

# LWMP/WAC Treatment Options

**Council Meeting, Apr 09,  
2018**

PREPARED BY: Paul Nash  
DATE: April 09, 2018

**Phasing, Funding and  
Implementation Options**



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## Original Mandate

**“to develop an environmentally sustainable method to treat the liquid waste that is produced by the Village”**

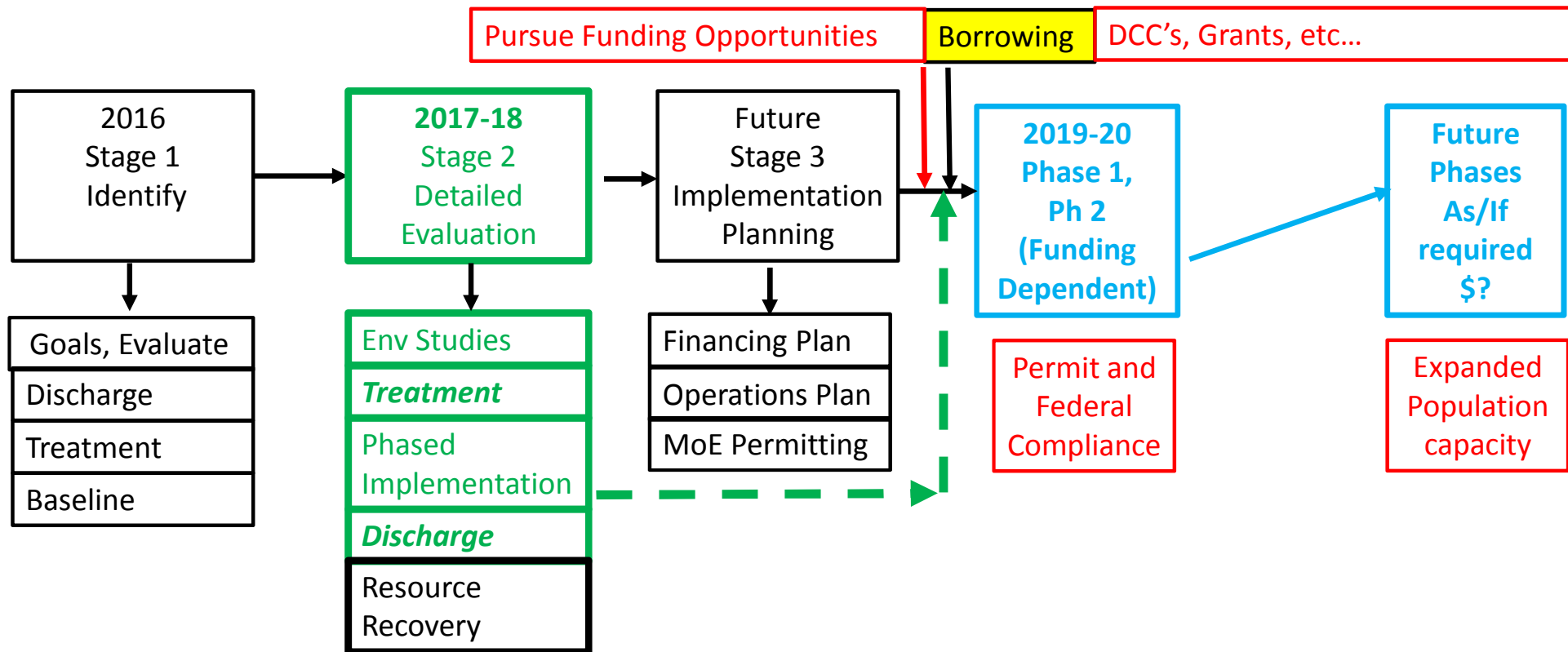
## WAC expanded mandate

**“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 (Apr 2018)





## Today's Objectives

- Consider the WAC's recommendations and;
- Confirm a Preferred Discharge Option
- Confirm a Preferred Treatment Option
- Confirm a preferred Phasing Approach
- Select a preferred Grant Funding approach
- Preference on implementation vs LWMP Stg 3

**And that's it!**

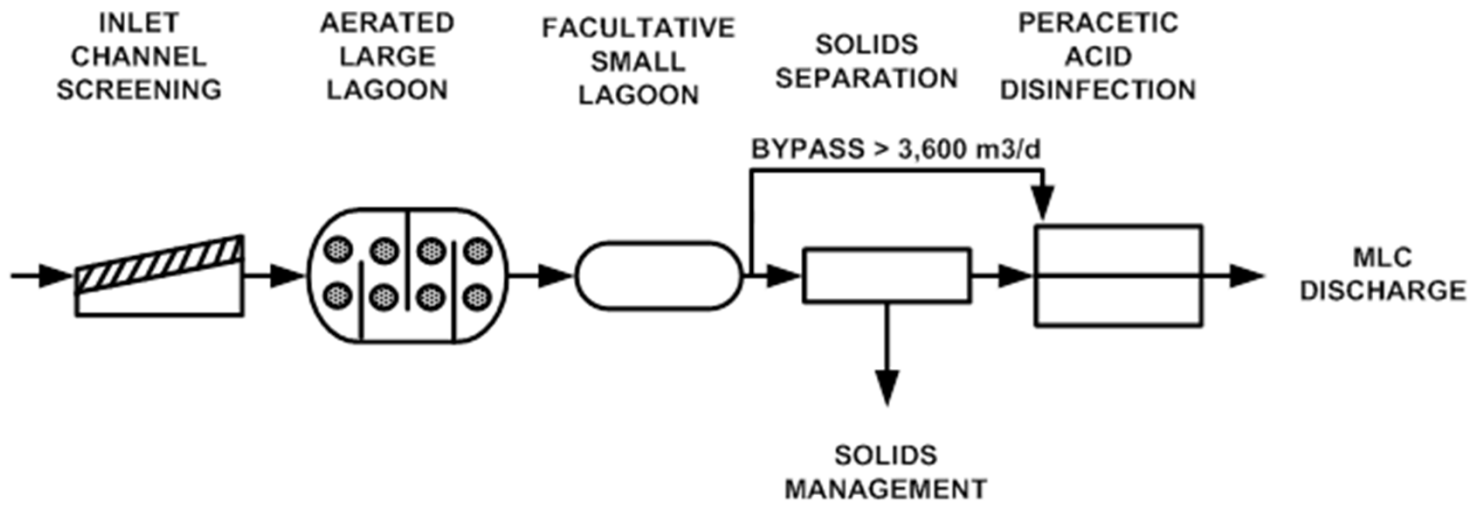




## The Permit Compliance Approach.

- Cumberland **MUST** meet the permit conditions ASAP.
- Doing a project (Phase 1) to just meet the Permit conditions is a change in thinking from normal LWMP planning
- Grant funding for 2019 will allow Phase 2 to be done, meeting LWMP requirements (MEP quality)
- The performance of the system + Reed Bed *might* meet GEP quality
- Potential for future upgrade to GEP if desired, or required





# LAGOON

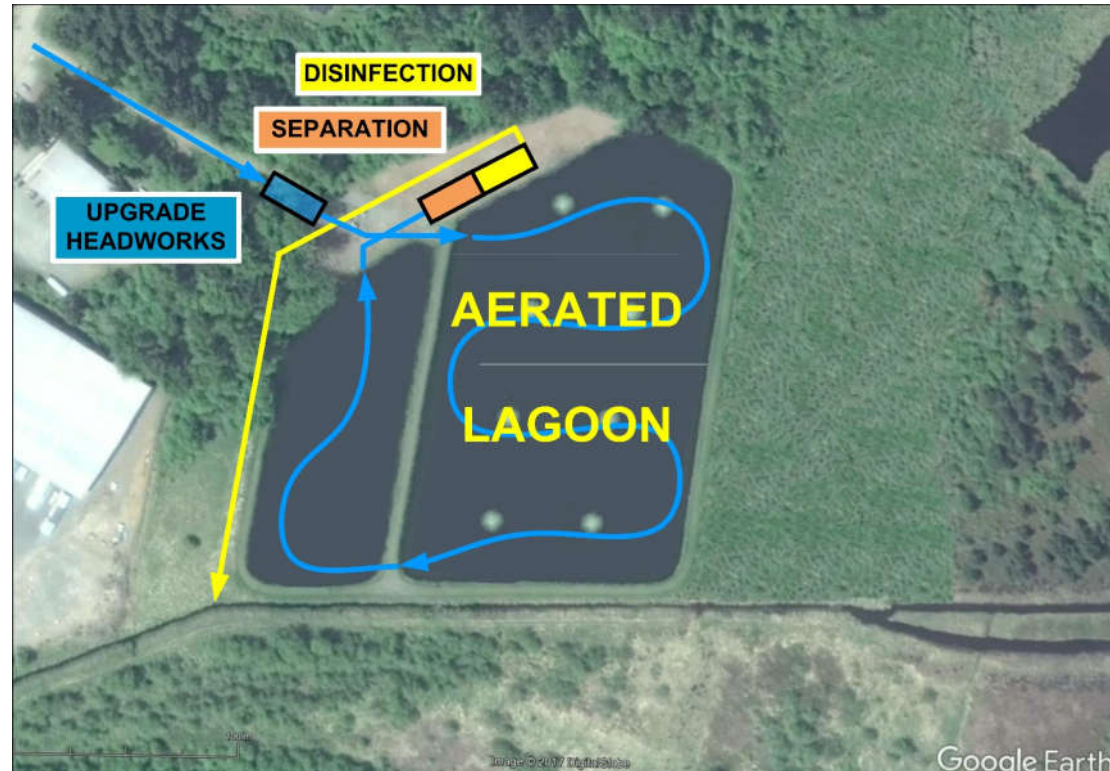
## Option1, Phase 1 – Permit Compliance

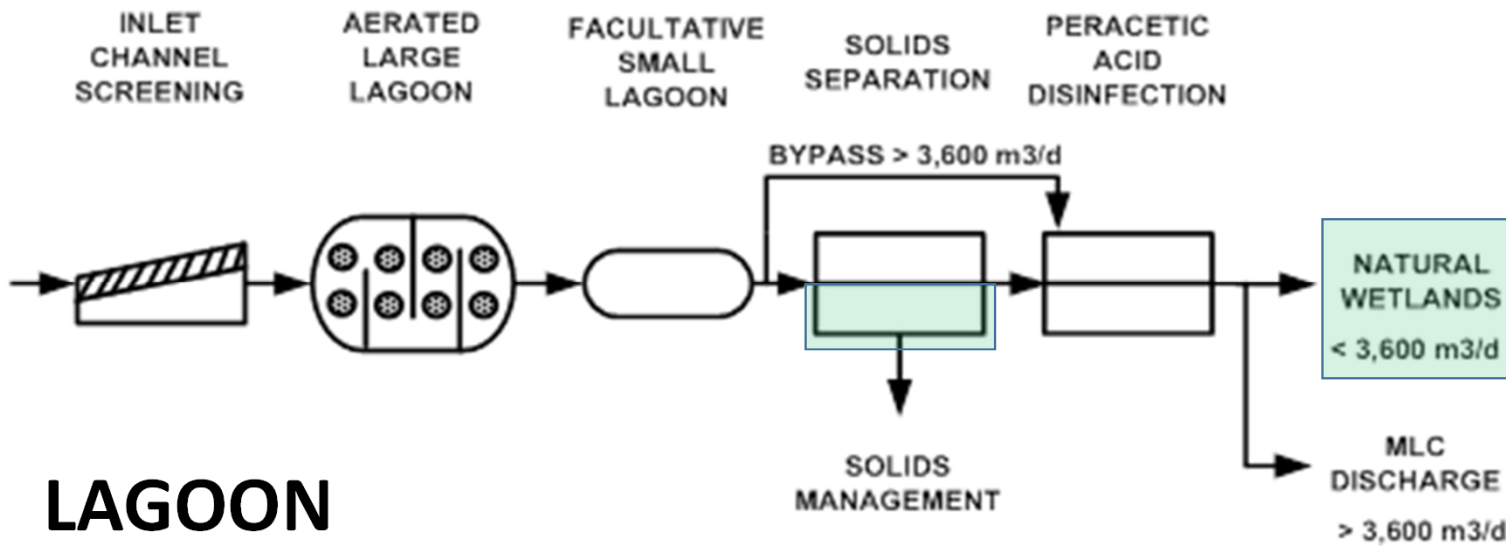






# LAGOON Option 1, Phase 1





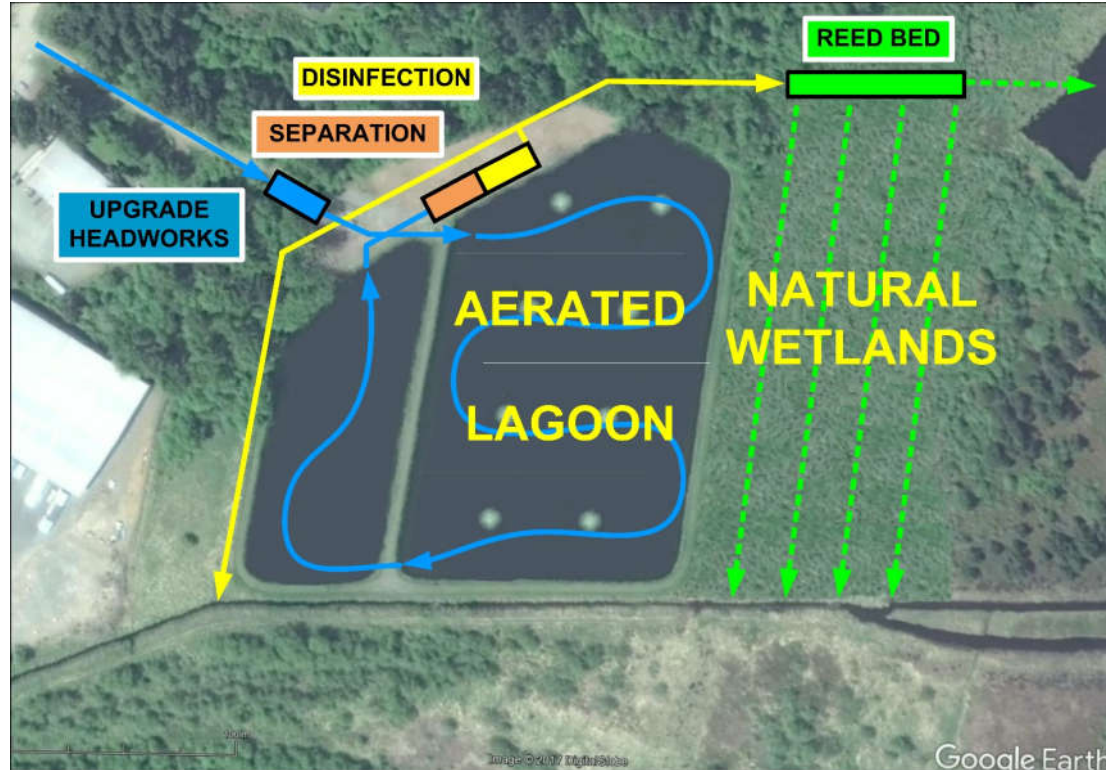
# LAGOON OPTION 1, Phase 2A – MWR “MEP” Quality





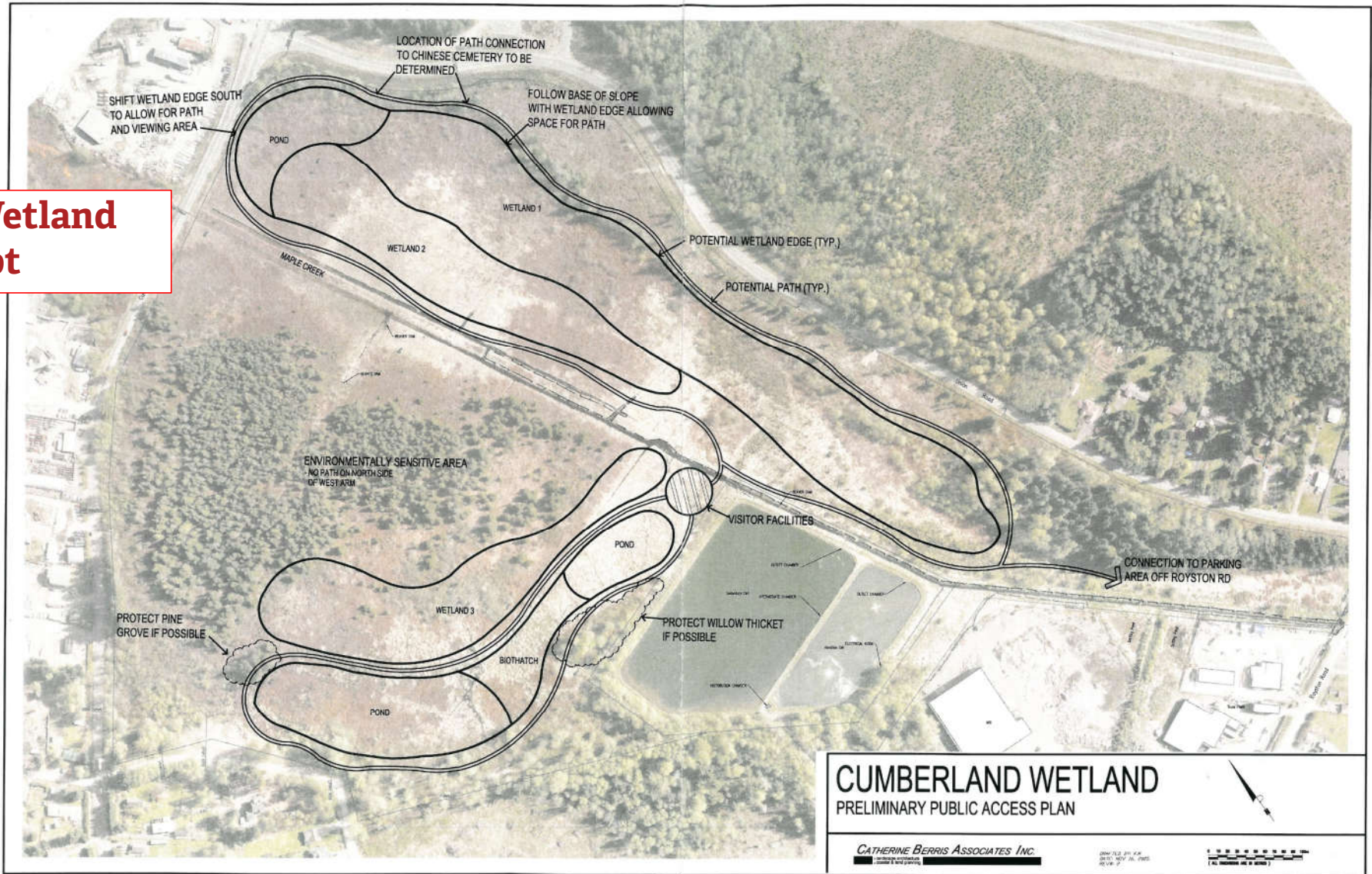


# LAGOON OPTION 1, Phase 2A





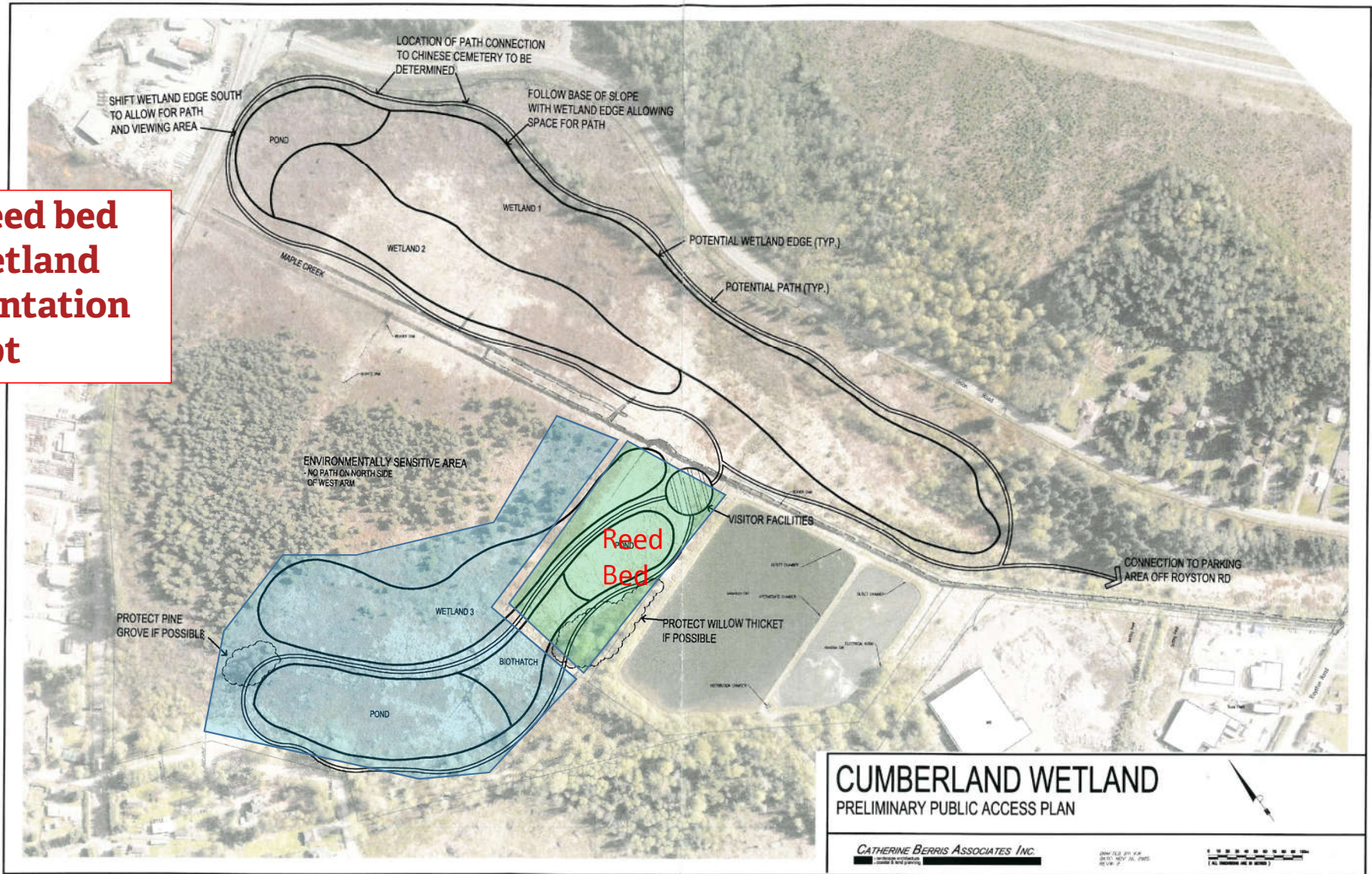
# 2005 Wetland Concept

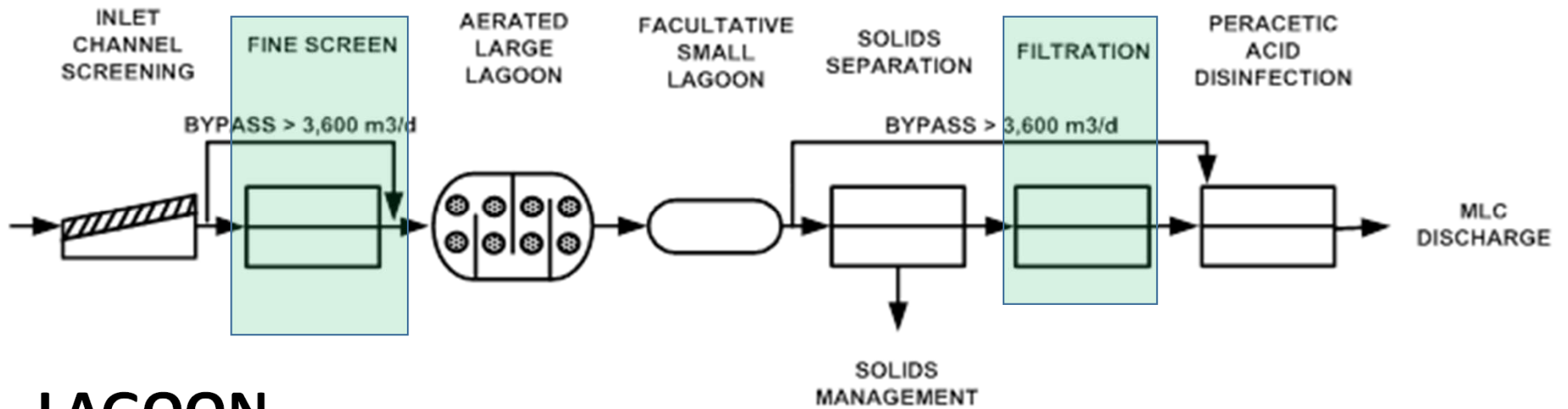






# 2018 Reed bed and Wetland Augmentation Concept





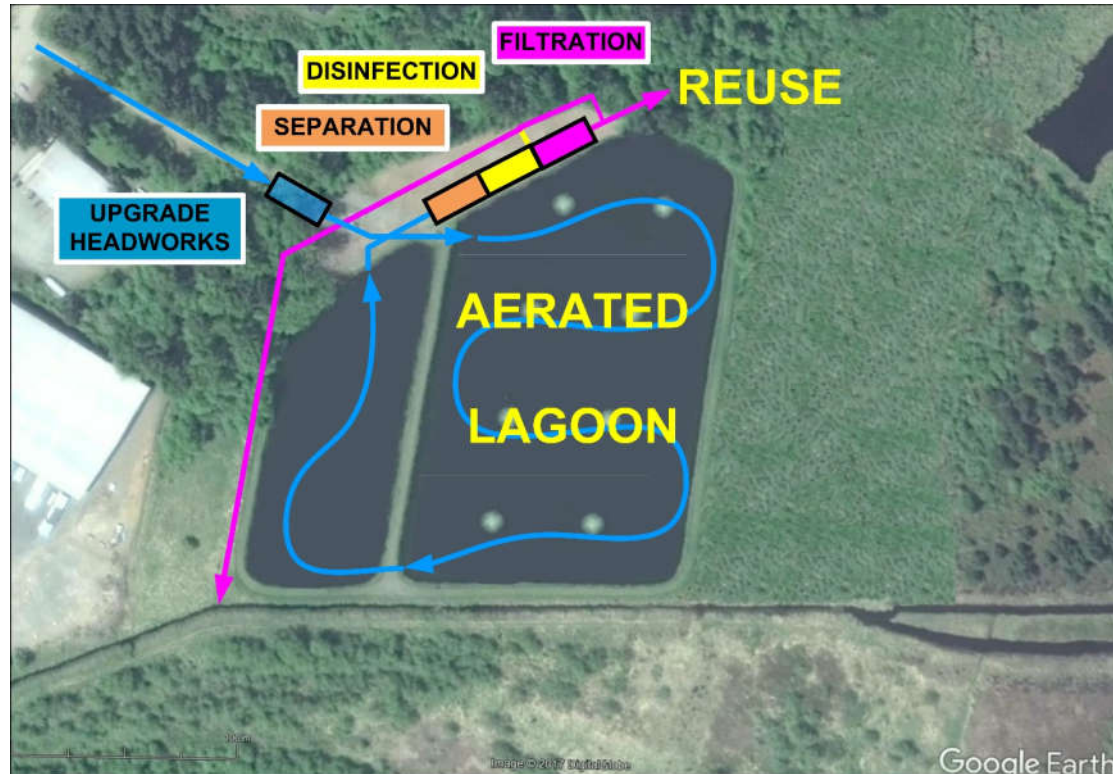
# LAGOON OPTION 1, Phase 2B, MWR “GEP” Quality







# LAGOON OPTION 1, Phase 2B





## Cost Comparison



	Option 1			Option 2	Option 3
	Phase 1	<b>Phase 2A</b>	Phase 2B		
Capital Cost for one-phase execution	\$5.6 M	<b>\$8.7M*</b>	<b>\$10.6M</b>	\$ 9.3 M	\$14.8 M
Capital cost for two-phased execution	\$5.6M	<b>\$9.5M*</b>	\$ 11.7M	\$10.2M	\$16.3M
Capital cost for two phases, with wetland	\$6.6M	<b>\$9.5M</b>	\$12.7M	\$11.2M	\$17.3M
Operating Cost	\$350k	<b>\$375k</b>	\$425k	\$450k	\$500k

\* Includes the wetland as this is integral to Option 1A





	Present System	Option 1			Option 2	Option 3
		Phase 1	Phase 2A	Phase 2B		
Description	Aerated and Facultative Lagoons	Upgraded Lagoon to <b>Permit Compliance</b>	<b>Upgraded Lagoon to MEP</b>	Upgraded Lagoon to GEP	Base flow mechanical to GEP	Full flow mechanical to GEP
Population	<4,000	5,000	<b>7,000</b>	7,000	7,000	7,000
Discharge Location	Maple Lake Creek	Maple Lake Creek	<b>North Wetlands</b>	Maple Lake Creek	Maple Lake Creek	Maple Lake Creek
Effluent Quality (BOD-TSS, mg/L)	25-25 (winter) 50-50 (Smr)	25-25	<b>25-25</b>	10-10	10-10	10-10
Disinfection PAA	None	<200CFU/100mL	<b>&lt;100CFU&lt;100mL</b>	<1CFU/100mL	<1CFU/100mL	<1CFU/100mL
Biosolids Withdrawal	Periodic dredging	Periodic dredging + low vol. continuous	<b>Periodic dredging + low vol. continuous</b>	Periodic dredging + low vol. continuous	Continuous	Continuous
Op. Class	1	2-3	<b>2-3</b>	3	4	3-4
Energy use	Low	Moderate	<b>Moderate</b>	Moderate	High	Highest
Carbon Footprint	Very Low	Low	<b>Low</b>	Low	High	Highest
Land Reclaimed	No	No	<b>No</b>	No	No	Yes –4Ha

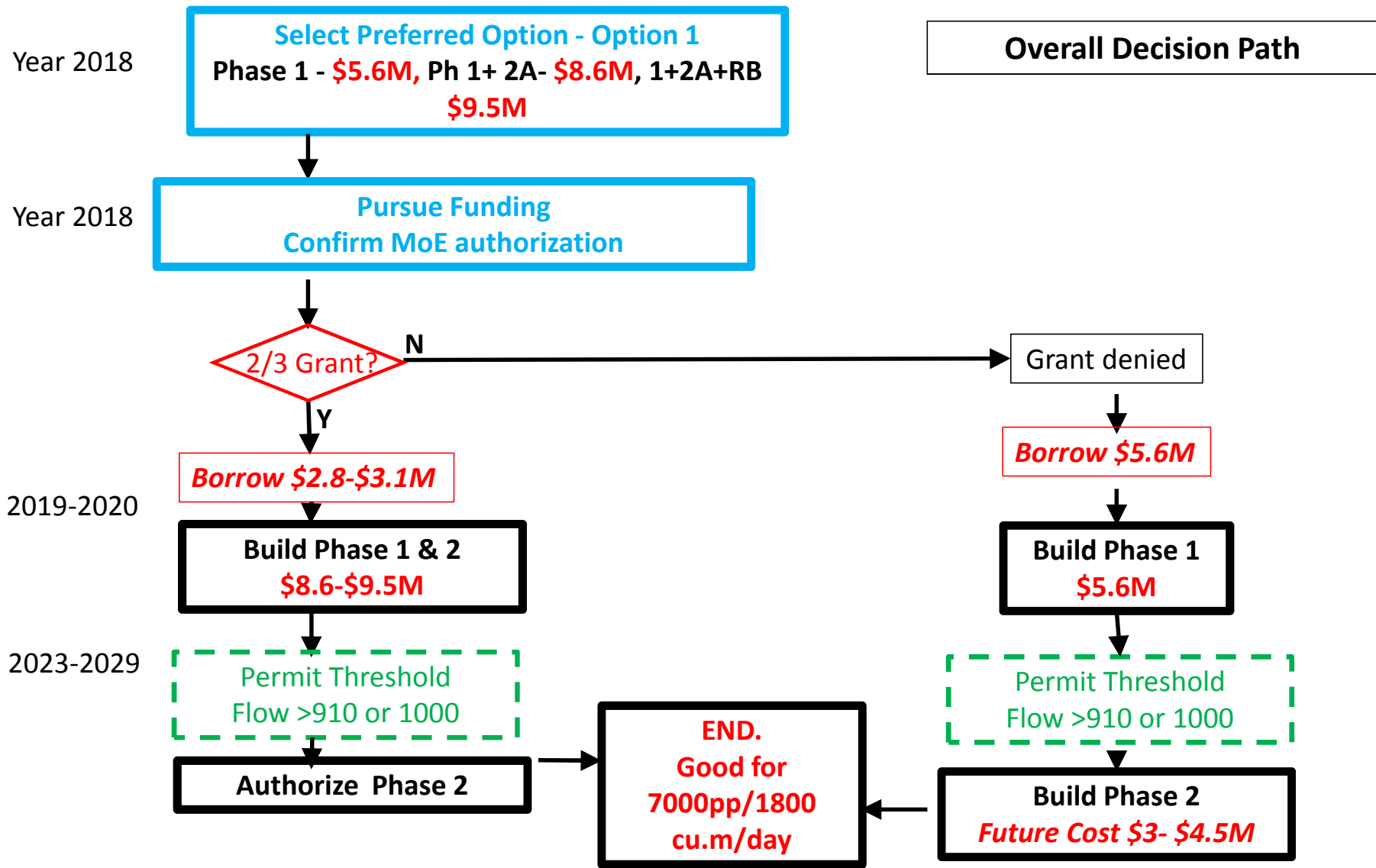


## Cost Comparison



	Option 1	Option 2	Option 3
	Upgraded Lagoon	Baseflow Mechanical	Full Flow mechanical
Capital cost	\$8.6	\$9.3M	\$14.8M
Op cost	\$350k	\$450k	\$500k
Dry weather treatment	Good	Excellent	Very good.
Wet weather treatment	Good	Good	Good
Best features	Simplest to operate Upgradeable in stages	Highest quality water for reuse	Lagoons decommissioned







## Implementation

2018

- Finalise STG 2 LWMP
- Pursue Grant Funding
- Biochar Reed Bed Study

2019

- **Finalize scope - Ph2 + Reed Bed dependent on Grant Funding**
- Pre-Design and Procurement

2020

- Construction





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**Thank You!**

