



# Presentation Overview

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- ▶ Introductions & History
- ▶ Purpose of this Meeting
- ▶ Review of Findings
- ▶ Review of Concepts
- ▶ Review of Public Input
- ▶ Design Recommendations
- ▶ Cost Estimates
- ▶ Preliminary Assessments
- ▶ Questions

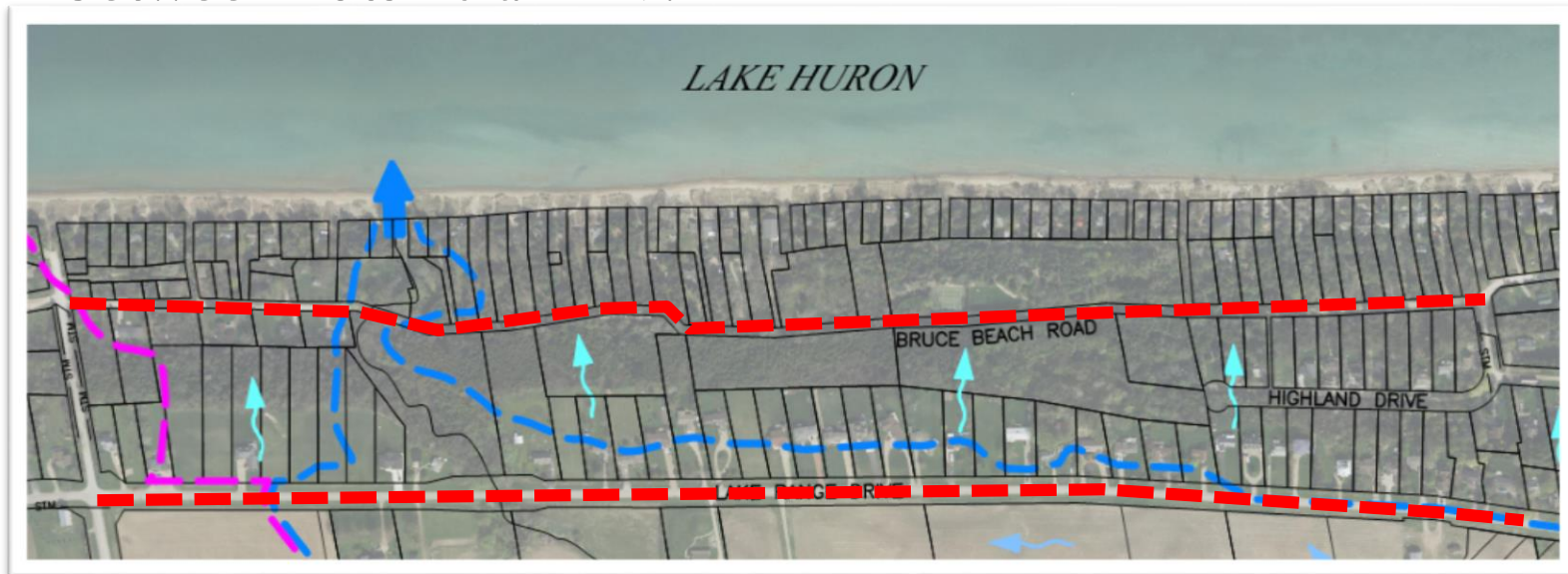


# Introduction and History

# Introduction

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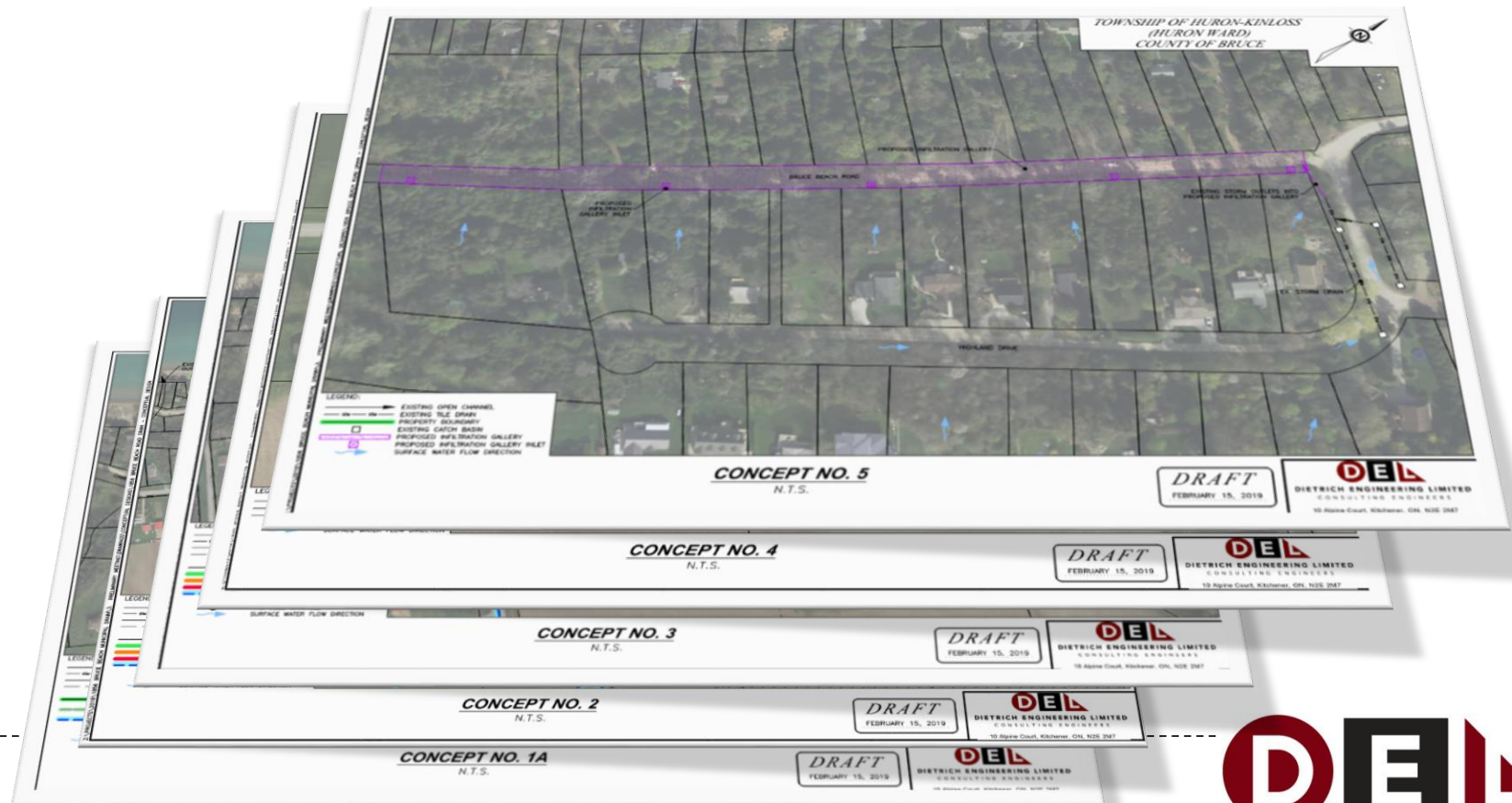
- ▶ Dietrich Engineering Limited Appointed by the **Council** of the Township of Huron-Kinloss on November 19, 2018 under Section 4 (1)(c) of the Drainage Act.
- ▶ To provide a drainage works for Bruce Beach Road between Concession 8 road and Highland Drive and Lake Range Road between Lots 40 and 49.





# History

- ▶ Dietrich Engineering Limited presented five conceptual designs and a general project plan at the February 11, 2019 Council Meeting.



# History

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- ▶ Dietrich Engineering Limited attended a Public Open House hosted by the Township on May 25, 2019. The purpose of the open house was for the Engineer to receive public input about the project.



# Purpose of this Meeting

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- ▶ To present design recommendations to Council, including cost estimates, and estimated assessments.
- ▶ To re-initiate public discussion by providing the Township of Huron-Kinloss staff with information to be posted to the *HaveYourSayHK* website.

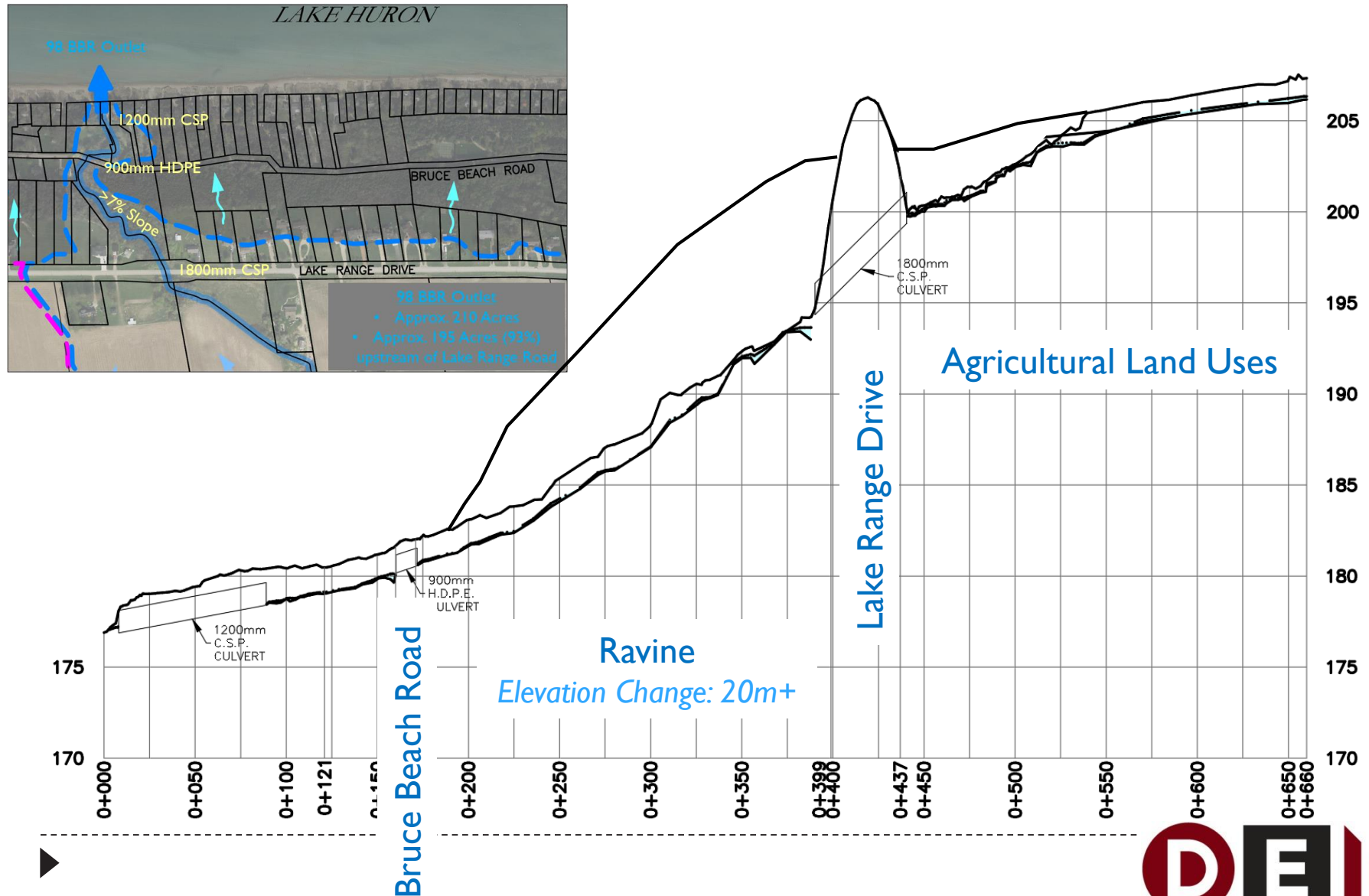


# Findings





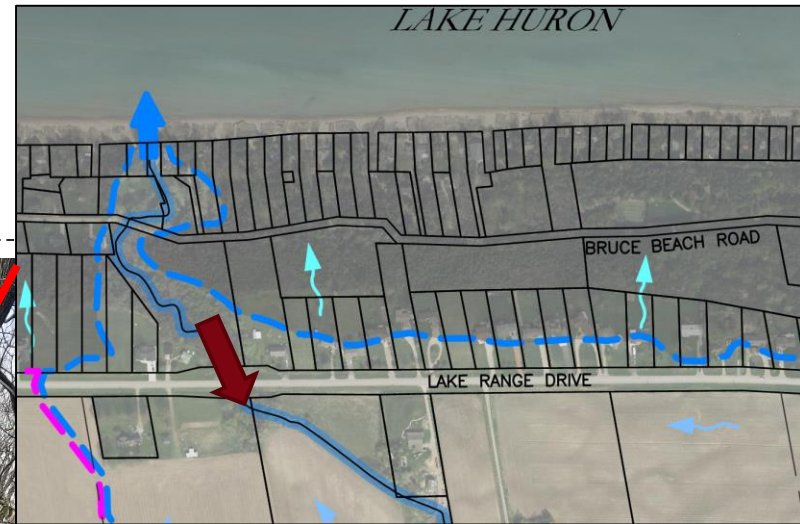
# Findings





# Findings *(previously presented)*

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LAKE HURON

BRUCE BEACH ROAD

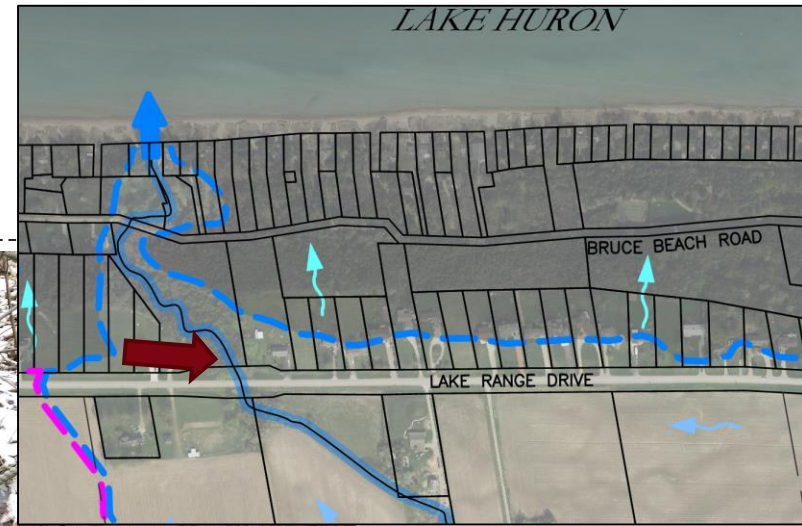
LAKE RANGE DRIVE

The map shows a residential area with property lines. A large red arrow points from the bottom left towards the center. A blue dashed line with arrows indicates a path or flow. A green dashed line with arrows indicates another path or flow. A pink dashed line with arrows indicates a third path or flow. The map is labeled 'LAKE HURON' at the top, 'BRUCE BEACH ROAD' in the middle, and 'LAKE RANGE DRIVE' at the bottom.





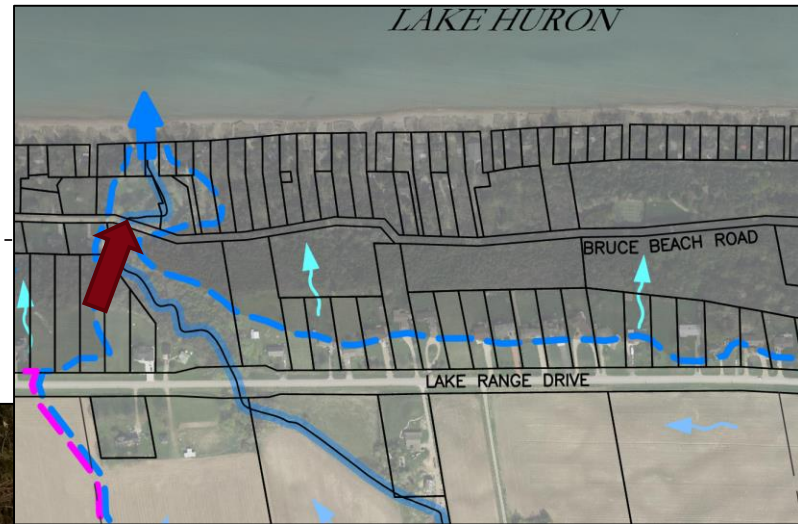
# Findings *(previously presented)*





# Findings *(previously presented)*

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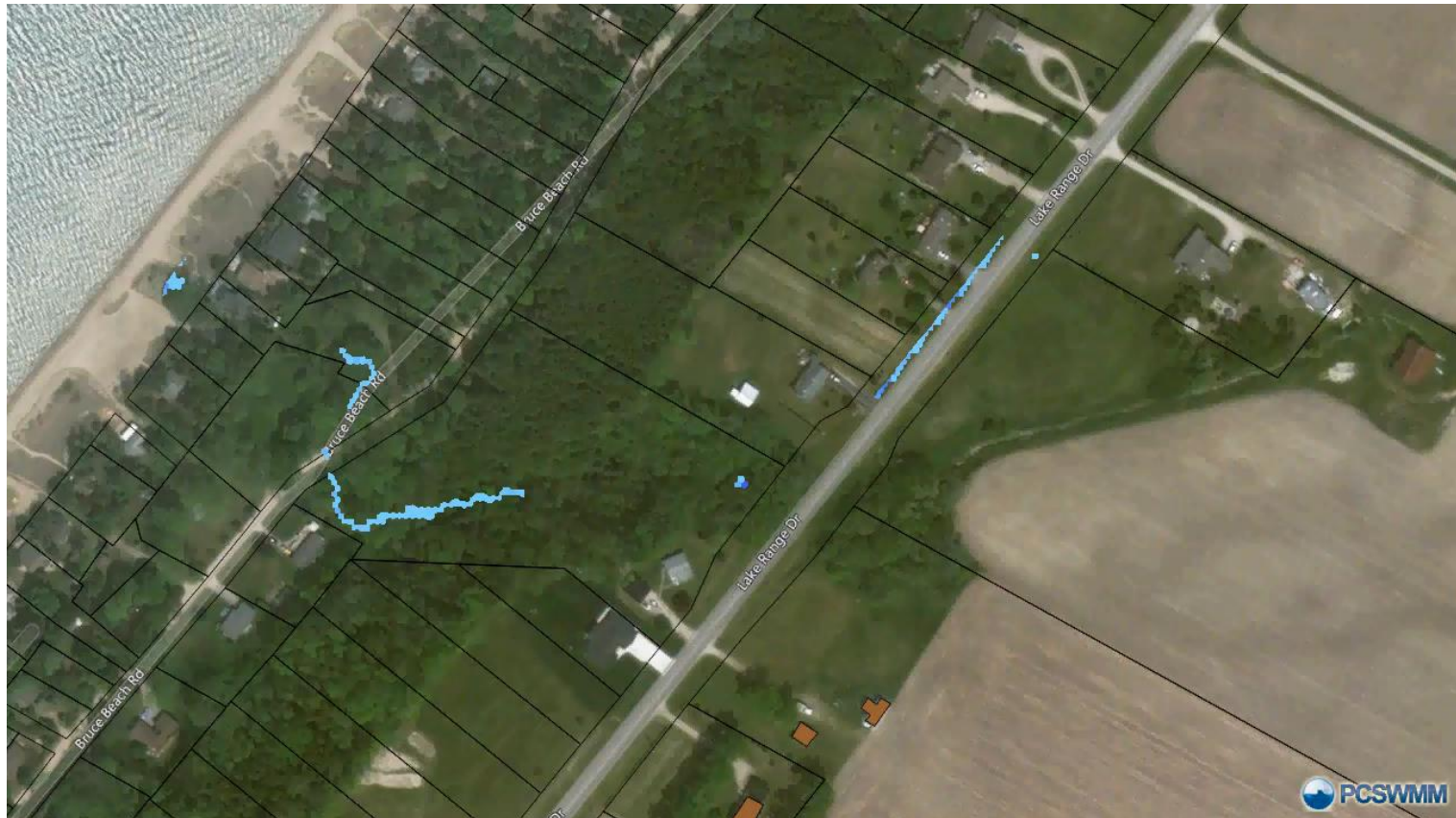


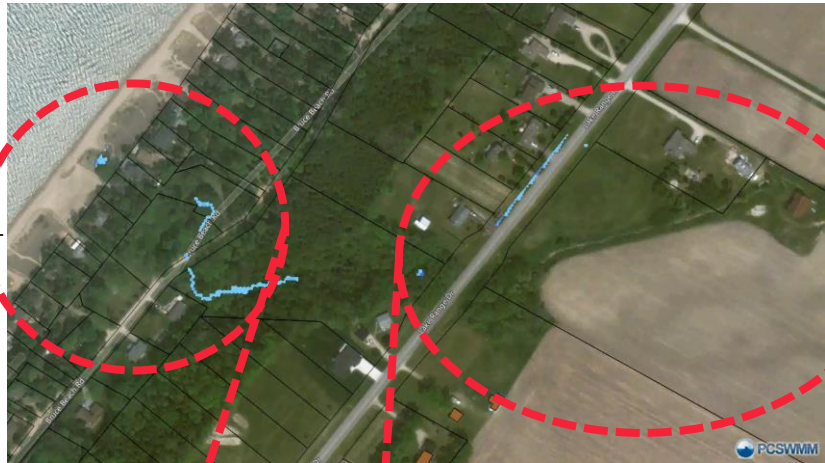
# Findings

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## ► Existing Conditions Modelling

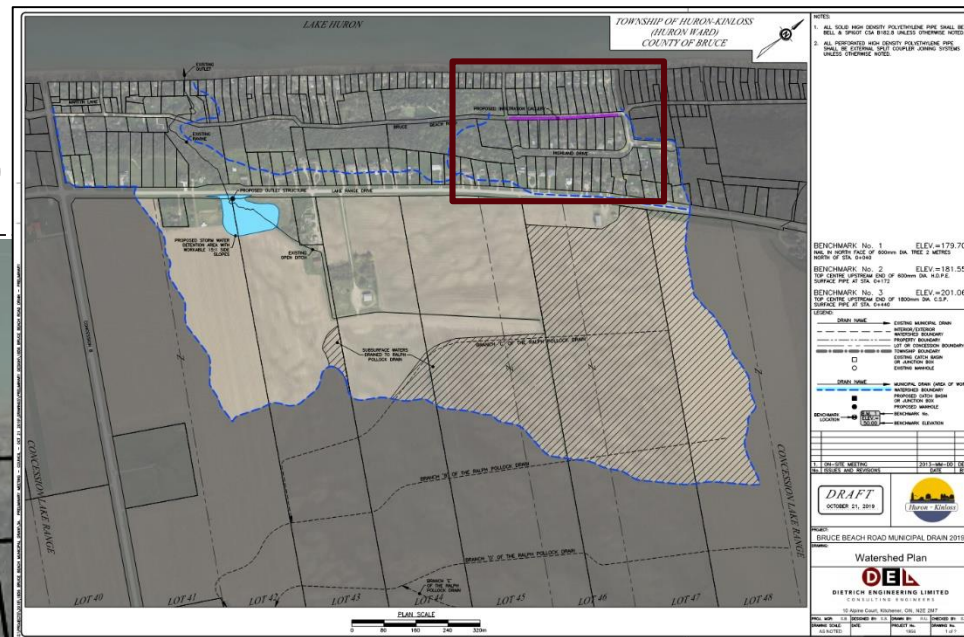
- 5, 10, 25, 50, 100Year Rainfall Events (*50 Year Event animated below*)







# Findings (previously presented)





# Findings *(previously presented)*

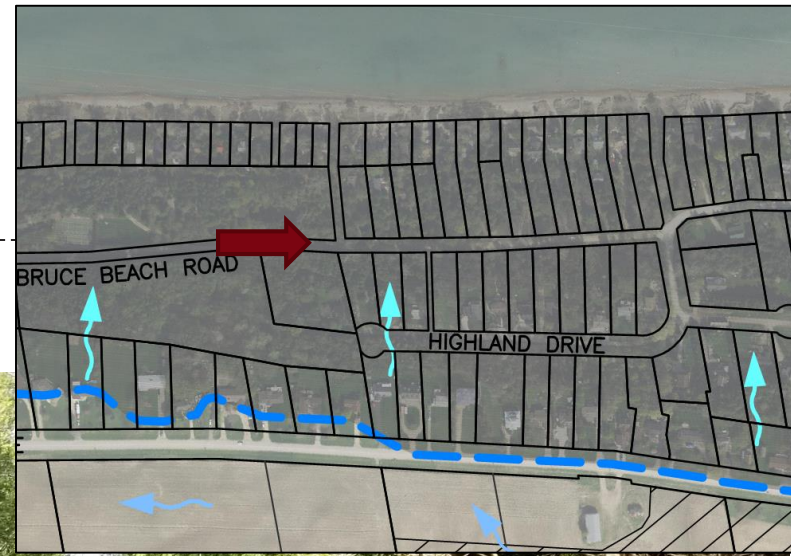
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# Findings *(previously presented)*

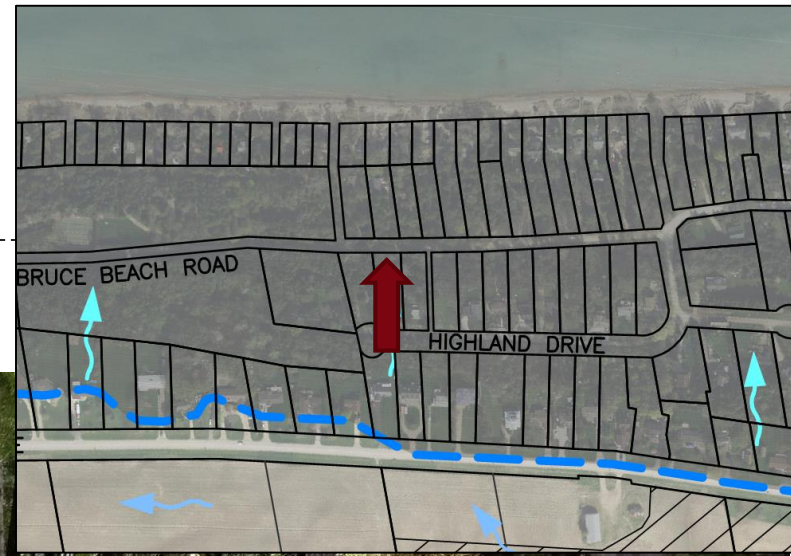
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# Findings *(previously presented)*

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# Findings *(previously presented)*

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# Findings

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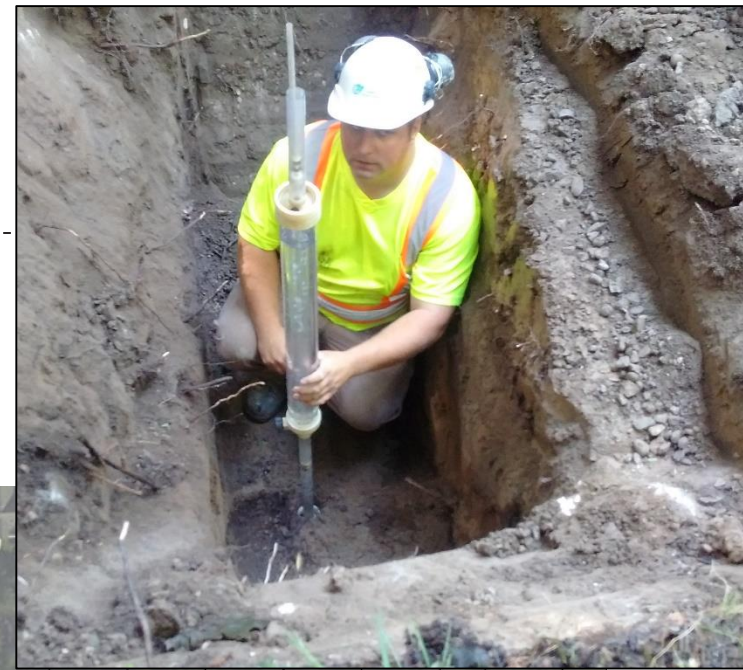




# Findings

## ► Soils Investigation

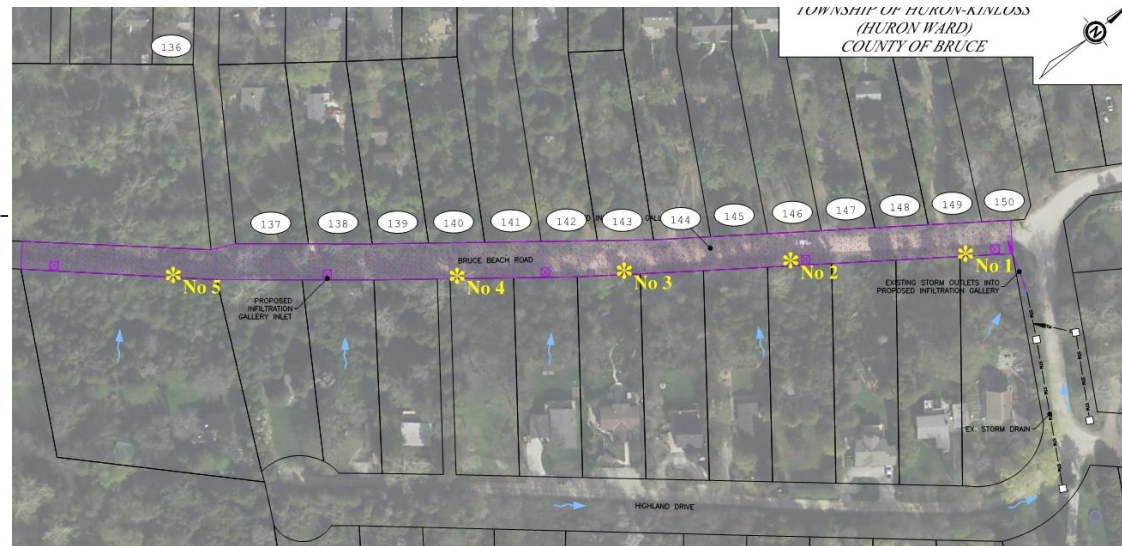
- Assess soils ability to infiltrate runoff.



# Findings

## ► Soils Investigation

Hydraulic  
Conductivity of  
Clay: 1 foot per year



Test Pit No.	Soil Strata	Location	Hydraulic Conductivity
1	Fine to Medium SAND (1.16m to 2.48m)	Cottage No. 149	<b>975mm/hr (3.2ft/hr)</b>
2	Fine to Medium SAND (0.60m to 2.13m)	Cottage No. 146	<b>875mm/hr (2.8ft/hr)</b>
3	Fine to Medium SAND (0.60m to 2.13m)	Cottage No. 143	<b>875mm/hr (2.8ft/hr)</b>
4	Fine to Medium SAND (0.91m to 1.82m)	Cottage No. 140	<b>605mm/hr (2.0ft/hr)</b>
5	Fine to Medium SAND (1.27m to 2.13m)	Cottage No. 136	<b>875mm/hr (2.8ft/hr)</b>



# Findings

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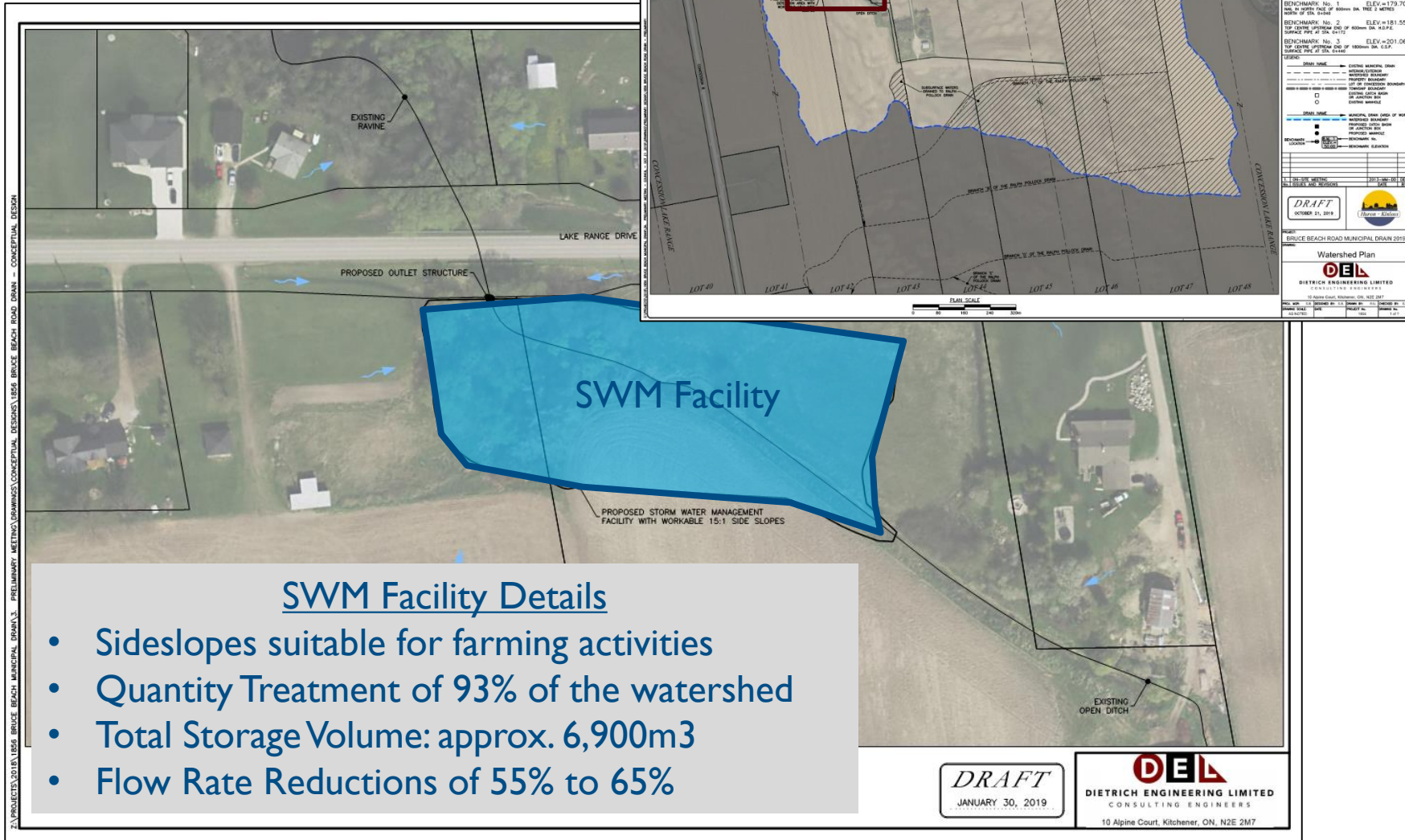
## ► Existing Conditions Modelling

- 5, 10, 25, 50, 100Year Rainfall Events (*50 Year Event animated below*)



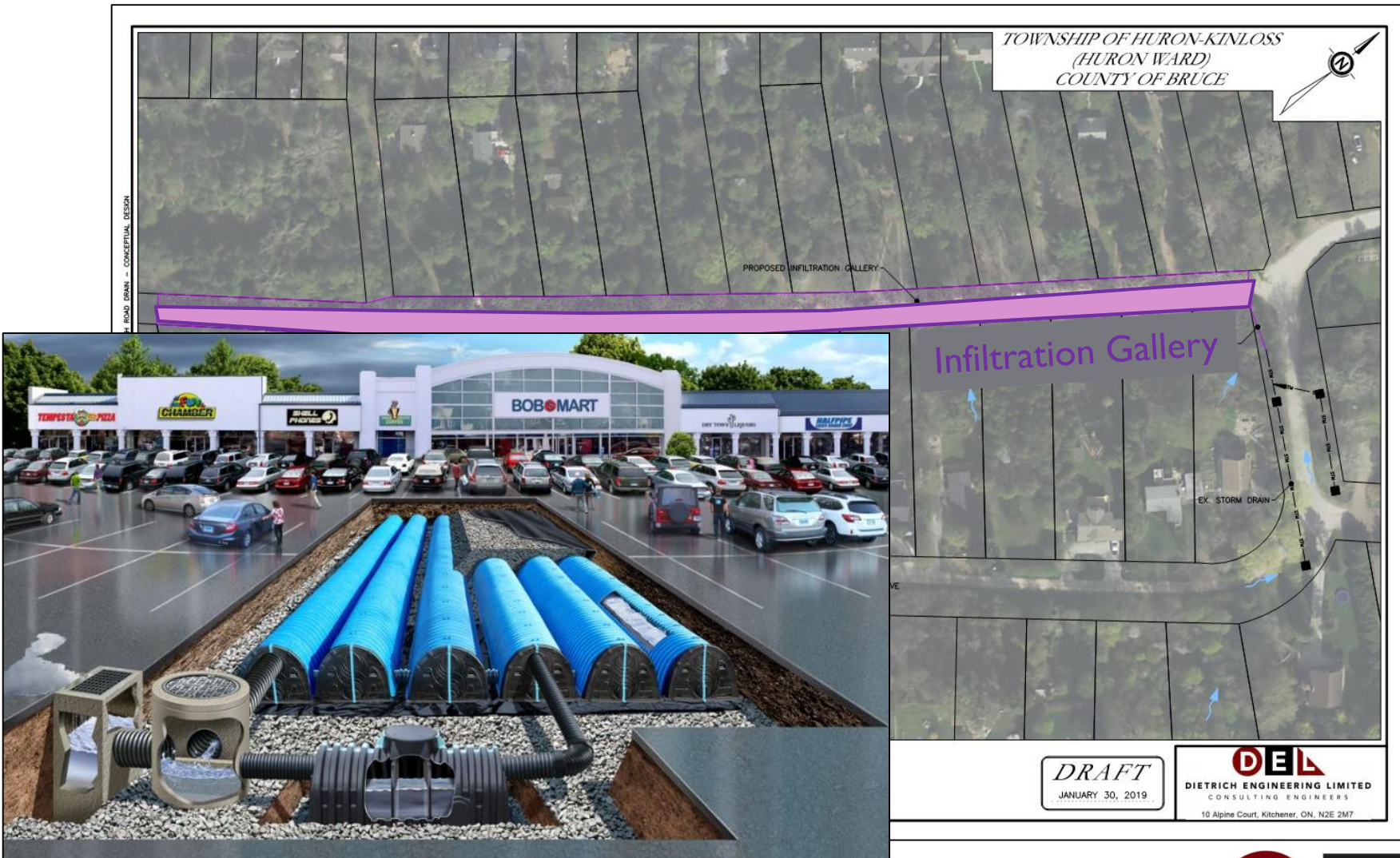
# Review of Preferred Concepts

# Concept No. 4





# Concept No. 5



► Photo Source: Aqua Q website

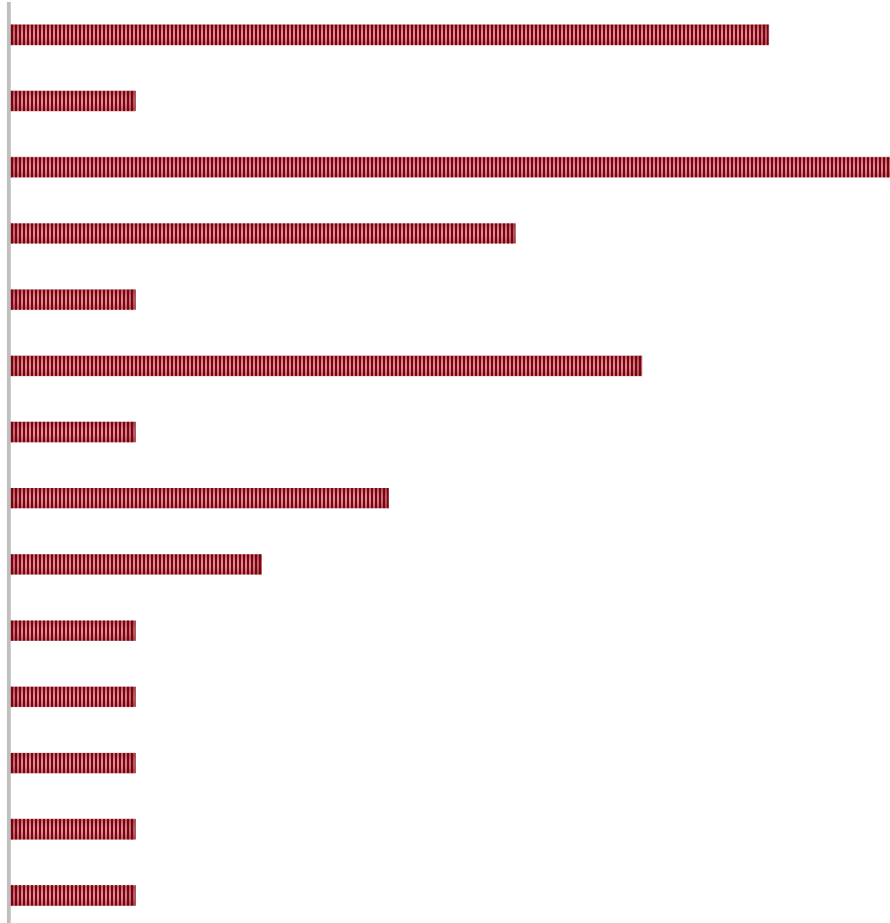


# Review of Public Input

# *Have Your Say HK* Input – Design

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## DESIGN COMMENTS



Design a solution at the source of the flow

Design a solution at the problem location (BBR)

Water quality

No new outlets to the beach

Support for Concept No. 1

Support for Concept No. 4 (SWMF)

Do not support Concept No. 4

Support for Concept No. 5 (Infiltration)

New roadside ditches along BBR

Build up BBR

French Drains along LRR and Highland Drive

Bank Stability

Reference to national sewer/SWM guide

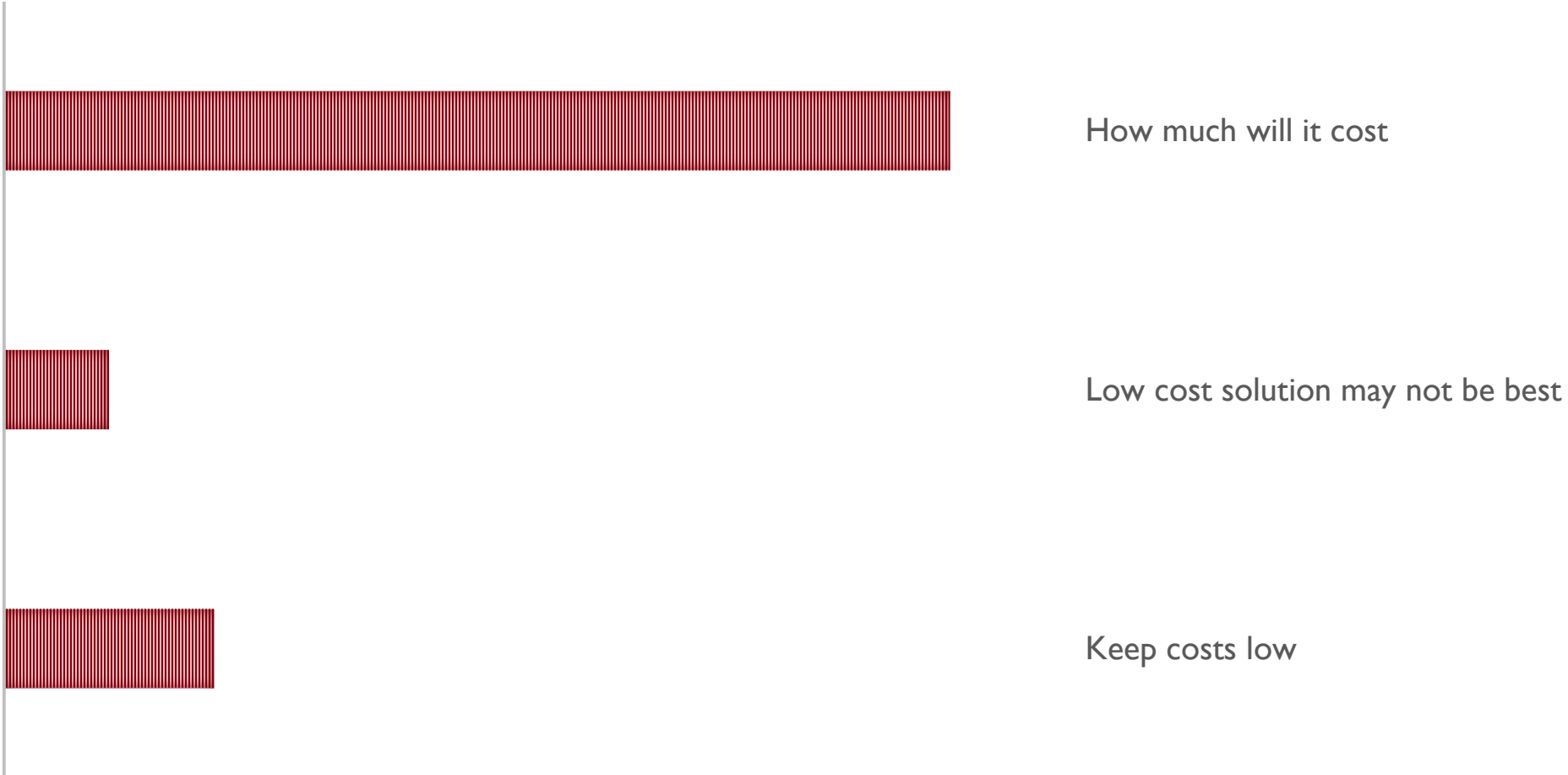
Do nothing



# *HaveYourSayHK* Input – Costs & Assessments

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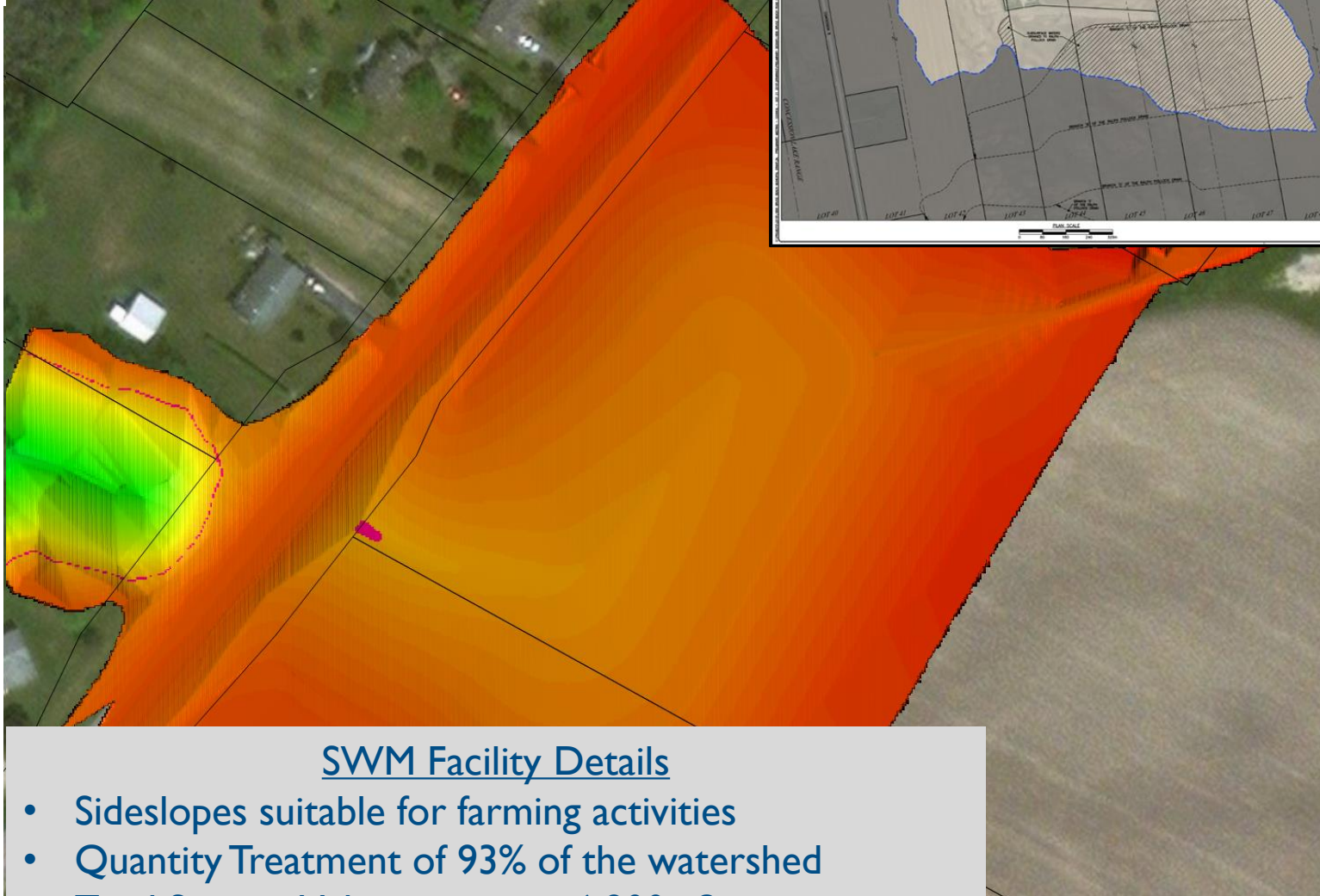
## **COSTS & ASSESMENT COMMENTS**





# Design Recommendations

# South Bruce Beach Road Stormwater Attenuation Centre

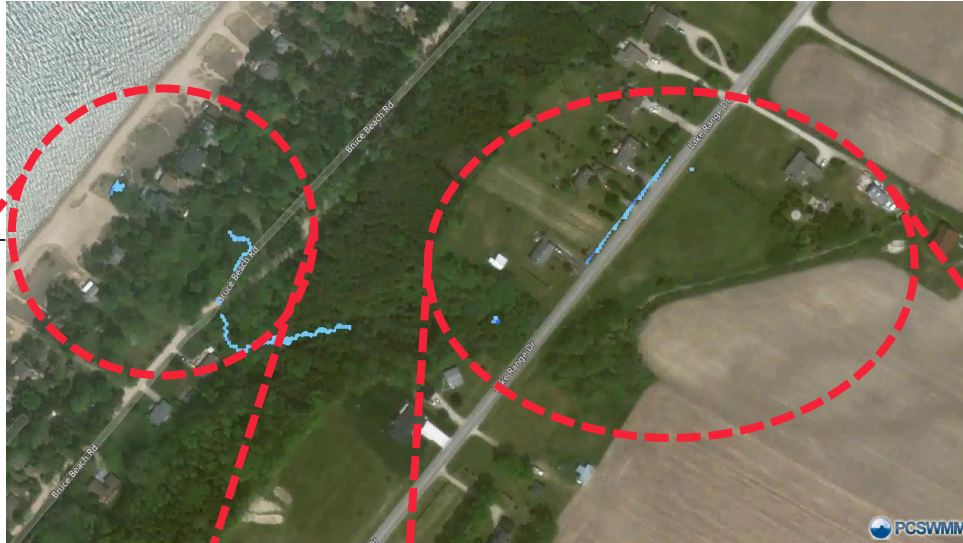


## SWM Facility Details

- Sideslopes suitable for farming activities
- Quantity Treatment of 93% of the watershed
- Total Storage Volume: approx. ~~6,900m<sup>3</sup>~~ **9,100m<sup>3</sup>**
- Flow Rate Reductions of ~~55% to 65%~~ **90% (approx)**

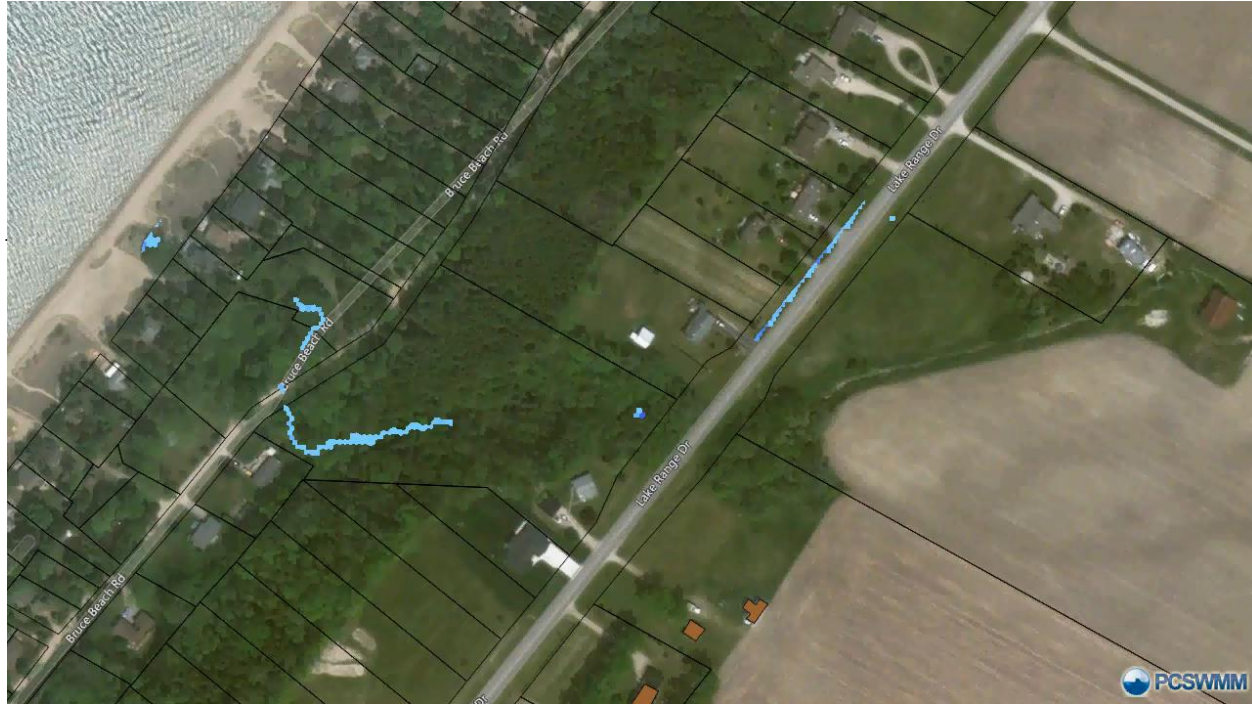




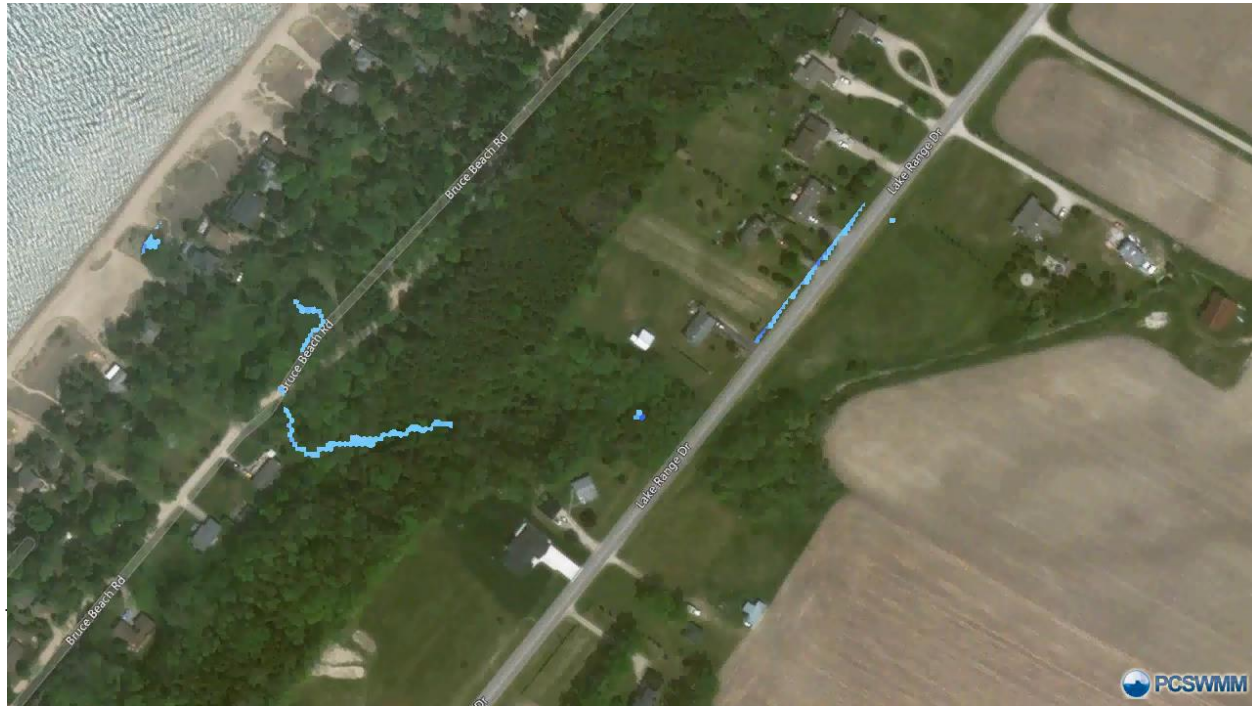


# Existing

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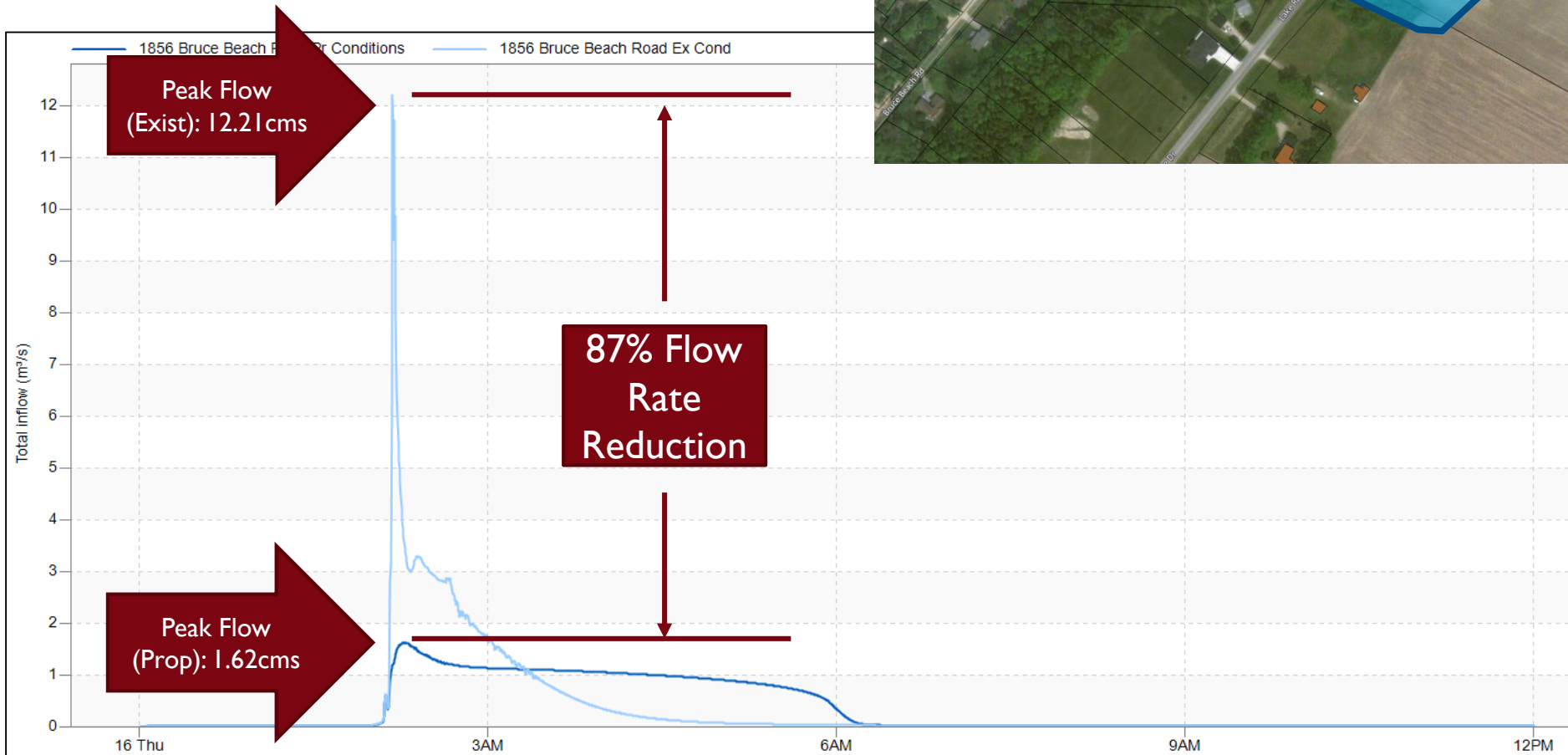
# Proposed





# South Bruce Beach Road Stormwater Attenuation Centre

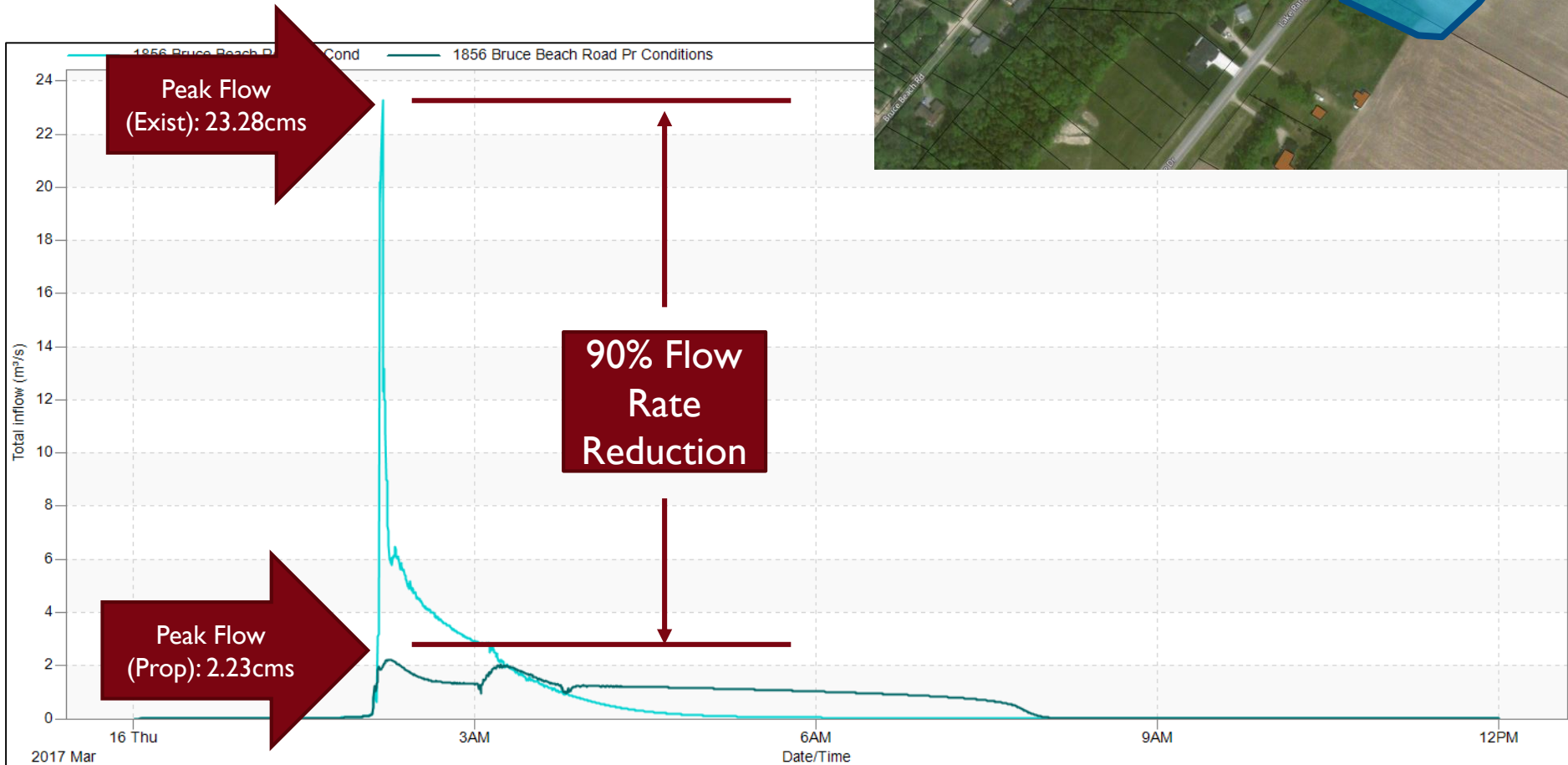
## ► 5 Year Rainfall Event





# South Bruce Beach Road Stormwater Attenuation Centre

## ► 50 Year Rainfall Event



# South Bruce Beach Road Stormwater Attenuation Centre

## ► Comparison of Flow Rates



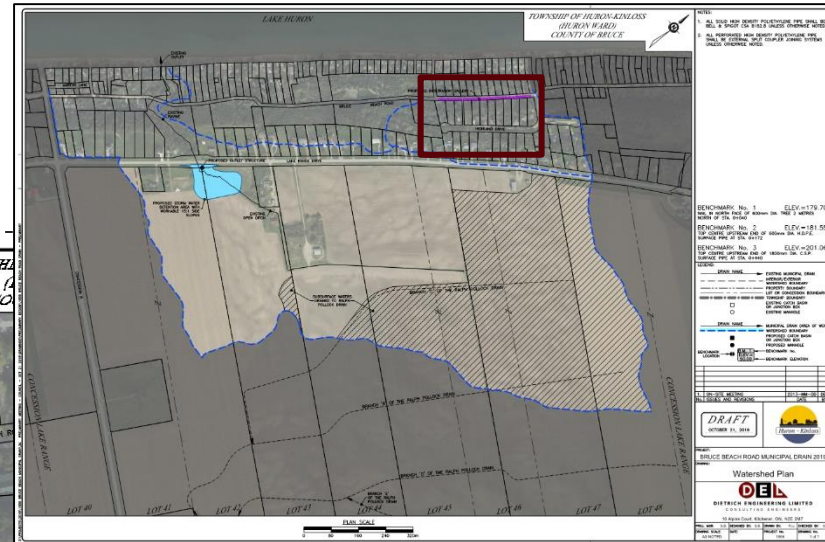
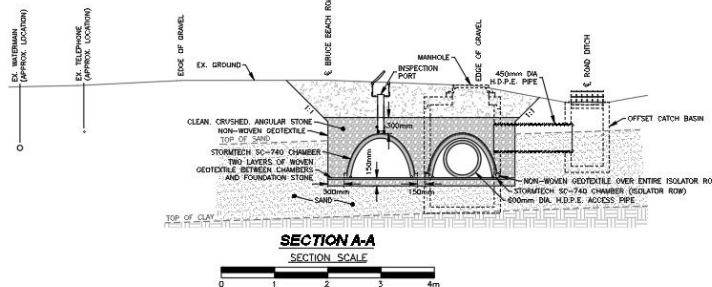
Rainfall Event	Existing Peak Flow Rate	Proposed Peak Flow Rate	Percent Change
<b>2 Year</b>	5.71 m <sup>3</sup> /s	1.35 m <sup>3</sup> /s	<b>76% Reduction</b>
<b>5 Year</b>	12.21 m <sup>3</sup> /s	1.62 m <sup>3</sup> /s	<b>86% Reduction</b>
<b>10 Year</b>	16.40 m <sup>3</sup> /s	1.81 m <sup>3</sup> /s	<b>89% Reduction</b>
<b>25 Year</b>	18.51 m <sup>3</sup> /s	2.04 m <sup>3</sup> /s	<b>89% Reduction</b>
<b>50 Year</b>	23.28 m <sup>3</sup> /s	2.23 m <sup>3</sup> /s	<b>90% Reduction</b>
<b>100 Year</b>	25.30 m <sup>3</sup> /s	2.87 m <sup>3</sup> /s	<b>89% Reduction</b>



# North Bruce Beach Road Infiltration Gallery



PLAN SCALE  
0 30 60 90 120m



BENCHMARK No. 1 ELEV.=179.70  
NAIL IN NORTH FACE OF 600mm DIA TREE 2 METRES NORTH OF STA 0+040

BENCHMARK No. 2 ELEV.=181.55  
TOP CENTRE UPSTREAM END OF 600mm DIA. H.D.P.E. SURFACE PIPE AT STA. 0+172

BENCHMARK No. 3 ELEV.=201.06  
TOP CENTRE UPSTREAM END OF 1800mm DIA. C.S.P. SURFACE PIPE AT STA. 0+440

**LEGEND:**  
 DRAIN NAME: EXISTING MUNICIPAL DRAIN  
 WATERSHED BOUNDARY  
 PROPERTY BOUNDARY  
 LOT OR CONCESSION BOUNDARY  
 TOWNSHIP BOUNDARY  
 EXISTING CATCH BASIN OR JUNCTION BOX  
 EXISTING MANHOLE  
 DRAIN NAME: MUNICIPAL DRAIN (AREA OF WORK)  
 WATERSHED BOUNDARY  
 PROPOSED CATCH BASIN OR JUNCTION BOX  
 PROPOSED MANHOLE  
 BENCHMARK LOCATION  
 BENCHMARK NO. 1  
 BENCHMARK ELEVATION

1 ON-SITE MEETING 2019-MM-DD  
 NO. OF ISSUES AND REVISIONS DATE BY

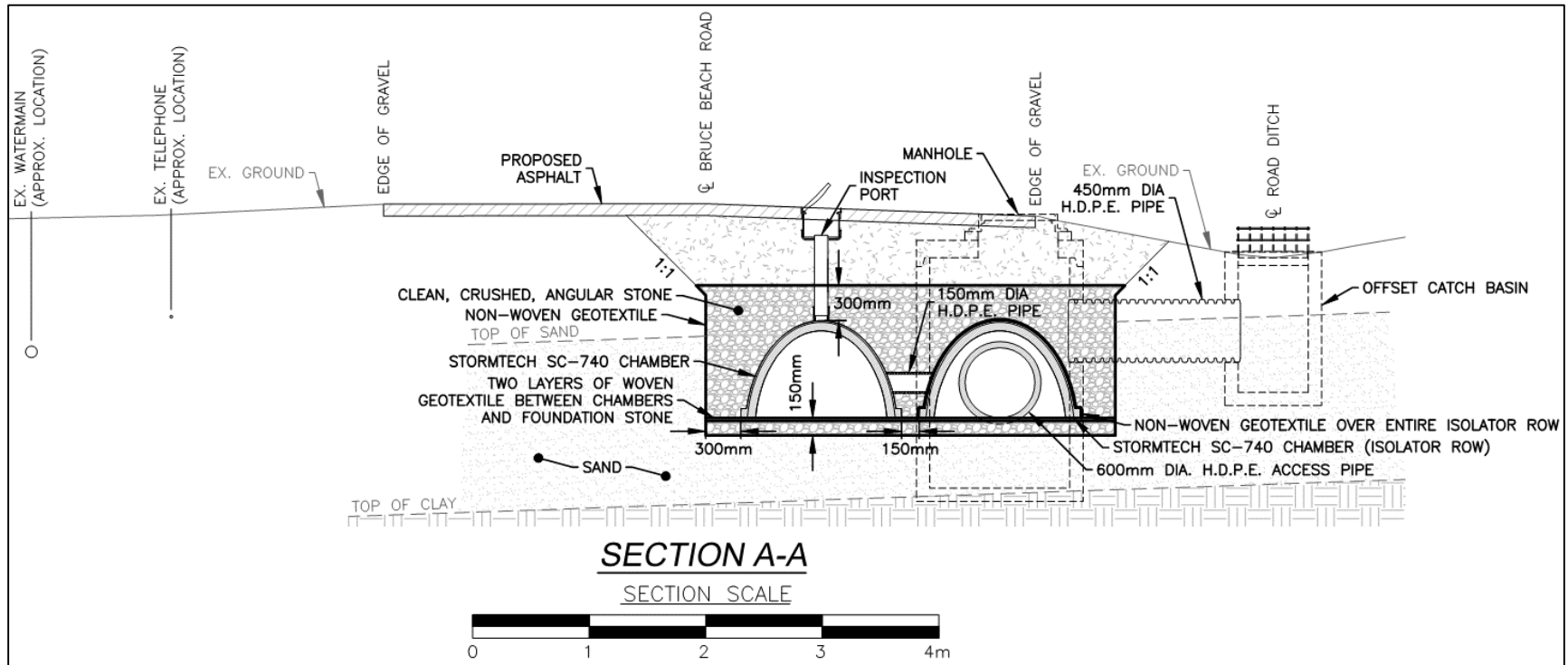
**DRAFT**  
 OCTOBER 21, 2019

PROJECT: BRUCE BEACH ROAD MUNICIPAL DRAIN 2019  
 DRAWING: Watershed Plan  
**DEL**  
 DIETRICH ENGINEERING LIMITED  
 CONSULTING ENGINEERS  
 10 Alpine Court, Kitchener, ON, N2E 2M7  
 REAL. MAP. I.S.B. (REVISED BY: S.B. (DRAWN BY: R.U. (CHECKED BY: S.B.)  
 DRAWING SCALE: DATE: PROJECT NO.: 1856 DRAWING NO.: 1 of 7  
 AS NOTED

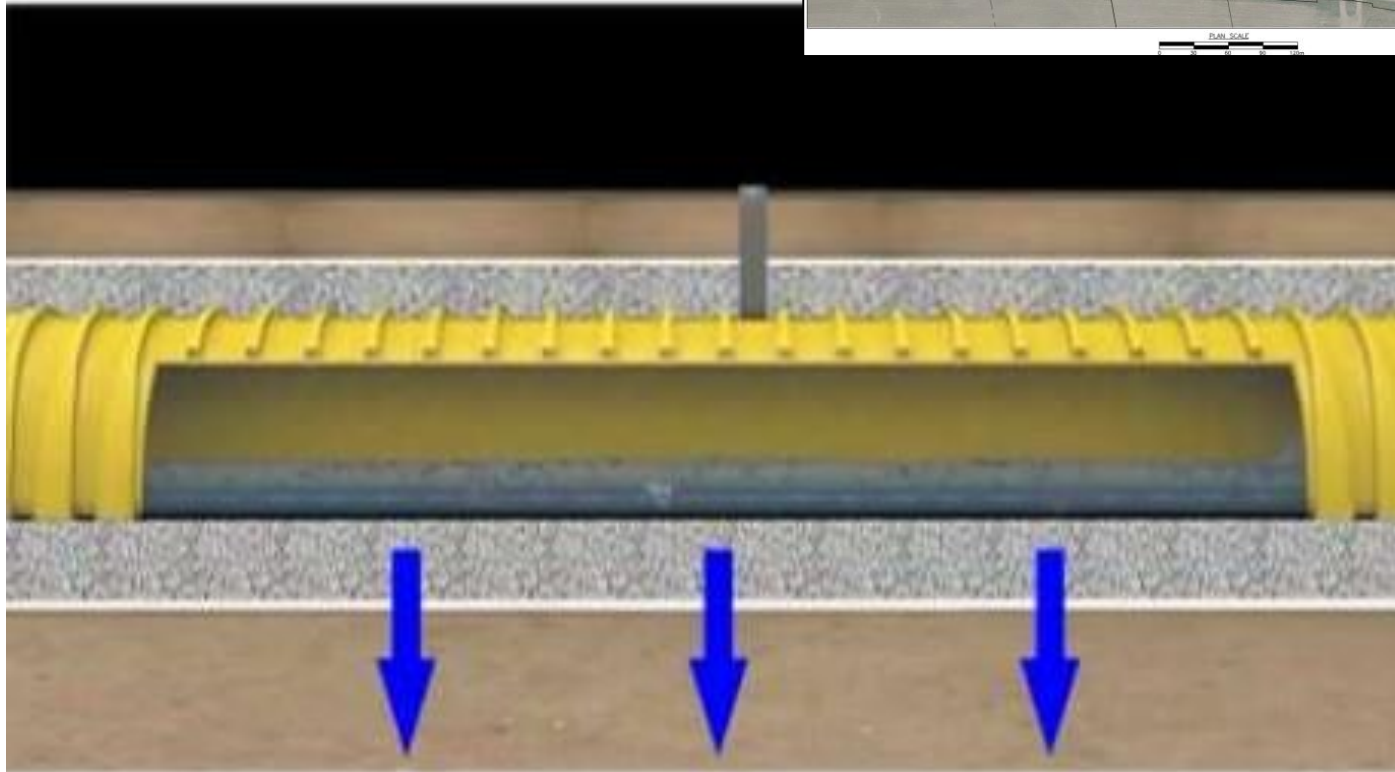




# North Bruce Beach Road Infiltration Gallery



# North Bruce Beach Road Infiltration Gallery





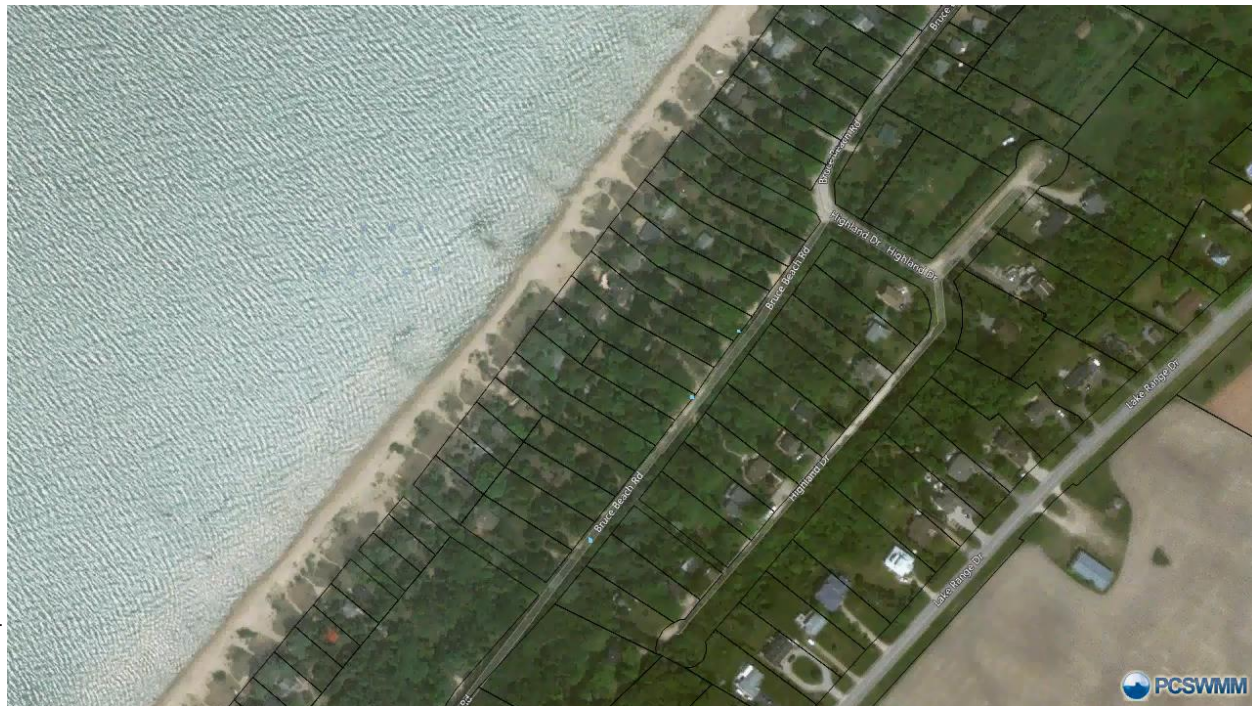
# Existing

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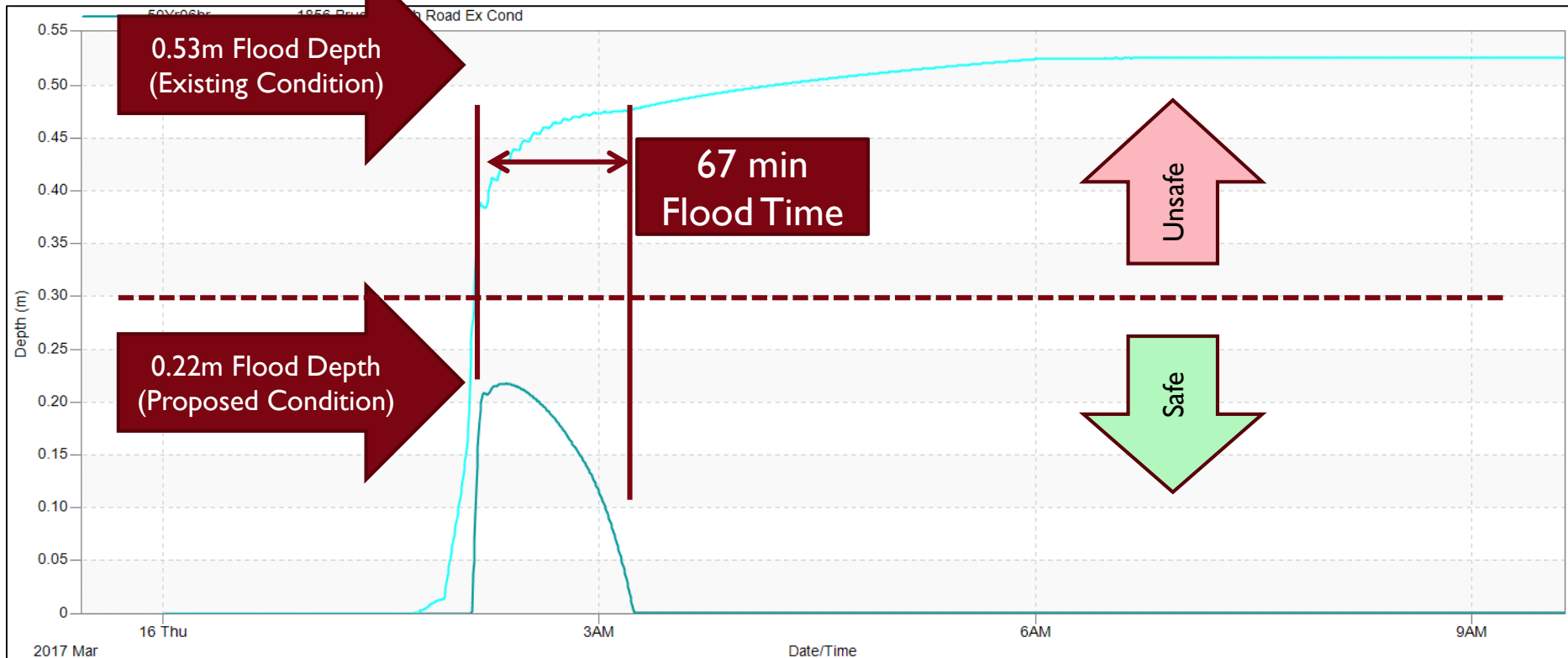
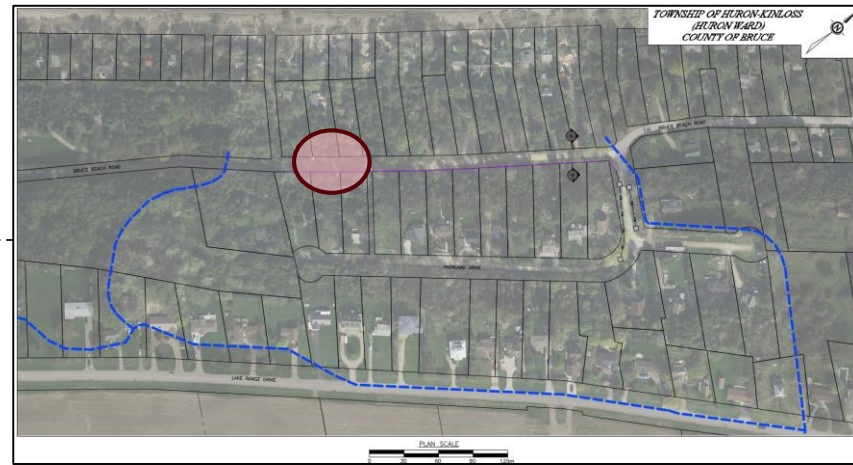
# Proposed

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# Bruce Beach Road South Infiltration Gallery

## ► 50 Year Rainfall Event





# South Bruce Beach Road Infiltration Gallery

## ► Comparison of Flow Depths



	Existing Conditions		Proposed Conditions	
Rainfall Event	Flood Depth	Flood Time	Flood Depth	Flood Time
<b>2 Year</b>	0.33m	Days	<b>Zero</b>	<b>Zero</b>
<b>5 Year</b>	0.41m	Days	<b>0.04m</b>	<b>16 min</b>
<b>10 Year</b>	0.45m	Days	<b>0.12m</b>	<b>36 min</b>
<b>25 Year</b>	0.49m	Days	<b>0.19m</b>	<b>54 min</b>
<b>50 Year</b>	0.53m	Days	<b>0.22m</b>	<b>67 min</b>
<b>100 Year</b>	0.56m	Days	<b>0.25m</b>	<b>84 min</b>



# Cost Estimates



# Cost Estimate

## ► South Bruce Beach Road Stormwater Attenuation Centre



	Cost Estimate
Allowances	\$101,610
Construction Costs	\$313,830
Administration	\$141,200
Contingencies & Tax	\$20,060
<b>Sub-Total</b>	<b>\$576,700</b>



# Cost Estimate

## ► North Bruce Beach Road Stormwater Attenuation Centre

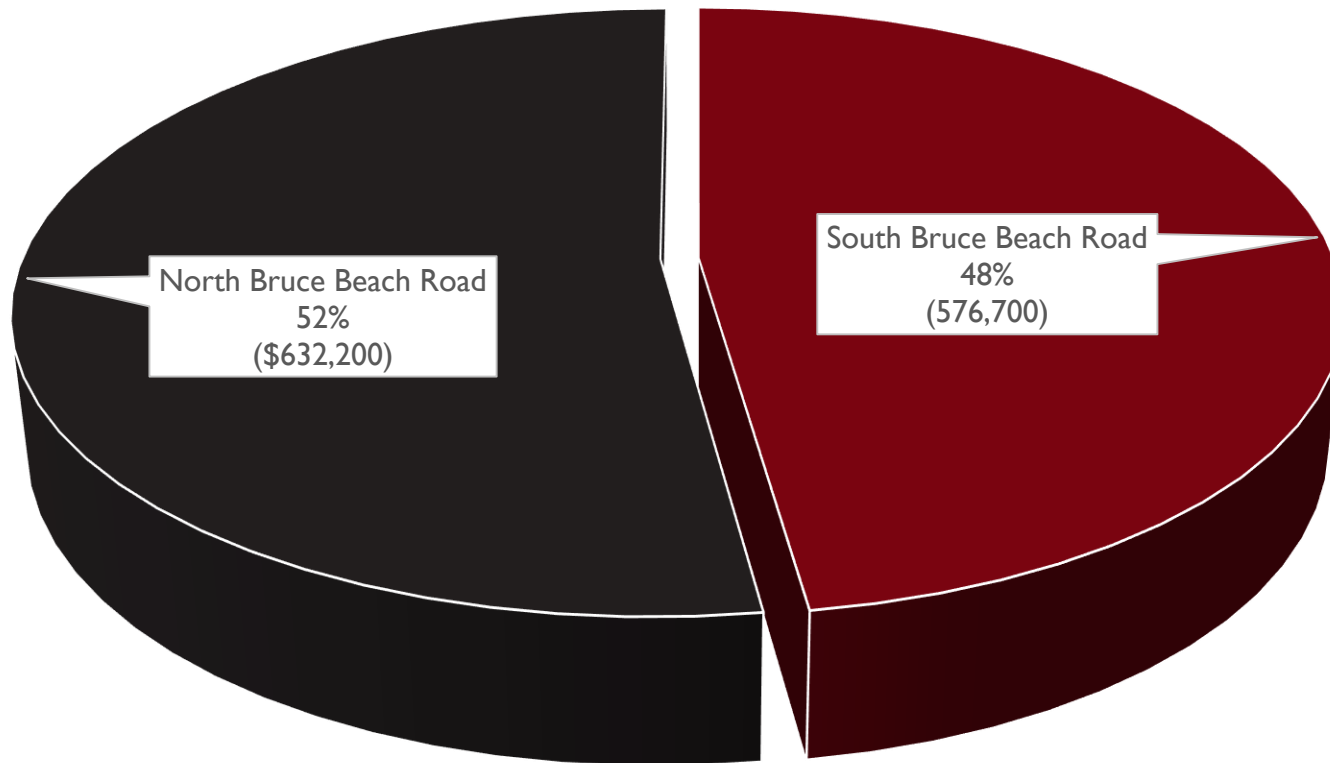


	Cost Estimate
Allowances	\$13,500
Construction Costs	\$487,630
Administration	\$99,900
Contingencies & Tax	\$31,170
<b>Sub-Total</b>	<b>\$632,200</b>



# Cost Estimate

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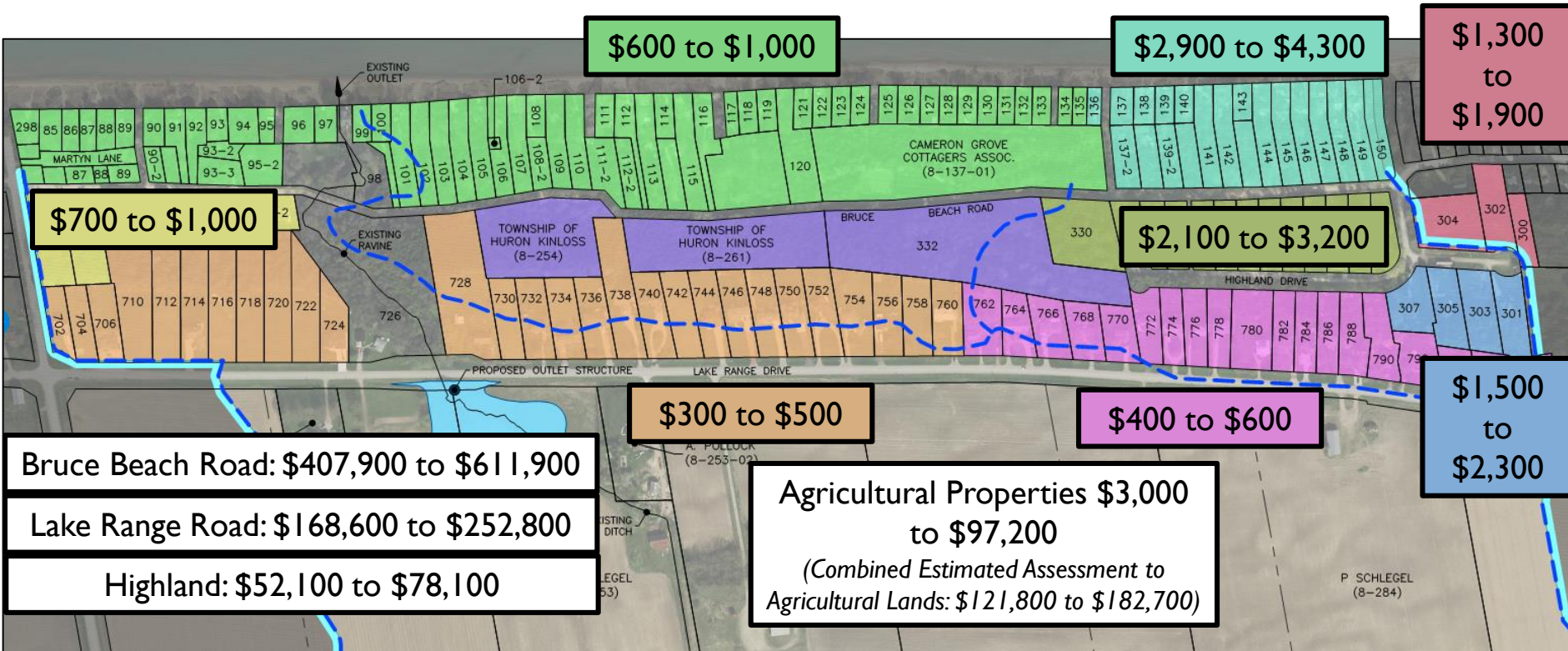
► Total Estimated Costs: \$1,208,900



# Preliminary Assessment of Costs

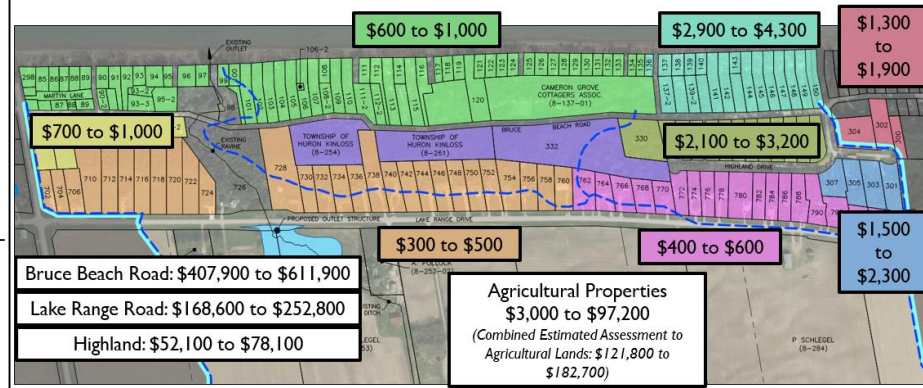
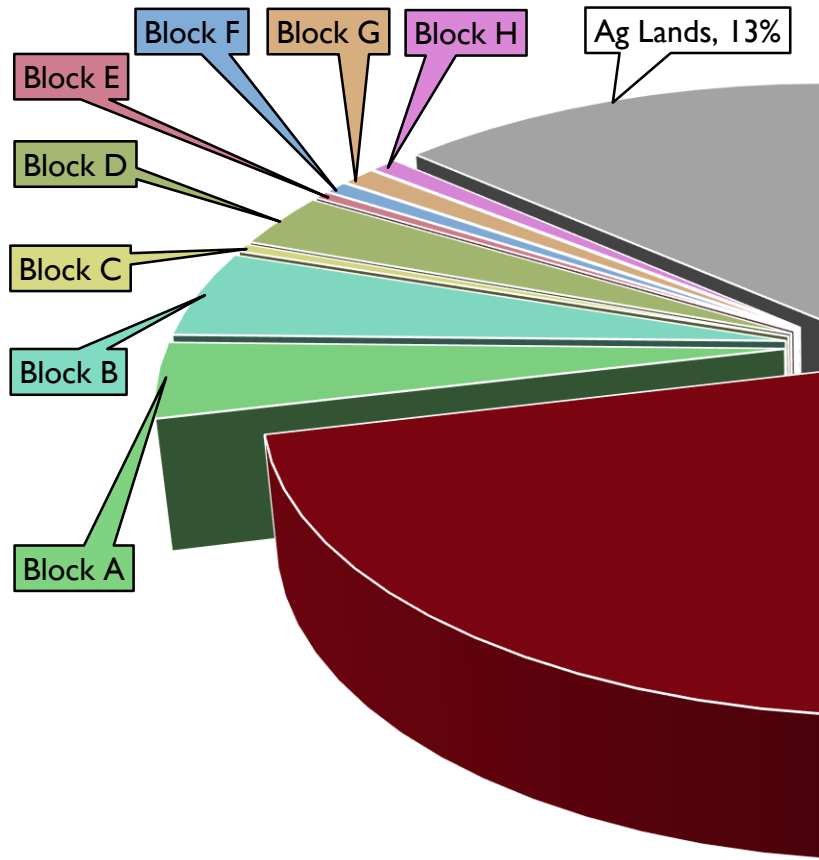


# Preliminary Estimated Assessments



- Note: Above values are a range of the estimated average assessment per property in the block.

# Preliminary Estimated Assessments



► Note: Above estimated preliminary assessments are a range of the estimated average assessment per property in the block.



# Questions