LWMP Wastewater Advisory Committee
Meeting #12

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2017 Progress Update

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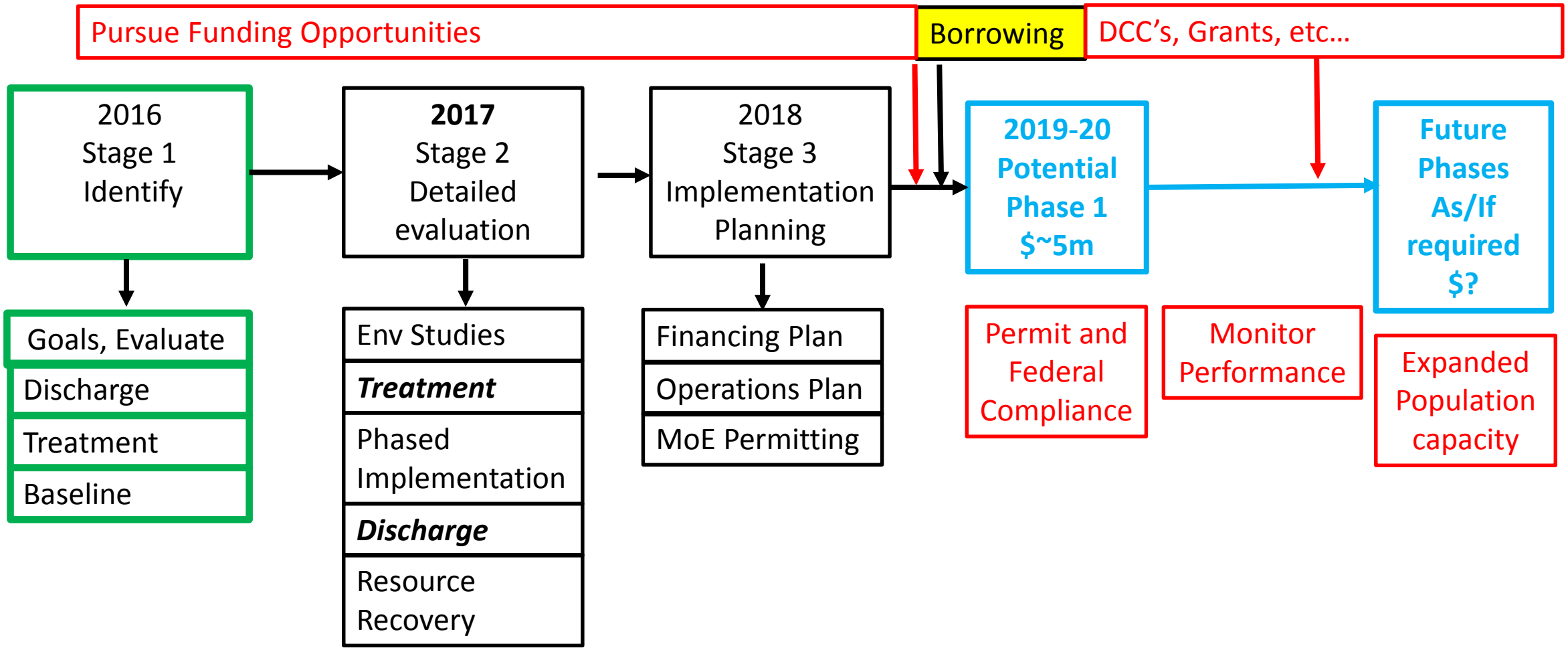
Original Mandate

"to develop an environmentally sustainable method to treat the liquid waste that is produced by the Village"

WAC expanded mandate

"to develop an environmentally sustainable method to **treat the liquid waste** that is produced by the Village, that is ***affordable***, and, ideally, economically *productive*, environmentally *enhancing* and socially *beneficial*"

Cumberland LWMP Road Map (Sep 2017)



MoE Permitting

- A new look at the existing permit (1998) was revealing…
- *Required* Cumberland to make certain upgrades by 1999 and 2015;
  - Disinfection
  - Treatment to 30-30 BOD – TSS
  - Phosphorus to <1.0mg/L
  - Peak flows to less than 2700 cu.m/day
  - Average Dry Weather Flow up to 910 cu.m/day
  - Environmental monitoring in MLC & Trent River
  - **Requires** consideration of alternate discharge to MLC
    - **A miniature LWMP!**

MoE Permitting

Criteria	Permit Pre 1999	Permit Post 2015	2021 Federal WSER requirements	BC MWR (Municipal Wastewater Regulation) requirements for MLC discharge (MoE LWMP goals)
Average Dry Weather Flow cu.m/day	910	910		
Peak Wet weather flow, cu.m/day	7,160	2,710		<2x ADWF
BOD5 (mg/L)	<30	<30 (max)	<25 (average)	<10
TSS (mg/L)	<60	<30 (max)	<25 (average)	<10
Fecal Coliforms (MPN/100mL)		<200		<1
Total Phosphorus (mg/L)		<1.0		<0.005 at Trent River

What does the MoE permit mean for the present?

- There is no dilution criteria in the existing Permit
- Advanced treatment is not needed to meet the Permit requirement of 30-30.
- In designing to meet 30-30, we expect will also meet the 2021 Federal deadline for 25-25
- By meeting Permit, finally, Cumberland will be off the polluters list

And for the future?

- After demonstrating compliance, future upgrades can improve quality to get to the MWR 10-10 and Reuse standard
- Future expansions can handle increased population
- Future options for seasonal storage
- All of this can be done in **phases**

- **The basis of a 5-10-20 yr LWMP!**

The Phased Approach

Why?

1. Doing the full project, for high quality treatment and future growth capacity ***requires*** outside funding
2. There are ***no guarantees*** of getting any in the next few years
3. But Cumberland ***must*** make upgrades to meet Permit and Federal requirements by 2021

The Phased Approach

What?

1. A first phase that makes improves treatment ***quality*** to achieve Permit and Federal ***compliance***
2. And the cost is within Cumberland's funding/borrowing capacity
3. Allows for future upgrades can be made to treatment ***capacity***, if needed

Puts the decision within Cumberland's control !

The Phased Approach

Future phases?

1. Monitor the performance of the first phase – it may do better than expected
2. Future upgrades can be made to treatment ***quality & capacity***, if needed
3. Desire to ensure that works in the first phase are not made redundant by future phases

Puts the decision within Cumberland's control !

2017 Field Studies

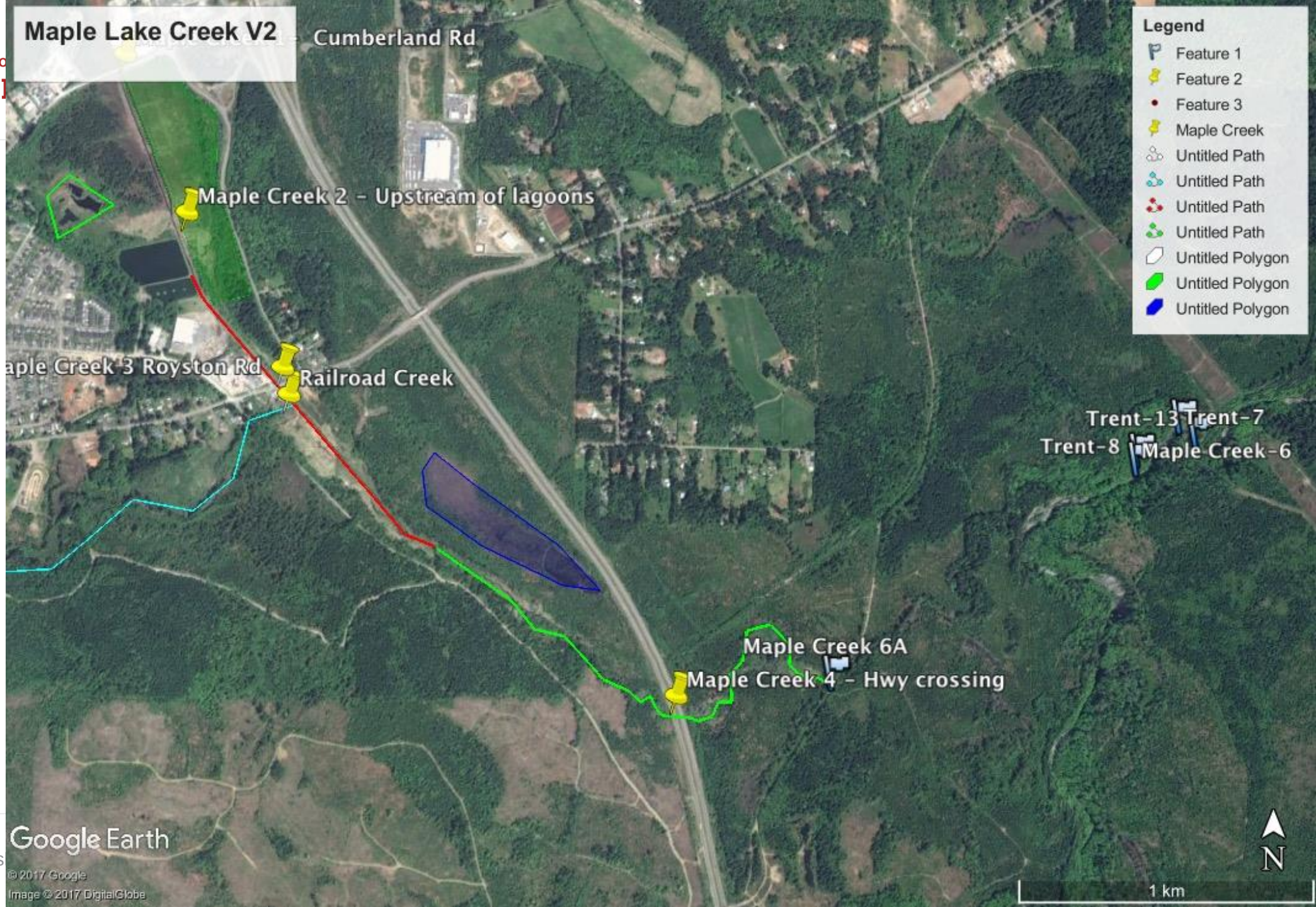
1. Flow monitoring on Maple Lake Creek, and Trent River
2. Water quality monitoring at lagoons, MLC and Trent River

2017 Field Studies

1. Flow monitoring on Lagoon influent, Maple Lake Creek, and Trent River
2. Water quality monitoring at lagoons, MLC and Trent River
3. Groundwater wells adjacent to lagoons
4. Investigation of wetlands distribution concept

THE VILLAGE O
CUMBE

Field Sampling Locations



THE VILLAGE OF
CUMBERLAND

Flow measurement near 6A

What does the water look like?

How much water is there??

Location	Flow (cu.m/day)	Dilution ratio
Maple Lake Creek at Cumberland Rd	none	
Lagoon Effluent	800	0:1
MLC at end of wetlands reach	4-500	
Trent River at Hwy 19	4-500	1:1
Trent River at Royston	~1000	1:1

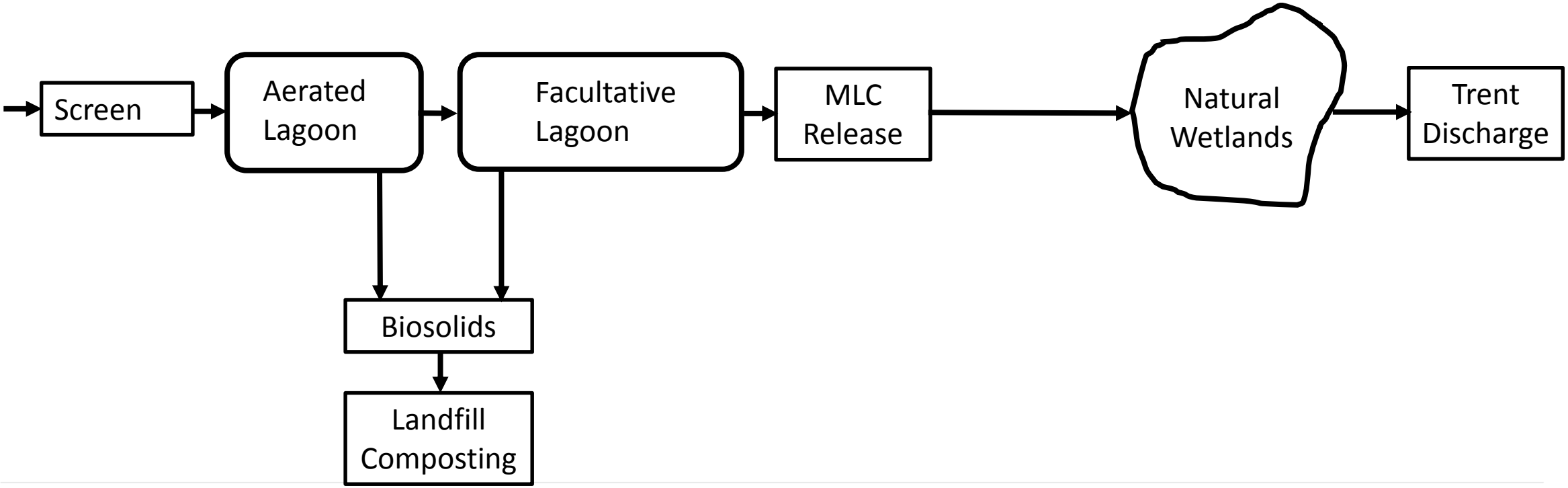
There is way less than the 10:1 dilution threshold!

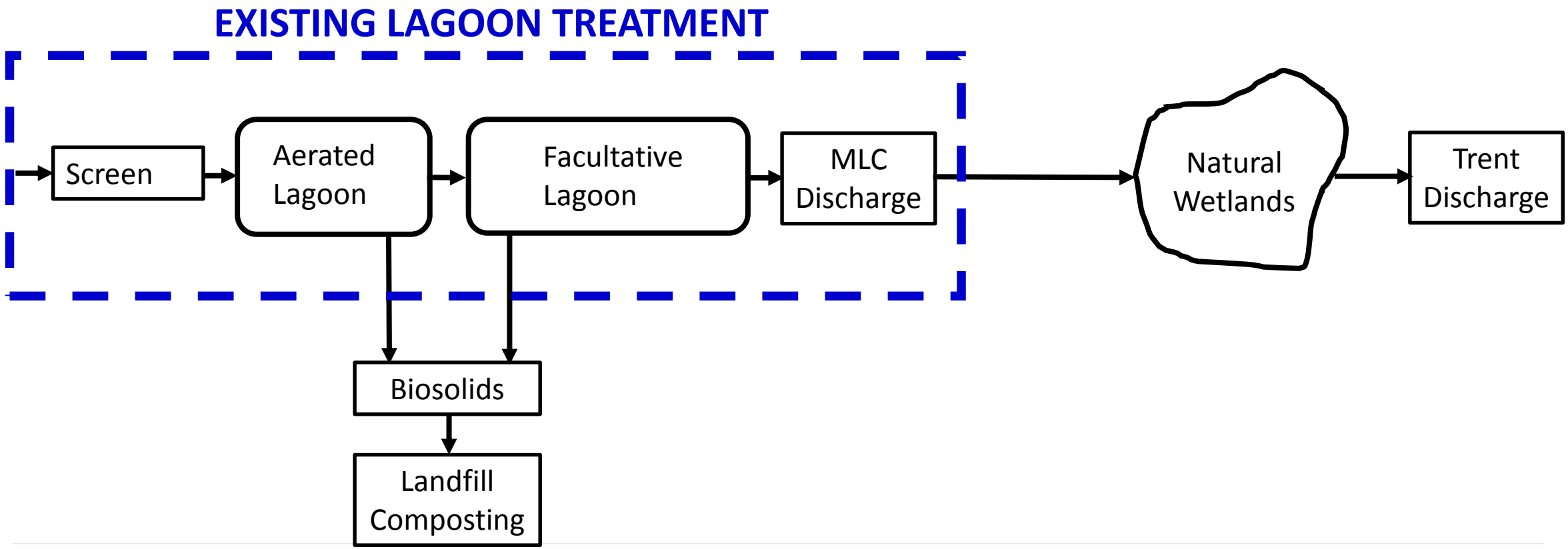
How much Phosphorus is in it?

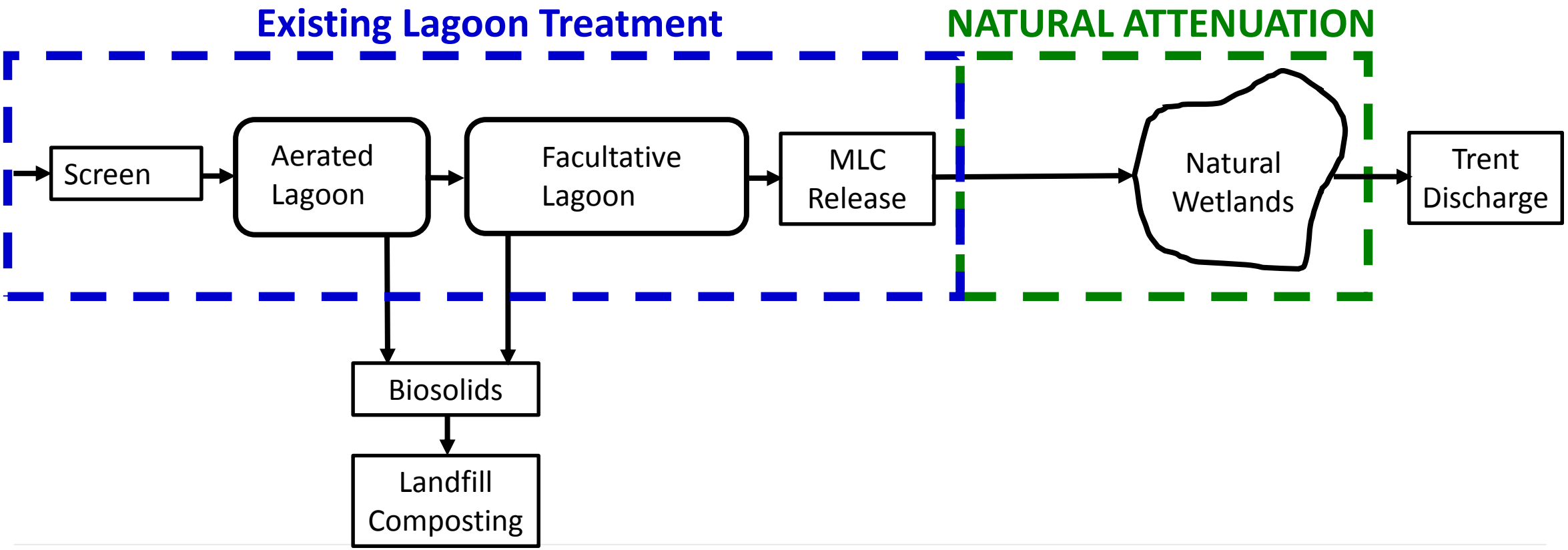
Location	Phosphorus	% reduction
Maple Lake Creek (Upstream)	0.1	
Lagoon Effluent	5.7	
MLC at Royston Rd	5.7	0
MLC at end of wetlands reach	0.67	88%
MLC 100m upstream of Trent	0.26	95%
Trent 100m upstream of MLC	<0.005	
Trent 400m downstream of MLC	0.01	99.8%

The MLC wetlands are doing a better job of P removal than a treatment plant!

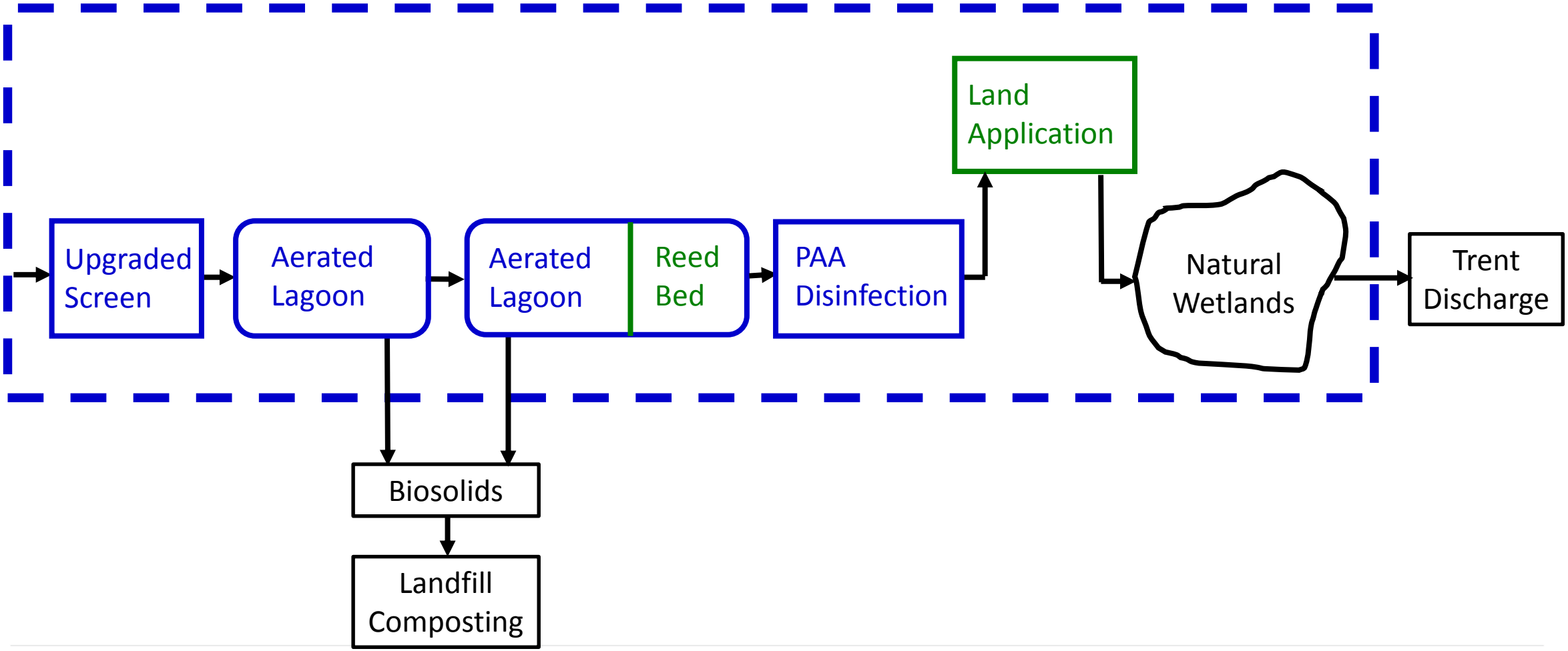
What does it all mean?




EXISTING LAGOON TREATMENT
Screen
Aerated Lagoon
Facultative Lagoon
MLC Discharge
Natural Wetlands
Trent Discharge
Biosolids
Landfill Composting

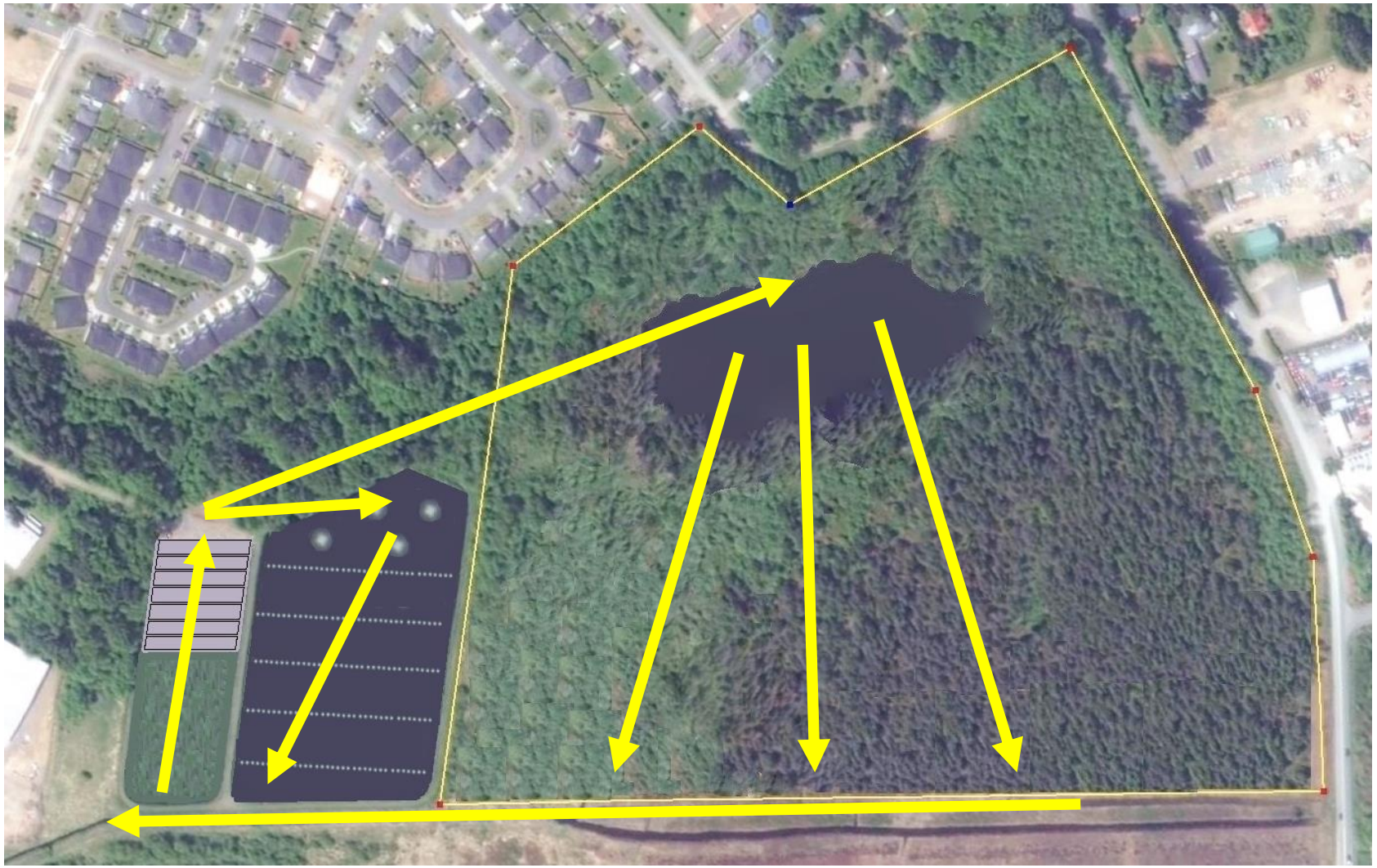

Existing Lagoon Treatment
NATURAL ATTENUATION
Screen
Aerated Lagoon
Facultative Lagoon
MLC Release
Natural Wetlands
Trent Discharge
Biosolids
Landfill Composting

ENHANCED Lagoon Treatment & Natural Attenuation

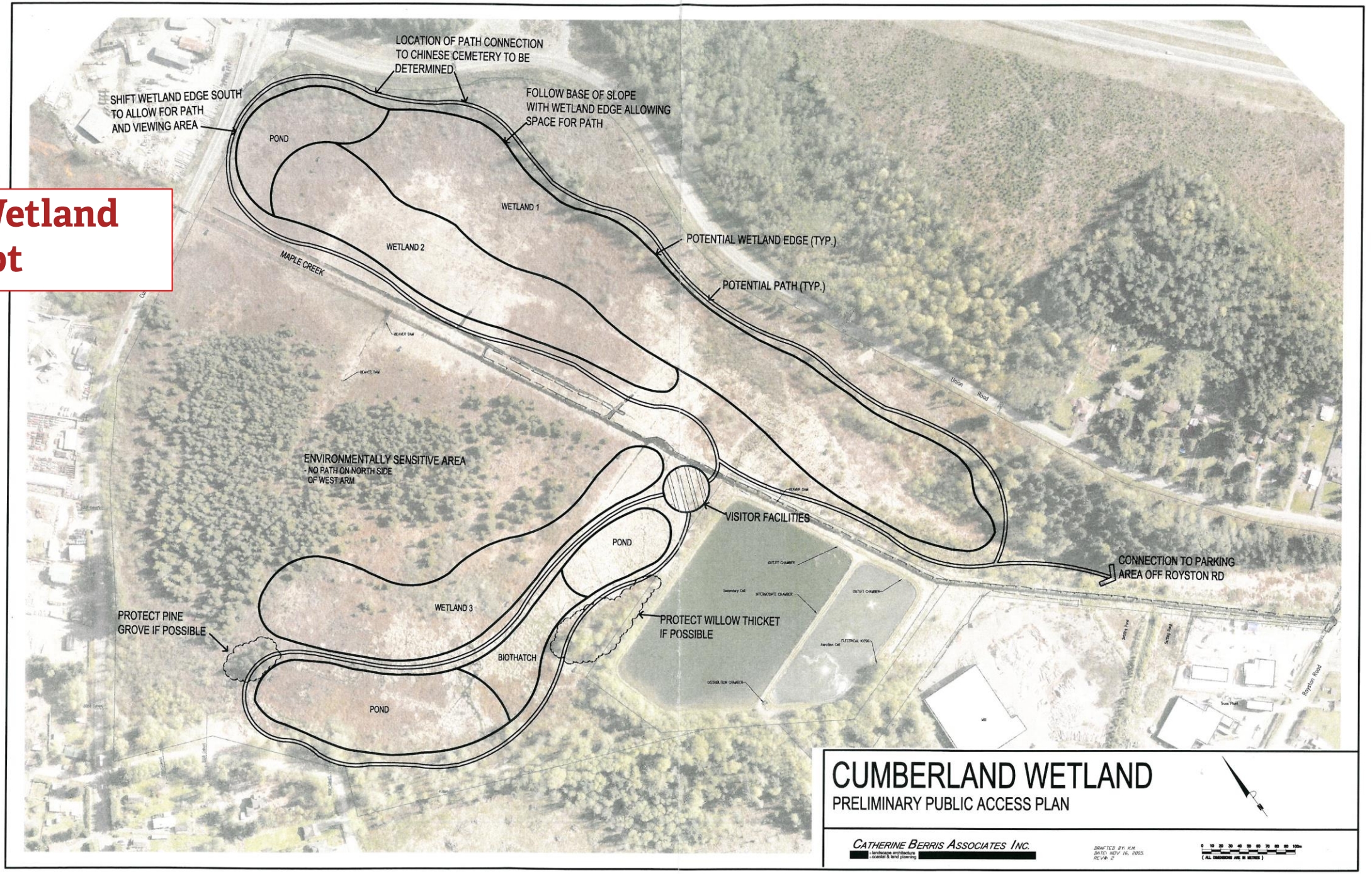


Aerial View, 2017

Conceptual Layout of enhanced lagoon and wetland application



2005 Wetland Concept



Conceptual Treatment Options

All options include the Reed Bed and Chemical Disinfection

- 1A “Base quality” Upgraded Lagoon system
- 1B “Full quality” Upgraded Lagoon system with additional chemical and mechanical treatments
- 2A “Base Flow” mechanical (up to 2x ADWF, 3600 cu.m/day)
- 2B “Full Flow” mechanical, (up to 8xADWF, 14,400 cu.m/day) (*2016 CWWF application*)

Conceptual Discharge Options

Winter

- Maple Lake Creek

Summer

- Maple Lake Creek
- Storage Reservoir (near Teal Lake)
- Storage Wetland (eco gift lands north of lagoons)
- Wetland Distribution (eco gift lands north of lagoons)

2017 Workplan

Major Study areas

1. Environmental studies on MLC and Trent River
2. Assess performance of existing lagoons
3. Update “Flow and Load” model
4. Effluent polishing by Reed Bed
5. Wetlands Distribution discharge concept
6. **Finalise Conceptual Treatment Options**, and suitability of Phased approach
7. **Finalise conceptual Discharge Options**

2017 Workplan

Additional Studies

- Treatment for removal of Trace Organics (pharmaceuticals, etc)
- Analysis of rainwater Infiltration and groundwater Inflow (“I&I”)
- Options for Comox Lake houses on septic
- Resource Recovery studies
  - reclaimed water,
  - heat recovery
- Water Conservation – potable water savings from reclaimed water
- Biosolids disposal and processing options
- Carbon footprint/sequestration

What about the WAC?

Major decisions for the WAC are at the end of the study period; Use

- Select a preferred discharge option
- Select a preferred treatment option
- Are the resource recovery concepts (reclaimed water, heat recovery) worth pursuing in the near, or long term?
- ***At the end of 2017, the preferred direction is set, completing LWMP Stage 2***

Fall 2017 meeting schedule

11. Sept 7 Progress update
12. Nov 2 – full day meeting (9-4)
    - Evaluation of Treatment Options
    - Evaluation of Discharge Options
    - Discussion of resource recovery, etc
13. Nov 23 public Open House (evening)
14. Nov 30 (1-4) review feedback, finalise recommendations.
15. Dec 11 – present recommendations to Council

2018 Stage 3

- Refine Implementation Plan
- Financing Plan
  - Grants
  - User fees
  - DCC's
  - Borrowing
- Documentation
- Public Consultation
- Submit Final Report to MoE

Thank You!