

Municipality of Brockton

Class EA for Saugeen River Bank Erosion - Walkerton

Council Meeting
December 10, 2024


Agenda

- Background
- Erosion Monitoring
- Class EA Alternatives
- Recommended Approach
- Cost Estimates
- Confirm Selection of Preferred Alternative
- Next Steps

Project Study Area



Legend

 Area of Erosion


0 50 100 200
METRES

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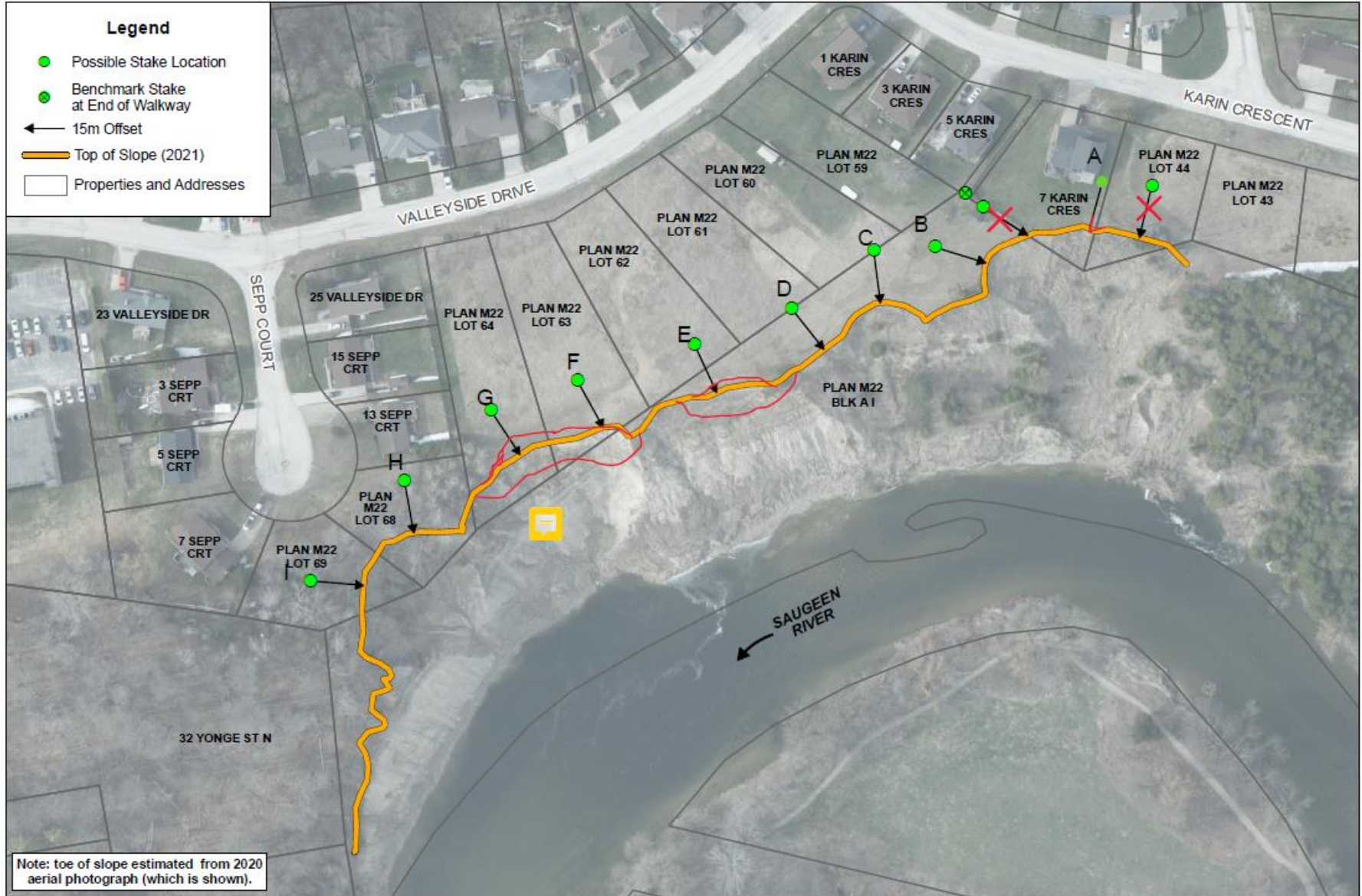
Background

- Phase 1 of Class EA Initiated June 2020
 - Mailed to Adjacent Properties and published in Walkerton Herald Times for two consecutive weeks
 - Letters sent to Agencies and Indigenous Communities
 - SVCA Provided copy of 1987 Geotech Report May 2020
- Phase 2 of Class EA
 - Complete Topographic Survey April 2021
 - Golder retained to update 1987 Report June 2021
 - Class EA Alternatives Identified June 2021
 - Cost Estimates Developed March 2022
 - Fluvial Geomorphology Study Nov. 2022

Background, cont'd

- Council Presentation January 2023
 - Reviewed Class EA Process Completed to Date
 - Reviewed Geotechnical Report & Fluvial Geomorphology
 - Presented Preferred Alternative Recommendation
- Work Completed in 2023/24
 - Erosion Monitoring March 2023 
 - Received Input from Geotech June 2023
 - Building Condition Surveys July 2023
 - Disaster Mitigation Fund Application July 2023
 - Opinion from Second Geotech October 2023
 - Results of Funding Application May 2024

Erosion Monitoring – March 2023

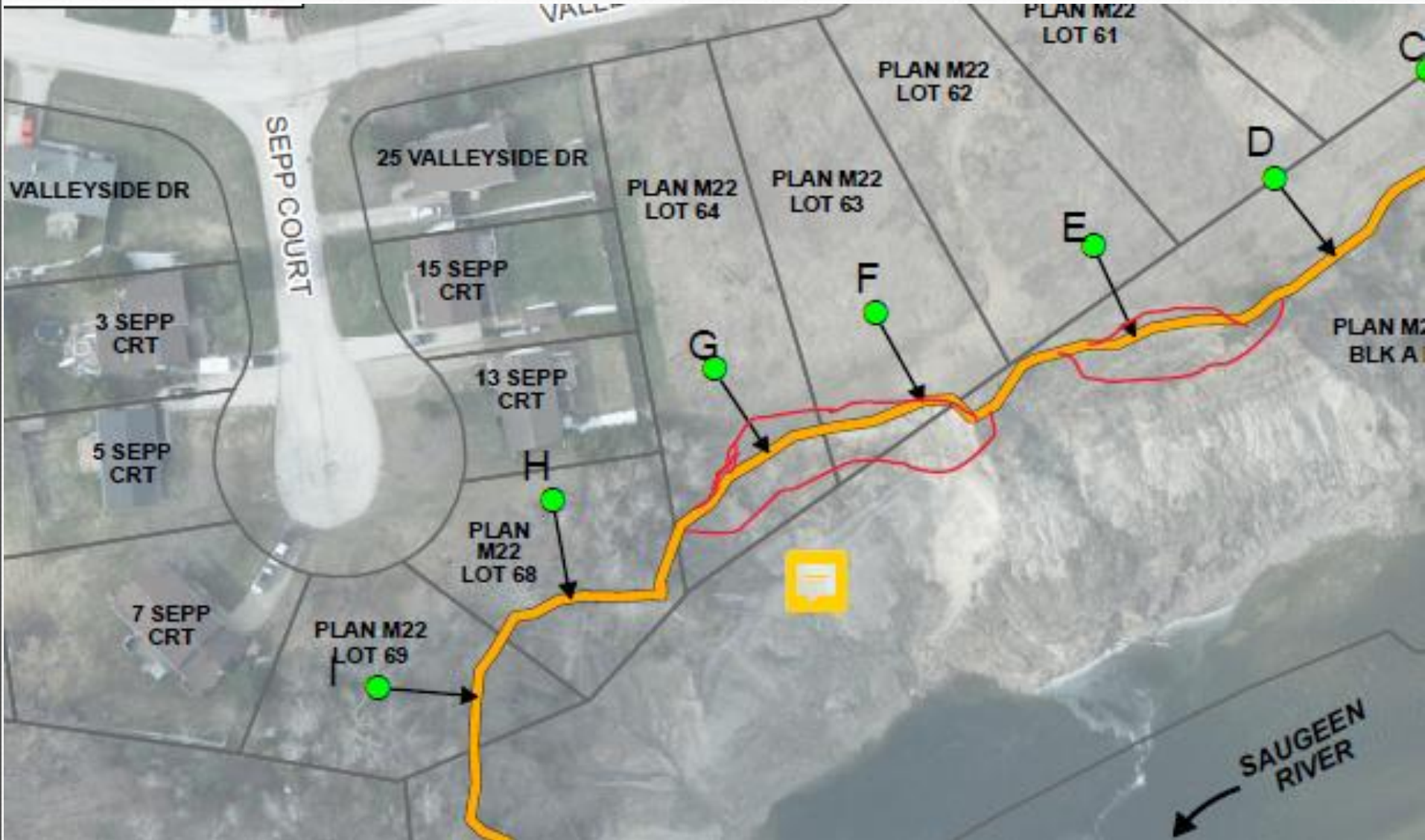


Erosion Monitoring

- Suggested by Geotechnical Engineers
- Provides documented evidence of recession rate

| LOCATIONS WITH MEASUREMENTS FROM TOP OF SLOPE (m) | | | | | | | | | |
|---|----|----|----|----|------|------|------|----|----|
| DATE | A | B | C | D | E | F | G | H | I |
| 2023-04-26 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-05-01 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-05-08 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-05-16 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-06-13 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-06-26 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-07-13 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-07-27 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-08-03 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 12 |
| 2023-09-12 | 14 | 15 | 15 | 15 | 14.9 | 15 | 15 | 11 | 12 |
| 2023-10-13 | 14 | 15 | 15 | 15 | 14.9 | 15 | 15 | 11 | 12 |
| 2023-11-23 | 14 | 15 | 15 | 15 | 14.9 | 15 | 15 | 11 | 12 |
| 2024-02-22 | 14 | 15 | 15 | 15 | 14.7 | 14.7 | 13.8 | 11 | 12 |
| 2024-04-19 | 14 | 15 | 15 | 15 | 14.7 | 14.6 | 13.4 | 11 | 12 |
| 2024-06-13 | 14 | 15 | 15 | 15 | 14.6 | 14.5 | 13.3 | 11 | 12 |

Erosion Monitoring



Recent Site photos (June 2024)







100 year recession limit



Class EA Alternatives

- 1) Provide erosion protection at toe and regrade slope by cutting
- 2) Realign river to south, protect toe, and regrade slope by filling
- 3) Realign river to south, protect toe, and regrade slope by filling and cutting
- 4) **Protect toe of slope – leave bank as is – Preferred Option**
- 5) Do Nothing

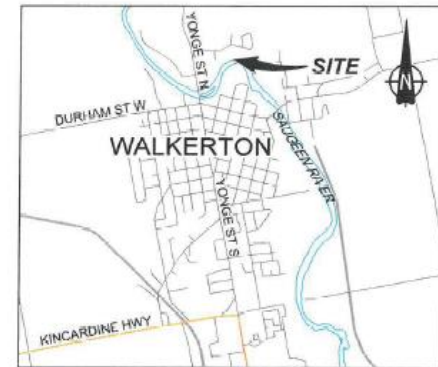
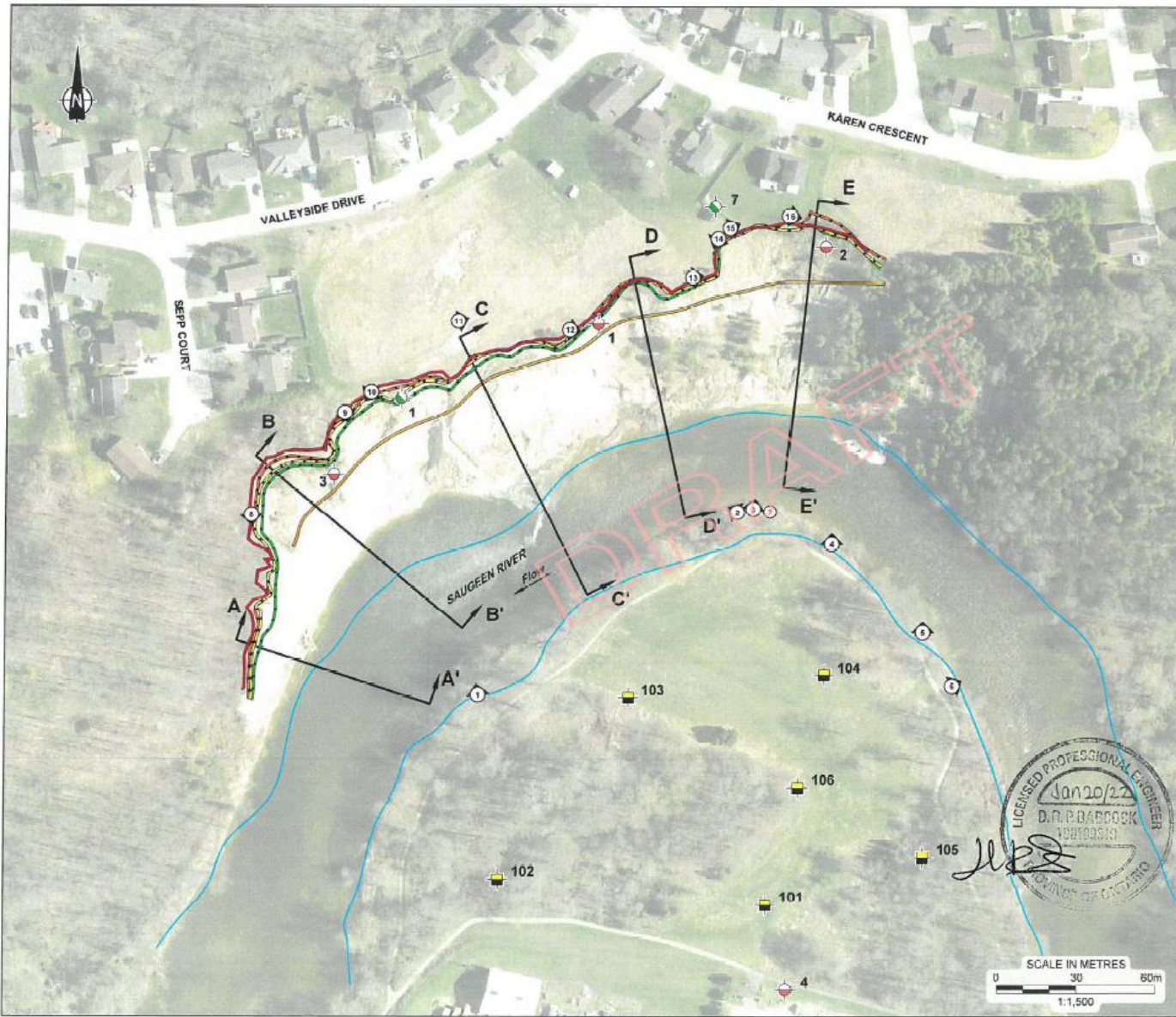
Feedback following Jan. Mtg.

- Agencies & Indigenous Communities were contacted following the 2023 Council Mtg. & Public Meeting
- Golder Associates (WSP) was retained to complete an additional evaluation of the preferred approach
- Ministry of Citizenship and Multiculturalism provided standard feedback
- MECP had no specific comments but requested to review draft EA report prior to issuance of Notice of Completion

Feedback from residents

- Resident concerned that a swale was not shown at the top of bank to divert runoff away from the slope
- Resident questioned the heritage status of the slope area and suggested that a Cultural Heritage Evaluation Report (CHER) be completed along with archaeological investigations
- Resident requested links to Provincial Cultural Heritage criteria and Environmental Assessment processes

Feedback from Golder (WSP)



KEY PLAN

LEGEND

- ① PHOTOGRAPH LOCATION, VIEWING DIRECTION, AND NUMBER
- ② PHOTOGRAPH LOCATION, LOOKING DOWN, AND NUMBER
- BOREHOLE (Golder Investigation 8613052)
- BOREHOLE (By Others)
- TEST PIT (Golder Investigation 8613052)
- APPROXIMATE SAUGUEEN RIVER SHORELINE (1986)
- TOP OF SLOPE LINES
- 2021 (B.M. ROSS Survey July 2021)
- 2015 (B.M. ROSS Aerial Image Analysis)
- 2010 (B.M. ROSS Aerial Image Analysis)
- 2006 (B.M. ROSS Aerial Image Analysis)
- 1974 (Kenting Earth Sciences Limited)


REFERENCE

DRAWING BASED ON 2015 AERIAL IMAGE PROVIDED BY BRUCE COUNTING INTERACTIVE MAPPING, BY PERMISSION;
 B.M. ROSS AND ASSOCIATES LIMITED, BANK EROSION BY YEAR, MAY 2020;
 KENTING EARTH SCIENCES LIMITED, TOPOGRAPHIC MAP OF SAUGUEEN RIVER, 1974; AND
 CANMAP STREETFILES V2008.4.

NOTES

THIS DRAWING IS SCHEMATIC ONLY AND IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.
 FOR CROSS-SECTIONS, REFER TO FIGURES 2A TO 2E.
 ALL LOCATIONS ARE APPROXIMATE.



| | | | |
|--|-------------|----------|------------------------------|
| PROJECT | | | |
| GEOTECHNICAL SLOPE ASSESSMENT MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT SAUGUEEN RIVERBANK EROSION MUNICIPALITY OF BROCKTON, ONTARIO | | | |
| TITLE | | | |
| LOCATION PLAN | | | |
|  MEMBER OF WSP | PROJECT No. | 214/2020 | FILE No. 214/2020-1000-BR/00 |
| | DATE | 02/11/22 | SCALE AS SHOWN |
| | CHECK | DR | REV. |
| | | | FIGURE 1 |

Client: B.M. Ross and Associates Limited
 Drawing No.: 214/2020-1000-001/001.dwg
 Date: Sep 23, 2020
 Original Format: in Tabloid 279 mm x 432mm
 Scale: 1:1,500

Feedback from Golder (WSP)

- Following the January 2023 Council Meeting, Golder was retained to complete a more detailed slope evaluation and to provide input on the preliminary preferred alternative
- June 26, 2023 Technical Memorandum
 - Slope Section B-B' & C-C' are unstable to marginally stable in their current configuration with factor of safety of 1.0 & 1.1
 - A design minimum factor of safety of 1.3-1.5 is considered adequate for a long-term stable slope for residential use
 - Factor of safety improves only slightly to 1.1 & 1.2, respectively following installation of toe protection
 - Concerned with health and safety of construction workers during installation of the protection

Feedback from Golder (WSP) cont'd

- **June 26, 2023 Technical Memorandum**

- Also a risk that the completed toe erosion could be damaged from future upper transitional slope failures
- For these reasons they recommend that the Preferred Alternative for Slope Rehabilitation consist of toe erosion protection combined with flattening of the slope by cutting to a stable slope inclination

- **Geotechnical Peer Review – CMT Engineering**

- Reviewed recommendations from Golder (WSP)
- Generally agree with methodology and recommendations from Golder, however suggest that installation of the toe protection is the most critical component of the protection

Construction Estimate

- Two Approaches were Considered
 - Approach 1 – Construct an access road from the east along the toe of the bluff to access the area for installation of the toe protection
 - Approach 2 – Use a barge to access the site for construction. A staging area would be required on the south side of the river (Riverbend park) for loading/unloading and stockpiling of materials and equipment

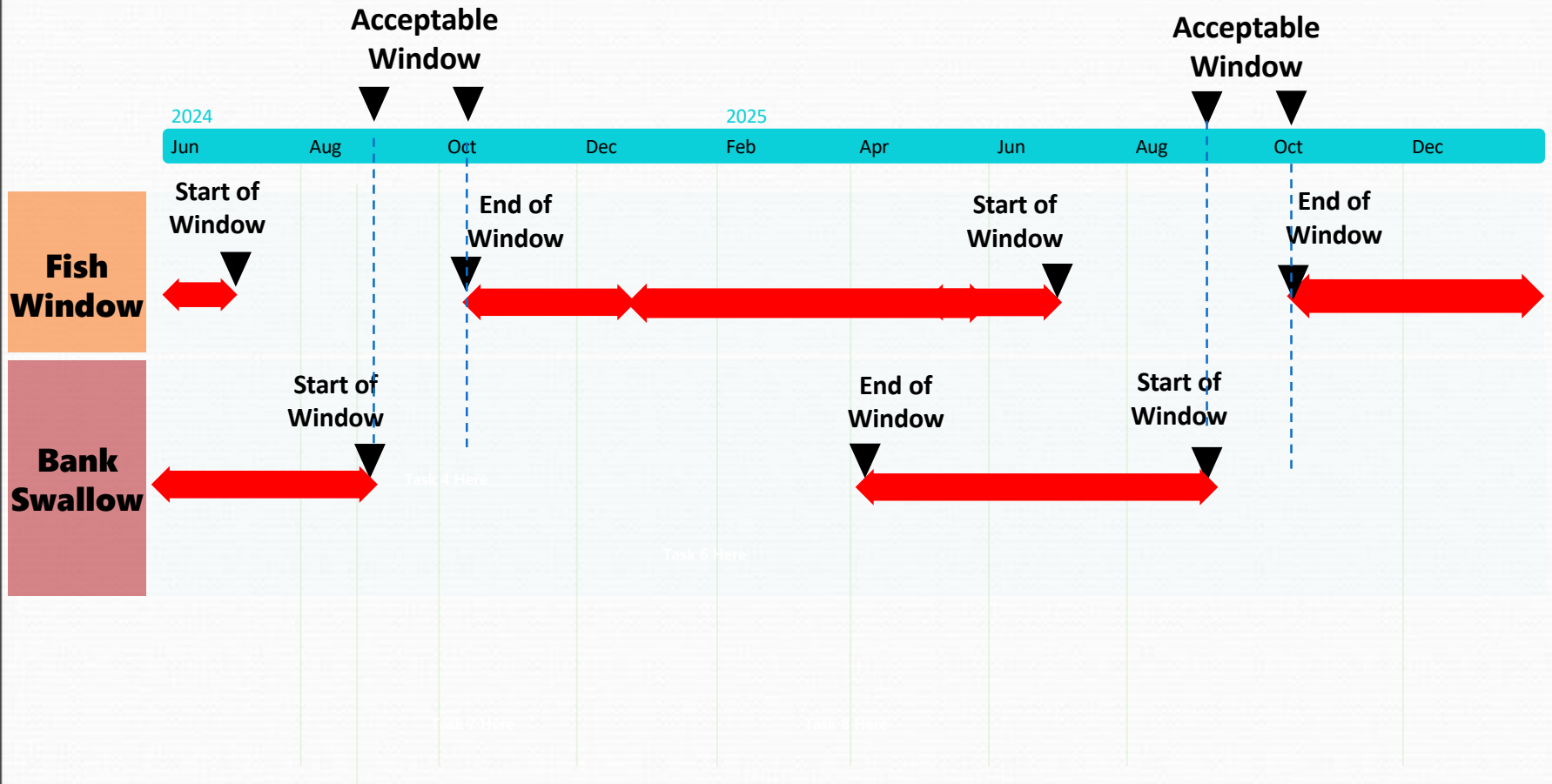
Approval Requirements

- Stage 1-2 Archaeological Assessment
- MECP – Permit required under ESA (Endanger Species Act) due to presence of Bank Swallows
- SVCA – CA Regulations
- MNRF – Permit Needed
- DFO – Fish Habitat Impacts
 - Freshwater mussels
 - Alterations to fish habitat
 - Authorization Required
 - Compensation needed

Bank Swallow nesting habitat



Regulatory Timing Constraints



Construction Cost Estimates – Approach 1

Alternatives

Estimated Costs

- | | |
|---|------------------------------|
| 1) Protect toe, regrade slope by cutting | \$ 7,820,000 + HST* |
| 2) Realign river, protect toe, regrade slope by filling | >\$ 7,820,000 + HST* |
| 3) Realign river, protect toe, regrade slope by filling and cutting | >\$ 7,820,000 + HST* |
| 4) Protect toe of slope – leave bank | \$ 3,100,000 + \$500,000 HST |
| 5) Do Nothing | |



yside Dr

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Walkerton

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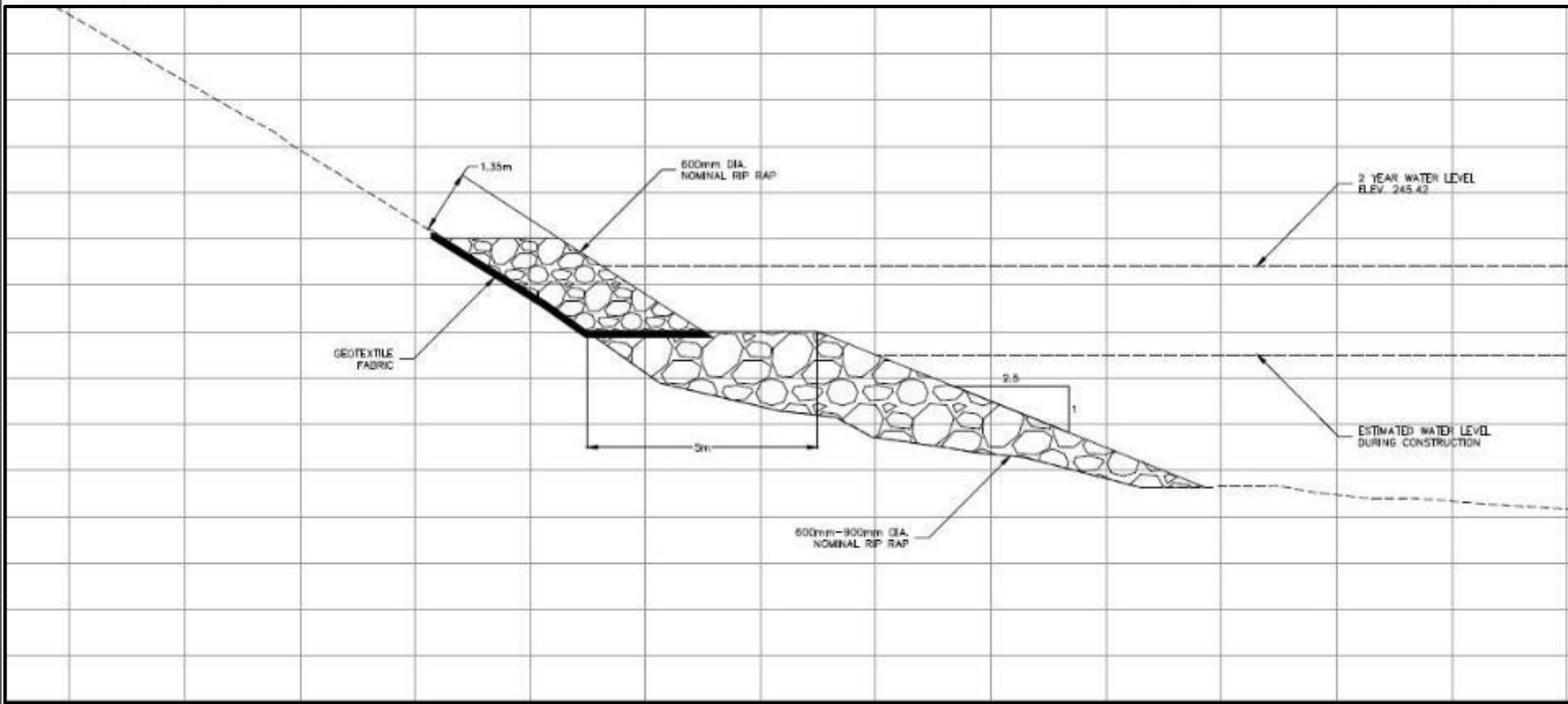
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on-St-N

ne-St-N

Cross-section of toe protection



SCALE - 1:75

Construction Cost Estimates – Approach 2

Alternatives

Estimated Costs

- | | |
|---|--------------------------------|
| 1) Protect toe, regrade slope by cutting | \$ 7,820,000 + HST* |
| 2) Realign river, protect toe, regrade slope by filling | \$ >7,820,000 + HST* |
| 3) Realign river, protect toe, regrade slope by filling and cutting | \$ >7,820,000 + HST* |
| 4) Protect toe of slope – leave bank | \$ 3,100,000 + \$500,000 + HST |
| 5) Do Nothing | |

* Assuming ESA permit obtained for bank swallows



General Concept – Not to scale

Revised Council Recommendation

- Based upon information collected since the January 2023 Council Presentation, we are revising our recommendation
- **Alternative 5 – Do Nothing is now Recommended Due to:**
 - Costs to implement the bank protection without grant funding are excessive
 - Regulatory timing window is very restrictive and makes implementation more expensive due to multi-year construction
 - Regulatory approvals (DFO/MECP) may also be very difficult to obtain and will add significantly to costs

What does “Do Nothing” Mean?

- Monitoring of the slope area and potential risk to residents would continue
- Drainage swale would be installed along the top of bank to prevent erosion associated with runoff and capture some sub-surface drainage
- Tree planting recommended for vacant lots located on south side of Valleyside Drive
- Monitor municipal infrastructure and relocate if necessary
- Continue to explore Grant Funding Opportunities

Next Steps

- Seek input from Residents on Revised Recommendation
- Council to confirm selection of Preferred Alternative
- Finalize Environmental Screening Report
- Issue Notice of Study Completion
- Class EA process can then be finalized
- Continue monitoring and implement other measures in support of the “Do Nothing” Alternative

Questions?