

Purpose of Presentation

1. To provide the Project Board with a cost effective, efficient, and environmentally sustainable component of the CRD's Core sewage treatment requirements, with the intent that it be incorporated into the business plan and ultimately included as part of the CRD's Core sewage treatment solution.
2. Colwood commits to the timely establishment of a site appropriate for a sewage treatment plant envisaged within this presentation.

Objectives of the Project Board

- Use existing infrastructure
- Maximize resource recovery
- Cost per door lower than CRD base case (McLoughlin)
- Minimize cost to taxpayers
- Treatment site supported by host municipality and likely to be zoned

CRD 2-plant base case (Alternative 1) – CRD ADWF data*

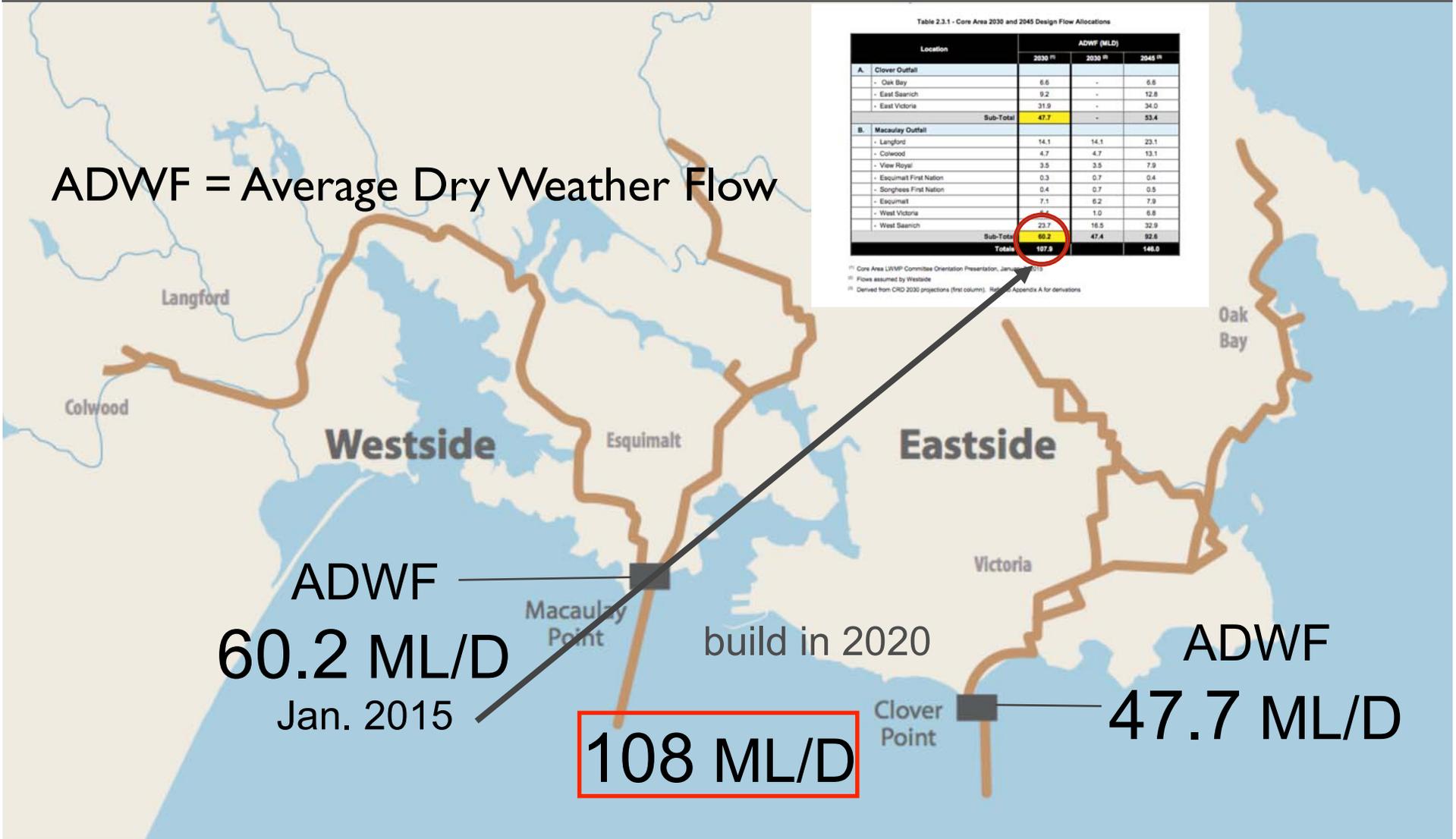
* from Table 2.3.1 – US/C Technical Memorandum #1

ADWF = Average Dry Weather Flow

Table 2.3.1 - Core Area 2030 and 2045 Design Flow Allocations

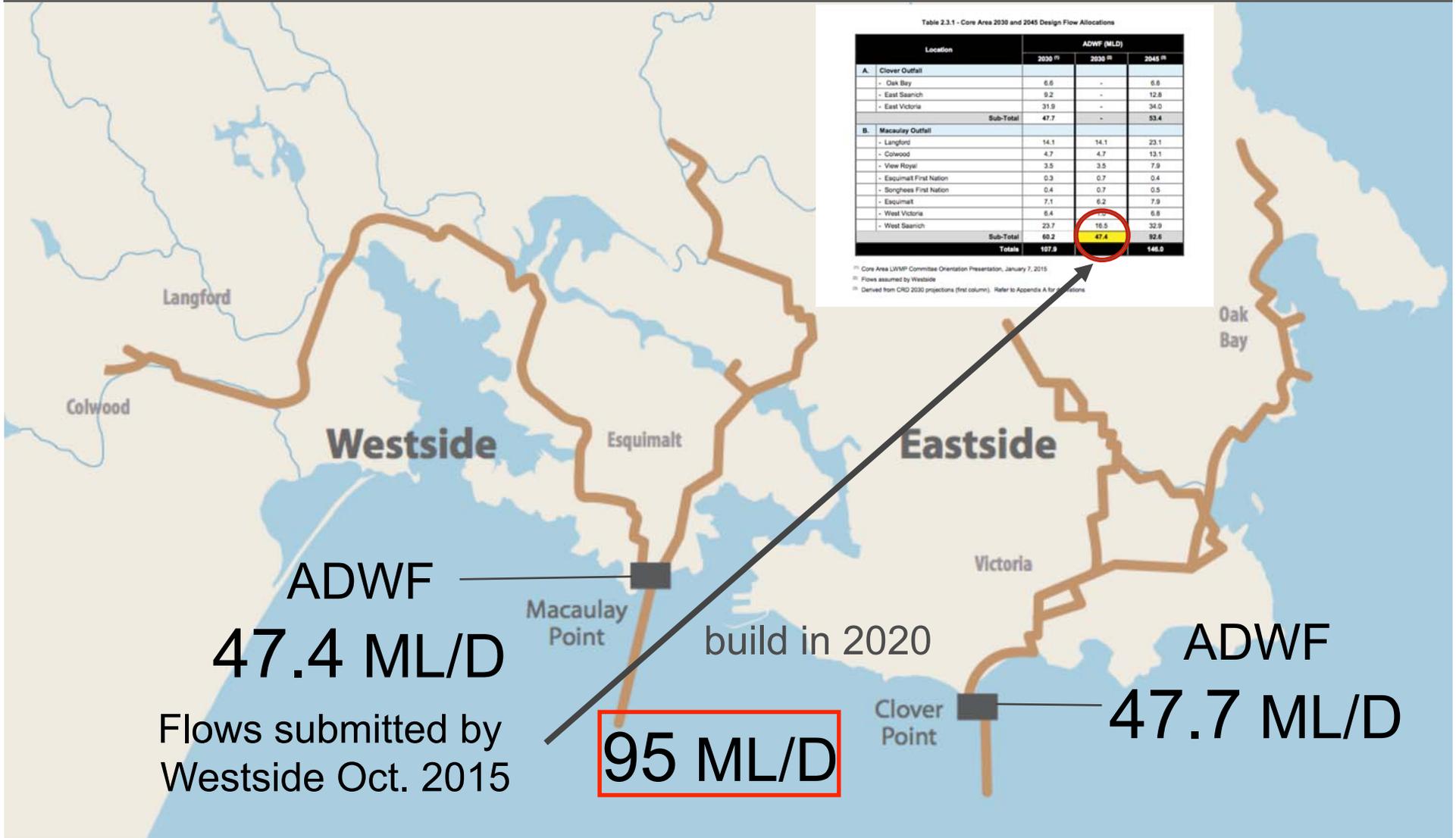
Location	ADWF (ML/D)		
	2030 #	2030 #	2045 #
A. Clover Outfall			
- Oak Bay	6.6	-	6.6
- East Search	9.2	-	12.8
- East Victoria			34.0
Sub-Total	47.7	-	53.4
B. Macaulay Outfall			
- Langford	14.1	14.1	23.1
- Colwood	4.7	4.7	13.1
- View Royal	3.5	3.5	7.9
- Esquimalt First Nation	0.3	0.7	0.4
- Songhees First Nation	0.4	0.7	0.5
- Esquimalt	7.1	6.2	7.9
- West Victoria	2.4	1.0	6.8
- West Search			18.5
Sub-Total	60.2	47.4	92.8
Total	107.9		146.0

⁽¹⁾ Core Area LWMP Committee Orientation Presentation, January 2015
⁽²⁾ Flows assumed by Westside
⁽³⁾ Derived from CRD 2030 projections (first column). Refer to Appendix A for derivations

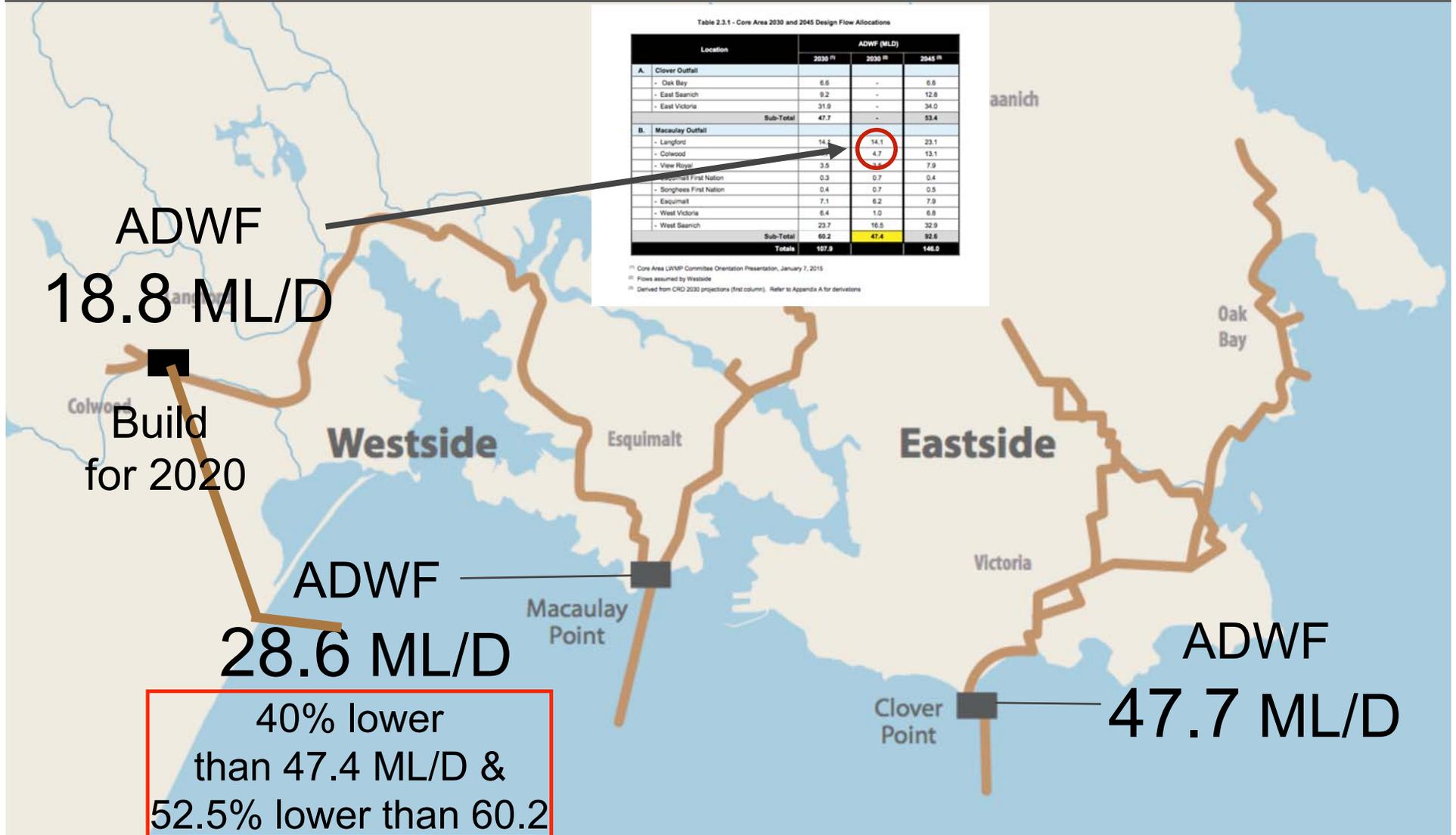


CRD 2-plant base case (Alternative 1) – CRD ADWF data*

* from Table 2.3.1 – US/C Technical Memorandum #1



Modified CRD 3-plant Option – Westside Plant to be added for 2020



US/C Westside Plant for 2020 & 2030

Table 6 Appendix Tech Memo #3

- 2015 Capital Cost \$106.8 M
- Conveyance, piping, pumping \$63 M
- Outfall \$33.8 M
- 2020 cost $\$106.8 + \$63 + \$33.8 = \204.6 M
- 2030 Additions = \$119.5 M (based on pop'n projections)
- Total Capital Cost at 2030 = \$323.1 M

City of Colwood + Langford Goals

Colwood

1. Highest level of treatment
2. Treat and recycle wastewater
 - This is known as “Reuse of Reclaimed Water”
3. Avoid a new ocean outfall
4. Use the existing outfall only in an extreme emergency

Langford

1. Less than \$154/ door/yr residential

This map and accompanying information are not intended to be used for site specific evaluation of properties. Soil and ground conditions in the map area were interpreted based on borehole data and other information, as available prior to the date of publication and obtained from a variety of sources. Conditions and interpretations are subject to change with time as the quantity and quality of available data improves. The authors and the Ministry of Energy and Mines are not liable for any omissions or actions arising from the use or interpretation of this data and do not warrant its accuracy and reliability.

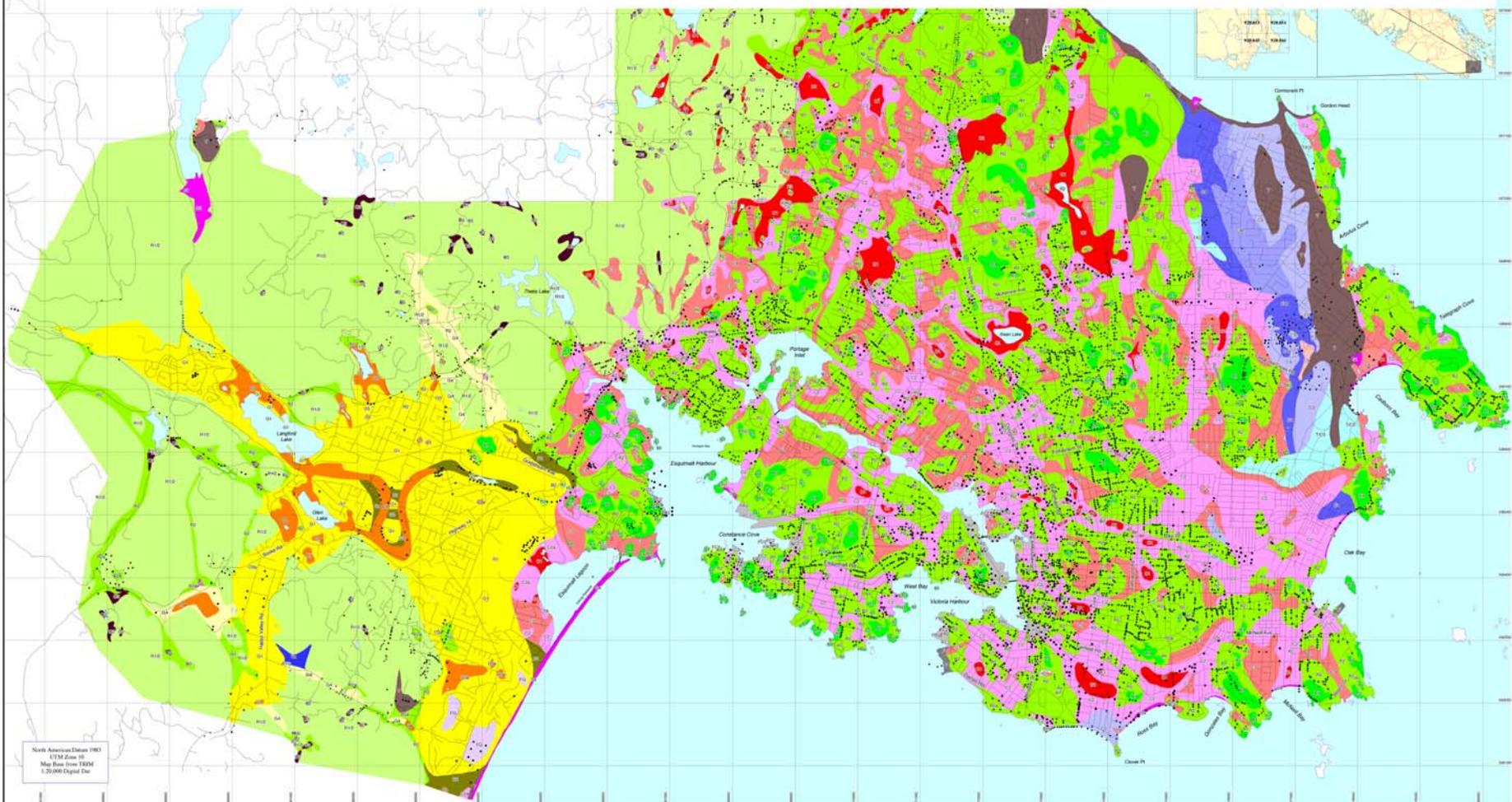
- Borehole Legend**
- Flat
 - 0 to Grey Clay
 - 0 to Victoria Clay < 3 to Grey Clay
 - 0 to Victoria Clay
 - 0 to Victoria Clay
- Adjacent to unit Q1 = 3 to bedrock or in red area = 3 to red bedrock
- Boreholes with lithologic data but insufficient depth to classify
 - ▲ In unit Q1, none present at base
 - ▲ Bedrock in situ
 - * Small outcrop

BRITISH COLUMBIA
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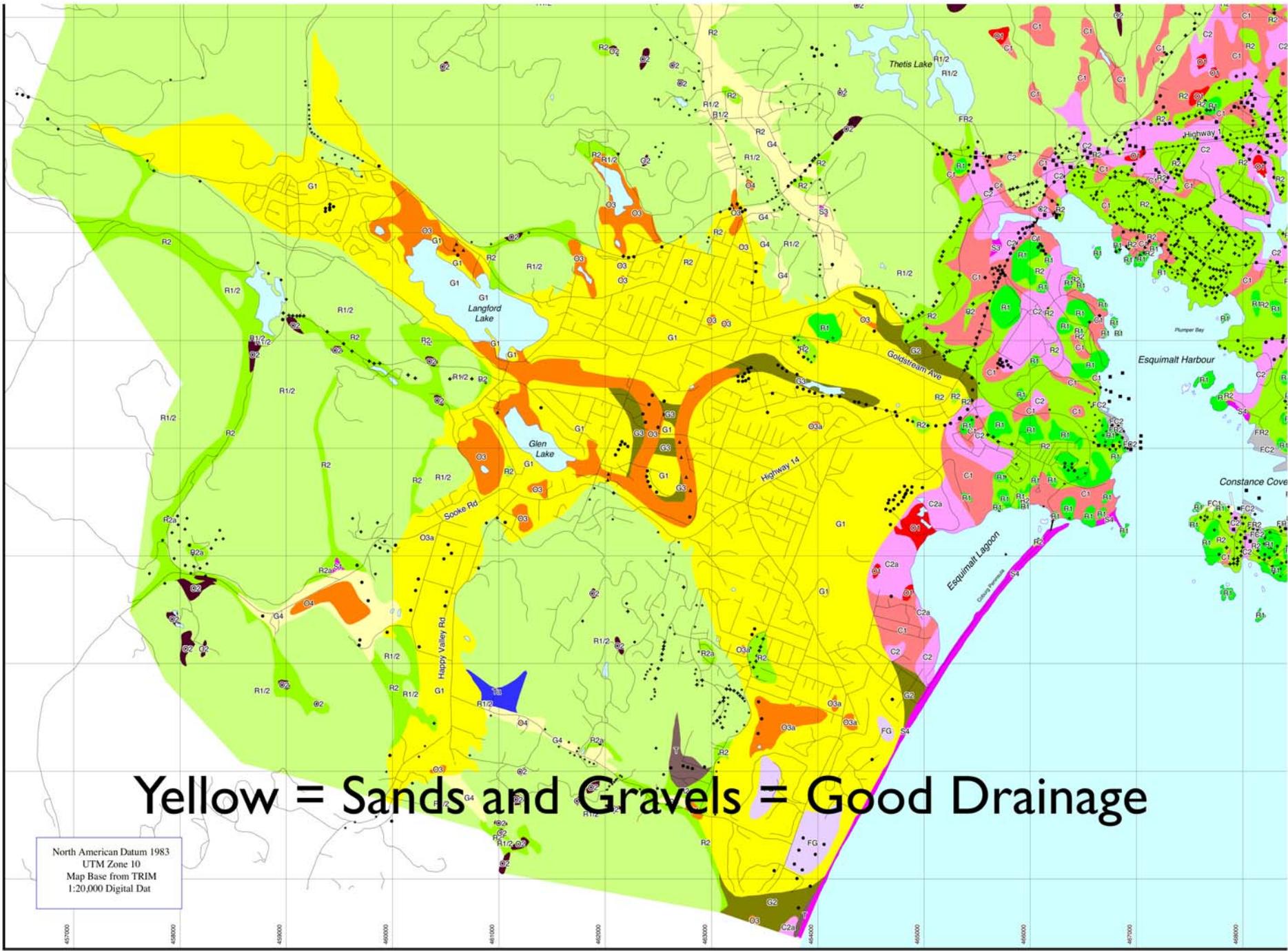
Geoscience Survey Branch
Geoscience Map 2000-2

QUATERNARY GEOLOGICAL MAP OF GREATER VICTORIA
TRIM SHEETS (92B.043, 044, 053 & 054)
Patrick A. Monahan, P. Geo., and Victor M. Levson, P. Geo.
Scale 1:25,000 (approximate)

What Makes Colwood & Langford Different?



North American Datum 1983
UTM Zone 18
Map from TRIM
1:25,000 Digital Data

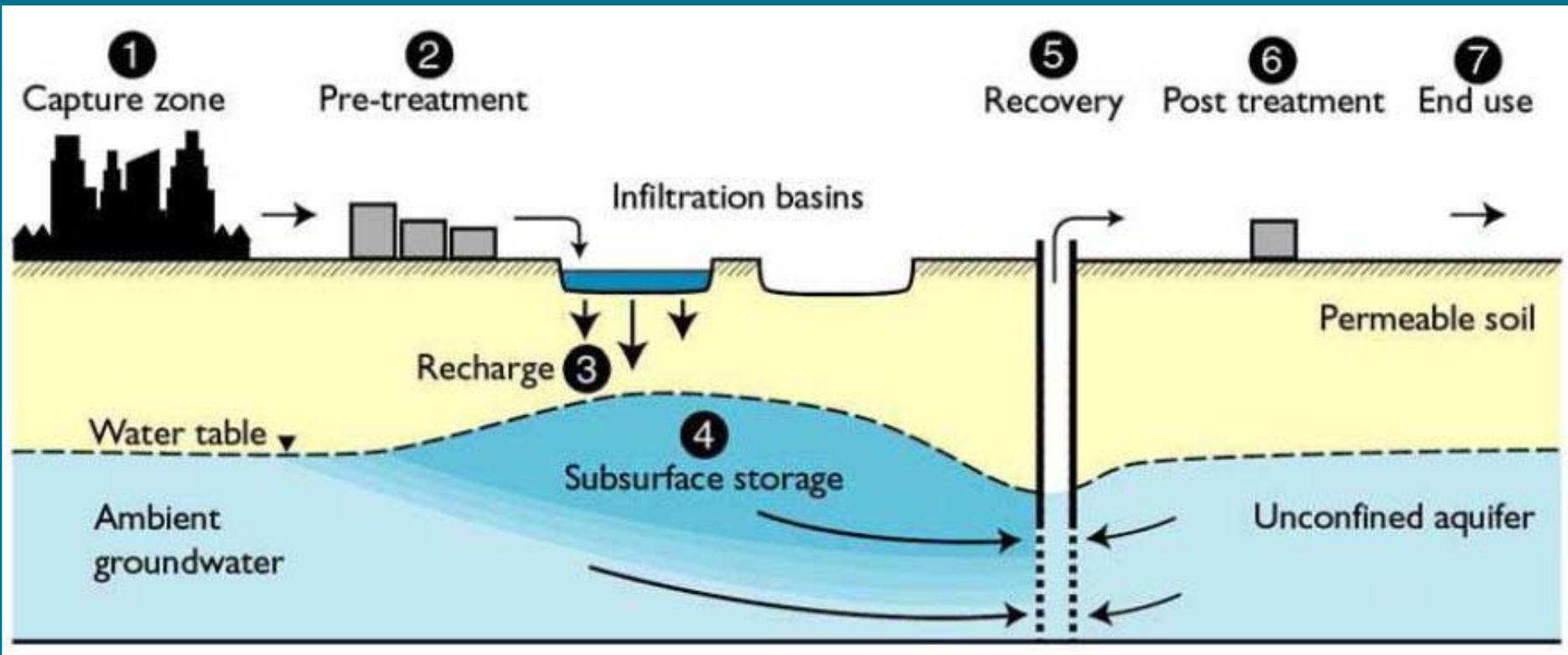


Yellow = Sands and Gravels = Good Drainage

North American Datum 1983
UTM Zone 10
Map Base from TRIM
1:20,000 Digital Dat

457000 458000 459000 460000 461000 462000 463000 464000 465000 466000 467000 468000

Aquifer restoration and indirect water reuse



Future proof against changing climate & droughts

Colwood + Langford Alternative Option for 2020



Colwood + Langford Just-in-Time Design

- Build Colwood + Langford Plant ASAP using 2016 flows (ADWF = 7.4 ML/D)
- New pipes = low I&I - use 2 x ADWF, not 4 x ADWF
- 10 ML/D = extra capacity (+26%) for Westshore growth
- Add capacity only when needed
- New capacity paid for by reasonable Development Cost Charges (DCC = \$2,000)
- $4,800 \times \$2,000 = \9.6 M

	ADWF
2016	10 ML/D
2030	18 ML/D?
2037	25 ML/D??

What Does a 10 ML/D Plant Cost?

Comparable Operational Plants in BC:

- Sechelt \$25 M for 14,000 people 4 ML/D (May 2015)
- Tsawwassen First Nation \$27 M for 6.7 ML/D (March 2016)



Our Cost Estimate:

\$48 M = \$1 M EIS + \$35 M WWTP (incl. biosolids) + \$12 M ground disposal (CAPEX)

Add \$10 M contingency = \$58 M not \$204 M (\$323 M in 2030)

- Sewage flows = 1/4 Colwood 3/4 Langford
(most of Colwood is on septic)

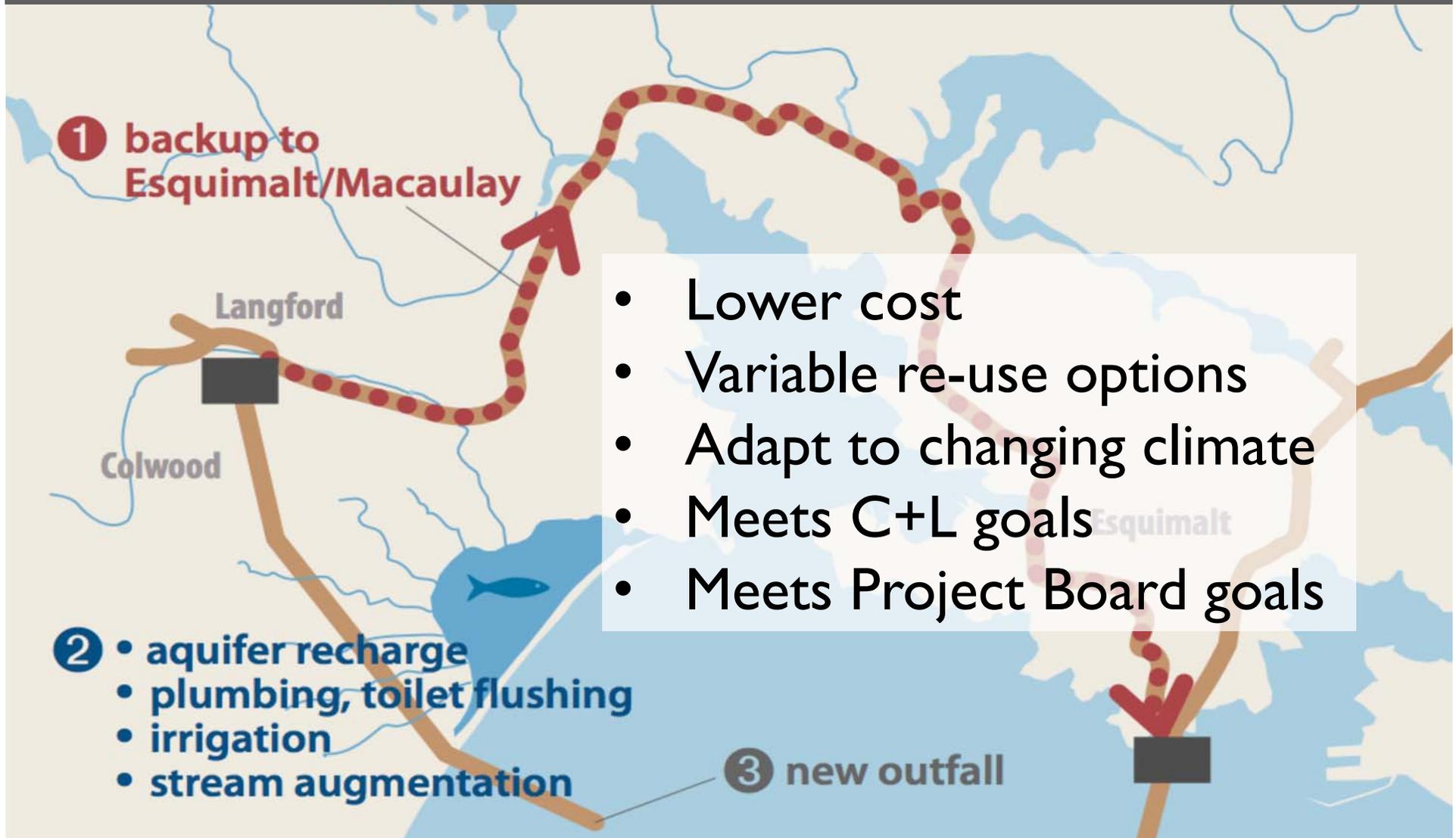
Cost to the Colwood/Langford Taxpayer for the Proposed Project vs. Urban Systems' Cost

Colwood ¼ Langford ¾	Proposed Project Total Cost = \$58 M Colwood = \$14.5 M Langford = \$43.5 M		Urban Systems Total Cost = \$204 M Colwood = \$51 M Langford = \$153 M	
Colwood	With 2/3 Grant Residential	With 2/3 Grant Commercial	With 2/3 Grant Residential	With 2/3 Grant Commercial
Taxed across whole municipality (17,000 people)	\$34/yr	\$435/yr	\$119/yr	\$1535/yr
Langford	With 2/3 Grant Residential	With 2/3 Grant Commercial	With 2/3 Grant Residential	With 2/3 Grant Commercial
Taxed across whole municipality (37,000 people)	\$50/yr	\$613/yr	\$177/yr	\$2163/yr
	Future expansion paid for by DCC's		Future expansion estimated at \$119 M	

Reasons for Project Cost Reduction

1. Reducing design flows (18.8 ML/D to 10 ML/D)
2. 2 x ADWF (plant design capacity) (not 4 x ADWF)
3. Avoiding requirement for ocean outfall, subject to EIS and MOE approval
4. Using specified WWT technology vs. indicative design
5. Adopt just-in-time WW treatment plant capacity to meet future growth, funded by DCCs
6. Cost reduction for Colwood residents from \$119/door/yr to \$34/door/yr (taxed across entire municipality)

Colwood-Langford – Alternate Disposal



Managing Risks

1. Project costs are being independently peer reviewed (available early September)
2. Future treatment capacity beyond 2020 funded by DCC's limits tax increases to the taxpayer
3. Final decision on discharge pipe lies with MOE
4. Procurement subject to direction and management of Project Board
5. Project meets Sustainability Objectives

Peer Review

- Natural Systems Utilities, LLC, Hillsborough, NJ, USA – Ed Clerico, P.E., Robert Schwartz, P.E.
- Review current and projected wastewater flows and strength, the conceptual basis of design, and estimated capital and operating costs of WWTP.
- Evaluate beneficial approach of decentralized wastewater and water reuse concept.
- Assess assumptions and recommendations.
- Present our experience with decentralized wastewater and water reuse systems and the current trends in integrated infrastructure.
- Complete draft memo by August 24, 2016

Next Steps

1. Colwood Council commits to the timely selection and approval of a site in Colwood.
2. Project Board incorporates a plant in Colwood (to address the sewage flows of Colwood and Langford) as part of the greater CRD sewage treatment solution.
3. Project Board incorporates a Colwood-Langford plant into their overall business plan.