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CORE AREA AND WEST SHORE SEWAGE TREATMENT
TECHNICAL AND COMMUNITY ADVISORY COMMITTEE MEETING
Notice of Meeting on **Tuesday, March 29, 2016 at 1 pm**
Boardroom, 625 Fisgard Street, Victoria, BC

L. Helps (Chair)	R. Barnhart	M. Baxter	M. Coburn
T. Davies	G. Gillespie	E. Ishiguro	H. Machielse
M. Mahovlich	J. McIsaac	J. Miller	J. Paul
D. Purewall	L. Resnick	J. Rose	J. Rosenberg
A. Teekasingh	T. Tiedje	D. White	C. Witter

AGENDA

1. Approval of Agenda
2. Adoption of Minutes of February 16, 2016
3. Introductions
4. Chair's Remarks
5. Update – Core Area Liquid Waste Management Committee
6. New Business
7. Adjournment

Attachments: 1. Staff Report to March 9, 2016 CALWMC
2. Recommendations from CALWMC

Next Meeting: TBA

To ensure a quorum, please advise Margaret Reilly at 250.360.3046 or mreilly@crd.bc.ca if you cannot attend.

ENVS-1205887834-445

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DRAFT

Minutes of a Meeting of the Core Area and West Shore Sewage Treatment Technical and Community Advisory Committee (TCAC)
Held February 16, 2016, in Room 107, 625 Fisgard St., Victoria, BC

Present: **Committee Members:** L. Helps (Chair), R. Barnhart, M. Baxter, M. Coburn, E. Ishiguro, H. Machielse, J. Miller, G. Montgomery (for J. McIsaac), D. Purewall, A. Teekasingh, T. Tiedje, D. White, C. Witter
Staff: L. Hutcheson, General Manager, Parks & Environmental Services; D. Telford, Project Manager, Core Area Wastewater and Resource Recovery Project; L. Taylor, Communications Coordinator, Corporate Communications; M. Reilly (recorder)
External Resources: none
Also Present: A. Gibbs, Consultant; C. Houghton, Consultant; E. Lee, Consultant
Absent: T. Davies, G. Gillespie, M. Mahovlich, J. Paul, L. Resnick, J. Rose, J. Rosenberg

The meeting was called to order at 2:01 pm.

1. Approval of Agenda

MOVED by C. Witter, **SECONDED** by R. Barnhart,
That the agenda be approved as circulated.

CARRIED

2. Adoption of Minutes

MOVED by C. Witter, **SECONDED** by R. Barnhart,
That the minutes of the January 18, 2016 meeting be adopted as circulated.

CARRIED

3. Chairs Remarks

Chair Helps commented that the phase 2 public consultation is coming to an end on Saturday, February 20 at noon. Following this, staff and consultants will work together to prepare a report for the Core Area Liquid Waste Management Committee (CALWMC) which will be a recommendation for a sewage treatment option. This staff report will be sent to TCAC members as soon as it is posted on Monday, February 22 and TCAC members are encouraged to send their comments to Chair Helps by Tuesday, February 23 at midnight. The report will be under consideration by the CALWMC on February 24. The CALWMC will meet again on February 26 at which time a decision will need to be made.

4. Core Area Siting Options Development Phase 2 Public Consultation Update

Christine Houghton (Aurora Innovations) gave a PowerPoint presentation on the Westside public engagement process and technical developments. She noted:

- Westside has developed a 3 plant option

- Westside technical staff researched the cost for a sewage treatment facility using a 2 times average dry weather flow (2xADWF) capacity model (4xADWF is the standard) which may be feasible given the low levels of inflow and infiltration in the western communities
- the high school competition in which students have an opportunity to present their vision of a sewage treatment plant is ongoing
- there has been extensive use of social media in the phase 2 consultation
- there have been 4 open houses on the Westside and one joint Eastside/Westside open house
- targeted meetings have been held with community associations, chambers of commerce and neighbourhood associations
- advertisements have been placed in all local papers and on local radio and television
- the survey was changed on February 12 to add the option "none of the above" – results of this change will be analysed

Amanda Gibbs (Public Assembly) reported that Eastside and Westside shared a common strategy for the phase 2 public consultations. She noted:

- 14 events will have been held on the Eastside by February 17
- meetings were also held with community groups, CUPE, arts groups and business groups
- open houses and workshops attracted fewer participants than anticipated although there were very specific questions and ideas from those who attended
- the online survey has been completed by approximately 1200 to date – the goal is 1500 responses

D. Purewall joined the meeting at 2:15 pm.

5. Core Area Liquid Waste Management Committee Progress Update

Ehren Lee (Urban Systems) gave a PowerPoint presentation. He noted that:

- Technical Memo 3 has been revised and expanded in response to requests and comments from the CALWMC
- Technical Memo 3 was accepted by the CALWMC last week and this final version was circulated to the TCAC members with the February 16 agenda
- Urban Systems is assisting with the open houses, particularly with answering technical questions
- the 7 options that are being presented cover all of the charter requests and present a full spectrum of choices to the public
- sites, costing, level of treatment, water reuse, heat recovery, solids technologies, infrastructure and conveyance systems, and options for solids processing at Hartland or Rock Bay have been laid out
- Technical Memo 4 will be an executive summary
- the inclusion of gasification in the options was questioned as this method is experimental and there are no successful working plants using this method for sewage sludge – the response is that gasification was included as there was a mandate to examine this option but it was noted that this method requires the

inclusion of landfill waste and the final choice will need to balance innovation, risk and cost

Mr. Lee thanked the members of the TCAC for their engagement, ideas, recommendations and helpfulness in offering "take home initiatives" throughout the process of preparing the technical memos.

6. TCAC Membership

There are several positions on the TCAC that have not been filled. Letters have been written to these organizations, both those who have previously declined and those who have yet to nominate someone, reminding them that under our Terms of Reference they are permitted to have representation on the committee and asking if they would like to nominate a representative.

7. Zoning Clarification

The zoning for McLoughlin Point was circulated to the committee with the February 16 agenda. Larisa Hutcheson reported that CRD owned lands at Macaulay Point are zoned for all of its current functions (i.e. sewage pump station, sewage outfall, sewage screening, and laboratory).

8. New Business

Thank You to Consultants

As this phase of the sewage treatment project is drawing to a close, A. Teekasingh offered thanks to Ehren Lee, Amanda Gibbs and Christine Houghton for their valuable work over the past several months.

9. Adjournment

MOVED by R. Barnhart, **SECONDED** by A. Teekasingh,
That the meeting be adjourned at 2:41 pm.

CARRIED

Next Meeting: March 29, 2016

RECORDER **CHAIR**

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EHQ 16-31

REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, MARCH 9, 2016

SUBJECT **Options Analysis and Recommendation – Core Area Wastewater Treatment and Resource Recovery**

ISSUE

To provide the Core Area Liquid Waste Management Committee (CALWMC) with follow-up information on costing and other implications for a number of wastewater treatment and resource recovery options arising from the committee meeting held February 24, 2016.

BACKGROUND

On February 24, 2016, the CALWMC considered a staff report recommending a preferred option for conditional amendment to the Core Area Liquid Waste Management Plan. This report laid out numerous implications, including regulatory, environmental, consultation, siting and financial. Upon deliberation, the committee referred to staff to work with consultants to undertake value engineering and report back as soon as possible with cost estimates for a series of options, including Rock Bay as a centralized site, Macaulay/McLoughlin together with Clover Point, and other combinations of these sites. At a special meeting held March 2, the committee added consideration of a Westside plant, in combination with the other sites.

Urban Systems/Carollo Engineers has prepared a letter report, included as Appendix A, which details the costing and rationale for three options.

ALTERNATIVES

That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District (CRD) Board:

Alternative 1

1. That a conditional Liquid Waste Management Plan Amendment No. 10 be prepared as a basis for approval and submitted to the Minister of Environment with the following elements:

    a) A tertiary wastewater treatment plant at Clover Point, servicing all flows currently directed to Clover Point, up to 2030[1], and;
    b) A tertiary wastewater treatment plant at McLoughlin Point, servicing all flows currently directed to Macaulay Point outfall, up to 2030, and;
    c) Provision for a Westside wastewater treatment plant for future growth, at a location to be determined
    d) Hartland Landfill as the preferred site for biosolids processing with technology to be confirmed by the process below.

Note 1: Facility footprint to accommodate 2045 flows with tender process to incent longest-term capacity.

2. That included within the Plan amendment is a process under which the CRD would invite the submission of project concepts to achieve the goals of the Project Charter. The submissions would include sufficient detail to allow for meaningful evaluation of the project concepts against each other and against the base case, including details regarding sites, technology, a feasibility assessment, demonstration of compatibility with current infrastructure, compliance with provincial and federal requirements and demonstration of significant fiscal advantages and/or environmental advantages over the base case, including financial backing.

   The submissions could demonstrate solutions for:
   a) A Rock Bay/Westside combination.
   b) A tertiary wastewater plant at either McLoughlin Point or Macaulay Point as an alternative to Rock Bay, a tertiary wastewater plant at Clover Point, provision for a tertiary plant on the Westside.
   c) The treatment of biosolids at Hartland, possibly in combination with food scraps, municipal solid waste and wood waste.
   d) Other feasible alternatives that demonstrate compatibility with current infrastructure, compliance with provincial and federal requirements and demonstration of significant fiscal advantages and/or environmental advantages and financial backing.

3. That the preferred approach be formally communicated to all senior levels of government involved in funding the project, including the Province, 3P Canada and Infrastructure Canada.

4. That a referral be made to both Esquimalt and Victoria Councils seeking approval in principle of the proposed sites as locations for tertiary wastewater treatment plants.

5. That staff be directed to continue working with Colwood, Songhees and Esquimalt First Nations on issues related to purchased capacity and cost considerations for those system users and report back to Committee.

Alternative 2

1. That a conditional Liquid Waste Management Plan Amendment No. 10 be prepared as a basis for approval and submitted to the Minister of Environment with the following elements:

   a) A centralized tertiary wastewater treatment plant at Rock Bay
   b) The BC Hydro/Transport Canada lands as the preferred wastewater treatment site
   c) Provision for a Westside wastewater treatment plant for future growth, at a location to be determined
   d) Hartland Landfill as the preferred site for biosolids processing, with technology to be confirmed by the process outlined below

2. That included within the Plan amendment is a process under which the CRD would invite the submission of project concepts to achieve the goals of the Project Charter. The submissions would include sufficient detail to allow for meaningful evaluation of the project concepts against each other and against the base case, including details regarding sites,

technology, a feasibility assessment, demonstration of compatibility with current infrastructure, compliance with provincial and federal requirements and demonstration of significant fiscal advantages and/or environmental advantages over the base case, including financial backing.

The submissions could demonstrate solutions for:

a) The Rock Bay/Westside combination as outlined above.
b) A possible tertiary wastewater plant at either McLoughlin Point or Macaulay Point as an alternative to Rock Bay, a tertiary wastewater plant at Clover Point, provision for a tertiary plant on the Westside.
c) The treatment of biosolids at Hartland, possibly in combination with food scraps, municipal solid waste and wood waste.
d) Other feasible alternatives that demonstrate compatibility with current infrastructure, compliance with provincial and federal requirements and demonstration of significant fiscal advantages and/or environmental advantages and financial backing.

3. That the above approach be formally communicated to all senior levels of government involved in funding the project, including the Province, 3P Canada and Infrastructure Canada.

4. That staff be directed to finalize, subject to Board approval, Options to Purchase on the lands in Rock Bay as identified in Appendix D.

5. That staff be directed to continue working with Colwood, Songhees and Esquimalt First Nations on issues related to purchased capacity and cost considerations for system users and report back to Committee.

FINANCIAL IMPLICATIONS

Refinement of capital costs for a centralized tertiary treatment plant at Rock Bay has resulted in a cost estimate of $1.077 billion, a cost savings of $54 million over the prior estimate. As outlined in Urban Systems/Carollo's letter, a number of system components have been deferred, including the water reuse system and upgrades to the outfalls.

The combination of two tertiary wastewater treatment plants at McLoughlin Point and Clover Point results in the lowest overall capital cost of $1.052 billion; however, capital costs for the three options evaluated are very close, all within a range of only $37 million. A summary table of capital costs for all options evaluated is included in Appendix B.

Urban Systems/Carollo did not have sufficient time to determine operating costs for the new options. This information has been requested and is necessary to determine per household costs for each participant.

SITING IMPLICATIONS

The Clover Point land is entirely owned by the City of Victoria; however, up until 1988, the majority of the site was owned by the Federal Department of National Defense (DND) and leased to the

City. The lands owned by DND were granted to the City through a Crown Grant with an expectation that future use would be park.

There have been two different site areas derived for the two options considered at Clover Point, as shown in Appendix C. The lands that do not overlap with the Crown Grant and originally identified by the City of Victoria are 0.47 hectares. A larger area, required for a full tertiary treatment facility, and overlapping with the Crown Grant, is 1.25 hectares.

The recommended option includes a tertiary wastewater treatment facility constructed underground at Clover Point utilizing an area of 1.25 ha. Staff are currently communicating with the federal Department of Justice to confirm the permissibility of the CRD constructing a facility below the land that was granted in 1988, while maintaining the use of the land surface for park. This process may ultimately require an amendment to the Crown Grant. Staff anticipate that further details can be communicated at the committee meeting.

Underground facilities are not readily expanded to accommodate future growth. It is proposed to construct the Clover Point treatment facility to the 2045 footprint requirements.

The lands owned by the CRD at Macaulay Point are not large enough to support a wastewater treatment plant under the indicative design parameters established by Urban Systems/Carollo Engineers. Under the recommended configuration, a pump station would remain at this location servicing the McLoughlin Point wastewater treatment facility.

Under the recommended option, the McLoughlin Point wastewater treatment facility will service the Westside participants, in addition to Saanich west and Victoria west flows, to the year 2030. Growth beyond this time will be accommodated with an additional wastewater treatment facility on the Westside.

Consistent with the process undertaken over the past year, and to provide for the best opportunity for conditional approval by the province, approval in principle of the sites should be obtained in support of the amendment from both Esquimalt and City of Victoria councils.

CONSULTATION IMPLICATIONS

As reported to committee on February 24, key overall themes were observed and recorded over the course of the comprehensive pubic consultation process conducted in January and February, as follows:

- Concern for overall costs and how the project will affect taxes
- Support for higher level of treatment and level of water quality being discharged into the ocean
- Support for increased opportunities for heat and water reuse

Also heard, primarily from Eastside residents, was concern about the overall increase in the cost of the project, an understanding of the additional costs for the Rock Bay location for conveyancing, and a desire to include other locations, and technologies where those costs might be lower (closer

proximity to the existing outfalls). Early in the Eastside Dialogues process, Clover Point emerged as a "green-lighted" publicly-acceptable site for sewage treatment, along with Rock Bay, Ogden Point, Saanich Works Yard and Gordon Head/Cadboro Bay. Recent consultation with the community regarding Clover Point has been limited to the location as an enhanced pump station.

All options that include Rock Bay will necessitate construction of significant conveyancing to and from Clover Point. During the recent consultation process, concerns were expressed on this issue around the impacts to traffic flow and business continuity over the course of the construction period. The two-plant configuration of McLoughlin/Clover Point eliminates these construction impacts and represents the shortest overall construction duration of the new options considered. A small diameter conveyancing line will be constructed to pump raw sludge from both McLoughlin and Clover Points to the Hartland biosolids processing facility.

Recent consultation has not taken place around Macaulay/McLoughlin Point, as these sites were not put forward by Esquimalt Council under the current process. McLoughlin Point is the location for a centralized facility under the current LWMP.

Given that the most cost effective option for Westside participants is to accommodate growth with a new facility on the Westside in the future, a location for this treatment plant can be identified in future amendments to the Plan and in consultation with Westside communities.

CONCLUSION

A number of additional options have been considered in response to public consultation conducted in January/February. Costing analysis including sites at McLoughlin and Clover Points has resulted in a two-plant configuration that is marginally lower in cost to a centralized facility at Rock Bay. This option eliminates the need to construct significant conveyancing infrastructure to and from Rock Bay and Clover Point.

RECOMMENDATION

That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:

1. That a conditional Liquid Waste Management Plan Amendment No. 10 be prepared as a basis for approval and submitted to the Minister of Environment with the following elements:

    a) A tertiary wastewater treatment plant at Clover Point, servicing all flows currently directed to Clover Point, up to 2030[1], and;
    b) A tertiary wastewater treatment plant at McLoughlin Point, servicing all flows currently directed to Macaulay Point outfall, up to 2030, and;
    c) Provision for a Westside wastewater treatment plant for future growth, at a location to be determined
    d) Hartland Landfill as the preferred site for biosolids processing with technology to be confirmed by the process below.

Note 1: Facility footprint to accommodate 2045 flows with tender process to incent longest-term capacity.

2. That included within the Plan amendment is a process under which the CRD would invite the submission of project concepts to achieve the goals of the Project Charter. The submissions would include sufficient detail to allow for meaningful evaluation of the project concepts against each other and against the base case, including details regarding sites, technology, a feasibility assessment, demonstration of compatibility with current infrastructure, compliance with provincial and federal requirements and demonstration of significant fiscal advantages and/or environmental advantages over the base case, including financial backing.

   The submissions could demonstrate solutions for:
   a) A Rock Bay/Westside combination.
   b) A tertiary wastewater plant at either McLoughlin Point or Macaulay Point as an alternative to Rock Bay, a tertiary wastewater plant at Clover Point, provision for a tertiary plant on the Westside.
   c) The treatment of biosolids at Hartland, possibly in combination with food scraps, municipal solid waste and wood waste.
   d) Other feasible alternatives that demonstrate compatibility with current infrastructure, compliance with provincial and federal requirements and demonstration of significant fiscal advantages and/or environmental advantages and financial backing.

3. That the preferred approach be formally communicated to all senior levels of government involved in funding the project, including the Province, 3P Canada and Infrastructure Canada.

4. That a referral be made to both Esquimalt and Victoria Councils seeking approval in principle of the proposed sites as locations for tertiary wastewater treatment plants.

5. That staff be directed to continue working with Colwood, Songhees and Esquimalt First Nations on issues related to purchased capacity and cost considerations for those system users and report back to Committee.

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 Letter from Urban Systems/Carollo *Core Area Wastewater – Analysis Summary for Motions of February 26 and March 2, 2016: Cost and Option Set Alternatives*
Appendix B – Core Area Sewage Treatment Projected Capital Cost by Option
Appendix C-1 – Site Requirements at Clover Point for a Primary Plant
Appendix C-2 – Site Requirements at Clover Point for a Tertiary Plant
Appendix D – Orthophoto of Rock Bay Site

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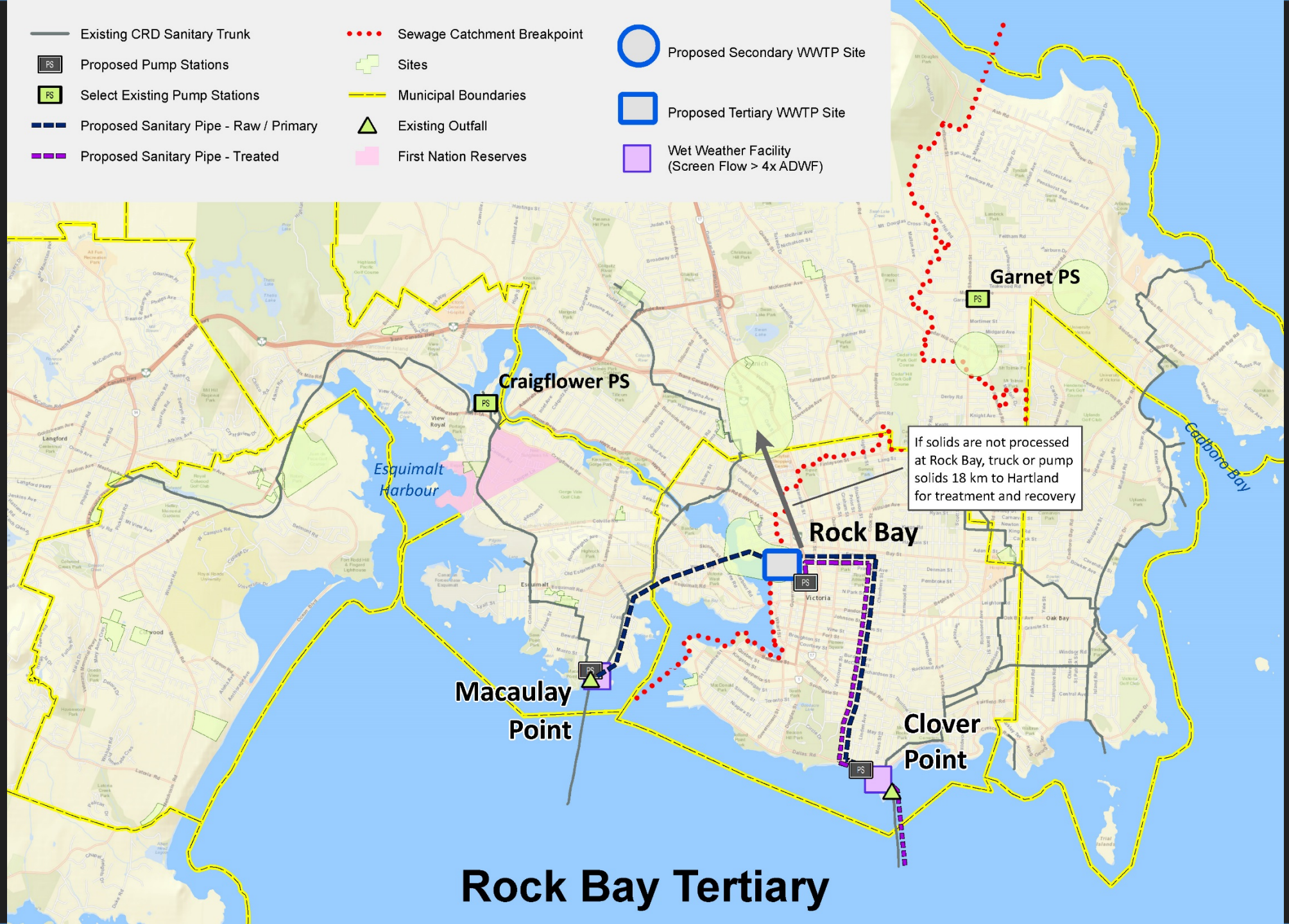
Core Area Liquid Waste Management Committee

March 9, 2016


Existing CRD Sanitary Trunk
Proposed Pump Stations
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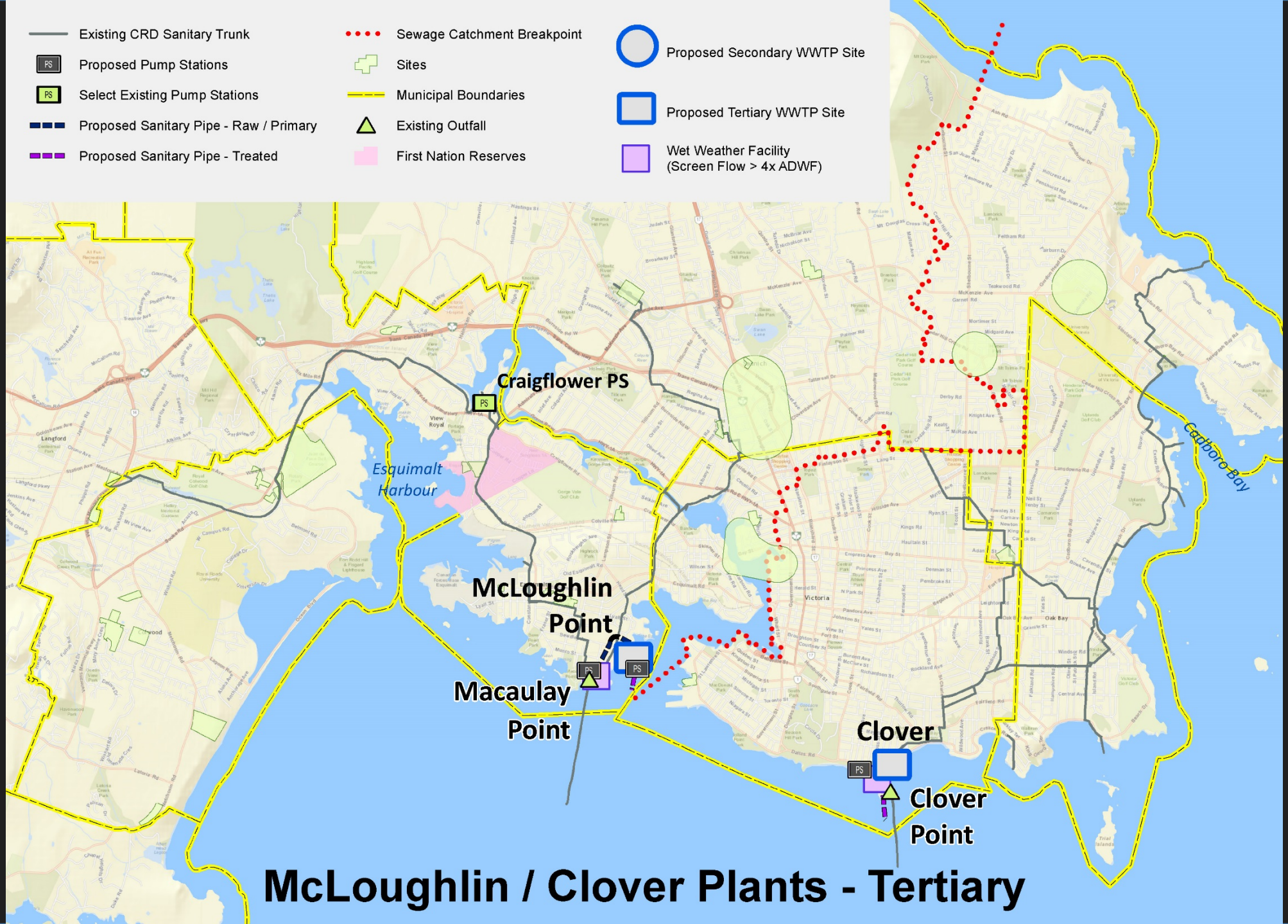
Proposed Sanitary Pipe - Raw / Primary
Proposed Sanitary Pipe - Treated
Sewage Catchment Breakpoint
Sites
Municipal Boundaries
Existing Outfall
First Nation Reserves
Proposed Secondary WWTP Site
Proposed Tertiary WWTP Site
Wet Weather Facility
(Screen Flow > 4x ADWF)
Garnet PS
Craigflower PS
Esquimalt Harbour
If solids are not processed at Rock Bay, truck or pump solids 18 km to Hartland for treatment and recovery
Rock Bay
Macaulay Point
Clover Point
Cadboro Bay
Rock Bay Tertiary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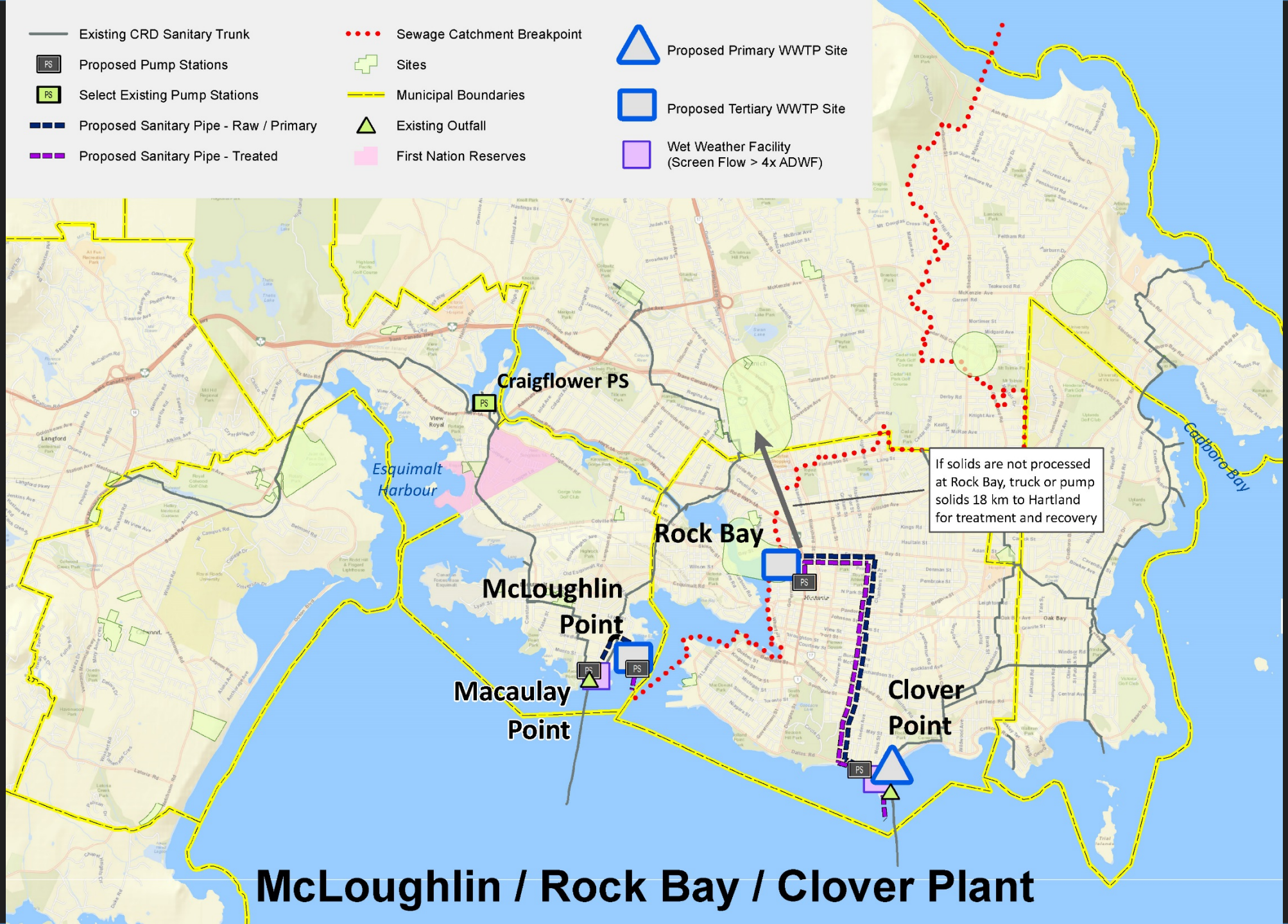
Craigflower PS
Esquimalt Harbour
McLoughlin Point
Macaulay Point
Clover
Clover Point
Cadboro Bay
McLoughlin / Clover Plants - Tertiary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Clover Point
Cadboro Bay
If solids are not processed at Rock Bay, truck or pump solids 18 km to Hartland for treatment and recovery
McLoughlin / Rock Bay / Clover Plant

MACAULAY AND MCLOUGHLIN POINT

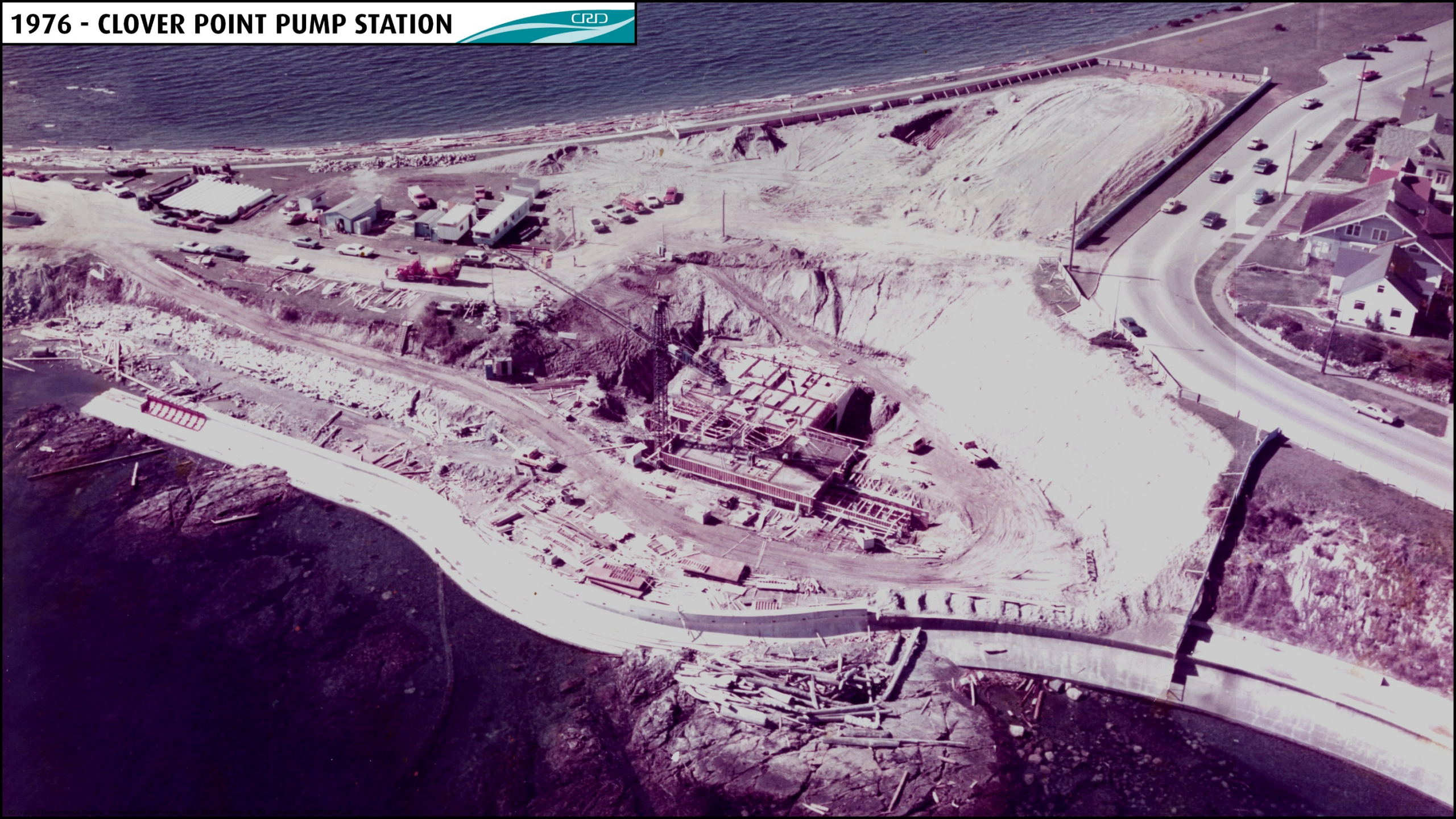
CRD - Parks & Environmental Services - Environmental Engineering - Mar 08, 2016 - Technologist: jpbezeau - Map Document: MacaulayMcLoughlinForPP.mxd

MACAULAY POINT

MCLOUGHLIN POINT

CLOVER POINT TERTIARY TREATMENT PLANT SITE

1976 - CLOVER POINT PUMP STATION



Questions?

March 4, 2016

File: 1692.0037.01

Capital Regional District (CRD)
625 Fisgard Street, PO Box 1000
Victoria, BC V8W 2S6

Attention: **Larisa Hutcheson; GM Parks and Environmental Services**

RE: **Core Area Wastewater - Analysis Summary for Motions of February 26 and March 2, 2016: Cost and Option Set Alternatives**

The *Core Area Liquid Waste Management Committee* (the Committee) is considering multiple option sets for wastewater treatment and resource recovery. Phase 2 comprises technical and financial analysis as well as public consultation to provide foundational information to the Committee to set levels of service, identify facility locations and define amendments to the Liquid Waste Management Plan.

Phase 2 analysis and findings encompass seven option sets ranging from centralized to distributed, secondary to tertiary, and solids recovery technologies and locations. While continuing to consider these seven option sets, the Committee would like to explore options to reduce conveyance costs at already proposed and new locations. This technical letter summarizes analysis stemming from motions of the February 26 and March 2 meetings which is to study elements of preliminary *value engineering*, including contracting levels of service for key elements and to study costing at alternative treatment locations: the information provided in this memo supports Committee is making a decision on a new plan for Core Area liquid waste management.

Motions and Staff direction arising from the February 26 and March 2 meetings include the following cost and option set alternatives:

1. **Costing and feasibility information to reduce the overall costs for a central, tertiary plant at Rock Bay** (i.e. cost saving potential for Option 1b Rock Bay tertiary, at the conceptual planning stage).

2. **3 Plant Tertiary Option:** *two tertiary plants and 1 primary plant to serve two catchments to reduce conveyance costs.*

    a) Costing and feasibility information for two tertiary plants at McLoughlin/Macaulay and Rock Bay with consideration to a primary plant at Clover Point to reduce the scope of conveyance infrastructure through urban areas of Victoria.
        - Flows from the East Coast Interceptor undergo primary treatment at Clover Point (maximizing known available land of <0.5ha at Clover Point) with 0x to 2x dry weather flows conveyed to Rock Bay for tertiary treatment
        - Flows from the Macaulay catchment treated to a tertiary level at McLoughlin (where suitable land space exists)

- Provision for a future plant in Colwood/Langford to accommodate flows for the Westshore beyond 2030
- All solids conveyed to Hartland Landfill for processing and potential integrated resource recovery

3. **2 Plant Configuration at Sites Adjacent the Outfalls:** *two plants to serve two existing catchments with new facilities located at sites adjacent the outfalls to largely eliminate conveyance costs.*

   b) Costing and feasibility information for two tertiary treatment plants for flows from the two existing sewer catchments (Clover Point and Macaulay Point) at McLoughlin/Macaulay and Clover Point sites.
      - Flows from the East Coast Interceptor would be treated to tertiary level at Clover Point, by means of an ultra-compact facility, with site feasibility confirmed by CRD Staff
      - Flows from the Macaulay catchment treated to a tertiary level at McLoughlin (where suitable land exists)
      - Provision for a future plant in Colwood/Langford to accommodate flows for the Westshore beyond 2030
      - All solids conveyed to Hartland Landfill for processing and potential integrated resource recovery

Analysis Summary

Overall Cost Alternative Considerations

The Committee's interest in cost reductions and cost alternatives at the planning-comparison stage is best met by contracting, eliminating or deferring select infrastructure. Future value-engineering exercises will uncover more detailed information which will inform contingencies and likely reduce overall costs, however those decisions are based on the results of subsequent design phases. Cost-alternatives and reductions for select infrastructure based on the motions arising from February 26 and March 2, include:

a) **Defer the installation of water reuse systems** to save initial capital costs and allow for gradual installation of reuse systems as warranted. There are no water reuse systems in any of the three option set alternatives.

b) **Defer upgrades to the existing long outfalls** (>1,500m) because their condition is likely adequate to carry beyond the 2030 design scenario.

c) **Install moderate-length outfalls (250m) for tertiary quality water** at Clover and/or Macaulay Points to avoid upsizing the long outfalls for future flows.

d) **Eliminate the Barnhard Pump Station** in option sets with 2 or more plants to eliminate the cost of conveying flows from the Macaulay catchment (flows from West Saanich and Vic West) back to eastside plants (previously included to respect municipal service governance)

e) Include the costs to convey solids to Hartland Landfill however these costs are separated from the base total to allow for a straight-line comparison to the costs of the option sets previously presented to the Committed (which accounted for a solids recovery plant in Rock Bay)

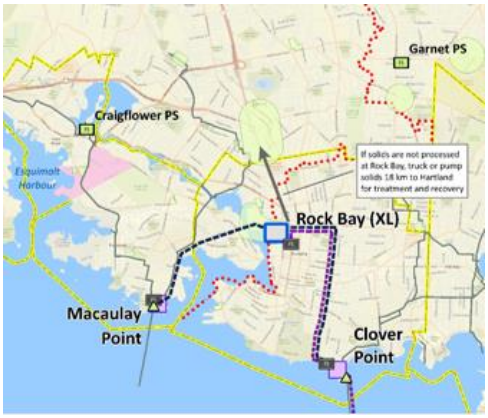
Considerations for a Westshore Plant (e.g. Colwood, Langford) for 2030

Each of the two new option set alternatives that include the McLoughlin site also include the provision for a Westshore plant serving Colwood and or Langford. Multiple option sets prepared for both the *Westside Select Committe*e and the *Core Area Committee* during Phase 2 provide key insights into the cost feasibility of a plant there.

A Westshore plant is considered suitable and more cost-effective for the future, toward 2045, so as to locate additional treatment capacity for growth, near the actual location of growth. Including a plant in the option set alternatives for the 2030 scenario would increase overall costs because of the loss in economies of scale for smaller plants and more significantly, due to the need for additional infrastructure to convey treated effluent to either Macaulay Point or a new outfall.

Cost and Technical Feasibility Results for Three Option Set Alternatives

Results summaries per option set outline the considerations and cost reductions with each of the three option set alternatives. Overall considerations follow the technical results table, to support upcoming Committee dialogue.

Map	Description + Cost Alternatives
	**1 Plant Rock Bay Tertiary** Central, tertiary plant at Rock Bay. ***Cost Management*** • Defer water reuse until there are sufficient connections for a system • Defer upsize to existing outfalls; instead install 250m outfalls for higher quality effluent • Although not reflected in costs in this letter, further optimization could reduce costs through conveyance • Cost reduced by $54M Capital 2030 Cost: **$1,077M**

Map	Description + Cost Alternatives
	3 Plant: Clover Pt., McLoughlin and Rock Bay Tertiary 2 tertiary plants and 1 primary plant to serve both catchments and to reduce conveyance costs. ***Cost Management*** • Reduce size of pipes and pumps from Clover to Rock Bay by up to 45%; • Eliminate Barnhard PS and provide adequate capacity for each existing catchment • Defer water reuse until there are sufficient connections for a system • Defer upsize to existing outfalls; instead install 250m outfalls for higher quality effluent • Suitable land exists at all locations; primary treatment at Clover has a projected footprint of 0.4ha Capital 2030 Cost: **$1,089M**
	2 Plant: Clover Pt. and McLoughlin Tertiary Two plants to serve the existing catchments with new facilities located at sites adjacent the outfalls to largely eliminate conveyance costs. ***Cost Management*** • Eliminate conveyance infrastructure from Clover or Macaulay points through urban areas • Defer water reuse until there are sufficient connections for a system • Defer upsize to existing outfalls; instead install 250m outfalls for higher quality effluent • A tertiary plant Clover point requires 1.25ha of land, yet further site analysis and design work is needed to potentially reduce this footprint further. Capital 2030 Cost: **$1,052M**

Overall Cost Considerations for Committee

The results of recent analysis suggest that key cost elements can be eliminated or deferred to manage overall costs. And further, that locating two plants at each outfall is a key strategy to reduce the cost of conveyance and this approach enables greater levels of treatment at similar or less cost to a centralized

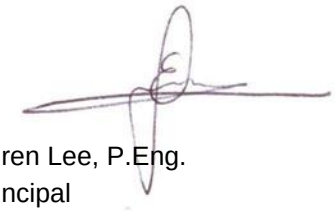
option. However, land availability at Clover Point must be determined if a tertiary plant is to be considered at this location.

Further consideration to the three plant configuration with primary treatment at Clover maximizes the land and sites available as part of the Committee's motion, and reduces the size of conveyance infrastructure, and offers treatment plants at sites with confirmed land areas. Further route optimization through urban areas (a standard but important optimization exercise) is a fundamental need for subsequent design phases, to both lower costs and to minimize impacts to neighborhoods.

Thank you for the opportunity to provide ongoing services to the Committee.

Sincerely,

URBAN SYSTEMS LTD.



Ehren Lee, P.Eng.
Principal

/el

Cc: Dan Telford, Senior Manager Environmental Services, CRD

Encl: Cost Breakdowns for Three Alternatives

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

Cost Component	Capital Cost Incurred [1]	
	2015	2030
1. Conveyance		
(a) Clover Pt PS and Forcemain to Rock Bay	$ 51,400	N/A
(b) Macaulay Pt PS and Forcemain to Rock Bay	$ 65,400	N/A
(c) Effluent PS and Forcemain to Clover Point	$ 83,900	N/A
(d) Tertiary Outfall Clover	$ 6,500	N/A
Conveyance Subtotal:	$ 207,200	$ -
2. Liquid Treatment (Tertiary)	$ 500,000	$ 220,000
3. Solids Treatment - AD	$ 258,000	$ 90,600
4. Existing System Capacity Upgrades		
(a) Craigflower PS - Constructed	$ 12,100	N/A
(b) Arbutus Attenuation Tank- incl land	$ 20,000	N/A
(c) Siphon Extension (1600 m)	$ 7,500	N/A
(d) Upgrade Currie St PS	$ 2,300	N/A
(e) Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A
Existing System Subtotal:	$ 45,000	$ -
5. Land Costs*	$ 67,200	N/A
Total:	**$ 1,077,400**	**$ 310,600**
6. Solids Conveyance - All to Hartland	$ 36,400	

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

* Land costs include raw land, site development, contingencies and pro-rated mitigation sum; all data sourced by CRD Real Estate.

Cost Components for 3 Plants: Clover-Rock Bay - McLoughlin (x 1000)

Cost Component			Capital Cost Incurred [1] 2015	2030
1.	Conveyance - Rock Bay & Clover			
	(a)	Clover Pt PS and Forcemain to Rock Bay	$ 29,600	*TBD*
	(b)	Effluent PS and Forcemain to Clover Point	$ 29,600	*TBD*
	(c)	Clover Pt Primary + Outfall Pumpstations	$ 41,100	*TBD*
	(d)	New Tertiary Only Outfall	$ 4,200	*TBD*
		Conveyance - Rock Bay Subtotal:	$ 104,500	$ -
2.	Liquid Treatment - Rock Bay (Tertiary)		$ 180,700	*TBD*
3.	Liquid Treatment - Clover Point (Primary)		$ 38,700	*TBD*
4.	Conveyance - McLoughlin			
	(a)	Macaulay Pt PS and Forcemain to McLoughlin	$ 54,700	*TBD*
	(b)	Effluent PS to Outfall	$ 44,900	*TBD*
	(c)	New Tertiary Only Outfall	$ 5,700	*TBD*
		Conveyance - McLoughlin Subtotal:	$ 105,300	$ -
5.	Liquid Treatment - McLoughlin (Tertiary)		$ 293,100	*TBD*
6.	Solids Treatment - AD at Hartland		$ 258,000	*TBD*
7.	Existing System Capacity Upgrades			
	(a)	Craigflower PS - Constructed	$ 12,100	N/A
	(b)	Arbutus Attenuation Tank- incl land	$ 20,000	N/A
	(c)	Siphon Extension (1600 m)	$ 7,500	N/A
	(d)	Upgrade Currie St PS	$ 2,300	N/A
	(e)	Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A
		Existing System Subtotal:	$ 45,000	$ -
8.	Land Costs*		$ 63,500	N/A
		SubTotal	**$ 1,088,800**	*TBD*
9.	Solids Conveyance - All to Hartland		$ 47,800	*TBD*

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

* Land costs include raw land, site development, contingencies and pro-rated mitigation sum; all data sourced by CRD Real Estate.

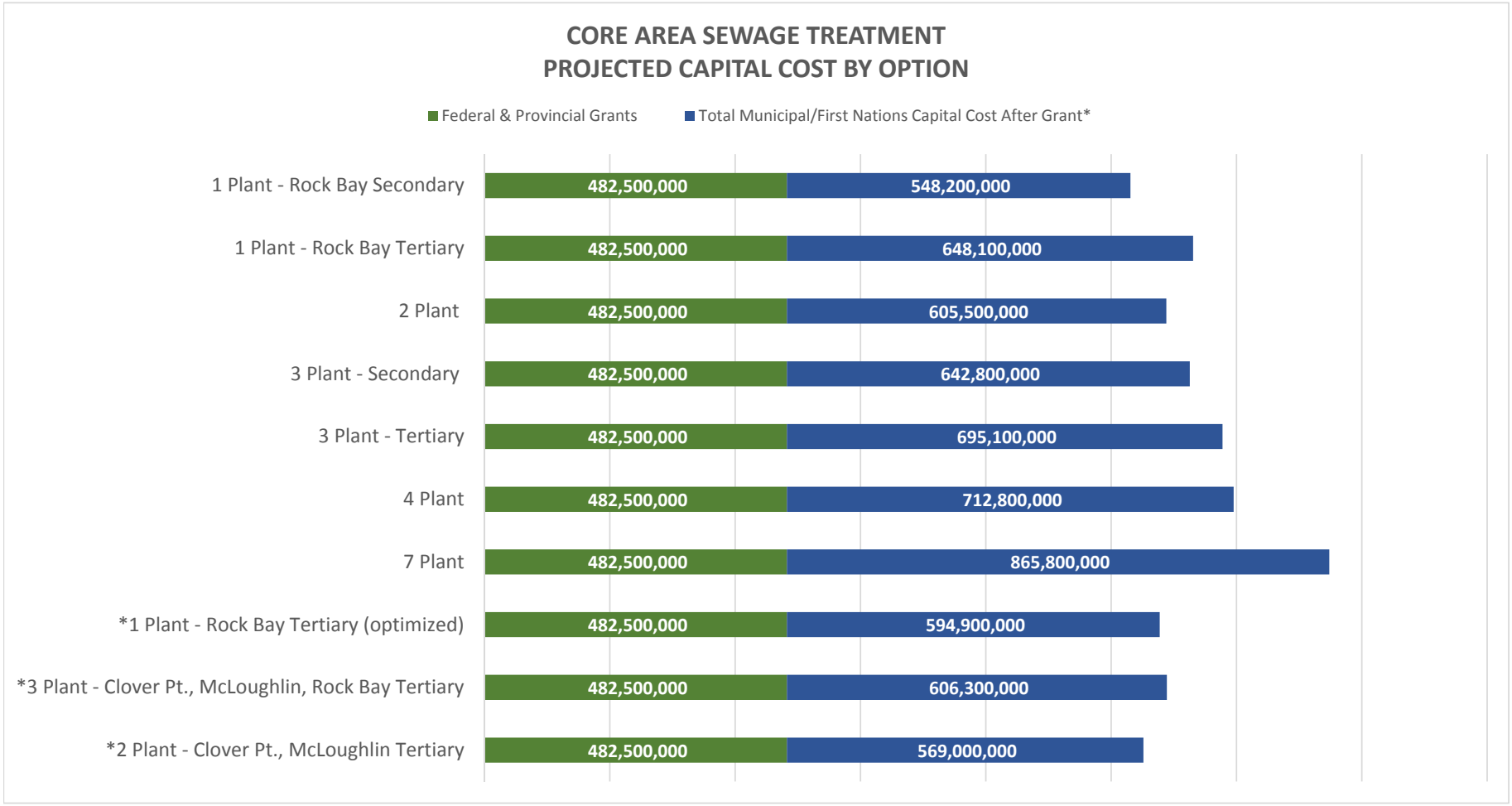
Cost Components for 2 Plants: Clover - McLoughlin (x 1000)

Cost Component			Capital Cost Incurred [1]	
			2015	2030
1.	Conveyance - Clover			
	(a)	Clover Pt RS + TE Pumpstations	$ 54,500	*TBD*
	(b)	New Tertiary Only Outfall	$ 4,200	*TBD*
		Conveyance - Clover Subtotal:	$ 58,700	$ -
2.	Liquid Treatment - Clover Point (Tertiary)		$ 219,400	*TBD*
3.	Conveyance - McLoughlin			
	(a)	Macaulay Pt PS and Forcemain to McLoughlin	$ 54,700	*TBD*
	(b)	Effluent PS to Outfall	$ 44,900	*TBD*
	(c)	New Tertiary Only Outfall	$ 5,700	*TBD*
		Conveyance - McLoughlin Subtotal:	$ 105,300	$ -
4.	Liquid Treatment - McLoughlin (Tertiary)		$ 293,100	*TBD*
5.	Solids Treatment - AD at Hartland		$ 258,000	*TBD*
6.	Existing System Capacity Upgrades			
	(a)	Craigflower PS - Constructed	$ 12,100	N/A
	(b)	Arbutus Attenuation Tank- incl land	$ 20,000	N/A
	(c)	Siphon Extension (1600 m)	$ 7,500	N/A
	(d)	Upgrade Currie St PS	$ 2,300	N/A
	(e)	Upgrade East Coast Interceptor (1400 m)	$ 3,100	N/A
		Existing System Subtotal:	$ 45,000	$ -
7.	Land Costs*		$ 72,000	N/A
		SubTotal	**$ 1,051,500**	*TBD*
8.	*Solids Conveyance - All to Hartland*		*$ 48,300*	

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

* Land costs include raw land, site development, contingencies and pro-rated mitigation sum; all data sourced by CRD Real Estate.

APPENDIX B



7-Mar-16

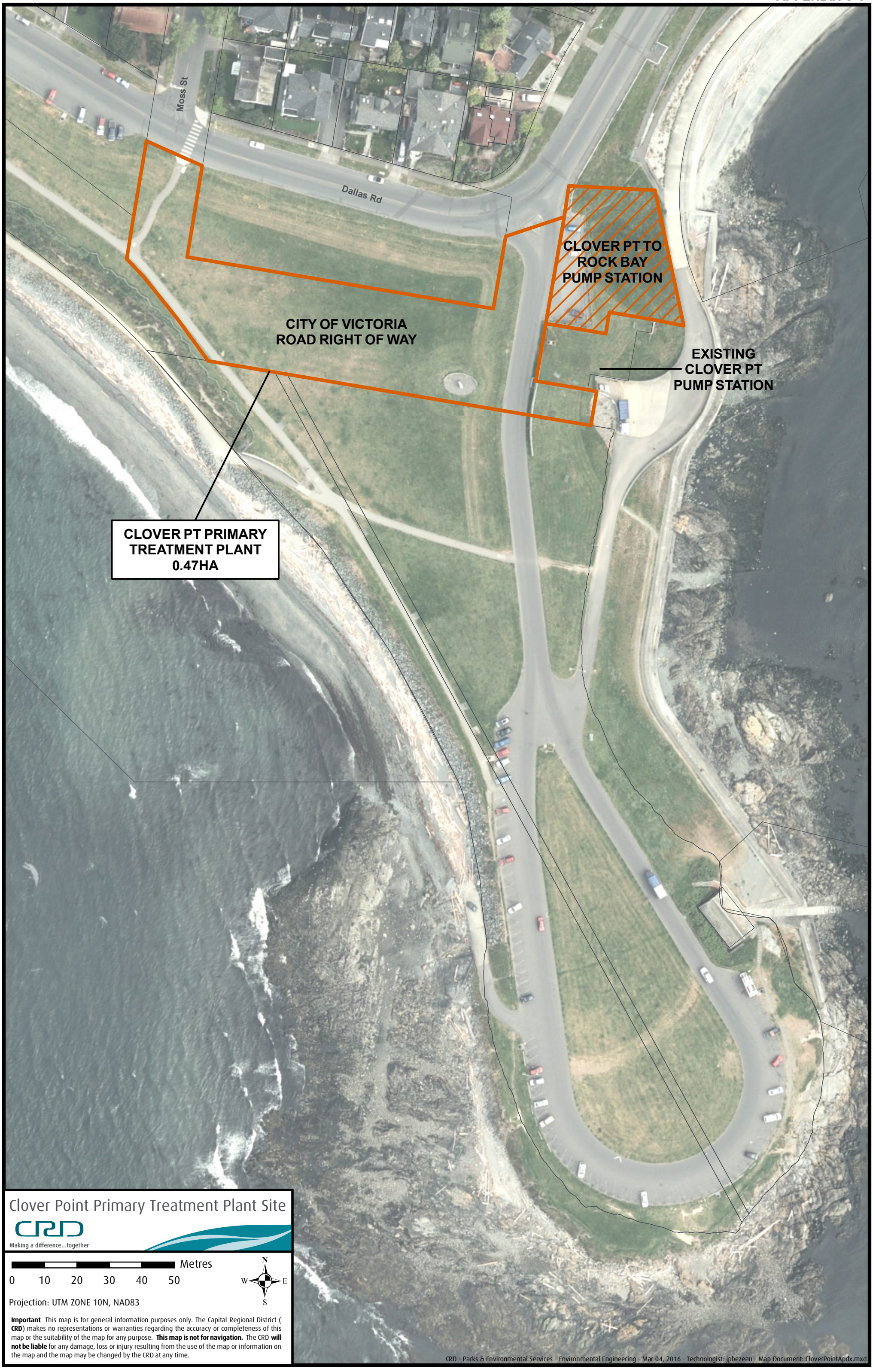
Core Area Waste Water Treatment Program Options - Costing

Options	Capital Cost	Federal and Provincial Grants	Total Municipal/First Nations Capital Cost After Grant*	Operating Costs (at 2030)
1 Plant - Rock Bay Secondary	1,030,700,000	482,500,000	548,200,000	21,765,000
1 Plant - Rock Bay Tertiary	1,130,600,000	482,500,000	648,100,000	26,435,000
2 Plant	1,088,000,000	482,500,000	605,500,000	22,810,000
3 Plant - Secondary	1,125,300,000	482,500,000	642,800,000	22,987,000
3 Plant - Tertiary	1,177,600,000	482,500,000	695,100,000	24,062,000
4 Plant	1,195,300,000	482,500,000	712,800,000	25,345,000
7 Plant	1,348,300,000	482,500,000	865,800,000	26,630,000
*1 Plant - Rock Bay Tertiary (optimized)	1,077,400,000	482,500,000	594,900,000	26,360,000
*3 Plant - Clover Pt., McLoughlin, Rock Bay Tertiary	1,088,800,000	482,500,000	606,300,000	note 1
*2 Plant - Clover Pt., McLoughlin Tertiary	1,051,500,000	482,500,000	569,000,000	note 1

* New Option set alternatives per motions of February 26 and March 2, 2016

Note 1 - Operating costs for the new option sets have not been provided by Urban Systems. They are in progress.

Note 2 - New Option sets capital costs above have not been refined from the base case.



Clover Point Primary Treatment Plant Site

CRD
Making a difference...together

Metres

0 10 20 30 40 50

N
W E
S

Projection: UTM ZONE 10N, NAD83

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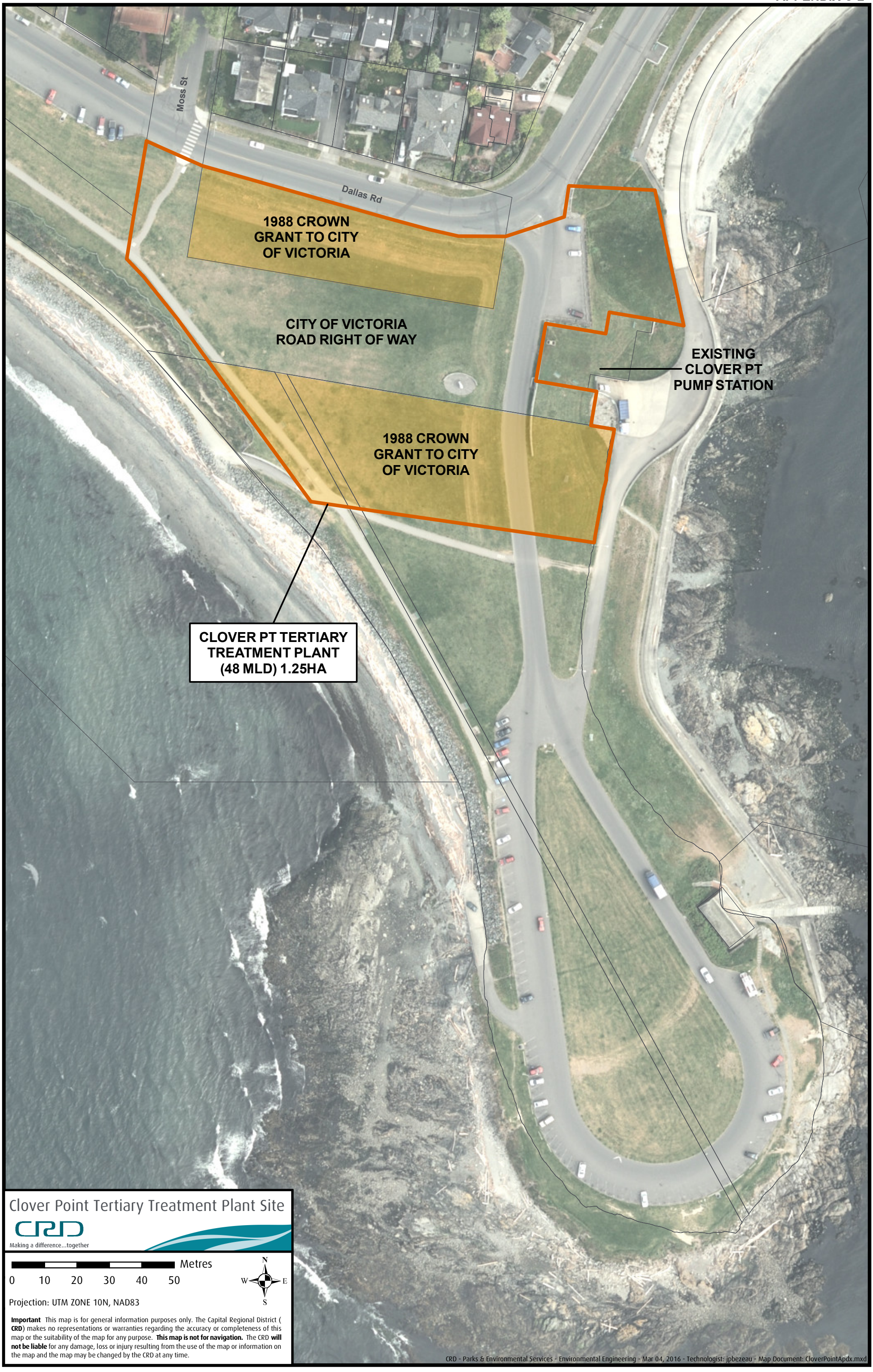
CRD - Parks & Environmental Services - Environmental Engineering - Mar 04, 2016 - Technologist: jpbezeau - Map Document: CloverPointApdx.mxd



Clover Point Tertiary Treatment Plant Site

CRD
Making a difference...together

Metres

0 10 20 30 40 50

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W E
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Projection: UTM ZONE 10N, NAD83

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CRD - Parks & Environmental Services - Environmental Engineering - Mar 04, 2016 - Technologist: jpbezeau - Map Document: CloverPointApdx.mxd

Rock Bay Site

Making a difference...together

Transport Canada Property

BC Hydro Property

Private Property

Metres

0 50 100 150

Projection: UTM ZONE 10N, NAD83

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RECOMMENDATIONS FROM
CRD CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE

March 9, 2016 Recommendation

Options Analysis and Recommendation - Core Area Wastewater Treatment and Resource Recovery

1. *That a conditional Liquid Waste Management Plan Amendment No. 10 be prepared as a basis for approval and submitted to the Minister of Environment with the following elements:*
   a) *A secondary, advanced (tertiary) or equivalent to advanced (tertiary) wastewater treatment plant at Clover Point, servicing all flows currently directed to Clover Point, up to 20301, and;*
   b) *A secondary, advanced (tertiary) or equivalent to advanced (tertiary) wastewater treatment plant at McLoughlin Point or Macaulay Plain, servicing all flows currently directed to Macaulay Point outfall, up to 2030[1], and;*
   c) *Provision for a Westside wastewater treatment plant for future growth, at a location to be determined*
   d) *Hartland Landfill as the preferred site for biosolids processing with technology to be confirmed by the process below.*

2. *That included within the Plan amendment is a process under which the CRD would invite the submission of project concepts to achieve the goals of the Project Charter. The submissions would include sufficient detail to allow for meaningful evaluation of the project concepts against each other and against the base case, including details regarding sites, technology, a feasibility assessment, demonstration of compatibility with current infrastructure, compliance with provincial and federal requirements and demonstration of significant fiscal advantages and/or environmental advantages over the base case, including financial backing.*

   The submissions could demonstrate solutions for:

   a) *A Rock Bay/Westside combination.*
   b) *A secondary, advanced (tertiary) or equivalent to advanced (tertiary) wastewater plant at either McLoughlin Point or Macaulay Point as an alternative to Rock Bay, an advanced (tertiary) wastewater plant at Clover Point, provision for an advanced (tertiary) plant on the Westside.*
   c) *The treatment of biosolids at Hartland, possibly in combination with food scraps, municipal solid waste and wood waste.*
   d) *Other feasible alternatives that demonstrate compatibility with current infrastructure, compliance with provincial and federal requirements and demonstration of significant fiscal advantages and/or environmental advantages and financial backing.*

3. *That the preferred approach be formally communicated to all senior levels of government involved in funding the project, including the Province, 3P Canada and Infrastructure Canada.*

4. *That a referral be made to both Esquimalt and Victoria Councils seeking approval in principle of the proposed sites as locations for tertiary wastewater treatment plants.*

5. *That staff be directed to continue working with Colwood, Songhees and Esquimalt First Nations on issues related to purchased capacity and cost considerations for those system users and report back to Committee.*

   Note 1: Facility footprint to accommodate 2045 flows with tender process to incent longest-term capacity.

March 23, 2016 Recommendation

Update on Municipal Referrals – Core Area Wastewater and Resource Recovery System

That City of Victoria be requested to cooperate with the CRD on the community engagement process for the proposed facility at Clover Point, and that the process be funded from the Core Area Liquid Waste Management Program Phase 2 Planning Process.

And that the City of Victoria be invited provide comment to the CAWLMC on this approach by April 13, 2016.

That the matter be referred to Esquimalt to determine how they would like to deal with the lead of the community engagement process in their community, that the process be funded from the Core Area Liquid Waste Management Program Phase 2 Planning budget and that Esquimalt report back to the CALWMC on April 13.