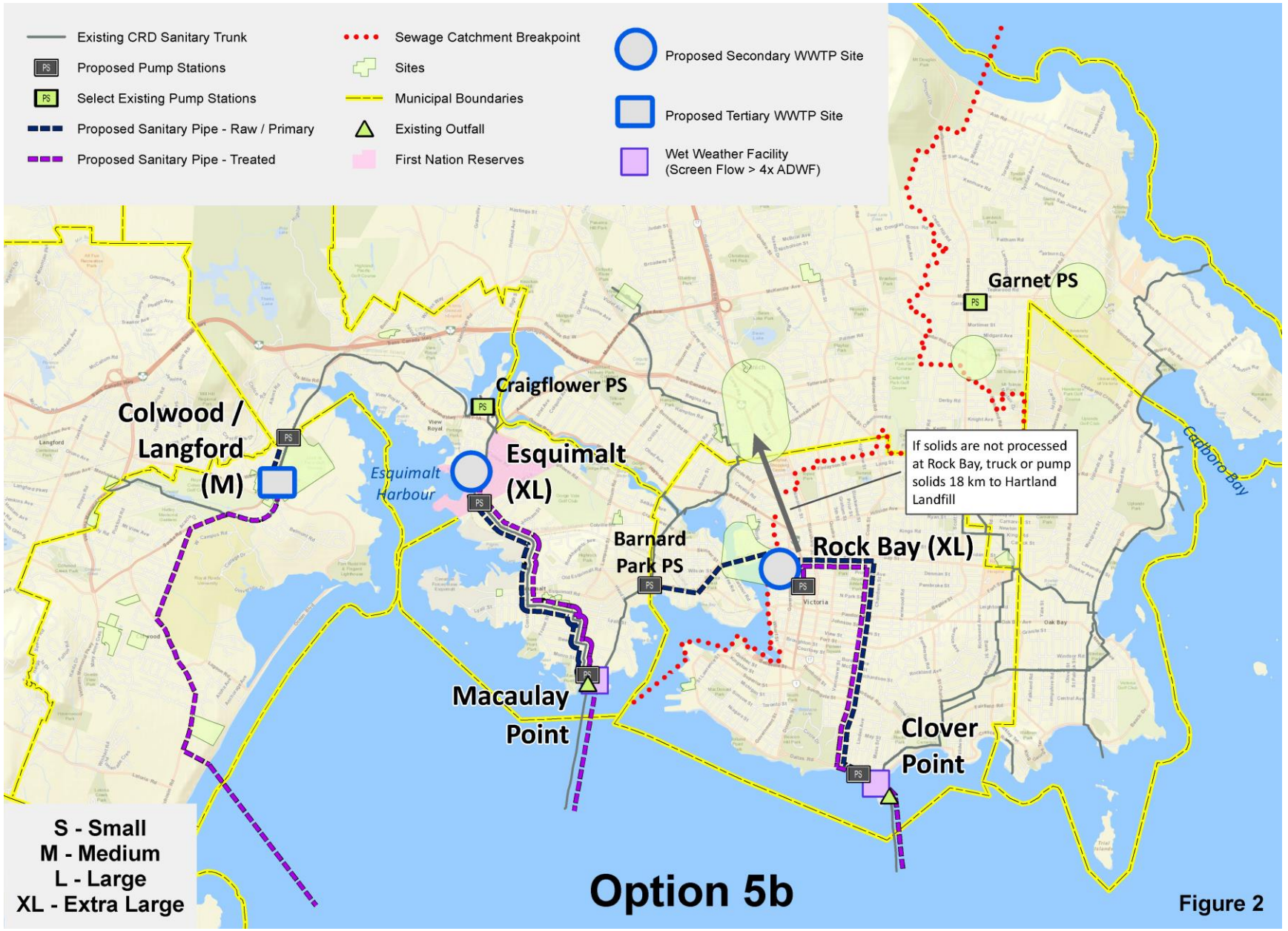

Existing CRD Sanitary Trunk
Proposed Pump Stations
Select Existing Pump Stations
Proposed Sanitary Pipe - Raw / Primary
Proposed Sanitary Pipe - Treated
Sewage Catchment Breakpoint
Sites
Municipal Boundaries
Existing Outfall
First Nation Reserves
Proposed Secondary WWTP Site
Proposed Tertiary WWTP Site
Wet Weather Facility
(Screen Flow > 4x ADWF)
Garnet PS
Craigflower PS
Colwood / Langford (M)
Esquimalt (XL)
Esquimalt Harbour
If solids are not processed at Rock Bay, truck or pump solids 18 km to Hartland Landfill
Barnard Park PS
Rock Bay (XL)
Macaulay Point
Clover Point
Cadboro Bay
S - Small
M - Medium
L - Large
XL - Extra Large
Option 5a

Figure 1


Existing CRD Sanitary Trunk
Proposed Pump Stations
Select Existing Pump Stations
Proposed Sanitary Pipe - Raw / Primary
Proposed Sanitary Pipe - Treated
Sewage Catchment Breakpoint
Sites
Municipal Boundaries
Existing Outfall
First Nation Reserves
Proposed Secondary WWTP Site
Proposed Tertiary WWTP Site
Wet Weather Facility
(Screen Flow > 4x ADWF)
Garnet PS
Craigflower PS
Colwood / Langford (M)
Esquimalt (XL)
Esquimalt Harbour
If solids are not processed at Rock Bay, truck or pump solids 18 km to Hartland Landfill
Barnard Park PS
Rock Bay (XL)
Macaulay Point
Clover Point
Cadboro Bay
S - Small
M - Medium
L - Large
XL - Extra Large
Option 5b
Figure 2

1.2 Components

The follow key components to implement this option are summarized in Table 2. Sizing for these components is consistent with the methodology outlined in Technical Memo #1 and #2.

Table 2a – Option 5a - Key Components

Key Components Required	2030 (m^3/d)	2045 (m^3/d)
Rock Bay		
1. Sewage Pumping Locations		
• Clover Point (2 x ADWF)	144,000	160,000
• Near Barnhard Park (4 x ADWF) – West Saanich and West Victoria	120,000	159,000
2. Primary Treatment	264,000	319,000
3. Secondary Treatment and Disinfection	156,000	186,500
4. Treated Effluent Pumping	264,000	319,000
5. Tertiary Treatment (Sidestream)	10,000	10,000
6. Clover Outfall Capacity (> 4 x ADWF)	317,000+	369,000+ [(1)]
Colwood		
1. Raw Sewage Pumping (4 x ADWF)	18,800	52,400
Colwood/Langford		
1. Primary Treatment (4 x ADWF)	75,200	144,800
2. Secondary Treatment (Incl. Solids Dewatering)	37,600	72,400
3. Treated Effluent Pumping to Outfall	75,200	144,800
4. Treated Effluent Pumping for Reuse	0	0
5. Royal Bay Outfall Capacity	75,200	144,800
Esquimalt (EFN)		
1. Sewage Pumping Locations		
• Near Admirals Road (View Royal) (4 x ADWF)	14,000	31,600
• Macaulay Point (Two FNs, Esquimalt Nation) (4 x ADWF)	31,200	35,000
2. Primary Treatment	45,200	66,600
3. Secondary Treatment	22,600	32,800
4. Treated Effluent Pumping	45,200	66,600
5. Tertiary Treatment (Slipstream)	5,000	5,000
6. Macaulay Outfall Capacity	45,200+	66,600+

[(1)] *By 2045 the Clover Outfall capacity will have to be increased from approximately 200 MLD to 369 MLD+*

Table 2b – Option 5b - Key Components

Key Components Required	2030 (m^3/d)	2045 (m^3/d)
Rock Bay		
1. Sewage Pumping Locations		
• Clover Point (2 x ADWF)	144,000	160,000
• Near Barnhard Park (4 x ADWF) – West Saanich and West Victoria	120,000	159,000
2. Primary Treatment	264,000	319,000
3. Secondary Treatment and Disinfection	156,000	186,500
4. Treated Effluent Pumping	264,000	319,000
5. Tertiary Treatment (Sidestream)	10,000	10,000
6. Clover Outfall Capacity (> 4 x ADWF)	317,000+	369,000+ (1)
Colwood		
1. Raw Sewage Pumping (4 x ADWF)	18,800	52,400
Colwood/Langford		
1. Primary Treatment (4 x ADWF)	75,200	144,800
2. Tertiary Treatment (Incl. Solids Dewatering)	37,600	72,400
3. Treated Effluent Pumping to Outfall	75,200	144,800
4. Treated Effluent Pumping for Reuse	10,000	10,000
5. Royal Bay Outfall Capacity	75,200	144,800
Esquimalt (EFN)		
1. Sewage Pumping Locations		
• Near Admirals Road (View Royal) (4 x ADWF)	14,000	31,600
• Macaulay Point (Two FNs, Esquimalt Nation) (4 x ADWF)	31,200	35,000
2. Primary Treatment	45,200	66,600
3. Secondary Treatment	22,600	32,800
4. Treated Effluent Pumping	45,200	66,600
5. Tertiary Treatment (Slipstream)	5,000	5,000
6. Macaulay Outfall Capacity	45,200+	66,600+

(1) *By 2045 the Clover Outfall capacity will have to be increased from approximately 200 MLD to 369 MLD+*

Table 3 summarizes the estimated piping and outfall lengths, with secondary treatment and no reuse in Colwood.

Table 3 – Option 5a Secondary Treatment Piping and Outfall Lengths [1]

From	To	Purpose	Length
A. Required			
Rock Bay			
Clover Point	Rock Bay WWTP	Screened Raw Sewage (SRS)	5,300 m
Rock Bay WWTP	Clover Point	Treated Effluent	5,300 m
Clover Point	End of Outfall	Treated Effluent/SRS	1,300 m
Pump Station near Barnard Park	Rock Bay WWTP	Raw Sewage	2,400 m
Colwood			
East Boundary of Colwood	Colwood WWTP	Raw Sewage	1,150 m
Langford/Colwood			
WWTP	Royal Bay Shore	Treated Effluent	5,500 m
Royal Bay Shore	End of Outfall	Treated Effluent	2,300 m
Esquimalt Nation			
Macaulay Point	Esquimalt Nation WWTP	Screened Raw Sewage	4,600 m
Esquimalt Nation WWTP	Macaulay Point	Treated Effluent	4,600 m
Admirals Road	Esquimalt Nation WWTP	Raw Sewage	300 m
Macaulay Point	End of Outfall	Treated Effluent/SRS	1,700 m
		Total	**34,450 m**
B. Optional			
• Rock Bay WWTP	End of Reuse	Reuse	18,500 m
• Esquimalt Nation WWTP	End of Reuse	Reuse	17,000 m
		Optional Total	**35,500 m**

[1] *Pipe lengths are approximate pending a routing review.*

Table 4 summarizes the estimated piping and outfall lengths, with tertiary treatment.

Table 4 – Option 5b Tertiary Treatment Piping and Outfall Lengths [1]

From	To	Purpose	Length
C. Required			
Rock Bay			
Clover Point	Rock Bay WWTP	Screened Raw Sewage (SRS)	5,300 m
Rock Bay WWTP	Clover Point	Treated Effluent	5,300 m
Clover Point	End of Outfall	Treated Effluent/SRS	1,300 m
Pump Station near Barnard Park	Rock Bay WWTP	Raw Sewage	2,400 m
Colwood			
East Boundary of Colwood	Colwood WWTP	Raw Sewage	1,150 m
Colwood WWTP	End of Reuse	Irrigation/Aquifer Recharge	19,500 m
Langford/Colwood			
WWTP	Royal Bay Shore	Treated Effluent	5,500 m
Royal Bay Shore	End of Outfall	Treated Effluent	2,300 m
Esquimalt Nation			
Macaulay Point	Esquimalt Nation WWTP	Screened Raw Sewage	4,600 m
Esquimalt Nation WWTP	Macaulay Point	Treated Effluent	4,600 m
Admirals Road	Esquimalt Nation WWTP	Raw Sewage	300 m
Macaulay Point	End of Outfall	Treated Effluent/SRS	1,700 m
		Total	**53,950 m [2]**
D. Optional			
• Rock Bay WWTP	End of Reuse	Reuse	18,500 m
• Esquimalt Nation WWTP	End of Reuse	Reuse	17,000 m
		Optional Total	**35,500 m**

[1] *Pipe lengths are approximate pending a routing review.*

[2] *Includes Colwood reuse piping.*

1.3 Cost Estimates

The cost estimates have been undertaken with the same assumptions used in Technical Memo #3 (as documented in Technical Memo #1). The summary tables are attached in Tables 5 and 6. For the collection system costs uniform average unit rates have been used across the regional district without the benefit of routing reviews. Local site conditions may result in individual component costs being lower or higher than the average.

Table 5 – Cost Components for Option 5a – Three Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]		
	2015	2030	at 2015	at 2030	at 2045
1. Conveyance - Rock Bay					
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 560	$ 650	$ 730
(b) Barnhard Park PS and Forcemain to Rock Bay	$ 39,600	N/A	$ 320	$ 330	$ 340
(c) Effluent PS and Forcemain to Clover Point	$ 53,700	N/A	$ 710	$ 760	$ 800
(d) Replace Clover Outfall	$ 23,500	N/A	in c above	in c above	in c above
Conveyance - Rock Bay Subtotal:	$ 168,200	$ -	$ 1,590	$ 1,740	$ 1,870
2. Liquid Treatment - Rock Bay (Secondary)	$ 282,000	$ 70,000	$ 5,000	$ 7,800	$ 9,900
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300
4. Reuse - Rock Bay					
(a) Tertiary Slipstream	$ 8,100	N/A	$ 230	$ 230	$ 230
(b) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80
Reuse - Rock Bay Subtotal:	$ 24,200	$ -	$ 300	$ 305	$ 310
5. Existing System Capacity Upgrades					
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A
(b) Arbutus Attenuation Tank- incl land	$ 20,000	N/A	N/A	N/A	N/A
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A
(e) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -
6. Conveyance - Colwood					
(a) East Boundary PS/FM to Plant	$ 14,500	N/A	$ 133	$ 140	$ 146
7. Liquid Treatment - Colwood/Langford (Secondary)	$ 71,100	$ 72,600	$ 1,300	$ 2,100	$ 3,800
8. Conveyance - Colwood/Langford					
(a) Effluent PS and FM to Shore	$ 31,900		$ 214	$ 250	$ 285
(b) New Outfall	$ 33,800		in b above	in b above	in b above
9. Conveyance - Esquimalt FN					
(a) Admirals Rd Trunk Tie-in and FM to Plant	$ 1,900		$ 43	$ 44	$ 45
(b) Macaulay Pt PS and Forcemain to WWTP	$ 16,600		$ 138	$ 140	$ 143
(c) Effluent PS and Forcemain to Macaulay	$ 18,700		$ 176	$ 188	$ 200
(d) Replace Macaulay Outfall	$ 12,600		in c above	in c above	in c above
Conveyance - Esquimalt FN Subtotal:	$ 49,800	$ -	$ 357	$ 372	$ 388
10. Liquid Treatment - Esquimalt (Secondary)	$ 51,700	$ 20,200	$ 900	$ 1,300	$ 2,000
11. Reuse - Esquimalt					
(a) Tertiary Slipstream	$ 4,100	N/A	$ 120	$ 120	$ 120
(b) Effluent Pumping/Piping/Controls	$ 14,000	N/A	$ 50	$ 60	$ 70
Reuse Esquimalt FN Subtotal:	$ 18,100	$ -	$ 170	$ 180	$ 190
13. Land Costs	$ 77,000 [2]	N/A			
Total:	**$ 1,125,300**	**$ 253,400**	**$ 14,964**	**$ 22,987**	**$ 29,189**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

[2] Remove East Saanich and Langford VM Way at Meadford Way, but increase area at Colwood. Allow similar land cost to the Four Plant Option.

Table 6 – Cost Components for Option 5b – Three Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]		
	2015	2030	at 2015	at 2030	at 2045
1. Conveyance - Rock Bay					
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 560	$ 650	$ 730
(b) Barnhard Park PS and Forcemain to Rock Bay	$ 39,600	N/A	$ 320	$ 330	$ 340
(c) Effluent PS and Forcemain to Clover Point	$ 53,700	N/A	$ 710	$ 760	$ 800
(d) Replace Clover Outfall	$ 23,500	N/A	in c above	in c above	in c above
Conveyance - Rock Bay Subtotal:	$ 168,200	$ -	$ 1,590	$ 1,740	$ 1,870
2. Liquid Treatment - Rock Bay (Secondary)	$ 282,000	$ 70,000	$ 5,000	$ 7,800	$ 9,900
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300
4. Reuse - Rock Bay					
(a) Tertiary Slipstream	$ 8,100	N/A	$ 230	$ 230	$ 230
(b) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80
Reuse - Rock Bay Subtotal:	$ 24,200	$ -	$ 300	$ 305	$ 310
5. Existing System Capacity Upgrades					
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A
(b) Arbutus Attenuation Tank- incl land	$ 20,000	N/A	N/A	N/A	N/A
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A
(e) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -
6. Conveyance - Colwood					
(a) East Boundary PS/FM to Plant	$ 14,500	N/A	$ 133	$ 140	$ 146
7. Liquid Treatment - Colwood/Langford (Tertiary)	$ 106,800	$ 119,500	$ 2,000	$ 3,100	$ 5,800
8. Reuse - Colwood					
(a) Effluent Pumping/Piping/Controls	$ 16,600	N/A	$ 70	$ 75	$ 80
9. Conveyance - Colwood/Langford					
(a) Effluent PS and FM to Shore	$ 31,900		$ 214	$ 250	$ 285
(b) New Outfall	$ 33,800		in b above	in b above	in b above
10. Conveyance - Esquimalt FN					
(a) Admirals Rd Trunk Tie-in and FM to Plant	$ 1,900		$ 43	$ 44	$ 45
(b) Macaulay Pt PS and Forcemain to WWTP	$ 16,600		$ 138	$ 140	$ 143
(c) Effluent PS and Forcemain to Macaulay	$ 18,700		$ 176	$ 188	$ 200
(d) Replace Macaulay Outfall	$ 12,600		in c above	in c above	in c above
Conveyance - Esquimalt FN Subtotal:	$ 49,800	$ -	$ 357	$ 372	$ 388
11. Liquid Treatment - Esquimalt (Secondary)	$ 51,700	$ 20,200	$ 900	$ 1,300	$ 2,000
12. Reuse - Esquimalt					
(a) Tertiary Slipstream	$ 4,100	N/A	$ 120	$ 120	$ 120
(b) Effluent Pumping/Piping/Controls	$ 14,000	N/A	$ 50	$ 60	$ 70
Reuse Esquimalt FN Subtotal:	$ 18,100	$ -	$ 170	$ 180	$ 190
13. Land Costs	$ 77,000 [2]	N/A			
Total:	**$ 1,177,600**	**$ 300,300**	**$ 15,734**	**$ 24,062**	**$ 31,269**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

[2] Remove East Saanich and Langford VM Way at Meadford Way, but increase area at Colwood. Allow similar land cost to the Four Plant Option.

MEMORANDUM

Date:	January 4, 2016
To:	Dan Telford P.Eng.
From:	Chris Town, P.Eng., MASc
File:	1692.0037.01
Subject:	Resident's Distributed Tertiary Treatment

1. Introduction

Oscar Regier presented a distributed tertiary treatment concept to the Technical Oversight Panel on November 23, 2015. Chris Town met with Mr. Regier on December 17, 2015 to go over the concept in some detail. Mr. Regier provided some additional documentation to elaborate on the option. The purpose of this memo is to review the advantages and challenges of the concept. No detailed engineering or costing of the concept has been undertaken.

2. General Description of the Concept

The attached figure illustrates the locations of where liquid treatment plants are envisioned to go. Solids would be dewatered at each plant and trucked to a central gasification facility which would incorporate other organic and municipal solid wastes. The site for solids treatment has not been identified.

The general approach to this concept involves:

- Maximizing the use of existing CRD trunk lines (often in a reverse flow direction);
- Locating liquid treatment plants adjacent to potential reuse demands;
- Treating all 2XADWF to a tertiary level (Greater Exposure Potential, with advanced oxidation);
- Discharging unused tertiary effluent to existing streams, constructed wetlands, or existing near shore sanitary sewer outfalls. The two existing deep outfalls are also included for some smaller treated and wet weather flows;
- Wet weather treatment facilities at Clover and Macaulay Points;
- Building some larger treatment plants along the East Coast Interceptor line with the intent of eliminating the need to build the Arbutus Attenuation Tank, Trent Siphon Extension, Upgrade to Currie Pump Station and Twinning 1,400 m of the East Coast Interceptor downstream of the Currie Pump Station.

3. Advantages

A lot of thought has been put into this concept and there are some real advantages and/or ideas that could be incorporated into the final option that is selected. We have highlighted the following for consideration in developing the final solution.

1. Minimize the length of new pipes;
2. Where possible, utilize existing pump stations;
3. Where possible, utilize existing CRD trunk mains in a reverse mode;
4. Maximizing reuse and heat recovery around each plant;
5. Treat all sewage to a high level to minimize impact on the environment and public health;
6. Install a pipe within the tunnel on the Northern Northwest Trunk to deliver flow from Barnhard Park to Rock Bay;

7. Technologies, process and layout designs standardized as much as possible;
8. Process trains and capacities standardized as much as possible;
9. Utilize prefabrication and replication of common units as much as possible;
10. Add extensions to WWTP buildings where possible to provide community amenities;
11. Manage wet weather flows using real time monitoring and flow control to take advantage of in-line storage;
12. Although there is no approved land at Royal Jubilee Hospital/Trent Pump Station as proposed in this concept, there was a publically acceptable site at Windsor Park. Could a large enough plant be built there to eliminate the need to build the Attenuation Tank, twinning of ECI, Trent siphon extension and Currie St. Pump Station upgrades? A new plant with a new outfall should have a lower life cycle cost than building and operating the noted infrastructure improvements (which are estimated to have a capital cost of $45 M).

4. Challenges

There are some challenges with this distributed tertiary treatment concept that we have identified, as follows:

1. Based on our understanding of the BC MWR and through discussions with the Ministry of Environment, whenever a discharger chooses reuse of reclaimed water (such as stream augmentation, irrigation, toilet flushing and even constructed wetlands) a redundant backup method of disposal is required that meets the terms of the MWR (Sections 114 and115). Essentially, within the Core Area, this means secondary treatment with an ocean outfall at least 10 m below low water and a minimum of 30 m from shore. Each location for a discharge requires an environmental impact study (EIS).

   Under some circumstances a waiver may be granted by the Minister for the type of redundant backup method of disposal (Section 8 of the MWR), when supported by an EIS. The costs of redundant backup methods of disposal are potentially very expensive and must be weighed against the cost savings.

2. A number of the WWTP sites selected were not provided by the municipalities – for example, Macaulay Pt. Given the public process used since April 2015 to review sites and provide comments, it is difficult to imagine how these sites could be included in the timeframes required. We assume each municipality would have to first accept these sites and then some public process would be required as well to incorporate them into the final preferred solution.
3. Approximately 12 EIS would be required to implement this concept – one for each creek discharge and one for each new near shore outfall. There is an expense and a time requirement for each EIS.
4. In our experience, any proposed reuse for stream augmentation (four of the sites) and aquifer discharge (one site) will likely require the reduction of nitrogen and phosphorous. The current concept did not anticipate this. There is a significant cost for treatment plants to achieve low levels of nitrogen and phosphorous.

5. There is a reliance on using existing near shore outfalls that are currently used for sanitary sewer overflows. It is unclear if these pipes will be adequately sized to handle the 2XADWF from the proposed treatment plant, as well as the storm overflow quantity. In addition, it is likely that they would have to be extended to meet the requirements of the MWR. The other issue with using these pipes has to do with governance. We are uncertain as to the ownership of these overflow lines and whether there would need to be changes if they became a key component of the solution.
6. The developable land (including required setbacks) at Clover Pt. is approximately 0.5 ha. It appears that this site is scheduled to house a small tertiary plant to handle 2XADWF from the local area, all of the 2 to 3XADWF (wet weather) and screening/pumping of all flows greater than 3XADWF. It is unclear as to whether the site is large enough given the need for parking, access roads, operations building (control room, offices, lunchroom, washrooms, change rooms) storage, workshop, chemical handling, sludge dewatering, treatment processes, odour control, influent and effluent pumping, grit and screening, heating and ventilation, emergency power and redundant systems.
7. The plan includes the use of advanced oxidation however as outlined in Technical Memo #1 it is unclear what the desired numerical outcomes are for the advanced oxidation and as such how the equipment would be sized.

Sincerely,

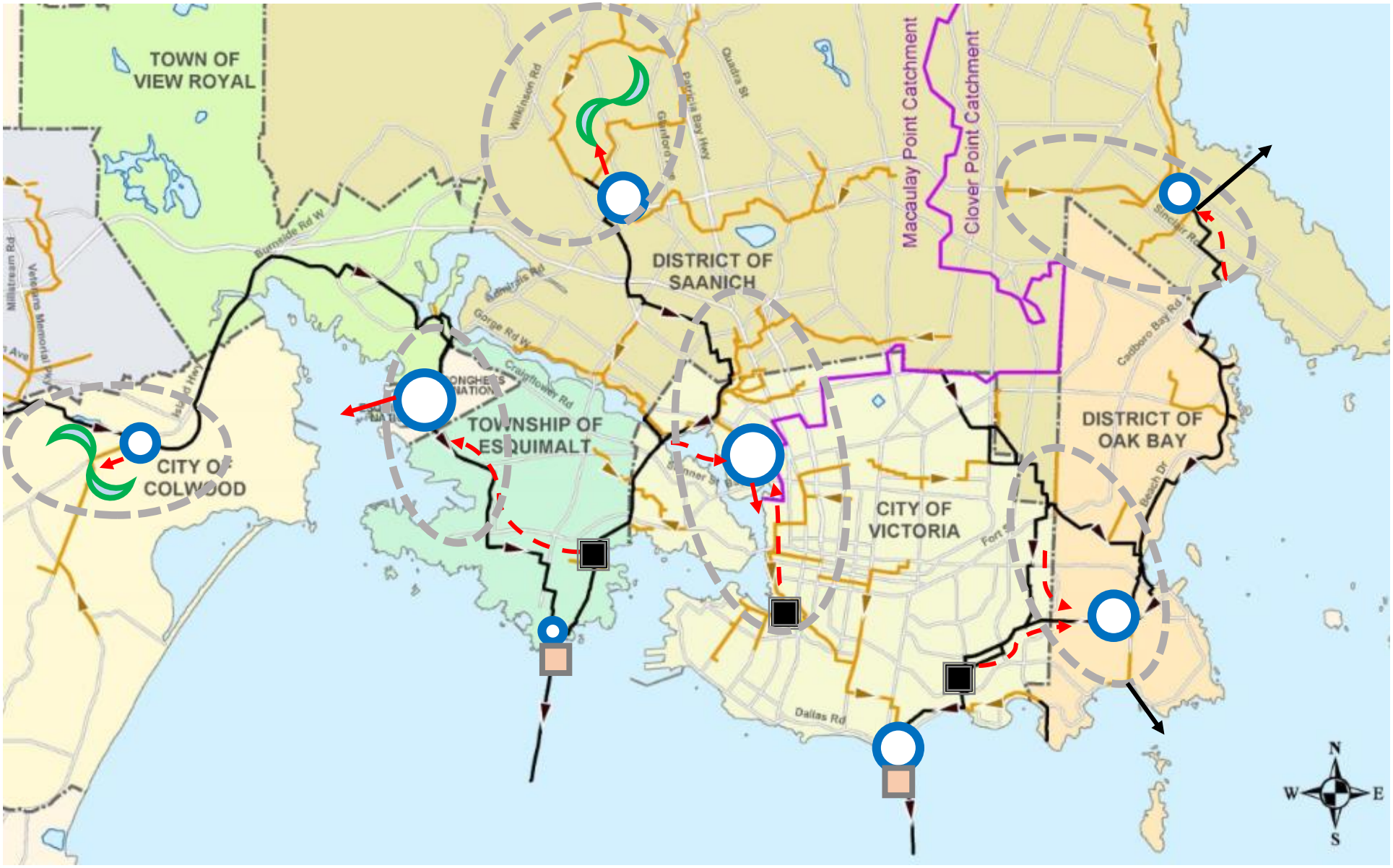
URBAN SYSTEMS LTD.

for

Chris Town, P.Eng., MASc
Senior Environmental Engineer

CT/mcn

Attachments: Map of Distributed Option



Tertiary WWTP Approx. 20 % of Total Flow	Tertiary WWTP Approx. 10-15 % of Total Flow	Tertiary WWTP Approx. 5 % of Total Flow	Wet Weather Facility Pump Station
Constructed Wetlands or Infiltration Basins	Gasifier & Energy Production Centre TBD	Recovered Resource Use Area	Redirected Flow –Optimized Use of Existing Pump Stations & Pipes

Summary - One Plant Option - Rock Bay - Secondary Treatment

One-Time and Ongoing Costs

Capital Costs to 2045 [(1)]	Annual Costs (at 2030)			Annual Resource Income (at 2030)
	O&M	Borrowing	Total	
$ 1,283,300,000	$ 21,800,000	$ -	$ 21,800,000	$ 900,000

Notes
(1) Includes initial construction costs in 2015 as well as plant upgrades in 2030. Also includes land costs.

	Initial Capital Costs (at 2015)	Net Annual Costs (at 2030)
One Plant - Rock Bay - Secondary Treatment	$ 1,030,700,000	$ 20,900,000

Net Present Value

Assumptions	
Interest Rate	7%
Inflation	2%
Real Discount Rate	5%
Time period	2015 to 2045

A real discount rate is used because we are using constant dollars.

Resource Income (from 2015 to 2045)

	Total Revenue (no discounting)	Present Value
Reclaimed water use	$ 23,300,000	$ 8,600,000
Heat recovery	$ -	$ -
Carbon credits	$ -	
Total	$ 23,300,000	$ 8,600,000

Costs (from 2015 to 2045)

	Total Costs (no discounting)	Present Value
Capital Costs	$ 1,283,300,000	$ 1,097,300,000
O&M	$ 633,900,000	$ 287,900,000
Borrowing Costs	$ -	$ -
Total	$ 1,917,200,000	$ 1,385,200,000

Net Present Value (2015 to 2045)	-$ 1,376,600,000

Ratio of Resource Income to Costs (at 2030)

Total annual revenues	$ 900,000
Total annual costs	$ 21,800,000
Ratio of revenues to costs	4%

Notes
(1) All costs in constant 2015 dollars.

Capital Costs - One Plant Option - Rock Bay - Secondary Treatment

	Capital costs to be incurred in 2015	Capital costs to be incurred in 2030
Total Construction Costs	$ 1,030,700,000	$ 252,600,000
Grants		
Net Project Costs	$ 1,030,700,000	$ 252,600,000

Notes

(1) Construction costs include general requirements (10%), contractor profit/overhead (10%), contingency (35%), escalation (2%/yr for four years), engineering (15%), CRD admin (8%) and interim financing (4%).

(2) Construction costs include land costs.

(3) Grant information from CRD.

Year	Capital Costs
2015	$ 1,030,700,000
2016	$ -
2017	$ -
2018	$ -
2019	$ -
2020	$ -
2021	$ -
2022	$ -
2023	$ -
2024	$ -
2025	$ -
2026	$ -
2027	$ -
2028	$ -
2029	$ -
2030	$ 252,600,000
2031	$ -
2032	$ -
2033	$ -
2034	$ -
2035	$ -
2036	$ -
2037	$ -
2038	$ -
2039	$ -
2040	$ -
2041	$ -
2042	$ -
2043	$ -
2044	$ -
2045	$ -
Total Capital Costs	$ 1,283,300,000

Present Value of Total Capital Costs
(2015 to 2045) $ 1,097,338,000

Annual Costs - One Plant Option - Rock Bay - Secondary Treatment

Year	O&M Costs	Annual Borrowing Costs	Total Annual Costs
2015	$ -		$ -
2016	$ 14,460,000		$ 14,460,000
2017	$ 14,981,786		$ 14,981,786
2018	$ 15,503,571		$ 15,503,571
2019	$ 16,025,357		$ 16,025,357
2020	$ 16,547,143		$ 16,547,143
2021	$ 17,068,929		$ 17,068,929
2022	$ 17,590,714		$ 17,590,714
2023	$ 18,112,500		$ 18,112,500
2024	$ 18,634,286		$ 18,634,286
2025	$ 19,156,071		$ 19,156,071
2026	$ 19,677,857		$ 19,677,857
2027	$ 20,199,643		$ 20,199,643
2028	$ 20,721,429		$ 20,721,429
2029	$ 21,243,214		$ 21,243,214
2030	$ 21,765,000		$ 21,765,000
2031	$ 22,062,667		$ 22,062,667
2032	$ 22,360,333		$ 22,360,333
2033	$ 22,658,000		$ 22,658,000
2034	$ 22,955,667		$ 22,955,667
2035	$ 23,253,333		$ 23,253,333
2036	$ 23,551,000		$ 23,551,000
2037	$ 23,848,667		$ 23,848,667
2038	$ 24,146,333		$ 24,146,333
2039	$ 24,444,000		$ 24,444,000
2040	$ 24,741,667		$ 24,741,667
2041	$ 25,039,333		$ 25,039,333
2042	$ 25,337,000		$ 25,337,000
2043	$ 25,634,667		$ 25,634,667
2044	$ 25,932,333		$ 25,932,333
2045	$ 26,230,000		$ 26,230,000
Total	$ 633,883,000	$ -	$ 633,883,000
Present Value	$ 287,932,000	$ -	$ 287,932,000

Notes

(1) O&M estimates provided by Urban Systems for 2016, 2030 and 2045. These have been highlighted in blue.

(2) O&M costs between 2016, 2030 and 2045 have been interpolated linearly.

Revenue- One Plant Option - Rock Bay - Secondary Treatment

Assumptions	Water Rate (per cubic metre) [1]	Reclaimed water use rate (per cubic metre) 80% of Water Rate	Reclaimed water use rate for toilet flushing (per ML)	Reclaimed water use rate for land application
Rock Bay	$1.26	$1.01	$1,011.30	$ 510.00
Colwood	$1.81	$1.45	$1,448.00	$ 510.00
Esquimalt First Nation	$1.26	$1.01	$1,011.30	$ 510.00
East Saanich	$1.54	$1.23	$1,233.60	$ 510.00
Esquimalt Bullen Park	$1.26	$1.01	$1,011.30	$ 510.00
East Saanich	$1.54	$1.23	$1,233.60	$ 510.00
Saanich Core	$1.54	$1.23	$1,233.60	$ 510.00
Langford	$1.81	$1.45	$1,448.00	$ 510.00
View Royal	$1.81	$1.45	$1,448.00	$ 510.00

Notes:
(1) Source: Respective municipal websites.

	Rock Bay							
	Reclaimed Water Use (ML/yr)							
Year	Land Application [1]	Toilet Flushing[2]	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	19	0	19	$ 9,520				$ 9,520
2017	37	0	37	$ 19,040				$ 19,040
2018	56	0	56	$ 28,560				$ 28,560
2019	75	0	75	$ 38,080				$ 38,080
2020	93	73	167	$ 121,741				$ 121,741
2021	93	147	240	$ 195,882				$ 195,882
2022	93	220	313	$ 270,023				$ 270,023
2023	93	293	387	$ 344,164				$ 344,164
2024	93	367	460	$ 418,305				$ 418,305
2025	93	440	533	$ 492,446				$ 492,446
2026	93	513	607	$ 566,587				$ 566,587
2027	93	587	680	$ 640,727				$ 640,727
2028	93	660	753	$ 714,868				$ 714,868
2029	93	733	826	$ 789,009				$ 789,009
2030	93	806	900	$ 863,150				$ 863,150
2031	93	880	973	$ 937,291				$ 937,291
2032	93	953	1046	$ 1,011,432				$ 1,011,432
2033	93	1026	1120	$ 1,085,573				$ 1,085,573
2034	93	1100	1193	$ 1,159,714				$ 1,159,714
2035	93	1173	1266	$ 1,233,855				$ 1,233,855
2036	93	1173	1266	$ 1,233,855				$ 1,233,855
2037	93	1173	1266	$ 1,233,855				$ 1,233,855
2038	93	1173	1266	$ 1,233,855				$ 1,233,855
2039	93	1173	1266	$ 1,233,855				$ 1,233,855
2040	93	1173	1266	$ 1,233,855				$ 1,233,855
2041	93	1173	1266	$ 1,233,855				$ 1,233,855
2042	93	1173	1266	$ 1,233,855				$ 1,233,855
2043	93	1173	1266	$ 1,233,855				$ 1,233,855
2044	93	1173	1266	$ 1,233,855				$ 1,233,855
2045	93	1173	1266	$ 1,233,855				$ 1,233,855
Total	2613	21701	24314	$ 23,278,516				$ 23,278,516
Present Value (2015 to 2045)				$ 8,608,000				$ 8,608,000

Notes
(1) Land application assumed to start at 0 in 2015 and increase linearly to max re-use in 2020.
(2) Flushing substitution assumed to be at 0 until 2020 and increase linearly to max re-use in 2035.
(3) Quantity data from Urban Systems, Nov 18, 2015.

Summary - One Plant Option - Rock Bay - Tertiary Treatment

One-Time and Ongoing Costs

Capital Costs to 2045 [1]	Annual Costs (at 2030)			Annual Resource Income (at 2030)
	O&M	Borrowing	Total	
$ 1,441,200,000	$ 26,400,000	$ -	$ 26,400,000	$ 900,000

Notes
(1) Includes initial construction costs in 2030 as well as plant upgrades in 2030. Also includes land costs.

	Initial Capital Costs (at 2015)	Net Annual Costs (at 2030)
One Plant - Rock Bay - Tertiary Treatment	$ 1,130,600,000	$ 25,500,000

Net Present Value

Assumptions	
Interest Rate	7%
Inflation	2%
Discount Rate	5%
Time period	2015 to 2045

Resource Income (from 2015 to 2045)

	Total Revenue (no discounting)	Present Value
Reclaimed water use	$ 23,300,000	$ 8,600,000
Heat recovery	$ -	$ -
Carbon credits	$ -	
Total	$ 23,300,000	$ 8,600,000

Costs (from 2015 to 2045)

	Total Costs (no discounting)	Present Value
Capital Costs	$ 1,441,200,000	$ 1,219,100,000
O&M	$ 788,700,000	$ 360,800,000
Borrowing Costs	$ -	$ -
Total	$ 2,229,900,000	$ 1,579,900,000

Net Present Value (2015 to 2045)	-$ 1,571,300,000

Ratio of Resource Income to Costs (at 2030)

Total annual revenues	$ 900,000
Total annual costs	$ 26,400,000
Ratio of revenues to costs	3%

Notes
(1) All costs in constant 2015 dollars.

Capital Costs - One Plant Option - Rock Bay - Tertiary Treatment

	Capital costs to be incurred in 2015	Capital costs to be incurred in 2030
Total Construction Costs	$ 1,130,600,000	$ 310,600,000
Grants		
Net Project Costs	$ 1,130,600,000	$ 310,600,000

Notes

(1) Construction costs include general requirements (10%), contractor profit/overhead (10%), contingency (35%), escalation (2%/yr for four years), engineering (15%), CRD admin (8%) and interim financing (4%).
(2) Construction costs include land costs.

Year	Capital Costs
2015	$ 1,130,600,000
2016	$ -
2017	$ -
2018	$ -
2019	$ -
2020	$ -
2021	$ -
2022	$ -
2023	$ -
2024	$ -
2025	$ -
2026	$ -
2027	$ -
2028	$ -
2029	$ -
2030	$ 310,600,000
2031	$ -
2032	$ -
2033	$ -
2034	$ -
2035	$ -
2036	$ -
2037	$ -
2038	$ -
2039	$ -
2040	$ -
2041	$ -
2042	$ -
2043	$ -
2044	$ -
2045	$ -
Total Capital Costs	$ 1,441,200,000

Present Value of Total Capital Costs
(2015 to 2045) $ 1,219,051,000

Annual Costs - One Plant Option - Rock Bay - Tertiary Treatment

Year	O&M Costs	Annual Borrowing Costs	Total Annual Costs
2015	$ -		$ -
2016	$ 19,230,000		$ 19,230,000
2017	$ 19,744,643		$ 19,744,643
2018	$ 20,259,286		$ 20,259,286
2019	$ 20,773,929		$ 20,773,929
2020	$ 21,288,571		$ 21,288,571
2021	$ 21,803,214		$ 21,803,214
2022	$ 22,317,857		$ 22,317,857
2023	$ 22,832,500		$ 22,832,500
2024	$ 23,347,143		$ 23,347,143
2025	$ 23,861,786		$ 23,861,786
2026	$ 24,376,429		$ 24,376,429
2027	$ 24,891,071		$ 24,891,071
2028	$ 25,405,714		$ 25,405,714
2029	$ 25,920,357		$ 25,920,357
2030	$ 26,435,000		$ 26,435,000
2031	$ 26,849,333		$ 26,849,333
2032	$ 27,263,667		$ 27,263,667
2033	$ 27,678,000		$ 27,678,000
2034	$ 28,092,333		$ 28,092,333
2035	$ 28,506,667		$ 28,506,667
2036	$ 28,921,000		$ 28,921,000
2037	$ 29,335,333		$ 29,335,333
2038	$ 29,749,667		$ 29,749,667
2039	$ 30,164,000		$ 30,164,000
2040	$ 30,578,333		$ 30,578,333
2041	$ 30,992,667		$ 30,992,667
2042	$ 31,407,000		$ 31,407,000
2043	$ 31,821,333		$ 31,821,333
2044	$ 32,235,667		$ 32,235,667
2045	$ 32,650,000		$ 32,650,000
Total	$ 788,733,000	$ -	$ 788,733,000
Present Value	$ 360,798,000	$ -	$ 360,798,000

Notes

(1) O&M estimates provided by Urban Systems for 2016, 2030 and 2045. These have been highlighted in blue.

(2) O&M costs between 2016, 2030, and 2045 have been interpolated linearly.

Revenue- One Plant Option - Rock Bay - Tertiary Treatment

Assumptions	Water Rate (per cubic metre)	Reclaimed water use rate (per cubic metre) 80% of Water Rate	Reclaimed water use rate for flushing (per ML)	Water rate for land application
Rock Bay	$1.26	$1.01	$1,011.30	$ 510
Colwood	$1.81	$1.45	$1,448.00	$ 510
Esquimalt First Nation	$1.26	$1.01	$1,011.30	$ 510
East Saanich	$1.54	$1.23	$1,233.60	$ 510
Esquimalt Bullen Park	$1.26	$1.01	$1,011.30	$ 510
East Saanich	$1.54	$1.23	$1,233.60	$ 510
Saanich Core	$1.54	$1.23	$1,233.60	$ 510
Langford	$1.81	$1.45	$1,448.00	$ 510
View Royal	$1.81	$1.45	$1,448.00	$ 510

	Rock Bay							
	Reclaimed Water Use (ML/yr)							
Year	Land Application [1]	Toilet Flushing[2]	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	19	0	19	$ 9,520				$ 9,520
2017	37	0	37	$ 19,040				$ 19,040
2018	56	0	56	$ 28,560				$ 28,560
2019	75	0	75	$ 38,080				$ 38,080
2020	93	73	167	$ 121,741				$ 121,741
2021	93	147	240	$ 195,882				$ 195,882
2022	93	220	313	$ 270,023				$ 270,023
2023	93	293	387	$ 344,164				$ 344,164
2024	93	367	460	$ 418,305				$ 418,305
2025	93	440	533	$ 492,446				$ 492,446
2026	93	513	607	$ 566,587				$ 566,587
2027	93	587	680	$ 640,727				$ 640,727
2028	93	660	753	$ 714,868				$ 714,868
2029	93	733	826	$ 789,009				$ 789,009
2030	93	806	900	$ 863,150				$ 863,150
2031	93	880	973	$ 937,291				$ 937,291
2032	93	953	1046	$ 1,011,432				$ 1,011,432
2033	93	1026	1120	$ 1,085,573				$ 1,085,573
2034	93	1100	1193	$ 1,159,714				$ 1,159,714
2035	93	1173	1266	$ 1,233,855				$ 1,233,855
2036	93	1173	1266	$ 1,233,855				$ 1,233,855
2037	93	1173	1266	$ 1,233,855				$ 1,233,855
2038	93	1173	1266	$ 1,233,855				$ 1,233,855
2039	93	1173	1266	$ 1,233,855				$ 1,233,855
2040	93	1173	1266	$ 1,233,855				$ 1,233,855
2041	93	1173	1266	$ 1,233,855				$ 1,233,855
2042	93	1173	1266	$ 1,233,855				$ 1,233,855
2043	93	1173	1266	$ 1,233,855				$ 1,233,855
2044	93	1173	1266	$ 1,233,855				$ 1,233,855
2045	93	1173	1266	$ 1,233,855				$ 1,233,855
Total	2613	21701	24314	$ 23,278,516		-		$ 23,278,516
Present Value (2015 to 2045)				$ 8,608,000				$ 8,608,000

Notes

(1) Land application assumed to start at 0 in 2015 and increase linearly to max re-use in 2020.

(2) Flushing substitution assumed to be at 0 until 2020 and increase linearly to max re-use in 2035.

Summary - Two Plant Option - Rock Bay and Colwood

One-Time and Ongoing Costs

Capital Costs to 2045 [1]	Annual Costs (at 2030)			Annual Resource Income (at 2030)
	O&M	Borrowing	Total	
$ 1,340,600,000	$ 22,800,000	$ -	$ 22,800,000	$ 2,500,000

Notes
(1) Includes initial construction costs in 2015 as well as plant upgrades in 2030. Also includes land costs.

	Intial Capital Costs (at 2015)	Net Annual Costs (at 2030)
Two Plants	$ 1,088,000,000	$ 20,300,000

Net Present Value

Assumptions	
Interest Rate	7%
Inflation	2%
Discount Rate	5%
Time period	2015 to 2045

Resource Income (from 2015 to 2045)

	Total Revenue (no discounting)	Present Value
Reclaimed water use	$ 66,900,000	$ 25,600,000
Heat recovery	$ -	$ -
Total	$ 66,900,000	$ 25,600,000

Costs (from 2015 to 2045)

	Total Costs (no discounting)	Present Value
Capital Costs	$ 1,340,600,000	$ 1,151,900,000
O&M	$ 663,000,000	$ 301,600,000
Borrowing Costs	$ -	$ -
Total	$ 2,003,600,000	$ 1,453,500,000

Net Present Value (2015 to 2045)	-$ 1,427,900,000

Ratio of Resource Income to Costs (at 2030)

Total annual revenues	$ 2,500,000
Total annual costs	$ 22,800,000
Ratio of revenues to costs	11%

Notes
(1) All costs in constant 2015 dollars.

Capital Costs - Two Plant Option - Rock Bay and Colwood

	Capital costs to be incurred in 2015	Capital costs to be incurred in 2030
Total Construction Costs	$ 1,088,000,000	$ 252,600,000
Grants		
Net Project Costs	$ 1,088,000,000	$ 252,600,000

Notes
(1) Construction costs include general requirements (10%), contractor profit/overhead (10%), contingency (35%), escalation (2%/yr for four years), engineering (15%), CRD admin (8%) and interim financing (4%).
(2) Construction costs include land costs.

Year	Capital Costs
2015	$ 1,088,000,000
2016	$ -
2017	$ -
2018	$ -
2019	$ -
2020	$ -
2021	$ -
2022	$ -
2023	$ -
2024	$ -
2025	$ -
2026	$ -
2027	$ -
2028	$ -
2029	$ -
2030	$ 252,600,000
2031	$ -
2032	$ -
2033	$ -
2034	$ -
2035	$ -
2036	$ -
2037	$ -
2038	$ -
2039	$ -
2040	$ -
2041	$ -
2042	$ -
2043	$ -
2044	$ -
2045	$ -
Total Capital Costs	$ 1,340,600,000

Present Value of Total Capital Costs (2015 to 2045)	$ 1,151,909,000

Annual Costs - Two Plant Option - Rock Bay and Colwood

Year	O&M Costs	Annual Borrowing Costs	Total Annual Costs
2015	$ -		$ -
2016	$ 15,200,000		$ 15,200,000
2017	$ 15,743,571		$ 15,743,571
2018	$ 16,287,143		$ 16,287,143
2019	$ 16,830,714		$ 16,830,714
2020	$ 17,374,286		$ 17,374,286
2021	$ 17,917,857		$ 17,917,857
2022	$ 18,461,429		$ 18,461,429
2023	$ 19,005,000		$ 19,005,000
2024	$ 19,548,571		$ 19,548,571
2025	$ 20,092,143		$ 20,092,143
2026	$ 20,635,714		$ 20,635,714
2027	$ 21,179,286		$ 21,179,286
2028	$ 21,722,857		$ 21,722,857
2029	$ 22,266,429		$ 22,266,429
2030	$ 22,810,000		$ 22,810,000
2031	$ 23,108,333		$ 23,108,333
2032	$ 23,406,667		$ 23,406,667
2033	$ 23,705,000		$ 23,705,000
2034	$ 24,003,333		$ 24,003,333
2035	$ 24,301,667		$ 24,301,667
2036	$ 24,600,000		$ 24,600,000
2037	$ 24,898,333		$ 24,898,333
2038	$ 25,196,667		$ 25,196,667
2039	$ 25,495,000		$ 25,495,000
2040	$ 25,793,333		$ 25,793,333
2041	$ 26,091,667		$ 26,091,667
2042	$ 26,390,000		$ 26,390,000
2043	$ 26,688,333		$ 26,688,333
2044	$ 26,986,667		$ 26,986,667
2045	$ 27,285,000		$ 27,285,000
Total	$ 663,025,000	$ -	$ 663,025,000
Present Value	$ 301,552,000	$ -	$ 301,552,000

Notes

(1) O&M estimates provided by Urban Systems for 2016, 2030 and 2045. These have been highlighted in blue.

(2) O&M costs between 2016, 2030, and 2045 have been interpolated linearly.

Revenue- Two Plant Option - Rock Bay and Colwood

Assumptions	Water Rate (per cubic metre)	Reclaimed water use rate (per cubic metre) 80% of Water Rate	Reclaimed water use rate for flushing (per ML)	Water rate for land application
Rock Bay	$ 1.26	$ 1.01	$ 1,011.30	$ 510.00
Colwood	$ 1.81	$ 1.45	$ 1,448.00	$ 510.00
Esquimalt First Nation	$ 1.26	$ 1.01	$ 1,011.30	$ 510.00
East Saanich	$ 1.54	$ 1.23	$ 1,233.60	$ 510.00
Esquimalt Bullen Park	$ 1.26	$ 1.01	$ 1,011.30	$ 510.00
East Saanich	$ 1.54	$ 1.23	$ 1,233.60	$ 510.00
Saanich Core	$ 1.54	$ 1.23	$ 1,233.60	$ 510.00
Langford	$ 1.81	$ 1.45	$ 1,448.00	$ 510.00
View Royal	$ 1.81	$ 1.45	$ 1,448.00	$ 510.00

	Rock Bay								Colwood								Total Resource Income			
	Reclaimed Water Use (ML/yr)								Reclaimed Water Use (ML/yr)											
Year	Land Application [1]	Toilet Flushing[2]	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL	Land Application [1]	Toilet Flushing[2]	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL	Reclaimed Water Use	Heat Recovery	Carbon Offsets	Total
2015	0	0	0	$ -				$ -	0	0	0	$ -				$ -	$ -			$ -
2016	19	0	19	$ 9,520				$ 9,520	165	0	165	$ 84,320				$ 84,320	$ 93,840			$ 93,840
2017	37	0	37	$ 19,040				$ 19,040	331	0	331	$ 168,640				$ 168,640	$ 187,680			$ 187,680
2018	56	0	56	$ 28,560				$ 28,560	496	0	496	$ 252,960				$ 252,960	$ 281,520			$ 281,520
2019	75	0	75	$ 38,080				$ 38,080	661	0	661	$ 337,280				$ 337,280	$ 375,360			$ 375,360
2020	93	73	167	$ 121,741				$ 121,741	827	74	901	$ 529,024				$ 529,024	$ 650,764			$ 650,764
2021	93	147	240	$ 195,882				$ 195,882	827	148	975	$ 636,447				$ 636,447	$ 832,329			$ 832,329
2022	93	220	313	$ 270,023				$ 270,023	827	223	1049	$ 743,871				$ 743,871	$ 1,013,893			$ 1,013,893
2023	93	293	387	$ 344,164				$ 344,164	827	297	1123	$ 851,294				$ 851,294	$ 1,195,458			$ 1,195,458
2024	93	367	460	$ 418,304				$ 418,304	827	371	1198	$ 958,718				$ 958,718	$ 1,377,022			$ 1,377,022
2025	93	440	533	$ 492,445				$ 492,445	827	445	1272	$ 1,066,141				$ 1,066,141	$ 1,558,586			$ 1,558,586
2026	93	513	607	$ 566,586				$ 566,586	827	519	1346	$ 1,173,565				$ 1,173,565	$ 1,740,151			$ 1,740,151
2027	93	587	680	$ 640,727				$ 640,727	827	594	1420	$ 1,280,988				$ 1,280,988	$ 1,921,715			$ 1,921,715
2028	93	660	753	$ 714,868				$ 714,868	827	668	1494	$ 1,388,412				$ 1,388,412	$ 2,103,280			$ 2,103,280
2029	93	733	826	$ 789,009				$ 789,009	827	742	1569	$ 1,495,835				$ 1,495,835	$ 2,284,844			$ 2,284,844
2030	93	806	900	$ 863,150				$ 863,150	827	816	1643	$ 1,603,259				$ 1,603,259	$ 2,466,408			$ 2,466,408
2031	93	880	973	$ 937,291				$ 937,291	827	890	1717	$ 1,710,682				$ 1,710,682	$ 2,647,973			$ 2,647,973
2032	93	953	1046	$ 1,011,432				$ 1,011,432	827	964	1791	$ 1,818,106				$ 1,818,106	$ 2,829,537			$ 2,829,537
2033	93	1026	1120	$ 1,085,572				$ 1,085,572	827	1039	1865	$ 1,925,529				$ 1,925,529	$ 3,011,101			$ 3,011,101
2034	93	1100	1193	$ 1,159,713				$ 1,159,713	827	1113	1939	$ 2,032,953				$ 2,032,953	$ 3,192,666			$ 3,192,666
2035	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2036	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2037	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2038	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2039	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2040	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2041	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2042	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2043	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2044	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
2045	93	1173	1266	$ 1,233,854				$ 1,233,854	827	1187	2014	$ 2,140,376				$ 2,140,376	$ 3,374,230			$ 3,374,230
Total	2613	21701	24314	$ 23,278,503		-		$ 23,278,503	23147	21960	45106	$ 43,602,156	-			$ 43,602,156	$ 66,880,659	-	-	$ 66,880,659
Present Value (2015 to 2045)				$ 8,608,000				$ 8,608,000				$ 17,025,000				$ 17,025,000	$ 25,632,000			$ 25,632,000

Notes
(1) Land application assumed to start at 0 in 2015 and increase linearly to max re-use in 2020.
(2) Flushing substitution assumed to be at 0 until 2020 and increase linearly to max re-use in 2035.

Summary - Four Plant Option

One-Time and Ongoing Costs

Capital Costs to 2045 [1]	Annual Costs (at 2030)			Annual Resource Income (at 2030)
	O&M	Borrowing	Total	
$ 1,449,400,000	$ 25,300,000	$ -	$ 25,300,000	$ 3,800,000

Notes
(1) Includes initial construction costs in 2015 as well as plant upgrades in 2030. Also includes land costs.

	Intial Capital Costs (at 2015)	Net Annual Costs (at 2030)
Four Plants	$ 1,195,300,000	$ 21,500,000

Net Present Value

Assumptions	
Interest Rate	7%
Inflation	2%
Discount Rate	5%
Time period	2015 to 2045

Resource Income (from 2015 to 2045)

	Total Revenue (no discounting)	Present Value
Reclaimed water use	$ 102,600,000	$ 40,400,000
Heat recovery	$ -	$ -
Total	$ 102,600,000	$ 40,400,000

Costs (from 2015 to 2045)

	Total Costs (no discounting)	Present Value
Capital Costs	$ 1,449,400,000	$ 1,254,800,000
O&M	$ 739,100,000	$ 334,600,000
Borrowing Costs	$ -	$ -
Total	$ 2,188,500,000	$ 1,589,400,000

Net Present Value (2015 to 2045)	-$ 1,549,000,000

Ratio of Resource Income to Costs (at 2030)

Total annual revenues	$ 3,800,000
Total annual costs	$ 25,300,000
Ratio of revenues to costs	15%

Notes
(1) All costs in constant 2015 dollars.

Capital Costs - Four Plant Option

	Capital costs to be incurred in 2015	Capital costs to be incurred in 2030
Total Construction Costs	$ 1,195,300,000	$ 254,100,000
Grants		
Net Project Costs	$ 1,195,300,000	$ 254,100,000

Notes

(1) Construction costs include general requirements (10%), contractor profit/overhead (10%), contingency (35%), escalation (2%/yr for four years), engineering (15%), CRD admin (8%) and interim financing (4%).

(2) Construction costs include land costs.

Year	Capital Costs
2015	$ 1,195,300,000
2016	$ -
2017	$ -
2018	$ -
2019	$ -
2020	$ -
2021	$ -
2022	$ -
2023	$ -
2024	$ -
2025	$ -
2026	$ -
2027	$ -
2028	$ -
2029	$ -
2030	$ 254,100,000
2031	$ -
2032	$ -
2033	$ -
2034	$ -
2035	$ -
2036	$ -
2037	$ -
2038	$ -
2039	$ -
2040	$ -
2041	$ -
2042	$ -
2043	$ -
2044	$ -
2045	$ -
Total	$ 1,449,400,000

Present Value of Total Capital Costs (2015 to 2045)	$ 1,254,787,000

Annual Costs - Four Plant Option

Year	O&M Costs	Annual Borrowing Costs	Total Annual Costs
2015	$ -		$ -
2016	$ 16,550,000		$ 16,550,000
2017	$ 17,178,214		$ 17,178,214
2018	$ 17,806,429		$ 17,806,429
2019	$ 18,434,643		$ 18,434,643
2020	$ 19,062,857		$ 19,062,857
2021	$ 19,691,071		$ 19,691,071
2022	$ 20,319,286		$ 20,319,286
2023	$ 20,947,500		$ 20,947,500
2024	$ 21,575,714		$ 21,575,714
2025	$ 22,203,929		$ 22,203,929
2026	$ 22,832,143		$ 22,832,143
2027	$ 23,460,357		$ 23,460,357
2028	$ 24,088,571		$ 24,088,571
2029	$ 24,716,786		$ 24,716,786
2030	$ 25,345,000		$ 25,345,000
2031	$ 25,717,667		$ 25,717,667
2032	$ 26,090,333		$ 26,090,333
2033	$ 26,463,000		$ 26,463,000
2034	$ 26,835,667		$ 26,835,667
2035	$ 27,208,333		$ 27,208,333
2036	$ 27,581,000		$ 27,581,000
2037	$ 27,953,667		$ 27,953,667
2038	$ 28,326,333		$ 28,326,333
2039	$ 28,699,000		$ 28,699,000
2040	$ 29,071,667		$ 29,071,667
2041	$ 29,444,333		$ 29,444,333
2042	$ 29,817,000		$ 29,817,000
2043	$ 30,189,667		$ 30,189,667
2044	$ 30,562,333		$ 30,562,333
2045	$ 30,935,000		$ 30,935,000
Total	$ 739,108,000	$ -	$ 739,108,000
Present Value	$ 334,562,000	$ -	$ 334,562,000

Notes

(1) O&M estimates provided by Urban Systems for 2016, 2030 and 2045. These have been highlighted in blue.

(2) O&M costs between 2016, 2030, and 2045 have been interpolated linearly.

Resource Income- Four Plant Option

Assumptions	Water Rate (per cubic metre)[1]	Reclaimed water use rate (per cubic metre) 80% of Water Rate	Reclaimed water use rate for flushing (per ML)	Water rate for land use
Rock Bay	$ 1.26	$ 1.01	$ 1,011.30	$ 510.00
Colwood	$ 1.81	$ 1.45	$ 1,448.00	$ 510.00
Esquimalt First Nation	$ 1.26	$ 1.01	$ 1,011.30	$ 510.00
East Saanich	$ 1.54	$ 1.23	$ 1,233.60	$ 510.00
Esquimalt Bullen Park	$ 1.26	$ 1.01	$ 1,011.30	$ 510.00
East Saanich	$ 1.54	$ 1.23	$ 1,233.60	$ 510.00
Saanich Core	$ 1.54	$ 1.23	$ 1,233.60	$ 510.00
Langford	$ 1.81	$ 1.45	$ 1,448.00	$ 510.00
View Royal	$ 1.81	$ 1.45	$ 1,448.00	$ 510.00

Notes
(1) Source: Respective municipal websites.

Rock Bay

Year	Reclaimed Water Use (ML/yr): Land Application [1]	Toilet Flushing[2]	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	19	0	19	$ 9,520				$ 9,520
2017	37	0	37	$ 19,040				$ 19,040
2018	56	0	56	$ 28,560				$ 28,560
2019	75	0	75	$ 38,080				$ 38,080
2020	93	73	167	$ 121,762				$ 121,762
2021	93	147	240	$ 195,924				$ 195,924
2022	93	220	313	$ 270,086				$ 270,086
2023	93	293	387	$ 344,248				$ 344,248
2024	93	367	460	$ 418,410				$ 418,410
2025	93	440	533	$ 492,572				$ 492,572
2026	93	513	607	$ 566,734				$ 566,734
2027	93	587	680	$ 640,896				$ 640,896
2028	93	660	753	$ 715,058				$ 715,058
2029	93	733	827	$ 789,220				$ 789,220
2030	93	807	900	$ 863,382				$ 863,382
2031	93	880	973	$ 937,544				$ 937,544
2032	93	953	1047	$ 1,011,705				$ 1,011,705
2033	93	1027	1120	$ 1,085,867				$ 1,085,867
2034	93	1100	1193	$ 1,160,029				$ 1,160,029
2035	93	1173	1267	$ 1,234,191				$ 1,234,191
2036	93	1173	1267	$ 1,234,191				$ 1,234,191
2037	93	1173	1267	$ 1,234,191				$ 1,234,191
2038	93	1173	1267	$ 1,234,191				$ 1,234,191
2039	93	1173	1267	$ 1,234,191				$ 1,234,191
2040	93	1173	1267	$ 1,234,191				$ 1,234,191
2041	93	1173	1267	$ 1,234,191				$ 1,234,191
2042	93	1173	1267	$ 1,234,191				$ 1,234,191
2043	93	1173	1267	$ 1,234,191				$ 1,234,191
2044	93	1173	1267	$ 1,234,191				$ 1,234,191
2045	93	1173	1267	$ 1,234,191				$ 1,234,191
Total	2613	21707	24320	$ 23,284,740		-		$ 23,284,740
Present Value (2015 to 2045)				$ 8,610,000		$ -		$ 8,610,000

Colwood

Year	Reclaimed Water Use (ML/yr): Land Application [1]	Toilet Flushing[2]	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	165	0	165.3333333	$ 84,320				$ 84,320
2017	331	0	330.6666667	$ 168,640				$ 168,640
2018	496	0	496	$ 252,960				$ 252,960
2019	661	0	661.3333333	$ 337,280				$ 337,280
2020	827	74	901	$ 528,993				$ 528,993
2021	827	148	975	$ 636,387				$ 636,387
2022	827	223	1049	$ 743,780				$ 743,780
2023	827	297	1123	$ 851,173				$ 851,173
2024	827	371	1198	$ 958,567				$ 958,567
2025	827	445	1272	$ 1,065,960				$ 1,065,960
2026	827	519	1346	$ 1,173,353				$ 1,173,353
2027	827	593	1420	$ 1,280,747				$ 1,280,747
2028	827	668	1494	$ 1,388,140				$ 1,388,140
2029	827	742	1568	$ 1,495,533				$ 1,495,533
2030	827	816	1643	$ 1,602,927				$ 1,602,927
2031	827	890	1717	$ 1,710,320				$ 1,710,320
2032	827	964	1791	$ 1,817,713				$ 1,817,713
2033	827	1038	1865	$ 1,925,107				$ 1,925,107
2034	827	1113	1939	$ 2,032,500				$ 2,032,500
2035	827	1187	2013	$ 2,139,893				$ 2,139,893
2036	827	1187	2013	$ 2,139,893				$ 2,139,893
2037	827	1187	2013	$ 2,139,893				$ 2,139,893
2038	827	1187	2013	$ 2,139,893				$ 2,139,893
2039	827	1187	2013	$ 2,139,893				$ 2,139,893
2040	827	1187	2013	$ 2,139,893				$ 2,139,893
2041	827	1187	2013	$ 2,139,893				$ 2,139,893
2042	827	1187	2013	$ 2,139,893				$ 2,139,893
2043	827	1187	2013	$ 2,139,893				$ 2,139,893
2044	827	1187	2013	$ 2,139,893				$ 2,139,893
2045	827	1187	2013	$ 2,139,893				$ 2,139,893
Total	23,147	21,953	45,100	$ 43,593,227	-			$ 43,593,227
Present Value (2015 to 2045)				$ 17,021,000		$0		$ 17,021,000

Esquimalt First Nation

Year	Reclaimed Water Use (ML/yr): Land Application [1]	Toilet Flushing[2]	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	45	0	45	$ 23,120				$ 23,120
2017	211	0	211	$ 107,440				$ 107,440
2018	376	0	376	$ 191,760				$ 191,760
2019	541	0	541	$ 276,080				$ 276,080
2020	227	18	245	$ 133,930				$ 133,930
2021	227	36	263	$ 152,260				$ 152,260
2022	227	54	281	$ 170,589				$ 170,589
2023	227	73	299	$ 188,919				$ 188,919
2024	227	91	317	$ 207,249				$ 207,249
2025	227	109	335	$ 225,579				$ 225,579
2026	227	127	354	$ 243,909				$ 243,909
2027	227	145	372	$ 262,238				$ 262,238
2028	227	163	390	$ 280,568				$ 280,568
2029	227	181	408	$ 298,898				$ 298,898
2030	227	199	426	$ 317,228				$ 317,228
2031	227	218	444	$ 335,558				$ 335,558
2032	227	236	462	$ 353,887				$ 353,887
2033	227	254	480	$ 372,217				$ 372,217
2034	227	272	499	$ 390,547				$ 390,547
2035	227	290	517	$ 408,877				$ 408,877
2036	227	290	517	$ 408,877				$ 408,877
2037	227	290	517	$ 408,877				$ 408,877
2038	227	290	517	$ 408,877				$ 408,877
2039	227	290	517	$ 408,877				$ 408,877
2040	227	290	517	$ 408,877				$ 408,877
2041	227	290	517	$ 408,877				$ 408,877
2042	227	290	517	$ 408,877				$ 408,877
2043	227	290	517	$ 408,877				$ 408,877
2044	227	290	517	$ 408,877				$ 408,877
2045	227	290	517	$ 408,877				$ 408,877
Total	7,067	5,365	12,432	$ 9,029,621	-			$ 9,029,621
Present Value (2015 to 2045)				$ 3,766,000				$ 3,766,000

East Saanich

Year	Reclaimed Water Use (ML/yr): Land Application [1]	Toilet Flushing[2]	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	192	0	192	$ 97,920				$ 97,920
2017	357	0	357	$ 182,240				$ 182,240
2018	523	0	523	$ 266,560				$ 266,560
2019	688	0	688	$ 350,880				$ 350,880
2020	960	36	996	$ 533,804				$ 533,804
2021	960	72	1032	$ 578,008				$ 578,008
2022	960	108	1068	$ 622,212				$ 622,212
2023	960	143	1103	$ 666,416				$ 666,416
2024	960	179	1139	$ 710,620				$ 710,620
2025	960	215	1175	$ 754,824				$ 754,824
2026	960	251	1211	$ 799,028				$ 799,028
2027	960	287	1247	$ 843,232				$ 843,232
2028	960	323	1283	$ 887,436				$ 887,436
2029	960	358	1318	$ 931,640				$ 931,640
2030	960	394	1354	$ 975,844				$ 975,844
2031	960	430	1390	$ 1,020,048				$ 1,020,048
2032	960	466	1426	$ 1,064,252				$ 1,064,252
2033	960	502	1462	$ 1,108,456				$ 1,108,456
2034	960	538	1498	$ 1,152,660				$ 1,152,660
2035	960	573	1533	$ 1,196,864				$ 1,196,864
2036	960	573	1533	$ 1,196,864				$ 1,196,864
2037	960	573	1533	$ 1,196,864				$ 1,196,864
2038	960	573	1533	$ 1,196,864				$ 1,196,864
2039	960	573	1533	$ 1,196,864				$ 1,196,864
2040	960	573	1533	$ 1,196,864				$ 1,196,864
2041	960	573	1533	$ 1,196,864				$ 1,196,864
2042	960	573	1533	$ 1,196,864				$ 1,196,864
2043	960	573	1533	$ 1,196,864				$ 1,196,864
2044	960	573	1533	$ 1,196,864				$ 1,196,864
2045	960	573	1533	$ 1,196,864				$ 1,196,864
Total	26,720	10,607	37,327	$ 26,711,584	-			$ 26,711,584
Present Value (2015 to 2045)				$ 11,021,000				$ 11,021,000

Total Resource Income

Year	Reclaimed Water Use	Heat Recovery	Carbon Offsets	Total
2015	$ -			$ -
2016	$ 214,880			$ 214,880
2017	$ 477,360			$ 477,360
2018	$ 739,840			$ 739,840
2019	$ 1,002,320			$ 1,002,320
2020	$ 1,318,489			$ 1,318,489
2021	$ 1,562,578			$ 1,562,578
2022	$ 1,806,667			$ 1,806,667
2023	$ 2,050,756			$ 2,050,756
2024	$ 2,294,845			$ 2,294,845
2025	$ 2,538,935			$ 2,538,935
2026	$ 2,783,024			$ 2,783,024
2027	$ 3,027,113			$ 3,027,113
2028	$ 3,271,202			$ 3,271,202
2029	$ 3,515,291			$ 3,515,291
2030	$ 3,759,380			$ 3,759,380
2031	$ 4,003,469			$ 4,003,469
2032	$ 4,247,558			$ 4,247,558
2033	$ 4,491,647			$ 4,491,647
2034	$ 4,735,736			$ 4,735,736
2035	$ 4,979,826			$ 4,979,826
2036	$ 4,979,826			$ 4,979,826
2037	$ 4,979,826			$ 4,979,826
2038	$ 4,979,826			$ 4,979,826
2039	$ 4,979,826			$ 4,979,826
2040	$ 4,979,826			$ 4,979,826
2041	$ 4,979,826			$ 4,979,826
2042	$ 4,979,826			$ 4,979,826
2043	$ 4,979,826			$ 4,979,826
2044	$ 4,979,826			$ 4,979,826
2045	$ 4,979,826			$ 4,979,826
Total	$ 102,619,172	-	-	$ 102,619,172
Present Value (2015 to 2045)	$ 40,418,000			$ 40,418,000

Notes
(1) Land application assumed to start at 0 in 2015 and increase linearly to max re-use in 2020.
(2) Flushing substitution assumed to be at 0 until 2020 and increase linearly to max re-use in 2035.
(3) Quantity estimates for 2020 and 2035 provided by Urban Systems, Nov. 18th, 2015.

Summary - Seven Plant Option

One-Time and Ongoing Costs

Capital Costs to 2045 [1]	Annual Costs (at 2030)			Annual Resource Income (at 2030)
	O&M	Borrowing	Total	
$ 1,645,900,000	$ 26,600,000	$ -	$ 26,600,000	$ 4,100,000

Notes
(1) Includes initial construction costs in 2015 as well as plant upgrades in 2030. Also includes land costs.

	Initial Capital Costs (at 2015)	Net Annual Costs (at 2030)
Seven Plants	$ 1,348,300,000	$ 22,500,000

Net Present Value

Assumptions	
Interest Rate	7%
Inflation	2%
Discount Rate	5%
Time period	2015 to 2045

Resource Income (from 2015 to 2045)

	Total Revenue (no discounting)	Present Value
Reclaimed water use	$ 111,900,000	$ 44,000,000
Heat recovery	$ -	$ -
Total	$ 111,900,000	$ 44,000,000

Costs (from 2015 to 2045)

	Total Costs (no discounting)	Present Value
Capital Costs	$ 1,645,900,000	$ 1,420,400,000
O&M	$ 781,900,000	$ 353,200,000
Borrowing Costs	$ -	$ -
Total	$ 2,427,800,000	$ 1,773,600,000

Net Present Value (2015 to 2045)	-$ 1,729,600,000

Ratio of Resource Income to Costs (at 2030)

Total annual revenues	$ 4,100,000
Total annual costs	$ 26,600,000.00
Ratio of revenues to costs	15%

Notes
(1) All costs in constant 2015 dollars.

Capital Costs - Seven Plant Option

	Capital costs to be incurred in 2015	Capital costs to be incurred in 2030
Total Construction Costs	$ 1,348,300,000	$ 297,600,000
Grants		
Net Project Costs	$ 1,348,300,000	$ 297,600,000

Notes
(1) Construction costs include general requirements (10%), contractor profit/overhead (10%), contingency (35%), escalation (2%/yr for four years), engineering (15%), CRD admin (8%) and interim financing (4%).
(2) Construction costs include land costs.

Year	Capital Costs
2015	$ 1,348,300,000
2016	$ -
2017	$ -
2018	$ -
2019	$ -
2020	$ -
2021	$ -
2022	$ -
2023	$ -
2024	$ -
2025	$ -
2026	$ -
2027	$ -
2028	$ -
2029	$ -
2030	$ 297,600,000
2031	$ -
2032	$ -
2033	$ -
2034	$ -
2035	$ -
2036	$ -
2037	$ -
2038	$ -
2039	$ -
2040	$ -
2041	$ -
2042	$ -
2043	$ -
2044	$ -
2045	$ -
Total Capital Costs	$ 1,645,900,000

Present Value of Total Capital Costs
(2015 to 2045) $ 1,420,429,000

Annual Costs - Seven Plant Option

Year	O&M Costs	Annual Borrowing Costs	Total Annual Costs
2015	$ -		$ -
2016	$ 17,455,000		$ 17,455,000
2017	$ 18,110,357		$ 18,110,357
2018	$ 18,765,714		$ 18,765,714
2019	$ 19,421,071		$ 19,421,071
2020	$ 20,076,429		$ 20,076,429
2021	$ 20,731,786		$ 20,731,786
2022	$ 21,387,143		$ 21,387,143
2023	$ 22,042,500		$ 22,042,500
2024	$ 22,697,857		$ 22,697,857
2025	$ 23,353,214		$ 23,353,214
2026	$ 24,008,571		$ 24,008,571
2027	$ 24,663,929		$ 24,663,929
2028	$ 25,319,286		$ 25,319,286
2029	$ 25,974,643		$ 25,974,643
2030	$ 26,630,000		$ 26,630,000
2031	$ 27,061,667		$ 27,061,667
2032	$ 27,493,333		$ 27,493,333
2033	$ 27,925,000		$ 27,925,000
2034	$ 28,356,667		$ 28,356,667
2035	$ 28,788,333		$ 28,788,333
2036	$ 29,220,000		$ 29,220,000
2037	$ 29,651,667		$ 29,651,667
2038	$ 30,083,333		$ 30,083,333
2039	$ 30,515,000		$ 30,515,000
2040	$ 30,946,667		$ 30,946,667
2041	$ 31,378,333		$ 31,378,333
2042	$ 31,810,000		$ 31,810,000
2043	$ 32,241,667		$ 32,241,667
2044	$ 32,673,333		$ 32,673,333
2045	$ 33,105,000		$ 33,105,000
Total	$ 781,888,000	$ -	$ 781,888,000
Present Value	$ 353,245,000	$ -	$ 353,245,000

Notes

(1) O&M estimates provided by Urban Systems for 2016, 2030 and 2045. These have been highlighted in blue.

(2) O&M costs between 2016, 2030, and 2045 have been interpolated linearly.

Resource Income- Seven Plant Option

Assumptions	Water Rate (per cubic metre)	Reclaimed water use rate (per cubic metre) 80% of Water Rate	Reclaimed water use rate (per ML) for flushing	Reclaimed water use rate (per ML) for land application
Rock Bay	$ 1.26	$ 1.01	$ 1,011	$ 510
Colwood	$ 1.81	$ 1.45	$ 1,448	$ 510
Esquimalt First Nation	$ 1.26	$ 1.01	$ 1,011	$ 510
East Saanich	$ 1.54	$ 1.23	$ 1,234	$ 510
Esquimalt Bullen Park	$ 1.26	$ 1.01	$ 1,011	$ 510
East Saanich	$ 1.54	$ 1.23	$ 1,234	$ 510
Saanich Core	$ 1.54	$ 1.23	$ 1,234	$ 510
Langford	$ 1.81	$ 1.45	$ 1,448	$ 510
View Royal	$ 1.81	$ 1.45	$ 1,448	$ 510

Rock Bay

Year	Reclaimed Water Use (ML/yr)							
	Land Application (1)	Toilet Flushing(2)	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	19	0	19	$ 9,520				$ 9,520
2017	37	0	37	$ 19,040				$ 19,040
2018	56	0	56	$ 28,560				$ 28,560
2019	75	0	75	$ 38,080				$ 38,080
2020	93	73	167	$ 121,762				$ 121,762
2021	93	147	240	$ 195,924				$ 195,924
2022	93	220	313	$ 270,086				$ 270,086
2023	93	293	387	$ 344,248				$ 344,248
2024	93	367	460	$ 418,410				$ 418,410
2025	93	440	533	$ 492,572				$ 492,572
2026	93	513	607	$ 566,734				$ 566,734
2027	93	587	680	$ 640,896				$ 640,896
2028	93	660	753	$ 715,058				$ 715,058
2029	93	733	827	$ 789,220				$ 789,220
2030	93	807	900	$ 863,382				$ 863,382
2031	93	880	973	$ 937,544				$ 937,544
2032	93	953	1047	$ 1,011,705				$ 1,011,705
2033	93	1027	1120	$ 1,085,867				$ 1,085,867
2034	93	1100	1193	$ 1,160,029				$ 1,160,029
2035	93	1173	1267	$ 1,234,191				$ 1,234,191
2036	93	1173	1267	$ 1,234,191				$ 1,234,191
2037	93	1173	1267	$ 1,234,191				$ 1,234,191
2038	93	1173	1267	$ 1,234,191				$ 1,234,191
2039	93	1173	1267	$ 1,234,191				$ 1,234,191
2040	93	1173	1267	$ 1,234,191				$ 1,234,191
2041	93	1173	1267	$ 1,234,191				$ 1,234,191
2042	93	1173	1267	$ 1,234,191				$ 1,234,191
2043	93	1173	1267	$ 1,234,191				$ 1,234,191
2044	93	1173	1267	$ 1,234,191				$ 1,234,191
2045	93	1173	1267	$ 1,234,191				$ 1,234,191
Total	2613	21707	24320	$ 23,284,740		-		$ 23,284,740
Present Value (2015 to 2045)				$ 8,610,000				$ 8,610,000

Colwood

Year	Reclaimed Water Use (ML/yr)							
	Land Application (1)	Toilet Flushing(2)	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	165	0	165	$ 84,320				$ 84,320
2017	331	0	331	$ 168,640				$ 168,640
2018	496	0	496	$ 252,960				$ 252,960
2019	661	0	661	$ 337,280				$ 337,280
2020	827	74	901	$ 528,993				$ 528,993
2021	827	148	975	$ 636,387				$ 636,387
2022	827	223	1049	$ 743,780				$ 743,780
2023	827	297	1123	$ 851,173				$ 851,173
2024	827	371	1198	$ 958,567				$ 958,567
2025	827	445	1272	$ 1,065,960				$ 1,065,960
2026	827	519	1346	$ 1,173,353				$ 1,173,353
2027	827	593	1420	$ 1,280,747				$ 1,280,747
2028	827	668	1494	$ 1,388,140				$ 1,388,140
2029	827	742	1568	$ 1,495,533				$ 1,495,533
2030	827	816	1643	$ 1,602,927				$ 1,602,927
2031	827	890	1717	$ 1,710,320				$ 1,710,320
2032	827	964	1791	$ 1,817,713				$ 1,817,713
2033	827	1038	1865	$ 1,925,107				$ 1,925,107
2034	827	1113	1939	$ 2,032,500				$ 2,032,500
2035	827	1187	2013	$ 2,139,893				$ 2,139,893
2036	827	1187	2013	$ 2,139,893				$ 2,139,893
2037	827	1187	2013	$ 2,139,893				$ 2,139,893
2038	827	1187	2013	$ 2,139,893				$ 2,139,893
2039	827	1187	2013	$ 2,139,893				$ 2,139,893
2040	827	1187	2013	$ 2,139,893				$ 2,139,893
2041	827	1187	2013	$ 2,139,893				$ 2,139,893
2042	827	1187	2013	$ 2,139,893				$ 2,139,893
2043	827	1187	2013	$ 2,139,893				$ 2,139,893
2044	827	1187	2013	$ 2,139,893				$ 2,139,893
2045	827	1187	2013	$ 2,139,893				$ 2,139,893
Total	23147	21953	45100	$ 43,593,227	-			$ 43,593,227
Present Value (2015 to 2045)				$ 17,021,000		$0		$ 17,021,000

Esquimalt Bullen Park

Year	Reclaimed Water Use (ML/yr)							
	Land Application (1)	Toilet Flushing(2)	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	45	0	45	$ 23,120				$ 23,120
2017	211	0	211	$ 107,440				$ 107,440
2018	376	0	376	$ 191,760				$ 191,760
2019	541	0	541	$ 276,080				$ 276,080
2020	227	18	245	$ 133,930				$ 133,930
2021	227	36	263	$ 152,260				$ 152,260
2022	227	54	281	$ 170,589				$ 170,589
2023	227	73	299	$ 188,919				$ 188,919
2024	227	91	317	$ 207,249				$ 207,249
2025	227	109	335	$ 225,579				$ 225,579
2026	227	127	354	$ 243,909				$ 243,909
2027	227	145	372	$ 262,238				$ 262,238
2028	227	163	390	$ 280,568				$ 280,568
2029	227	181	408	$ 298,898				$ 298,898
2030	227	199	426	$ 317,228				$ 317,228
2031	227	218	444	$ 335,558				$ 335,558
2032	227	236	462	$ 353,887				$ 353,887
2033	227	254	480	$ 372,217				$ 372,217
2034	227	272	499	$ 390,547				$ 390,547
2035	227	290	517	$ 408,877				$ 408,877
2036	227	290	517	$ 408,877				$ 408,877
2037	227	290	517	$ 408,877				$ 408,877
2038	227	290	517	$ 408,877				$ 408,877
2039	227	290	517	$ 408,877				$ 408,877
2040	227	290	517	$ 408,877				$ 408,877
2041	227	290	517	$ 408,877				$ 408,877
2042	227	290	517	$ 408,877				$ 408,877
2043	227	290	517	$ 408,877				$ 408,877
2044	227	290	517	$ 408,877				$ 408,877
2045	227	290	517	$ 408,877				$ 408,877
Total	7,067	5,365	12,432	$ 9,029,621	-			$ 9,029,621
Present Value (2015 to 2045)				$ 3,766,000				$ 3,766,000

East Saanich

Year	Reclaimed Water Use (ML/yr)							
	Land Application (1)	Toilet Flushing(2)	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	192	0	192	$ 97,920				$ 97,920
2017	357	0	357	$ 182,240				$ 182,240
2018	523	0	523	$ 266,560				$ 266,560
2019	688	0	688	$ 350,880				$ 350,880
2020	960	36	996	$ 533,804				$ 533,804
2021	960	72	1032	$ 578,008				$ 578,008
2022	960	108	1068	$ 622,212				$ 622,212
2023	960	143	1103	$ 666,416				$ 666,416
2024	960	179	1139	$ 710,620				$ 710,620
2025	960	215	1175	$ 754,824				$ 754,824
2026	960	251	1211	$ 799,028				$ 799,028
2027	960	287	1247	$ 843,232				$ 843,232
2028	960	323	1283	$ 887,436				$ 887,436
2029	960	358	1318	$ 931,640				$ 931,640
2030	960	394	1354	$ 975,844				$ 975,844
2031	960	430	1390	$ 1,020,048				$ 1,020,048
2032	960	466	1426	$ 1,064,252				$ 1,064,252
2033	960	502	1462	$ 1,108,456				$ 1,108,456
2034	960	538	1498	$ 1,152,660				$ 1,152,660
2035	960	573	1533	$ 1,196,864				$ 1,196,864
2036	960	573	1533	$ 1,196,864				$ 1,196,864
2037	960	573	1533	$ 1,196,864				$ 1,196,864
2038	960	573	1533	$ 1,196,864				$ 1,196,864
2039	960	573	1533	$ 1,196,864				$ 1,196,864
2040	960	573	1533	$ 1,196,864				$ 1,196,864
2041	960	573	1533	$ 1,196,864				$ 1,196,864
2042	960	573	1533	$ 1,196,864				$ 1,196,864
2043	960	573	1533	$ 1,196,864				$ 1,196,864
2044	960	573	1533	$ 1,196,864				$ 1,196,864
2045	960	573	1533	$ 1,196,864				$ 1,196,864
Total	26,720	10,607	37,327	$ 26,711,584	-			$ 26,711,584
Present Value (2015 to 2045)				$ 11,021,000				$ 11,021,000

Saanich Core

Year	Reclaimed Water Use (ML/yr)							
	Land Application (1)	Toilet Flushing(2)	Total Reclaimed Water Use	Total Annual Revenues from Reclaimed Water Use	Heat Recovery	Total Annual Revenues from Heat Recovery	Carbon Offsets	TOTAL
2015	0	0	0	$ -				$ -
2016	24	0	24	$ 12,240				$ 12,240
2017	48	0	48	$ 24,480				$ 24,480
2018	72	0	72	$ 36,720				$ 36,720
2019	96	0	96	$ 48,960				$ 48,960
2020	120	21	141	$ 86,900				$ 86,900
2021	120	42	162	$ 112,600				$ 112,600
2022	120	63	183	$ 138,300				$ 138,300
2023	120	83	203	$ 164,000				$ 164,000
2024	120	104	224	$ 189,700				$ 189,700
2025	120	125	245	$ 215,400				$ 215,400
2026	120	146	266	$ 241,100				$ 241,100
2027	120	167	287	$ 266,800				$ 266,800
2028	120	188	308	$ 292,500				$ 292,500
2029	120	208	328	$ 318,200				$ 318,200
2030	120	229	349	$ 343,900				$ 343,900
2031	120	250	370	$ 369,600				$ 369,600
2032	120	271	391	$ 395,300				$ 395,300
2033	120	292	412	$ 421,000				$ 421,000
2034	120	313	433	$ 446,700				$ 446,700
2035	120	333	453	$ 472,400				$ 472,400
2036	120	333	453	$ 472,400				$ 472,400
2037	120	333	453	$ 472,400				$ 472,400
2038	120	333	453	$ 472,400				$ 472,400
2039	120	333	453	$ 472,400				$ 472,400
2040	120	333	453	$ 472,400				$ 472,400
2041	120	333	453	$ 472,400				$ 472,400
2042	120	333	453	$ 472,400				$ 472,400
2043	120	333	453	$ 472,400				$ 472,400
2044	120	333	453	$ 472,400				$ 472,400
2045	120	333	453	$ 472,400				$ 472,400
Total	3,360	6,167	9,527	9,320,800	-			$ 9,320,800
Present Value (2015 to 2045)				$ 3,561,000		$0		$ 3,561,000

Total Resource Income

Year	Reclaimed Water Use	Heat Recovery	Carbon Offsets	Total
2015	$ -			$ -
2016	$ 227,120			$ 227,120
2017	$ 501,840			$ 501,840
2018	$ 776,560			$ 776,560
2019	$ 1,051,280			$ 1,051,280
2020	$ 1,405,389			$ 1,405,389
2021	$ 1,675,178			$ 1,675,178
2022	$ 1,944,967			$ 1,944,967
2023	$ 2,214,756			$ 2,214,756
2024	$ 2,484,545			$ 2,484,545
2025	$ 2,754,335			$ 2,754,335
2026	$ 3,024,124			$ 3,024,124
2027	$ 3,293,913			$ 3,293,913
2028	$ 3,563,702			$ 3,563,702
2029	$ 3,833,491			$ 3,833,491
2030	$ 4,103,280			$ 4,103,280
2031	$ 4,373,069			$ 4,373,069
2032	$ 4,642,858			$ 4,642,858
2033	$ 4,912,647			$ 4,912,647
2034	$ 5,182,436			$ 5,182,436
2035	$ 5,452,226			$ 5,452,226
2036	$ 5,452,226			$ 5,452,226
2037	$ 5,452,226			$ 5,452,226
2038	$ 5,452,226			$ 5,452,226
2039	$ 5,452,226			$ 5,452,226
2040	$ 5,452,226			$ 5,452,226
2041	$ 5,452,226			$ 5,452,226
2042	$ 5,452,226			$ 5,452,226
2043	$ 5,452,226			$ 5,452,226
2044	$ 5,452,226			$ 5,452,226
2045	$ 5,452,226			$ 5,452,226
Total	$ 111,939,972			$ 111,939,972
Present Value (2015 to 2045)	$ 43,979,000			$ 43,979,000

Notes
(1) Land application assumed to start at 0 in 2015 and increase linearly to max re-use in 2020.
(2) Flushing substitution assumed to be at 0 until 2020 and increase linearly to max re-use in 2035.

Cost Comparison – Previous LWMP Capital Program with Urban Systems/Carollo Cost Estimate

The following table presents a summary comparison of the budget envelope for the previous Liquid Waste Management Plan (LWMP) capital program with the cost estimate for Option 1A as prepared by Urban Systems/Carollo. Also provided is the RFP bid price for the liquid treatment component received in early 2014. When making comparisons, soft costs must be accounted for and can represent significant costs including: contingences, financing, engineering (including owner's representative consulting, site inspection and contract management) and administration (project management office including salaries for project director, project managers, clerical, comptroller, scheduler and risk manager in addition to expenses such as real estate fees, legal fees, corporate overhead and office lease).

In both the summary budget prepared in 2010 and the new cost estimates prepared in 2015, soft costs are rolled into each system component line item. Tendered bids from construction consortiums do not include soft costs, although a contingency may be stipulated. The summary presented below is a global comparison and is not intended to provide a detailed comparison of individual system components or unit rates.

System Component	Previous LWMP Budget Estimate		RFP Bid Price/Added Costs		Urban Systems/Carollo	Cost Variance Bid Price vs. Urban Systems/Carollo Estimate[10]
	2010 Budget Allowance[1]	2015 (11.5% Escalation)[2]	2014 Bid Price[3]	Soft Costs Added and Escalated 2 Years[4,5]	2015 Option 1A	
Conveyance[6]	101,587,000	113,270,000			244,300,000	
Liquid Treatment	333,125,000	371,434,000	178,376,000	361,968,000	392,000,000	8.3%
Solids Treatment[7]	283,844,000	316,486,000			258,000,000	
Existing System Upgrades[8]	54,107,000	60,329,000			45,000,000	
Resource Recovery	3,000,000	3,345,000			24,200,000	
Land[9]	13,000,000	14,495,000			67,150,000	
Total	**788,663,000**	**879,359,000**			**1,030,650,000**	

Notes:

1. Includes 94% allowance for soft costs (i.e., general requirements, project contingency, engineering, administration and program management, misc., interim financing, inflation to mid-term)
2. Cost escalation of 11.5% from 2010 to 2015 is based on *Engineering News Record* construction cost index, Stats Canada construction base index for Victoria area, impact of the exchange rate and recent construction-related projects.
3. Bid price adjusted to remove conveyance, harbour crossing and marine outfall components carried in other line items.
4. Soft costs added to liquid treatment bid price based on 94% allowance to be consistent with the previous LWMP budget estimate.
5. Cost escalation for 2014 and 2015 based on 2.3% per year (as per note 2 above).

6. The US/Carollo budget estimate provide servicing for conveyancing to 2045, compared to 2030 under the previous Program. Conveyancing includes new outfalls and harbour crossing under both Programs.
7. The previous capital plan included a biosolids dryer, struvite recovery
8. Includes projects such as Trent Street siphon, ECI upgrades, Craigflower Pump Station and Arbutus attenuation tank.
9. Land costs allowances are higher in Rock Bay as compared to McLoughlin Point. The Urban Systems/Carollo land costs include site development, geotechnical and environmental allowances, as well as community benefit allowances not included in the previous 2010 LWMP budget estimate.
10. Cost variance between the RFP bid price, including 94% soft costs and 2 years escalation to 2015 versus the Urban Systems/Carollo 2015 estimate.

Cost Comparison Summary of Previous Solids Processing Studies

The CRD has commissioned various reports over the past number of years using several different consultants to provide specific information related to biosolids and solid waste stream processing options for the Region. The following summaries are provided as an overview, and drawing direct comparison on a $/tonne basis is not possible without significant follow-up analysis. The reports evaluate different processing technologies/solutions and waste streams and have fundamentally different project assumptions, applying unique costing methodologies and allowances for design and construction contingencies.

- A report prepared by Stantec/Brown &Caldwell (*CRD Core Area Wastewater Treatment Program Biosolids Management Plan,* November, 2009) deals with a number of biosolids treatment options, all including costs for anaerobic digestion, dewatering and drying of biosolids. Adding on waste-to-energy for biosolids alone ranged from $270 to $290 million and combined with municipal solid waste ranged from $414 to $442 million (inflated to 2014 dollars). Gasification costs were not provided.
- The subsequent Stantec technical memorandum on gasification (*Review of Gasification for CRD Sludge/Biosolids Processing*, February 2015) provides a high level examination of sludge/biosolids gasification for the CRD. Options presented include landfilling of dewatered sludge (digested and raw), gasification (digested/raw), incineration (digested/raw) and off-site use of dried sludge (digested/raw) for fuel. Costs for these various technologies range from $135 to $300 million (2009 dollars).
- A report prepared by AECOM (*Tri-Regional District Solid Waste Study*, May 2011) deals primarily with waste-to-energy options for residual municipal solid waste with biosolids added as a small portion of the overall volume. The report provides an overview of treatment technologies available for processing approximately 200,000 tonnes of combined municipal solid waste from the CRD, RDN and CVRD and allowance for dried biosolids volume of up to 15,000 tonnes. Capital costs for gasification were estimated at $322 million, plasma arc gasification at $291 million and mass burn at $215 million. Costs/tonne of installed capacity are lower than Stantec/Brown and Caldwell figures from 2009; however, these costs do not include any biosolids pre-processing costs, contingencies, land costs and allowances for profit, whereas the Stantec report includes these allowances. Stantec's costs have been built around individual system components and include project management costs, whereas the AECOM report compares capital costs based on global information drawn from the public domain.
- The current costing by Urban Systems (*Draft Technical Memo #3*, December 2015) focuses on two energy recovery options for biosolids and other potential waste streams, namely anaerobic digestion and gasification. Anaerobic digestion is estimated at $258 million and gasification ranges from $263 and $413 million, and costs do not include any pre-processing of the waste streams. The costs provided by Urban Systems include contingencies and other soft costs.

January 8, 2016

MEMORANDUM

Date:	December 23, 2015
To:	Dan Telford P.Eng.
From:	Chris Town, P.Eng., MASc
File:	1692.0037.01
Subject:	Design Flows

1. Purpose

The purpose of this memorandum is to provide additional documentation on how the design flows were developed and to review the requirements in the BC Municipal Wastewater Regulation (MWR) in so far as it pertains to design flows. This further expands on the information contained in Technical Memo #1.

2. Background

The Core Area (i.e. Macaulay and Clover outfalls) regularly has flows exceeding 2 times average dry weather flows (ADWF). After a review of actual flow meter since 2007, it is estimated that at Macaulay, flows exceed 2XADWF on average 11 times/year. Since 2007 the flows at Macaulay Pt have exceeded 4XADWF thirty times. It is well known that flows in the Eastside are higher than the Westside and therefore it is assumed that there would be a similar number of storm events at the Clover Outfall. The significance of the ADWF will be explained in the section under MWR. These higher flows are due to groundwater and rainwater getting into the sewer collection pipes. This type of flow is called infiltration/inflow (I/I).

The CRD has for many years implemented an aggressive plan to reduce I/I. This program is making progress and is expected to reduce the number of times that flows exceed 2XADWF.

The CRD is also promoting water conservation and reduced water use within residences and businesses. It has been projected that average per person daily wastewater flows will reduce in the future. In Urban Systems' Technical Memorandum #1, the summary of design flows noted the following statement, "To account for ongoing water conservation programs and demand management initiatives, the project per capita flow rates decrease around the Core Area from 225 to 250 litres per capita per day now, to 195 in 2030 and 2045." This reduced per capita rate is built into the design flows being used. This reduced average domestic flow of 195 litres per capita per day was reported in Section 2.4 of the May 4, 2010 report by Stantec entitled, "Core Area Wastewater Treatment Program Wastewater Treatment Plant…" and is most recently documented in the Core Area Liquid Waste Management Plan (CALWMP), Amendement No. 8, Section 4.

The CRD has studied and reported on design flows through a number of reports, some are listed below for reference.

1. DP-1-033 Wastewater Flow Management Strategy – Existing and Future Populations, ICI Equivalents and I&I; November 2008 to January 2009.
2. DP-2-033 Wastewater Flow Management Strategy – Design Flows; September 2008 to January 2009.
3. CRD Core Area Wastewater Treatment – Assessment of Wastewater Treatment – Options 1A, 1B and 1C; September 2009

4. CRD Core Area Wastewater Treatment, Wastewater Treatment Plant – Option 1A; December 2009.
5. CRD Design Flows and Loads; February 2010.
6. CAWTP Wastewater Treatment Plant – Option 1A, Rev, 1A Prime, 1D, 1F and 1G; May 2010.
7. CRD CAWTP LWMP amendments 7 and 8; December 2009 and June 2010 respectively.

As of October 14, 2015, the CRD has recently confirmed with each community the 2030 design flow allocations (based on ADWF) that they would like to reserve in the new system. As outlined in TM #1 2045 flows were determined by utilizing estimated growth rates in each community and 195 litres per capita per day.…

3. BC Municipal Wastewater Regulation (MWR)

The MWR provides specific direction for communities that have high I/I flows (defined as > 2XADWF). For communities greater than 10,000 people one option is to address how I/I can be reduced in a Liquid Waste Management Plan (LWMP). If reductions below 2XADWF are not possible, or cost effective the discharger must:

- Provide full secondary treatment for the entire flow at all times; or
- Provide at least primary treatment for flows greater than 2XADWF, use the full capacity of the secondary treatment system and combine the primary and secondary effluent prior to discharge.

Earlier versions of the Core Area LWMP have also determined that flows at the Clover Outfall greater than 3XADWF, and flows at the Macaulay Outfall greater than 4XADWF will need to be at least screened using openings of at least 6mm diameter before discharge down the deep outfalls.

4. Collection System Design

In general terms local sanitary sewer collection systems are designed using a different methodology than using a factor of the average dry weather flow. Rather the average dry weather flows are first peaked using a chosen peaking factor method and then inflow and infiltration is typically added on a volume per area contributing to the sanitary sewer system. Most municipalities will dictate the values to be used through their design criteria manual or subdivision and development bylaw. The Master Municipal Construction Documents Association Design Guidelines 2014 recommend that new systems with pipes above the groundwater table be sized for 0.06 litres/second/hectare while older systems or systems with pipes below the water table be sized for at least 0.12 l/s/ha. These values are for areas where no cross connections to roof leaders, foundation drains or any storm system exists. In the Capital Regional District where there are areas of numerous cross connections localized criteria or more comprehensive modeling is required to confirm sizing.

5. Discussion

The estimation of design flows is a complex exercise that must account for changes in population, changes in flow rates per person as well as changes in infiltration and inflow. The CRD has undertaken numerous studies over many years to establish the design flows. The design flows for each community have been agreed to by each community. It is clear that storms do cause flows to increase well beyond 2XADWF. Therefore, it is necessary to design treatment facilities to meet the MWR and previous

CALWMP commitments. However, since there is some uncertainty around how effective the water conservation and I/I programs will be at reducing the flows, it is recommended that initial construction be built in modules that have some excess capacity, but not necessarily for the full buildout at 2030 flows. In this way, if the I/I reduction program is very successful, and/or if actual average daily flows per capita are lower than 195 litres/d, then it may not be necessary to ever build to the design flows identified in Technical Memo #1.

Sincerely,

URBAN SYSTEMS LTD.

for

Chris Town, P.Eng., MASc
Senior Environmental Engineer

CT/mcn

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APPENDIX G

REPORT TO THE EASTSIDE AND WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE MEETINGS OF WEDNESDAY, JANUARY 6 AND 8, 2016 RESPECTIVELY

SUBJECT Core Area Sewage and Resource Recovery System Cost Sharing

ISSUE

To provide the Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees with cost sharing impacts for the various sewer option sets, comparing "design capacity benefit" allocations with two possible options for unitized cost sharing.

BACKGROUND

The current cost sharing under Bylaw No 2312 "Liquid Waste Management Core Area and Western Communities Service Establishment Bylaw No. 1, 1995", as amended, is based on design capacity benefit.

A description of this allocation was included in the December 9th, 2015 report to the Core Area Liquid Waste Management Committee "Draft Technical Memorandum #3 – Costing and Financial Analysis". Subsequent to that meeting, discussion has transpired regarding alternative costing on an "all for one basis" across the entire system and an "all for one basis" Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees.

During discussions on capital cost sharing for the previous wastewater treatment system, the program configuration was such that all participants had a vested interest in the capital infrastructure as a whole, thus, the design capacity benefit for each participant was a share in the entire system, rather than by component sets.

Attached are summary schedules comparing the total capital cost for the five option sets presented in December, and estimated 2020 operating costs and 2030 operating cost projections. Additionally included are summary option comparisons for the annual estimated cost per participant household, after grant, at 2030. Also included are individual schedules for each participant comparing total the annual cost per option set and comparing Household costs by option set and cost sharing methodology.

The summary schedules were previously distributed to the participant administrators for review on December 18th, 2015.

ALTERNATIVES

1. That the Select Committees review the documentation and make a recommendation to the Core Area Committee meeting scheduled for January 13, 2016.

2. That the Select Committees receive this report for information.

FINANCIAL IMPLICATIONS

The various cost sharing alternatives result a range of differences per participant household. The cost sharing is defined within the Establishment Bylaw and a change to that Bylaw would require the approval of 2/3rds of the participating municipalities, the Board, and the Inspector of Municipalities. The First Nations participate under the original Letters Patent, so are not part of the statutory approval process for Bylaw No 2313.

CONCLUSION

The method of cost sharing is defined within the current Establishment Bylaw. Two options for cost sharing have been calculated for information purposes.

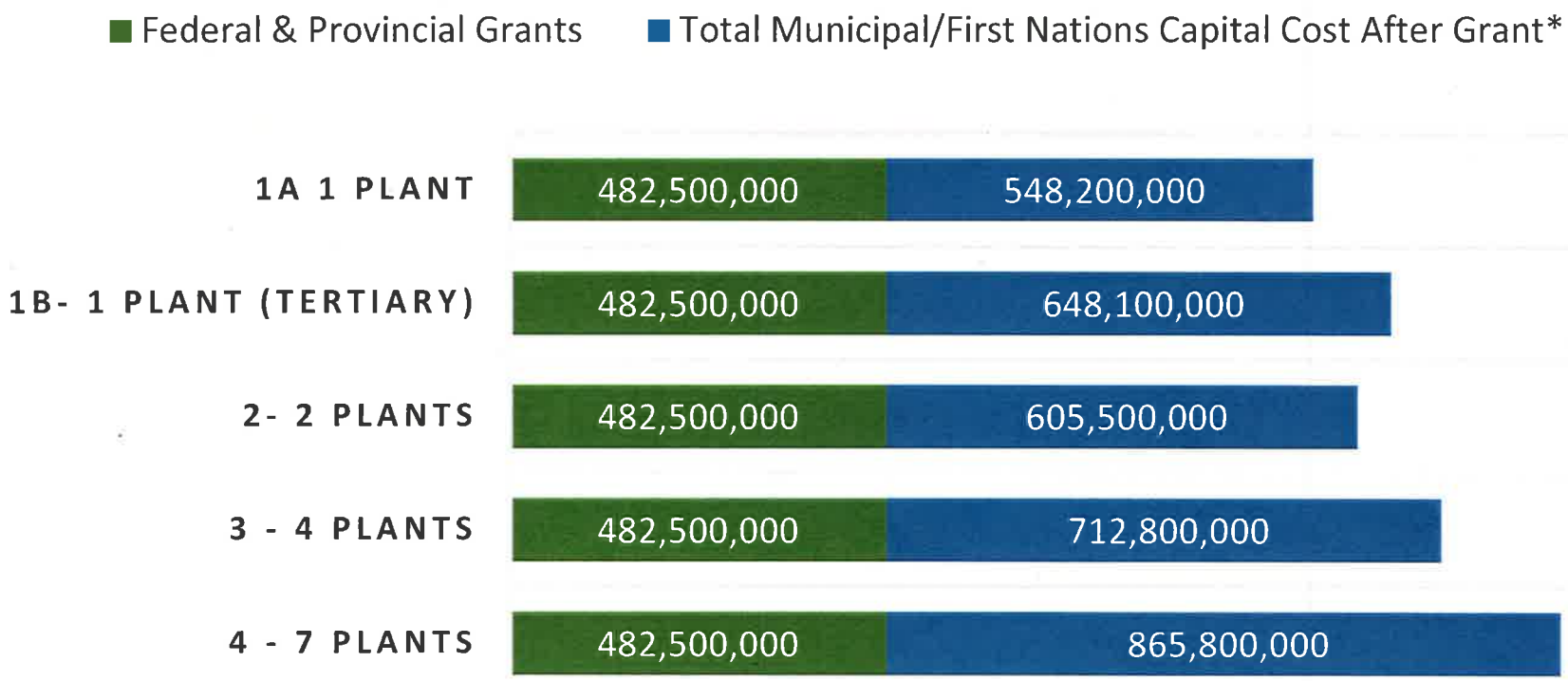
RECOMMENDATION(S)

That the Select Committees review the documentation and make a recommendation to the Core Area Liquid Waste Management Committee meeting scheduled for January 13, 2016.

Prepared by:	Diana E. Lokken, CPA, CMA, General Manager, Finance & Technology
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

Attachments: Appendix A: Core Area Sewage Treatment Capital Costs – All Options

CORE AREA SEWAGE TREATMENT CAPITAL COSTS - ALL OPTIONS



Core Area Waste Water Treatment Program Options - Costing

Option	Capital Cost	Federal & Provincial Grants	Total Municipal/First Nations Capital Cost After Grant*	Operating Costs (at 2020)	Operating Costs (at 2030)
1a 1 plant	1,030,700,000	482,500,000	548,200,000	16,895,000	21,765,000
1b- 1 plant (Tertiary)	1,130,600,000	482,500,000	648,100,000	21,631,667	26,435,000
2- 2 plants	1,088,000,000	482,500,000	605,500,000	17,736,667	22,810,000
3 - 4 plants	1,195,300,000	482,500,000	712,800,000	19,481,667	25,345,000
4 - 7 plants	1,348,300,000	482,500,000	865,800,000	20,513,333	26,630,000

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		Total Annual Cost	63,847,080
Annual Debt	42,082,080	Annual Operating	21,765,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	591	582	(10)
Saanich	365	372	8
Victoria	513	509	(4)
Esquimalt	455	471	16
View Royal	430	417	(13)
Colwood	254	248	(5)
Langford	415	406	(9)

OPTION 1b - 1 PLANT TERTIARY		Total Annual Cost	76,214,460
Annual Debt	49,779,460	Annual Operating	26,435,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	705	695	(10)
Saanich	437	444	8
Victoria	611	608	(4)
Esquimalt	546	562	16
View Royal	511	498	(13)
Colwood	302	296	(5)
Langford	493	484	(9)

OPTION 2 - 2 PLANTS		Total Annual Cost	69,331,955
Annual Debt	46,521,955	Annual Operating	22,810,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	590	630	40
Saanich	364	404	40
Victoria	512	552	41
Esquimalt	454	511	57
View Royal	429	454	24
Colwood	767	270	(497)
Langford	414	441	27

OPTION 3 - 4 PLANTS		Total Annual Cost	80,220,524
Annual Debt	54,875,524	Annual Operating	25,345,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	573	728	156
Saanich	437	468	30
Victoria	504	639	135
Esquimalt	724	591	(133)
View Royal	593	526	(67)
Colwood	864	313	(552)
Langford	572	511	(61)

OPTION 4 - 7 PLANTS		Total Annual Cost	93,452,382
Annual Debt	66,822,382	Annual Operating	26,630,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	590	845	254
Saanich	509	545	36
Victoria	519	743	224
Esquimalt	1,075	689	(386)
View Royal	987	615	(372)
Colwood	711	365	(345)
Langford	793	598	(195)

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		Total Annual Cost	63,847,080
Annual Debt	42,082,080	Annual Operating	21,765,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	591	598	7
Saanich	365	383	18
Victoria	513	523	11
Esquimalt	455	436	(19)
View Royal	430	389	(41)
Colwood	254	229	(24)
Langford	415	375	(40)

OPTION 1b - 1 PLANT TERTIARY		Total Annual Cost	76,214,460
Annual Debt	49,779,460	Annual Operating	26,435,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	705	712	7
Saanich	437	455	18
Victoria	611	622	11
Esquimalt	546	527	(19)
View Royal	511	470	(41)
Colwood	302	277	(24)
Langford	493	453	(40)

OPTION 2 - 2 PLANTS		Total Annual Cost	69,331,955
Annual Debt	46,521,955	Annual Operating	22,810,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	590	598	7
Saanich	364	382	18
Victoria	512	522	11
Esquimalt	454	584	130
View Royal	429	524	94
Colwood	767	309	(458)
Langford	414	505	91

OPTION 3 - 4 PLANTS		Total Annual Cost	80,220,524
Annual Debt	54,875,524	Annual Operating	25,345,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	573	651	78
Saanich	437	415	(23)
Victoria	504	568	64
Esquimalt	724	761	37
View Royal	593	689	96
Colwood	864	405	(459)
Langford	572	665	93

OPTION 4 - 7 PLANTS		Total Annual Cost	93,452,382
Annual Debt	66,822,382	Annual Operating	26,630,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	590	692	102
Saanich	509	442	(68)
Victoria	519	604	85
Esquimalt	1,075	1,022	(53)
View Royal	987	930	(57)
Colwood	711	547	(164)
Langford	793	899	105

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

OAK BAY - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,639,130	1,518,845	4,157,975
Option 1b - 1 plant tertiary	3,110,767	1,844,571	4,955,339
Option 2 - 2 plants	2,633,312	1,518,845	4,152,158
Option 3 - 4 plants	2,483,697	1,543,919	4,027,616
Option 4 - 7 plants	2,609,910	1,542,697	4,152,607

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,675,460	1,533,526	4,208,986
3,147,119	1,859,252	5,006,371
2,669,675	1,533,526	4,203,201
2,790,030	1,789,476	4,579,506
3,021,909	1,846,277	4,868,186

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,571,683	1,518,078	4,089,761
3,042,078	1,843,804	4,885,882
2,843,008	1,590,965	4,433,973
3,353,504	1,767,778	5,121,282
4,083,590	1,857,405	5,940,995

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	591
Option 1a - 1 plant tertiary	705
Option 2 - 2 plants	590
Option 3 - 4 plants	573
Option 4 - 7 plants	590

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
591	598	7
705	712	7
590	598	7
573	651	78
590	692	102

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
591	582	(10)
705	695	(10)
590	630	40
573	728	156
590	845	254

SAANICH - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	12,424,952	6,565,431	18,990,383
Option 1b - 1 plant tertiary	14,767,783	7,974,385	22,742,167
Option 2 - 2 plants	12,395,439	6,565,431	18,960,870
Option 3 - 4 plants	15,733,702	7,045,131	22,778,833
Option 4 - 7 plants	18,862,549	7,656,080	26,518,629

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
13,292,430	6,633,392	19,925,822
15,635,761	8,042,346	23,678,107
13,263,689	6,633,392	19,897,081
13,861,645	7,740,524	21,602,169
15,013,682	7,986,223	22,999,904

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
12,819,448	6,566,569	19,386,018
15,164,299	7,975,523	23,139,822
14,171,966	6,881,849	21,053,815
16,716,711	7,646,667	24,363,377
20,356,078	8,034,355	28,390,433

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	365
Option 1a - 1 plant tertiary	437
Option 2 - 2 plants	364
Option 3 - 4 plants	437
Option 4 - 7 plants	509

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
365	383	18
437	455	18
364	382	18
437	415	(23)
509	442	(68)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
365	372	8
437	444	8
364	404	40
437	468	30
509	545	36

VICTORIA - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	15,083,168	8,087,462	23,170,629
Option 1b - 1 plant tertiary	17,811,719	9,822,141	27,633,861
Option 2 - 2 plants	15,049,347	8,087,462	23,136,808
Option 3 - 4 plants	14,575,991	8,208,501	22,784,492
Option 4 - 7 plants	15,249,488	8,203,773	23,453,261

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
15,478,872	8,166,918	23,645,790
18,207,651	9,901,598	28,109,249
15,445,402	8,166,918	23,612,320
16,141,715	9,530,000	25,671,715
17,483,248	9,832,500	27,315,748

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
14,923,552	8,084,647	23,008,200
17,653,272	9,819,327	27,472,598
16,498,064	8,472,814	24,970,878
19,460,487	9,414,444	28,874,931
23,697,197	9,891,760	33,588,957

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	513
Option 1a - 1 plant tertiary	611
Option 2 - 2 plants	512
Option 3 - 4 plants	504
Option 4 - 7 plants	519

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
513	523	11
611	622	11
512	522	11
504	568	64
519	604	85

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
513	509	(4)
611	608	(4)
512	552	41
504	639	135
519	743	224

ESQUIMALT - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,624,683	1,446,838	4,071,520
Option 1b - 1 plant tertiary	3,130,399	1,757,413	4,887,813
Option 2 - 2 plants	2,618,261	1,446,838	4,065,099
Option 3 - 4 plants	4,435,635	2,044,482	6,480,117
Option 4 - 7 plants	7,084,597	2,537,323	9,621,920

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,497,049	1,404,907	3,901,956
3,002,692	1,715,483	4,718,174
3,555,445	1,675,222	5,230,667
5,184,628	1,625,773	6,810,401
7,349,708	1,801,672	9,151,380

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,766,507	1,447,470	4,213,977
3,272,539	1,758,045	5,030,584
3,058,388	1,516,967	4,575,355
3,607,558	1,685,556	5,293,113
4,392,953	1,771,014	6,163,967

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	455
Option 1a - 1 plant tertiary	546
Option 2 - 2 plants	454
Option 3 - 4 plants	724
Option 4 - 7 plants	1,075

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
455	436	(19)
546	527	(19)
454	584	130
724	761	37
1,075	1,022	(53)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
455	471	16
546	562	16
454	511	57
724	591	(133)
1,075	689	(386)

VIEW ROYAL - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,424,284	635,197	2,059,481
Option 1b - 1 plant tertiary	1,676,496	771,547	2,448,043
Option 2 - 2 plants	1,421,184	635,197	2,056,381
Option 3 - 4 plants	2,004,725	836,114	2,840,839
Option 4 - 7 plants	3,679,504	1,047,314	4,726,818

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
1,245,007	616,788	1,861,796
1,497,117	753,139	2,250,255
1,772,715	735,463	2,508,178
2,585,012	713,754	3,298,766
3,664,502	790,978	4,455,480

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,363,771	635,474	1,999,246
1,613,223	771,825	2,385,048
1,507,656	665,985	2,173,641
1,778,373	740,000	2,518,373
2,165,540	777,518	2,943,058

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	430
Option 1a - 1 plant tertiary	511
Option 2 - 2 plants	429
Option 3 - 4 plants	593
Option 4 - 7 plants	987

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
430	389	(41)
511	470	(41)
429	524	94
593	689	96
987	930	(57)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
430	417	(13)
511	498	(13)
429	454	24
593	526	(67)
987	615	(372)

COLWOOD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,890,998	864,574	2,755,572
Option 1b - 1 plant tertiary	2,225,856	1,050,162	3,276,018
Option 2 - 2 plants	6,422,590	1,909,574	8,332,163
Option 3 - 4 plants	7,203,807	2,183,044	9,386,851
Option 4 - 7 plants	6,184,109	1,533,756	7,717,865

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
1,652,976	839,517	2,492,493
1,987,697	1,025,105	3,012,803
2,353,604	1,001,047	3,354,652
3,432,078	971,498	4,403,576
4,865,300	1,076,609	5,941,908

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,831,350	864,951	2,696,301
2,166,328	1,050,539	3,216,868
2,024,567	906,480	2,931,047
2,388,102	1,007,222	3,395,324
2,908,011	1,058,289	3,966,300

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	254
Option 1a - 1 plant tertiary	302
Option 2 - 2 plants	767
Option 3 - 4 plants	864
Option 4 - 7 plants	711

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
254	229	(24)
302	277	(24)
767	309	(458)
864	405	(459)
711	547	(164)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
254	248	(5)
302	296	(5)
767	270	(497)
864	313	(552)
711	365	(345)

LANGFORD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	5,713,228	2,523,143	8,236,372
Option 1b - 1 plant tertiary	6,724,928	3,064,757	9,789,685
Option 2 - 2 plants	5,700,796	2,523,143	8,223,940
Option 3 - 4 plants	8,041,552	3,321,231	11,362,784
Option 4 - 7 plants	11,988,259	3,763,543	15,751,802

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
4,994,098	2,450,020	7,444,118
6,005,383	2,991,634	8,997,018
7,110,889	2,921,424	10,032,313
10,369,256	2,835,189	13,204,445
14,699,416	3,141,940	17,841,356

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
5,533,014	2,524,246	8,057,260
6,545,077	3,065,860	9,610,937
6,116,776	2,645,442	8,762,218
7,215,115	2,939,444	10,154,560
8,785,906	3,088,475	11,874,381

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	415
Option 1a - 1 plant tertiary	493
Option 2 - 2 plants	414
Option 3 - 4 plants	572
Option 4 - 7 plants	793

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
415	375	(40)
493	453	(40)
414	505	91
572	665	93
793	899	105

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
415	406	(9)
493	484	(9)
414	441	27
572	511	(61)
793	598	(195)

SONGHEES NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	241,404	105,866	347,270
Option 1b - 1 plant tertiary	284,152	128,591	412,743
Option 2 - 2 plants	240,879	105,866	346,745
Option 3 - 4 plants	339,784	139,352	479,136
Option 4 - 7 plants	1,025,339	298,640	1,323,979

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
211,018	102,798	313,816
253,749	125,523	379,272
300,460	122,577	423,037
438,138	118,959	557,097
621,102	131,830	752,932

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
233,789	105,912	339,702
276,553	128,637	405,190
258,455	110,998	369,453
304,864	123,333	428,197
371,235	129,586	500,822

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

ESQUIMALT NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	40,234	17,644	57,878
Option 1b - 1 plant tertiary	47,359	21,432	68,791
Option 2 - 2 plants	40,146	17,644	57,791
Option 3 - 4 plants	56,631	23,225	79,856
Option 4 - 7 plants	138,627	46,874	185,501

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
35,170	17,133	52,303
42,291	20,921	63,212
50,077	20,430	70,506
73,023	19,826	92,849
103,517	21,972	125,489

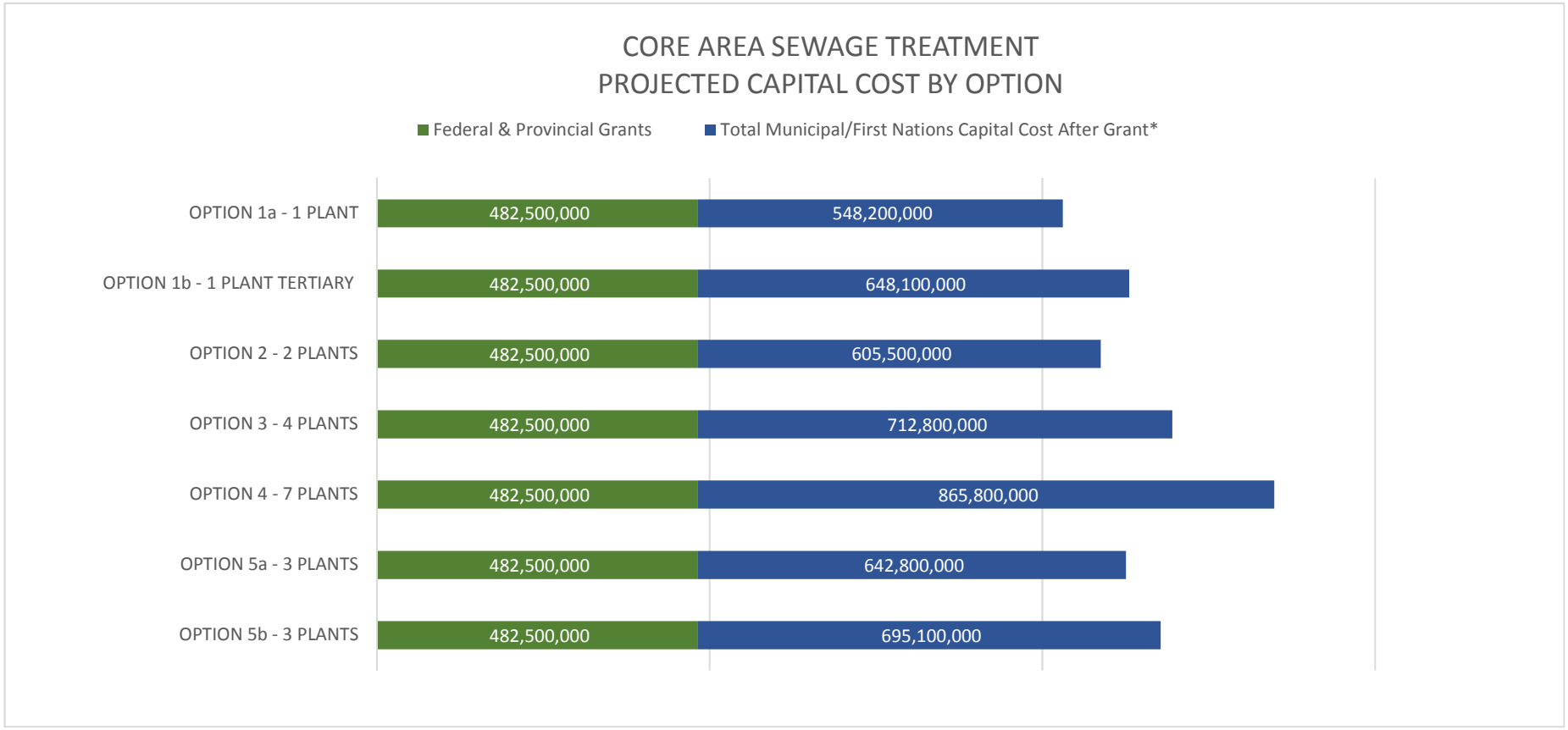
Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
38,965	17,652	56,617
46,092	21,440	67,532
43,076	18,500	61,575
50,811	20,556	71,366
61,873	21,598	83,470

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

APPENDIX H


CORE AREA SEWAGE TREATMENT
PROJECTED CAPITAL COST BY OPTION
Federal & Provincial Grants
Total Municipal/First Nations Capital Cost After Grant*
OPTION 1a - 1 PLANT
482,500,000
548,200,000
OPTION 1b - 1 PLANT TERTIARY
482,500,000
648,100,000
OPTION 2 - 2 PLANTS
482,500,000
605,500,000
OPTION 3 - 4 PLANTS
482,500,000
712,800,000
OPTION 4 - 7 PLANTS
482,500,000
865,800,000
OPTION 5a - 3 PLANTS
482,500,000
642,800,000
OPTION 5b - 3 PLANTS
482,500,000
695,100,000

Core Area Waste Water Treatment Program Options - Costing

Options	Capital Cost	Federal and Provincial Grants	Total Municipal/First Nations Capital Cost After Grant*	Operating Costs (at 2030)
OPTION 1a - 1 PLANT	1,030,700,000	482,500,000	548,200,000	21,765,000
OPTION 1b - 1 PLANT TERTIARY	1,130,600,000	482,500,000	648,100,000	26,435,000
OPTION 2 - 2 PLANTS	1,088,000,000	482,500,000	605,500,000	22,810,000
OPTION 3 - 4 PLANTS	1,195,300,000	482,500,000	712,800,000	25,345,000
OPTION 4 - 7 PLANTS	1,348,300,000	482,500,000	865,800,000	26,630,000
OPTION 5a - 3 PLANTS	1,125,300,000	482,500,000	642,800,000	22,987,000
OPTION 5b - 3 PLANTS	1,177,600,000	482,500,000	695,100,000	24,062,000

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		**Total Annual Cost**	**63,847,080**
Annual Debt	**42,082,080**	**Annual Operating**	**21,765,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	591	582	(10)
Saanich	365	372	8
Victoria	513	509	(4)
Esquimalt	455	471	16
View Royal	430	417	(13)
Colwood	254	248	(5)
Langford	415	406	(9)

OPTION 1b - 1 PLANT TERTIARY		**Total Annual Cost**	**76,214,460**
Annual Debt	**49,779,460**	**Annual Operating**	**26,435,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	705	695	(10)
Saanich	437	444	8
Victoria	611	608	(4)
Esquimalt	546	562	16
View Royal	511	498	(13)
Colwood	302	296	(5)
Langford	493	484	(9)

OPTION 2 - 2 PLANTS		**Total Annual Cost**	**69,331,955**
Annual Debt	**46,521,955**	**Annual Operating**	**22,810,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	590	630	40
Saanich	364	404	40
Victoria	512	552	41
Esquimalt	454	511	57
View Royal	429	454	24
Colwood	767	270	(497)
Langford	414	441	27

OPTION 3 - 4 PLANTS		**Total Annual Cost**	**80,220,524**
Annual Debt	**54,875,524**	**Annual Operating**	**25,345,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	573	728	156
Saanich	437	468	30
Victoria	504	639	135
Esquimalt	724	591	(133)
View Royal	593	526	(67)
Colwood	864	313	(552)
Langford	572	511	(61)

OPTION 4 - 7 PLANTS		**Total Annual Cost**	**93,452,382**
Annual Debt	**66,822,382**	**Annual Operating**	**26,630,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	590	845	254
Saanich	509	545	36
Victoria	519	743	224
Esquimalt	1,075	689	(386)
View Royal	987	615	(372)
Colwood	711	365	(345)
Langford	793	598	(195)

OPTION 5a - 3 PLANTS		**Total Annual Cost**	**72,486,240**
Annual Debt	**49,499,240**	**Annual Operating**	**22,987,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	561	678	117
Saanich	377	436	59
Victoria	495	595	100
Esquimalt	827	551	(277)
View Royal	849	490	(359)
Colwood	415	291	(124)
Langford	490	477	(13)

OPTION 5b - 3 PLANTS		**Total Annual Cost**	**77,582,164**
Annual Debt	**53,520,164**	**Annual Operating**	**24,062,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	573	724	150
Saanich	379	466	87
Victoria	504	635	131
Esquimalt	785	588	(196)
View Royal	809	524	(285)
Colwood	626	311	(315)
Langford	632	510	(122)

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

January 7, 2016

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		**Total Annual Cost**	**63,847,080**
Annual Debt	**42,082,080**	**Annual Operating**	**21,765,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	591	598	7
Saanich	365	383	18
Victoria	513	523	11
Esquimalt	455	436	(19)
View Royal	430	389	(41)
Colwood	254	229	(24)
Langford	415	375	(40)

OPTION 1b - 1 PLANT TERTIARY		**Total Annual Cost**	**76,214,460**
Annual Debt	**49,779,460**	**Annual Operating**	**26,435,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	705	712	7
Saanich	437	455	18
Victoria	611	622	11
Esquimalt	546	527	(19)
View Royal	511	470	(41)
Colwood	302	277	(24)
Langford	493	453	(40)

OPTION 2 - 2 PLANTS		**Total Annual Cost**	**69,331,955**
Annual Debt	**46,521,955**	**Annual Operating**	**22,810,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	590	598	7
Saanich	364	382	18
Victoria	512	522	11
Esquimalt	454	584	130
View Royal	429	524	94
Colwood	767	309	(458)
Langford	414	505	91

OPTION 3 - 4 PLANTS		**Total Annual Cost**	**80,220,524**
Annual Debt	**54,875,524**	**Annual Operating**	**25,345,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	573	651	78
Saanich	437	415	(23)
Victoria	504	568	64
Esquimalt	724	761	37
View Royal	593	689	96
Colwood	864	405	(459)
Langford	572	665	93

OPTION 4 - 7 PLANTS		**Total Annual Cost**	**93,452,382**
Annual Debt	**66,822,382**	**Annual Operating**	**26,630,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	590	692	102
Saanich	509	442	(68)
Victoria	519	604	85
Esquimalt	1,075	1,022	(53)
View Royal	987	930	(57)
Colwood	711	547	(164)
Langford	793	899	105

OPTION 5a - 3 PLANTS		**Total Annual Cost**	**72,486,240**
Annual Debt	**49,499,240**	**Annual Operating**	**22,987,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	561	577	15
Saanich	377	368	(9)
Victoria	495	503	8
Esquimalt	827	713	(114)
View Royal	849	643	(206)
Colwood	415	379	(36)
Langford	490	621	131

OPTION 5b - 3 PLANTS (TERTIARY)		**Total Annual Cost**	**77,582,164**
Annual Debt	**53,520,164**	**Annual Operating**	**24,062,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	573	577	3
Saanich	379	368	(11)
Victoria	504	503	(1)
Esquimalt	785	850	65
View Royal	809	767	(42)
Colwood	626	452	(174)
Langford	632	741	109

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

January 7, 2016

OAK BAY - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,639,130	1,518,845	4,157,975
Option 1b - 1 plant tertiary	3,110,767	1,844,571	4,955,339
Option 2 - 2 plants	2,633,312	1,518,845	4,152,158
Option 3 - 4 plants	2,483,697	1,543,919	4,027,616
Option 4 - 7 plants	2,609,910	1,542,697	4,152,607
Option 5a - 3 plants	2,402,773	1,543,919	3,946,692
Option 5b - 3 plants (tertiary)	2,487,310	1,543,919	4,031,229

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,675,460	1,533,526	4,208,986
3,147,119	1,859,252	5,006,371
2,669,675	1,533,526	4,203,201
2,790,030	1,789,476	4,579,506
3,021,909	1,846,277	4,868,186
2,516,647	1,538,100	4,054,746
2,516,696	1,538,100	4,054,796

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,571,683	1,518,078	4,089,761
3,042,078	1,843,804	4,885,882
2,843,008	1,590,965	4,433,973
3,353,504	1,767,778	5,121,282
4,083,590	1,857,405	5,940,995
3,149,666	1,618,028	4,767,694
3,395,389	1,693,007	5,088,396

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	591
Option 1a - 1 plant tertiary	705
Option 2 - 2 plants	590
Option 3 - 4 plants	573
Option 4 - 7 plants	590
Option 5a - 3 plants	561
Option 5b - 3 plants (tertiary)	573

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
591	598	7
705	712	7
590	598	7
573	651	78
590	692	102
561	577	15
573	577	3

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
591	582	(10)
705	695	(10)
590	630	40
573	728	156
590	845	254
561	678	117
573	724	150

January 7, 2016

SAANICH - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	12,424,952	6,565,431	18,990,383
Option 1b - 1 plant tertiary	14,767,783	7,974,385	22,742,167
Option 2 - 2 plants	12,395,439	6,565,431	18,960,870
Option 3 - 4 plants	15,733,702	7,045,131	22,778,833
Option 4 - 7 plants	18,862,549	7,656,080	26,518,629
Option 5a - 3 plants	12,994,778	6,630,131	19,624,909
Option 5b - 3 plants (tertiary)	13,110,965	6,630,131	19,741,096

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
13,292,430	6,633,392	19,925,822
15,635,761	8,042,346	23,678,107
13,263,689	6,633,392	19,897,081
13,861,645	7,740,524	21,602,169
15,013,682	7,986,223	22,999,904
12,503,401	6,653,176	19,156,576
12,503,646	6,653,176	19,156,822

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
12,819,448	6,566,569	19,386,018
15,164,299	7,975,523	23,139,822
14,171,966	6,881,849	21,053,815
16,716,711	7,646,667	24,363,377
20,356,078	8,034,355	28,390,433
15,700,608	6,998,910	22,699,518
16,925,500	7,323,241	24,248,741

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	365
Option 1a - 1 plant tertiary	437
Option 2 - 2 plants	364
Option 3 - 4 plants	437
Option 4 - 7 plants	509
Option 5a - 3 plants	377
Option 5b - 3 plants (tertiary)	379

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
365	383	18
437	455	18
364	382	18
437	415	(23)
509	442	(68)
377	368	(9)
379	368	(11)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
365	372	8
437	444	8
364	404	40
437	468	30
509	545	36
377	436	59
379	466	87

January 7, 2016

VICTORIA - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	15,083,168	8,087,462	23,170,629
Option 1b - 1 plant tertiary	17,811,719	9,822,141	27,633,861
Option 2 - 2 plants	15,049,347	8,087,462	23,136,808
Option 3 - 4 plants	14,575,991	8,208,501	22,784,492
Option 4 - 7 plants	15,249,488	8,203,773	23,453,261
Option 5a - 3 plants	14,186,711	8,208,501	22,395,211
Option 5b - 3 plants (tertiary)	14,593,755	8,208,501	22,802,256

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
15,478,872	8,166,918	23,645,790
18,207,651	9,901,598	28,109,249
15,445,402	8,166,918	23,612,320
16,141,715	9,530,000	25,671,715
17,483,248	9,832,500	27,315,748
14,560,056	8,191,275	22,751,331
14,560,342	8,191,275	22,751,617

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
14,923,552	8,084,647	23,008,200
17,653,272	9,819,327	27,472,598
16,498,064	8,472,814	24,970,878
19,460,487	9,414,444	28,874,931
23,697,197	9,891,760	33,588,957
18,277,607	8,616,938	26,894,545
19,703,546	9,016,248	28,719,794

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	513
Option 1a - 1 plant tertiary	611
Option 2 - 2 plants	512
Option 3 - 4 plants	504
Option 4 - 7 plants	519
Option 5a - 3 plants	495
Option 5b - 3 plants (tertiary)	504

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
513	523	11
611	622	11
512	522	11
504	568	64
519	604	85
495	503	8
504	503	(1)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
513	509	(4)
611	608	(4)
512	552	41
504	639	135
519	743	224
495	595	100
504	635	131

January 7, 2016

ESQUIMALT - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,624,683	1,446,838	4,071,520
Option 1b - 1 plant tertiary	3,130,399	1,757,413	4,887,813
Option 2 - 2 plants	2,618,261	1,446,838	4,065,099
Option 3 - 4 plants	4,435,635	2,044,482	6,480,117
Option 4 - 7 plants	7,084,597	2,537,323	9,621,920
Option 5a - 3 plants	5,588,368	1,819,447	7,407,815
Option 5b - 3 plants (tertiary)	5,204,927	1,819,447	7,024,375

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
2,497,049	1,404,907	3,901,956
3,002,692	1,715,483	4,718,174
3,555,445	1,675,222	5,230,667
5,184,628	1,625,773	6,810,401
7,349,708	1,801,672	9,151,380
4,675,148	1,708,406	6,383,554
5,620,711	1,986,482	7,607,193

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,766,507	1,447,470	4,213,977
3,272,539	1,758,045	5,030,584
3,058,388	1,516,967	4,575,355
3,607,558	1,685,556	5,293,113
4,392,953	1,771,014	6,163,967
3,388,277	1,542,770	4,931,048
3,652,616	1,614,263	5,266,878

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	455
Option 1a - 1 plant tertiary	546
Option 2 - 2 plants	454
Option 3 - 4 plants	724
Option 4 - 7 plants	1,075
Option 5a - 3 plants	827
Option 5b - 3 plants (tertiary)	785

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
455	436	(19)
546	527	(19)
454	584	130
724	761	37
1,075	1,022	(53)
827	713	(114)
785	850	65

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
455	471	16
546	562	16
454	511	57
724	591	(133)
1,075	689	(386)
827	551	(277)
785	588	(196)

January 7, 2016

VIEW ROYAL - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,424,284	635,197	2,059,481
Option 1b - 1 plant tertiary	1,676,496	771,547	2,448,043
Option 2 - 2 plants	1,421,184	635,197	2,056,381
Option 3 - 4 plants	2,004,725	836,114	2,840,839
Option 4 - 7 plants	3,679,504	1,047,314	4,726,818
Option 5a - 3 plants	3,293,252	774,156	4,067,407
Option 5b - 3 plants (tertiary)	3,102,010	774,156	3,876,166

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
1,245,007	616,788	1,861,796
1,497,117	753,139	2,250,255
1,772,715	735,463	2,508,178
2,585,012	713,754	3,298,766
3,664,502	790,978	4,455,480
2,330,989	750,032	3,081,021
2,802,439	872,114	3,674,553

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,363,771	635,474	1,999,246
1,613,223	771,825	2,385,048
1,507,656	665,985	2,173,641
1,778,373	740,000	2,518,373
2,165,540	777,518	2,943,058
1,670,277	677,314	2,347,591
1,800,585	708,701	2,509,286

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	430
Option 1a - 1 plant tertiary	511
Option 2 - 2 plants	429
Option 3 - 4 plants	593
Option 4 - 7 plants	987
Option 5a - 3 plants	849
Option 5b - 3 plants (tertiary)	809

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
430	389	(41)
511	470	(41)
429	524	94
593	689	96
987	930	(57)
849	643	(206)
809	767	(42)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
430	417	(13)
511	498	(13)
429	454	24
593	526	(67)
987	615	(372)
849	490	(359)
809	524	(285)

January 7, 2016

COLWOOD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,890,998	864,574	2,755,572
Option 1b - 1 plant tertiary	2,225,856	1,050,162	3,276,018
Option 2 - 2 plants	6,422,590	1,909,574	8,332,163
Option 3 - 4 plants	7,203,807	2,183,044	9,386,851
Option 4 - 7 plants	6,184,109	1,533,756	7,717,865
Option 5a - 3 plants	3,420,718	1,089,456	4,510,174
Option 5b - 3 plants (tertiary)	5,382,000	1,419,664	6,801,665

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
1,652,976	839,517	2,492,493
1,987,697	1,025,105	3,012,803
2,353,604	1,001,047	3,354,652
3,432,078	971,498	4,403,576
4,865,300	1,076,609	5,941,908
3,094,816	1,020,877	4,115,693
3,720,752	1,187,044	4,907,797

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,831,350	864,951	2,696,301
2,166,328	1,050,539	3,216,868
2,024,567	906,480	2,931,047
2,388,102	1,007,222	3,395,324
2,908,011	1,058,289	3,966,300
2,242,944	921,899	3,164,843
2,417,929	964,620	3,382,549

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	254
Option 1a - 1 plant tertiary	302
Option 2 - 2 plants	767
Option 3 - 4 plants	864
Option 4 - 7 plants	711
Option 5a - 3 plants	415
Option 5b - 3 plants (tertiary)	626

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
254	229	(24)
302	277	(24)
767	309	(458)
864	405	(459)
711	547	(164)
415	379	(36)
626	452	(174)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
254	248	(5)
302	296	(5)
767	270	(497)
864	313	(552)
711	365	(345)
415	291	(124)
626	311	(315)

January 7, 2016

LANGFORD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	5,713,228	2,523,143	8,236,372
Option 1b - 1 plant tertiary	6,724,928	3,064,757	9,789,685
Option 2 - 2 plants	5,700,796	2,523,143	8,223,940
Option 3 - 4 plants	8,041,552	3,321,231	11,362,784
Option 4 - 7 plants	11,988,259	3,763,543	15,751,802
Option 5a - 3 plants	6,961,432	2,770,861	9,732,293
Option 5b - 3 plants (tertiary)	9,025,804	3,515,652	12,541,456

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
4,994,098	2,450,020	7,444,118
6,005,383	2,991,634	8,997,018
7,110,889	2,921,424	10,032,313
10,369,256	2,835,189	13,204,445
14,699,416	3,141,940	17,841,356
9,350,296	2,979,294	12,329,590
11,241,422	3,464,231	14,705,653

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
5,533,014	2,524,246	8,057,260
6,545,077	3,065,860	9,610,937
6,116,776	2,645,442	8,762,218
7,215,115	2,939,444	10,154,560
8,785,906	3,088,475	11,874,381
6,776,554	2,690,441	9,466,995
7,305,231	2,815,117	10,120,348

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	415
Option 1a - 1 plant tertiary	493
Option 2 - 2 plants	414
Option 3 - 4 plants	572
Option 4 - 7 plants	793
Option 5a - 3 plants	490
Option 5b - 3 plants (tertiary)	632

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
415	375	(40)
493	453	(40)
414	505	91
572	665	93
793	899	105
490	621	131
632	741	109

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
415	406	(9)
493	484	(9)
414	441	27
572	511	(61)
793	598	(195)
490	477	(13)
632	510	(122)

January 7, 2016

SONGHEES NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	241,404	105,866	347,270
Option 1b - 1 plant tertiary	284,152	128,591	412,743
Option 2 - 2 plants	240,879	105,866	346,745
Option 3 - 4 plants	339,784	139,352	479,136
Option 4 - 7 plants	1,025,339	298,640	1,323,979
Option 5a - 3 plants	558,178	129,026	687,204
Option 5b - 3 plants (tertiary)	525,764	129,026	654,790

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
211,018	102,798	313,816
253,749	125,523	379,272
300,460	122,577	423,037
438,138	118,959	557,097
621,102	131,830	752,932
395,083	125,005	520,088
474,990	145,352	620,342

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
233,789	105,912	339,702
276,553	128,637	405,190
258,455	110,998	369,453
304,864	123,333	428,197
371,235	129,586	500,822
286,333	112,886	399,219
308,672	118,117	426,789

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-
Option 5a - 3 plants	-
Option 5b - 3 plants (tertiary)	-

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

January 7, 2016

ESQUIMALT NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	40,234	17,644	57,878
Option 1b - 1 plant tertiary	47,359	21,432	68,791
Option 2 - 2 plants	40,146	17,644	57,791
Option 3 - 4 plants	56,631	23,225	79,856
Option 4 - 7 plants	138,627	46,874	185,501
Option 5a - 3 plants	93,030	21,504	114,534
Option 5b - 3 plants (tertiary)	87,627	21,504	109,132

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
35,170	17,133	52,303
42,291	20,921	63,212
50,077	20,430	70,506
73,023	19,826	92,849
103,517	21,972	125,489
65,847	20,834	86,681
79,165	24,225	103,390

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
38,965	17,652	56,617
46,092	21,440	67,532
43,076	18,500	61,575
50,811	20,556	71,366
61,873	21,598	83,470
47,722	18,814	66,536
51,445	19,686	71,131

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-
Option 5a - 3 plants	-
Option 5b - 3 plants (tertiary)	-

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

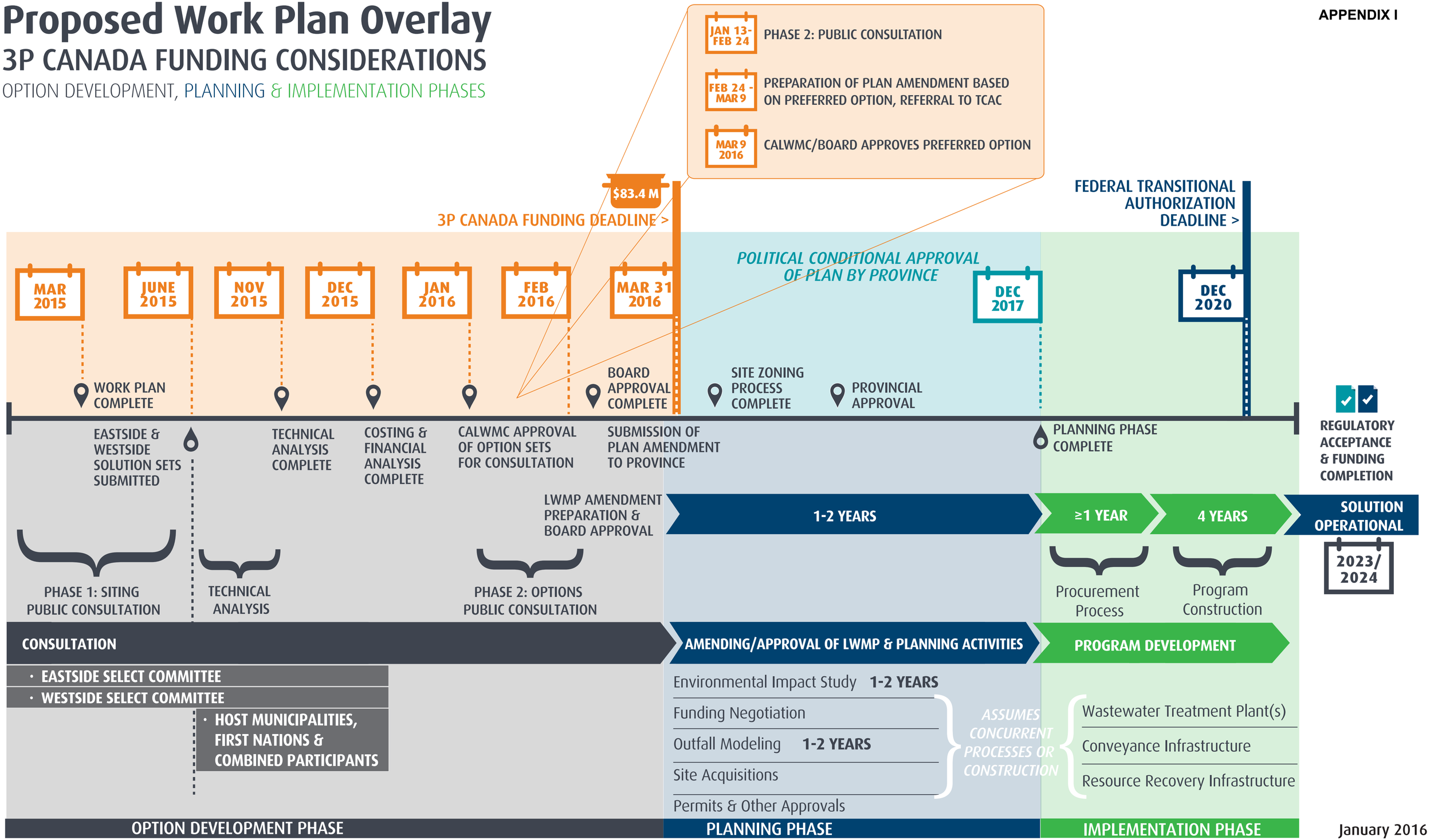
January 7, 2016

APPENDIX I

Proposed Work Plan Overlay

3P CANADA FUNDING CONSIDERATIONS

OPTION DEVELOPMENT, PLANNING & IMPLEMENTATION PHASES



January 2016

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REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, JANUARY 13, 2016

SUBJECT **Technical Oversight Panel Report #7**

ISSUE

Technical Oversight Panel (TOP) summary of recent period to January 4, 2016

BACKGROUND

TOP was directed by the Core Area Liquid Waste Management Committee (CALWMC) at the meeting of December 9, 2015 to further investigate the small footprint plant option at the outfalls. The objective of this exercise was to save the infrastructure cost and to alleviate disruption that will be caused during the construction of dual large diameter sewer lines to and from Rock Bay. Four TOP members (a quorum) visited the Noram Vertreat technology site at the Chevron Refinery in Burnaby on December 29, 2015 along with one consultant from Carollo and one consultant from Urban Systems, to better understand the deep shaft technology and its potential for this project. Further discussions with Noram relevant to CRD sites suggested that the small footprint plants conceptually did fit on the two sites identified as closest to the existing outfalls (Clover Point and Bullen Park) and although the two plants were mostly buried and not visible, and although the deep shaft technology itself is viable and proven, the solution set as proposed was not acceptable to TOP. This is because Noram advised that the combination of the MBR and the deep shaft is not proven and would need to be piloted first. Additionally, there are no built examples of deep shaft WWTPs at this scale so there is no confirmation that the technology is scalable without risk, and the operations and servicing activities were deemed to be extensive and disruptive and inappropriate for the local residential streets. Meeting minutes will be prepared and posted publically by January 31, 2016.

The eastside public group requested a response to their distributed sites proposal. This request was forwarded to the consultants, the report on their findings will be issued through the CRD to the chair of the CALWMC for January 13, 2016.

The CALWMC directed the consultants to investigate a three plant option at Colwood, EFN and Rock Bay and provide a report. The objective of this exercise was to save treatment plant costs and improve the performance of the system now described in the four plant option 5a) in draft TM#3. The three plant option set, 5b), will be reviewed by TOP as part of the final TM#3 submission January 20, 2016, and will be discussed at face to face meetings January 11, 2016.

The CALWMC directed TOP to prepare a summary document of all meetings with technology vendors. TOP is preparing a binder of materials and summary statement for each provider that will be available to the public and the CALWMC on line. TOP is meeting with a final provider, Pivotal, on January 12, 2016 to better understand how they propose to provide tertiary treatment and gasification for a total project cost of $250M. The summary binder will be completed after the meeting with Pivotal.

The CALWMC directed the consultants to prepare a report on the flow assumptions for the planning stage of the work. The objective of this work was to clarify and come to agreement on the assumptions made around ministry, municipal and regional standards used, infiltration and inflow upgrades cost allocations and impacts on system design, population growth assumptions

and impact on design, and the 2030 and 2045 capacity targets. TOP reviewed and commented on this report January 4, 2016 and the consultants will include TOP comments in the draft submitted to the CALWMC for January 13, 2106.

Draft TM#3R1 that was made available on line to the public does not include revisions to reflect TOP comments, or the new three plant option developed by the consultant team in December, and this should be clarified during public consultation scheduled to begin January 14, 2016, to avoid confusion. Draft Technical Memo #3R1 was issued to the CALWMC by the consultants December 4, 2015. TOP has competed a detailed review of items that are to be addressed in TM#3R2 when it is submitted January 20, 2016 for TOP's final review. TOP also has a series of notes on TM#2 that are to be addressed by the consultants for the official record as an appendix to the final version of TM#3.

Draft Technical Memo #4 is scheduled to be issued to the CALWMC by the consultants February 10, 2015. The critical path dates for the draft TM#4 documents, TOP's review, and the consultant presentation to the CALWMC need revision and reconfirmation.

The critical path schedule has been developed by the team for the planning phase. The CALWMC passed a motion November 25, 2015 for the CRD to develop a schedule for the project out to 2020 with TOP support. Work should begin immediately on this.

The organization chart for the project team has not been resolved and an overarching project delivery organization chart is needed urgently. The CALWMC passed a motion November 25, 2015 for the CRD to develop this organization chart out to 2020 with TOP support. Discussion and planning should begin on this.

TOP has provided expert technical oversight of the consultant work and the vendor presentations through the planning stage. Several of the six TOP members are willing to continue to support the project through the preparation of the project schedule and organization chart, detailed project cost planning, and the RFSI process and the implementation of the project to the final delivery to CRD. TOP will be meeting with the chair and vice chair of the Core Area Wastewater Treatment Program Commission on February 9, 2016 to determine if there is a need to extend the TOP mandate, and will provide a report on the results to the CALWMC for direction from the CALWMC to TOP in February.

ALTERNATIVES

That TOP recommends that:

1. *That the Core Area Liquid Waste Management Committee receive this document for information and accept the recommendations.*

2. *That the Core Area Liquid Waste Management Committee receive this document for information, and revise and accept the recommendations.*

3. *That the Core Area Liquid Waste Management Committee receive this document for information and not accept the recommendations.*

IMPLICATIONS

SOCIAL IMPLICATIONS
TM#3 should be updated to reflect the current options to avoid confusion.
Confidence in the project must be restored to attract the full participation of the market and support the most competitive bids.

ENVIRONMENTAL IMPLICATIONS
Some of TOP's comments on the draft TM#3R1 relate to environmental impact and will need to be incorporated.

ECONOMIC IMPLICATIONS
Some of TOP's comments on the draft TM#3R1 relate to cost issues and will need to be incorporated.

INTERGOVERNMENTAL IMPLICATIONS
Some of TOP's comments on the draft TM#3R1 relate to funding issues and will need to be incorporated.

GROWTH MANAGEMENT IMPLICATIONS
The report on flow and 2030 and 2045 targets is an important piece of the growth management of this project. The 2016 study by the CRD on water supply will inform 2045 targets. Design and construction will be to the 2030 targets.

CONCLUSIONS

TOP understands that the public consultation process through January and February 2016 will be directed at the public to garner comments and feedback on the options sets as presented. TOP will present its technical conclusions once the public consultation process is completed.

RECOMMENDATION

That TOP recommends:

1. That the CRD begin immediately to develop a schedule for the project out to 2020 with TOP support per the motion CALWMC passed November 25, 2015.
2. That the CRD begin immediately to develop an organization chart for the project out to 2020 with TOP support per the motion CALWMC passed November 25, 2015.

Submitted by:	Teresa Coady, Chair, Technical Oversight Panel

TC:ll

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EEE 16-09

REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, JANUARY 13, 2016

SUBJECT **Urban Systems Contract 15-1834 – Scope Change No. 3**

ISSUE

To seek approval for a scope change to Urban Systems Contract 15-1834 for the additional level of effort associated with engaging and collaborating with the Technical Oversight Panel and further direction by the Core Area Liquid Waste Management Committee (CALWMC) and the Westside and Eastside Select Committees.

BACKGROUND

At its meeting of August 12, 2015, the Capital Regional District Board (CRD) approved the formation of the Technical Oversight Panel (TOP) as defined in the Terms of Reference provided in Appendix A.

In order to provide the additional level of effort associated with engaging, collaborating and documenting discussions with the Technical Oversight Panel while completing the tasks set out in its Contract 15-1834, Urban Systems submitted a Request for Scope Change No. 1 (RSC#1) in the amount of $68,000, which was approved by the CRD Board on September 9, 2015.

Urban Systems' scope of work was further expanded to include additional conference calls and face-to-face meetings with the TOP, full-day site tour and vendors meeting, and a resource recovery presentation to the Core Area Liquid Waste Management Committee on November 25, 2015 with the approval of a Request for Scope Change No. 2 (RSC#2) in the amount of $44,799 by the CRD Board on November 4, 2015.

Appendix B provides Urban Systems' January 5, 2016 Request for Scope Change No. 3 (RSC#3) in the amount of up to $86,700 (excluding GST) for completing additional tasks as directed by the Technical Oversight Panel, CALWMC and Select Committees. The RSC#3 provides a breakdown of tasks, deliverables, scheduling and a budget adjustment for consideration.

ALTERNATIVES

Alternative 1

That the Core Area Liquid Waste Management Committee recommend to the CRD Board:

That the Request for Scope Change No. 3, as outlined in Urban Systems' letter of submittal dated January 5, 2016, in the amount of up to $86,700 (excluding GST) be approved.

Alternative 2

That the Core Area Wastewater Management Committee revise the Scope Change prior to

approval.

FINANCIAL IMPLICATIONS

The total upset budget limit for any unanticipated scope changes under Contract 15-1834 was approved by the CRD Board on August 12, 2015, in the amount of $200,000. If this change is approved, the total value of scope changes under Contract 15-1834 would be $199,499 (excluding GST). Funds for this project will be drawn from the Core Area Liquid Waste Management Plan operating reserve, funded by all participants in the service, based on projected design capacity for 2030.

CONCLUSION

A third scope change to Contract 15-1834 is required in order for Urban Systems to provide the additional level of effort required to complete the additional tasks as directed by the Technical Oversight Panel, CALWMC and Select Committees, while completing the already contracted tasks set out in its Contract 15-1834.

RECOMMENDATION

That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:

That the Request for Scope Change No. 3, as outlined in Urban Systems' letter of submittal dated January 5, 2016, in the amount of up to $86,700 (excluding GST) be approved.

Submitted by:	Dan Telford, P.Eng., Project Manager, Core Area Wastewater and Resource Recovery Project
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Office

DT:mer

Attachments: Appendix A – Independent Technical Oversight Panel – Terms of Reference and Selection Criteria
Appendix B – Urban Systems Core Area LWMP Wastewater Treatment Feasibility and Costing – Scope Adjustment #3 R1

Independent Technical Oversight Panel
Terms of Reference and Selection Criteria

The Technical Oversight Panel:

1. Will be comprised of six members.
2. Will be given a $12,000/year honorarium + $750/meeting (up to 4 hours, additional $750 over 4 hours) + travel disbursements. Chair will receive $30,000/year + same meeting and travel expenses.*
3. Will commence work in August 2015 and end no later than March 2016, or be extended according to need as determined by the Core Area Liquid Waste Management Committee (CALWMC) and with the willingness of the panel members to continue to serve.
4. Will provide independent oversight to the work of the engineering, business case, lifecycle costing and other project analysis done post August 2015. The panel must be proactive, jointly preparing a work plan with the consultant to be proposed to the CALWMC, vetting the options in conjunction with the consultant, identifying items that should be taken to the CALWMC and the public early in the process. The Technical Oversight Panel (TOP), in conjunction with experienced consultants, must undertake a "rapid assessment" to assess if a concept or configuration is feasible or not, and whether it should be taken to the next level of analysis or not.
5. After the initial settling in period and approval of the consultant's work plan, the TOP chair will report biweekly to the CALWMC until November 2015 to keep the CALWMC apprised of the project costing and solutions analysis. The Chair of the Panel will have the primary responsibility for presenting updates and answering questions of the committee and speaking on behalf of the Panel at public sessions.
6. Will advise as to how to best canvas the private sector broadly to see what solutions they have to best meet the goals of this project.
7. The team will begin its work with the option set sites provided. But it may consider additional sites that will ensure the best business case scenario that maximizes benefit to the best value for taxpayers. Once identified, the TOP will recommend to the CALWMC that the budget be amended and the respective councils will be asked to put forward the sites for further analysis.

*Based on Core Area Wastewater Program Commission.

Selection Criteria/Skill Sets Sought:

1. Significant private sector business, finance and large-scale project-management experience.
2. Wastewater, residuals treatment technology – up-to-date understanding of innovative/emerging/best practices including wastewater and reclaimed water regulatory context.
3. Resource recovery – wastewater reuse (irrigation, purple pipe), district energy systems, energy conversion systems and other community benefits, and ability to evaluate technologies to allow for integration of other waste streams into the

wastewater treatment in the future.

4. Financial costing including capital/operating/life cycle, comparative evaluations, business case analysis, risk, financing, procurement options and achieving social capital on a project.
5. Proven ability to pull conceptual ideas into overarching plan.
6. Chair, proven ability to deliver, able to present detailed concepts in political arena and to broad public, comfortable with public speaking, media, videotaped proceedings and large venues.
7. Climate adaptation and mitigation experience.

Approved by CRD Core Area Liquid Waste Management Committee
on May 27, 2015
And revised by Core Area Liquid Waste Management Committee
on August 12, 2015

VIA EMAIL

January 5, 2016 File: 1692.0037.01

Capital Regional District (CRD)
625 Fisgard Street, PO Box 1000
Victoria, BC V8W 2S6

VIA EMAIL:dtelford@crd.bc.ca

Attention: Dan Telford, P.Eng. – Senior Manager, Environmental Engineering

RE: Core Area LWMP Wastewater Treatment Feasibility and Costing – Scope Adjustment #3 R1

At your request, we are pleased to provide this scoping document to outline our team's level of effort associated with additional efforts to collaborate and engage with the Technical Oversight Panel and further direction by the CALWMP Committee.

PHASE 2 ADDITIONAL ENGAGEMENT WITH THE PANEL: LEVEL OF EFFORT

We remain fully adaptable to the process and the direction that stems from the Committee and offer a concise list of potential tasks for project budget and overall process consideration. This list of tasks includes events and activities that we anticipate as we have discussed. Proposed tasks and activity descriptions include the following items.

- ***Task 1 Additional Conference Calls***

ToP has requested seven additional conference calls from those proposed in Scope Adjustment #1 and #2 to the middle of December. We propose to continue with these conference calls with only two team members in order to keep the costs appropriate to the value of the discussion during the calls. Meetings beyond January are not included.

Scope Adjustment #1 – 3 Meetings September 28, October 6, October 13

Scope Adjustment #2 – 3 Meetings October 20, October 28, November 3

Scope Adjustment #3 – 7 Meetings November 10, November 17, December 1, December 8, December 15, January 5, January 26

- ***Task 2 Additional In Person TOP Meeting***

ToP has scheduled an in person meeting on January 11. We have included participation in this meeting similar to our past involvement. Disbursements are reduced due to planning with the CALWMP meeting on January 13. Urban Systems will attend in person and Carollo will be available by phone.

- ***Task 3 Technical Memo #2 Extra Revisions***

In our original proposal and our Scope Adjustment request we had assumed that only a single draft report would be submitted to the CRD Committee and based on one set of comments from the Committee and

Staff the report would be revised. With the involvement of TOP we have had to complete an additional draft version and had to respond to significant out of scope comments.

PHASE 2 – ADDITIONAL MEETINGS WITH CRD AND COMMITTEES

- ***Task 4 Extra Meeting with CALWMP***

We will present the progress on the tasks outlined in this scope change at the January 13 CALWMP meeting. Urban Systems will attend in person and Carollo will be available by phone if necessary.

PHASE 2 – ADDITIONAL INVESTIGATIVE ITEMS

- ***Task 5 Review Distributed Model Option with Stormwater Integration***

We will meet with the CRD and the proponent for this option to ensure we have a solid understanding of what is being proposed. Based on this meeting we will prepare a memo outlining the areas that the CRD will need to consider and seek further direction from the Committee and Province on before this option can be integrated into the option sets. This will only be done through description and mapping. If the CALWMP decides to add another distributed option set we will provide pricing at that time for the completion of costing.

- ***Task 6 Review of Noram Technology***

We will provide support to TOP in reviewing the feasibility of deep shaft treatment technology developed and marketed by Noram. The focus will be on understanding how compliance with the water quality requirements of the LWMP will be achieved and what footprint if required for the treatment technology. With this information in hand we will be able to determine if this can be inserted into an existing option set or would create a new option set. At this point in time no costing will be completed.

- ***Task 7 Provide Additional Information on Flows and Regulations***

We will provide support to the CRD to review how design flows were established and the governing regulations for wet weather flows. A summary memo will be provided. At this point in time we have assumed that Technical Memo #1 will not be revised again.

PHASE 2 – REVISIONS TO TECHNICAL MEMO 3

- ***Task 8 Additional Option Sets for Westside***

We will prepare an additional option set to add to TM 3 that replaces the two Westside plants in the four plant option with two alternative plants. These plants will produce only secondary effluent (Option 5A) or 100% tertiary effluent (Option 5B) and handle all wet weather flows. One plant would capture flows from Colwood and Langford with its own outfall, and one plant in Esquimalt that would handle all flows from Esquimalt, the two first nations and View Royal. We will review the results of this option set analysis with the Westside Select Committee prior to bringing it to the CLWMP Committee. Solids will continue to be processed at Rock Bay or Hartland.

- ***Task 9 Additional Requested Edits to TM 3***

We have already completed two drafts of TM 3 and so the additional requested edits will be incorporated into the updated TM 3. The budget for these edits do not currently include adding the additional distributed option sets or deep shaft technology.

SCOPE ADJUSTMENT BUDGET

The following table outlines the budget associated with the items discussed above.

Task	Unit Cost	Estimated Units	Estimated Total Cost
1. Additional Conference Calls (7)	$1,400	7	$9,800
2. Additional In Person Meeting	$9,500	1	$9,500
3. Technical Memo #2 Extra Revisions	$7,900	1	$7,900
4. Meeting with CLWMP Committee	$4,100	1	$4,100
5. Review Distributed Option Set Impacts of Stormwater	$4,700	1	$4,700
6. Review of Noram Technology	$6,500	1	$6,500
7. Provide Additional Information on Flows and Regulations	$5,700	1	$5,700
8. Additional Option Sets for Westside	$24,600	1	$24,600
9. TM#3 Additional Revisions	$13,900	1	$13,900
Total			**$86,700+ GST**

We will complete as much of this work as possible and provide an update at the January 13 meeting. Updates to TM#3 will not be completed until after the January 13 meeting.

Sincerely,

URBAN SYSTEMS LTD.

URBAN systems

Steve Brubacher, P.Eng.
Principal

/sb/el

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Monthly Report to the CRD from the Fairness and Transparency Advisor November 2015

This report provides a summary of the FTA's activities for the Core Area Sewage Treatment Project for the period from **October 29th** to **November 25th.**

FTA Activities

Monitoring Role

During this period, the FTA continued to review and monitor upcoming meetings of the various committees, flagging any potential issues associated with transparency, impartiality, or fairness.

Other Activities

Complaints

There was no contact from the public received during this reporting period.

October - November 2015 Complaints Statistics

Number of applications received	0
Number of "eligible" complaints	0
Number of decisions rendered	0
Number of Complaints previously reported	2

As indicated in the table, no complaints were received. This brings the number of formal complaints received by the FTA to date to 2.

Activities Summary

Provided in the table below is a summary of the FTA's Project hours devoted to each of the abovementioned tasks.

October - November 2015 Activities

Activity	Hours Worked
Setting up procedures	0
Monitoring	2.7
Meetings	0
Complaints	0
Other admin	.2
Total	**2.9**

The total number of hours to be billed for this period (spanning the period of October 29th to November 25th) is 2.9 for a total of $509.50 plus tax.

Monthly Report to the CRD from the Fairness and Transparency Advisor December 2015

This report provides a summary of the FTA's activities for the Core Area Sewage Treatment Project for the period from **November 28h to December 31st.**

FTA Activities

Monitoring Role

During this period, the FTA continued to review and monitor upcoming meetings of the various committees, flagging any potential issues associated with transparency, impartiality, or fairness. In this capacity, the FTA also reviewed minutes of committee meetings.

The FTA notes a minor procedural challenge related to the timeliness of the availability of meeting minutes. I note delays in the posting of meeting minutes for various project committees. While it is understood that the timelines are a constraint as they are restrictive, such delays expose the process to risk. A measure of fairness will be *timely provision of information*. Further to this, the unavailability of meeting minutes limits the effectiveness of the FTA's role to monitor for issues of procedural concern.

Complaints

A significant aspect of the FTA's mandate and role is to screen and (if eligible) review submitted complaints regarding the wastewater planning process. The table below summarizes the FTA's activities in this capacity for the reporting period.

November 28 – December31 2015 Complaints Statistics

Number of applications received	2
Number of "eligible" complaints	2
Number of decisions rendered	2
Number of Complaints previously reported	2

Two formal complaints were received, screened and reviewed during this reporting period. This brings the number of formal complaints received by the FTA to date to four (4). A summary of the recent complaints and the FTA's decisions are provided below.

Complaint #3 (ID no. 394437)

The FTA received notice of complaint no. 394437 ("the complaint") on Monday December 7th and proceeded with screening the complaint.

Summary of complaint:

The complainant raised several issues related to whether the Technical Oversight Panel (TOP)'s recent meetings with various citizen groups to address concerns with the project falls outside its mandate and is contrary to the CRD's agreed upon process for addressing public complaints on the wastewater planning process.

Summary of findings:

The final decision on the complaint was issued by the FTA on Friday December 11th and later posted to the CRD website.

Overall, the FTA found that for the TOP to actively engage with the public (i.e., citizen groups) is inconsistent with their mandate and is ultimately beyond their jurisdiction. It would be entirely within the purview of the CALWMC (and in fact, it would be consistent with the Project Charter) to direct the TOP to refrain from future public engagement.

Complaint #4 (ID no. 395039)

The FTA received notice of complaint no. 395039 ("the complaint") on Tuesday December 15th and proceeded with screening the complaint.

Summary of complaint:

The complainant raised two separate issues. The first centres on the potential unfairness and bias in the site selection process. Specifically, the complaint relates to the criteria used to narrow site options, and how these criteria have been weighted in the process of selecting the option sets. In the second issue, the complaint raises procedural concerns with the Eastside consultation process, which the complainant suggests, is inadequate.

Summary of findings:

The final decision on the complaint was issued by the FTA on Tuesday January 5th and later posted to the CRD website.

With respect to the first issue, the FTA found an apparent lack of any clearly articulated, overarching criteria guiding the site options evaluation process. Given the lack of clarity on the process, the FTA was unable to determine whether some factors were given priority weighting over others.

In terms of the second issue raised, the FTA did find that the level of consultation undertaken was adequate in that it was proportional to the issues at hand and that the opportunities for real engagement were robust. However, with respect to one issue raised related to the consultation - lack of information provided to the public on detrimental effects or potential risks associated with a site failure- the FTA found no provision of such information to the public, and determined the process to be lacking with respect to the complete provision of all relevant information.

Other Issues

There were no other issues raised by the public to the FTA during this reporting period.

It is beneficial to restate that the FTA has a role in providing oversight to consultation processes and associated procedures. In part, this is in consideration of the complaints the FTA has received to date, many of which relate to ambiguity around formal project procedures, including the roles and responsibilities of decision-makers. The FTA reminds the parties involved in various processes that the FTA is available for consultation on procedural aspects of undertakings.

Activities Summary

Provided in the table below is a summary of the FTA's Project hours devoted to each of the abovementioned activities.

Monthly Report to the CRD from the Fairness and Transparency Advisor December 2015

November - December 2015 Activities

Activity	Hours Worked
Setting up procedures	0
Monitoring	2
Meetings	0
Complaints	89.3
Other admin	0
Total	**91.3**

The total number of hours to be billed for this period (spanning November 28th to December 31st) is 91.30 hours, which totals $18, 007.50 before tax.

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EEE 16-08

REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, JANUARY 13, 2016

SUBJECT **Core Area Sewage and Resource Recovery System 2.0 – Budget Update No. 3**

ISSUE

To provide the Core Area Liquid Waste Management Committee (CALWMC) with a monthly budget update.

BACKGROUND

The CALWMC requested that a detailed operating budget for the Core Area Sewage and Resource Recovery System 2.0 (including securing final treatment sites, rezoning, public consultation, LWMP Amendment No. 10 and final submission to 3P Canada by March 31, 2016 deadline) with actual expenses and commitments be provided to the CALWMC on a monthly basis. At its November 25, 2015 meeting, the CALWMC received and approved Budget Update No. 2.

Phase 2 Budget Update No. 3 provides actual expenses and outstanding commitments to November 30, 2015, as summarized in Appendix A.

The Core Area Liquid Waste Management Plan (LWMP) Options Development Phase 2 of the project is scheduled for completion by the end of March 2016.

FINANCIAL IMPLICATIONS

Funding for the project is being drawn from the Core Area Liquid Waste Management Plan (LWMP) operating account.

CONCLUSION

A budget is presented for the Core Area LWMP Options Development Phase 2 of the project to the end of March 2016. Due to the accelerated pace of work on the project, invoicing received from some of the suppliers and consultants has lagged. Any invoices received after the cut-off date for reporting will be brought up to date with the next budget report.

The Committee will continue to receive monthly budget updates through the course of the project.

RECOMMENDATION

That the Core Area Liquid Waste Management Committee receive this budget update for information.

Submitted by:	Dan Telford, P.Eng., Project Manager, Core Area Wastewater and Resource Recovery Project
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

DT:mer

Attachment: Appendix A – Core Area Sewage and Resource Recovery System 2.0 – Budget Update No. 3

APPENDIX A

CORE AREA LIQUID WASTE MANAGEMENT PROGRAM

Options Development - Phase 2 Budget Update No. 3
November 30, 2015

	BUDGET (est. Oct 14, 2015)	ACTUAL	COMMITTED	TOTAL	REMAINING
Project Oversight (FTA & ToP)	280,000	204,735		204,735	75,265
Public Consultation	240,000	18,550		18,550	221,450
Feasibility and Costing Analysis	450,000	168,871	281,129	450,000	-
Property and Rezoning	75,000			-	75,000
LWMP Amendment No. 10	75,000			-	75,000
Project Management (Staff & Wages)	300,000	13,634		13,634	286,366
Miscellaneous and Legal	30,000			-	30,000
CALWMP Total	**$ 1,450,000**	**$ 405,790**	**$ 281,129**	**$ 686,919**	**$ 763,081**

Terms of Reference

CRD

EASTSIDE PUBLIC ADVISORY COMMITTEE

PREAMBLE

The Eastside Wastewater and Resource Recovery Select Committee (Eastside Select Committee) will develop a wastewater and resource recovery plan (the plan) for Oak Bay, Saanich and Victoria. This plan, in combination with the plan from the Westside Select Committee, could form the basis for an amendment to the Core Area Liquid Waste Management Plan (CALWMP).

1.0 PURPOSE

The Eastside Public Advisory Committee (Advisory Committee) will advise the Eastside Select Committee on the public consultation required for the development of the wastewater and resource recovery plan. The Advisory Committee will serve as a sounding board on the consultation process by:

- reviewing information and material prepared by consultants and staff and referred to by the Eastside Select Committee;
- providing feedback and advice on the consultation process;
- reviewing and providing advice on the structure and tools that could be used to consult with the participating communities.

The Advisory Committee will focus on the public consultation process and will not provide advice on the selection of treatment technology or specific sites for facilities.

In their work, Advisory Committee members may be informed by the public and benefit from the informed exchange of ideas with the community. The Advisory Committee is a term-limited committee that will be in place for approximately one year, with the possibility of an extension.

2.0 OBJECTIVES

Project objectives are to:

- work with the Eastside Select Committee, staff and consultants to assist with the development and implementation of a public consultation process, which will help in the development of a wastewater treatment and resource recovery plan for the Eastside;
- comply with all CRD, provincial, and federal guidelines, regulatory and legislative requirements;
- consider resource requirements and budget for public consultation initiatives;

- work to build public support for the Eastside Wastewater Treatment and Resource Recovery Plan in order to get the plan approved as soon as possible.

3.0 MEMBERSHIP CRITERIA

The Eastside Public Advisory Committee will be made up of 10 members of the public. Membership will be selected using the following criteria:

1. A mixture of individuals who consider themselves both knowledgeable and new to the wastewater treatment project in the core area, as well as those who have participated in other citizen engagement initiatives in the past.
2. Individuals selected from the three participating municipalities with representation based on population: one member from Oak Bay, five members from Saanich and four members from Victoria.
3. A willingness to commit volunteer time of approximately one year to the project. This will include monthly to bi-monthly meetings, as well as potentially attending public meetings, workshops, field trips or other project-related meetings.
4. The ability to work in a group and develop agreement with others who may hold different views.
5. Members are to serve without remuneration.

4.0 SELECTION PROCESS

The CRD will invite the public to apply for membership on the Eastside Public Advisory Committee through an advertising process.

The Eastside Select Committee will review and assess all applications based on the above membership criteria and make recommendations to the CRD Board through the Core Area Liquid Waste Management Committee regarding appointments to the Eastside Public Advisory Committee.

5.0 APPOINTMENT

The Eastside Public Advisory Committee members will be appointed for a one-year term, renewable to a maximum term of three years if an extension to the Eastside Public Advisory Committee term is made. If vacancies arise during the project term, the Chair will consult with the Eastside Select Committee to identify alternates, as required.

6.0 ATTENDANCE

Meetings will be held at CRD Headquarters, 625 Fisgard Street, unless otherwise noted.

Meeting frequency will vary through the course of the project to meet timeline constraints and key milestones. Regular meeting attendance is required to remain a member in good standing. Members absent without prior notification to the Chair for three consecutive meetings may be deemed to have resigned.

7.0 PROCEDURES

The Chair and Vice Chair or designated members of the Eastside Select Committee will also Chair and Vice Chair the Eastside Public Advisory Committee. The Advisory Committee will meet on the first and third Wednesday of the month which will correspond to the dates of the Eastside Wastewater Treatment and Resource Recovery Select Committee meetings. Any additional meetings will be at the call of the chair.

The Eastside Public Advisory Committee will follow the CRD Rules of Procedure as enacted in Bylaw No. 3828, the Capital Regional District Board Procedures Bylaw, 2012.

Capital Regional District
625 Fisgard St.,
Victoria, BC V8W 1R7

Notice of Meeting and Meeting Agenda

Westside Wastewater Treatment and Resource Recovery Select Committee

Tuesday, November 24, 2015 **2:00 PM** **Esquimalt Town Hall, 1229 Esquimalt Road**

Due to the location, this meeting will not be available on video.

B. Desjardins (Co-Chair), C. Hamilton (Co-Chair), Chief R. Sam, Chief A. Thomas, D. Screech, L. Seaton, S. Young

1. Approval of Agenda

2. Adoption of Minutes

2.1. **15-1257** Adoption of the Minutes of October 27 and November 2, 2015

Recommendation: That the minutes of October 27 and November 2, 2015 be adopted.

Attachments: 2015-10-27 Minutes Westside WTRRSC

2015-11-02 Minutes Westside WTRRSC

3. Chair's Remarks

4. Presentations/Delegations

5. Committee Business

5.1. **15-1271** Technical Analysis for Further Comprehensive Evaluation of Potential Sites, Scenarios and Technologies

Recommendation: That the Westside Select Committee receive this report for information.

Attachments: Staff Report: Technical Analysis for Evaluation of Potential Sites

Appendix A: Westside Technical Team Analysis

5.2. **15-1272** Westside Solutions Public Consultation Update

Recommendation: That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.

Attachments: Staff Report: Westside Solutions Public Consultation Update

Appendix A: Westside Consultation Plan

5.3. **15-1266** Westside Concept Planning - Phase 2 Budget Update No. 2

Recommendation: That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.

Attachments: Staff Report: Westside Phase 2 Budget Update No. 2

Appendix A: Table Showing Budget

5.4. **15-1275** Eastside Wastewater Treatment and Resource Recovery Select Committee Verbal Update

6. New Business

7. Adjournment

Next Meeting: To be determined

To ensure quorum, please advise Allison Boyd 250-360-3129 if you or your alternate are unable to attend.

Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Meeting Minutes
Westside Wastewater Treatment and Resource Recovery Select Committee

Tuesday, October 27, 2015 **10:30 AM** **Esquimalt Town Hall, 1229 Esquimalt Road**

PRESENT:

MEMBERS: B. Desjardins (Co-Chair), C. Hamilton (Co-Chair), D. Screech, L. Seaton
Absent: Chief R. Sam; Chief A. Thomas; S. Young

STAFF: B. L. Hutcheson, General Manager, Parks and Environmental Services; D. Lokken, General Manager, Finance and Technology; S. Santarossa, Corporate Officer (Recorder); D. Telford, Senior Manager Environmental Engineering; A. Genero, Manager Accounting Services; L. Taylor, Communications Coordinator; S. Hallatt, Manager, Aboriginal Initiatives

ALSO PRESENT: L. Helps, Chair, Eastside; L. Hundleby, Alternate Director; B. Burton-Krahn, Alternate Director; R. Atkins, Technical Oversight Panel; E. Lee, Urban Systems; G. Nason, Colwood; S. Russell, Colwood; M. Baxter, Colwood; R. Morrison, Esquimalt; J. Miller, Esquimalt; L. Hurst, Esquimalt; J. O'Reardon, Aurora, C. Houghton, Aurora; K. Anema, View Royal

Co-Chair Desjardins called the meeting to order at 11:05 a.m.

1. Approval of Agenda

The agenda was amended to consider Item 5.4 before Item 5.1 and to add Item 6.1 - Correspondence from Township of Esquimalt regarding Potential Sites for Wastewater Treatment Plants in Township of Esquimalt.

MOVED by Director Screech, SECONDED by Co-Chair Hamilton,
That the agenda be adopted as amended.
CARRIED

2. Adoption of Minutes

2.1. **15-1193** Adoption of the Minutes of September 29, 2015

MOVED by Director Seaton, SECONDED by Director Screech,
That the minutes of September 29, 2015 be adopted.
CARRIED

3. Chair's Remarks

There were none.

4. Presentations/Delegations

There were none.

5. Committee Business

5.4. 15-1014 Eastside Select Committee - Verbal Update

This item was considered before Item 5.1.

Director Helps, Chair of the Eastside Select Committee, reported that the Committee met last week and received an update from Urban Systems on the option sets. She noted that the range of distributed options fits with the Westside flows and that the current focus is on costing the 2 and 5 plan option set. Urban Systems will report on the option sets at their next meeting on November 23 prior to the December 2 Core Area Liquid Waste Management Committee meeting. Director Helps also noted that Westside Select Committee appears to be ahead in the process at this time.

MOVED by Director Screech, SECONDED by Co-Chair Hamilton,
That the verbal update be received for information.
CARRIED

5.1. 15-1187 Westside Technical Team Analysis on Report from Urban Systems for Phase 2 of the Westside Wastewater Treatment Plant Siting Analysis

E. Lee, Urban Systems, and R. Killian, Carollo (via teleconference), provided a PowerPoint presentation regarding Phase II Technical Report and highlighted the following:

- feasibility and costing elements
- design criteria
- target markets
    - water reuse - 4 plant creates an operating deficit where a 2 plant option is close to addressing operating costs
    - solids and heat recovery - anaerobic digestion is energy positive for wastewater solids and gasification with yard waste improves the case
- solids recovery technologies review
- costing factors
- option sets - advantages and challenges
    - 4 plant option set
    - 1 plant option set
    - 2 plant option set
- site prioritization

R. Killian highlighted the following in relation to solids and heat recovery:

- Cost to manage yard waste
- Gasifiers are more beneficial for larger facilities
- Additional cost of $6-10 million to include solids processing at a facility
- Biochar from gasifiers vs. bio solids from anaerobic digestion
- Anaerobic digestion is an energy positive approach whereas gasification is energy neutral and requires yard waste to make it energy positive
- Centralized option has better economies of scale
- The market will determine the options for resource recovery once an option set is identified

- Revisiting the issue of land application of bio solids and biochar

The consultants were requested to outline the difference between biochar and bio solids and other uses for biochar at a future Core Area Liquid Waste Management Committee meeting.

The Committee was requested to consider limiting the analysis to anaerobic digestion and gasification with yard waste at large sites only.

It was noted that the Westside CAOs and Technical Group only received this information the day before and did not have ample time to review the information.

MOVED by Co-Chair Hamilton, SECONDED by Co-Chair Desjardins,
That further consideration of this item be postponed to a meeting to be scheduled before November 4, 2015.
CARRIED

5.2. 15-1178 Westside Wastewater Treatment - Phase 2 Public Consultation (draft Ipsos polling report anticipated to be circulated at the meeting)

C. Houghton, provided a PowerPoint presentation regarding Phase 2 of the Public Consultation process and highlighted the following:
- Public engagement history and objectives
- Methodology
- Possible public engagement with Eastside
- Public engagement timing
  - Stage 1 - October 20 to November 30
  - Stage 2 - December 1 to January 13
  - Stage 3 - post January 13

C. Houghton noted that 92% of those interviewed had not before participated in a public consultation process regarding sewage treatment but that 63% were aware of the issue. A report outlining more detail will be provided at the next meeting.

MOVED by Director Screech, SECONDED by Co-Chair Hamilton,
That further consideration of this item be postponed to the next meeting.
CARRIED

5.3. 15-1177 Westside Concept Planning - Phase 2 Budget Update No. 1

MOVED by Director Screech, SECONDED by Co-Chair Hamilton,
That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.
CARRIED

6. New Business

15-1196 Correspondence: Township of Esquimalt, October 15, 2015 re: Potential Sites for Wastewater Treatment Plants in Township of Esquimalt

Correspondence dated October 15, 2015 was circulated for consideration. In the interest of time, the Committee agreed to postpone consideration of this item to the next meeting.

MOVED by Director Screech, SECONDED by Co-Chair Hamilton,
That the correspondence be received for information and postponed for discussion at the next meeting.
CARRIED

7. Adjournment

MOVED by Director Seaton, SECONDED by Co-Chair Hamilton.
That the meeting adjourn at 11:58 am.
CARRIED

_____

CHAIR

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RECORDER

Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Meeting Minutes
Westside Wastewater Treatment and Resource Recovery Select Committee

Monday, November 2, 2015 **1:30 PM** **Esquimalt Town Hall, 1229 Esquimalt Road**

PRESENT:

MEMBERS: B. Desjardins (Co-Chair), C. Hamilton (Co-Chair), D. Screech, L. Seaton, W. Sifert (for S. Young)
Absent: Chief R. Sam; Chief A. Thomas
ALSO PRESENT: B. Burton-Krahn, Alternate Member; E. Lee, Urban Systems; G. Nason, Colwood; M. Baxter, Colwood; R. Morrison, Esquimalt; J. Miller, Esquimalt; J. Davidson, View Royal
L. Hurst, Esquimalt; J. O'Reardon, Aurora, C. Houghton, Aurora; K. Anema, View Royal; J. Bowden, Langford
STAFF: B. L. Hutcheson, General Manager, Parks and Environmental Services; D. Lokken, General Manager, Finance and Technology; S. Santarossa, Corporate Officer (Recorder); D. Telford, Senior Manager Environmental Engineering; L. Taylor, Communications Coordinator; S. Hallatt, Manager, Aboriginal Initiatives, A. Boyd, Committee Clerk (recorder)

Co-Chair Hamilton called the meeting to order at 1:30 p.m.

1. Approval of Agenda

MOVED by Co-Chair Desjardins, SECONDED by Director Screech,
That the agenda be approved.
CARRIED

2. Chair's Remarks

There were none.

3. Presentations/Delegations

There were none.

4. Committee Business

4.1. 15-1187 Westside Technical Team Analysis on Report from Urban Systems for Phase 2 of the Westside Wastewater Treatment Plant Siting Analysis

E. Lee of Urban Systems provided a review of the PowerPoint from the previous meeting including some updated slides. He noted that there was a fulsome discussion with the Westside Technical Committee since the last meeting.

J. Miller of Westside Technical Committee provided an update noting some things need to be further explored, including flows, as their report is based on

63ml flows.

E. Lee noted that biochar has broader uses and applications but we need to know who is going to use it and biosolids have less range but are more established.

MOVED by Co-Chair Desjardins, SECONDED by Director Screech,
That Urban Systems clarify the content of biochar vs. biosolids for the purpose of land application consideration.
CARRIED

E. Lee noted that looking at 2030 vs. 2045 design flows (table 2.1 in report) we are building for 2030, but also looking out to 2045 to accommodate growth. The 2045 flows are part of a previous draft version and there as a placeholder on the table with the data coming from the broader regional population percentage growth provided by the municipalities.

Discussion ensued relative to:
- design and capacity for the future
- water reclamation
- potential future flows in Colwood and Langford, with new development
- additional costs when adding on to a single plant
- all plant options are assuming similar tertiary treatment

MOVED by Co-Chair Desjardins, SECONDED by Alternate Director Sifert,
That Westside Wastewater Treatment and Resource Recovery Select Committee refer to the Core Area Liquid Waste Management Committee:
That the use of yard and garden waste as a feedstock be considered at a future meeting of the Core Area Liquid Waste Management Committee.
CARRIED

MOVED by Co-Chair Desjardins, SECONDED by Director Screech,
That the Westside Wastewater Treatment and Resource Recovery Select Committee recommend:
1. That Westside Wastewater Treatment Plant Citing Analysis - Phase 2 Report (Urban Systems, October 2015) be forwarded to the Core Area Liquid Waste Management Committee for information;
2. That the three options presented in this report be considered further as part of the Core Area Phase 2 feasibility, technical and life-cycle costing analysis; and,
3. That the list of prioritized sites accompany the three option sets for further study in Phase 2 of the Core Area analysis.
CARRIED

MOVED by Co-Chair Desjardins, SECONDED by Director Screech,
That the Westside Technical Committee comments for further analysis and matrix be endorsed by the Westside Wastewater Treatment and Resource Recovery Select Committee and forwarded to the Core Area Liquid Waste Management Committee for inclusion in the next phase of analysis.
CARRIED

MOVED by Co-Chair Desjardins, SECONDED by Alternate Director Sifert,
That analysis of water reclamation through the above options be incorporated as part of Westside option sets next phase of evaluation, within overall core work.

DEFEATED
Opposed: Screech, Seaton, Sifert

MOVED by Co-Chair Desjardins, SECONDED by Director Screech,
That the following motion be referred by the Westside Wastewater Treatment and Resource Recovery Select Committee to the Core Area Liquid Waste Management Committee at an appropriate time in the future:
That the CRD work with the private sector to distribute risk appropriately in an effort to identify and fund the recovery of the resources available in the sewage. CRD to issue a Request for Statements of Interest (RFSI) to the general private market to propose on resource recovery opportunities with their technologies and provide the CRD with a two-step all-in cost to install the technology, receive (solids or liquid) the product, process it and provide a higher value material as well as the recovered materials extracted from the product.

That the CRD evaluate these proposals and rank them based on their:
1. Alignment with CRD Goals and Objectives
2. Environmental Benefit
3. Cost
4. Risk to CRD and member municipalities
CARRIED

Staff was requested to determine how the Technical Committee can continue to participate in the process.

4.2. 15-1178 Westside Wastewater Treatment - Phase 2 Public Consultation (draft Ipsos polling report anticipated to be circulated at the meeting)

C. Houghton noted that the IPSOs Reid survey results were just in and provided a PowerPoint on some of the key results. She also noted that for part of the public participation she will get highschool students engaged in a competition.

MOVED by Co-Chair Desjardins, SECONDED by Director Screech,
That the Westside Wastewater Treatment and Resource Recovery Select Committee endorse the public consultation plan as presented in Appendix A.
CARRIED

MOVED by Director Screech, SECONDED by Co-Chair Desjardins,
That the IPSOs Reid survey results, upon further review, be brought back to the next Westside Wastewater Treatment and Resource Recovery Select Committee meeting.
CARRIED

5. Correspondence

5.1. 15-1196 Correspondence: Township of Esquimalt, October 15, 2015 re: Potential Sites for Wastewater Treatment Plants in Township of Esquimalt

MOVED by Co-Chair Desjardins, SECONDED by Director Screech,
That the correspondence be received for information and that the Westside Wastewater Treatment and Resource Recovery Select Committee remove the

"Esquimalt Village Project Plans - Site Profile #18 Esquimalt Town Centre", as a potential sewage treatment site.
CARRIED

6. New Business

There were none.

7. Adjournment

MOVED by Co-Chair Desjardins, SECONDED by Alternate Director Sifert,
That the meeting adjourn at 2:54 p.m.
CARRIED

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CHAIR

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RECORDER

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EHQ 15-135

REPORT TO WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE
MEETING OF TUESDAY, NOVEMBER 24, 2015

SUBJECT **TECHNICAL ANALYSIS FOR FURTHER COMPREHENSIVE EVALUATION OF POTENTIAL SITES, SCENARIOS AND TECHNOLOGIES**

ISSUE

To provide Select Committee members with Terms of Reference and expected outcomes of the next phase of technical analysis on possible wastewater/resource recovery facilities on the Westside.

BACKGROUND

The Westside technical committee, consisting of technical staff and consultants from the participating communities, has been involved in guiding the technical work and analysis of Westside activities.

Under the direction of the municipal technical committee, Urban Systems and Carollo Engineers prepared and presented a report to the Westside Select Committee on October 29, 2015. The objectives of the report included:

- Wastewater Treatment Technologies (liquids): focus on technologies that span secondary to tertiary treatment for potential costing.
- Solids Treatment and Recovery: focus on technologies for gasification and digestion for one-plant, two-plant and four-plant comparisons.
- Resource Recovery Target Market: focus on target markets and highest potential locations for reclaimed water and solids recovery.
- Indicative Design: focus on instructional outcomes from the workshop to guide option set analysis and costing.
- Order of Magnitude: focus on costing for one-plant, two-plant or four-plant option sets.
- Site Reprioritization: focus on incorporating technical analysis, real estate findings and overall feasibility into a node-by-node update.

The technical committee conducted a high-level assessment and provided comment on the report's findings and analysis (see Appendix A). The analysis concluded that while there were valuable information and insights in the report, there needed to be a further, more detailed look at a number of critical factors.

Urban Systems and Carollo are in the process of integrating the technical and financial analysis they produced for the Westside, with sites and scenarios brought forward by the Eastside Select Committee in conjunction with the Technical Oversight Panel. This work will be brought forward for public consultation in December and January.

In a meeting with the Westside technical committee on November 16, 2015, Urban Systems provided a verbal update as to how they are addressing the issues raised by the technical

committee for the December report to the Core Area Liquid Waste Management Committee (Technical Memo #3). That report will consist of a more thorough analysis of sites, scenarios, technologies and order of magnitude costing associated with the various options.

Urban Systems has agreed to provide a verbal report to the Westside Select Committee on their technical analysis and how it responds to issues raised by the Westside municipal technical committee.

CONCLUSION

As Technical Memo #3 will be presented to the Core Area Liquid Waste Management Committee in December and then brought forward for public consultation, a Westside Select Committee update from Urban Systems is a critical step in ensuring that the committee's Terms of Reference and Project Framework are being met.

WESTSIDE STAFF WORKING GROUP

The Westside staff working group is in agreement with this report.

RECOMMENDATION

That the Westside Select Committee receive this report for information.

Submitted by:	Dan Telford, P.Eng., Project Manager, Core Area Wastewater and Resource Recovery Project
Concurrence:	Glenn Harris, Ph.D., R.P.Bio., Acting General Manager, Parks & Environmental Services

CH:cl

Attachment: Appendix A – Westside Technical Team Analysis

WESTSIDE SOLUTIONS
Westside Wastewater Treatment & Resource Recovery

APPENDIX A

Westside Technical Team Analysis

In the time available to fully consider the report authored by Urban Systems for Phase 2 of the Westside Wastewater Treatment Plant Siting Analysis, the technical committee has conducted a high level assessment to help inform recommendations and actions in moving the wastewater treatment and resource recovery process forward for the Westside. Regardless of the time constraints, the technical team has great confidence in the work done by Urban Systems in the short period of time and limited budget available to do the level of analysis that this important project deserves.

The report highlights several important points for consideration, most notably issues regarding dealing with solids, and enlisting the private sector in providing solutions that meet the outcomes to be articulated by decision makers.

As this report is only one step in the overall project, it is hoped that following steps will incorporate a more comprehensive and detailed evaluation of the following factors in order to arrive at a decision that best meets the needs, values and aspirations of the communities:

- Integration of public opinions as indicated in the various public engagement activities over the last year and how it applies to the characteristics of each solution set,
- Full life cycle costing as per industry standards - potentially over 50 years
- Further and a more thorough cost analysis including potential revenues and cost offsets with sensitivity analyses for those factors that are very difficult to forecast, e.g., availability and value of water,
- Inclusion of costs associated with acquiring sites for proposed facilities,
- Exclusion of those sites that are not available for acquisition,
- Quantifying non-financial benefits and liabilities associated with options particularly associated with water reclamation, energy recovery and climate change, and
- Addressing the need for resiliency within proposed solutions.

As a final note it needs to be documented that the flows used in the report do not match the flows now anticipated from Saanich and Victoria West. Unfortunately these revisions were received too late to be used in the calculations. Clearly the conclusions on viable sites – particularly in Esquimalt - could be affected by the significant difference in these numbers and must be addressed without delay.

WESTSIDE SOLUTIONS
Westside Wastewater Treatment & Resource Recovery

Based on the draft report the following matrix broadly summarizes the characteristics of the three solution sets covered by the report and in accordance with the decision criteria support by the Select Committee in its Project Framework.

					NC	North Colwood		Lang	Meaford			
West Side Option Set Matrix	Positive	Neutral	Fair		EFN	Esquimalt First Nation		VR	View Royal			
Criteria	Option 4A - Lang/NC/VR/EFN Four Plant				Option 1B - EFN One Plant				Option 2C - NC/EFN Two Plant			
Capital $												
Operating $												
Life Cycle $												
Existing Infrastructure												
Revenue and Resource												
Water re-use												
Capacity Phasing												
Carbon Footprint												
Positive and Safe for Public												
Water Quality Tertiary												
Size												
Near Trunk Main												
Near Truck Route												
On Site Solids (EFN)												
Include other waste (EFN)												

The matrix presented above is not intended to be an in depth and definitive recommendation from the WTC, however it may assist the reader in comparing the 3 options presented.

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EHQ 15-136

REPORT TO WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE
MEETING OF TUESDAY, NOVEMBER 24, 2015

SUBJECT Westside Solutions Public Consultation Update

ISSUE

To provide information regarding Westside Solutions public consultation activities.

BACKGROUND

In October 2014, the Westside Select Committee launched the Westside Solutions Project as a way to inform, educate and involve Westside residents and stakeholders in decisions about Westside wastewater treatment and resource recovery. Since then, the Westside Select Committee has undertaken a number of successful public engagement initiatives, including open houses, innovation days, roundtables, community events and online surveys. Through the efforts of municipal staff and consultants, thousands of residents from Colwood, Esquimalt, Langford, View Royal, Songhees Nation and Esquimalt Nation participated in the public consultation process.

In October 2015, Westside Solutions launched a poll in Westside communities to further engage the public using recognized industry polling standards. The methodology included a tiered approach, which involved broadening the response pool to residents who have not yet been engaged in the process, along with those who have been engaged in the process to date. This stakeholder group was asked if they could be contacted in the future to provide further feedback as distributed options are defined and preliminary costing information becomes available, and 34% of respondents agreed. The Westside Phase 2 Public Consultation plan is attached as Appendix A.

Additional highlights from the poll of Westside residents include:

- 68% of respondents say they are closely following wastewater planning
- 91% of respondents had not participated in previous planning activities
- 50% of respondents are most concerned with the continued discharge of sewage into the ocean
- 24% of respondents are most concerned with the increase to their tax bill
- 20% of respondents are most concerned with impact on neighbourhood quality of life
- 81% of respondents prefer a higher cost solution that allows for potential reuse

In November, Westside Solutions and Eastside Community Dialogues began planning the integration of some region-wide public engagement approaches, while continuing to maintain the focus on responding to specific community processes and values. Integrated activities include an online survey for all of the Core Area, a newspaper insert and coordinated advertising purchases.

The newspaper insert will focus on advising Core Area residents of the potential options and will include information about each of the five option sets, a glossary of terms, an overview of the public consultation process and how feedback is being considered, and information on how residents can further participate in the wastewater conversation. The insert will also be available at community centres, municipal halls and online on the Westside Solutions website.

WESTSIDE STAFF WORKING GROUP

The Westside staff working group is in agreement with the content of this report.

CONCLUSION

The Westside Solutions public consultation plan will provide Westside communities opportunities to give further public feedback to the Westside Wastewater Treatment and Resource Recovery Select Committee and Core Area Liquid Waste Management Committee, to assist the committees in identifying preferred solution sets for wastewater treatment in the Core Area.

RECOMMENDATION

That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.

Submitted by:	Andy Orr, Senior Manager, Corporate Communications
Concurrence:	Glenn Harris, Ph.D., R.P.Bio., Acting General Manager, Parks & Environmental Services

LT:cl

Attachment: Appendix A – Westside Consultation Plan

Public Engagement Plan

WESTSIDE SOLUTIONS
Westside Wastewater Treatment & Resource Recovery

STAGE 1

METHODOLOGY	TARGET	OBJECTIVE/OUTCOME
IPSOS telephone poll of randomly selected respondents	• Randomly selected residents from Westside communities and First Nations - N=400	• statistical data on attitudes of randomly selected Westside residents • identification of residents who wish to participate in more detailed online workbooks and questionnaires
Online options workbook/questionnaire "SolutionSpeak" – a more detailed online analysis of options adopted by Westside Select Committee (October 27)	• general population • previously identified pool of respondents	• engage public in feedback on sites and scenarios • educate on technology options – benefits/drawbacks • educate on resource recovery options – benefits and costs • identify further information requirements through process
Media release and editorial board meetings	• Media partners • general population	• inform public of options and solutions • greater public feedback
Social media (municipal web pages, Facebook sites, twitter – CRD website, Facebook and twitter)	• general population	• inform public of options and solutions • greater public feedback
Launch online newsletter/update fact sheet	• general population • partners	• regular updates on project's progress
Joint Westside/Eastside High school student engagement competition (possible prizes)	• students • general population	• engage younger demographic in wastewater treatment resource recovery project • receive innovative design and integration concepts
Work with CRD and Eastside to reorganize and update wastewater website www.crd.bc.ca/project/wastewater-planning	• general population	• better information access on CRD site

STAGE 2

METHODOLOGY	TARGET	OBJECTIVE/OUTCOME
Joint Westside/Eastside online survey regarding solutions and costs decided at the CALWMC December meeting	• general population • previously identified pool of respondents	• feedback on wastewater treatment and resource recovery solutions and associated costs for entire region
Offer meetings and open houses targeted to specific stakeholder groups	• community associations particularly focusing on communities where a facility could be sited • business associations • chambers of commerce • recreation organizations	• present more detailed information to community members • encourage more feedback on online survey tool
Press release and editorial meetings	• press • general population	• inform public of options and solutions • greater public feedback
Paid advertising campaign on option sets: Joint Westside / Eastside including • **Black Press** • **Online TC** • **Used Victoria** • **Facebook**	• general population	• inform public of options and solutions • greater public feedback
Westside postcard drop	• residents of the Westside	• inform public of options and solutions • greater public feedback
Social media (municipal web pages, Facebook sites, twitter – CRD website, Facebook and twitter)	• general population	• inform public of options and solutions • greater public feedback
Ongoing newsletters	• general population • partners	• regular updates

STAGE 3

METHODOLOGY	TARGET	OBJECTIVE/OUTCOME
Joint Westside/Eastside information session on design possibilities (Bruce Hayden)	• general population	• engage public at looking at design opportunities
Design charrette for option chosen by CALWMC at January meeting	• neighbourhood groups in area(s) where facility(s) are to be sited • general public	• public participation in facility design and innovation • potential new and innovative concepts

Targeted stakeholder meetings	• neighbourhood groups where facility(s) are to be sited	• address concerns of citizens
Support for municipalities if requested on potential re-zoning	• municipalities	• information
Select and Announce winner of High School engagement competition	• students • general population	• continued engagement of younger demographic
Social media (municipal web pages, Facebook sites, twitter – CRD website, Facebook and twitter)	• general population	• inform public of options and solutions • greater public feedback
Ongoing newsletters	• general population • partners	• regular updates

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EHQ 15-133

REPORT TO WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE
MEETING OF TUESDAY, NOVEMBER 24, 2015

SUBJECT Westside Concept Planning – Phase 2 Budget Update No. 2

ISSUE

To provide the Westside Wastewater Treatment and Resource Recovery Select Committee (Westside Select Committee) with a monthly budget update.

BACKGROUND

At its meeting of November 5, 2014, the Westside Select Committee directed staff to provide a budget status update on a monthly basis for the identification of potential treatment sites and public consultation phase of the project.

Phase 1 of the Concept Planning for this project was completed and closed out on August 31, 2015. The Phase 1 Final Budget Update No. 8 was approved by the Westside Select Committee on September 29, 2015 with actual expenditures of $366,870. Phase 1 invoices that were received after September 29 have been added to the Phase 2 budget, in the Revised Budget column of Appendix A.

Phase 2 of the Concept Planning for this project commenced September 1, 2015 with an anticipated completion by December 31, 2015. Actual expenses and outstanding commitments are summarized in Appendix A.

FINANCIAL IMPLICATIONS

Under the Core Area Wastewater Treatment Program budget, requisitioned funds can only be apportioned on the cost sharing basis on which they were raised. The cost sharing of the Program budget is currently apportioned based on 2030 design capacity, 70% average dry weather flow and 30% average annual flow, as previously declared by each participant. This cost sharing may be revisited by the participants in the service. The Westside collectively accounts for 26.76% of the total Core Area requisition funds raised. Westside expenditures will be funded from the four Westside municipal participant's requisition funds as follows.

Colwood	15.92%
Esquimalt	24.85%
Langford	47.31%
View Royal	11.92%

CONCLUSION

Phase 2 Concept Planning for the project commenced on September 1, 2015, with an anticipated completion by the end of December 2015. Due to the accelerated pace of work on the project, invoicing received from some of the suppliers and consultants has tended to lag somwhat. The

actual expenditures incurred but invoiced after the reporting cutoff date are carried forward to the following update report. The Committee will continue to receive monthly budget updates for Phase 2 Concept Planning through to the end of December 31, 2015.

RECOMMENDATION

That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.

Submitted by:	Dan Telford, P.Eng., Senior Manager, Environmental Engineering
Concurrence:	Glenn Harris, Ph.D., R.P.Bio, Acting General Manager, Parks & Environmental Services

DT:mer

Attachment: Appendix A – Westside Concept Planning – Phase 2 Budget Update No. 2

APPENDIX A

WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY
SELECT COMMITTEE

Westside Concept Planning - Phase 2 Budget Update No. 2
October 31, 2015

	BUDGET	REVISED BUDGET (Oct 2015)	ACTUAL	COMMITTED	TOTAL	REMAINING
Outreach						
Consultants						
Outreach and Consultation	48,562	67,799	37,987	27,500	65,487	2,312
Technical Support	60,000	64,260	55,383	8,877	64,260	0
Outreach Disbursements	40,000	44,928	5,728		5,728	39,200
Project Management						
Staff and Wages	20,000	20,000	-		-	20,000
Miscellaneous	5,000	5,022	22		22	5,000
Westside Total	**$ 173,562**	**$ 202,009**	**$ 99,120**	**$ 36,377**	**$ 135,496**	**$ 66,513**

Revised Budget due to late invoices from Phase 1.

Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Notice of Meeting and Meeting Agenda

Westside Wastewater Treatment and Resource Recovery Select Committee

Friday, January 8, 2016 | **10:30 AM** | **6th Floor Boardroom**

B. Desjardins (Co-Chair), C. Hamilton (Co-Chair), Chief R. Sam, D. Screech, L. Seaton, S. Young

1. Approval of Agenda

2. Adoption of Minutes

2.1. **16-22** Adoption of the Minutes of November 24, 2015

Recommendation: That the minutes of the November 24, 2015, meeting of the Westside Wastewater Treatment and Resource Recovery Select Committee be adopted.

Attachments: 2015-11-24 Minutes Westside WTRR Select Committee

3. Chair's Remarks

4. Presentations/Delegations

5. Committee Business

5.1. **16-24** Feasibility and Costing Analysis of an Additional Option Set to Treat Westside Sewage, Including a Wastewater Treatment Facility and Disposal Service for Colwood and Langford

Recommendation: That the Westside Select Committee receive this report for information and forward it to the Core Area Liquid Waste Management Committee for consideration.

Attachments: Staff Report: Feasibility & Costing Analysis - Option Set Colwood/Langford

Appendix A: Technical Memo Supplement - Option 5 Prelim Costing

Attachment: Summary of Options by Household

5.2. **16-25** Public Consultation Update

Recommendation: That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this update for information.

Attachments: Staff Report: Public Consultation Update

Appendix A: Westside Public Consultation Plan

Appendix B: Westside Ipsos Reid Poll

5.3. **16-14** Core Area Sewage and Resource Recovery System Cost Sharing

Recommendation: That the Select Committees review the documentation and make a recommendation to the Core Area Liquid Waste Management Committee meeting scheduled for January 13, 2016.

Attachments: Staff Report: Core Area Sewage and Resource Recovery System Cost Sharing

Appendix A: Core Area Sewage Treatment Capital Costs - All Options

5.4. 16-26 Cost Comparison of Budgets - New Options Versus Previous Plan

Recommendation: That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.

Attachments: Staff Report: Cost Comparison of Budgets - New Options vs Previous Plan

Appendix A: Cost Comparison Table

5.5. 16-29 Westside Concept Planning - Phase 2 Budget Update No. 3

Recommendation: That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.

Attachments: Staff Report: Westside Concept Planning - Phase 2 Budget Update No 3

Appendix A: Phase 2 Budget Update No. 3

5.6. 16-28 Eastside Select Committee Verbal Update

6. Motion with Notice

6.1. 15-311 Motion with Notice: Options for Wastewater Treatment (Director Hamilton)

Recommendation: (The following motion was originally put forward in August 2014 to the Core Area Liquid Waste Management Committee and has been referred to the Westside Select Committee.)
That it be recommended to the Core Area Liquid Waste Management Committee to recommend to the Capital Regional District Board that:

WHEREAS: It is critical that there be positive action taken to meet funding deadlines and regulatory requirements for waste water treatment for the Capital Regional District;
BE IT RESOLVED that: Capital Regional District (CRD) staff be directed to support municipalities and First Nations who want to explore options for waste water treatment that are economically responsible, technically feasible, environmentally sound and meet current provincial and federal deadlines;
AND THAT funding be provided from the sewage treatment budget to support an independent assessment of alternative locations to McLoughlin and Hartland, with full and regular engagement of staff and elected representatives from participating municipalities, First Nations and the public; and,
AND THAT any decisions taken to amend the Liquid Waste Management Plan be done in an open and transparent public process;
AND THAT any further money spent be recoverable under the funding arrangement with the Provincial and Federal Governments and that clarity be sought that the funding arrangement with Provincial and Federal governments be able to support the communities to the extent it supported the CRD driven process.

Attachments: Notice of Motion: Options for Wastwater Treatment (Director Hamilton)

7. New Business

8. Adjournment

Next Meeting: TBA

To ensure quorum, please advise Nancy More (250-360-3024) if you or your alternate CANNOT attend.

625 Fisgard St.,
Victoria, BC V8W 1R7

Capital Regional District

Meeting Minutes
Westside Wastewater Treatment and Resource Recovery Select Committee

Tuesday, November 24, 2015 | **2:00 PM** | **Esquimalt Town Hall, 1229 Esquimalt Road**

PRESENT:

MEMBERS: B. Desjardins (Co-Chair), C. Hamilton (Co-Chair), D. Screech, L. Seaton, S. Young
Absent: Chief R. Sam; Chief A. Thomas

ALSO PRESENT: B. Burton-Krahn, Alternate Member; L. Hundleby, Esquimalt; E. Lee, Urban Systems; C. Houghton, Aurora; G. Nason, Colwood; M. Baxter, Colwood; R. Morrison, Esquimalt; J. Miller, Esquimalt; L. Hurst, Esquimalt; K. Anema, View Royal; J. Bowden, Langford; S. Russell, Colwood

STAFF: L. Hutcheson, General Manager, Parks and Environmental Services; S. Santarossa, Corporate Officer; L. Taylor, Communications Coordinator; S. Hallatt, Manager, Aboriginal Initiatives, A. Boyd, Committee Clerk (recorder)

Co-Chair Desjardins called the meeting to order at 2:00 p.m.

1. Approval of Agenda

MOVED by Director Seaton, SECONDED by Co-Chair Hamilton,
That the agenda be approved.
CARRIED

2. Adoption of Minutes

2.1. **15-1257** Adoption of the Minutes of October 27 and November 2, 2015

MOVED by Director Seaton, SECONDED by Director Screech,
That the minutes of October 27 and November 2, 2015 be adopted.
CARRIED

3. Chair's Remarks

There were none.

4. Presentations/Delegations

There were none.

5. Committee Business

5.1. **15-1271** Westside Select Technical Analysis for Further Comprehensive Evaluation of Potential Sites, Scenarios and Technologies

J. Miller provided an update noting the November 16th meeting of Urban Systems and the Technical Committee included a high level discussion of Technical Memo #3, although they had not yet seen the Technical Oversight Panel's Technical Memo #3.

E. Lee of Urban Systems provided a PowerPoint presentation on "Phase II Update". Highlights included:
- the 4, 2 and 1 plant option sets
- Westside Option Set Matrix, looking at different angles
- option set criteria
- life cycle costing; and performance criteria
- analysis of potential site areas.

E. Lee noted that Urban Systems has been interacting with the Technical Overight Panel through weekly teleconferences since September.

E. Lee noted that Technical Memo #3, looks at all five option sets, with the following criteria:
- making sure performance links together
- lifecycle costing (now and future)
- an analysis of the areas and differences
- levels of treatment
- solids energy recovery
- heat recovery, and
- option set characterizations.

It was requested to have the Technical Analysis for Further Comprehensive Evaluation of Potential Sites, Scenarios and Technologies staff report and appendix be forwarded to the next Core Area Liquid Waste Management Committee meeting for information.

MOVED by Co-Chair Hamilton, SECONDED by Director Screech,
That the Westside Select Committee receive this report for information.
CARRIED

5.2. 15-1272 Westside Solutions Public Consultation Update

C. Houghton provided an update on the public consultation process noting that the draft Westside Solutions letter circulated at the meeting will be customized for each association or community group.

C. Houghton noted public consultation accomplishments to date:
- completed the Ipso Reid survey and reported out
- first newsletter went out and is available on the website
- high school competition is under way - planning for a January launch
- website is being updated (coreareawastewater.ca)
- ads being looked at
- online survey - waiting for some information from Urban Systems and will launch after December 2nd
- looking to target a panel of those who have not participated on a public consultation before

The Committee discussed the timing of the high school competition.

Staff was requested to reorder the sites on the letter to be circualted so that Rock Bay does not appear as the first site under each option.

MOVED by Director Seaton, SECONDED by Director Screech,
That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.
CARRIED

5.3. 15-1266 Westside Concept Planning - Phase 2 Budget Update No. 2

L. Hutcheson provided an update noting that this is for Westside's activities only. The budget includes a couple of late invoices and has no other anomalies.

MOVED by Director Screech, SECONDED by Co-Chair Hamilton,
That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.
CARRIED

5.4. 15-1275 Eastside Wastewater Treatment and Resource Recovery Select Committee Verbal Update

It was noted that Eastside Wastewater Treatment and Resource Recovery Select Committee has not met since their last update to Westside, and therefore no update was provided.

6. New Business

There was no new business.

The next meeting will be at the call of the Co-Chairs.

15-1283 Delegation: Robert Drew re: Item 5.1 Technical Analysis for Further Comprehensive Evaluation of Potential Sites, Scenarios, and Technologies and 5.2 Westside Solutions Public Consultation Update

Committee recognized that a member of the public wished to speak on item 5.1 Technical Analysis for Further Comprehensive Evaluation of Potential Sites, Scenarios and Technologies.

Mr. Robert Drew noted that he is a new resident of the area, and has been impressed with the efforts of the Westside Wastewater Treatment and Resource Recovery Select Committee. He requested that a sampling on what a wastewater plant would look like be circulated in the neighborhoods affected. He also noted that concentrating too much on the Rock Bay site and harbour might not be in the best interest of the Committee.

MOVED by Mayor Young, SECONDED by Director Screech,
That the Westside Wastewater Treatment and Resource Recovery Select Committee approve the delegation's request to speak.

CARRIED UNANIMOUSLY

7. Adjournment

MOVED by Director Seaton, SECONDED by Director Screech,
That the meeting adjourn at 2:53 p.m.
CARRIED

CHAIR

RECORDER

Making a difference...together

EHQ 16-05

REPORT TO WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE MEETING OF FRIDAY JANUARY 8, 2016

SUBJECT **Feasibility and Costing Analysis of an Additional Option Set to Treat Westside Sewage, Including a Wastewater Treatment Facility and Disposal Service for Colwood and Langford**

ISSUE

To provide a feasibility and costing analysis for an additional siting option set to the Core Area Liquid Waste Management Committee (CALWMC) and Westside Select Committee that would serve Colwood and Langford.

BACKGROUND

The Westside Technical Committee, consisting of technical staff and consultants from the participating communities, has been involved in steering the technical work and analysis of Westside activities.

Under the direction of the Westside Technical Committee, Urban Systems and Carollo prepared and presented their report titled Westside Wastewater Treatment Plant Siting Analysis – Phase 2 to the Westside Select Committee on October 27, 2015. By applying the agreed-to objectives set out by the Westside Select Committee, the report incorporated a number of elements, including a focus on technologies that spanned secondary to tertiary, gasification and digestion technologies for the treatment of liquid, residual solids, resource recovery opportunities, site prioritization, and order of magnitude costing for 1, 2 and 4 plant option sets.

Subsequent to that report, Urban Systems and Carollo integrated the Westside Technical and financial analysis with sites and scenarios brought forward by the Eastside Select Committee in conjunction with the core area Technical Oversight Panel. The resulting analysis titled Core Area Liquid Waste Management Plan Phase 2: Wastewater Treatment System Feasibility and Costing Analysis – Technical Memorandum #3 Costing and Financial Analysis was presented to the CALWMC on December 9, 2015.

Upon consideration of the analysis provided, the CALWMC requested that additional information and clarification be provided to committee prior to the options being taken forward to the public for input. Included in the request for more information was a motion for a modified option set to be developed, costed and analyzed for a wastewater treatment plant conveyance and disposal system to serve Colwood and Langford flows (secondary and tertiary). This motion was referred to the Westside Select Committee.

The Westside Technical Committee met with representatives from Urban Systems and agreed that this modified option set would have impacts on flows and options for the other Westside participants that needed to be considered.

It was determined that within the allocated time and budget, the focus should include a technical analysis and costing for the separate secondary/tertiary treatment facility for the Colwood/Langford flows would be sited in Colwood. The remaining Westside flows (Esquimalt, View Royal, Songhees Nation and Esquimalt Nation) would be served by a second treatment facility located at the Esquimalt Nation site and the Macaulay outfall system.

The Westside Technical Committee will review the Urban Systems analysis report on January 7 with the final report being forwarded to the Westside Select Committee on January 8.

Appendix A provides the Urban Systems modified option report titled Technical Memorandum Supplement – Option 5 Preliminary Costing.

CONCLUSION

Options 5a and 5b, as developed and analyzed by Urban Systems, are the two feasible option sets that could serve the Westside, notably a Colwood/Langford facility with a new outfall. Residual solids generated at this facility would be transported to a centralized facility in Rock Bay or at Hartland Landfill for processing.

WESTSIDE TECHNICAL COMMITTEE

The Westside Technical Committee is in agreement with this report.

RECOMMENDATION

That the Westside Select Committee receive this report for information and forward it to the Core Area Liquid Waste Management Committee for consideration.

Submitted by:	Dan Telford, P.Eng., Senior Manager, Environmental Engineering
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services

DT:cl

Attachment: Appendix A – Technical Memorandum Supplement – Option 5 Preliminary Costing – Core Area Liquid Waste Management Plan – Phase 2: Wastewater Treatment System Feasibility and Costing Analysis (Urban Systems and Carollo Engineers)

APPENDIX A
January 7, 2016

Capital Regional District

Core Area Liquid Waste Management Plan

Phase 2: Wastewater Treatment System Feasibility and Costing Analysis

Technical Memorandum Supplement – Option 5 Preliminary Costing

Project: 1692.0037.01

urbansystems.ca
402 – 645 Fort Street
Victoria, BC, V8W 1G2

carollo
Engineers...Working Wonders With Water™

URBAN systems

Table of Contents

1.0 OPTION SET 5 – THREE PLANTS

1.1 General Description

As requested by the Core Area Committee an additional option set has been created for preliminary review. Figure 1 illustrates the three plant option set. Wastewater (liquids) would be treated at a plant in Colwood serving Colwood/Langford, at Esquimalt Nation and at Rock Bay. The plant at Colwood is costed with secondary treatment (5a) and with tertiary treatment (5b). Option 5b includes reuse around the Colwood plant. The plants at Rock Bay and Esquimalt Nation are designed to provide a secondary level of treatment to meet the federal and provincial regulations, but they would also be equipped with disinfection for increased water quality. Sidestream tertiary treatment would be included in the costing for local reuse, for 10 MLD and 5 MLD at Rock Bay and Esquimalt Nation, respectively consistent with the previous options sets. In addition to the aforementioned water reuse opportunities, the treated effluent forcemain between Rock Bay and Clover Point, between Esquimalt Nation and Macaulay Point and between Colwood and the Royal Bay outfall could be accessed for heat recovery or other water reuse applications.

It is noted that if the Rock Bay, Esquimalt Nation and Colwood plants were all increased to tertiary treatment, there is a possibility that reduced piping and outfalls could ensue. However, this would have to be approved by the Ministry of Environment through a specific environmental impact study for the receiving environments.

Solids treatment and recovery would occur at either Rock Bay or Hartland Landfill consistent with Technical Memo 3. In other words, the solids at Esquimalt and Colwood would be dewatered and trucked to the central solids treatment facility.

As noted in Technical Memo #2 the City of Colwood has completed some feasibility work that shows the possibility of reusing 100% of the effluent via irrigation and aquifer recharge with a capacity estimated at 10 MLD.

It is currently assumed that a pump station will be required in Colwood in order to pump flows to the Colwood treatment plant. The CRD trunk main presently runs next to the proposed treatment plant site and there may be the ability to divert a portion of the flows via gravity to the treatment plant depending on what elevation the plant is located at. However, the amount of flows able to be diverted is not known at this time. There is also the Wilfret Pump Station that is municipally owned that may be able to be upgraded to provide the function for the Colwood Pump Station. However we have not had sufficient time to review the capacity of this station in order to determine what upgrading would be required. As

such for the purpose of this memo, and consistent with Technical Memo #3 all flows from Colwood to the new WWTP have been assumed to be conveyed from a new pump station and force main.

The plant at Colwood/Langford will treat all flows up to 4 x ADWF, and would discharge out its own outfall into Royal Bay. This outfall will serve as the alternate discharge for any reuse that is undertaken as well. It should be noted that specific approval will need to be obtained as part of the Liquid Waste Management Plan to match the treatment requirements of the Macauley outfall (i.e. only screening beyond 4XADWF). In addition an EIS will be required. If peak wet weather flow requirements for Colwood and Langford are able to be confirmed and committed to be less than 4xADWF, to the satisfaction of the CRD and the Ministry, then the conveyance and primary treatment components sizing and costs may be able to be reduced.

Rock Bay flows will include wastewater from all Eastside communities including flows currently directed to Macaulay from west Saanich and west Victoria by way of a pump station near Barnard Park. All other eastside flows would be pumped from Clover Point, or other strategic locations along the eastside to reduce the scope of new infrastructure.

The Esquimalt Nation plant will include a connection to the Craigflower lift station forcemain to collect flows that originate upstream of the proposed plant (to avoid having to pump all of the upstream flows from Macaulay Point) and a pump station for all other flows that converge at Macaulay (downstream of the plant). It will be possible to utilize the existing screens at Macaulay, so that only screened raw sewage needs to be pumped back to Esquimalt Nation. All treated effluent that is not reused, is pumped back to Macaulay Point for discharge out a new outfall. This plant will treat all flows from View Royal, Esquimalt and Songhees First nations and Esquimalt Township. The current, 2030 and 2045 ADWF design flows for Rock Bay, Colwood/Langford and Esquimalt Nation plants are summarized in Table 1 below. These are consistent with the values presented in Technical Memo #1.

Table 1 – Current 2030 and 2045 ADWF Design Flows

Plant	Current (MLD)	2030 (MLD)	2045 (MLD)
Esquimalt Nation	7.0	11.3	16.7
Rock Bay	56.1 (1)	77.8 (1)	93.1 (1)
Colwood/Langford	7.4	18.8	36.2
Total	**70.5**	**107.9**	**146.0**

(1) *Including West Saanich and West Victoria*

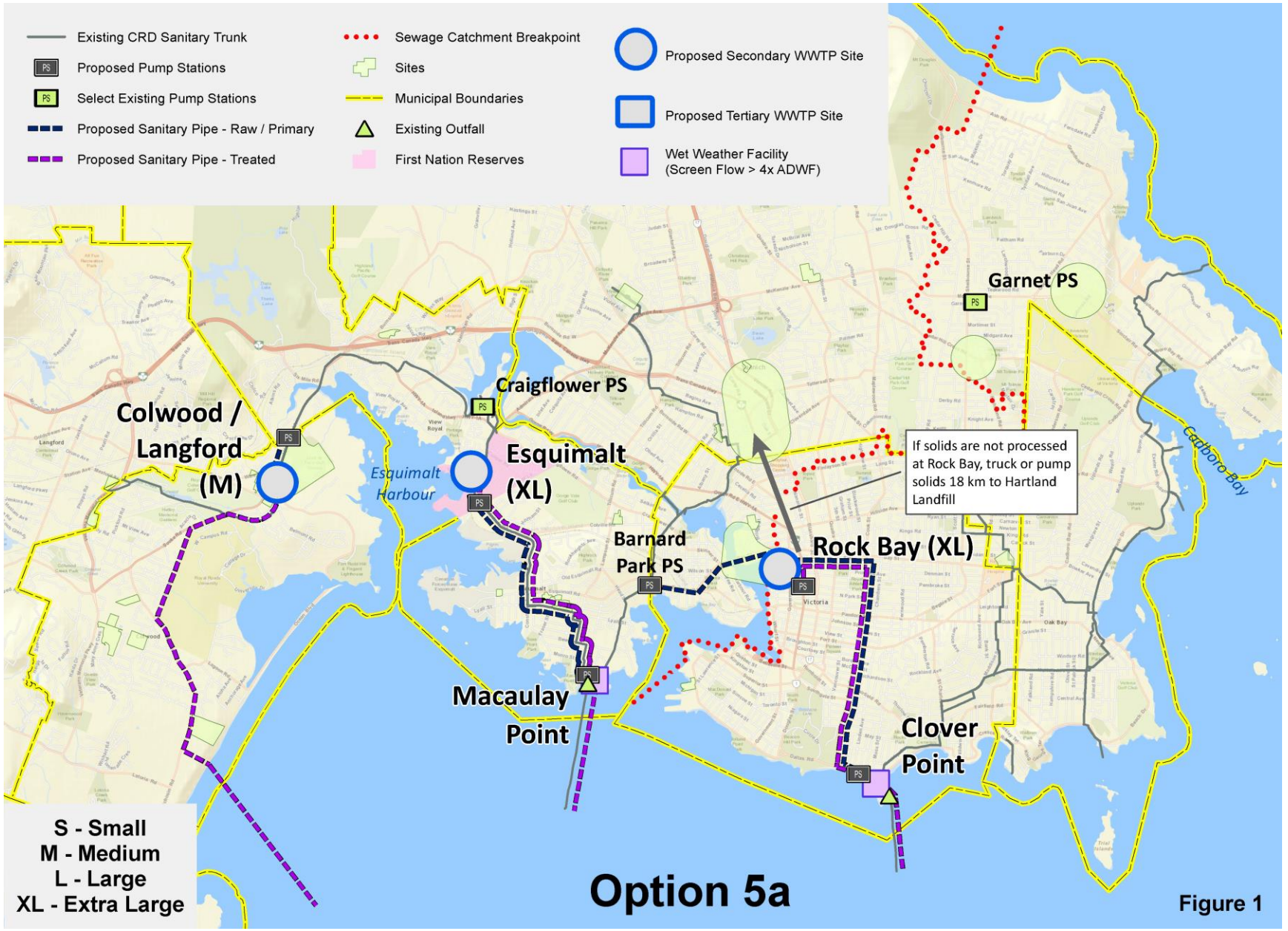
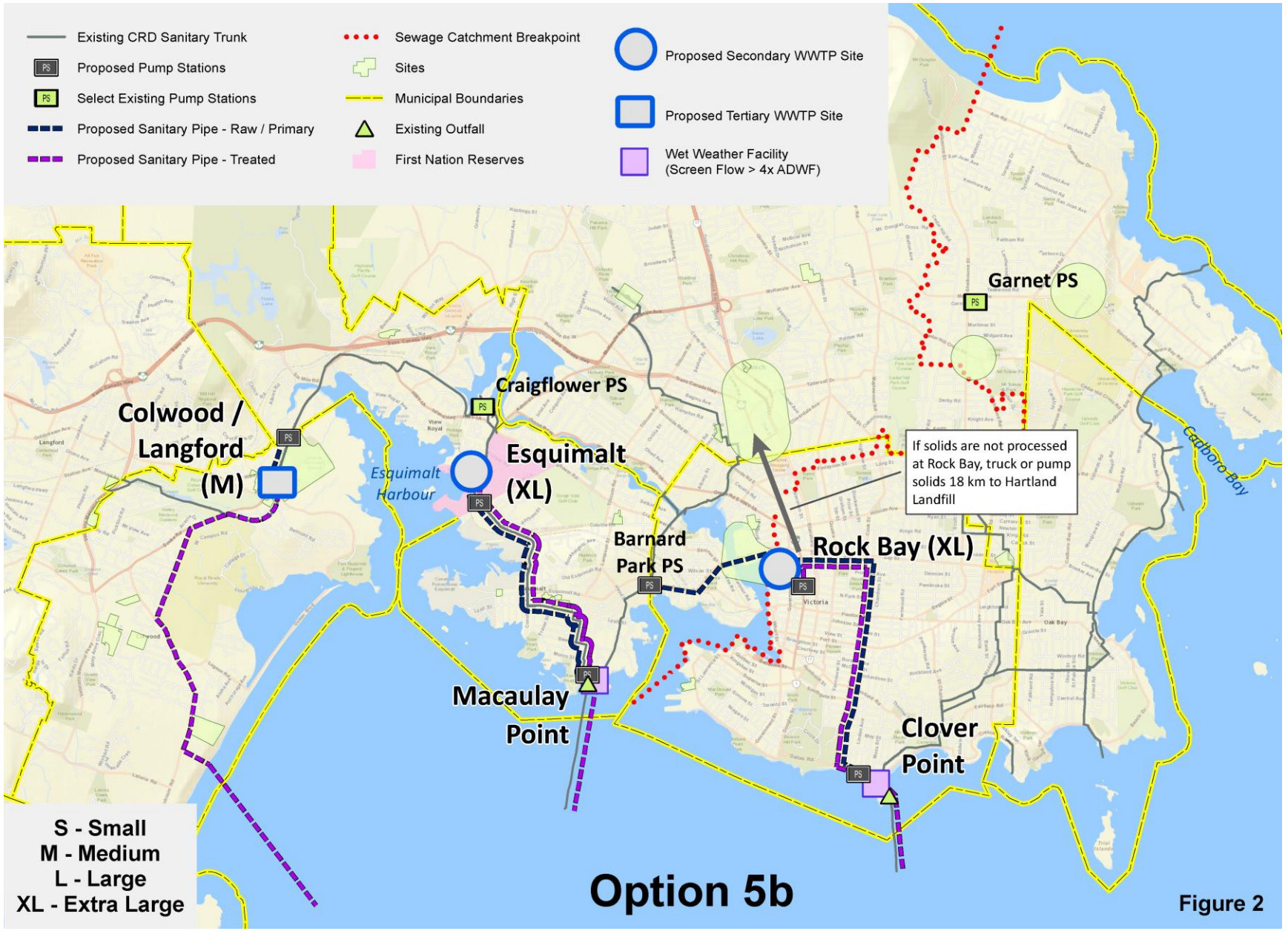

Existing CRD Sanitary Trunk
Proposed Pump Stations
Select Existing Pump Stations
Proposed Sanitary Pipe - Raw / Primary
Proposed Sanitary Pipe - Treated
Sewage Catchment Breakpoint
Sites
Municipal Boundaries
Existing Outfall
First Nation Reserves
Proposed Secondary WWTP Site
Proposed Tertiary WWTP Site
Wet Weather Facility
(Screen Flow > 4x ADWF)
Garnet PS
Craigflower PS
Colwood / Langford (M)
Esquimalt (XL)
Esquimalt Harbour
If solids are not processed at Rock Bay, truck or pump solids 18 km to Hartland Landfill
Barnard Park PS
Rock Bay (XL)
Macaulay Point
Clover Point
Cadboro Bay
S - Small
M - Medium
L - Large
XL - Extra Large
Option 5a

Figure 1


Existing CRD Sanitary Trunk
Proposed Pump Stations
Select Existing Pump Stations
Proposed Sanitary Pipe - Raw / Primary
Proposed Sanitary Pipe - Treated
Sewage Catchment Breakpoint
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Municipal Boundaries
Existing Outfall
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(Screen Flow > 4x ADWF)
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If solids are not processed at Rock Bay, truck or pump solids 18 km to Hartland Landfill
Barnard Park PS
Rock Bay (XL)
Macaulay Point
Clover Point
Cadboro Bay
S - Small
M - Medium
L - Large
XL - Extra Large
Option 5b
Figure 2

1.2 Components

The follow key components to implement this option are summarized in Table 2. Sizing for these components is consistent with the methodology outlined in Technical Memo #1 and #2.

Table 2a – Option 5a - Key Components

Key Components Required	2030 (m^3/d)	2045 (m^3/d)
Rock Bay		
1. Sewage Pumping Locations		
• Clover Point (2 x ADWF)	144,000	160,000
• Near Barnhard Park (4 x ADWF) – West Saanich and West Victoria	120,000	159,000
2. Primary Treatment	264,000	319,000
3. Secondary Treatment and Disinfection	156,000	186,500
4. Treated Effluent Pumping	264,000	319,000
5. Tertiary Treatment (Sidestream)	10,000	10,000
6. Clover Outfall Capacity (> 4 x ADWF)	317,000+	369,000+ [(1)]
Colwood		
1. Raw Sewage Pumping (4 x ADWF)	18,800	52,400
Colwood/Langford		
1. Primary Treatment (4 x ADWF)	75,200	144,800
2. Secondary Treatment (Incl. Solids Dewatering)	37,600	72,400
3. Treated Effluent Pumping to Outfall	75,200	144,800
4. Treated Effluent Pumping for Reuse	0	0
5. Royal Bay Outfall Capacity	75,200	144,800
Esquimalt (EFN)		
1. Sewage Pumping Locations		
• Near Admirals Road (View Royal) (4 x ADWF)	14,000	31,600
• Macaulay Point (Two FNs, Esquimalt Nation) (4 x ADWF)	31,200	35,000
2. Primary Treatment	45,200	66,600
3. Secondary Treatment	22,600	32,800
4. Treated Effluent Pumping	45,200	66,600
5. Tertiary Treatment (Slipstream)	5,000	5,000
6. Macaulay Outfall Capacity	45,200+	66,600+

[(1)] *By 2045 the Clover Outfall capacity will have to be increased from approximately 200 MLD to 369 MLD+*

Table 2b – Option 5b - Key Components

Key Components Required	2030 (m^3/d)	2045 (m^3/d)
Rock Bay		
1. Sewage Pumping Locations		
• Clover Point (2 x ADWF)	144,000	160,000
• Near Barnhard Park (4 x ADWF) – West Saanich and West Victoria	120,000	159,000
2. Primary Treatment	264,000	319,000
3. Secondary Treatment and Disinfection	156,000	186,500
4. Treated Effluent Pumping	264,000	319,000
5. Tertiary Treatment (Sidestream)	10,000	10,000
6. Clover Outfall Capacity (> 4 x ADWF)	317,000+	369,000+ (1)
Colwood		
1. Raw Sewage Pumping (4 x ADWF)	18,800	52,400
Colwood/Langford		
1. Primary Treatment (4 x ADWF)	75,200	144,800
2. Tertiary Treatment (Incl. Solids Dewatering)	37,600	72,400
3. Treated Effluent Pumping to Outfall	75,200	144,800
4. Treated Effluent Pumping for Reuse	10,000	10,000
5. Royal Bay Outfall Capacity	75,200	144,800
Esquimalt (EFN)		
1. Sewage Pumping Locations		
• Near Admirals Road (View Royal) (4 x ADWF)	14,000	31,600
• Macaulay Point (Two FNs, Esquimalt Nation) (4 x ADWF)	31,200	35,000
2. Primary Treatment	45,200	66,600
3. Secondary Treatment	22,600	32,800
4. Treated Effluent Pumping	45,200	66,600
5. Tertiary Treatment (Slipstream)	5,000	5,000
6. Macaulay Outfall Capacity	45,200+	66,600+

(1) *By 2045 the Clover Outfall capacity will have to be increased from approximately 200 MLD to 369 MLD+*

Table 3 summarizes the estimated piping and outfall lengths, with secondary treatment and no reuse in Colwood.

Table 3 – Option 5a Secondary Treatment Piping and Outfall Lengths [1]

From	To	Purpose	Length
A. Required			
Rock Bay			
Clover Point	Rock Bay WWTP	Screened Raw Sewage (SRS)	5,300 m
Rock Bay WWTP	Clover Point	Treated Effluent	5,300 m
Clover Point	End of Outfall	Treated Effluent/SRS	1,300 m
Pump Station near Barnard Park	Rock Bay WWTP	Raw Sewage	2,400 m
Colwood			
East Boundary of Colwood	Colwood WWTP	Raw Sewage	1,150 m
Langford/Colwood			
WWTP	Royal Bay Shore	Treated Effluent	5,500 m
Royal Bay Shore	End of Outfall	Treated Effluent	2,300 m
Esquimalt Nation			
Macaulay Point	Esquimalt Nation WWTP	Screened Raw Sewage	4,600 m
Esquimalt Nation WWTP	Macaulay Point	Treated Effluent	4,600 m
Admirals Road	Esquimalt Nation WWTP	Raw Sewage	300 m
Macaulay Point	End of Outfall	Treated Effluent/SRS	1,700 m
		Total	**34,450 m**
B. Optional			
• Rock Bay WWTP	End of Reuse	Reuse	18,500 m
• Esquimalt Nation WWTP	End of Reuse	Reuse	17,000 m
		Optional Total	**35,500 m**

[1] *Pipe lengths are approximate pending a routing review.*

Table 4 summarizes the estimated piping and outfall lengths, with tertiary treatment.

Table 4 – Option 5b Tertiary Treatment Piping and Outfall Lengths [1]

From	To	Purpose	Length
C. Required			
Rock Bay			
Clover Point	Rock Bay WWTP	Screened Raw Sewage (SRS)	5,300 m
Rock Bay WWTP	Clover Point	Treated Effluent	5,300 m
Clover Point	End of Outfall	Treated Effluent/SRS	1,300 m
Pump Station near Barnard Park	Rock Bay WWTP	Raw Sewage	2,400 m
Colwood			
East Boundary of Colwood	Colwood WWTP	Raw Sewage	1,150 m
Colwood WWTP	End of Reuse	Irrigation/Aquifer Recharge	19,500 m
Langford/Colwood			
WWTP	Royal Bay Shore	Treated Effluent	5,500 m
Royal Bay Shore	End of Outfall	Treated Effluent	2,300 m
Esquimalt Nation			
Macaulay Point	Esquimalt Nation WWTP	Screened Raw Sewage	4,600 m
Esquimalt Nation WWTP	Macaulay Point	Treated Effluent	4,600 m
Admirals Road	Esquimalt Nation WWTP	Raw Sewage	300 m
Macaulay Point	End of Outfall	Treated Effluent/SRS	1,700 m
		Total	**53,950 m [2]**
D. Optional			
• Rock Bay WWTP	End of Reuse	Reuse	18,500 m
• Esquimalt Nation WWTP	End of Reuse	Reuse	17,000 m
		Optional Total	**35,500 m**

[1] *Pipe lengths are approximate pending a routing review.*

[2] *Includes Colwood reuse piping.*

1.3 Cost Estimates

The cost estimates have been undertaken with the same assumptions used in Technical Memo #3 (as documented in Technical Memo #1). The summary tables are attached in Tables 5 and 6. For the collection system costs uniform average unit rates have been used across the regional district without the benefit of routing reviews. Local site conditions may result in individual component costs being lower or higher than the average.

Table 5 – Cost Components for Option 5a – Three Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]		
	2015	2030	at 2015	at 2030	at 2045
1. Conveyance - Rock Bay					
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 560	$ 650	$ 730
(b) Barnhard Park PS and Forcemain to Rock Bay	$ 39,600	N/A	$ 320	$ 330	$ 340
(c) Effluent PS and Forcemain to Clover Point	$ 53,700	N/A	$ 710	$ 760	$ 800
(d) Replace Clover Outfall	$ 23,500	N/A	in c above	in c above	in c above
Conveyance - Rock Bay Subtotal:	$ 168,200	$ -	$ 1,590	$ 1,740	$ 1,870
2. Liquid Treatment - Rock Bay (Secondary)	$ 282,000	$ 70,000	$ 5,000	$ 7,800	$ 9,900
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300
4. Reuse - Rock Bay					
(a) Tertiary Slipstream	$ 8,100	N/A	$ 230	$ 230	$ 230
(b) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80
Reuse - Rock Bay Subtotal:	$ 24,200	$ -	$ 300	$ 305	$ 310
5. Existing System Capacity Upgrades					
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A
(b) Arbutus Attenuation Tank- incl land	$ 20,000	N/A	N/A	N/A	N/A
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A
(e) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -
6. Conveyance - Colwood					
(a) East Boundary PS/FM to Plant	$ 14,500	N/A	$ 133	$ 140	$ 146
7. Liquid Treatment - Colwood/Langford (Secondary)	$ 71,100	$ 72,600	$ 1,300	$ 2,100	$ 3,800
8. Conveyance - Colwood/Langford					
(a) Effluent PS and FM to Shore	$ 31,900		$ 214	$ 250	$ 285
(b) New Outfall	$ 33,800		in b above	in b above	in b above
9. Conveyance - Esquimalt FN					
(a) Admirals Rd Trunk Tie-in and FM to Plant	$ 1,900		$ 43	$ 44	$ 45
(b) Macaulay Pt PS and Forcemain to WWTP	$ 16,600		$ 138	$ 140	$ 143
(c) Effluent PS and Forcemain to Macaulay	$ 18,700		$ 176	$ 188	$ 200
(d) Replace Macaulay Outfall	$ 12,600		in c above	in c above	in c above
Conveyance - Esquimalt FN Subtotal:	$ 49,800	$ -	$ 357	$ 372	$ 388
10. Liquid Treatment - Esquimalt (Secondary)	$ 51,700	$ 20,200	$ 900	$ 1,300	$ 2,000
11. Reuse - Esquimalt					
(a) Tertiary Slipstream	$ 4,100	N/A	$ 120	$ 120	$ 120
(b) Effluent Pumping/Piping/Controls	$ 14,000	N/A	$ 50	$ 60	$ 70
Reuse Esquimalt FN Subtotal:	$ 18,100	$ -	$ 170	$ 180	$ 190
13. Land Costs	$ 77,000 [2]	N/A			
Total:	**$ 1,125,300**	**$ 253,400**	**$ 14,964**	**$ 22,987**	**$ 29,189**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

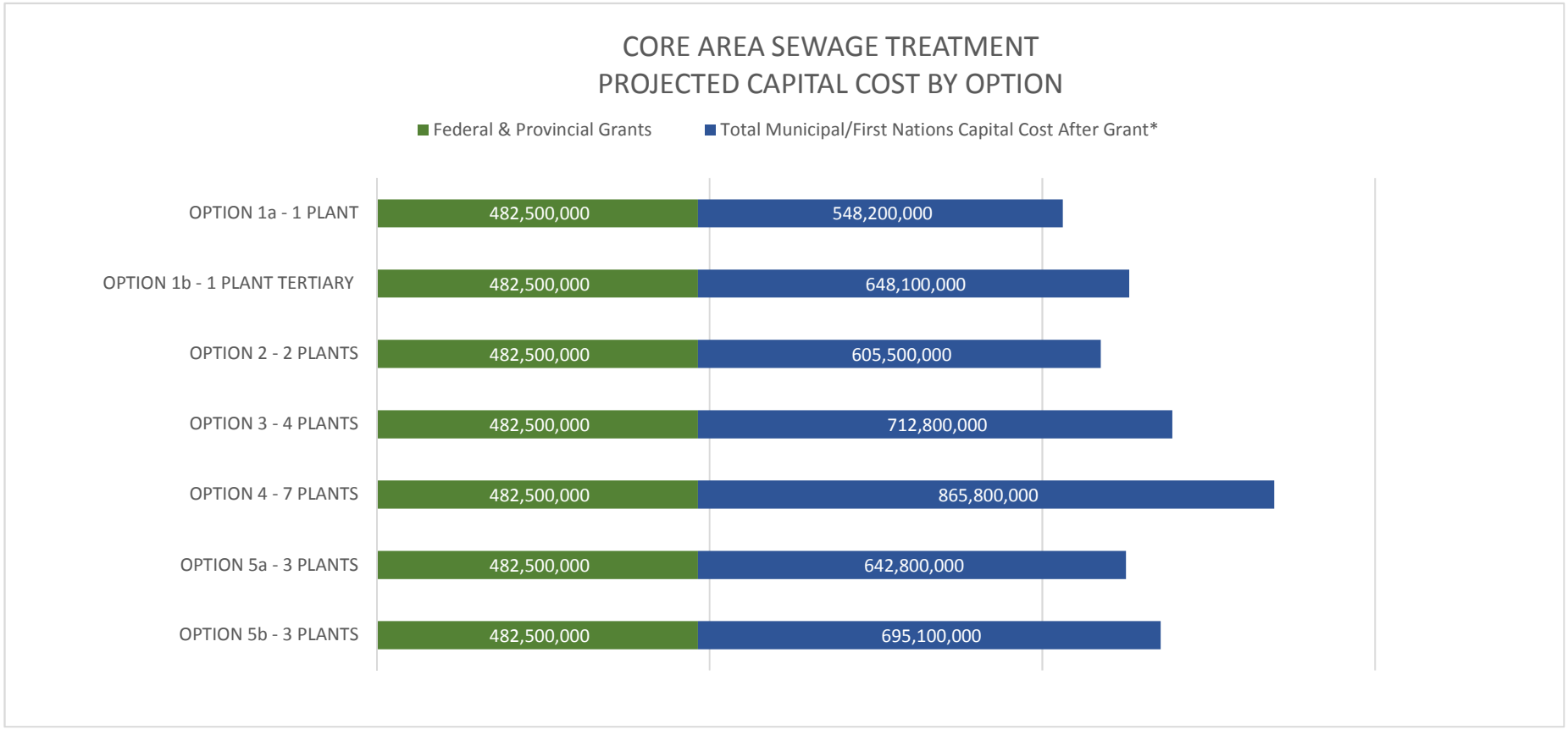
[2] Remove East Saanich and Langford VM Way at Meadford Way, but increase area at Colwood. Allow similar land cost to the Four Plant Option.

Table 6 – Cost Components for Option 5b – Three Plants (x 1000)

Cost Component	Capital Cost Incurred [1]		Operating Cost [1]		
	2015	2030	at 2015	at 2030	at 2045
1. Conveyance - Rock Bay					
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A	$ 560	$ 650	$ 730
(b) Barnhard Park PS and Forcemain to Rock Bay	$ 39,600	N/A	$ 320	$ 330	$ 340
(c) Effluent PS and Forcemain to Clover Point	$ 53,700	N/A	$ 710	$ 760	$ 800
(d) Replace Clover Outfall	$ 23,500	N/A	in c above	in c above	in c above
Conveyance - Rock Bay Subtotal:	$ 168,200	$ -	$ 1,590	$ 1,740	$ 1,870
2. Liquid Treatment - Rock Bay (Secondary)	$ 282,000	$ 70,000	$ 5,000	$ 7,800	$ 9,900
3. Solids Treatment - AD at Rock Bay	$ 258,000	$ 90,600	$ 5,000	$ 8,800	$ 10,300
4. Reuse - Rock Bay					
(a) Tertiary Slipstream	$ 8,100	N/A	$ 230	$ 230	$ 230
(b) Effluent Pumping/Piping/Controls	$ 16,100	N/A	$ 70	$ 75	$ 80
Reuse - Rock Bay Subtotal:	$ 24,200	$ -	$ 300	$ 305	$ 310
5. Existing System Capacity Upgrades					
(a) Craigflower PS - Constructed	$ 12,100	N/A	N/A	N/A	N/A
(b) Arbutus Attenuation Tank- incl land	$ 20,000	N/A	N/A	N/A	N/A
(c) Siphon Extension (1600 m)	$ 7,500	N/A	N/A	N/A	N/A
(d) Upgrade Currie St PS	$ 2,300	N/A	N/A	N/A	N/A
(e) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A	N/A	N/A	N/A
Existing System Subtotal:	$ 45,000	$ -	$ -	$ -	$ -
6. Conveyance - Colwood					
(a) East Boundary PS/FM to Plant	$ 14,500	N/A	$ 133	$ 140	$ 146
7. Liquid Treatment - Colwood/Langford (Tertiary)	$ 106,800	$ 119,500	$ 2,000	$ 3,100	$ 5,800
8. Reuse - Colwood					
(a) Effluent Pumping/Piping/Controls	$ 16,600	N/A	$ 70	$ 75	$ 80
9. Conveyance - Colwood/Langford					
(a) Effluent PS and FM to Shore	$ 31,900		$ 214	$ 250	$ 285
(b) New Outfall	$ 33,800		in b above	in b above	in b above
10. Conveyance - Esquimalt FN					
(a) Admirals Rd Trunk Tie-in and FM to Plant	$ 1,900		$ 43	$ 44	$ 45
(b) Macaulay Pt PS and Forcemain to WWTP	$ 16,600		$ 138	$ 140	$ 143
(c) Effluent PS and Forcemain to Macaulay	$ 18,700		$ 176	$ 188	$ 200
(d) Replace Macaulay Outfall	$ 12,600		in c above	in c above	in c above
Conveyance - Esquimalt FN Subtotal:	$ 49,800	$ -	$ 357	$ 372	$ 388
11. Liquid Treatment - Esquimalt (Secondary)	$ 51,700	$ 20,200	$ 900	$ 1,300	$ 2,000
12. Reuse - Esquimalt					
(a) Tertiary Slipstream	$ 4,100	N/A	$ 120	$ 120	$ 120
(b) Effluent Pumping/Piping/Controls	$ 14,000	N/A	$ 50	$ 60	$ 70
Reuse Esquimalt FN Subtotal:	$ 18,100	$ -	$ 170	$ 180	$ 190
13. Land Costs	$ 77,000 [2]	N/A			
Total:	**$ 1,177,600**	**$ 300,300**	**$ 15,734**	**$ 24,062**	**$ 31,269**

[1] Includes all contingencies, engineering, etc. outlined in TM #1

[2] Remove East Saanich and Langford VM Way at Meadford Way, but increase area at Colwood. Allow similar land cost to the Four Plant Option.


CORE AREA SEWAGE TREATMENT
PROJECTED CAPITAL COST BY OPTION
Federal & Provincial Grants
Total Municipal/First Nations Capital Cost After Grant*
OPTION 1a - 1 PLANT
482,500,000
548,200,000
OPTION 1b - 1 PLANT TERTIARY
482,500,000
648,100,000
OPTION 2 - 2 PLANTS
482,500,000
605,500,000
OPTION 3 - 4 PLANTS
482,500,000
712,800,000
OPTION 4 - 7 PLANTS
482,500,000
865,800,000
OPTION 5a - 3 PLANTS
482,500,000
642,800,000
OPTION 5b - 3 PLANTS
482,500,000
695,100,000

Core Area Waste Water Treatment Program Options - Costing

Options	Capital Cost	Federal and Provincial Grants	Total Municipal/First Nations Capital Cost After Grant*	Operating Costs (at 2030)
OPTION 1a - 1 PLANT	1,030,700,000	482,500,000	548,200,000	21,765,000
OPTION 1b - 1 PLANT TERTIARY	1,130,600,000	482,500,000	648,100,000	26,435,000
OPTION 2 - 2 PLANTS	1,088,000,000	482,500,000	605,500,000	22,810,000
OPTION 3 - 4 PLANTS	1,195,300,000	482,500,000	712,800,000	25,345,000
OPTION 4 - 7 PLANTS	1,348,300,000	482,500,000	865,800,000	26,630,000
OPTION 5a - 3 PLANTS	1,125,300,000	482,500,000	642,800,000	22,987,000
OPTION 5b - 3 PLANTS	1,177,600,000	482,500,000	695,100,000	24,062,000

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		**Total Annual Cost**	**63,847,080**
Annual Debt	**42,082,080**	**Annual Operating**	**21,765,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	591	582	(10)
Saanich	365	372	8
Victoria	513	509	(4)
Esquimalt	455	471	16
View Royal	430	417	(13)
Colwood	254	248	(5)
Langford	415	406	(9)

OPTION 1b - 1 PLANT TERTIARY		**Total Annual Cost**	**76,214,460**
Annual Debt	**49,779,460**	**Annual Operating**	**26,435,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	705	695	(10)
Saanich	437	444	8
Victoria	611	608	(4)
Esquimalt	546	562	16
View Royal	511	498	(13)
Colwood	302	296	(5)
Langford	493	484	(9)

OPTION 2 - 2 PLANTS		**Total Annual Cost**	**69,331,955**
Annual Debt	**46,521,955**	**Annual Operating**	**22,810,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	590	630	40
Saanich	364	404	40
Victoria	512	552	41
Esquimalt	454	511	57
View Royal	429	454	24
Colwood	767	270	(497)
Langford	414	441	27

OPTION 3 - 4 PLANTS		**Total Annual Cost**	**80,220,524**
Annual Debt	**54,875,524**	**Annual Operating**	**25,345,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	573	728	156
Saanich	437	468	30
Victoria	504	639	135
Esquimalt	724	591	(133)
View Royal	593	526	(67)
Colwood	864	313	(552)
Langford	572	511	(61)

OPTION 4 - 7 PLANTS		**Total Annual Cost**	**93,452,382**
Annual Debt	**66,822,382**	**Annual Operating**	**26,630,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	590	845	254
Saanich	509	545	36
Victoria	519	743	224
Esquimalt	1,075	689	(386)
View Royal	987	615	(372)
Colwood	711	365	(345)
Langford	793	598	(195)

OPTION 5a - 3 PLANTS		**Total Annual Cost**	**72,486,240**
Annual Debt	**49,499,240**	**Annual Operating**	**22,987,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	561	678	117
Saanich	377	436	59
Victoria	495	595	100
Esquimalt	827	551	(277)
View Royal	849	490	(359)
Colwood	415	291	(124)
Langford	490	477	(13)

OPTION 5b - 3 PLANTS		**Total Annual Cost**	**77,582,164**
Annual Debt	**53,520,164**	**Annual Operating**	**24,062,000**
	Design Capacity	**All for One**	**Increase (Decrease)**
Oak Bay	573	724	150
Saanich	379	466	87
Victoria	504	635	131
Esquimalt	785	588	(196)
View Royal	809	524	(285)
Colwood	626	311	(315)
Langford	632	510	(122)

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

January 7, 2016

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		**Total Annual Cost**	**63,847,080**
Annual Debt	**42,082,080**	**Annual Operating**	**21,765,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	591	598	7
Saanich	365	383	18
Victoria	513	523	11
Esquimalt	455	436	(19)
View Royal	430	389	(41)
Colwood	254	229	(24)
Langford	415	375	(40)

OPTION 1b - 1 PLANT TERTIARY		**Total Annual Cost**	**76,214,460**
Annual Debt	**49,779,460**	**Annual Operating**	**26,435,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	705	712	7
Saanich	437	455	18
Victoria	611	622	11
Esquimalt	546	527	(19)
View Royal	511	470	(41)
Colwood	302	277	(24)
Langford	493	453	(40)

OPTION 2 - 2 PLANTS		**Total Annual Cost**	**69,331,955**
Annual Debt	**46,521,955**	**Annual Operating**	**22,810,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	590	598	7
Saanich	364	382	18
Victoria	512	522	11
Esquimalt	454	584	130
View Royal	429	524	94
Colwood	767	309	(458)
Langford	414	505	91

OPTION 3 - 4 PLANTS		**Total Annual Cost**	**80,220,524**
Annual Debt	**54,875,524**	**Annual Operating**	**25,345,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	573	651	78
Saanich	437	415	(23)
Victoria	504	568	64
Esquimalt	724	761	37
View Royal	593	689	96
Colwood	864	405	(459)
Langford	572	665	93

OPTION 4 - 7 PLANTS		**Total Annual Cost**	**93,452,382**
Annual Debt	**66,822,382**	**Annual Operating**	**26,630,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	590	692	102
Saanich	509	442	(68)
Victoria	519	604	85
Esquimalt	1,075	1,022	(53)
View Royal	987	930	(57)
Colwood	711	547	(164)
Langford	793	899	105

OPTION 5a - 3 PLANTS		**Total Annual Cost**	**72,486,240**
Annual Debt	**49,499,240**	**Annual Operating**	**22,987,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	561	577	15
Saanich	377	368	(9)
Victoria	495	503	8
Esquimalt	827	713	(114)
View Royal	849	643	(206)
Colwood	415	379	(36)
Langford	490	621	131

OPTION 5b - 3 PLANTS (TERTIARY)		**Total Annual Cost**	**77,582,164**
Annual Debt	**53,520,164**	**Annual Operating**	**24,062,000**
	Design Capacity	**East West All for One**	**Increase (Decrease)**
Oak Bay	573	577	3
Saanich	379	368	(11)
Victoria	504	503	(1)
Esquimalt	785	850	65
View Royal	809	767	(42)
Colwood	626	452	(174)
Langford	632	741	109

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

January 7, 2016

OAK BAY - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,639,130	1,518,845	4,157,975
Option 1b - 1 plant tertiary	3,110,767	1,844,571	4,955,339
Option 2 - 2 plants	2,633,312	1,518,845	4,152,158
Option 3 - 4 plants	2,483,697	1,543,919	4,027,616
Option 4 - 7 plants	2,609,910	1,542,697	4,152,607
Option 5a - 3 plants	2,402,773	1,543,919	3,946,692
Option 5b - 3 plants (tertiary)	2,487,310	1,543,919	4,031,229

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,675,460	1,533,526	4,208,986
3,147,119	1,859,252	5,006,371
2,669,675	1,533,526	4,203,201
2,790,030	1,789,476	4,579,506
3,021,909	1,846,277	4,868,186
2,516,647	1,538,100	4,054,746
2,516,696	1,538,100	4,054,796

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,571,683	1,518,078	4,089,761
3,042,078	1,843,804	4,885,882
2,843,008	1,590,965	4,433,973
3,353,504	1,767,778	5,121,282
4,083,590	1,857,405	5,940,995
3,149,666	1,618,028	4,767,694
3,395,389	1,693,007	5,088,396

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	591
Option 1a - 1 plant tertiary	705
Option 2 - 2 plants	590
Option 3 - 4 plants	573
Option 4 - 7 plants	590
Option 5a - 3 plants	561
Option 5b - 3 plants (tertiary)	573

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
591	598	7
705	712	7
590	598	7
573	651	78
590	692	102
561	577	15
573	577	3

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
591	582	(10)
705	695	(10)
590	630	40
573	728	156
590	845	254
561	678	117
573	724	150

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SAANICH - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	12,424,952	6,565,431	18,990,383
Option 1b - 1 plant tertiary	14,767,783	7,974,385	22,742,167
Option 2 - 2 plants	12,395,439	6,565,431	18,960,870
Option 3 - 4 plants	15,733,702	7,045,131	22,778,833
Option 4 - 7 plants	18,862,549	7,656,080	26,518,629
Option 5a - 3 plants	12,994,778	6,630,131	19,624,909
Option 5b - 3 plants (tertiary)	13,110,965	6,630,131	19,741,096

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
13,292,430	6,633,392	19,925,822
15,635,761	8,042,346	23,678,107
13,263,689	6,633,392	19,897,081
13,861,645	7,740,524	21,602,169
15,013,682	7,986,223	22,999,904
12,503,401	6,653,176	19,156,576
12,503,646	6,653,176	19,156,822

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
12,819,448	6,566,569	19,386,018
15,164,299	7,975,523	23,139,822
14,171,966	6,881,849	21,053,815
16,716,711	7,646,667	24,363,377
20,356,078	8,034,355	28,390,433
15,700,608	6,998,910	22,699,518
16,925,500	7,323,241	24,248,741

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	365
Option 1a - 1 plant tertiary	437
Option 2 - 2 plants	364
Option 3 - 4 plants	437
Option 4 - 7 plants	509
Option 5a - 3 plants	377
Option 5b - 3 plants (tertiary)	379

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
365	383	18
437	455	18
364	382	18
437	415	(23)
509	442	(68)
377	368	(9)
379	368	(11)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
365	372	8
437	444	8
364	404	40
437	468	30
509	545	36
377	436	59
379	466	87

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VICTORIA - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	15,083,168	8,087,462	23,170,629
Option 1b - 1 plant tertiary	17,811,719	9,822,141	27,633,861
Option 2 - 2 plants	15,049,347	8,087,462	23,136,808
Option 3 - 4 plants	14,575,991	8,208,501	22,784,492
Option 4 - 7 plants	15,249,488	8,203,773	23,453,261
Option 5a - 3 plants	14,186,711	8,208,501	22,395,211
Option 5b - 3 plants (tertiary)	14,593,755	8,208,501	22,802,256

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
15,478,872	8,166,918	23,645,790
18,207,651	9,901,598	28,109,249
15,445,402	8,166,918	23,612,320
16,141,715	9,530,000	25,671,715
17,483,248	9,832,500	27,315,748
14,560,056	8,191,275	22,751,331
14,560,342	8,191,275	22,751,617

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
14,923,552	8,084,647	23,008,200
17,653,272	9,819,327	27,472,598
16,498,064	8,472,814	24,970,878
19,460,487	9,414,444	28,874,931
23,697,197	9,891,760	33,588,957
18,277,607	8,616,938	26,894,545
19,703,546	9,016,248	28,719,794

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	513
Option 1a - 1 plant tertiary	611
Option 2 - 2 plants	512
Option 3 - 4 plants	504
Option 4 - 7 plants	519
Option 5a - 3 plants	495
Option 5b - 3 plants (tertiary)	504

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
513	523	11
611	622	11
512	522	11
504	568	64
519	604	85
495	503	8
504	503	(1)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
513	509	(4)
611	608	(4)
512	552	41
504	639	135
519	743	224
495	595	100
504	635	131

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ESQUIMALT - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,624,683	1,446,838	4,071,520
Option 1b - 1 plant tertiary	3,130,399	1,757,413	4,887,813
Option 2 - 2 plants	2,618,261	1,446,838	4,065,099
Option 3 - 4 plants	4,435,635	2,044,482	6,480,117
Option 4 - 7 plants	7,084,597	2,537,323	9,621,920
Option 5a - 3 plants	5,588,368	1,819,447	7,407,815
Option 5b - 3 plants (tertiary)	5,204,927	1,819,447	7,024,375

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
2,497,049	1,404,907	3,901,956
3,002,692	1,715,483	4,718,174
3,555,445	1,675,222	5,230,667
5,184,628	1,625,773	6,810,401
7,349,708	1,801,672	9,151,380
4,675,148	1,708,406	6,383,554
5,620,711	1,986,482	7,607,193

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,766,507	1,447,470	4,213,977
3,272,539	1,758,045	5,030,584
3,058,388	1,516,967	4,575,355
3,607,558	1,685,556	5,293,113
4,392,953	1,771,014	6,163,967
3,388,277	1,542,770	4,931,048
3,652,616	1,614,263	5,266,878

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	455
Option 1a - 1 plant tertiary	546
Option 2 - 2 plants	454
Option 3 - 4 plants	724
Option 4 - 7 plants	1,075
Option 5a - 3 plants	827
Option 5b - 3 plants (tertiary)	785

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
455	436	(19)
546	527	(19)
454	584	130
724	761	37
1,075	1,022	(53)
827	713	(114)
785	850	65

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
455	471	16
546	562	16
454	511	57
724	591	(133)
1,075	689	(386)
827	551	(277)
785	588	(196)

January 7, 2016

VIEW ROYAL - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,424,284	635,197	2,059,481
Option 1b - 1 plant tertiary	1,676,496	771,547	2,448,043
Option 2 - 2 plants	1,421,184	635,197	2,056,381
Option 3 - 4 plants	2,004,725	836,114	2,840,839
Option 4 - 7 plants	3,679,504	1,047,314	4,726,818
Option 5a - 3 plants	3,293,252	774,156	4,067,407
Option 5b - 3 plants (tertiary)	3,102,010	774,156	3,876,166

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
1,245,007	616,788	1,861,796
1,497,117	753,139	2,250,255
1,772,715	735,463	2,508,178
2,585,012	713,754	3,298,766
3,664,502	790,978	4,455,480
2,330,989	750,032	3,081,021
2,802,439	872,114	3,674,553

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,363,771	635,474	1,999,246
1,613,223	771,825	2,385,048
1,507,656	665,985	2,173,641
1,778,373	740,000	2,518,373
2,165,540	777,518	2,943,058
1,670,277	677,314	2,347,591
1,800,585	708,701	2,509,286

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	430
Option 1a - 1 plant tertiary	511
Option 2 - 2 plants	429
Option 3 - 4 plants	593
Option 4 - 7 plants	987
Option 5a - 3 plants	849
Option 5b - 3 plants (tertiary)	809

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
430	389	(41)
511	470	(41)
429	524	94
593	689	96
987	930	(57)
849	643	(206)
809	767	(42)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
430	417	(13)
511	498	(13)
429	454	24
593	526	(67)
987	615	(372)
849	490	(359)
809	524	(285)

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COLWOOD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,890,998	864,574	2,755,572
Option 1b - 1 plant tertiary	2,225,856	1,050,162	3,276,018
Option 2 - 2 plants	6,422,590	1,909,574	8,332,163
Option 3 - 4 plants	7,203,807	2,183,044	9,386,851
Option 4 - 7 plants	6,184,109	1,533,756	7,717,865
Option 5a - 3 plants	3,420,718	1,089,456	4,510,174
Option 5b - 3 plants (tertiary)	5,382,000	1,419,664	6,801,665

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
1,652,976	839,517	2,492,493
1,987,697	1,025,105	3,012,803
2,353,604	1,001,047	3,354,652
3,432,078	971,498	4,403,576
4,865,300	1,076,609	5,941,908
3,094,816	1,020,877	4,115,693
3,720,752	1,187,044	4,907,797

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,831,350	864,951	2,696,301
2,166,328	1,050,539	3,216,868
2,024,567	906,480	2,931,047
2,388,102	1,007,222	3,395,324
2,908,011	1,058,289	3,966,300
2,242,944	921,899	3,164,843
2,417,929	964,620	3,382,549

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	254
Option 1a - 1 plant tertiary	302
Option 2 - 2 plants	767
Option 3 - 4 plants	864
Option 4 - 7 plants	711
Option 5a - 3 plants	415
Option 5b - 3 plants (tertiary)	626

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
254	229	(24)
302	277	(24)
767	309	(458)
864	405	(459)
711	547	(164)
415	379	(36)
626	452	(174)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
254	248	(5)
302	296	(5)
767	270	(497)
864	313	(552)
711	365	(345)
415	291	(124)
626	311	(315)

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LANGFORD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	5,713,228	2,523,143	8,236,372
Option 1b - 1 plant tertiary	6,724,928	3,064,757	9,789,685
Option 2 - 2 plants	5,700,796	2,523,143	8,223,940
Option 3 - 4 plants	8,041,552	3,321,231	11,362,784
Option 4 - 7 plants	11,988,259	3,763,543	15,751,802
Option 5a - 3 plants	6,961,432	2,770,861	9,732,293
Option 5b - 3 plants (tertiary)	9,025,804	3,515,652	12,541,456

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
4,994,098	2,450,020	7,444,118
6,005,383	2,991,634	8,997,018
7,110,889	2,921,424	10,032,313
10,369,256	2,835,189	13,204,445
14,699,416	3,141,940	17,841,356
9,350,296	2,979,294	12,329,590
11,241,422	3,464,231	14,705,653

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
5,533,014	2,524,246	8,057,260
6,545,077	3,065,860	9,610,937
6,116,776	2,645,442	8,762,218
7,215,115	2,939,444	10,154,560
8,785,906	3,088,475	11,874,381
6,776,554	2,690,441	9,466,995
7,305,231	2,815,117	10,120,348

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	415
Option 1a - 1 plant tertiary	493
Option 2 - 2 plants	414
Option 3 - 4 plants	572
Option 4 - 7 plants	793
Option 5a - 3 plants	490
Option 5b - 3 plants (tertiary)	632

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
415	375	(40)
493	453	(40)
414	505	91
572	665	93
793	899	105
490	621	131
632	741	109

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
415	406	(9)
493	484	(9)
414	441	27
572	511	(61)
793	598	(195)
490	477	(13)
632	510	(122)

January 7, 2016

SONGHEES NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	241,404	105,866	347,270
Option 1b - 1 plant tertiary	284,152	128,591	412,743
Option 2 - 2 plants	240,879	105,866	346,745
Option 3 - 4 plants	339,784	139,352	479,136
Option 4 - 7 plants	1,025,339	298,640	1,323,979
Option 5a - 3 plants	558,178	129,026	687,204
Option 5b - 3 plants (tertiary)	525,764	129,026	654,790

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
211,018	102,798	313,816
253,749	125,523	379,272
300,460	122,577	423,037
438,138	118,959	557,097
621,102	131,830	752,932
395,083	125,005	520,088
474,990	145,352	620,342

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
233,789	105,912	339,702
276,553	128,637	405,190
258,455	110,998	369,453
304,864	123,333	428,197
371,235	129,586	500,822
286,333	112,886	399,219
308,672	118,117	426,789

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-
Option 5a - 3 plants	-
Option 5b - 3 plants (tertiary)	-

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

January 7, 2016

ESQUIMALT NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	40,234	17,644	57,878
Option 1b - 1 plant tertiary	47,359	21,432	68,791
Option 2 - 2 plants	40,146	17,644	57,791
Option 3 - 4 plants	56,631	23,225	79,856
Option 4 - 7 plants	138,627	46,874	185,501
Option 5a - 3 plants	93,030	21,504	114,534
Option 5b - 3 plants (tertiary)	87,627	21,504	109,132

Total Dollars - based on Westside All for One		
Annual Debt	Annual Operating	Total
35,170	17,133	52,303
42,291	20,921	63,212
50,077	20,430	70,506
73,023	19,826	92,849
103,517	21,972	125,489
65,847	20,834	86,681
79,165	24,225	103,390

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
38,965	17,652	56,617
46,092	21,440	67,532
43,076	18,500	61,575
50,811	20,556	71,366
61,873	21,598	83,470
47,722	18,814	66,536
51,445	19,686	71,131

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-
Option 5a - 3 plants	-
Option 5b - 3 plants (tertiary)	-

Dollars per HH - Design vs Westside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

January 7, 2016

Making a difference...together

EHQ 16-04

REPORT TO WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE MEETING OF WEDNESDAY, JANUARY 8, 2016

SUBJECT **Public Consultation Update**

ISSUE

To provide the Westside Wastewater Treatment and Resource Recovery Select Committee (Westside Solutions) with an update regarding public consultation activities.

BACKGROUND

In October 2014, the Westside Select Committee launched the Westside Solutions Project as a way to inform, educate and involve Westside residents and stakeholders in decisions about Westside wastewater treatment and resource recovery. Since then, the Westside Select Committee has undertaken a number of successful public engagement initiatives, including open houses, innovation days, roundtables, community events and online surveys. Through the efforts of municipal staff and consultants, thousands of residents from Colwood, Esquimalt, Langford, View Royal, Songhees Nation and Esquimalt Nation participated in the public consultation process.

In the fall of 2015, the Westside Communications Team presented a Westside Public Consultation Plan that was approved at the Westside Select Committee on October 27, 2015 (see Appendix A).

In brief, the consultation plan has 3 stages:

- Stage 1 consultation consisted of continued communication with engaged Westside residents and, through a representative poll that broadened the response pool (see Appendix B).
- Stage 2 consultation will take place after the Core Area Liquid Waste Management Committee (CALWMC) meeting on January 13 and will include a range of opportunities for residents to give input on the costed option sets, including targeted meetings with community groups where sites have been identified, information on the options distributed widely through advertising, community venues and social media, and an on-line public feed-back tool.
- Stage 3 of consultation will take place after an option has been confirmed.

On December 2, 2015, the CALWMC requested further information regarding the costed options that will further inform the information presented to the public for feedback. This has resulted in a delay in the implementation of Stage 2 of the consultation plan.

Westside Solutions and Eastside Dialogue have been working on the integration of some region-wide public engagement approaches where feasible, while continuing to maintain the focus on responding to specific community processes and values.

Below is a list of currently planned integrated public consultation activities:

- online survey
- postcard mailer to all Core Area residents
- information available at community centres, municipal halls and online

All of the feedback collected through this phase of consultation will contribute to a decision at the CALWMC. The work of the Eastside and Westside Select Committees, the CALWMC and feedback from the public inform the direction of the project and the work towards an amendment to the currently approved Liquid Waste Management Plan.

CONCLUSION

The Westside Solutions public consultation plan will continue provide further public feedback to the Westside Wastewater Treatment and Resource Recovery Select Committee and assist in identifying solution sets to recommend to the CALWMC.

RECOMMENDATION

That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this update for information.

Submitted by:	Andy Orr, Sr. Manager, Corporate Communications
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services

LT:cl

Attachments: Appendix A – Westside Public Consultation Plan
Appendix B – Westside Ipsos Reid Poll

Public Engagement Plan

WESTSIDE SOLUTIONS
Westside Wastewater Treatment & Resource Recovery

STAGE 1

METHODOLOGY	TARGET	OBJECTIVE/OUTCOME
IPSOS telephone poll of randomly selected respondents COMPLETED NOV. 2015	• Randomly selected residents from Westside communities and First Nations - N=400	• statistical data on attitudes of randomly selected Westside residents • identification of residents who wish to participate in more detailed online workbooks and questionnaires
Online options workbook/questionnaire "SolutionSpeak" – a more detailed online analysis of options adopted by Westside Select Committee (October 27)	• general population • previously identified pool of respondents	• engage public in feedback on sites and scenarios • educate on technology options – benefits/drawbacks • educate on resource recovery options – benefits and costs • identify further information requirements through process
Media release and editorial board meetings	• Media partners • general population	• inform public of options and solutions • greater public feedback
Social media (municipal web pages, Facebook sites, twitter – CRD website, Facebook and twitter)	• general population	• inform public of options and solutions • greater public feedback
Launch online newsletter/update fact sheet	• general population • partners	• regular updates on project's progress
Joint Westside/Eastside High school student engagement competition (possible prizes)	• students • general population	• engage younger demographic in wastewater treatment resource recovery project • receive innovative design and integration concepts
Work with CRD and Eastside to reorganize and update wastewater website www.crd.bc.ca/project/wastewater-planning	• general population	• better information access on CRD site

STAGE 2

METHODOLOGY	TARGET	OBJECTIVE/OUTCOME
Joint Westside/Eastside online survey regarding solutions and costs decided at the CALWMC December meeting	• general population • previously identified pool of respondents	• feedback on wastewater treatment and resource recovery solutions and associated costs for entire region
Offer meetings and open houses targeted to specific stakeholder groups	• community associations particularly focusing on communities where a facility could be sited • business associations • chambers of commerce • recreation organizations	• present more detailed information to community members • encourage more feedback on online survey tool
Press release and editorial meetings	• press • general population	• inform public of options and solutions • greater public feedback
Paid advertising campaign on option sets: Joint Westside / Eastside including • **Black Press** • **Online TC** • **Used Victoria** • **Facebook**	• general population	• inform public of options and solutions • greater public feedback
Westside postcard drop	• residents of the Westside	• inform public of options and solutions • greater public feedback
Social media (municipal web pages, Facebook sites, twitter – CRD website, Facebook and twitter)	• general population	• inform public of options and solutions • greater public feedback
Ongoing newsletters	• general population • partners	• regular updates

STAGE 3

METHODOLOGY	TARGET	OBJECTIVE/OUTCOME
Joint Westside/Eastside information session on design possibilities (Bruce Hayden)	• general population	• engage public at looking at design opportunities
Design charrette for option chosen by CALWMC at January meeting	• neighbourhood groups in area(s) where facility(s) are to be sited • general public	• public participation in facility design and innovation • potential new and innovative concepts

Targeted stakeholder meetings	• neighbourhood groups where facility(s) are to be sited	• address concerns of citizens
Support for municipalities if requested on potential re-zoning	• municipalities	• information
Select and Announce winner of High School engagement competition	• students • general population	• continued engagement of younger demographic
Social media (municipal web pages, Facebook sites, twitter – CRD website, Facebook and twitter)	• general population	• inform public of options and solutions • greater public feedback
Ongoing newsletters	• general population • partners	• regular updates

WESTSIDE SOLUTIONS
Westside Wastewater Treatment & Resource Recovery

Ipsos Public Affairs

Westside Solutions

Public Engagement Tracking Survey

Draft Report

METHODOLOGY

This report presents the findings of a telephone survey conducted on behalf of Westside Solutions.

A total of 401 telephone interviews were conducted with a randomly selected representative sample of adults (aged 18 years or older) living in Langford, Colwood, View Royal, Esquimalt, Songhees Nation, and Esquimalt Nation.

Sample was pulled by a combination of census subdivisions and six digit postal codes.

All interviewing was conducted between October 20 and 26, 2015.

The data has been weighted to reflect the population based on Census data for region, age, and gender.

Overall results are accurate to within ±4.9 percentage points, 19 times out of 20. The margin of error will be larger for sample subgroups.

Interpreting and Viewing the Results

Please note that some "Totals" in this report may seem off due to rounding error. For example, 35% and 24% might add to 60% (not 59%). With decimals, the component percentages might be 35.4% (rounds down to 35%) and 24.2% (rounds down to 24%), making the total 59.6%, which rounds up to 60%. All percentages shown are correct.

Analysis of some of the statistically significant results is included where applicable. While a number of significant differences may appear in the cross-tabulation output, not all differences warrant discussion.

METHODOLOGY

The unweighted and weighted sample sizes by region, gender, and age can be found below.

	Unweighted	Weighted	Weighted Percentage
Region			
Langford	125	161	40%
Colwood	100	88	22%
View Royal	69	54	13%
Esquimalt/Esquimalt Nation/Songhees Nation	107	98	25%
Gender			
Male	193	195	49%
Female	208	206	51%
Age			
Under 55 years	202	270	67%
55 years or older	199	131	33%

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Awareness and Interest

Just over two-thirds (68%) of residents say they are closely following the planning of a wastewater treatment solution for the region.

Claimed participation in previous public consultation activities is significantly lower, with less than one-in-ten (9%) residents saying they have participated in a public information event or survey about the building of the wastewater treatment solution in the last 12 months.

Concerns

Of the three specific concerns presented to respondents, the single biggest one is 'the continued discharge of sewage into the ocean', with half (50%) of residents identifying this as the issue they are MOST CONCERNED about.

Significantly fewer mention 'the increase you will pay on your city tax bill to pay for a wastewater treatment solution' (24% MOST CONCERNED) or 'how building of project's treatment sites will impact quality of life in your neighbourhood' (20% MOST CONCERNED).

EXECUTIVE SUMMARY

Willingness to Pay and Design Priorities

Residents overwhelming prefer 'pay more to build a solution that allows potential reuse of water and removed solids for energy recovery' (81%) over 'pay less to build a solution that meets current regulation but does not allow reuse of water or solids removed during treatment' (16%).

When asked about support for a variety of higher and lower cost design solutions, the more expensive solutions are preferred by a strong majority of residents in all instances.

- 78% prefer 'a higher cost solution that treats water so it can be used for things like irrigation' versus 21% who prefer 'a lower cost solution that treats water but discharges it all into the ocean'.
- 84% prefer 'a higher cost solution that allows conversion of solids to produce revenue' versus 14% who prefer 'a lower cost solution that has no revenue potential and solids are placed in landfill'.
- 78% prefer 'a higher cost wastewater treatment facility that allows for multi-use such as green space or renting as commercial property' versus 22% who prefer 'a lower cost wastewater treatment facility that has no multi-use or cost recovery purposes'.
- 80% prefer 'a higher cost solution that reduces the impact on neighbourhood quality of life' versus 18% who prefer 'a lower cost solution that has a bigger impact on neighbourhood quality of life'.

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AWARENESS AND INTEREST

AWARENESS AND INTEREST

Following Plans for a Wastewater Treatment Solution

Just over two-thirds (68%) of residents say they are closely following the planning of a wastewater treatment solution for the region. This includes 14% saying 'very closely' and 54% saying 'somewhat closely'.

- Residents who are more likely to say they are closely ('very' or 'somewhat') following plans for a regional wastewater treatment solution include those living in Esquimalt/Esquimalt Nation/Songhees Nation (77% vs. 58% in View Royal, 64% in Colwood, 67% in Langford) and older residents (80% of 55+ years vs. 62% of 18-54 years).

Participated in Public Information Event or Survey on Issue (Last 12 Months)

Less than one-in-ten (9%) residents say they have participated in a public information event or survey about the building of the wastewater treatment solution in the last 12 months.

- Claimed past participation is higher among those living in Esquimalt/Esquimalt Nation/Songhees Nation (21% vs. 3% in Langford, 7% in Colwood, 8% in View Royal).

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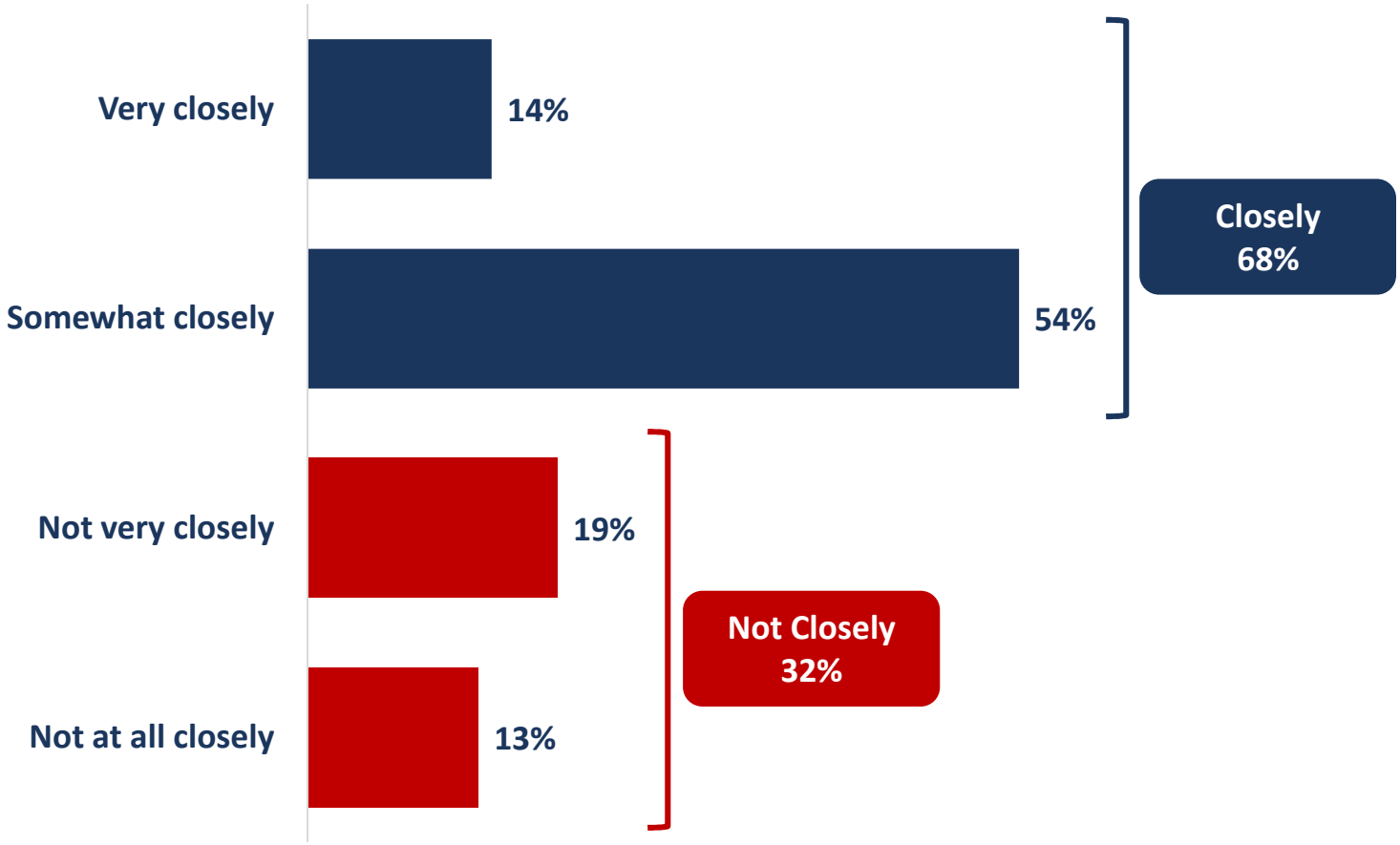
FOLLOWING PLANS FOR A WASTEWATER TREATMENT SOLUTION



Q1. How closely are you following the planning of a wastewater treatment solution for the region?
Base: All respondents (n=401)

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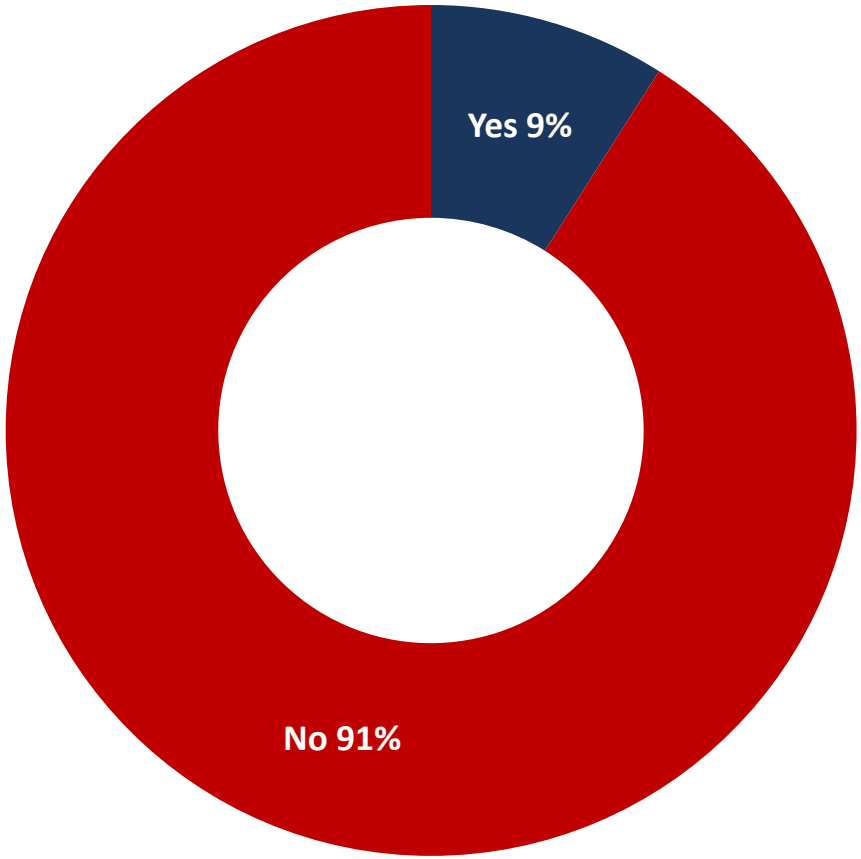
PARTICIPATED IN PUBLIC INFORMATION EVENT OR SURVEY ON ISSUE (LAST 12 MONTHS)



Q15. In the last 12 months, have you participated in a public information event or survey about the building of the wastewater treatment solution?
Base: All respondents (n=401)

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CONCERNS

PRIORITIZING CONCERNS AROUND TREATING AREA WASTEWATER (PROMPTED)

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Of the three specific concerns presented to respondents, the single biggest one is 'the continued discharge of sewage into the ocean', with half (50%) of residents identifying this as the issue they are MOST CONCERNED about.

- Sewage discharge is the leading concern across all key demographic segments. Women are especially likely to identify this as the issue they are MOST CONCERNED about (60% vs. 40% of men).

In comparison, 24% say they are MOST CONCERNED about 'the increase you will pay on your city tax bill to pay for a wastewater treatment solution' and 20% say they are MOST CONCERNED about 'how building of project's treatment sites will impact quality of life in your neighbourhood'.

- Those living in Colwood and Langford are more likely to emphasize tax increases (35% and 27%) while those living in Esquimalt/Esquimalt Nation/Songhees Nation and View Royal are more likely to emphasize the impact on quality of life (29% and 28%).
- Tax increases are also a greater concern to men (35% vs. 14% of women) and business owners (35% vs. 22% of non-business owners).

When asked which one they are NEXT MOST CONCERNED about, 'how building of project's treatment sites will impact quality of life in your community or neighbourhood' rises to the top (41%).

- The impact on quality of life is the leading second-tier priority across all key demographic segments. Younger residents are especially likely to identify this as the issue they are NEXT MOST CONCERNED about (45% of 18-54 years vs. 34% of 55+ years).

OTHER CONCERNS AROUND TREATING AREA WASTEWATER (UNPROMPTED)

When asked on an open-ended basis about other concerns regarding local wastewater treatment, nearly four-in-ten (37%) residents do not mention any other specific concerns (includes 24% saying 'none/nothing' and 13% saying 'don't know').

Of the concerns that are mentioned, the top two mentions are 'decisions are delayed/no action so far' (11%) and 'cost/whether it's cost effective' (10%).

All other concerns are mentioned by less than 10% of respondents and include 'the environmental impact' (8%), 'it's necessary/needs to be done' (8%), 'location of the treatment plant' (7%), 'project management' (7%), 'not sure if it's necessary/needed' (6%), 'efficiency of the treatment' (5%), and 'the continued discharge of sewage into the ocean' (5%), among others.

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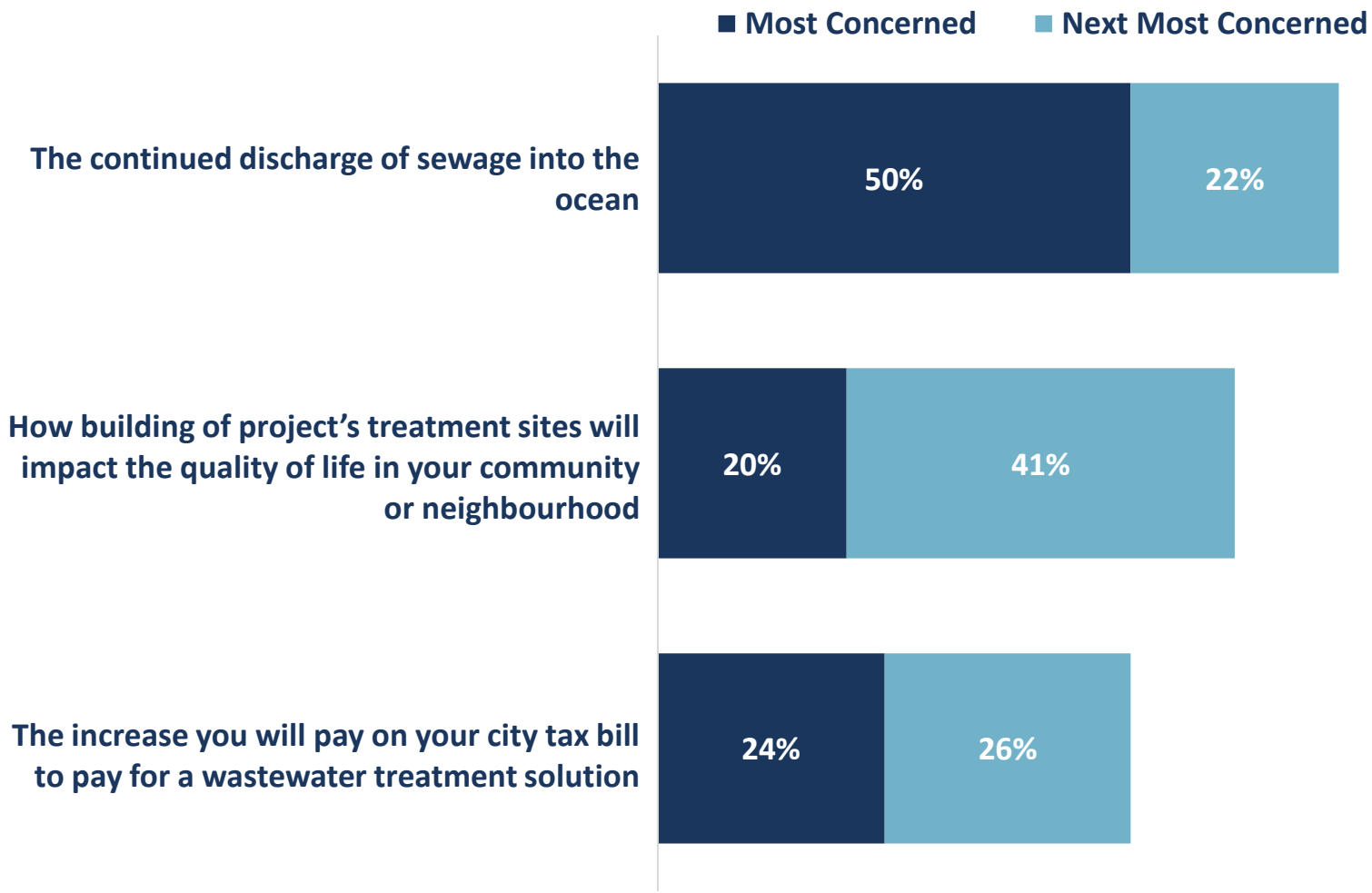
PRIORITIZING CONCERNS AROUND TREATING AREA WASTEWATER (PROMPTED)



Q2. Based on what you know or have heard about the need to treat wastewater, which one of the following are you **MOST** concerned about? Which one are you **NEXT MOST** concerned about?

Base: All respondents (n=401)

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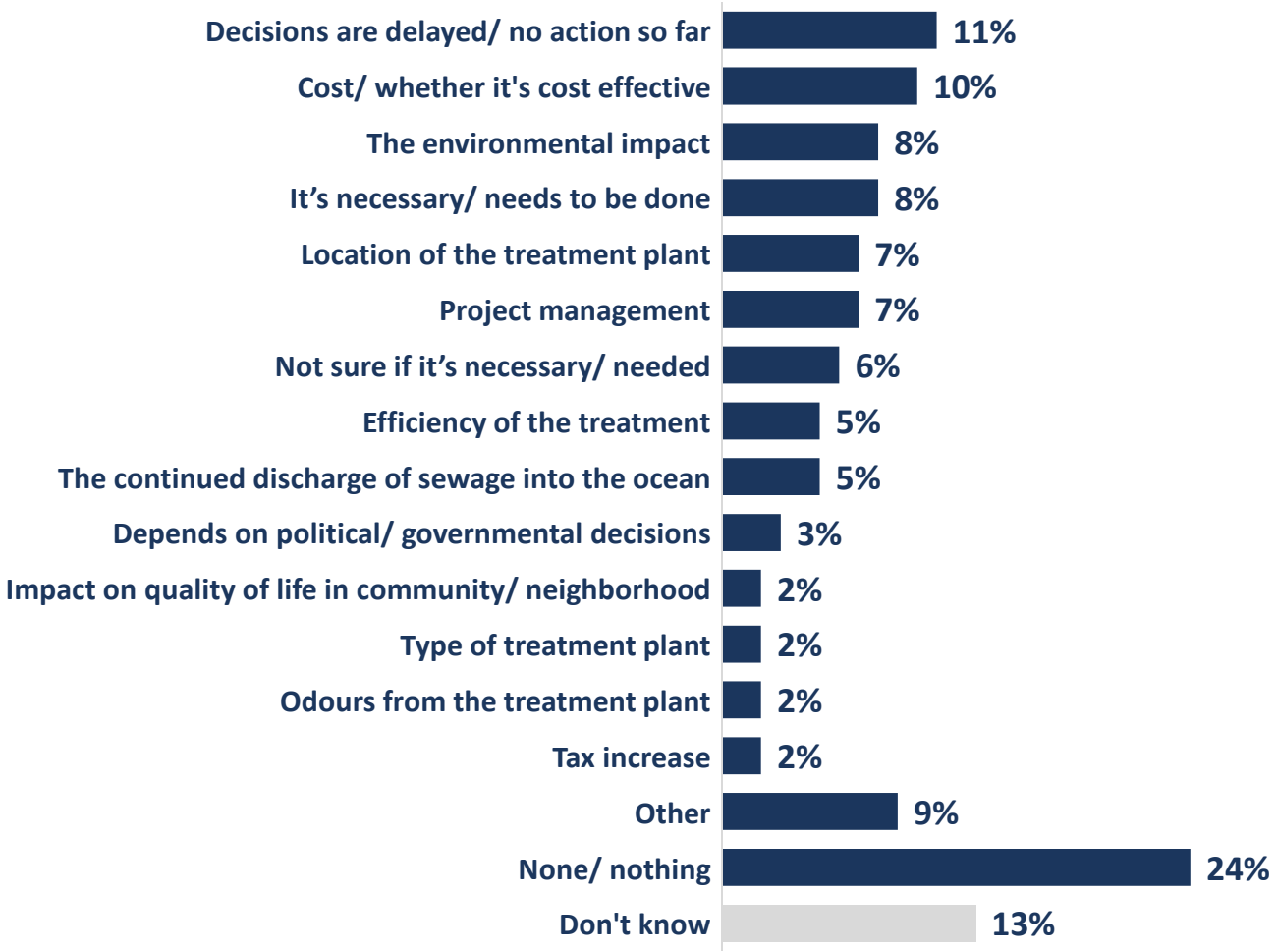
OTHER CONCERNS AROUND TREATING AREA WASTEWATER (UNPROMPTED)



Multiple mentions accepted.

Q2a. What, if any, other concerns do you have about treating area wastewater? Anything else?
Base: All respondents (n=401)

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WILLINGNESS TO PAY

WILLINGNESS TO PAY FOR A MORE EXPENSIVE SOLUTION THAT ALLOWS POTENTIAL REUSE OF WATER AND REMOVED SOLIDS

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Overall Design Preference

Of the two options presented, residents overwhelming prefer 'pay more to build a solution that allows potential reuse of water and removed solids for energy recovery' (81%) over 'pay less to build a solution that meets current regulation but does not allow reuse of water or solids removed during treatment' (16%).

- Preference for a more expensive solution that reuses water and removed solids is highest among younger residents (84% of 18-54 years vs. 74% of 55+ years) and women (86% vs. 76% of men).

Impact of Potential Revenue on Support for Higher Cost Solution (Among Those Not Opting to Pay More for a Solution that Allows Potential Reuse of Water and Removed Solids for Energy Recovery)

Respondents who did not opt to pay more were told that costs could be reduced by using technology that allows recovered solids to be used for revenue.

Nearly six-in-ten (59%) of these respondents say they are more likely to support a solution that can reuse water and removed solids if higher project costs can be reduced by revenue (20% 'much more likely to support', 39% 'somewhat more likely to support'). Four-in-ten (39%) say this has 'no impact' on their support.

Overall, the results of these two questions suggest that 92% of all residents either prefer or may be willing to consider a more expensive treatment solution that allows for potential reuse of water and removed solids if revenue could help reduce costs.

AMOUNT WILLING TO PAY PER DAY (AMONG THOSE SAYING THEY ARE MORE LIKELY TO SUPPORT/DEPENDS/DON'T KNOW IN Q4)

Respondents who said they were more likely to support (as well as those saying depends or don't know) a solution that can reuse water and removed solids if higher project costs can be reduced by revenue were then asked a series of questions around the amount they would be willing to pay per day for a higher treatment level*.

Reasonable Amount to Pay Per Day

When asked what would be a reasonable amount for each household to pay per day, one-quarter (24%) of these respondents say 0 cents/day. The most common response is 1 to 25 cents/day (42%).

Starting to Get Expensive

When asked what price they consider the solution as starting to get expensive, the most common response is 26 to 50 cents/day (35%).

So Expensive that No Longer Willing to Support

When asked what price they consider the solution to be so expensive that they would not be willing to support it, the most common response is 51 to 75 cents/day (34%).

**Small base size, interpret with caution.*

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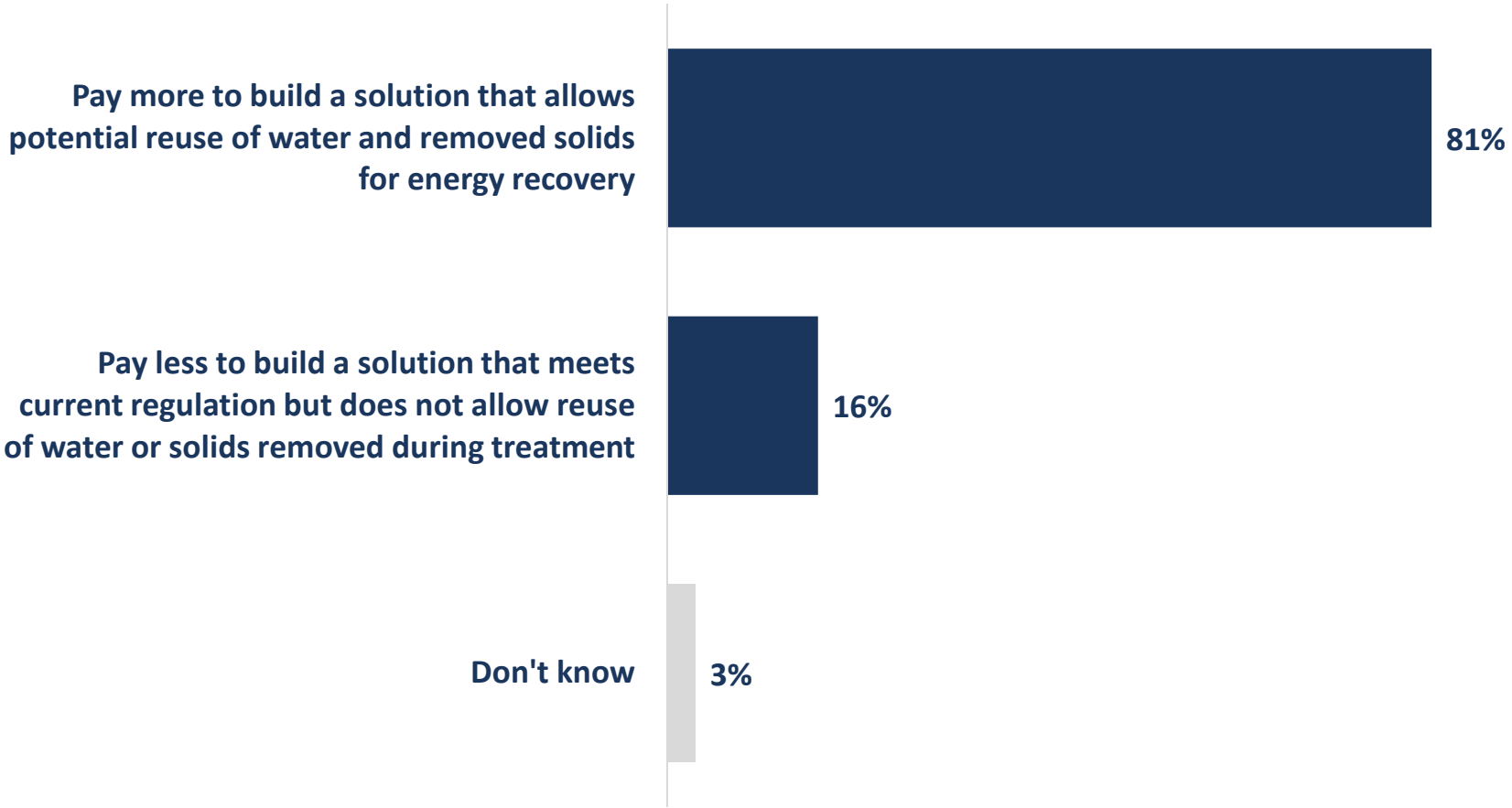
OVERALL DESIGN PREFERENCE



The cost of building a wastewater treatment solution is unknown until the location and capabilities of the wastewater treatment solution are finalized. These next few questions ask about wastewater treatment solution location and technology options that effect costs.

Q3. Which of the following two options do you support more?

Base: All respondents (n=401)

IMPACT OF POTENTIAL REVENUE ON SUPPORT FOR HIGHER COST SOLUTION (AMONG THOSE NOT OPTING TO PAY MORE FOR A SOLUTION THAT ALLOWS POTENTIAL REUSE OF WATER AND REMOVED SOLIDS FOR ENERGY RECOVERY)

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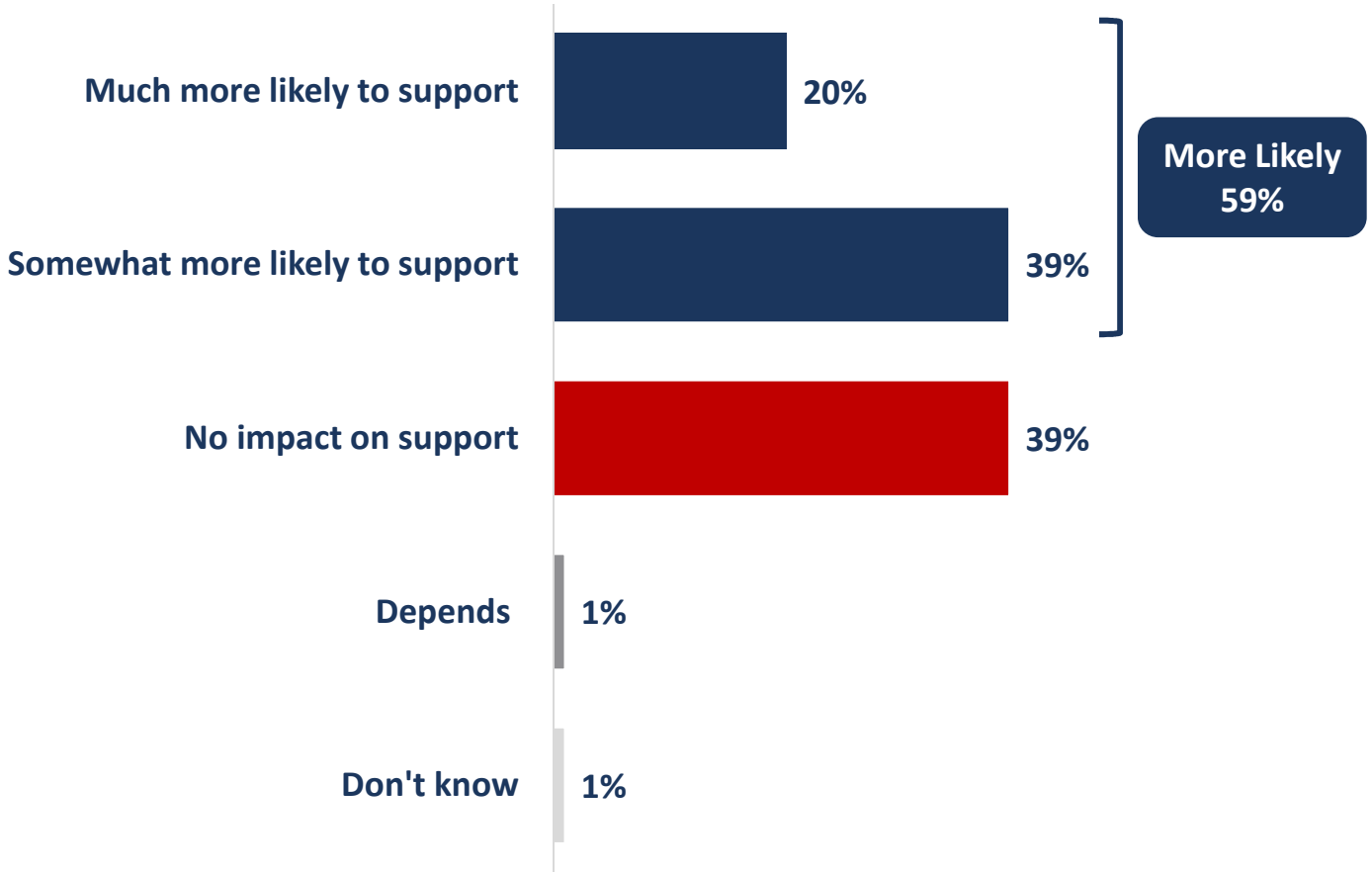

Small base size, interpret with caution.

Q4. Costs could be reduced by using technology that allows recovered solids to be used for revenue. What impact, if any, does knowing that higher project costs can be reduced by revenue have on your support for a solution that can reuse water and removed solids?

Base: Those not opting to pay more for a solution that allows potential reuse of water and removed solids for energy recovery (n=82)*

AMOUNT WILLING TO PAY PER DAY (AMONG THOSE SAYING THEY ARE MORE LIKELY TO SUPPORT/DEPENDS/DON'T KNOW IN Q4)

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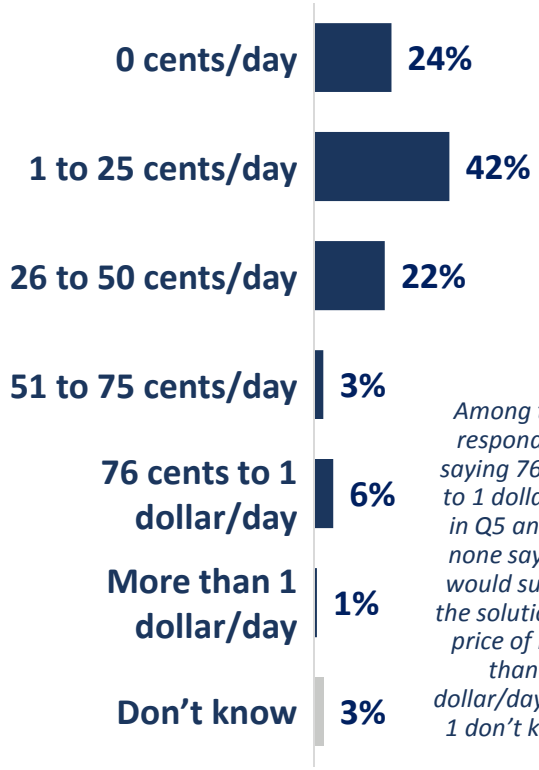
Reasonable Amount to Pay Per Day

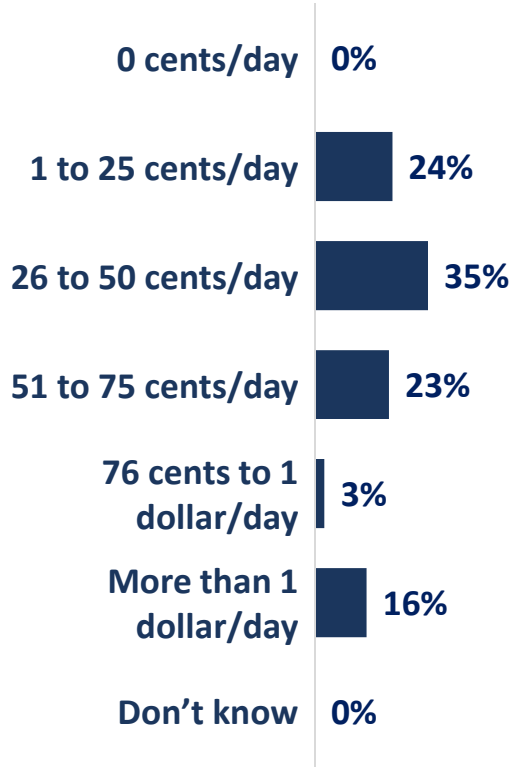


Among the 5 respondents saying 76 cents to 1 dollar/day in Q5 and Q6, none say they would support the solution at a price of more than 1 dollar/day (4 no, 1 don't know).

Q5. Regulations require the region to treat wastewater to at least secondary treatment levels. If there were additional costs attached to a higher level of treatment, what would be a reasonable amount for each household to pay per day?

Base: Those saying they are more likely to support/depends/don't know in Q4 (n=49)*

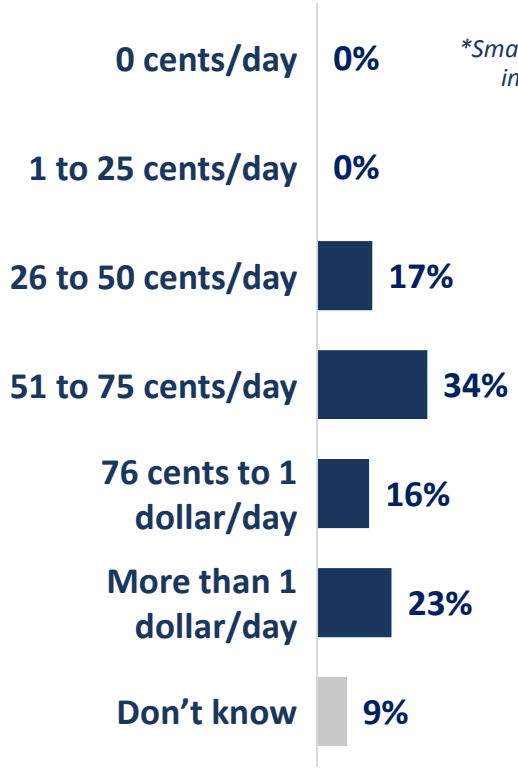
Starting to Get Expensive



Q6. At what price would you consider such a solution as starting to get expensive so that it is not out of the question but you would have to give it more thought before supporting it?

Base: Those saying 75 cents per day or less in Q5 (n=43)*

So Expensive that No Longer Willing to Support



**Small base sizes, interpret with caution.*

Q7. At what price would you consider the solution to be so expensive that you would not be willing to support it?

Base: Those saying 75 cents per day or less in Q6 (n=37)*

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DESIGN PRIORITIES

DESIGN PRIORITIES – BALANCING COSTS WITH DESIGN SOLUTIONS

Respondents were read a series of questions presenting higher and lower cost design solutions, and asked which one they were more likely to support in each scenario.

Overall, the more expensive design solutions are preferred by a strong majority of residents in all instances.

- 78% prefer 'a higher cost solution that treats water so it can be used for things like irrigation' versus 21% who prefer 'a lower cost solution that treats water but discharges it all into the ocean'.
- 84% prefer 'a higher cost solution that allows conversion of solids to produce revenue' versus 14% who prefer 'a lower cost solution that has no revenue potential and solids are placed in landfill'.
- 78% prefer 'a higher cost wastewater treatment facility that allows for multi-use such as green space or renting as commercial property' versus 22% who prefer 'a lower cost wastewater treatment facility that has no multi-use or cost recovery purposes'.
- 80% prefer 'a higher cost solution that reduces the impact on neighbourhood quality of life' versus 18% who prefer 'a lower cost solution that has a bigger impact on neighbourhood quality of life'.

PRIORITIZING DESIGN PRIORITIES (AMONG THOSE WHO PREFER TWO OR MORE HIGHER COST SOLUTIONS)

Overall, 90% of residents prefer two or more higher cost design solutions.

When these respondents were asked which one of these higher cost design solutions is MOST IMPORTANT, the greatest emphasis is placed on 'a higher cost solution that treats water so it can be used for things like irrigation' (38%).

- Women are more likely than men to identify this as MOST IMPORTANT (44% vs. 32%).

While there is generally little differentiation in the MOST IMPORTANT ratings for the other three attributes, the results are more clear when looking at the solution deemed the SECOND MOST IMPORTANT, with 'a higher cost solution that allows conversion of solids to produce revenue' rising to the top (23% MOST IMPORTANT, 32% SECOND MOST IMPORTANT).

Of the two remaining options, residents place slightly greater emphasis on 'a higher cost solution that reduces the impact on neighbourhood quality of life' (21% MOST IMPORTANT, 19% SECOND MOST IMPORTANT) than 'a higher cost wastewater treatment facility that allows for multi-use such as green space or renting as commercial property' (17% MOST IMPORTANT, 14% SECOND MOST IMPORTANT).

DESIGN PRIORITIES – BALANCING COSTS WITH DISCHARGING VERSUS REUSING TREATED WATER

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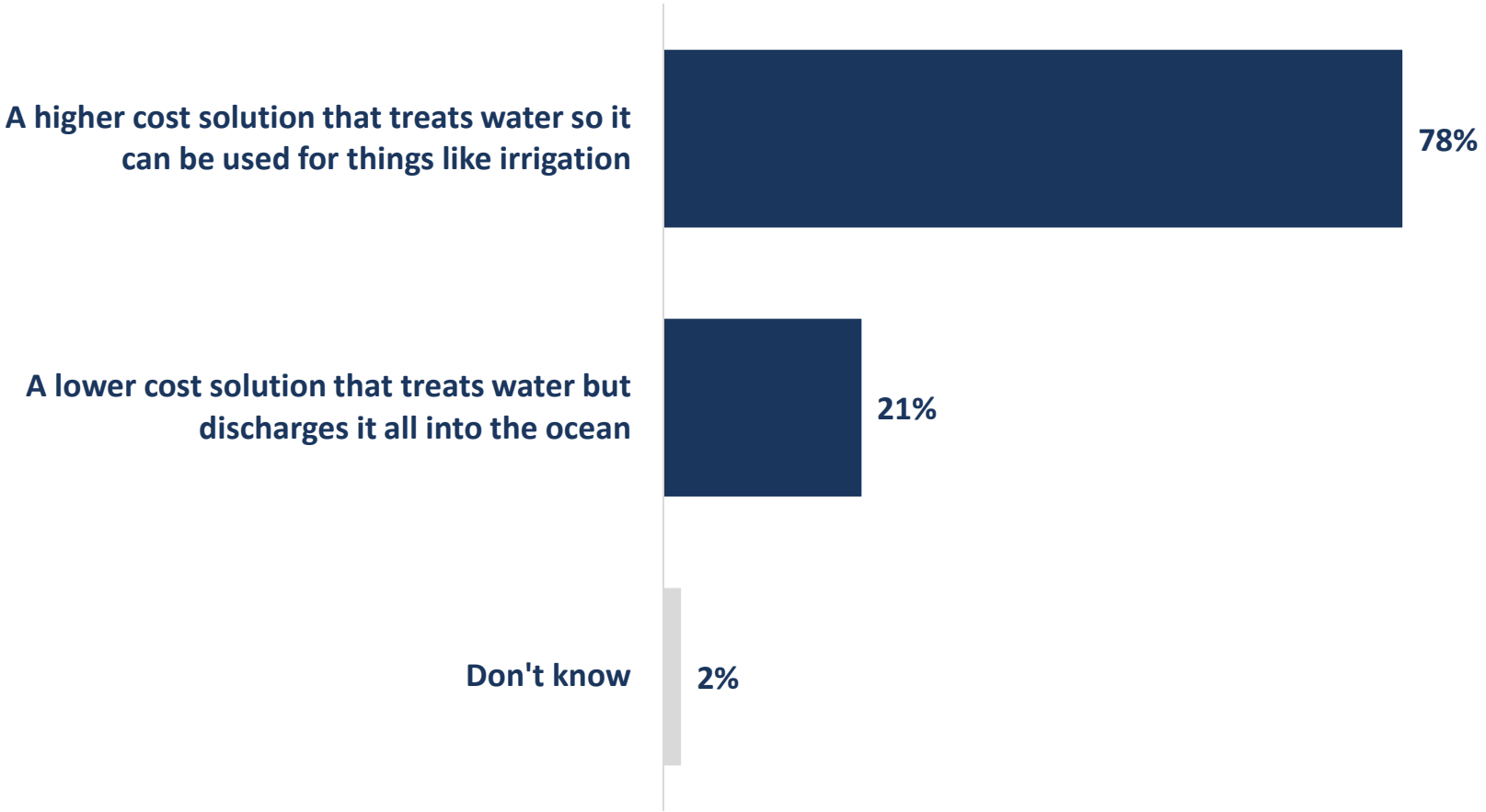

I am going to read you a series of wastewater solution design options that effect costs. For each one please tell me which choice you are more likely to support.
Q8. Which of the following solutions are you more likely to support?
Base: All respondents (n=401)

DESIGN PRIORITIES – BALANCING COSTS WITH CONVERTING SOLIDS VERSUS PLACING SOLIDS IN LANDFILL

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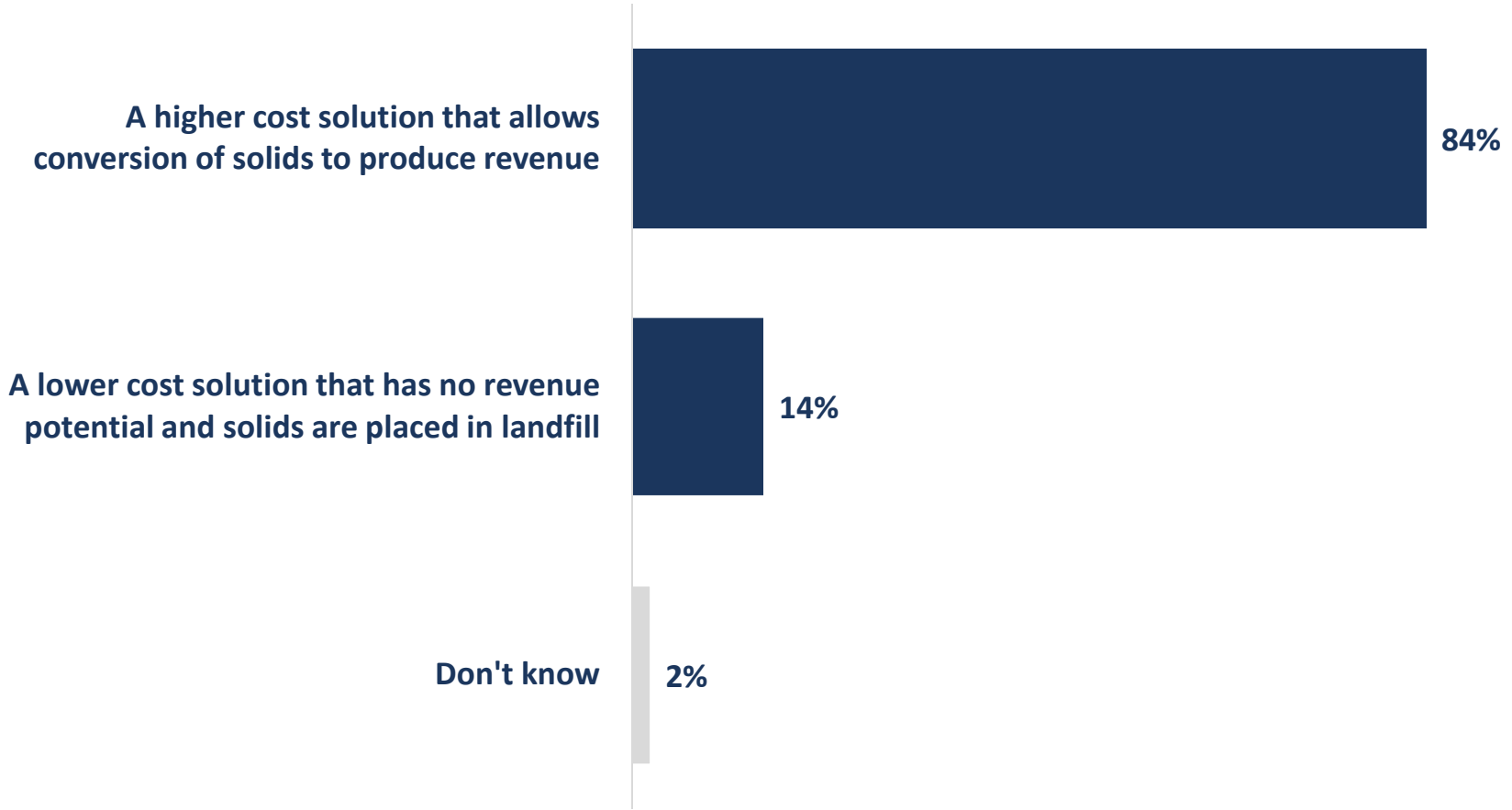
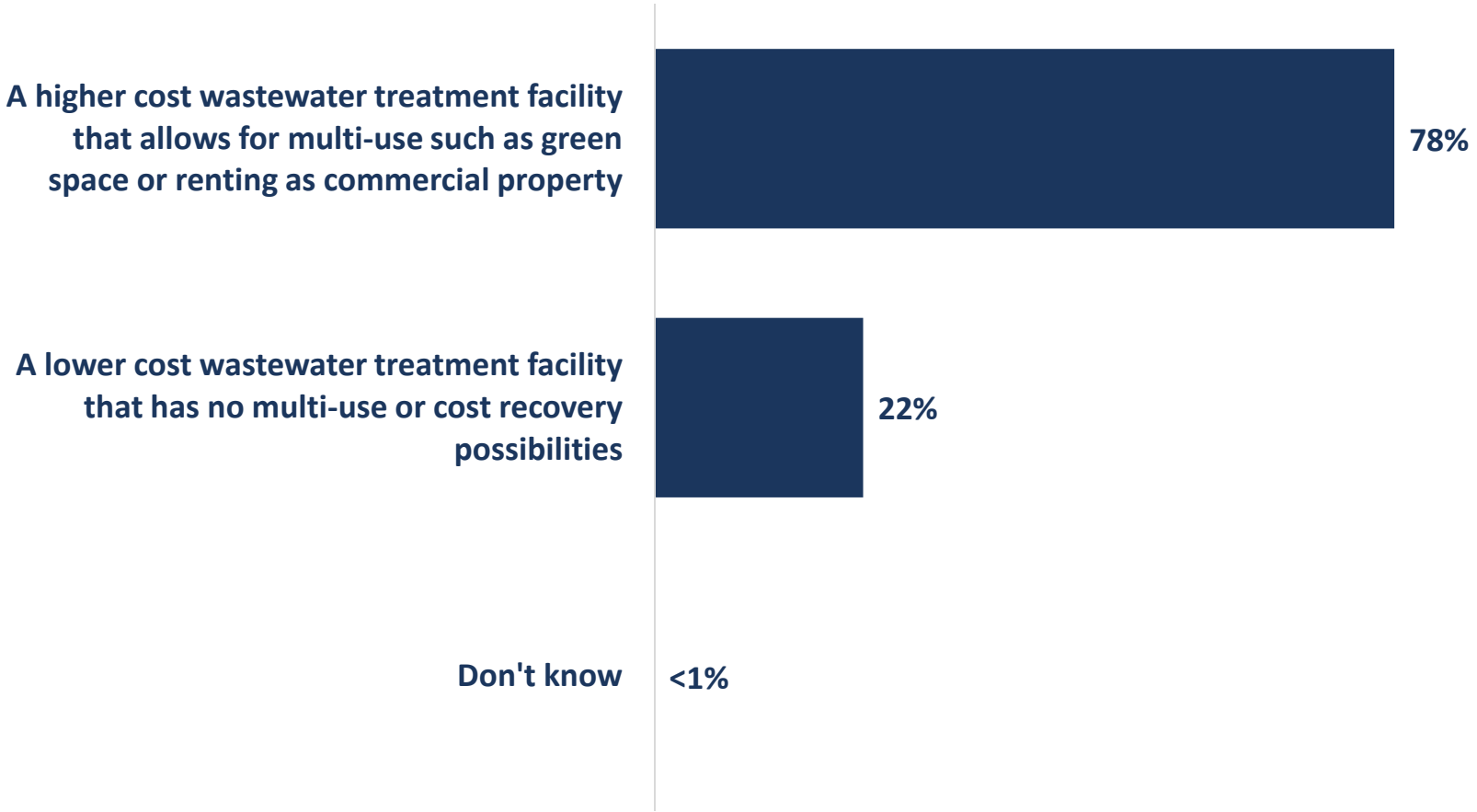


Q9. Converting solids to produce energy can produce revenues which may cover the additional cost of processing. Which one of the following solutions are you more likely to support?

Base: All respondents (n=401)

DESIGN PRIORITIES – BALANCING COSTS WITH MULTI-USE VERSUS NON MULTI-USE FACILITY

Ipsos Public Affairs



Q10. Which one of the following solutions are you more likely to support?
Base: All respondents (n=401)

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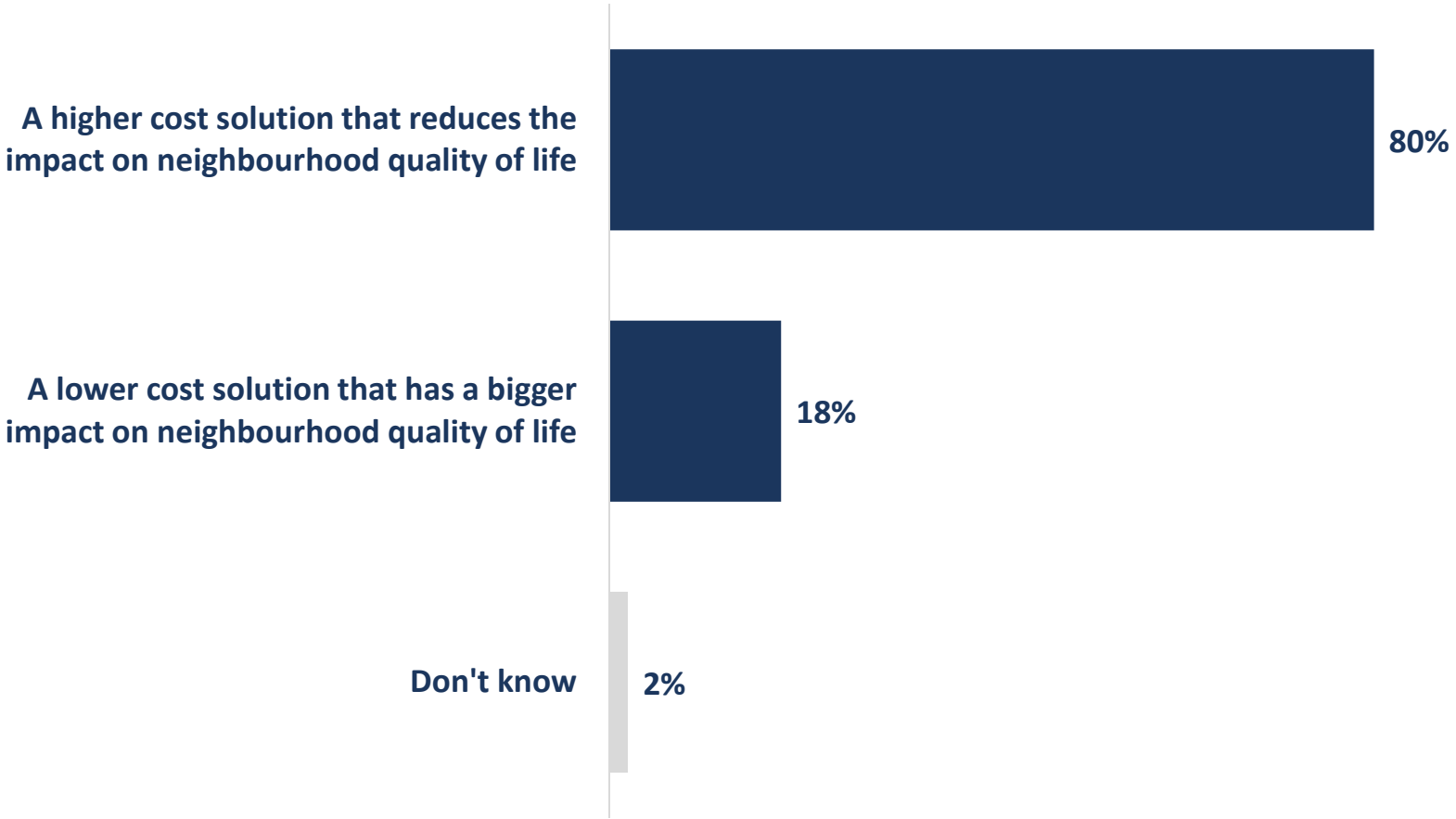
DESIGN PRIORITIES – BALANCING COSTS WITH IMPACT ON QUALITY OF LIFE



Q11. Which one of the following solutions are you more likely to support?
Base: All respondents (n=401)

PRIORITIZING DESIGN PRIORITIES (AMONG THOSE WHO PREFER TWO OR MORE HIGHER COST SOLUTIONS)

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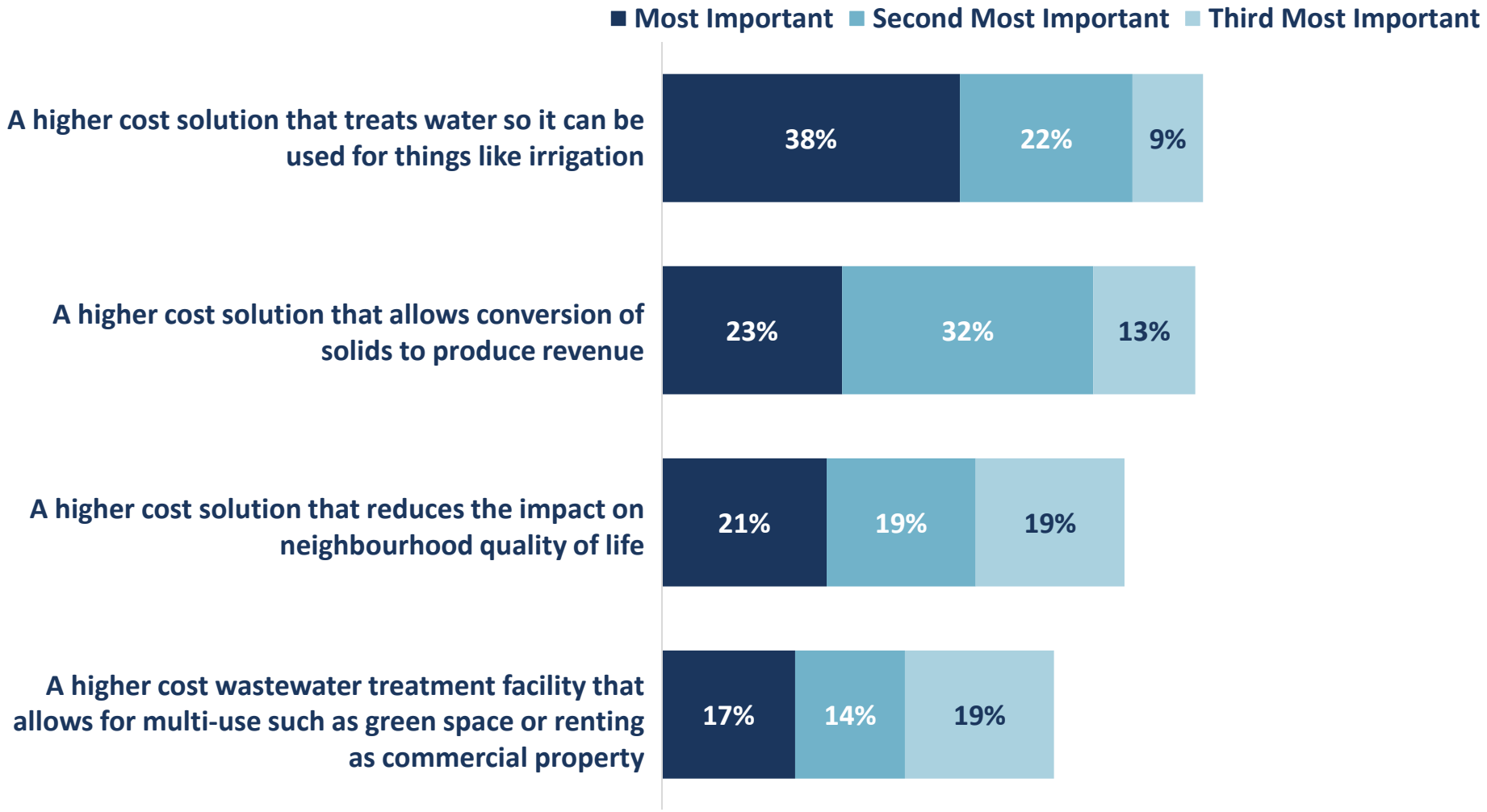

Q12. You supported more than one option that increases project costs. If only one of your choices was affordable, which one is **MOST** important to you? Which one is **SECOND MOST** important to you? Which one is **THIRD MOST** important to you?

Base: Those who prefer two or more higher cost solutions (n=357)

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ADDITIONAL COMMENTS AND SUGGESTIONS

ADDITIONAL COMMENTS AND SUGGESTIONS

At the end of the survey, respondents were asked if they had any final comments or suggestions related to the wastewater treatment project or this survey.

Overall, six-in-ten (60%) residents do not provide any additional comments or suggestions (includes 38% saying 'none/nothing' and 22% saying 'don't know').

Of the comments and suggestions that are provided, 'taking too long/should be done sooner' (10%) and 'just do it/get on with it' (9%) top the list. Another 7% mention 'a treatment plant is needed'. All other comments and suggestions are mentioned by less than 5% of respondents.

INTEREST IN BEING CONTACTED BY WESTSIDE SOLUTIONS FOR FUTURE SURVEYS OR PUBLIC CONSULTATION ACTIVITIES ON ISSUE

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Overall, one-third (34%) of respondents are interested in being contacted by Westside Solutions about future surveys or public consultation activities regarding this issue.

- Interest is highest among those living in Esquimalt/Esquimalt Nation/Songhees Nation (42% vs. 28% in Langford, 33% in Colwood, 36% in View Royal).

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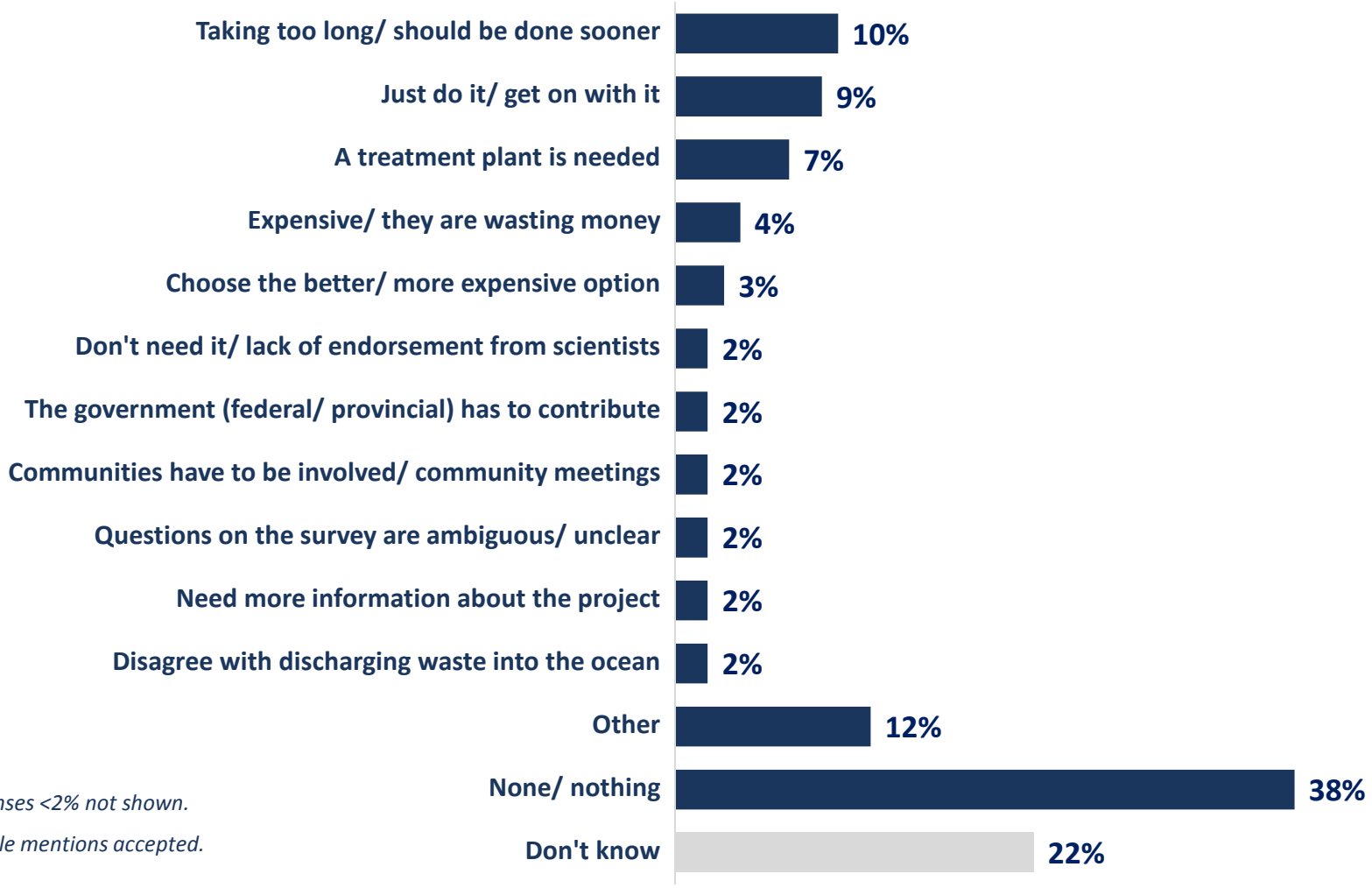
ADDITIONAL COMMENTS AND SUGGESTIONS



Responses <2% not shown.

Multiple mentions accepted.

Q16. Do you have any final comments or suggestions related to the wastewater treatment project or this survey? Any others?
Base: All respondents (n=401)

INTEREST IN BEING CONTACTED BY WESTSIDE SOLUTIONS FOR FUTURE SURVEYS OR PUBLIC CONSULTATION ACTIVITIES ON ISSUE

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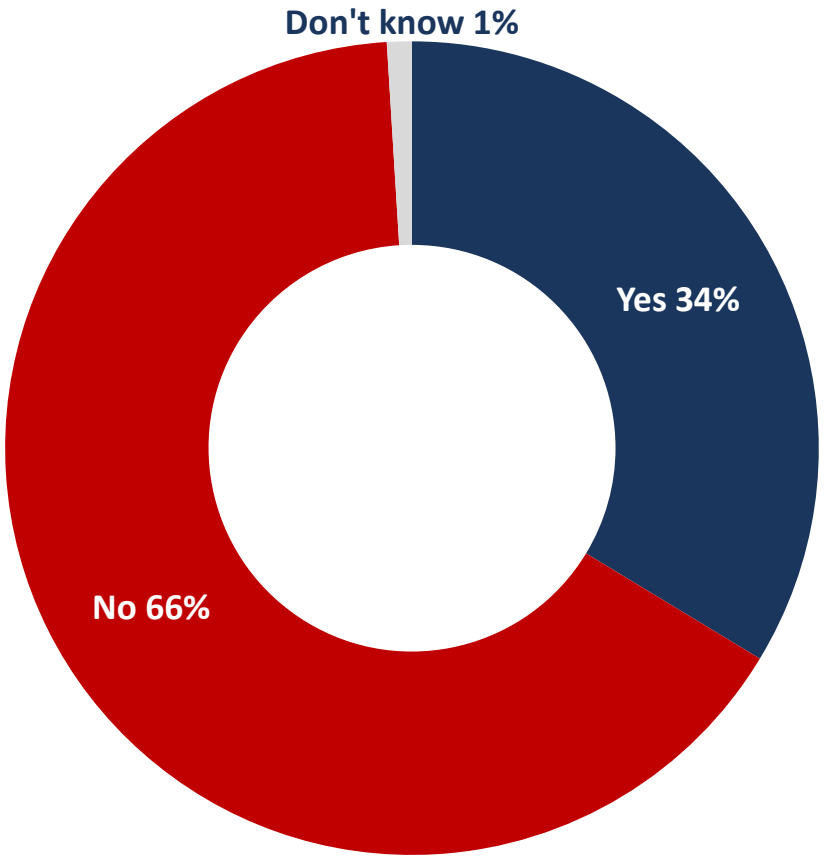

Q17. Many choices have yet to be made about the location and design of the region's wastewater management solution. Are you interested in being contacted by Westside Solutions about future surveys or public consultation activities regarding this issue?

Base: All respondents (n=401)

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WEIGHTED SAMPLE CHARACTERISTICS

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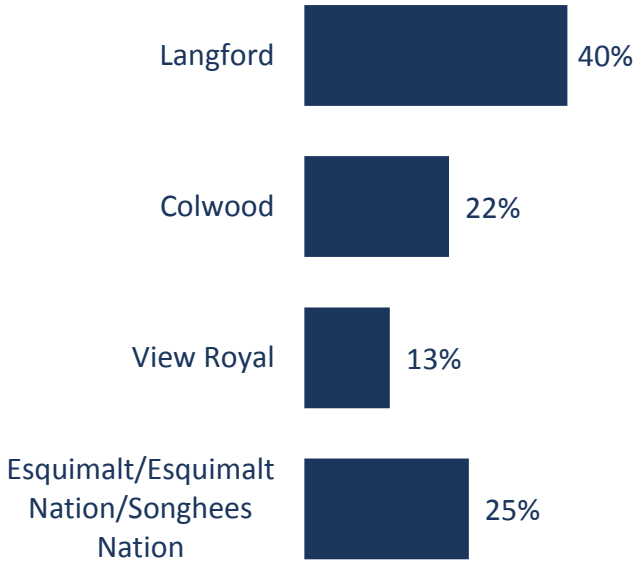
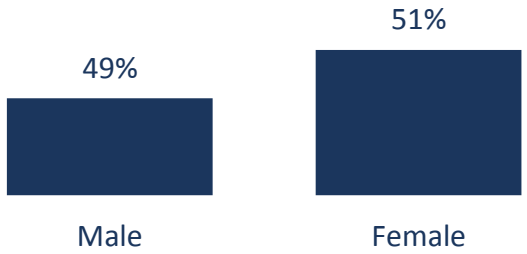
WEIGHTED SAMPLE CHARACTERISTICS

COMMUNITY

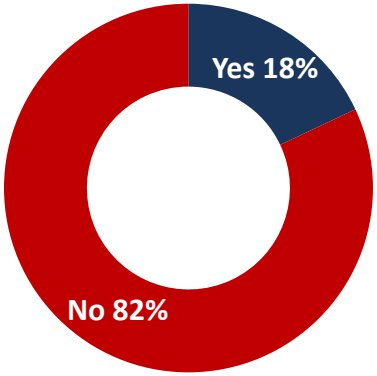


AGE

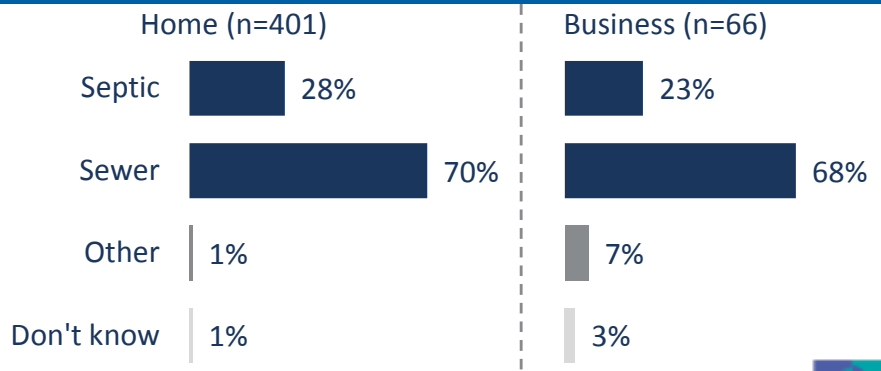
GENDER



OWN A BUSINESS



SEPTIC OR SEWER SERVICE



GAME CHANGERS

Ipsos Public Affairs

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Making a difference...together

REPORT TO THE EASTSIDE AND WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE MEETINGS OF WEDNESDAY, JANUARY 6 AND 8, 2016 RESPECTIVELY

SUBJECT Core Area Sewage and Resource Recovery System Cost Sharing

ISSUE

To provide the Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees with cost sharing impacts for the various sewer option sets, comparing "design capacity benefit" allocations with two possible options for unitized cost sharing.

BACKGROUND

The current cost sharing under Bylaw No 2312 "Liquid Waste Management Core Area and Western Communities Service Establishment Bylaw No. 1, 1995", as amended, is based on design capacity benefit.

A description of this allocation was included in the December 9th, 2015 report to the Core Area Liquid Waste Management Committee "Draft Technical Memorandum #3 – Costing and Financial Analysis". Subsequent to that meeting, discussion has transpired regarding alternative costing on an "all for one basis" across the entire system and an "all for one basis" Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees.

During discussions on capital cost sharing for the previous wastewater treatment system, the program configuration was such that all participants had a vested interest in the capital infrastructure as a whole, thus, the design capacity benefit for each participant was a share in the entire system, rather than by component sets.

Attached are summary schedules comparing the total capital cost for the five option sets presented in December, and estimated 2020 operating costs and 2030 operating cost projections. Additionally included are summary option comparisons for the annual estimated cost per participant household, after grant, at 2030. Also included are individual schedules for each participant comparing total the annual cost per option set and comparing Household costs by option set and cost sharing methodology.

The summary schedules were previously distributed to the participant administrators for review on December 18th, 2015.

ALTERNATIVES

1. That the Select Committees review the documentation and make a recommendation to the Core Area Committee meeting scheduled for January 13, 2016.

2. That the Select Committees receive this report for information.

FINANCIAL IMPLICATIONS

The various cost sharing alternatives result a range of differences per participant household. The cost sharing is defined within the Establishment Bylaw and a change to that Bylaw would require the approval of 2/3rds of the participating municipalities, the Board, and the Inspector of Municipalities. The First Nations participate under the original Letters Patent, so are not part of the statutory approval process for Bylaw No 2313.

CONCLUSION

The method of cost sharing is defined within the current Establishment Bylaw. Two options for cost sharing have been calculated for information purposes.

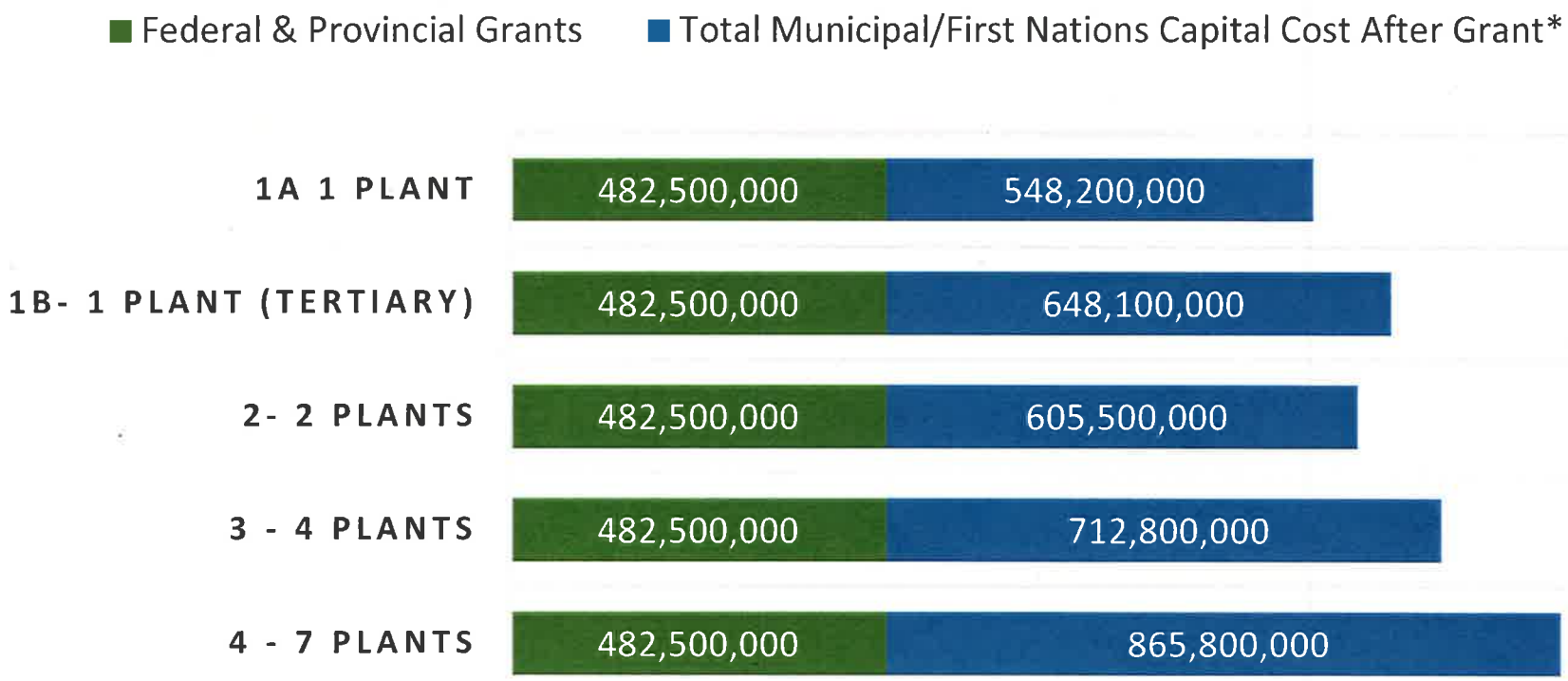
RECOMMENDATION(S)

That the Select Committees review the documentation and make a recommendation to the Core Area Liquid Waste Management Committee meeting scheduled for January 13, 2016.

Prepared by:	Diana E. Lokken, CPA, CMA, General Manager, Finance & Technology
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

Attachments: Appendix A: Core Area Sewage Treatment Capital Costs – All Options

CORE AREA SEWAGE TREATMENT CAPITAL COSTS - ALL OPTIONS



Core Area Waste Water Treatment Program Options - Costing

Option	Capital Cost	Federal & Provincial Grants	Total Municipal/First Nations Capital Cost After Grant*	Operating Costs (at 2020)	Operating Costs (at 2030)
1a 1 plant	1,030,700,000	482,500,000	548,200,000	16,895,000	21,765,000
1b- 1 plant (Tertiary)	1,130,600,000	482,500,000	648,100,000	21,631,667	26,435,000
2- 2 plants	1,088,000,000	482,500,000	605,500,000	17,736,667	22,810,000
3 - 4 plants	1,195,300,000	482,500,000	712,800,000	19,481,667	25,345,000
4 - 7 plants	1,348,300,000	482,500,000	865,800,000	20,513,333	26,630,000

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		Total Annual Cost	63,847,080
Annual Debt	42,082,080	Annual Operating	21,765,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	591	582	(10)
Saanich	365	372	8
Victoria	513	509	(4)
Esquimalt	455	471	16
View Royal	430	417	(13)
Colwood	254	248	(5)
Langford	415	406	(9)

OPTION 1b - 1 PLANT TERTIARY		Total Annual Cost	76,214,460
Annual Debt	49,779,460	Annual Operating	26,435,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	705	695	(10)
Saanich	437	444	8
Victoria	611	608	(4)
Esquimalt	546	562	16
View Royal	511	498	(13)
Colwood	302	296	(5)
Langford	493	484	(9)

OPTION 2 - 2 PLANTS		Total Annual Cost	69,331,955
Annual Debt	46,521,955	Annual Operating	22,810,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	590	630	40
Saanich	364	404	40
Victoria	512	552	41
Esquimalt	454	511	57
View Royal	429	454	24
Colwood	767	270	(497)
Langford	414	441	27

OPTION 3 - 4 PLANTS		Total Annual Cost	80,220,524
Annual Debt	54,875,524	Annual Operating	25,345,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	573	728	156
Saanich	437	468	30
Victoria	504	639	135
Esquimalt	724	591	(133)
View Royal	593	526	(67)
Colwood	864	313	(552)
Langford	572	511	(61)

OPTION 4 - 7 PLANTS		Total Annual Cost	93,452,382
Annual Debt	66,822,382	Annual Operating	26,630,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	590	845	254
Saanich	509	545	36
Victoria	519	743	224
Esquimalt	1,075	689	(386)
View Royal	987	615	(372)
Colwood	711	365	(345)
Langford	793	598	(195)

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		Total Annual Cost	63,847,080
Annual Debt	42,082,080	Annual Operating	21,765,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	591	598	7
Saanich	365	383	18
Victoria	513	523	11
Esquimalt	455	436	(19)
View Royal	430	389	(41)
Colwood	254	229	(24)
Langford	415	375	(40)

OPTION 1b - 1 PLANT TERTIARY		Total Annual Cost	76,214,460
Annual Debt	49,779,460	Annual Operating	26,435,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	705	712	7
Saanich	437	455	18
Victoria	611	622	11
Esquimalt	546	527	(19)
View Royal	511	470	(41)
Colwood	302	277	(24)
Langford	493	453	(40)

OPTION 2 - 2 PLANTS		Total Annual Cost	69,331,955
Annual Debt	46,521,955	Annual Operating	22,810,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	590	598	7
Saanich	364	382	18
Victoria	512	522	11
Esquimalt	454	584	130
View Royal	429	524	94
Colwood	767	309	(458)
Langford	414	505	91

OPTION 3 - 4 PLANTS		Total Annual Cost	80,220,524
Annual Debt	54,875,524	Annual Operating	25,345,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	573	651	78
Saanich	437	415	(23)
Victoria	504	568	64
Esquimalt	724	761	37
View Royal	593	689	96
Colwood	864	405	(459)
Langford	572	665	93

OPTION 4 - 7 PLANTS		Total Annual Cost	93,452,382
Annual Debt	66,822,382	Annual Operating	26,630,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	590	692	102
Saanich	509	442	(68)
Victoria	519	604	85
Esquimalt	1,075	1,022	(53)
View Royal	987	930	(57)
Colwood	711	547	(164)
Langford	793	899	105

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

OAK BAY - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,639,130	1,518,845	4,157,975
Option 1b - 1 plant tertiary	3,110,767	1,844,571	4,955,339
Option 2 - 2 plants	2,633,312	1,518,845	4,152,158
Option 3 - 4 plants	2,483,697	1,543,919	4,027,616
Option 4 - 7 plants	2,609,910	1,542,697	4,152,607

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,675,460	1,533,526	4,208,986
3,147,119	1,859,252	5,006,371
2,669,675	1,533,526	4,203,201
2,790,030	1,789,476	4,579,506
3,021,909	1,846,277	4,868,186

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,571,683	1,518,078	4,089,761
3,042,078	1,843,804	4,885,882
2,843,008	1,590,965	4,433,973
3,353,504	1,767,778	5,121,282
4,083,590	1,857,405	5,940,995

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	591
Option 1a - 1 plant tertiary	705
Option 2 - 2 plants	590
Option 3 - 4 plants	573
Option 4 - 7 plants	590

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
591	598	7
705	712	7
590	598	7
573	651	78
590	692	102

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
591	582	(10)
705	695	(10)
590	630	40
573	728	156
590	845	254

SAANICH - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	12,424,952	6,565,431	18,990,383
Option 1b - 1 plant tertiary	14,767,783	7,974,385	22,742,167
Option 2 - 2 plants	12,395,439	6,565,431	18,960,870
Option 3 - 4 plants	15,733,702	7,045,131	22,778,833
Option 4 - 7 plants	18,862,549	7,656,080	26,518,629

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
13,292,430	6,633,392	19,925,822
15,635,761	8,042,346	23,678,107
13,263,689	6,633,392	19,897,081
13,861,645	7,740,524	21,602,169
15,013,682	7,986,223	22,999,904

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
12,819,448	6,566,569	19,386,018
15,164,299	7,975,523	23,139,822
14,171,966	6,881,849	21,053,815
16,716,711	7,646,667	24,363,377
20,356,078	8,034,355	28,390,433

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	365
Option 1a - 1 plant tertiary	437
Option 2 - 2 plants	364
Option 3 - 4 plants	437
Option 4 - 7 plants	509

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
365	383	18
437	455	18
364	382	18
437	415	(23)
509	442	(68)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
365	372	8
437	444	8
364	404	40
437	468	30
509	545	36

VICTORIA - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	15,083,168	8,087,462	23,170,629
Option 1b - 1 plant tertiary	17,811,719	9,822,141	27,633,861
Option 2 - 2 plants	15,049,347	8,087,462	23,136,808
Option 3 - 4 plants	14,575,991	8,208,501	22,784,492
Option 4 - 7 plants	15,249,488	8,203,773	23,453,261

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
15,478,872	8,166,918	23,645,790
18,207,651	9,901,598	28,109,249
15,445,402	8,166,918	23,612,320
16,141,715	9,530,000	25,671,715
17,483,248	9,832,500	27,315,748

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
14,923,552	8,084,647	23,008,200
17,653,272	9,819,327	27,472,598
16,498,064	8,472,814	24,970,878
19,460,487	9,414,444	28,874,931
23,697,197	9,891,760	33,588,957

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	513
Option 1a - 1 plant tertiary	611
Option 2 - 2 plants	512
Option 3 - 4 plants	504
Option 4 - 7 plants	519

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
513	523	11
611	622	11
512	522	11
504	568	64
519	604	85

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
513	509	(4)
611	608	(4)
512	552	41
504	639	135
519	743	224

ESQUIMALT - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,624,683	1,446,838	4,071,520
Option 1b - 1 plant tertiary	3,130,399	1,757,413	4,887,813
Option 2 - 2 plants	2,618,261	1,446,838	4,065,099
Option 3 - 4 plants	4,435,635	2,044,482	6,480,117
Option 4 - 7 plants	7,084,597	2,537,323	9,621,920

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,497,049	1,404,907	3,901,956
3,002,692	1,715,483	4,718,174
3,555,445	1,675,222	5,230,667
5,184,628	1,625,773	6,810,401
7,349,708	1,801,672	9,151,380

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,766,507	1,447,470	4,213,977
3,272,539	1,758,045	5,030,584
3,058,388	1,516,967	4,575,355
3,607,558	1,685,556	5,293,113
4,392,953	1,771,014	6,163,967

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	455
Option 1a - 1 plant tertiary	546
Option 2 - 2 plants	454
Option 3 - 4 plants	724
Option 4 - 7 plants	1,075

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
455	436	(19)
546	527	(19)
454	584	130
724	761	37
1,075	1,022	(53)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
455	471	16
546	562	16
454	511	57
724	591	(133)
1,075	689	(386)

VIEW ROYAL - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,424,284	635,197	2,059,481
Option 1b - 1 plant tertiary	1,676,496	771,547	2,448,043
Option 2 - 2 plants	1,421,184	635,197	2,056,381
Option 3 - 4 plants	2,004,725	836,114	2,840,839
Option 4 - 7 plants	3,679,504	1,047,314	4,726,818

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
1,245,007	616,788	1,861,796
1,497,117	753,139	2,250,255
1,772,715	735,463	2,508,178
2,585,012	713,754	3,298,766
3,664,502	790,978	4,455,480

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,363,771	635,474	1,999,246
1,613,223	771,825	2,385,048
1,507,656	665,985	2,173,641
1,778,373	740,000	2,518,373
2,165,540	777,518	2,943,058

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	430
Option 1a - 1 plant tertiary	511
Option 2 - 2 plants	429
Option 3 - 4 plants	593
Option 4 - 7 plants	987

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
430	389	(41)
511	470	(41)
429	524	94
593	689	96
987	930	(57)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
430	417	(13)
511	498	(13)
429	454	24
593	526	(67)
987	615	(372)

COLWOOD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,890,998	864,574	2,755,572
Option 1b - 1 plant tertiary	2,225,856	1,050,162	3,276,018
Option 2 - 2 plants	6,422,590	1,909,574	8,332,163
Option 3 - 4 plants	7,203,807	2,183,044	9,386,851
Option 4 - 7 plants	6,184,109	1,533,756	7,717,865

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
1,652,976	839,517	2,492,493
1,987,697	1,025,105	3,012,803
2,353,604	1,001,047	3,354,652
3,432,078	971,498	4,403,576
4,865,300	1,076,609	5,941,908

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,831,350	864,951	2,696,301
2,166,328	1,050,539	3,216,868
2,024,567	906,480	2,931,047
2,388,102	1,007,222	3,395,324
2,908,011	1,058,289	3,966,300

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	254
Option 1a - 1 plant tertiary	302
Option 2 - 2 plants	767
Option 3 - 4 plants	864
Option 4 - 7 plants	711

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
254	229	(24)
302	277	(24)
767	309	(458)
864	405	(459)
711	547	(164)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
254	248	(5)
302	296	(5)
767	270	(497)
864	313	(552)
711	365	(345)

LANGFORD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	5,713,228	2,523,143	8,236,372
Option 1b - 1 plant tertiary	6,724,928	3,064,757	9,789,685
Option 2 - 2 plants	5,700,796	2,523,143	8,223,940
Option 3 - 4 plants	8,041,552	3,321,231	11,362,784
Option 4 - 7 plants	11,988,259	3,763,543	15,751,802

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
4,994,098	2,450,020	7,444,118
6,005,383	2,991,634	8,997,018
7,110,889	2,921,424	10,032,313
10,369,256	2,835,189	13,204,445
14,699,416	3,141,940	17,841,356

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
5,533,014	2,524,246	8,057,260
6,545,077	3,065,860	9,610,937
6,116,776	2,645,442	8,762,218
7,215,115	2,939,444	10,154,560
8,785,906	3,088,475	11,874,381

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	415
Option 1a - 1 plant tertiary	493
Option 2 - 2 plants	414
Option 3 - 4 plants	572
Option 4 - 7 plants	793

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
415	375	(40)
493	453	(40)
414	505	91
572	665	93
793	899	105

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
415	406	(9)
493	484	(9)
414	441	27
572	511	(61)
793	598	(195)

SONGHEES NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	241,404	105,866	347,270
Option 1b - 1 plant tertiary	284,152	128,591	412,743
Option 2 - 2 plants	240,879	105,866	346,745
Option 3 - 4 plants	339,784	139,352	479,136
Option 4 - 7 plants	1,025,339	298,640	1,323,979

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
211,018	102,798	313,816
253,749	125,523	379,272
300,460	122,577	423,037
438,138	118,959	557,097
621,102	131,830	752,932

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
233,789	105,912	339,702
276,553	128,637	405,190
258,455	110,998	369,453
304,864	123,333	428,197
371,235	129,586	500,822

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

ESQUIMALT NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	40,234	17,644	57,878
Option 1b - 1 plant tertiary	47,359	21,432	68,791
Option 2 - 2 plants	40,146	17,644	57,791
Option 3 - 4 plants	56,631	23,225	79,856
Option 4 - 7 plants	138,627	46,874	185,501

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
35,170	17,133	52,303
42,291	20,921	63,212
50,077	20,430	70,506
73,023	19,826	92,849
103,517	21,972	125,489

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
38,965	17,652	56,617
46,092	21,440	67,532
43,076	18,500	61,575
50,811	20,556	71,366
61,873	21,598	83,470

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Making a difference...together

EHQ 16-06

REPORT TO WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE
MEETING OF FRIDAY, JANUARY 8, 2016

SUBJECT **Cost Comparison of Budgets – New Options versus Previous Plan**

ISSUE

To provide the Westside Wastewater Treatment and Resource Recovery Select Committee with a cost comparison of the estimate prepared by Urban Systems/Carollo for Option Set 1A with the previous Liquid Waste Management Plan capital program budget estimate.

BACKGROUND

At the December 9 Core Area Liquid Waste Management Committee meeting, members requested follow-up information on a series of technical and financial matters related to the Options Sets currently under consideration for the Core Area Liquid Waste Management Plan (LWMP). One such request was a cost comparison of the Urban Systems/Carollo cost estimates with the previous LWMP capital program. This same request has been made by Mayor Young.

A table presenting a global comparison of cost estimate Option 1A with the previous capital program, along with the actual bid price for the McLoughlin Point wastewater treatment facility, is presented in Appendix A, along with explanatory context and footnotes.

RECOMMENDATION

That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.

Submitted by:	Dan Telford, P.Eng., Senior Manager, Environmental Engineering
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services

LH:cl

Attachment: Appendix A – Cost Comparison – Previous LWMP Capital Program with Urban Systems/Carollo Cost Estimate

Cost Comparison – Previous LWMP Capital Program with Urban Systems/Carollo Cost Estimate

The following table presents a summary comparison of the budget envelope for the previous Liquid Waste Management Plan (LWMP) capital program with the cost estimate for Option 1A as prepared by Urban Systems/Carollo. Also provided is the RFP bid price for the liquid treatment component received in early 2014. When making comparisons, soft costs must be accounted for and can represent significant costs including: contingences, financing, engineering (including owner's representative consulting, site inspection and contract management) and administration (project management office including salaries for project director, project managers, clerical, comptroller, scheduler and risk manager in addition to expenses such as real estate fees, legal fees, corporate overhead and office lease).

In both the summary budget prepared in 2010 and the new cost estimates prepared in 2015, soft costs are rolled into each system component line item. Tendered bids from construction consortiums do not include soft costs, although a contingency may be stipulated. The summary presented below is a global comparison and is not intended to provide a detailed comparison of individual system components or unit rates.

System Component	Previous LWMP Budget Estimate		RFP Bid Price/Added Costs		Urban Systems/Carollo	Cost Variance Bid Price vs. Urban Systems/Carollo Estimate[10]
	2010 Budget Allowance[1]	2015 (11.5% Escalation)[2]	2014 Bid Price[3]	Soft Costs Added and Escalated 2 Years[4,5]	2015 Option 1A	
Conveyance[6]	101,587,000	113,270,000			244,300,000	
Liquid Treatment	333,125,000	371,434,000	178,376,000	361,968,000	392,000,000	8.3%
Solids Treatment[7]	283,844,000	316,486,000			258,000,000	
Existing System Upgrades[8]	54,107,000	60,329,000			45,000,000	
Resource Recovery	3,000,000	3,345,000			24,200,000	
Land[9]	13,000,000	14,495,000			67,150,000	
Total	**788,663,000**	**879,359,000**			**1,030,650,000**	

Notes:

1. Includes 94% allowance for soft costs (i.e., general requirements, project contingency, engineering, administration and program management, misc., interim financing, inflation to mid-term)
2. Cost escalation of 11.5% from 2010 to 2015 is based on *Engineering News Record* construction cost index, Stats Canada construction base index for Victoria area, impact of the exchange rate and recent construction-related projects.
3. Bid price adjusted to remove conveyance, harbour crossing and marine outfall components carried in other line items.
4. Soft costs added to liquid treatment bid price based on 94% allowance to be consistent with the previous LWMP budget estimate.
5. Cost escalation for 2014 and 2015 based on 2.3% per year (as per note 2 above).

6. The US/Carollo budget estimate provide servicing for conveyancing to 2045, compared to 2030 under the previous Program. Conveyancing includes new outfalls and harbour crossing under both Programs.
7. The previous capital plan included a biosolids dryer, struvite recovery
8. Includes projects such as Trent Street siphon, ECI upgrades, Craigflower Pump Station and Arbutus attenuation tank.
9. Land costs allowances are higher in Rock Bay as compared to McLoughlin Point. The Urban Systems/Carollo land costs include site development, geotechnical and environmental allowances, as well as community benefit allowances not included in the previous 2010 LWMP budget estimate.
10. Cost variance between the RFP bid price, including 94% soft costs and 2 years escalation to 2015 versus the Urban Systems/Carollo 2015 estimate.

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EHQ 16-03

REPORT TO WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE MEETING OF FRIDAY, JANUARY 8, 2016

SUBJECT Westside Concept Planning – Phase 2 Budget Update No. 3

ISSUE

To provide the Westside Wastewater Treatment and Resource Recovery Select Committee (Westside Select Committee) with a monthly budget update.

BACKGROUND

At its meeting of November 5, 2014, the Westside Select Committee directed staff to provide a budget status update on a monthly basis for the identification of potential treatment sites and public consultation phase of the project.

Phase 1 of the Concept Planning for this project was completed and closed out on August 31, 2015. The Phase 1 Final Budget Update No. 8 was approved by the Westside Select Committee on September 29, 2015 with actual expenditures of $366,870. Phase 1 invoices that were received after September 29 have been added to the Phase 2 budget, in the Revised Budget column of Appendix A.

Phase 2 of the Concept Planning for this project commenced September 1, 2015 and at the Committee's October 25 meeting, Budget Update No. 2 was approved.

Aurora Innovations' contract to provide consulting services to support the Westside Liquid Waste Management Project was extended by 1 month to now expire on January 31, 2016 for an additional maximum fee of $15,000 plus GST. This additional amount is reflected in the Revised Budget column in Appendix A.

Phase 2 Budget Update No. 3 provides actual expenses and outstanding commitments to November 30, 2015, as summarized in Appendix A.

FINANCIAL IMPLICATIONS

Under the Core Area Wastewater Treatment Program budget, requisitioned funds can only be apportioned on the cost sharing basis on which they were raised. The cost sharing of the Program budget is currently apportioned based on 2030 design capacity, 70% average dry weather flow and 30% average annual flow, as previously declared by each participant. This cost sharing may be revisited by the participants in the service. The Westside collectively accounts for 26.76% of the total Core Area requisition funds raised. Westside expenditures will be funded from the four Westside municipal participant's requisition funds as follows.

Colwood	15.92%
Esquimalt	24.85%
Langford	47.31%
View Royal	11.92%

CONCLUSION

Phase 2 Concept Planning for the project commenced on September 1, 2015. Due to the accelerated pace of work on the project, invoicing received from some of the suppliers and consultants has tended to lag somewhat. The actual expenditures incurred but invoiced after the reporting cutoff date are carried forward to the following update report. The Committee will continue to receive monthly budget updates through the course of the project.

RECOMMENDATION

That the Westside Wastewater Treatment and Resource Recovery Select Committee receive this report for information.

Submitted by:	Dan Telford, P.Eng., Senior Manager, Environmental Engineering
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services

DT:mer

Attachment: Appendix A – Westside Concept Planning – Phase 2 Budget Update No. 3

APPENDIX A

WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY
SELECT COMMITTEE

Westside Concept Planning - Phase 2 Budget Update No. 3
November 30, 2015

	BUDGET	REVISED BUDGET (Oct 2015)	REVISED BUDGET (Dec 2015)	ACTUAL	COMMITTED	TOTAL	REMAINING
Outreach							
Consultants							
Outreach and Consultation	48,562	67,799	82,799	39,093	27,500	66,593	16,206
Technical Support	60,000	64,260	64,260	55,398	8,862	64,260	-
Outreach Disbursements	40,000	44,928	44,928	5,728		5,728	39,200
Project Management							
Staff and Wages	20,000	20,000	20,000	-		-	20,000
Miscellaneous	5,000	5,022	5,022	22		22	5,000
Westside Total	**$ 173,562**	**$ 202,009**	**$ 217,009**	**$ 100,241**	**$ 36,362**	**$ 136,603**	**$ 80,406**

Revised Budget (Oct 2015) due to late invoices from Phase 1.
Revised Budget (Dec 2015) due to Aurora contract extension in Phase 2.

Motion for Which Notice Has Been Given:

OPTIONS FOR WASTEWATER TREATMENT – DIRECTOR HAMILTON

WHEREAS: It is critical that there be positive action taken to meet funding deadlines and regulatory requirements for waste water treatment for the Capital Regional District;

BE IT RESOLVED that: Capital Regional District (CRD) staff be directed to support municipalities and First Nations who want to explore options for waste water treatment that are economically responsible, technically feasible, environmentally sound and meet current provincial and federal deadlines;

AND THAT funding be provided from the sewage treatment budget to support an independent assessment of alternative locations to McLoughlin and Hartland, with full and regular engagement of staff and elected representatives from participating municipalities, First Nations and the public; and,

AND THAT any decisions taken to amend the Liquid Waste Management Plan be done in an open and transparent public process;

AND THAT any further money spent be recoverable under the funding arrangement with the Provincial and Federal Governments and that clarity be sought that the funding arrangement with Provincial and Federal governments be able to support the communities to the extent it supported the CRD driven process .

August 5, 2014

Capital Regional District
625 Fisgard St.,
Victoria, BC V8W 1R7

Notice of Meeting and Meeting Agenda

Eastside Wastewater Treatment and Resource Recovery Select Committee

Wednesday, January 6, 2016 | **2:30 PM** | **6th Floor Boardroom**

L. Helps (Chair), V. Derman (Vice Chair), M. Alto, R. Atwell, S. Brice, J. Brownoff, B. Isitt, N. Jensen, C. Plant, G. Young

1. Approval of Agenda

2. Adoption of Minutes

2.1. **16-8** Adoption of the Minutes of October 21, 2015

Recommendation: That the minutes of October 21, 2015 be adopted.

Attachments: 2015-10-21 Minutes Eastside WTRRSC

3. Chair's Remarks

4. Presentations/Delegations

4.1. **16-10** Presentation: Eastside Public Advisory Committee - Verbal Update

4.2. **16-16** Delegation: David Langley, re item 5.2

Attachments: Delegation Request: David Langley re item 5.2

4.3. **16-21** Delegation: Bryan Gilbert re items 5.1 and 5.2

Attachments: Delegation Request: Bryan Gilbert re Items 5.1 and 5.2

5. Committee Business

5.1. **16-11** Eastside Public Consultation Update
A. Gibbs will make a PowerPoint presentation to be circulated at the meeting

Attachments: Staff Report: Eastside Public Consultation Update

5.2. **16-14** Cost Sharing Options

Recommendation: That the Select Committees review the documentation and make a recommendation to the Core Area Liquid Waste Management Committee meeting scheduled for January 13, 2016.

Attachments: Staff Report: Core Area Sewage and Resource Recovery System Cost Sharing

Appendix A: Core Area Sewage Treatment Capital Costs - All Options

5.3. **16-12** Eastside Concept Planning - Phase 2 Budget Update No. 2

Recommendation: That the Eastside Wastewater Treatment and Resource Recovery Select Committee receive this budget update for information.

Attachments: Staff Report: Eastside Concept Planning Phase 2 Budget Update No.2

Appendix A: Phase 2 Budget Update No. 2

Staff Report COPY: Eastside Concept Planning Phase 2 Budget Update No.2

5.4. **16-13** Westside Wastewater Treatment and Resource Recovery Select Committee - Verbal Update

5.5. **16-9** Minutes of the Meetings of the Eastside Public Advisory Committee of October 27, November 10, December 1, and December 15, 2015 for Information

Recommendation: That the Eastside Public Advisory Committee minutes of October 27, November 10, December 1, and December 15, 2015 be received for information.

Attachments: 2015-10-27 Minutes Eastside Public Advisory Committee

2015-11-10 Minutes Eastside Public Advisory Committee

2015-12-01 Minutes Eastside Public Advisory Committee

2015-12-15 Minutes Eastside Public Advisory Committee

6. New Business

6.1. **16-19** Amendment to Section 7.0 of the Eastside Public Advisory Committee Terms of Reference

Recommendation: (The following recommendation arose from the December 1, 2015, meeting of the Eastside Select Committee)
That the Eastside Wastewater Treatment and Resource Recovery Select Committee recommend to the Core Area Liquid Waste Management Committee to recommend to the Capital Regional District Board:
That section 7.0 of the terms of reference for the Eastside Public Advisory Committee be amended to add the words "or designated members", as follows: "The Chair and Vice Chair or designated members of the Eastside Select Committee will also Chair and Vice Chair the Eastside Public Advisory Committee."

Attachments: Revised Terms of Reference Eastside Public Advisory Committee

7. Adjournment

Next Meeting: TBA

To ensure quorum, please advise Nancy More 250-360-3129 if you or your alternate are unable to attend.

Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Meeting Minutes

Eastside Wastewater Treatment and Resource Recovery Select Committee

Wednesday, October 21, 2015 | **2:30 PM** | **6th Floor Boardroom**

PRESENT:

MEMBERS: L. Helps (Chair), V. Derman (Vice Chair), M. Alto, R. Atwell, S. Brice, J. Brownoff, J. Loveday (for B. Isitt), N. Jensen (2:36), F. Haynes (for C. Plant), G. Young

STAFF: B. Lapham, Chief Administrative Officer; L. Hutcheson, General Manager, Parks and Environmental Services; D. Telford, Senior Manager Environmental Engineering; S. Santarossa, Corporate Officer; A. Orr, Senior Manager Corporate Communications; L. Taylor, Communications Coordinator; A. Genero, Manager Accounting Services; S. Henderson, Manager, Real Estate, Risk & Real Estate; A. Boyd, Committee Clerk (recorder)

OTHERS PRESENT: E. Lee, Urban Systems, J. Knock, Eastside Public Advisory Committee; A. Gibbs, Public Assembly; C. Houghton, Westside Solutions

The meeting was called to order at 2:30 p.m.

1. Approval of Agenda

MOVED by Director Alto, SECONDED by Director Brownoff,
That the agenda be approved.
CARRIED

2. Motion to Close the Meeting

2.1. **15-1132** Motion to Close

MOVED by Director Derman, SECONDED by Alternate Director Loveday,
That the Committee close the meeting in accordance with the Community Charter, Part 4, Division 3, 90 (1) (a) personal information about an identifiable individual who holds or is being considered for a position as an officer, employee or agent of the regional district or another position appointed by the regional district, 90 (1) (j) information that is prohibited, or information that if it were presented in a document would be prohibited, from disclosure under section 21 of the Freedom of Information and Protection of Privacy Act and 90 (1) (m) a matter that, under another enactment, is such that the public may be excluded from the meeting.
CARRIED

The meeting moved to closed session at 2:31 p.m.
The meeting reconvened in open session at 2:41 p.m.

3. Adoption of Minutes

3.1. 15-1134 Adoption of the Minutes of September 16, 2015

MOVED by Director Brownoff, SECONDED by Alternate Director Loveday,
That the minutes of September 16, 2015 be adopted.
CARRIED

4. Chair's Remarks

Chair Helps noted the substantial number of items of business on the agenda.

5. Presentations/Delegations

5.1. 15-1143 Presentation: Eastside Public Advisory Committee Update

Mr. Jim Knock provided a verbal update on the Eastside Public Advisory Committee. He noted that the Committee has been very pleased with the progress, recognizing the shift to integrate the two sides.
Concerns noted were:
- Are we reaching the same group of people when we survey?
- Maintaining volunteers for the committee
- Maintaining the momentum

6. Committee Business

6.1. 15-1138 Presentation - Proposed Option Sets - from Urban Systems

E. Lee, of Urban Systems provided a presentation on the proposed option sets for information noting the objective to ensure the 4 options sets provide for a breadth of possibilities.

Discussion ensued relative to:
- water reuse and heat recovery
- optimizing the cost of conveyance
- some locations can address multiple criteria

MOVED by Alternate Director Haynes, SECONDED by Director Derman,
That the presentation be received for information.
CARRIED

6.2. 15-1140 Eastside Wastewater Treatment - Phase 2 Public Involvement and Education Plan

A. Gibbs provided a presentation on the Public Involvement and Education Plan highlighting the process to date and on-going activities .

Discussion ensued relative to:
- diversity of tools is a positive
- are we reaching the same number of people?
- use of videos - ensure people will watch them
- taking advantage of the Christmas shopping season to reach the public

MOVED by Director Alto, SECONDED by Alternate Director Haynes,
That the Eastside Wastewater and Resource Recovery Select Committee endorse the public consultation plan as presented in Appendix A.
CARRIED

6.3. 15-1139 Eastside Concept Planning - Phase 2 Budget Update No. 1

Alternate Director F. Haynes left at 4:23 p.m.

L. Hutcheson noted that this budget is for Eastside Select Committee and is only until the end of December.

MOVED by Director Derman, SECONDED by Alternate Director Loveday,
That the Eastside Wastewater Treatment and Resource Recovery Select Committee receive this budget update for information.
CARRIED

6.4. 15-1137 Westside Wastewater Treatment and Resource Recovery Select Committee - Verbal Update

Alternate Director F. Haynes returned at 4:24 p.m.

On behalf of the Co-Chairs, C. Houghton provided a verbal update from the Westside Wastewater Treatment and Resource Recovery Select Committee meeting. She noted that Urban Systems and Carollo Engineers brought forward a presentation last week to Westside Select Committee on liquids and solids. Moving forward, the Committee tasked Urban Systems and Carollo to only examine 50 megalitre flows and not 35 megalitre flows. Work continues to narrow the option sets.

MOVED by Director Derman, SECONDED by Director Brownoff,
That the verbal update be received for information.
CARRIED

6.5. 15-1136 Minutes of the Meeting of the Eastside Public Advisory Committee September 17, 2015 for Information

MOVED by Director Derman, SECONDED by Director Alto,
That the minutes of the Eastside Public Advisory Committee September 17, 2015 be received for information.
CARRIED

7. New Business

8. Adjournment

MOVED by Director Alto, SECONDED by Alternate Director Loveday,
That the meeting be adjourned at 4:30 p.m.
CARRIED

_____

CHAIR

_____

RECORDER

Nancy More

From:
Sent: Friday, January 01, 2016 4:36 PM
To: Legserv
Subject: Addressing the Board - Submission

Categories: Eastside Select

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
David Langley

I represent::

Telephone::

Fax::

Email address::

Street address (optional)::

Municipality/Electoral Area in which you reside::
Saanich

I wish to address::
Eastside Select Committee

Meeting Date::
Jan 6th 2016

Agenda Item::
Item 5.2

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
Comments regarding Cost Sharing Options

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
No

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Nancy More

From:
Sent: Monday, January 04, 2016 12:26 PM
To: Legserv
Subject: Addressing the Board - Submission

Categories: Eastside Select

The following message was received through the form at 'https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees'. Neither the name nor the e-mail address can be confirmed as accurate.

••

Your name::
Bryan Gilbert

I represent::
myself as citizen of Victoria

Telephone::

Fax::

Email address::

Street address (optional)::

Municipality/Electoral Area in which you reside::
Victoria

I wish to address::
Eastside Select Committee

Meeting Date::
Jan 6, 2015

Agenda Item::
5.1 and 5.2

My reason(s) for appearing (is/are) and the substance of my presentation is as follows::
The CRD heard from a world leader in wastewater technology during a special meeting of the CALWMC on June 9th, 2015. This vendor stated they could treat the whole region's sewage for $250m capital costs and net zero long term operating costs; if they could optimize the system. They have a class C estimate.

This option is often referred to as the "250 million dollar option".

If this vendor can do it then others can too! My motivation is to save tax payers money and do something positive for the environment.

To date, this Eastside committee and the CALWMC have ignored the potential. The BEST they have to offer is a

BILLION dollar option with large long term costs.

Re 5.1 Public Engagement. The public was promised that all options are on the table and they would be given full cost information before you come back to the public for further consultation. You have promised so you must provide information similar to the $250m option or give a $2.5 billion reason why not.

Re 5.2 This cost allocation discussion is premature until the $250m option is part of the mix because it needs to have the answer to this question: "how to divvy up the profits?"

I will have a PowerPoint or video presentation and will submit it at least 24 hours in advance of the meeting.:
No

The meeting and my presentation will be webstreamed live via the CRD website and recorded.:
I understand,

Submitted at:1/4/2016 12:25:37 PM
Submitted via:https://www.crd.bc.ca/about/how-we-are-governed/addressing-the-board/addressing-the-crd-board-committees
User Agent:Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/47.0.2526.106 Safari/537.36
User Host Address:24.68.24.183

Making a difference...together

EHQ 15-

REPORT TO EASTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE
MEETING OF WEDNESDAY, JANUARY 6, 2016

SUBJECT Eastside Public Consultation Update

ISSUE

To provide the Eastside Wastewater Treatment and Resource Recovery Select Committee (Eastside Select Committee) with an update regarding Eastside public consultation activities.

BACKGROUND

In April 2015, the Eastside Select Committee launched Eastside Community Dialogues as a way to inform, educate and involve Eastside residents and stakeholders in decisions about wastewater treatment and resource recovery. Specifically, the public was consulted on potential site locations to distill down a list of technically feasible sites submitted by the Eastside municipalities. Eastside Community Dialogues hosted a number of successful public engagement initiatives, where more than 3000 citizens were engaged both face-to-face and online.

In the fall, Eastside Community Dialogues began planning for a second phase of consultation regarding the five Core Area option sets.

Below is a list of planned Eastside public consultation activities:

- Public Infrastructure Talk with Architects from Bruce Haden Architecture and Cascadia Architects
- Meetings with local organizations, community stakeholder groups and associations
- Eight 90-minute public workshops
- Twelve mall, library and community centre tabling
- Citizens Guide available in community centres, municipal halls and online

Recognizing that we are moving towards a Core Area approach, Eastside Community Dialogues and Westside Solutions began planning the integration of some Core Area wide public engagement approaches, while continuing to maintain the focus on responding to specific community processes and values.

Below is a list of planned integrated public consultation activities:

- Online survey
- Storefront at the 625 Fisgard building
- Postcard mailer to all Core Area residents
- Information available at community centres, municipal halls and online

All of the feedback collected through this phase of consultation will contribute to a decision at the CALWMC. The work of the Eastside and Westside Select Committees, the CALWMC and

feedback from the public inform the direction of the project and the work towards an amendment to the currently approved Liquid Waste Management Plan (LWMP).

CONCLUSION

The Eastside public consultation plan will provide Eastside residents opportunities to give feedback on the Core Area option sets to the Eastside Select Committee and Core Area Liquid Waste Management Committee, to assist the committees in identifying a preferred option set.

RECOMMENDATION

That the Eastside Wastewater Treatment and Resource Recovery Select Committee receive this update for information.

Submitted by:	Andy Orr, Senior Manager, Corporate Communications
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services

LT:cl

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REPORT TO THE EASTSIDE AND WESTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE MEETINGS OF WEDNESDAY, JANUARY 6 AND 8, 2016 RESPECTIVELY

SUBJECT Core Area Sewage and Resource Recovery System Cost Sharing

ISSUE

To provide the Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees with cost sharing impacts for the various sewer option sets, comparing "design capacity benefit" allocations with two possible options for unitized cost sharing.

BACKGROUND

The current cost sharing under Bylaw No 2312 "Liquid Waste Management Core Area and Western Communities Service Establishment Bylaw No. 1, 1995", as amended, is based on design capacity benefit.

A description of this allocation was included in the December 9th, 2015 report to the Core Area Liquid Waste Management Committee "Draft Technical Memorandum #3 – Costing and Financial Analysis". Subsequent to that meeting, discussion has transpired regarding alternative costing on an "all for one basis" across the entire system and an "all for one basis" Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees.

During discussions on capital cost sharing for the previous wastewater treatment system, the program configuration was such that all participants had a vested interest in the capital infrastructure as a whole, thus, the design capacity benefit for each participant was a share in the entire system, rather than by component sets.

Attached are summary schedules comparing the total capital cost for the five option sets presented in December, and estimated 2020 operating costs and 2030 operating cost projections. Additionally included are summary option comparisons for the annual estimated cost per participant household, after grant, at 2030. Also included are individual schedules for each participant comparing total the annual cost per option set and comparing Household costs by option set and cost sharing methodology.

The summary schedules were previously distributed to the participant administrators for review on December 18th, 2015.

ALTERNATIVES

1. That the Select Committees review the documentation and make a recommendation to the Core Area Committee meeting scheduled for January 13, 2016.

2. That the Select Committees receive this report for information.

FINANCIAL IMPLICATIONS

The various cost sharing alternatives result a range of differences per participant household. The cost sharing is defined within the Establishment Bylaw and a change to that Bylaw would require the approval of 2/3rds of the participating municipalities, the Board, and the Inspector of Municipalities. The First Nations participate under the original Letters Patent, so are not part of the statutory approval process for Bylaw No 2313.

CONCLUSION

The method of cost sharing is defined within the current Establishment Bylaw. Two options for cost sharing have been calculated for information purposes.

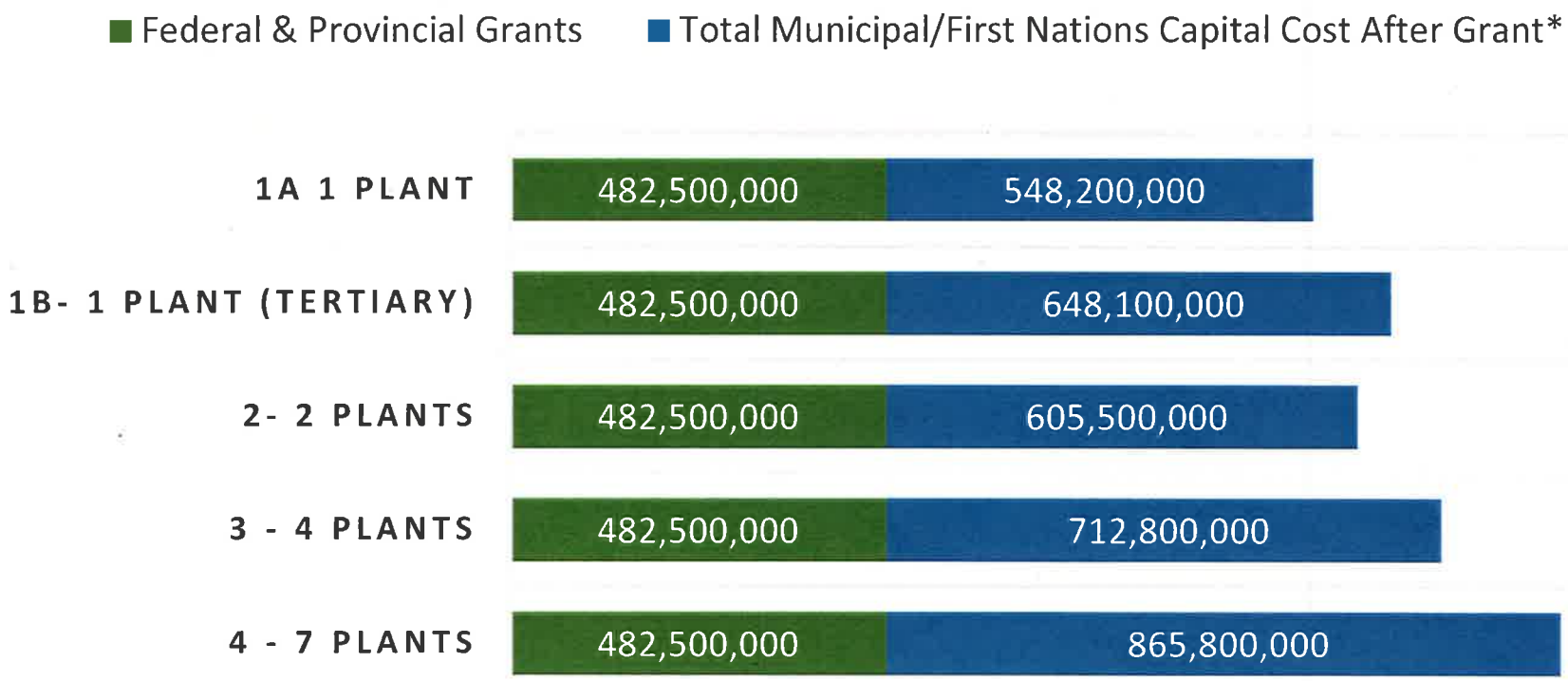
RECOMMENDATION(S)

That the Select Committees review the documentation and make a recommendation to the Core Area Liquid Waste Management Committee meeting scheduled for January 13, 2016.

Prepared by:	Diana E. Lokken, CPA, CMA, General Manager, Finance & Technology
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

Attachments: Appendix A: Core Area Sewage Treatment Capital Costs – All Options

CORE AREA SEWAGE TREATMENT CAPITAL COSTS - ALL OPTIONS



Core Area Waste Water Treatment Program Options - Costing

Option	Capital Cost	Federal & Provincial Grants	Total Municipal/First Nations Capital Cost After Grant*	Operating Costs (at 2020)	Operating Costs (at 2030)
1a 1 plant	1,030,700,000	482,500,000	548,200,000	16,895,000	21,765,000
1b- 1 plant (Tertiary)	1,130,600,000	482,500,000	648,100,000	21,631,667	26,435,000
2- 2 plants	1,088,000,000	482,500,000	605,500,000	17,736,667	22,810,000
3 - 4 plants	1,195,300,000	482,500,000	712,800,000	19,481,667	25,345,000
4 - 7 plants	1,348,300,000	482,500,000	865,800,000	20,513,333	26,630,000

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		Total Annual Cost	63,847,080
Annual Debt	42,082,080	Annual Operating	21,765,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	591	582	(10)
Saanich	365	372	8
Victoria	513	509	(4)
Esquimalt	455	471	16
View Royal	430	417	(13)
Colwood	254	248	(5)
Langford	415	406	(9)

OPTION 1b - 1 PLANT TERTIARY		Total Annual Cost	76,214,460
Annual Debt	49,779,460	Annual Operating	26,435,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	705	695	(10)
Saanich	437	444	8
Victoria	611	608	(4)
Esquimalt	546	562	16
View Royal	511	498	(13)
Colwood	302	296	(5)
Langford	493	484	(9)

OPTION 2 - 2 PLANTS		Total Annual Cost	69,331,955
Annual Debt	46,521,955	Annual Operating	22,810,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	590	630	40
Saanich	364	404	40
Victoria	512	552	41
Esquimalt	454	511	57
View Royal	429	454	24
Colwood	767	270	(497)
Langford	414	441	27

OPTION 3 - 4 PLANTS		Total Annual Cost	80,220,524
Annual Debt	54,875,524	Annual Operating	25,345,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	573	728	156
Saanich	437	468	30
Victoria	504	639	135
Esquimalt	724	591	(133)
View Royal	593	526	(67)
Colwood	864	313	(552)
Langford	572	511	(61)

OPTION 4 - 7 PLANTS		Total Annual Cost	93,452,382
Annual Debt	66,822,382	Annual Operating	26,630,000
	Design Capacity	All for One	Increase (Decrease)
Oak Bay	590	845	254
Saanich	509	545	36
Victoria	519	743	224
Esquimalt	1,075	689	(386)
View Royal	987	615	(372)
Colwood	711	365	(345)
Langford	793	598	(195)

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

ANNUAL ESTIMATED COST PER HOUSEHOLD (at 2030)
(after grant)

OPTION 1a - 1 PLANT		Total Annual Cost	63,847,080
Annual Debt	42,082,080	Annual Operating	21,765,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	591	598	7
Saanich	365	383	18
Victoria	513	523	11
Esquimalt	455	436	(19)
View Royal	430	389	(41)
Colwood	254	229	(24)
Langford	415	375	(40)

OPTION 1b - 1 PLANT TERTIARY		Total Annual Cost	76,214,460
Annual Debt	49,779,460	Annual Operating	26,435,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	705	712	7
Saanich	437	455	18
Victoria	611	622	11
Esquimalt	546	527	(19)
View Royal	511	470	(41)
Colwood	302	277	(24)
Langford	493	453	(40)

OPTION 2 - 2 PLANTS		Total Annual Cost	69,331,955
Annual Debt	46,521,955	Annual Operating	22,810,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	590	598	7
Saanich	364	382	18
Victoria	512	522	11
Esquimalt	454	584	130
View Royal	429	524	94
Colwood	767	309	(458)
Langford	414	505	91

OPTION 3 - 4 PLANTS		Total Annual Cost	80,220,524
Annual Debt	54,875,524	Annual Operating	25,345,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	573	651	78
Saanich	437	415	(23)
Victoria	504	568	64
Esquimalt	724	761	37
View Royal	593	689	96
Colwood	864	405	(459)
Langford	572	665	93

OPTION 4 - 7 PLANTS		Total Annual Cost	93,452,382
Annual Debt	66,822,382	Annual Operating	26,630,000
	Design Capacity	East West All for One	Increase (Decrease)
Oak Bay	590	692	102
Saanich	509	442	(68)
Victoria	519	604	85
Esquimalt	1,075	1,022	(53)
View Royal	987	930	(57)
Colwood	711	547	(164)
Langford	793	899	105

***updated Design Capacity
First Nations purchased overall capacity so their changes on individual sheets

OAK BAY - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,639,130	1,518,845	4,157,975
Option 1b - 1 plant tertiary	3,110,767	1,844,571	4,955,339
Option 2 - 2 plants	2,633,312	1,518,845	4,152,158
Option 3 - 4 plants	2,483,697	1,543,919	4,027,616
Option 4 - 7 plants	2,609,910	1,542,697	4,152,607

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,675,460	1,533,526	4,208,986
3,147,119	1,859,252	5,006,371
2,669,675	1,533,526	4,203,201
2,790,030	1,789,476	4,579,506
3,021,909	1,846,277	4,868,186

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,571,683	1,518,078	4,089,761
3,042,078	1,843,804	4,885,882
2,843,008	1,590,965	4,433,973
3,353,504	1,767,778	5,121,282
4,083,590	1,857,405	5,940,995

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	591
Option 1a - 1 plant tertiary	705
Option 2 - 2 plants	590
Option 3 - 4 plants	573
Option 4 - 7 plants	590

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
591	598	7
705	712	7
590	598	7
573	651	78
590	692	102

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
591	582	(10)
705	695	(10)
590	630	40
573	728	156
590	845	254

SAANICH - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	12,424,952	6,565,431	18,990,383
Option 1b - 1 plant tertiary	14,767,783	7,974,385	22,742,167
Option 2 - 2 plants	12,395,439	6,565,431	18,960,870
Option 3 - 4 plants	15,733,702	7,045,131	22,778,833
Option 4 - 7 plants	18,862,549	7,656,080	26,518,629

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
13,292,430	6,633,392	19,925,822
15,635,761	8,042,346	23,678,107
13,263,689	6,633,392	19,897,081
13,861,645	7,740,524	21,602,169
15,013,682	7,986,223	22,999,904

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
12,819,448	6,566,569	19,386,018
15,164,299	7,975,523	23,139,822
14,171,966	6,881,849	21,053,815
16,716,711	7,646,667	24,363,377
20,356,078	8,034,355	28,390,433

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	365
Option 1a - 1 plant tertiary	437
Option 2 - 2 plants	364
Option 3 - 4 plants	437
Option 4 - 7 plants	509

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
365	383	18
437	455	18
364	382	18
437	415	(23)
509	442	(68)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
365	372	8
437	444	8
364	404	40
437	468	30
509	545	36

VICTORIA - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	15,083,168	8,087,462	23,170,629
Option 1b - 1 plant tertiary	17,811,719	9,822,141	27,633,861
Option 2 - 2 plants	15,049,347	8,087,462	23,136,808
Option 3 - 4 plants	14,575,991	8,208,501	22,784,492
Option 4 - 7 plants	15,249,488	8,203,773	23,453,261

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
15,478,872	8,166,918	23,645,790
18,207,651	9,901,598	28,109,249
15,445,402	8,166,918	23,612,320
16,141,715	9,530,000	25,671,715
17,483,248	9,832,500	27,315,748

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
14,923,552	8,084,647	23,008,200
17,653,272	9,819,327	27,472,598
16,498,064	8,472,814	24,970,878
19,460,487	9,414,444	28,874,931
23,697,197	9,891,760	33,588,957

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	513
Option 1a - 1 plant tertiary	611
Option 2 - 2 plants	512
Option 3 - 4 plants	504
Option 4 - 7 plants	519

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
513	523	11
611	622	11
512	522	11
504	568	64
519	604	85

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
513	509	(4)
611	608	(4)
512	552	41
504	639	135
519	743	224

ESQUIMALT - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	2,624,683	1,446,838	4,071,520
Option 1b - 1 plant tertiary	3,130,399	1,757,413	4,887,813
Option 2 - 2 plants	2,618,261	1,446,838	4,065,099
Option 3 - 4 plants	4,435,635	2,044,482	6,480,117
Option 4 - 7 plants	7,084,597	2,537,323	9,621,920

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
2,497,049	1,404,907	3,901,956
3,002,692	1,715,483	4,718,174
3,555,445	1,675,222	5,230,667
5,184,628	1,625,773	6,810,401
7,349,708	1,801,672	9,151,380

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
2,766,507	1,447,470	4,213,977
3,272,539	1,758,045	5,030,584
3,058,388	1,516,967	4,575,355
3,607,558	1,685,556	5,293,113
4,392,953	1,771,014	6,163,967

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	455
Option 1a - 1 plant tertiary	546
Option 2 - 2 plants	454
Option 3 - 4 plants	724
Option 4 - 7 plants	1,075

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
455	436	(19)
546	527	(19)
454	584	130
724	761	37
1,075	1,022	(53)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
455	471	16
546	562	16
454	511	57
724	591	(133)
1,075	689	(386)

VIEW ROYAL - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,424,284	635,197	2,059,481
Option 1b - 1 plant tertiary	1,676,496	771,547	2,448,043
Option 2 - 2 plants	1,421,184	635,197	2,056,381
Option 3 - 4 plants	2,004,725	836,114	2,840,839
Option 4 - 7 plants	3,679,504	1,047,314	4,726,818

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
1,245,007	616,788	1,861,796
1,497,117	753,139	2,250,255
1,772,715	735,463	2,508,178
2,585,012	713,754	3,298,766
3,664,502	790,978	4,455,480

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,363,771	635,474	1,999,246
1,613,223	771,825	2,385,048
1,507,656	665,985	2,173,641
1,778,373	740,000	2,518,373
2,165,540	777,518	2,943,058

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	430
Option 1a - 1 plant tertiary	511
Option 2 - 2 plants	429
Option 3 - 4 plants	593
Option 4 - 7 plants	987

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
430	389	(41)
511	470	(41)
429	524	94
593	689	96
987	930	(57)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
430	417	(13)
511	498	(13)
429	454	24
593	526	(67)
987	615	(372)

COLWOOD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	1,890,998	864,574	2,755,572
Option 1b - 1 plant tertiary	2,225,856	1,050,162	3,276,018
Option 2 - 2 plants	6,422,590	1,909,574	8,332,163
Option 3 - 4 plants	7,203,807	2,183,044	9,386,851
Option 4 - 7 plants	6,184,109	1,533,756	7,717,865

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
1,652,976	839,517	2,492,493
1,987,697	1,025,105	3,012,803
2,353,604	1,001,047	3,354,652
3,432,078	971,498	4,403,576
4,865,300	1,076,609	5,941,908

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
1,831,350	864,951	2,696,301
2,166,328	1,050,539	3,216,868
2,024,567	906,480	2,931,047
2,388,102	1,007,222	3,395,324
2,908,011	1,058,289	3,966,300

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	254
Option 1a - 1 plant tertiary	302
Option 2 - 2 plants	767
Option 3 - 4 plants	864
Option 4 - 7 plants	711

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
254	229	(24)
302	277	(24)
767	309	(458)
864	405	(459)
711	547	(164)

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
254	248	(5)
302	296	(5)
767	270	(497)
864	313	(552)
711	365	(345)

LANGFORD - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	5,713,228	2,523,143	8,236,372
Option 1b - 1 plant tertiary	6,724,928	3,064,757	9,789,685
Option 2 - 2 plants	5,700,796	2,523,143	8,223,940
Option 3 - 4 plants	8,041,552	3,321,231	11,362,784
Option 4 - 7 plants	11,988,259	3,763,543	15,751,802

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
4,994,098	2,450,020	7,444,118
6,005,383	2,991,634	8,997,018
7,110,889	2,921,424	10,032,313
10,369,256	2,835,189	13,204,445
14,699,416	3,141,940	17,841,356

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
5,533,014	2,524,246	8,057,260
6,545,077	3,065,860	9,610,937
6,116,776	2,645,442	8,762,218
7,215,115	2,939,444	10,154,560
8,785,906	3,088,475	11,874,381

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	415
Option 1a - 1 plant tertiary	493
Option 2 - 2 plants	414
Option 3 - 4 plants	572
Option 4 - 7 plants	793

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
415	375	(40)
493	453	(40)
414	505	91
572	665	93
793	899	105

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
415	406	(9)
493	484	(9)
414	441	27
572	511	(61)
793	598	(195)

SONGHEES NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	241,404	105,866	347,270
Option 1b - 1 plant tertiary	284,152	128,591	412,743
Option 2 - 2 plants	240,879	105,866	346,745
Option 3 - 4 plants	339,784	139,352	479,136
Option 4 - 7 plants	1,025,339	298,640	1,323,979

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
211,018	102,798	313,816
253,749	125,523	379,272
300,460	122,577	423,037
438,138	118,959	557,097
621,102	131,830	752,932

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
233,789	105,912	339,702
276,553	128,637	405,190
258,455	110,998	369,453
304,864	123,333	428,197
371,235	129,586	500,822

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

ESQUIMALT NATION - ANNUAL ESTIMATED COSTS (at 2030)
(after grant)

Total Dollars - based on Design Capacity			
	Annual Debt	Annual Operating	Total
Option 1a - 1 plant	40,234	17,644	57,878
Option 1b - 1 plant tertiary	47,359	21,432	68,791
Option 2 - 2 plants	40,146	17,644	57,791
Option 3 - 4 plants	56,631	23,225	79,856
Option 4 - 7 plants	138,627	46,874	185,501

Total Dollars - based on Eastside All for One		
Annual Debt	Annual Operating	Total
35,170	17,133	52,303
42,291	20,921	63,212
50,077	20,430	70,506
73,023	19,826	92,849
103,517	21,972	125,489

Total Dollars - based on Total All for One		
Annual Debt	Annual Operating	Total
38,965	17,652	56,617
46,092	21,440	67,532
43,076	18,500	61,575
50,811	20,556	71,366
61,873	21,598	83,470

Dollars per Household (HH)	
	Design Capacity (at 2030)
Option 1 - 1 plant	-
Option 1a - 1 plant tertiary	-
Option 2 - 2 plants	-
Option 3 - 4 plants	-
Option 4 - 7 plants	-

Dollars per HH - Design vs Eastside All for One		
Design Capacity (at 2030)	All for One East (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Dollars per HH - Design vs Total All for One		
Design Capacity (at 2030)	All for One (at 2030)	Increase (Decrease)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Making a difference...together

EHQ 16-01

REPORT TO EASTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY SELECT COMMITTEE
MEETING OF WEDNESDAY, JANUARY 6, 2016

SUBJECT Eastside Concept Planning – Phase 2 Budget Update No. 2

ISSUE

To provide the Eastside Wastewater Treatment and Resource Recovery Select Committee (Eastside Select Committee) with a monthly budget update.

BACKGROUND

A detailed operating budget for the identification of potential treatment sites and public consultation phase with actual expenses and commitments is provided to the Eastside Select Committee on a monthly basis. Phase 1 of the Concept Planning for this project was completed and closed out on August 31, 2015. The Phase 1 Final Budget Update No. 5 was approved by the Committee on September 16, 2015. The actual expenditures for Phase 1 equaled $443,877. Phase 1 invoices that were received after September 29 have been added to the Phase 2 budget, in the Revised Budget column of Appendix A.

Phase 2 of the Concept Planning for this project commenced on September 1, 2015 and at its October 21, 2015 meeting, the Eastside Select Committee received and approved Budget Update No. 1.

Phase 2 Budget Update No. 2 provides actual expenses and outstanding commitments to November 30, 2015, as summarized in Appendix A.

FINANCIAL IMPLICATIONS

Under the Core Area Wastewater Treatment Program budget, requisitioned funds can only be apportioned on the cost sharing basis on which they were raised. The cost sharing of the Program budget is currently apportioned based on 2030 design capacity, 70% average dry weather flow and 30% average annual flow, as previously declared by each participant. This cost sharing may be revisited by the participants in the service. The Eastside collectively accounts for 73.24% of the requisition funds raised. The funds raised by the three Eastside municipal participants will be shared as follows:

Oak Bay	8.81%
Saanich	41.70%
Victoria	49.49%

CONCLUSION

Phase 2 Concept planning for this project commenced on September 1, 2015. Due to the accelerated pace of work on the project, invoicing received from some of the suppliers and

consultants has tended to lag somewhat. The actual expenditures incurred but invoiced after the reporting cutoff date are carried forward to the following update report. The committee will continue to receive monthly budget reports through the course of this project.

RECOMMENDATION

That the Eastside Wastewater Treatment and Resource Recovery Select Committee receive this budget update for information.

Submitted by:	Dan Telford, P.Eng., Project Manager, Core Area Wastewater and Resource Recovery Project
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services

DT:mer

Attachment: Appendix A – Eastside Concept Planning – Phase 2 Budget Update No. 2

APPENDIX A

EASTSIDE WASTEWATER TREATMENT AND RESOURCE RECOVERY
SELECT COMMITTEE

Eastside Concept Planning - Phase 2 Budget Update No. 3
November 30, 2015

	BUDGET	REVISED BUDGET (Nov 2015)	ACTUAL	COMMITTED	TOTAL	REMAINING
Outreach						
Consultants						
Outreach and Consultation	157,000	165,976	8,976	157,000	165,976	0
Technical Support	20,000	29,268	9,268		9,268	20,000
Outreach Disbursements	40,000	42,639	2,639		2,639	40,000
Project Management						
Staff and Wages	40,000	40,293	293		293	40,000
Miscellaneous	10,000	10,000			-	10,000
Eastside Total	**$ 267,000**	**$ 288,176**	**$ 21,176**	**$ 157,000**	**$ 178,176**	**$ 110,000**

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Minutes of a Meeting of the Eastside Public Advisory Committee
Held Tuesday, October 27, 2015, in Room 107, 625 Fisgard St., Victoria, BC

Present: D. Broad, B. Gilbert, G. Klima, J. Knock, S. Marks B. Mumford, D. Sutton,
Staff: Lindsay Taylor, Communications Coordinator, Corporate Communications; N. More, Committee Clerk (recorder)
Consultant: A. Gibbs, Public Assembly
Absent: Director V. Derman (Vice Chair), T. Davies, N. Thambirajah

The meeting was called to order at 4:00 p.m. and the Committee chose D. Sutton to Chair the meeting.

1. Approval of Agenda

MOVED by B. Mumford, **SECONDED** by S. Marks,
That the agenda be approved as circulated.

CARRIED

2. Adoption of Minutes

MOVED by B. Mumford, **SECONDED** by B. Gilbert,
That the minutes of the September 17, 2015, meeting be adopted as previously circulated.

CARRIED

3. Chair's Remarks: There were none.

4. Presentations/Delegations: There were none.

5. Review of Plan and Costing

A. Gibbs provided an Eastside Wastewater Public Engagement Planning document for November and December, 2015, and J. Knock reported on his verbal presentation to the Eastside Wastewater Treatment and Resource Recovery Select Committee meeting of October 21, 2015.

The Committee discussed the public engagement planning and A. Gibbs provided clarification on timelines for the integration of Eastside and Westside select committees activities, the release of technical information, and formal consultation in affected neighbourhoods. A Question and Answer section on the dedicated website was suggested, and the presence of CRD Directors at public engagement events.

6. Ongoing Role and Governance of EPAC

The Committee discussed improving the efficiency of the meetings, including the following points:

- The need to receive unbiased reporting on activity and decisions of the Eastside Wastewater Treatment and Resource Recovery Select Committee and what is required

by that Committee of the Eastside Public Advisory Committee, and conveying back the requests of this committee as advisors.

- The neutrality of the role of Chair, the length of Chair's Remarks, its place in the order of business on the agenda, and the need to stay in the present and keep moving forward rather than hearing about the past and the process that didn't work.

7. New Business: There was none.

8. General Discussion: There was none.

9. Adjournment

MOVED by B. Mumford, **SECONDED** by S. Marks,
That the meeting be adjourned at 5:27 p.m.

CARRIED

_____
CHAIR

_____
RECORDER

Making a difference...together

Minutes of a Meeting of the Eastside Public Advisory Committee
Held Tuesday, November 10, 2015, in Room 107, 625 Fisgard St., Victoria, BC

Present: B. Gilbert, G. Klima, J. Knock, S. Marks B. Mumford, D. Sutton
Staff: Lindsay Taylor, Communications Coordinator, Corporate Communications; N. More, Committee Clerk (recorder)
Consultant: A. Gibbs, Public Assembly
Absent: Director V. Derman (Vice Chair), D. Broad, T. Davies, N. Thambirajah

Don Sutton was voted Chair and called the meeting to order at 4:00 p.m.

1. Approval of Agenda

MOVED by J. Knock, **SECONDED** by B. Mumford,
That the agenda be approved as circulated.

CARRIED

2. Adoption of Minutes

MOVED by S. Marks, **SECONDED** by B. Mumford,
That the minutes of the October 27, 2015, meeting be adopted as previously circulated.

CARRIED

3. Chair's Remarks: There were none.

4. Presentations/Delegations: There were none.

5. Briefing on Latest from Core Area and Eastside Processes

A. Gibbs briefed the Committee on the status of the decision process and development of public engagement material. Westside and Eastside option sets have been integrated, and costing analysis has begun on the five wastewater treatment project options under consideration. The Eastside Public Advisory Committee can provide input on the public engagement process, such as helping to develop questions and answers for the website, updating the citizens' guide, and in survey design. She encouraged the Committee to provide two members to attend the survey design meetings. The Committee discussion included the following topics and points:

- the newspaper insert scheduled for publication in December and the integration of Westside and Eastside processes
- the information on the public website that remains with the past project under the name of Seaterra
- conveying to the public what the process has been to date, what has emerged from the technical analysis, how the public can be involved
- conveying to the public the option sets, including costs and trade-offs
- formalize and make plain the channels for the public to express their concerns
- the public can inform the decision-makers through the public engagement process
- Fairness and Transparency Advisor role in hearing complaints about the process itself
- Technical Oversight Panel interest in hearing about technical matters

The role of the Committee in presenting to the public information that has been vetted through the established processes of the project, as decided by the Capital Regional District Board, was discussed in light of a concern that technical and cost information from a citizen group was not part of the options under consideration, and thus, was not finding its way onto the public engagement material. A. Gibbs clarified the following avenues for bringing forward such concerns:

- as a delegation to the Technical Oversight Panel
- to the Fairness and Transparency Advisor which was established to hear and investigate complaints about the decision-making process
- through public feedback during the upcoming public engagement process

6. New Business: There was none.

7. General Discussion: There was none.

8. Workshop

The Committee worked on two main areas, as circulated to the Committee on November 9, 2015, in an email from A. Gibbs:

- FAQs for the public/ stakeholders
- information to be included in a citizens' discussion guide

In preparation for the workshop, members of the Committee discussed the topics via email previous to the meeting. The emails are on file at Legislative and Information Services. As base documents for the workshop, the Committee used the original citizens' guide and email from G. Klima on November 9 and B. Mumford on November 10, 2015. Also referenced were technical memos presented at the Core Area Liquid Waste Management Committee meeting of November 4, 2015.

At the end of the workshop, A. Gibbs encouraged the Committee to provide any further comment to her by email.

9. Adjournment

MOVED by B. Mumford, **SECONDED** by G. Klima,
That the meeting be adjourned at 6:05 p.m.

CARRIED

_____
CHAIR

_____
RECORDER

Making a difference...together

Minutes of a Meeting of the Eastside Public Advisory Committee
Held Tuesday, December 01, 2015, in Room 107, 625 Fisgard St., Victoria, BC

Present: D. Broad, T. Davies, B. Gilbert, G. Klima, J. Knock, S. Marks (4:33), B. Mumford, D. Sutton, N. Thambirajah
Staff: A. Bains, Manager, Information Services; Lindsay Taylor, Communications Coordinator, Corporate Communications; N. More, Committee Clerk (recorder)
Consultant: A. Gibbs, Public Assembly

The meeting was called to order at 4:00 p.m. The Committee elected Don Sutton as acting Chair.

1. Approval of Agenda

MOVED by T. Davies, **SECONDED** by B. Mumford,
That the agenda be amended to consider item 6 ahead of item 5 and a motion be considered under New Business; and that the agenda be approved as amended.

CARRIED

2. Adoption of Minutes

On the motion, the Committee discussed the completeness of the minutes, in reference to item 5, "Briefing on Latest from Core Area and Eastside Processes", in the first paragraph on page 2.

MOVED by T. Davies, **SECONDED** by N. Thambirajah,
That the minutes of the November 10, 2015, meeting be adopted as previously circulated.

CARRIED
Gilbert OPPOSED

3. Chair's Remarks: A. Gibbs remarked on the resignation of Vice Chair Derman from the Committee and gave an overview of the agenda items.

4. Presentation: Angila Bains, Manager, Information Services, Freedom of Information and Protection of Privacy Act

Angila Bains presented information and policy on the responsibility of CRD committees and commissions regarding the *Freedom of Information and Protection of Privacy Act* and provided a hand-out, on file at Legislative and Information Services.

MOVED by T. Davies, **SECONDED** by B. Gilbert,
That the presentation be received for information.

CARRIED

Item 6 was considered ahead of item 5.

6. Terms of Reference

S. Marks entered the meeting at 4:33 p.m.

The Committee discussed the vacant Chair and Vice-Chair positions and the importance to the role of the Committee in having a direct liaison with the Eastside Wastewater Treatment and Resource Recovery Select Committee.

MOVED by T. Davies, **SECONDED** by B. Gilbert,
That it be recommended to the Eastside Wastewater Treatment and Resource Recovery Select Committee:
That section 7.0 of the terms of reference for the Eastside Public Advisory Committee be amended as follows:
"The Chair and Vice Chair or designated members of the Eastside Select Committee will also Chair and Vice Chair the Eastside Public Advisory Committee."

CARRIED

5. Review of Public Engagement Plan and Materials

A. Gibbs provided sample work in progress and spoke of the timelines for the communications plan and reported that a draft of the citizen's guide will be updated after Technical Memo 3 at the December 9, 2015, Core Area Liquid Waste Management Committee meeting. The Committee provided feedback.

6. New Business

a) Motion to Include an Option Set

On the motion, B. Gilbert provided information on a wastewater treatment siting and technology plan called the RITE plan and the Committee discussed whether the motion was appropriate to the mandate of the Committee.

MOVED by B. Gilbert, **SECONDED** by D. Broad,
That it be recommended to the Eastside Wastewater Treatment and Resource Recovery Select Committee to recommend to the Core Area Liquid Waste Management Committee:
To provide an option set that meets the criteria as requested by the public, including 100% tertiary treatment distributed to reuse existing infrastructure, integrated resource management, and gasification.

DEFEATED
Broad, Davies, Klima, Knock, Marks, Mumford, Sutton, Thambirajah OPPOSED

b) Motion on Providing Key Points to the Eastside Select Committee

On the motion, the Committee discussed coming to agreement collectively on key points to present to the Eastside Select Committee rather than presenting individual viewpoints.

MOVED by S. Marks, **SECONDED** by J. Knock,
That at the end of each meeting, the Committee put together a brief agenda of key points to present to the Eastside Wastewater Treatment and Resource Recovery Select Committee.

CARRIED

7. General Discussion

8. Adjournment

MOVED by J. Knock, **SECONDED** by N. Thambirajah,
That the meeting be adjourned at 6:05 p.m.

CARRIED

_____
CHAIR

_____
RECORDER

Making a difference...together

Minutes of a Meeting of the Eastside Public Advisory Committee
Held Tuesday, December 15, 2015, in Room 107, 625 Fisgard St., Victoria, BC

Present: D. Broad, B. Gilbert, J. Knock, D. Sutton, N. Thambirajah (4:22)
Staff: Lindsay Taylor, Communications Coordinator, Corporate Communications; N. More, Committee Clerk (recorder)
Consultant: A. Gibbs, Public Assembly
Absent: T. Davies, G. Klima, S. Marks, B. Mumford

The meeting was called to order at 4:10 p.m. and the Committee selected D. Sutton to chair the meeting. Quorum was not met, so the Committee consented to an information-based meeting only. A. Gibbs provided an update on the project and activities of the Eastside Wastewater Treatment and Resource Recovery Select and Core Area Liquid Waste Management committees.

N. Thambirajah entered the meeting at 4:22 p.m. Quorum was met.

1. Approval of Agenda

MOVED by B. Gilbert, **SECONDED** by N. Thambirajah,
That the agenda be approved.

CARRIED

2. Adoption of Minutes

MOVED by B. Gilbert, **SECONDED** by D. Broad,
That the minutes of December 1, 2015, be approved.

CARRIED

3. Chair's Remarks: There were none.

4. EPAC Delegation to Eastside Select Committee in January and Motions

The Committee included the topics of agenda items 5 and 6 in their discussion. They discussed the status and timelines of the project, public process and consultation planning, and the input they would like to provide to the Eastside Wastewater Treatment and Resource Recovery Select Committee. The discussion included the following points:

- Communications materials and an approach have been developed, but content has not been confirmed by the Core Area Liquid Waste Management Committee, so the planned communications have not been implemented.
- Public engagement and consultation can provide the decision-makers with guiding information on public opinion.

A. Gibbs demonstrated the beta version of the proposed public survey and the Committee provided feedback. The Committee discussed that the survey would only go out once the content has been confirmed by the Core Area Liquid Waste Management Committee.

The Committee discussed several key points to present to the Select committee and directed A. Gibbs to canvass all Committee members for key points and to collect them in a brief to Eastside Wastewater Treatment and Resource Recovery Select Committee in time for their next meeting agenda.

5. **Public Process Discussion:** This was included in item 4.

6. **Consultation Planning Discussion:** This was included in item 4.

7. **Adjournment**

MOVED by D. Broad, **SECONDED** by N. Thambirajah,
That the meeting be adjourned.

CARRIED

D. Sutton left the meeting at 5:10 p.m.
The Committee continued talking and the meeting ended at 5:55 p.m.

_____
CHAIR

_____
RECORDER

Terms of Reference

CRD

EASTSIDE PUBLIC ADVISORY COMMITTEE

PREAMBLE

The Eastside Wastewater and Resource Recovery Select Committee (Eastside Select Committee) will develop a wastewater and resource recovery plan (the plan) for Oak Bay, Saanich and Victoria. This plan, in combination with the plan from the Westside Select Committee, could form the basis for an amendment to the Core Area Liquid Waste Management Plan (CALWMP).

1.0 PURPOSE

The Eastside Public Advisory Committee (Advisory Committee) will advise the Eastside Select Committee on the public consultation required for the development of the wastewater and resource recovery plan. The Advisory Committee will serve as a sounding board on the consultation process by:

- reviewing information and material prepared by consultants and staff and referred to by the Eastside Select Committee;
- providing feedback and advice on the consultation process;
- reviewing and providing advice on the structure and tools that could be used to consult with the participating communities.

The Advisory Committee will focus on the public consultation process and will not provide advice on the selection of treatment technology or specific sites for facilities.

In their work, Advisory Committee members may be informed by the public and benefit from the informed exchange of ideas with the community. The Advisory Committee is a term-limited committee that will be in place for approximately one year, with the possibility of an extension.

2.0 OBJECTIVES

Project objectives are to:

- work with the Eastside Select Committee, staff and consultants to assist with the development and implementation of a public consultation process, which will help in the development of a wastewater treatment and resource recovery plan for the Eastside;
- comply with all CRD, provincial, and federal guidelines, regulatory and legislative requirements;
- consider resource requirements and budget for public consultation initiatives;

- work to build public support for the Eastside Wastewater Treatment and Resource Recovery Plan in order to get the plan approved as soon as possible.

3.0 MEMBERSHIP CRITERIA

The Eastside Public Advisory Committee will be made up of 10 members of the public. Membership will be selected using the following criteria:

1. A mixture of individuals who consider themselves both knowledgeable and new to the wastewater treatment project in the core area, as well as those who have participated in other citizen engagement initiatives in the past.
2. Individuals selected from the three participating municipalities with representation based on population: one member from Oak Bay, five members from Saanich and four members from Victoria.
3. A willingness to commit volunteer time of approximately one year to the project. This will include monthly to bi-monthly meetings, as well as potentially attending public meetings, workshops, field trips or other project-related meetings.
4. The ability to work in a group and develop agreement with others who may hold different views.
5. Members are to serve without remuneration.

4.0 SELECTION PROCESS

The CRD will invite the public to apply for membership on the Eastside Public Advisory Committee through an advertising process.

The Eastside Select Committee will review and assess all applications based on the above membership criteria and make recommendations to the CRD Board through the Core Area Liquid Waste Management Committee regarding appointments to the Eastside Public Advisory Committee.

5.0 APPOINTMENT

The Eastside Public Advisory Committee members will be appointed for a one-year term, renewable to a maximum term of three years if an extension to the Eastside Public Advisory Committee term is made. If vacancies arise during the project term, the Chair will consult with the Eastside Select Committee to identify alternates, as required.

6.0 ATTENDANCE

Meetings will be held at CRD Headquarters, 625 Fisgard Street, unless otherwise noted.

Meeting frequency will vary through the course of the project to meet timeline constraints and key milestones. Regular meeting attendance is required to remain a member in good standing. Members absent without prior notification to the Chair for three consecutive meetings may be deemed to have resigned.

7.0 PROCEDURES

The Chair and Vice Chair or designated members of the Eastside Select Committee will also Chair and Vice Chair the Eastside Public Advisory Committee. The Advisory Committee will meet on the first and third Wednesday of the month which will correspond to the dates of the Eastside Wastewater Treatment and Resource Recovery Select Committee meetings. Any additional meetings will be at the call of the chair.

The Eastside Public Advisory Committee will follow the CRD Rules of Procedure as enacted in Bylaw No. 3828, the Capital Regional District Board Procedures Bylaw, 2012.

Legislative and Regulatory Services Department

Legislative Services

#1 Centennial Square
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British Columbia
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December 24, 2015

Mr. R. Lapham
Chief Administrative Officer
Capital Regional District
PO Box 1000
Victoria BC V8W 2S6

Dear Mr. Lapham

Re: Sewage Treatment

As you are aware City Council has risen and reported on the following motion resulting from the ongoing discussion about sewage treatment in the region:

> **"That Council is supportive of sewage treatment in Victoria, specifically in the Rock Bay area, as well as enhanced pumping facilities at Clover Point.**
>
> **Council's support is subject to:**
>
> **a. Broad public engagement to the satisfaction of the City of Victoria. The City of Victoria will hold a public hearing.**
>
> **b. An arrangement, to the satisfaction of the City of Victoria, for the operation and management for the sewage treatment plant to address any community impacts that could be associated with a facility of this nature.**
>
> **c. An amenity package to the satisfaction of the City of Victoria that supports positive neighbourhood integration.**
>
> **d. Consideration for the long term loss of tax revenue resulting from the removal of the lands from the city's tax base for regional purposes."**

Yours truly,

Chris Coates
City Clerk
/af

C: Fraser Work, Director of Engineering & Public Works

AECOM/Graham Joint Venture
Fourth Floor, 3292 Production Way
Burnaby, BC, Canada V5A 4R4
T 604.444.6400 F 604.294.8597

December 29, 2015

Chair Desjardins and the CRD Board of Directors
Capital Regional District
625 Fisgard Street
Victoria, British Columbia
Canada V8W 2S6

BY E-MAIL TO: CRDBoard@crd.bc.ca

Subject: **Harbour Resource Partners Affordable and Bylaw Complaint Solution for the CRD CALWMP Liquid Treatment Plant**

Dear Chair Desjardins and Directors:

Harbour Resource Partners (HRP) has had continued communications with CRD staff (and previously Seaterra) as recently as December 18, 2015, regarding the status of the project and our interest to be a part of the solution to the challenges that now face the CRD and its residents. HRP has provided to the CRD a fully complaint solution for the McLoughlin site, and we assert that after two years of discussion of alternatives is still the best solution for CRD and its residents.

We watched the recent committee meeting of December 9th and write in response to a number of the questions asked by CALWMC Directors. At that meeting several directors enquired as to the cost and comparative benefits of Harbour Resource Partners bid for McLoughlin site vs. the new option sets based on a possible new site at Rock Bay. For example, we heard Director Atwell ask staff “what was the price tag for that plant?” and comment that “it would be interesting to have a discussion on that because we have an actual price for a plant at McLoughlin.”

However before we provide response to the questions posed by the directors, we consider it appropriate to restate our involvement in the project to date:

HRP responded to a publicly issued request for Qualifications (#MC-300) that was published by the Capital Regional District in March 2013. Our consortium was subsequently shortlisted as one of three Proponents. The CRD issued Requests for Proposal on July 12, 2013, and following submission of Proposals, HRP was selected as the Preferred Proponent.

As the Preferred Proponent, and as required under the RFP HRP has had a Letter of Credit in the amount of $2,000,000 in place since May 16, 2014 and now after three extensions, this Letter of Credit expires on the 31st December 2015.

In October of 2014, with the encouragement and cooperation of the CRD commission's staff, HRP submitted a modified proposal for a design that was **fully complaint** with the current zoning bylaw for the McLoughlin site, however it is unclear if this bylaw compliant design was ever presented to the full committee and the residents.

Harbour Resource Partners has invested millions of dollars participating in this procurement, and appreciate that some stakeholders may consider our views to be biased. However, our team also brings collective experience of designing and building billions of dollars of wastewater treatment plants; experience that we believe could still benefit the CRD in successfully delivering the CALWMP on time and with the benefit of senior government grant funding that is now in jeopardy.

In answer to the directors' questions about how Harbour Resource Partners proposal compares with the new options sets at Rock Bay, we are pleased to provide the following summary of the comparative benefits of our solution:

Costs

HRP's proposal was under the Affordability Ceiling set by CRD within the RFP. This limit was $230M, inclusive of the new outfall and the bored pipe across the outer Harbour.

This compares to CRD's current estimate for a single plant at Rock Bay which is estimated as:
Liquid Treatment - $392M
New Outfall at Clover Point - $32.5M
Effluent PS and Conveyance to Clover Point - $83.9M
Clover Pt PS and Forcemain to Rock Bay - $51.4M
Macauley Pt PS and Forcemain to Rock Bay - $65.4M
Land Costs - $67.2M

Estimated Total Cost - $692.4M

Recognizing that the comparison is not precisely like for like, it can nevertheless be seen that the cost of the new solution is more than three times higher; for a lower flow and a lower standard of treatment, and with a significantly increased construction impact on Victoria.

Schedule

HRP's proposal was based on a construction schedule of 42 months; it should be noted that acceptance of our proposal now would still enable the CRD to meet their statutory obligations to implement secondary treatment by March 2020.

Beginning a new procurement would not allow the award of a contract until at least the autumn of 2017. Using a similar construction schedule, the project would not be completed until summer of 2021.

The other schedule critical component of our proposal is the outfall. The McLoughlin Point solution has an outfall location that is already permitted. Any new outfall requires extensive environmental assessment and permitting; a process that takes years to complete; this alone would likely delay the permitting of a plant at Rock Bay and breech the 2020 Federal Government requirement.

Design

As part of the RFP process, HRP developed a conceptual design to approximately the 20% level, including architectural treatments that were accepted by both Esquimalt and Victoria, and praised by Seaterra staff as, "the best looking wastewater plant they had ever seen." A new facility/site will require a similar review process and approval from the local agencies.

Future Flows

The Harbour Resource Partners solution was designed to treat flows up to 124 Ml/d which accommodates the future flows up to 2065. In order to reach 2065 flows a future expansion of the Rock Bay facility will be required. Estimated cost of that expansion will be an additional tens of millions to the current $692.4M.

Advanced Treatment

HRP's solution includes advanced treatment to mitigate substances of emerging concern.

Commercial

Following our selection as the Preferred Proponent, we successfully negotiated contract terms with CRD program staff to prepare a signature-ready contract.

Community Benefits

The Harbour Resource Partners solution provided several key benefits for the community including:

- Barging of bulk materials to prevent disruption of the Esquimalt community due to construction
- Major conveyance pipes were to be tunnelled under the Harbour as opposed to being open cut through the streets of Victoria
- Wet weather treatment was located at the McLoughlin site as opposed to being constructed in the public park at Clover Point

Bylaw Compliance

Following the selection of HRP as the Preferred Proponent we worked with CRD Programme staff to develop a fully bylaw compliant design that was the in line with the price of our selected bid, and which met the height, set-back and other all other physical requirements of the current bylaw. We still believe that the CALWMC still has the option to proceed with the plant at McLoughlin, thereby saving the taxpayers millions of dollars, whilst at the same time meeting their federal legal obligations to implement secondary treatment by 2020.

To summarize, the HRP solution based at McLoughlin Point has the following significant benefits to CRD:

1. Compliant - meets all requirements of current McLoughlin site zoning,
2. Cost certainty – Hundreds of millions lower than a new solution on an already negotiated design-build scope and contract,
3. Schedule certainty – Saves as least two years compared to a new design and procurement,
4. Design certainty – Technically superior and aesthetically pleasing design already vetted by independent technical advisors and selected by CRD staff,
5. Funding certainty – Mitigates potential loss of funding by meeting in-service deadline requirements,
6. Commitment certainty – allows CRD to meet provisional commitments on delivering a wastewater solution to the region,

In closing, we would like to offer that HRP would be willing to attend a meeting either public or in-camera with the CALWMC to answer any further questions, confidential or otherwise, that the directors may have in regard of our winning proposal. We also note that we have offered to further extend the validity period of our Letter of Credit beyond December 31, 2015 in order to secure our selected proposal (copy letter attached), should the CALWMC wish to retain the option of proceeding with HRP's affordable design for a single treatment plant.

We look forward to hearing from you.

Very Truly Yours,
Harbour Resource Partners

Ernie Maschner, DBIA
Respondent Team Lead Director
Harbour Resources Partners
AECOM / Graham Joint Venture

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Director Young
Chief Sam
Chief Thomas

Dragados Canada Inc.
Knappett Projects Inc.

Core Area Liquid Waste Management Committee

625 Fisgard Street

Victoria, BC

V8W 1R7

Attn: Mayor Lisa Helps, Chair and Committee members

Re: Deep Shaft, Small Footprint Solution at Clover Point and Elsewhere

Dear Committee Members,

Capital Clear, a Joint Venture of Dragados Canada Inc. and Knappett Projects Inc., was one of three teams prequalified to submit a response to the Request for Proposals for the McLoughlin Point WWTP and Outfall RFP # MC-300 (and submitted a highly rated and fully compliant proposal in response to the RFP).

NORAM Engineering and Constructors Ltd. is a private Engineering and Technology Company headquartered in Vancouver BC with several unique technologies in the Wastewater Treatment business. In particular NORAM possesses a patented technology for Deep Shaft Vertical Treatment of Wastewater streams (VerTreat™) and have engaged with the Capital Clear team to present the following alternative to the currently contemplated scenarios for the CALWMP.

We believe there is the ability with a combination of Technology and Design to site a treatment plant at Clover Point that would be both effective in meeting the goals of the CALWMP and be acceptable to the citizens of Greater Victoria. Although we have concentrated this proposal on the Clover Point site, as it is the most challenging, we believe the principals herein could equally be transferred to the West side situation as well, preferably at a location in close proximity to Macaulay Point Outfall. Our proposal is to place an underground plant at Clover Point that is both aesthetically appropriate and technically proven to treat the stream of flows directly from the South East Trunk System and return them to the Clover Point outfall directly. We do not at this time anticipate a solids handling facility at this site, however similar to the previous McLoughlin Point proposal we believe it would be simple and expeditious to pipe the solids in liquid state to the Macaulay point area and combine the solids with the Westside stream for beneficial reuse at a central location.

The advantages of this proposal are as follows:

- Greatly reduced impact on existing infrastructure relocations and dislocations within the downtown cores of the affected Municipalities and Cities. The Rock Bay Option in particular will require dislocation in downtown Victoria to relocate the Sewage flows and result in extraordinary Pumping costs and operating costs.
- The Clover Point Plant could enhance the Public's education and understanding of the system by incorporating viewpoints within the site to provide public involvement
- The seismic safety of these plants can be assured by immediate transfer of flows to the existing outfalls in the event of catastrophic seismic events and reduces the Seismic Risk of major pipelines through the downtown core.
- The cost of the Facilities will be greatly reduced by the reduction in Plant footprint and reduction in Piping, Pumping and Pump Stations required
- Cost certainty can be obtained by a process of early contractor involvement with the Capital Clear Team
- Time certainty can be achieved by a certain path forward that is achievable within the time constraints of the project funding partners through involvement with the Capital Clear Team
- This opportunity can be achieved by combining the unique characteristics of the Vertreat ™ Technology with membrane filtration technology and other processes. These processes are proven and robust.
- a proven local and international team with experience in construction of WWTP's within congested urban situations is assembled and ready to proceed

Capital Clear's Team has been assembling a basic design as to how this Plant would look and operate and given the short time available have become convinced that this alternative is one that should be pursued with utmost diligence. We have worked with the NORAM Team and with local renowned Architect Franc D'ambrosio to do an initial proposal and costing to ensure that the situation is both real and achievable prior to submitting this letter. The TOP Panel toured a small Vertreat™ Plant on the Lower Mainland on December 29th, 2015 and the NORAM Team responded to questions from the TOP at a subsequent meeting on the same date. Like all proposals of this magnitude there are numerous issues and challenges to review and overcome however nothing our Team has seen to date would lead us to believe that this Project cannot be accomplished within a timeframe and budget that is a significant benefit to the community.

Our current estimate of costs for the Clover Point Plant as envisioned would be in the order of $170 Million. Similarly we believe a second plant for the Northwest Trunk collection area (Westside) could be built with a budget that would not be excessive (although no work has been done on this costing and only limited design done due to time constraints) on a significantly reduced footprint than that

proposed for conventional plants. These costs are based on P50 estimates of plus 40% and minus 15%. However we believe the costs indicated are achievable. This would only leave the solids treatment and beneficial reuse portion of the Project to be sourced at a later chosen site and cost according to the chosen technology.

Operating Cost experience with VerTreat™ and Membrane Plants is assumed to be similar to operating costs as outlined in the Draft Report – Appendix C, Technical Memorandum #1 as submitted by Carollo/Urban systems on October 22nd, 2015. Operating costs will need to be baselined as part of an ongoing study of this Proposal. Operating costs worldwide for other VerTreat™ Plants has been found to be favourable due to the low maintenance and replacement costs of the Deep shaft Technology.

We believe that given the previous process which the CRD embarked upon for the MPWWTP Proposal that the CRD has within Clause 8.1(b) of that RFP the ability to choose a proponent and negotiate a comprehensive and feasible plan over the next couple of months during which the detailed Engineering analysis of the Plant(s) could be obtained. We would be pleased to participate in such a process as the providers of the proprietary Engineering technology that can make this system a success.

We enclose technical information on the Clover Point Plant proposal and an Architectural rendering of what a possible Plant at Clover Point would look like and its impact on the neighbourhood and values of Clover Point. A second Westside Plant could be situated in a similar low impact setting due to its compact nature.

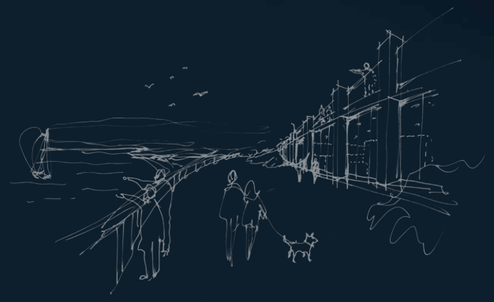
Sincerely,

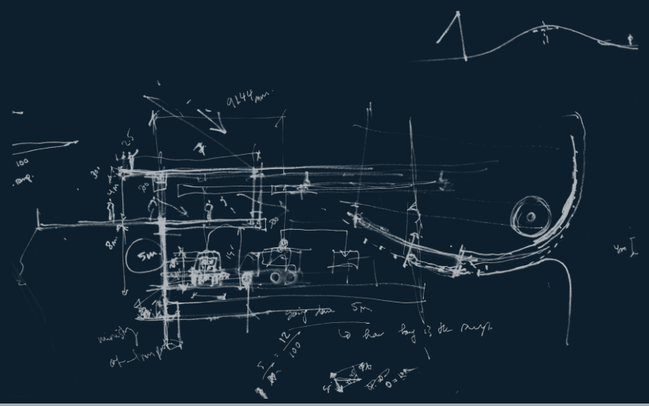
Capital Clear

Ramon Fiuza, Senior Vice President Operations Western Canada, Dragados Canada Inc.

John Knappett, President, Knappett Projects Inc.

cc: Teresa Coady, Chair Technical Oversight Panel of the CALWMC





INNER HARBOUR

OAK BAY

CLOVER POINT

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

Site Plan

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

After

Before

From North Side of Dallas Road

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

A Future View East Along Existing Pathway
B Public Entrance and Viewing Windows

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

A Section Through Underground Plant
B Grass Field at Dallas Road Level

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

A

A View of New Clover Point Field

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

A Existing Clover Point Field
B New Clover Point Field (Green Roof of Treatment Plant)
C Underground Treatment Plant

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

Before

After

A View to the North

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

Before

After

A View to the South

Clover Point
Regional Wastewater Treatment Plant

Before

After

A View to the East

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

Before

After

A View to the West

Clover Point
Regional Wastewater Treatment Plant

Site and building design by **D'AMBROSIO** architecture + urbanism

Systems by VERTREAT Technology

Motion for Which Notice Has Been Given:

OPTIONS FOR WASTEWATER TREATMENT – DIRECTOR HAMILTON

WHEREAS: It is critical that there be positive action taken to meet funding deadlines and regulatory requirements for waste water treatment for the Capital Regional District;

BE IT RESOLVED that: Capital Regional District (CRD) staff be directed to support municipalities and First Nations who want to explore options for waste water treatment that are economically responsible, technically feasible, environmentally sound and meet current provincial and federal deadlines;

AND THAT funding be provided from the sewage treatment budget to support an independent assessment of alternative locations to McLoughlin and Hartland, with full and regular engagement of staff and elected representatives from participating municipalities, First Nations and the public; and,

AND THAT any decisions taken to amend the Liquid Waste Management Plan be done in an open and transparent public process;

AND THAT any further money spent be recoverable under the funding arrangement with the Provincial and Federal Governments and that clarity be sought that the funding arrangement with Provincial and Federal governments be able to support the communities to the extent it supported the CRD driven process .

August 5, 2014

Motion from the November 25, 2015 Technical and Community Advisory Committee (TCAC) meeting to go forward to the Core Area Liquid Waste Management Committee

9. New Business:

Motion to Support Director Derman's Motion

MOVED by C. Witter, **SECONDED** by D. Purewall,
That the TCAC endorse Director Derman's motion

a. That the Core Area Liquid Waste Committee initiate a high level Request for Expressions of Interest designed to fully canvas the private sector and allow integrated waste approaches and other innovative solution sets to come forward.
b. That the Core Area Liquid Waste Committee insure means are established to fully and independently evaluate the viability of integrated waste approaches and other innovative solution sets in a manner that does no compromise the interests of applicants.

and respectfully request that the CALWMC implement it.

CARRIED
Ishiguro, Coburn, Tiedje, White OPPOSED

CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF JANUARY 13, 2016

Motion with Notice: Accountability and Representation in Governance of Components of Eastside and Westside Sub-systems

(Director Young, Jan. 2016)

BACKGROUND Under some options for the proposed core area liquíd waste management system that may be considered, part of the total flow volume to the proposed Westside infrastructure will originate from the District of Saanich and City of Victoria. It has also been suggested at the Board table that even if none of the East side flows are treated in the West side system, a part of the costs of these West side systems will be paid by East side taxpayers. The option sets and other preliminary planning undertaken for the Westside sub-system within the Core Area Liquid Waste Management Plan has occurred in the absence of participation, representation and input from the East side municipalities or directors. ln accordance with the principle of representation for users of a service provided by a regional district, it is proposed that the Core Area Liquid Waste Management Committee provide direction to staff to bring forward in a timely way recommendations on procedural changes and/or governance enhancements to ensure that each user of components of the service and each area that is paying for components of the system, are adequately represented in decision-making.

MOTION BE IT RESOLVED THAT the Core Area Liquid Waste Management Committee directs staff to report back at the next meeting on procedural changes and/or governance enhancements that will ensure that each participant who is anticipated to use or pay for a component of the eastside or westside wastewater treatment sub-systems is included in the governance system directing the design and eventual operation of that component of the system.

Notice of Motion

Core Area Liquid Waste Management Committee

WHEREAS the estimated costs for sewage treatment received by the Core Area Liquid Waste Management Committee (CALWMC) on December 9, 2015 set out the estimated costs to be borne by local residents for the five current options, and

WHEREAS the December 9, 2015 estimated costs to be borne by local residents range from twice to over three times as much as the earlier McLoughlin project proposal , and

WHEREAS costs borne by local residents would rise further if provincial and federal funding lapses due to the effluxion of time, and

WHEREAS a motion approved by CALWMC on December 9, 2015 has the potential for creating a sixth option involving a separate treatment facility for the municipalities of Langford and Colwood which may in turn reduce the size of a single facility required for the remaining five municipalities in order to meet the federal and provincial requirements, and

WHEREAS the CRD owns properties at McLoughlin Point and Maccaulay Point that are both currently zoned for sewage treatment and which may feasibly accommodate a smaller plant within the current zoning in the event the new Langford/Colwood initiative currently under consideration moves forward,

THEREFORE BE IT RESOLVED

1. That the Technical Oversight Panel (TOP) working with CRD staff and CRD consultants be requested to examine the feasibility of locating a single facility at either McLoughlin Point or Macaulay Point within the current zoning.

2. That in the event TOP concludes that the CRD property at Macaulay Point requires more land to be a feasibly sized site, that CRD staff be directed to renew inquiries with the new Minister of National Defence with a view to partnering with First Nations to acquire adjoining land at Macaulay Point.

Notice Given by Director Nils Jensen

CORE AREA SEWAGE AND RESOURCE RECOVERY SYSTEM 2.0

Phase 2: Analysis, Options Costing and Public Engagement

Project Charter - FINAL

Approved: October 2, 2015
(updated on November 2, 2015)

TABLE OF CONTENTS

1. VISION

In partnership with the public, the Core Area Liquid Waste Management Committee (CALWMC) will deliver a sewage treatment and resource recovery system that is proven, innovative and maximizes the benefits for people and the planet – economic, social, and environmental – for the long term.

2. BACKGROUND

In 2006, an environmental report commissioned by the Ministry of Environment noted the contamination of seabed sites close to Capital Regional District (CRD) outfalls where the region's wastewater is discharged. As a result, the Province mandated that the CRD plan for and initiate secondary sewage treatment for the region.

In 2007, the CRD received a letter from the Ministry of Environment giving six directives for the Core Area Liquid Waste Management Plan (LWMP). These six directives continue to inform the goals and commitments of this project.

Minister's Requirements:

1. Meet the regulatory standard for liquid waste
2. Minimize total project cost to the taxpayer by maximizing economic and financial benefits, including beneficial reuse of resources and generation of offsetting revenue
3. Optimize the distribution of infrastructure based on number 2 above
4. Aggressively pursue opportunities to minimize and reduce greenhouse gas emissions (e.g., reduced requirement of energy for pumping purposes and beneficial reuse of energy)
5. Optimize 'smart growth' results (e.g., district services, density, Dockside Green-like innovation)
6. Examine the opportunity to save money, transfer risk and add value through a public private partnership

In 2012, the federal government passed a law requiring all high-risk Canadian cities to provide secondary sewage treatment by 2020 at the latest. The CRD's core area was considered to be in the high-risk category.

Between 2009 and 2014, the CALWMC, CRD staff and consultants, and the Core Area Wastewater Program Commission (the Commission) worked to create and implement a publicly acceptable sewage treatment and resource recovery system for the Core Area.

While the approved CALWMP continues to identify McLoughlin Point as the location for the wastewater treatment facility, in April 2014, the CRD's revised McLoughlin Point rezoning application did not meet the zoning requirements for Esquimalt. In June 2014, the plan to build one regional plant at McLoughlin Point was put on hold by the CRD Board, in response to public input.

In June 2014, Langford, Colwood, View Royal, Esquimalt and the Songhees Nation formed the Westside Select Committee to begin planning for a new project to treat sewage and recover resources in those municipalities and the Nation. In September 2015, Esquimalt Nation joined the Westside Select Committee. In January 2015, a similar body – the Eastside Select Committee,

comprised of Saanich, Oak Bay and Victoria – was formed to develop a similar plan for the Eastside municipalities.

Since June 2014 and January 2015, respectively, both Select Committees have been engaged in in-depth public engagement activities to share information with the public, build trust, and seek public input on a range of factors including, but not limited to, level of treatment, treatment technologies, siting of treatment plants, costs, risks and long-term social, economic and environmental benefits.

In July 2015, both select committees presented their work and recommendations to the CALWMC. The CALWMC approved the solution sets and recommendations from the Eastside Select Committee, including potential sites and direction with regard to investigating secondary and tertiary treatment, anaerobic digestion and gasification, and resource recovery and revenue generation. The CALWMC received a presentation from the Westside Select Committee outlining five technically preferred sites and two scenarios, detailing its technical work to date. The Committee accepted the Westside Select Committee's proposal to carry on with further public engagement and more detailed costing and engineering analysis as per its terms of reference to be presented to the CALWMC as more fully-developed solutions in fall 2015.

The work of the Eastside and Westside Select Committees, the CALWMC, and the public between June 2014 and July 2015 lays the groundwork for the current project, *Core Area Sewage and Resource Recovery System 2.0.*

3. GOALS AND COMMITMENTS

The *Core Area Sewage and Resource Recovery System 2.0* project will deliver the following goals and meet the following commitments. *NB goals should be measurable. Each of these goals needs a corresponding metric so at project completion the CALWMC can determine whether it achieved its goals.*

Goals

a) Meet or exceed federal regulations for secondary treatment by December 31, 2020

b) Minimize costs to residents and businesses (life cycle cost) and provide value for money

c) Produce an innovative project that brings in costs at less than original estimates

d) Optimize opportunities for resource recovery to accomplish substantial net environmental benefit and reduce operating costs

e) Optimize greenhouse gas reduction through the development, construction and operation phases and ensure best practice for climate change mitigation

Commitments

a) Develop and implement the project in a transparent manner and engage the public throughout the process

b) Deliver a solution that adds value to the surrounding community and enhances the livability of neighbourhoods

c) Deliver solutions that are safe and resilient to earthquakes, tsunamis, sea level rise and storm surges

d) Develop innovative solutions that account for and respond to future challenges, demands and opportunities, including being open to investigating integration of other parts of the waste stream if doing so offers the opportunities to optimize other goals and commitments in the future

e) Optimize greenhouse gas reduction through the development, construction and operation phases and ensure best practice for climate change mitigation

4. SCOPE

The scope of this phase of the Core Area Sewage and Resource Recovery System 2.0 project, is to complete the Options Development Phase, by submitting an amendment to the Liquid Waste Management Plan and receiving conditional approval from the Minister of Environment of an Amendment for the Core Area. This Plan amendment will be approved by the provincial and federal funding agencies. Completion of this phase includes securing sites for all facilities (wastewater treatment and resource recovery).

The scope of this phase does not include detailed site assessments such as Environmental and Social Reviews, submission of detailed business cases (as may be required by funding agencies), indicative design, finalized cost sharing agreements or the procurement of infrastructure.

5. KEY STAKEHOLDERS

The graphic illustration (see Attachment 1) outlines all of the Core Area Sewage and Resource Recovery 2.0 project stakeholders and displays the relationships between them. For a description of the roles and responsibilities of each stakeholder, please see Section 6.

6. ROLES AND RESPONSIBILITIES

Project Lead (TBD)

Federal Government – In 2012, the federal government passed a law requiring all high-risk Canadian cities to provide secondary sewage treatment by 2020 at the latest. The CRD's Core Area was considered to be in the high-risk category. The federal government agreed to contribute up to $253 million towards the project out of three different funding programs: Building Canada Fund ($120 million), Green Infrastructure Fund ($50 million) and 3P Canada ($83.4 million).

- Secondary treatment mandated by 2020
- Funding up to $253 million

Provincial Government – In 2006, an environmental report commissioned by the Ministry of Environment noted the contamination of seabed sites close to CRD outfalls where wastewater is discharged. As a result, the CRD was mandated by the province to plan for and initiate secondary

wastewater treatment for the region. Provincial funding agreements provide a maximum of $248 million towards the project.

- Funding up to $248 million
- Approval of LWMP amendment and regulatory requirements

Capital Regional District Board (CRD Board) – The CRD Board is responsible for selecting final site locations and securing lands for wastewater treatment facilities, obtaining the rezoning of lands, approving the architectural design for facilities, and approving funding agreements and the budget. The CRD Board is responsible for delivering the project outlined in the Vision.

- Final approving body for funding, budget and major decisions
- Collect and disburse the local portion of the funding of $287 million

Core Area Liquid Waste Management Committee (CALWMC) – A standing committee of the CRD Board, the CALWMC consists of Directors from municipalities and First Nations participating in the Core Area Liquid Waste Management Plan (CALWMP). The committee is responsible for overseeing the CALWMP and making recommendations to the CRD Board about the CALWMP and certain aspects of the Core Area Wastewater Treatment Program.

- Standing Committee of CRD Board
- Responsible for overseeing CALWMP

Core Area Liquid Waste Management Committee (CALWMC) Chair – The CALWMC Chair is selected by the Chair of the CRD Board annually. The CALWMC Chair is responsible for participating in CALWMC agenda meetings and chairing CALWMC meetings. The Chair is also responsible for building and maintaining relationships, and liaising with the Chair of the Core Area Wastewater Program Commission and the Chair of the Technical Oversight Panel. The CALWMC Chair is the public face of the project and is responsible for communicating with other public bodies at the political level, as well as with the media.

Core Area Liquid Waste Management Committee (CALWMC) Vice Chair – The CALWMC Vice Chair is responsible for fulfilling the roles and responsibilities of the CALWMC Chair in the Chair's absence.

Westside Wastewater Treatment and Resource Recovery Select Committee – In June 2014, Westside participants (Colwood, Esquimalt, Langford, View Royal, and Songhees Nation) formed the Westside Wastewater and Resource Recovery Select Committee to evaluate Westside treatment options and develop a sub-regional wastewater treatment and resource recovery plan. The member municipalities' role is to provide political input and take feedback from the public and report to the Westside Select Committee. The participating municipalities also have zoning authority. In September 2015, the Esquimalt Nation joined the Westside Select Committee. The Songhees and Esquimalt Nation representatives provide political input to the Westside Select Committee. The Committee reports to the CALWMC and is supported by CRD staff, Westside staff, consultants and a technical working group.

The Westside Select Committee participants initiated the Westside Solutions Project as a way to engage residents to work collectively to identify solutions for wastewater treatment and resource recovery that meet the unique needs of the Westside communities. The Westside option sets

consider flow scenarios that include Eastside flows from Vic West and Saanich West. This work, along with the work from the Eastside Select Committee, will inform the Core Area Sewage and Resource Recovery 2.0 project and the amendment to the Liquid Waste Management Plan.

- Representatives from Colwood, Esquimalt, Langford, View Royal and Songhees Nation
- Reports to CALWMC
- Evaluates options to develop a sub-regional wastewater treatment plan
- Supported by CRD staff, Westside municipal staff, consultants and a technical working group

Eastside Wastewater Treatment and Resource Recovery Select Committee – In January 2015, Oak Bay, Saanich and Victoria formed the Eastside Wastewater and Resource Recovery Select Committee to engage with their communities and develop wastewater treatment options that meet the needs of the Eastside municipalities. The role of the participating municipalities is to provide political input and take feedback from the public and report to the Eastside Select Committee. The participating municipalities also have zoning authority. The Eastside Select Committee reports to the CALWMC and is supported by CRD staff, participating municipal staff and consultants.

The Eastside option sets consider a regional option, which includes all flows from Eastside and Westside, as well as a sub-regional and distributed option that includes flows from Eastside municipalities only and Eastside Clover Point outfall catchment flows. The Eastside Select Committee's plan, in combination with the work from the Westside Select Committee, will inform the Core Area Sewage and Resource Recovery 2.0 project and could form the basis for an amendment to the CALWMP.

- Representatives from Oak Bay, Saanich and Victoria
- Reports to CALWMC
- Working to develop wastewater treatment options for Eastside municipalities
- Supported by CRD staff, participating municipal staff, and consultants

CRD Chief Administrative Officer – The CAO oversees all administrative operations and staff, ensures CRD Board policies are implemented, oversees the operations and functions of the CRD, and aligns the organization to achieve strategic priorities set by the Board. This includes working with federal and provincial staff to coordinate funding agreements and providing advice to the CRD Board regarding potential risks and opportunities for the CRD Board.

- Oversees CRD operations and staff
- Works with partners and stakeholders
- Provides advice to the CRD Board

General Manager of Parks & Environmental Services – The GM of Parks & Environmental Services provides general direction and leadership to CRD staff and advises the CALWMC and the Eastside and Westside Wastewater Treatment and Resource Recovery Select Committees regarding the technical and legal aspects of the CALWMP and the wastewater treatment planning process. The General Manager's role is also to provide information to the Core Area Municipalities' CAOs and First Nations Administrators.

- Provides general direction and leadership to CRD staff

- Advises on technical and legal aspects of the CALWMP
- Informs Core Area Municipal CAOs and First Nation Administrators about the project

General Manager of Finance & Technology – The GM of Finance & Technology is the Chief Financial Officer for the CRD. The GM of Finance and Technology is responsible for the budget and all financial services, information technology and geographic information services (IT & GIS), property and real estate services, insurance and risk management, facilities management, and arts development for the Capital Region.

Corporate Officer – The CRD Corporate Officer provides support and procedural advice to the CRD Board and the CALWMC, and is responsible for maintaining the official records of these bodies. The officer also processes requests for records in accordance with the Freedom of Information and Protection of Privacy Act.

First Nations Liaison – The First Nations Liaison serves as a point of contact for First Nations communities involved with the project and provides departmental support and assistance in the areas of service delivery, referral processes, outreach, engagement and relationship building.

Manager, Corporate Communications – The Senior Manager of Corporate Communications provides professional expertise and leads the CRD Corporate Communications team, which works with the General Manager of Parks & Environmental Services and the CAO on overall communications for the CRD Board. There is a communications coordinator dedicated to working on the CALWMP.

Technical Oversight Panel (ToP) – The role of the Technical Oversight Panel is to review the costing and feasibility studies developed by the Engineering Team during the planning phase of the project and to ensure that the studies for the wastewater treatment options include the necessary due diligence. The Technical Oversight Panel will also advise on how to best engage the private sector in this phase of the project. Fundamental to providing independent technical oversight and confirming due diligence is to ensure that the engagement of the private sector in this phase of the project and the innovative solutions that may come forward is informed by, not necessarily bound by (as per the ToP Terms of Reference), decisions to date regarding sites, option sets, timelines, definitions of treatment and other potential limitations on analysis and costing.

The role of the ToP does not include public consultation, media interaction, land acquisition and rezoning, contract management or direction of the Engineering Team The ToP receives information from and liaises with the Engineering Team (Urban Systems and Carollo Associates), and provides feedback and recommendations to the CALWMC. The Chair of the ToP reports to the CALWMC biweekly. The ToP liaises with the Eastside and Westside Select Committee.

- Independent Technical Oversight Panel
- Reviews costing and feasibility studies
- Reports findings to the CALWMC

Independent Engineering Resources – The Independent Engineering Team's role is to conduct the Feasibility and Costing Analysis (Urban Systems partnered with Carollo) for the CALWMP Wastewater Treatment System. The Engineering Team is also working with the Westside Select Committee to do a more detailed analysis on the Westside flows. The team provides information

to and liaises with the ToP, and reports to and receives direction from the CALWMC. Additional external resources may be required for staff to prepare the LWMP amendment. The team is assessing the feasibility of a regional and sub-regional system in the Core. The team is also looking at a distributed system option based on the potential sites put forward from the Eastside Select Committee and Westside Select Committee.

- Conducts feasibility and costing analysis
- Assesses feasibility of regional and sub-regional systems in the Core Area
- Assists with preparation of LWMP amendment

Fairness and Transparency Advisor (FTA) – The FTA's role is to act as a point of contact for the public to submit complaints regarding the process of costing the options, working with the host jurisdiction(s) and preparing an amendment to the LWMP and to ensure that the process is fair, transparent, impartial and objective. The FTA is independent of the CRD. The FTA's role is to investigate appropriate complaints and report to the Board, through the CALWMC, the results of an investigation, to help strengthen the fairness, transparency or objectiveness of the process followed. The FTA is to provide monthly status reports to the CALWMC. The role of the FTA does not restrict the public from going to other sources for complaints and requests to review processes, such as the office of the Ombudsperson.

- Independent of the CRD
- Investigates public complaints regarding process
- Ensures process is fair, transparent, impartial and objective

Core Area Wastewater Treatment Program Commission (the Commission) – As part of the funding negotiations with the Province, the CRD was required to establish an independent non-political governance body to manage, implement and commission the Core Area Wastewater Treatment Program. The Commission governs the implementation and operation of the Wastewater Treatment Program and oversees the procurement process for all components of the Program. The Commission operates autonomously of the CALWMC and Regional Board; however, the Commission is required to seek CRD Board and funder approval on predetermined items as detailed in the CRD Commission bylaw. Several steps have been taken to scale back operations and reduce costs as the CRD continues its planning work to find a new solution to wastewater treatment. The Commission remains in place waiting to implement whatever system of wastewater projects the CRD Board decides upon, and is approved by the Province.

- Independent Commission required by Province
- Manages implementation and operations of the Wastewater Treatment Program
- Oversees procurement process

Technical and Community Advisory Committee (TCAC) – The Technical and Community Advisory Committee is an LWMP requirement of the province, and provides technical and community consultation advice and input to the CALWMC. TCAC assists the CALWMC in making appropriate recommendations to the CRD Board in the following areas: (a) plant design criteria and treatment technology, including opportunities for resource recovery, sludge management, odour control and general plant design criteria, (b) number and location of treatment plants, and (c) timing/scheduling of treatment.

- Provides technical and community consultation advice

- Makes recommendations regarding design criteria, treatment technology, number and location of treatment plants, and schedule for treatment

Eastside Public Advisory Committee (EPAC) – The Eastside Public Advisory Committee takes input from the public and provides guidance to the Eastside Wastewater and Resource Recovery Select Committee on the public consultation process.

- Takes input from the public
- Provides Eastside Select Committee on the public consultation process

Core Area CAOs + First Nation Administrators – The Core Area CAOs and First Nations Administrators are the principal policy advisors to councils, and provide support to the Eastside and Westside Select Committees. The Core Area CAOs and First Nations Administrators receive project-specific information and updates from the CRD's General Manager of Parks & Environmental Services regarding the progress of the CALWMC and the Eastside and Westside Select Committees.

- Principle policy advisors
- Receive project information
- Provide recommendations from municipal staff perspective

Municipal Councils – The role of municipal councils is to make land-use decisions for facility siting and to negotiate development agreements with the CRD.

Westside Communications Team – The Westside Communications Team is made up of Communications Coordinators from Colwood, Esquimalt, CRD and Aurora Consultants. The Team provides communication and public consultation support to the Westside Select Committee.

Eastside Communications Team – The Eastside Communications Team consists of a consultant from Public Assembly and the CRD Communications Manager and CRD CALWMP Communications Coordinator. The Eastside Communications Team provides communication and public consultation support to the Eastside Select Committee

Westside Technical Team – The Westside Technical Team consists of municipal staff, supported by Urban Systems. The technical team provides technical information and input to the Westside Select Committee.

- Comprised of municipal staff and supported by Urban Systems and Aurora Innovations for facilitation and coordination support
- Provides technical advice to the Westside Select Committee

Eastside Technical Team – The Eastside Technical Team is comprised of municipal staff and supported by Urban Systems and CRD Staff. The Technical Team provides support and input to the Eastside Select Committee.

- Comprised of municipal staff; provides support and information to the Eastside Select Committee

7. MILESTONES

The Proposed Work Plan Overlay, which was adopted and submitted to 3P Canada in March 2014, provides the overarching timelines and milestones through the completion of the project (Attachment 2). A draft schedule identifying key tasks and milestones of the feasibility and costing exercise to be achieved by the end of 2015 during Phase 2 of the Core Area Sewage and Resource Recovery System 2.0 project is included for discussion (Attachment 3). The scheduling and implementation of the public consultation on the preferred solution sets (after the costing analysis) is anticipated to occur in early December, but is dependent on all of the deadlines being met up until that point.

A detailed schedule is under development and will be circulated for comment.

8. BUDGET

Funding for the project will be drawn from the Core Area Liquid Waste Management Plan operating reserve, funded by all participants in the service based on projected design capacity for 2030. A total budget of $1,450,000 has been identified to support this phase of the project, including engineering and public consultation consulting fees, Technical Oversight Panel honorarium and disbursements, Fairness and Transparency Advisor, public consultation process delivery and CRD staff time.

Phase 2 Budget

Item	Cost
Project Oversight (FTA & ToP)	$280,000
Public Consultation	$240,000
Feasibility and Costing Analysis	$450,000
Property and Zoning	$75,000
LWMP Amendment No. 10	$75,000
Staff and Wages	$300,000
Miscellaneous and Legal	$30,000
TOTAL	$1,450,000

9. CONSTRAINTS, ASSUMPTIONS, RISKS AND DEPENDENCIES

a) Constraints

- The timelines for this phase of the project are extremely aggressive with no buffer
- The schedule is dependent on multiple parties and governance bodies meeting their sub-project schedules

b) Assumptions

- The Minister of Environment will provide direct *conditional* approval of the Liquid Waste Management Plan upon submission to the Province

c) Risks

- The costing analysis and public consultation processes will be subject to criticism due to time constraints
- The governance model of the project is complex, leading to miscommunication or contradictory decision making
- Municipal councils do not endorse siting preferences of the CRD Board
- Potential loss of senior government funding if timelines are not met

d) Risk Mitigation

- Ensure regular, open reporting of all parties to the Core Area Liquid Waste Management Committee to ensure "no surprises" when public consultation is formally conducted
- Engage in close municipal council and staff involvement as preferred sites emerge and municipal planning/siting processes are initiated
- Ensure ongoing and open discussions with the funding agencies to ensure "no surprises" when the LWMP amendment is submitted for approval and the project is submitted for funding
- Ensure transparent and deep engagement with the community
- Ensure there is enough time required to rezone and that there is public support for rezoning

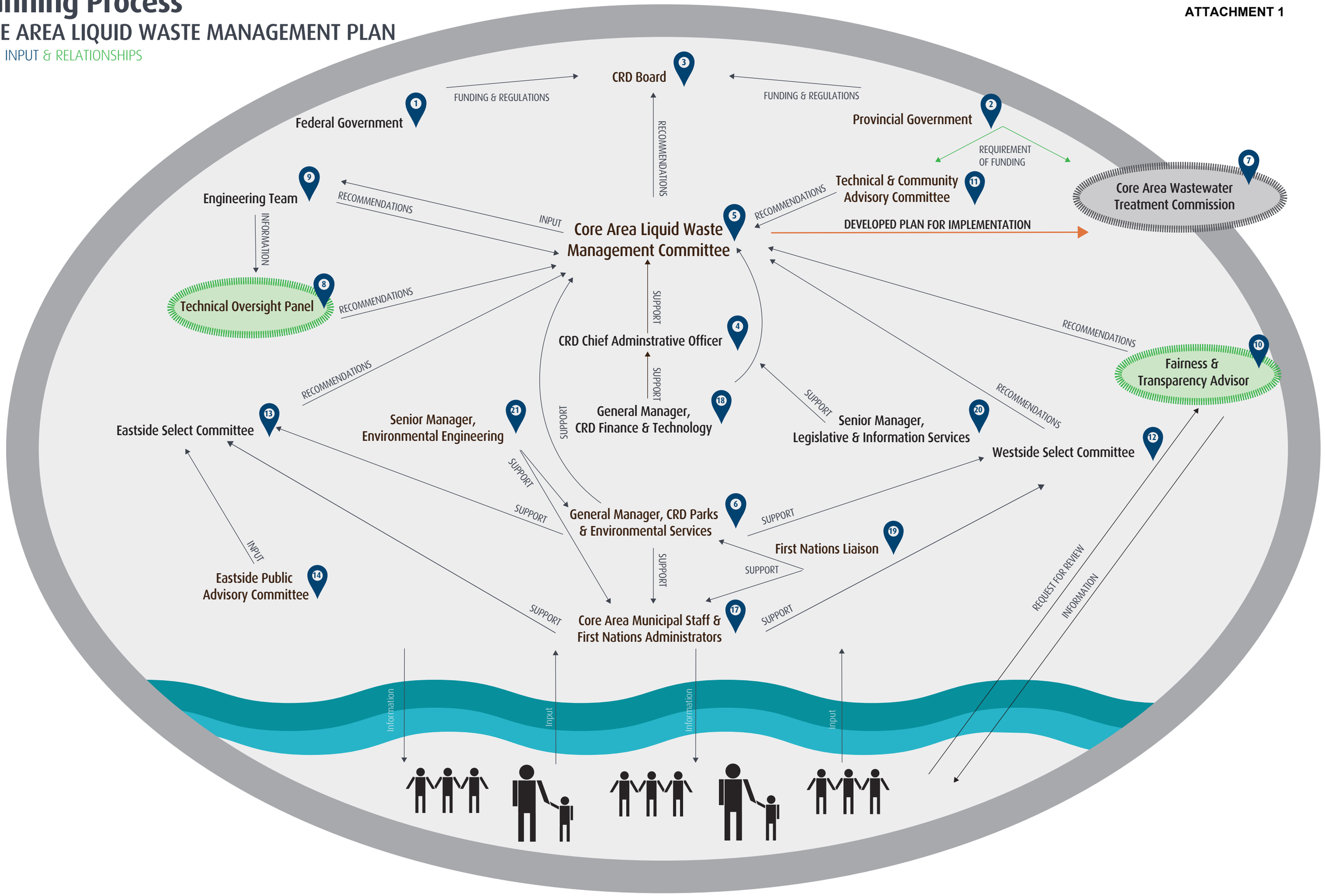
Attachments:	Attachment 1:	Planning Process – Core Area Liquid Waste Management Plan – Roles, Input & Relationships
	Attachment 2:	Proposed Work Plan Overlay – 3P Canada Funding Considerations
	Attachment 3:	Proposed Feasibility and Costing Analysis Schedule (Urban Systems) – August 31, 2015

Planning Process

CORE AREA LIQUID WASTE MANAGEMENT PLAN

ROLES, INPUT & RELATIONSHIPS

ATTACHMENT 1

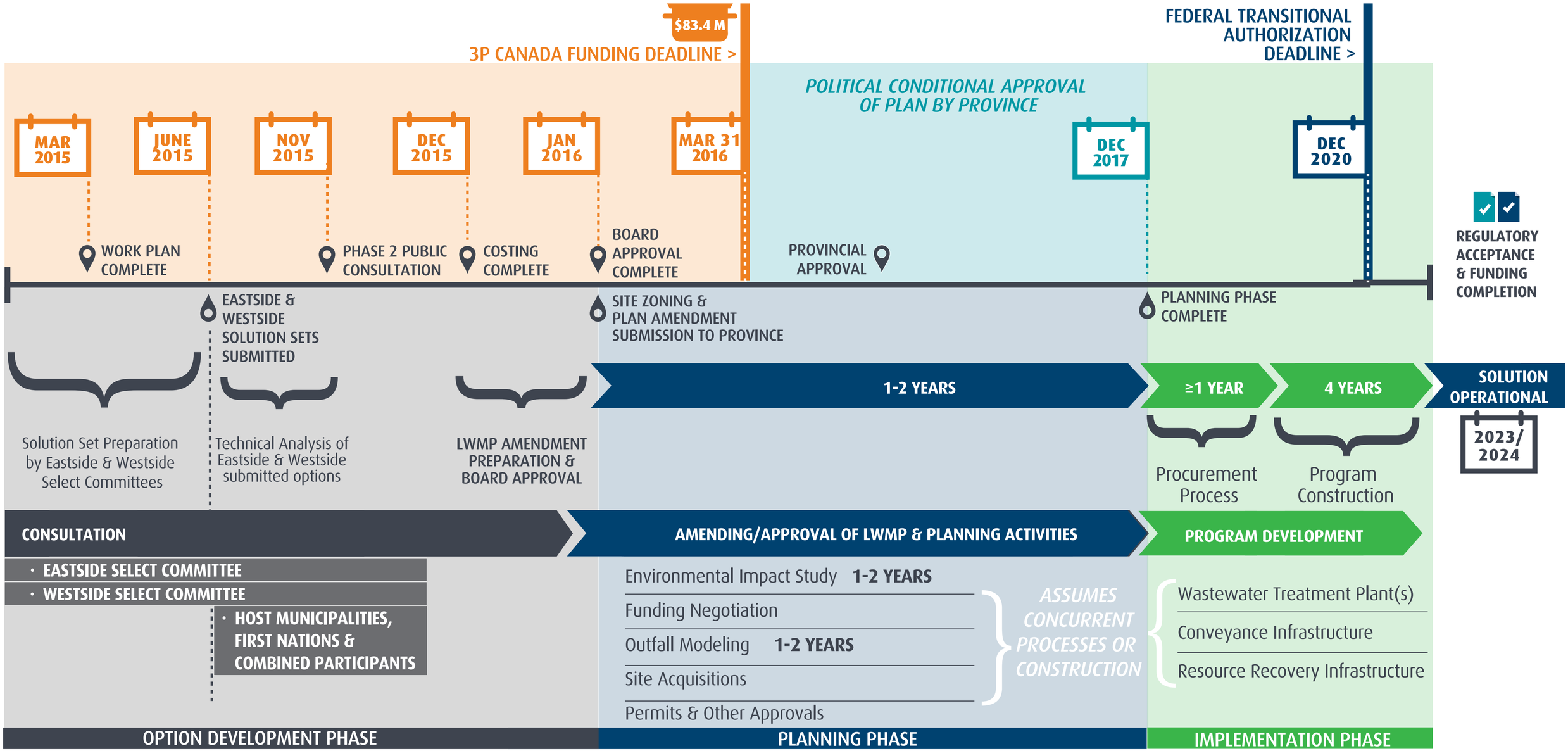


ATTACHMENT 2

Proposed Work Plan Overlay

3P CANADA FUNDING CONSIDERATIONS

OPTION DEVELOPMENT, PLANNING & IMPLEMENTATION PHASES



OCTOBER 2015

6.2 Proposed Schedule

URBAN systems

Capital Regional District
Core Area Liquid Waste Management Plan
Wastewater Treatment System Feasiblity & Costing Analysis
RFP 15-1834

Revised August 31, 2015

		2015																				
		August					September					October				November				December			
		Ju.y 27 - Aug 2	Aug 3 - 9	Aug 10 - 16	Aug 17 - 23	Aug 24 - 30	Aug 31 - Sept 6	Sept 7 - 13	Sept 14 - 20	Sept 21 - 27	Sept 28 - Oct 4	Oct 5 - 11	Oct 12 - 18	Oct 19 - 25	Oct 26 - Nov 1	Nov 2 - 8	Nov 9 - 15	Nov 16 - 22	Nov 23 - 29	Nov 31 - Dec 6	Dec 7 - 13	Dec 14 - 20	Dec 21 - 31
Task 1.0 - Background/Technical Foundation																						
1.1	Kick off Meeting					■																
1.2	Assess/Refine Cost Unit Rates							■	■	■												
1.3	Design Criteria							■	■	■												
1.4	Liaise with MoE to Guage Acceptance of Alternative Recovery/Reuse Options							■	■	■												
1.5	Refine Evaluation Criteria for Technical Analysis of the Option Sets							■	■	■												
1.6	Propose Analysis Methodology and Criteria with CALWM Committee										■											
TASK 2.0 - Review and Refine Solution Sets																						
2.1	Quantify Option Sets											■										
2.2	Conveyance and Pumping												■									
2.3	Treatment Including Technology Options							■	■	■	■	■	■									
2.4	Effluent management - Water Reclamation and Outfall							■	■	■	■	■	■	■								
2.5	Solids Residual Resource Recovery							■	■	■	■	■	■	■								
2.6	Energy/Heat Recovery							■	■	■	■	■	■	■								
2.7	Carbon Footprint							■	■	■	■	■	■	■								
2.8	Facility/Community Context														■							
2.9	Liaise with MoE														■							
2.10	Core Area Municipalities and CRD Presentation Meeting														■							
2.11	Finalize Option Sets															■						
TASK 3.0 - Costing and Financial Anaysis																						
3.1	Setup Costing and Financial Framework																■					
3.2	Cost Development (Lifecycle Costs, Operations, Expansions)																	■				
3.3	New Revenues, eg., Resource Recovery																	■				
3.4	Community Allocation																		■			
3.5	Procurement Assessment																		■			
3.6	Review Meeting - Core Area Municipalities and CRD																		■			
TASK 4.0 - Decision Making and Reporting																						
4.1	Prepare Materials for Public Input																			■		
4.2	Develop Materials for Political Engagement																			■		
4.3	Prepare Report: Methodology, and Option Set Details																			■		
4.4	Presentations - Core Area Municipalities																				■	■
4.5	Summarize Zoning Considerations																					■
TASK 5.0 - Engagement with Technical Oversight Panel																						
5.1	Orientation/Workshop								■													
5.2	Conference Calls										■		■				■				■	■
5.3	Review Meetings (in person)														■				■			