TECHNICAL MEMORANDUM

DATE January 27, 2025

Project No. CA-GLD-1791470A

TO David Hanratty, Stephen May
CBM Aggregates

FROM Amber Sabourin; George Schneider

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NATURAL ENVIRONMENT AND WATER REPORT TERMS OF REFERENCE CONCORDANCE CROSS-CHECK - PROPOSED CBM ABERFOYLE SOUTH LAKE PIT

CBM Aggregates (CBM) received an objection letter to the Aberfoyle South Lake Pit Aggregate Resources Act application submission for a Class A Pit from the Township of Puslinch on May 10, 2024. This technical memorandum provides a cross-check of the comments in the objection letter to the Terms of Reference (TOR), dated September 7, 2023, submitted to the Township.

The comments addressed here are specific to the Natural Environment Report (NER) and the Water Report Level 1/2 prepared by WSP Canada Inc. (WSP). The TOR concordance cross-check is presented in Table 1.

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Table 1: Terms of Reference Concordance Table

Terms of Reference Item / Agency Comment	Report Section / Page Reference
NATURAL ENVIRONMENT REPORT	
Background data compilation and review of existing documents and information sources which will be focused on designated features in the vicinity of the site. This will include a review of relevant County of Wellington and Provincial policies.	▪ Section 2.0 Environmental Policy Context, pg. 2 ▪ Section 4.1 Background Review, pg. 7
Review of the water balance completed as part of the surface water assessment, as described above, and assessment of the potential impacts of that water balance on natural features on, and in the vicinity of, the site.	▪ Section 6.0 Assessment of Significant Natural Heritage Features, pg. 33 ▪ Section 7.0 Impact Analysis, pg. 45
Species at Risk (SAR) screening focussing on those species listed under the Ontario Endangered Species Act (ESA) and federal Species at Risk Act (SARA). First completed at a desktop exercise using up to date air photos, and then updated based on the results of the field surveys.	▪ Section 4.1 Background Review, pg. 7 ▪ Section 5.5.3 Vascular Plants, pg. 23 ▪ Section 5.6 Wildlife, pg. 27, 30, 31, 32 ▪ Section 6.1 Habitat of Endangered or Threatened Species, pg. 33 ▪ Section 6.7.5 Habitat for Species of Conservation Concern, pg. 43 ▪ Appendix D, Species at Risk Screening
Communication with the MECP and MNRF for additional information regarding SAR, fisheries data and the Mill Creek Puslinch Provincially Significant Wetland.	▪ Section 4.1 Background Review, pg. 7 ▪ Appendix B, MNRF Correspondence
Plant community assessment using the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998).	▪ Section 4.3.1 Plant Community Surveys and Botanical Inventory, pg. 10 ▪ Section 5.5 Vegetation, pg. 18 ▪ Figure 2, Ecological Land Classification and Survey Stations

Terms of Reference Item / Agency Comment	Report Section / Page Reference
Delineate/confirm the boundaries of natural heritage features including wetlands and woodlands using a handheld GPS. Note that wetlands were delineated using Ontario Wetland Evaluation System (OWES). The wetland boundary will be verified in the field with the Grand River Conservation Authority (GRCA). The woodland boundary will be verified in the field with the County and/or Township. CBM will have the boundaries surveyed by a registered surveyor.	▪ Section 4.3.1 Plant Community Surveys and Botanical Inventory, pg. 10 ▪ Section 5.5 Vegetation, pg. 18 ▪ Section 6.3 Significant Wetlands, pg. 35 ▪ Section 6.4 Significant Woodlands, pg. 38 ▪ Figure 2, Ecological Land Classification and Survey Stations ▪ Figure 3, Significant Natural Heritage Features
Three season botanical inventory, including surveys for butternut and black ash.	▪ Section 4.3.1 Plant Community Surveys and Botanical Inventory, pg. 10 ▪ Section 5.5 Vegetation, pg. 18 ▪ Figure 2, Ecological Land Classification and Survey Stations ▪ Appendix C, Vascular Plants List
Aboud Comment: 16. A three season botanical was listed in the studies to be performed in the Terms of Reference, including a spring study.	The Terms of Reference included a three season botanical inventory, which was completed: early summer, late summer and fall. As discussed in Section 4.3.1, summer surveys were deemed more appropriate and useful because the majority of natural plant communities on the site were characterized by swamp, and summer is the period during which most wetland vegetation is identifiable. Several spring species and woodland sedges that would be captured during a spring visit were still recorded on the plant list, and no early-season SAR or rare plant species were flagged through the SAR screening. Further, because all of the swamp is also PSW and therefore must be protected, a conservative approach can be taken to assume that other common spring ephemeral species with swamp habitat preference are present.

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Three rounds of anuran call count surveys following protocols from the Marsh Monitoring Program method for vocalizing frog surveys (BSC 2008).	▪ Section 4.3.2 Anuran Call Count Survey, pg. 10 ▪ Section 5.6.1 Amphibians, pg. 23 ▪ Figure 2, Ecological Land Classification and Survey Stations ▪ Appendix E, Wildlife List
Two rounds of amphibian habitat assessment and egg mass surveys following protocols from the Sampling Protocol for Determining the Presence of Jefferson Salamanders (Ambystoma jeffersonianum) in Ontario (JSRT 2013).	▪ Section 4.3.4 Amphibian Egg Mass Survey, pg. 11 ▪ Section 5.6.1 Amphibians, pg. 23 ▪ Figure 2, Ecological Land Classification and Survey Stations ▪ Appendix E, Wildlife List
Assessment of the site and vicinity as habitat for Blanding's turtle.	▪ Section 4.3.3 Turtle Habitat Assessment, pg. 11 ▪ Section 5.6.5 Other Wildlife, pg. 31 ▪ Figure 2, Ecological Land Classification and Survey Stations ▪ Appendix E, Wildlife List
Three rounds of breeding bird surveys following protocols from the Canadian Breeding Bird Survey (Downes and Collins 2003), and the Ontario Breeding Bird Atlas (Cadman et al. 2007).	▪ Section 4.3.5 Breeding Bird Survey, pg. 11 ▪ Section 5.6.2 Breeding Birds, pg. 27 ▪ Figure 2, Ecological Land Classification and Survey Stations ▪ Appendix E, Wildlife List
Bat habitat and acoustic surveys based on guidance from the MNRF document Survey Protocol for Species at Risk Bats within Treed Habitats (MNRF 2017) and Bat and Bat Habitat: Guidelines for Wind Power Projects (MNR 2011).	▪ Section 4.3.6 Bat Survey, pg. 11 ▪ Section 5.6.3 Bats, pg. 28 ▪ Figure 2, Ecological Land Classification and Survey Stations ▪ Appendix E, Wildlife List
Wildlife habitat assessment and general wildlife surveys (Visual Encounter Surveys) following provincially accepted methods (Bookhout 1994; McDiarmid 2012; MNRF 2016; MNRF 2017; Pyle 1994).	▪ Section 4.3.8 Visual Encounter Survey, pg. 13 ▪ Section 5.6 Wildlife, pg. 23 ▪ Appendix E, Wildlife List

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Aboud Comment: 10. Per AA's Pre Consultation peer review, visual encounter surveys for snakes should have taken place alongside other herptile surveys.	Visual encounter surveys for snakes were conducted concurrently with all other field surveys. ▪ Section 4.3.8 Visual Encounter Survey, pg. 13 ▪ Section 5.6 Wildlife, pg. 23 ▪ Appendix E, Wildlife List
A qualitative fish habitat assessment in Mill Creek and tributaries on the site and in the vicinity, using MTO Fisheries Assessment Protocols and Golder's Technical Procedures (unpublished file information). These protocols include a description of aquatic habitat (e.g., permanence, stage, confinement), habitat mapping of key habitat features (e.g., riffles, pools, woody debris) and characteristics (e.g., wetted and bankfull width/depth, substrate types, cover, seepage areas), a description of riparian and/or aquatic vegetation, identifying locations of any critical fish habitat areas or barriers to fish movement and observations of any fish and aquatic species.	▪ Section 4.3.7 Fish and Fish Habitat Survey, pg. 12 ▪ Section 5.6.4 Fish and Fish Habitat, pg. 31 ▪ Figure 2, Ecological Land Classification and Survey Stations ▪ Appendix F, Fish Habitat Survey Results
Aboud Comment: 13. Per AA's Pre Consultation Peer Review, Fish Community Sampling was required for the on-site watercourses to determine species present, these surveys were not identified or discussed in the report.	As the *Fisheries Act* provides protection of all fish and fish habitat the assessment considered if Tributary #3 was frequented by fish or provided an area on which fish depended directly or indirectly to carry out their life processes. Given the amount and quality of background information available, and supporting data collected through the qualitative fish habitat assessment, a comprehensive fish community sampling was not deemed necessary to complete the assessment under the *Fisheries Act* for the NER. Tributary #3 was classified as fish habitat with assumed similar species assemblage as Mill Creek. This was in line with MNRF records and observations of small-bodied fish within Tributary #3. The assessment in the NER took into account that Tributary #3 is fish habitat.

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	Once the decision was made that Tributary #3 was fish habitat, the need to submit a Request for Review (RFR) was triggered to assess the potential of the Project to result in 'death of fish' and/or 'harmful alteration, disruption or destruction of fish habitat' (HADD). Based on the impact assessment in the NER and Water Report Level 1/2, the reduction in base flow in Tributary #3 was highlighted as a potential HADD. At this point, fish community composition was considered to incorporate spawning activities, nursery and rearing areas, as well as food supply and migration to inform the determination of a HADD. A fish community survey is often completed at this stage, however with existing records of brown trout spawning within the Mill Creek catchment, brown trout were selected as an indicator species to carry forward in the HADD assessment. Therefore, a fish community survey was not deemed necessary to complete the assessment of HADD for the RFR. Subsequently, in response to Aboud's comment, a fish community survey was undertaken in September 2024 and the assessment is attached to this letter. A total of 12 fish species were found within Tributaries #1, #2, #3, and #5. The survey also confirmed that although a range of small-bodied fish were caught within Tributary #3, several shallow muddy sections limit the movement of larger fish such as trout upstream. Within Tributary #3, upstream of Tributary #5, there is limited spawning and rearing habitat for coldwater species such as brown trout. The survey also validated notes and observations on the presence of watercress and channel morphology, with a note added that water levels were lower than

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	previously indicated and a deep muck section was present through the middle reach. The findings of the fish community survey support what is reported in the NER in: ▪ Section 5.6.4 Fish and Fish Habitat, pg. 31
Aboud Comment: 12. Per AA's Pre Consultation Peer Review, headwater drainage feature assessments were required for the site, these surveys are not identified or discussed in the report. This survey is particularly important to determine the regime for tributary 3 as well as to identify any HDF's that occur within the agricultural areas.	It should be noted that Tributary #3 has been referred to as both intermittent and perennial within the different existing conditions reports. The reference to the seasonality of the stream has been based on the fact that the installed loggers have measured zero flow on at least four occasions, while during these periods, pooled water was still present. Further to this, the water depth during these low flow periods is likely limiting to fish as during summer, there is insufficient baseflow to consistently sustain water in Tributary #3. Additional information is provided in the attached Fish Community Assessment. Therefore, referring to Tributary #3 as intermittent is appropriate when considering fish habitat. Per the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines (*TRCA & CVC 2014*)*, pre-consultation with the Conservation Authority is recommended to determine scope and identify gaps with respect to the need for a Headwater Drainage Feature (HDF) Assessment. GRCA reviewed and provided comments on the Terms of Reference in November 2021 and did not identify the need for a HDF assessment. As such, it was not included in the field survey scope. Subsequently, in response to Aboud's comment, a HDF Assessment has been undertaken. A site visit was completed in August 2024 in accordance with the abovementioned guideline (TRCA & CVC

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	2014) and Section 4, Module 11 for *Unconstrained Headwater Sampling of the Ontario Stream Assessment Protocol* (MNRF Version 10, 2017). Potential HDFs, drainage patterns and linkages between the site and watercourses (i.e. Tributary 3, Tributary 5 & Mill Creek) were identified for summer conditions and compared with aerial imagery. Eight areas were identified as having potential HDF: ▪ Four potential HDF areas along the south and east forest, where agricultural drainage was observed to have eroded the field edge and areas suggested impacts from surface flow. These four potential HDFs enter the forest and disperse, and had limited evidence of continued drainage towards Mill Creek. ▪ Three potential HDF areas associated with the northwest forest along Tributary #3 and Tributary #5. Observations included very wet areas with some standing water and erosion along the agricultural field that appeared to drain into the tributaries. ▪ The last potential HDF was identified in the agricultural field near Concession Road 2, where pockets of cattails and grasses were observed with standing water. Aerials suggest there is potential drainage from the north, southwestward through the field, however no defined channels or erosion was evident during the site visit.
Assessment of Significant Wildlife Habitat, per the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (2015).	▪ Section 6.7 Significant Wildlife Habitat, pg. 39
Assessment of linkages and connectivity for wildlife.	▪ Section 6.7.3 Animal Movement Corridors, pg. 42
Aboud Comment: 11. Per AA's Pre Consultation peer review, a linkage and connectivity assessment needed to take place. This appears not to have been done, and the results of such an assessment are not discussed in this document.	An assessment of wildlife movement corridors/linkages was completed as part of the discussion of animal movement corridor SWH. ▪ Section 6.7.3 Animal Movement Corridors, pg. 42

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Analysis of the data collected in conjunction with the background data compilation and integration with the hydrogeological and surface water studies to complete a potential impact assessment.	▪ Section 7.0 Impact Analysis, pg. 45
Aboud Comment: 14. Per AA's Pre Consultation Peer Review, a feature-based water balance assessment of the wetlands present on/adjacent to site (TRCA wetland water balance risk evaluation (2017), or equivalent), discussion of impacts to the wetland due to the proposed changes to the quantity of water, including the proposed significant changes in the groundwater elevation, should be included in the report.	A feature-based water balance assessment was not included in the approved Terms of Reference. The impact assessment was conducted in accordance with ARA, County of Wellington and GRCA guidelines. GRCA EIS guidelines require that potential impacts on specific wetland features and/or functions are assessed. However, a feature-based water balance assessment is not required. The surface water balance provides average monthly and annual estimate of changes to surface water surplus from changes to catchments and land uses. The wetland features collect water from shallow groundwater and overflow from stream high water events. For this reason, we feel the HGS model is a more accurate estimate of the impacts on the wetland features since it incorporates surplus information from the surface water balance, existing surface water monitoring data and the changes in groundwater levels.
Development of the final rehabilitation, including appropriate setbacks, upland and wetland plantings, creation of wetlands and wildlife habitat, and a monitoring plan, where appropriate.	▪ Section 8.1 Rehabilitation Concept, pg. 49 ▪ Figure 5, Rehabilitation Plan
Aboud Comment: 44. As noted in the ToR comments, a pre, during, and post development comprehensive monitoring plan, which includes adaptive management and appropriate triggers for additional investigation Is required.	▪ The surface water and groundwater monitoring program is described in Section 8.6 of the Water Report. The program specifies proposed monitoring locations. ▪ The following triggers and adaptive management steps are specified in the Water Report:

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	– Groundwater and surface water levels shall be reviewed by CBM quarterly, and reported to the MNRF annually as part of the licence requirements. – Water level trends during Operations and Post-Rehabilitation shall be compared to Pre-Operational conditions. – If the results of the monitoring program indicate the potential for adverse impact to groundwater users (private wells) or surface water features (Mill Creek and its tributaries), then appropriate enhanced monitoring and/or mitigative actions would be developed and implemented.
One single natural environment report that includes a description of existing conditions through the desktop review and results of the field surveys, an assessment of impacts on all natural features, as outlined in the Provincial Policy Statement (MMAH 2020), the rehabilitation plan, a description of any mitigation and monitoring, and will meet the requirements of: ▪ Natural Environment Report (NER), based on ARA standards (Ontario 2020). ▪ Environmental Impact Assessment (EIA) for the County of Wellington (Wellington 2021). ▪ Environmental Impact Study guidelines and submission standards for Wetlands of the GRCA (2005).	The NER meets the requirements of the province, County of Wellington and GRCA, as outlined in the following sections of the NER: ▪ Section 1.1 Purpose, pg. 1 ▪ Section 2.1 Aggregate Resources Act, pg. 2 ▪ Section 2.2 Provincial Policy Statement, pg. 3 ▪ Section 2.8 County of Wellington, pg. 6 ▪ Section 2.9 Grand River Conservation Authority, pg. 6 ▪ Section 3.0 Description of Proposed Development, pg. 7 ▪ Section 4.0 Methods, pg. 7 ▪ Section 5.0 Existing Conditions, pg. 14 ▪ Section 6.0 Assessment of Significant Natural Heritage Features, pg. 33 ▪ Section 7.0 Impact Analysis, pg. 45 ▪ Section 8.0 Rehabilitation / Mitigation / Monitoring, pg. 49

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WATER REPORT LEVEL 1/2	
A review of publicly available data and reports relevant to the Site and subwatershed.	▪ Section 3.0 – Background Information – pg. 3-4 - lists reports that were reviewed and incorporated into the assessment ▪ References – pg. 55-57 – lists all references cited in this assessment
A review of the Grand River Source Protection Plan (GRCA 2021) and any other applicable policies.	▪ Section 4.9 – Regional Setting - Source Water Protection Considerations - pg. 7 ▪ Section 8.3 Impact Assessment – Source Water Protection – pg. 41
A field investigation program that includes: ▪ Borehole drilling, grain size analysis and monitoring well installation (see Figure 1) ▪ Baseline groundwater quality monitoring (general water quality parameters including major ions, metals, and petroleum hydrocarbons) ▪ Hydraulic conductivity testing (single well response tests) of the monitoring wells installed as part of the field program ▪ Groundwater level and temperature monitoring (dataloggers to record water level and temperature hourly and downloaded quarterly)	▪ Section 5.0 - Site Field Program – pg. 8 ▪ Section 5.1 – Borehole Drilling and Monitoring Well Installation – pg. 9-10 ▪ Section 5.5 – Water Quality – pg. 17-20 ▪ Section 5.4 – Hydraulic Testing – Pg. 16 ▪ Section 5.3 – Groundwater Temperature – pg. 14-15 ▪ Associated figures, tables and appendices ▪ Field investigation also included an aggregate resource investigation, which was provided as a separate report.
A review of local groundwater users based on the Ministry of the Environment, Conservation and Parks (MECP) Water Well Information System (WWIS) and Permit To Take Water (PTTW) databases.	▪ Section 4.8, 4.8.1 and 4.8.2 – Water Users – Pg. 6-7.
A private well survey of properties surrounding the site was originally planned for 2020 or 2021. The purpose of such a survey was to supplement the MECP WWIS information and “ground truth” the current condition of neighbouring resident’s water supply wells. Activities would have included door-to-door visits	▪ Section 10.2 - Recommendations – recommendation to conduct a private well survey is included in the report. – pg. 51

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and subsequent interactions between field staff and residents. Participation would be entirely voluntary. However, as a result of ongoing COVID-19 concerns this task has been postponed for the time being. It is proposed that this activity be completed at later date prior to any aggregate extraction taking place on the site.	
In conjunction with surface water studies, the development of a Site water budget for Existing, Operations and Rehabilitated Scenarios to determine pre- and post-development surplus, runoff, and infiltration rates.	▪ Section 6.0 and subsections – Water Balance – pg. 30-37 ▪ Section 8.2 – Impact Assessment – Potential Impacts to surface Water – pg. 40
The construction and calibration of a 3D numerical groundwater flow model based on the “Tier 3 Model” with high resolution refinement of the model mesh within the immediate area of the site, and subsequent predictive simulations to estimate potential water flow impacts of the proposed below-water extraction on surrounding groundwater and surface water receptors.	▪ Section 7 – Groundwater Modelling – pg. 37 ▪ Appendix G – Groundwater Modelling
The development of a groundwater analytical model to predict the potential for thermal impacts to local watercourses, including Mill Creek, taking into account the Grand River Conservation Authority (GRCA) Cumulative Effects Assessment Best Practices Paper (GRCA 2010).	▪ Section 7 – Groundwater Modelling – pg. 37 ▪ Appendix G – Groundwater Modelling ▪ Section 8.1.3. – Potential Groundwater Temperature Impacts ▪ Section 9.0 – Cumulative Effects Assessment
Development of a monitoring plan for groundwater.	▪ Section 8.6 – Proposed Monitoring Program
The results of the hydrogeological assessment will be summarized in a Maximum Predicted Water Table Report and a Level 1 and 2 Water Report that fulfills the current County of Wellington Official Plan policies and ARA requirements.	▪ Level 1 &2 Water Report – November 2023 ▪ Maximum Predicted Water Table Report - November 2023
Background review of the available information pertaining to within approximately 500 metres of the site. the information reviewed will consist of: Aerial photographs and topographic, physiographic, and geologic mapping	▪ Section 3.0 – Background Information – pg. 3-4 - lists reports that were reviewed and incorporated into the assessment

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Published water resources reports Any existing permits or monitoring reports from the site, and nearby lands (e.g., Mill Creek Pit)	▪ References – pg. 55-57 – lists all references cited in this assessment ▪ Associated figures, tables
Review of GRCA floodplain data for the site, and assessment of potential impacts of extraction on flood elevations on-site and both upstream and downstream.	▪ Section 5.6.2 – GRCA Regulated Area and Floodplain Mapping pg. 21 ▪ Figure 6 – Floodplain Mapping ▪ NOTE – a more detailed flood mapping assessment has recently been completed and is attached to this response letter.
Site reconnaissance to identify and confirm drainage features and catchment boundaries adjacent to the pit. The site reconnaissance is also used to corroborate the findings of the information review and identify local features that were not apparent from the background review.	▪ Section 5.6 – Surface Water – pg. 20-30 ▪ Associated figures, tables
A water budget and pit water balance using a Thornthwaite water budget tool, developed for the existing pit footprint area (footprint) and the proposed expansion lands. The Thornthwaite water budget information will be used to develop an annual pit water balance for the existing operation. A future pit water balance will be estimated by including future footprint and land-use information.	▪ Section 6.0 and subsections – Water Balance – pg. 30-37 ▪ Section 8.2 – Impact Assessment – Potential Impacts to surface Water – pg. 40
The floodplain assessment will provide appropriate flooding intervals through mapping and elevations for the site and the study area.	▪ Section 5.6.2 – GRCA Regulated Area and Floodplain Mapping pg. 21 ▪ Figure 6 – Floodplain Mapping ▪ NOTE – a more detailed flood mapping assessment has recently been completed and is attached to this response letter.
The in-stream water level, temperature and flow monitoring in Mill Creek and associated tributaries in the vicinity of the site will allow Golder to characterise the creek reaches and therefore better understand potential effect of the	▪ Section 5.6 – Surface Water – pg. 20-30 ▪ Associated figures, tables

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proposed extraction on site. The in-stream water level monitors will be paired with stream piezometer monitoring stations and visited quarterly.	
An effects assessment on features within the catchment of the site that documents the magnitude and significance of expected changes in the water budget of the site.	▪ Section 6.0 and subsections – Water Balance – pg. 30-37 ▪ Section 8.2 – Impact Assessment – Potential Impacts to surface Water – pg. 40
Development of a monitoring plan for surface water.	▪ Section 8.6 – Proposed Monitoring Program
A report that describes the surface water assessments, including a description of existing and proposed conditions and expected effects, and will ultimately be included as an appendix to the Level 1 and 2 Water Report.	▪ Level 1 &2 Water Report – November 2023

CLOSURE

We trust that this memorandum meets your current needs. If you have any questions or require clarification, please contact WSP at your earliest convenience.

WSP Canada Inc.

[redacted]

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Senior Ecologist

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George Schneider, MSc, PGeo
Senior Geoscientist

AVS/HM/CDV/GWS/ld

Attachments: Attachment 1 – Fish Community Assessment
Attachment 2 – Flood Mapping Assessment

https://wsponline.sharepoint.com/sites/gld-21291g/deliverables/01 agency comments/township of puslinch/final/ca-gld-1791470a_tm_cbm aberfoyle lake_tor concordance_nat env & water_27jan2025.docx

ATTACHMENT 1

Fish Community Assessment

TECHNICAL MEMORANDUM

DATE January 27, 2025 **Project No.** CA-GLD-1791470A

TO David Hanratty
Votorantim Cimentos

CC Heather Melcher, Neal DeRuyter, Stephen May

FROM Warren Aken **EMAIL warren.aken@wsp.com**

CBM ABERFOYLE SOUTH LAKE PIT– FISH COMMUNITY ASSESSMENT

WSP Canada Inc. (WSP) has been retained by CBM Aggregates (CBM), a division of St. Marys Cement Inc. (Canada), to provide consulting services for the proposed CBM Aberfoyle South Lake Pit (the Project).

In order to fully address stakeholder comments and ensure CBM has the required information available to respond, WSP has undertaken a fish community survey associated with watercourses on the Aberfoyle South Lake Pit Site.

For the purpose of this memorandum, the following definitions are used (APPENDIX A):

- **Site** - the total land area within the property owned by CBM that is proposed for licensing under the ARA. The site is approximately 44 ha.
- **Extraction Limit** – The total area within the site in which aggregate is proposed for extraction. The total area of the Extraction Limit is approximately 27 ha.
- **Study Area** - The Study Area for the fish community survey encompasses the Mill Creek and associated unnamed tributaries.

Fish Community Survey

There are five unnamed tributaries to Mill Creek associated with the Site. The following four unnamed tributaries (excluding Tributary #3) lie outside of the licence boundary, as seen on the figure attached (APPENDIX A).

- **Tributary #1** originates in the Mill Creek-Puslinch PSW approximately 780 m southeast of the property and flows through the southeast corner of the property and into Mill Creek;
- **Tributary #2** originates in the Mill Creek-Puslinch PSW approximately 130 m east of the property and flows into Mill Creek;
- **Tributary #4** originates in the Mill Creek-Puslinch PSW approximately 180 m west of the property and flows into Tributary #3 just west of the property; and
- **Tributary #5** originates in the Mill Creek-Puslinch PSW just northwest property and flows southwest into Tributary #3.

Tributary #3 originates in the Mill Creek-Puslinch PSW approximately 330 m north of the property, flowing first through the Mill Creek-Puslinch PSW and then through the northwest portion of the Site before re-entering the Mill Creek-Puslinch PSW and joining Mill Creek approximately 530 m west of the property (APPENDIX A).

With extensive fisheries information available for the Mill Creek (i.e., from MNR), the focus of the fish community survey was on Tributary #3, and its associated branch (Tributary #5). Tributary #1 and #2 were also assessed along Sideroad 20 South prior to entering the Site. Tributary #4 was not assessed during the 2024 survey as it is located off-Site and is likely to have similar fish habitat characteristics and fish assemblage as Tributary #5.

Fish sampling was undertaken on September 9 and 10, 2024 by means of a portable battery driven electrofishing device (Smith-Root LR24). Electrofishing is the use of electricity to catch fish and is regarded as the most effective single method for sampling fish communities in streams (Plafkin *et al*, 1989[1]).

Results

Mill Creek has a coldwater thermal regime and is known to support several fish species, including blacknose dace (*Rhinichthys atratulus*), bluntnose minnow (*Pimephales notatus*), brook stickleback (*Culaea inconstans*), central mudminnow (*Umbra limi*), common shiner (*Luxilus cornutus*), creek chub (*Semotilus atromaculatus*), fathead minnow (*Pimephales promelas*), rainbow darter (*Etheostoma caeruleum*), rock bass (*Ambloplites rupestris*), and white sucker (*Catostomus commersonii*) (MNRF 2023a). It also supports sensitive coldwater species such as brown trout (*Salmo trutta*) and brook trout (*Salvelinus fontinalis fontinalis*) (MNRF 2023a and b).

MNR data indicate that Tributaries #1, #2, #3, and #4 have a coldwater thermal regime and are likely to support a similar fish community as recorded in the main branch of Mill Creek (MNRF 2023a). The fish community survey completed by WSP found 12 fish species within Tributaries #1, #2, #3, and #5 (Table 1). Brown trout were only caught in Tributary #1. The fish community survey also confirmed that although a range of small-bodied fish were caught within Tributary #3, several shallow muddy sections limit the movement of larger fish such as trout upstream. Within Tributary #3, upstream of Tributary #5, there is limited spawning and rearing habitat for coldwater species such as brown trout. Within the upper reaches of Tributary #3, brook stickleback and central mudminnow dominated the fish assemblage.

[1] Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Table 1: Fish Community Survey Results, September 2024

Species	Trib#1	Trib#2	Trib#3	Trib#5
Pumpkinseed (*Lepomis gibbosus*)	20		3	
Northern Redbelly Dace (*Chrosomus eos*)	33	1	72	
Western Blacknose Dace (*Rhinichthys obtusus*)	105		48	
Brook Stickleback (*Culaea inconstans*)	15	11	210	46
Fathead Minnow (*Pimephales promelas*)	3		6	
Central Mudminnow (*Umbra limi*)	20	4	72	3
Creek Chub (*Semotilus atromaculatu*)	5	1	155	
Golden Shiner (*Notemigonus crysoleucas*)	1		1	
White Sucker (*Catostomus commersonii*)		1	47	
Northern Pearl Dace (*Margariscus nachtriebi*)			4	
Blacknose Shiner (*Notropis heterolepis*)			1	
Brown Trout (*Salmo trutta*)	9			

All the fish species recorded in Mill Creek and the associated tributaries within the study area are considered secure and common in Ontario and globally (S5; G5). No aquatic SAR were assessed to have ranges that overlap the Study Area, and no critical aquatic SAR habitat was determined to be present within the Study Area (DFO 2024).

On-Site hydraulic and geomorphic investigations for Tributary #3 concluded that the tributary is an intermittent water feature that is characterized by a narrow channel and high riparian cover. It should be noted that Tributary #3 has been referred to as both intermittent and perennial within the different existing conditions reports. The reference to the seasonality of the stream has been based off the fact that the installed loggers have measured zero flow on at least four occasions, while during these periods, pooled water was still present. Further to this, the water depth during these low flow periods is likely limiting to fish as during summer, there is insufficient baseflow to consistently sustain water in Tributary #3. Therefore, referring to the Tributary #3 as intermittent is appropriate when considering fish habitat.

During the September 2024 survey, it was noted that the average wetted depth was less than 0.3 m with deep organic muck sections present through the middle reach of Tributary #3 (APPENDIX B). The presence of watercress indicates that the tributary is likely groundwater-fed (O'Neil and Hildebrand 1986 and WSP 2024). No specialized habitats (e.g., spawning) were identified in Tributary #3.

Closure

This information has been incorporated into the DFO Request for Review. We trust this memorandum meets your current needs. If you have any further questions regarding this memorandum, please contact the undersigned.

WSP Canada Inc.

[redacted]

Warren Aken
Senior Aquatic Ecologist

[redacted]

Amber Sabourin
Lead Ecologist

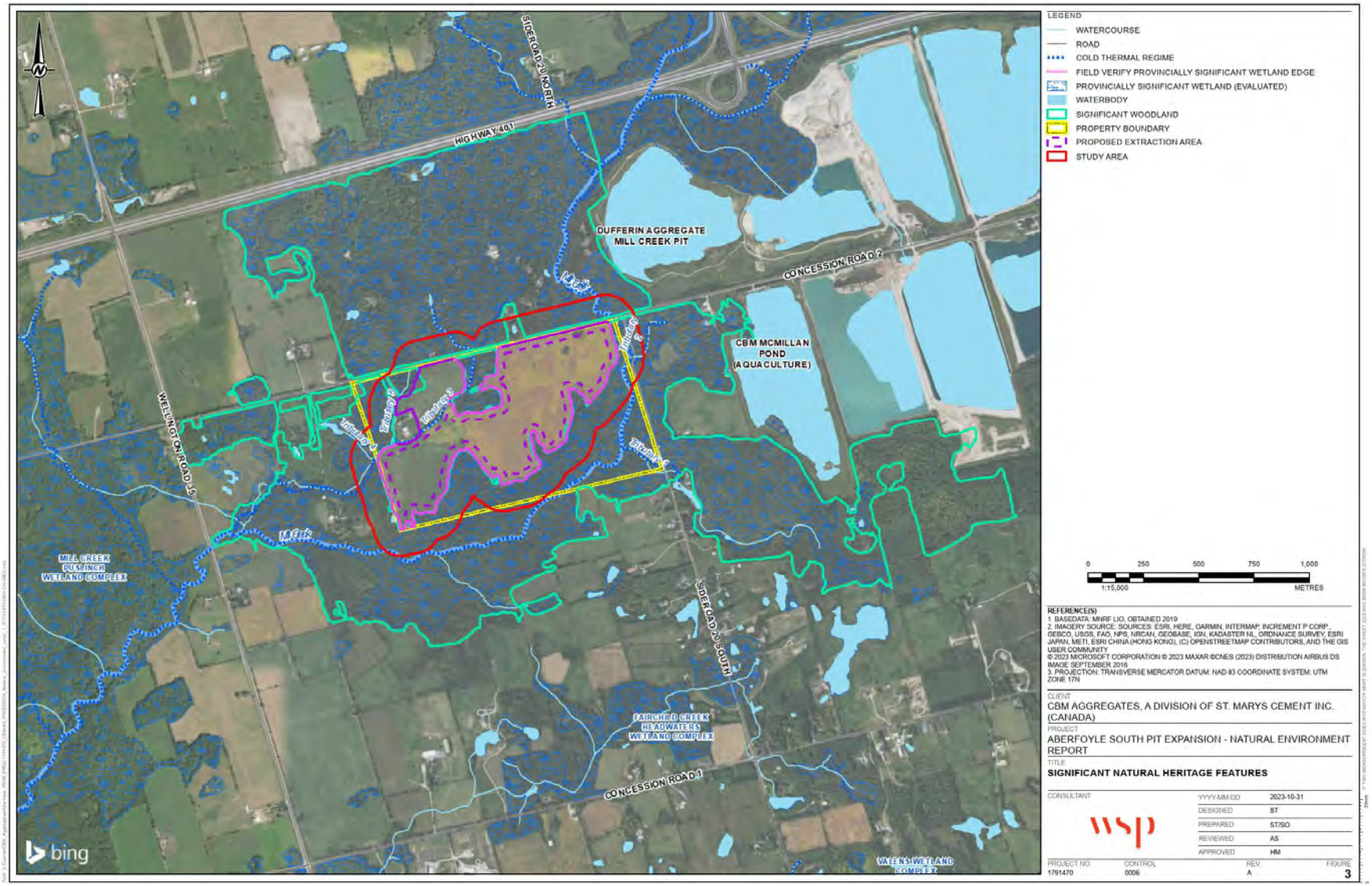
WA/AS/mp/ld

Attachments: Appendix A: Study Area - Associated Watercourses
Appendix B: Photos

https://wsponline.sharepoint.com/sites/gld-21291g/deliverables/01 agency comments/township of puslinch/final/attachment 1_fish memo/ca-gld-1791470a-l-rev0-cbm_aberfoyle_fish_community-01nov2024.docx

APPENDIX A

Study Area - Associated Watercourses


HIGHWAY 401
SIDEROAD 20 NORTH
DUFFERIN AGGREGATE
MILL CREEK PIT
CONCESSION ROAD 2
CBM MCMILLAN
POND
(AQUACULTURE)
WELLINGTON ROAD 35
MILL CREEK
PUSLINCH
WETLAND COMPLEX
SIDEROAD 20 SOUTH
FAIRCHILD CREEK
HEADWATERS
WETLAND COMPLEX
CONCESSION ROAD 1
VALENS WETLAND
COMPLEX
bing
LEGEND
WATERCOURSE
ROAD
COLD THERMAL REGIME
FIELD VERIFY PROVINCIALLY SIGNIFICANT WETLAND EDGE
PROVINCIALLY SIGNIFICANT WETLAND (EVALUATED)
WATERBODY
SIGNIFICANT WOODLAND
PROPERTY BOUNDARY
PROPOSED EXTRACTION AREA
STUDY AREA
0 250 500 750 1,000
1:15,000
METRES
REFERENCE(S)
1. BASEDATA: MNRF LIO, OBTAINED 2019
2. IMAGERY SOURCE: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
© 2023 MICROSOFT CORPORATION © 2023 MAXAR ©CNES (2023) DISTRIBUTION AIRBUS DS
IMAGE SEPTEMBER 2016
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N
CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)
PROJECT
ABERFOYLE SOUTH PIT EXPANSION - NATURAL ENVIRONMENT REPORT
TITLE
SIGNIFICANT NATURAL HERITAGE FEATURES
CONSULTANT
wsp
YYYY-MM-DD 2023-10-31
DESIGNED ST
PREPARED ST/SO
REVIEWED AS
APPROVED HM
PROJECT NO. 1791470
CONTROL 0006
REV. A
FIGURE 3

APPENDIX B

Photos

Insert file pathway here

Photo 1. Mill Creek at SW2 (March 2024)

Photo 2. Mill Creek at SW2 (March 2024)

Photo 3. Mill Creek at SW2 (October 2019)

Photo 4. Mill Creek at SW3 (October 2019)

Photo 5. Mill Creek at SW3 (March 2024)

Photo 6. Mill Creek at SW3 (July 2018)

Insert file pathway here

Photo 7. Tributary #3 at SW1 (March 2024)

Photo 8. Tributary #3 at SW1 (March 2024)

Photo 9. Tributary #3 at SW1 (October 2019)

Photo 10. Tributary #3 at SW4 (March 2024)

Photo 11. Tributary #3 at SW4 (March 2024)

Photo 12. Tributary #3 at SW4 (October 2019)

Insert file pathway here

Photo 7. Tributary #3 (September 2024)

Photo 8. Tributary #3 (September 2024)

Photo 9. Tributary #3 (September 2024)

Photo 10. Tributary #1 (September 2024)

Photo 11. Tributary #2 (September 2024)

Photo 12. Tributary #5 (September 2024)

ATTACHMENT 2

Flood Mapping Assessment

TECHNICAL MEMORANDUM

DATE January 23, 2025 **Project No.** 1791470A

TO David Hanratty
CBM Aggregates, a division of St. Mary's Cement Inc. (Canada)

CC George Schneider

FROM Mohsin Siddique; Craig DeVito **EMAIL craig.devito@wsp.com**

FLOOD MAPPING – PROPOSED ABERFOYLE SOUTH LAKE PIT

1.0 INTRODUCTION

In November 2023, CBM Aggregates (CBM), a division of St. Marys Cement Inc. (Canada), submitted a Class A Pit Below Water licence application under the *Aggregate Resources Act (ARA)* at the proposed Aberfoyle South Lake Pit located at 6947 Concession Road 2, in the Township of Puslinch, County of Wellington, Ontario (referred herein as Property). WSP Canada Inc. (WSP), has been retained by CBM to complete an assessment of various return period event flood elevations from Mill Creek on the Property, as requested from the Grand River Conservation Authority (GRCA) during their review of the Terms of Reference for the ARA licence application.

The Property is approximately 85 hectares (ha) in size and is located at 6947 Concession Road 2, in the Township of Puslinch, County of Wellington, Ontario. Of this Property, approximately 44 ha are proposed for licensing under ARA (referred herein as Site) and the extraction area within the Site is approximately 27 ha in size (Figure 1.1). The Property is comprised of approximately 50% agricultural fields which are flanked by three wooded areas in the northwest, north-central and southeast portions of the Property and an unoccupied residence in the western portion of the Property (Figure 1.1).

The predominant surface water features in the vicinity of the Site include Mill Creek and its tributaries. Mill Creek flows from north to south along the eastern and southeastern portion of the property (Figure 1.1), exits the Property along the southern boundary, and then flows westward approximately 150 m to the south of the Property boundary. There are five small tributaries to Mill Creek proximal to the Property (Figure 1.1), referred to as Tributary 1, 2, 3, 4 and 5. Tributaries 1, 3 and 5 originate off-Property but then flow onto the Property and join Mill Creek, while Tributaries 2 and 4 are located entirely off-Property.

2.0 OBJECTIVE

The primary objective of this technical memorandum is to assess floodplains of Mill Creek and Tributary 3 and provide the results in terms of storm flood elevations and floodplain maps for 5-year, 10-year, 25-year, 50-year and 100-year storm floods, noting that considering the layout of Site and extraction area, and the overall drainage pattern, floodplains of Tributaries 1, and 5 were not assessed.

3.0 METHODOLOGY

To assess the floodplain of the study area, hydraulic modeling was conducted using HEC-RAS software (version 6.3.1). Two (2) one-dimensional steady flow HEC-RAS models: (1) Mill Creek and (2) Tributary 3, were used. The models of Mill Creek and Tributary 3 are based on GRCA's HEC-RAS models for the regional flood (provided by GRCA) and uses Canadian Geodetic Vertical Datum of 1928 (CGVD28) / North American Datum (NAD) of 1983 of the Canadian Spatial Reference System (NAD83(CSRS)). Note that for floodplain mapping, flood elevations were converted to CGVD2013 / NAD1983 using GPS.H tool (Government of Canada, 2024).

The calibration parameters and associated values in both models were assumed unchanged from their respective regional flood models. Upstream and downstream boundary conditions in the models included storm inflows (for 100-year, 50-year, 25-year, 10-year and 5-year storm floods), extracted from GRCA's respective HEC-2 models, along the reaches and downstream channel bed slopes. Tables 1 and 2 provide input boundary conditions (storm inflows for 5-year to 100-year storm floods) for HEC-RAS models along the reaches of Mill Creek and Tributary 3, respectively.

4.0 RESULTS

The results of the HEC-RAS modeling based on CGVD2013 / NAD1983 are presented as storm flood elevations (Tables 3 and 4) and the floodplain maps (Figures 1.2 through 1.6) along the reaches of Mill Creek and Tributary 3. The summary of results is as follows:

- **Mill Creek:**
  - Floodplain boundaries of 100-year and 50-year storm floods, were found to overlap the Site boundary at the northeastern corner of the Property, however, floods were not found to extend beyond the extraction area limit. No flooding was observed in the other parts of the Site due to Mill Creek.
  - Storm flood elevations at the northeast corner of the Property, where the Mill Creek flood water is found to enter the Property (Section 14551), ranged from 303.61 metres above sea level (masl) for 100-year storm flood to 303.17 masl for 5-year storm flood.
- **Tributary 3:**
  - Floodplain boundaries of all storm floods were found to overlap the Site boundary, however, only the 100-year and 50-year storm floods were found to extended beyond the extraction area limit. Note that the extraction area is located on the southern side of the Tributary 3.
  - Storm flood elevations at the northern corner of the Property, where the Tributary 3 flood water is found to enter the Property (Section 1600.1), ranged from 302.8 masl for 100-year storm flood to 302.61 masl for 5-year storm flood.

5.0 POTENTIAL IMPACTS TO SURFACE WATER

- Due to the overlapping of floodplain and the extraction area, flood water is expected to enter the Site and extraction area. It is expected that the pits in the extraction area would act as storage area and provide additional temporary storage capacity for the flood water in comparison to the current conditions, which would help reduce the effects of flooding downstream from the Site. By extension, the retention of runoff and reduction to peak flows would lead to the potential for lower rates of sediment erosion / transport.
- It is expected that the large flood events would result in a temporary stoppage in operations, depending on the elevation of the flood waters. If pit access or the safe operation of equipment is at risk, operations will be stopped. This stoppage is expected to be short-lived, as flood waters are expected to recede in a matter of days and the potential for significant damage to the site infrastructure would be minimal.
- Pit operations will be planned to limit the risks of flood water being conveyed through the pit pond(s) and short circuiting of the creek channel. This will be achieved through earth berming and extraction planning. The site plans have been updated to address flood risk potential and the comments received so the pit pond can provide flood storage without short circuiting. Updated site plans are provided in the attachments.

6.0 CLOSURE

We trust that this technical memorandum meets your current needs. If you have any questions or require clarification, please contact the undersigned at your earliest convenience.

WSP Canada Inc.

Mohsin Siddique, PhD, PEng
Water Resources Engineer

Craig DeVito, PEng
Water Resources Engineer

MS/CDV/ld/mp

Attachments: **Tables:**

Table 1: Storm Inflows along Mill Creek
Table 2: Storm Inflows along Tributary 3
Table 3: Water Surface Elevations of Storm Floods along Mill Creek
Table 4: Water Surface Elevations of Storm Floods along Tributary 3

Figures:

Figure 1.1: Site Location and Cross Sections
Figure 1.2: Storm Flood Elevation Map for 100-year Storm Flood
Figure 1.3: Storm Flood Elevation Map for 50-year Storm Flood
Figure 1.4: Storm Flood Elevation Map for 25-year Storm Flood
Figure 1.5: Storm Flood Elevation Map for 10-year Storm Flood
Figure 1.6: Storm Flood Elevation Map for 5-year Storm Flood

Site Plans:

Drawing 1: Existing Features Plans
Drawing 2: Operational Plan
Drawing 3: Operational Notes Plan
Drawing 4: Rehabilitation Plan

https://wsponline.sharepoint.com/sites/gld-21291g/deliverables/hydrogeology level 1 and 2/15 floodplain assessment jun2024/1791470a-tm-rev0-final-cbm lake flood assessment-23jan2025.docx

REFERENCES

Government of Canada (2024). GPS.H tool. Available at: https://webapp.csrs-scrs.nrcan-rncan.gc.ca/geod/tools-outils/gpsh.php

TABLES

Table 1: Storm Inflows along Mill Creek

Cross-section ID	Storm Inflow (m^3/s)					
	Regional Flood (1982)	100-year	50-year	25-year	10-year	5-year
19380	127	15	12.5	9.8	6.2	4.1
16101	165	18.4	16	13.3	9.2	6.2
12200	165	16	14.2	12.5	9.2	6.4
8901.4	165	14.6	13.3	11.5	8.5	6
8886.3	153	n/a	n/a	n/a	n/a	n/a
4560	141	13.2	12	10.5	7.8	5.6

n/a: not applicable

Table 2: Storm Inflows along Tributary 3

Cross-section ID	Storm Inflow (m^3/s)					
	Regional Flood (1982)	100-year	50-year	25-year	10-year	5-year
1600.4	15.3	2.4	1.9	1.4	0.8	0.5

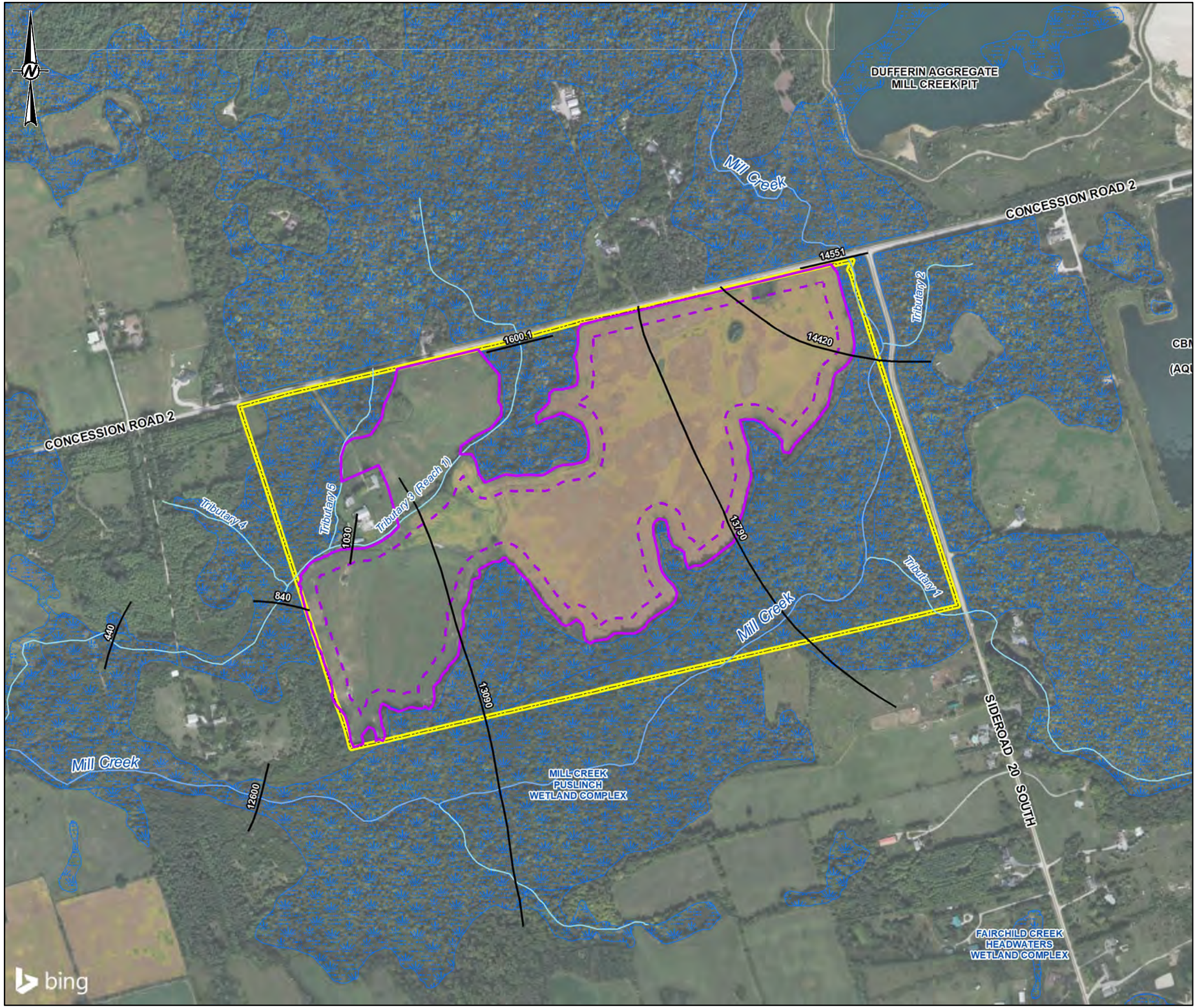
Table 3: Water Surface Elevations of Storm Floods along Mill Creek

Cross Section ID	Storm Flood Elevations (masl)					
	Regional Flood (1982)	100-year	50-year	25-year	10-year	5-year
14551	304.55	303.61	303.55	303.48	303.33	303.17
14420	304.48	303.51	303.45	303.37	303.19	303.01
13790	303.75	302.50	302.43	302.34	302.18	302.03
13090	303.27	301.24	301.17	301.08	300.91	300.76
12600	302.80	300.94	300.86	300.77	300.59	300.41

Table 4: Water Surface Elevations of Storm Floods along Tributary 3

Cross Section ID	Storm Flood Elevations (masl)					
	Regional Flood (1982)	100-year	50-year	25-year	10-year	5-year
1600.1	303.19	302.80	302.78	302.74	302.65	302.61
1030	302.55	301.96	301.90	301.84	301.86	301.79
840	302.03	301.59	301.55	301.50	301.21	301.14
440	301.66	300.78	300.74	300.71	300.65	300.61

FIGURES



LEGEND

- CROSS-SECTION
- WATERCOURSE
- ROAD
- PROVINCIALLY SIGNIFICANT WETLAND (EVALUATED)
- PROPERTY BOUNDARY
- LICENCE BOUNDARY / SITE BOUNDARY
- PROPOSED EXTRACTION AREA

KEY MAP

0 100 200 300 400

1:7,500 METRES

REFERENCE(S)

1. BASEDATA: MNRF LIO, OBTAINED 2019
2. IMAGERY SOURCE: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

IMAGE SEPTEMBER 2016
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
ABERFOYLE SOUTH LAKE PIT

TITLE
SITE LOCATION AND CROSS-SECTIONS

CONSULTANT

wsp

YYYY-MM-DD	2025-01-23
DESIGNED	ST
PREPARED	CGE/SO
REVIEWED	AS
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
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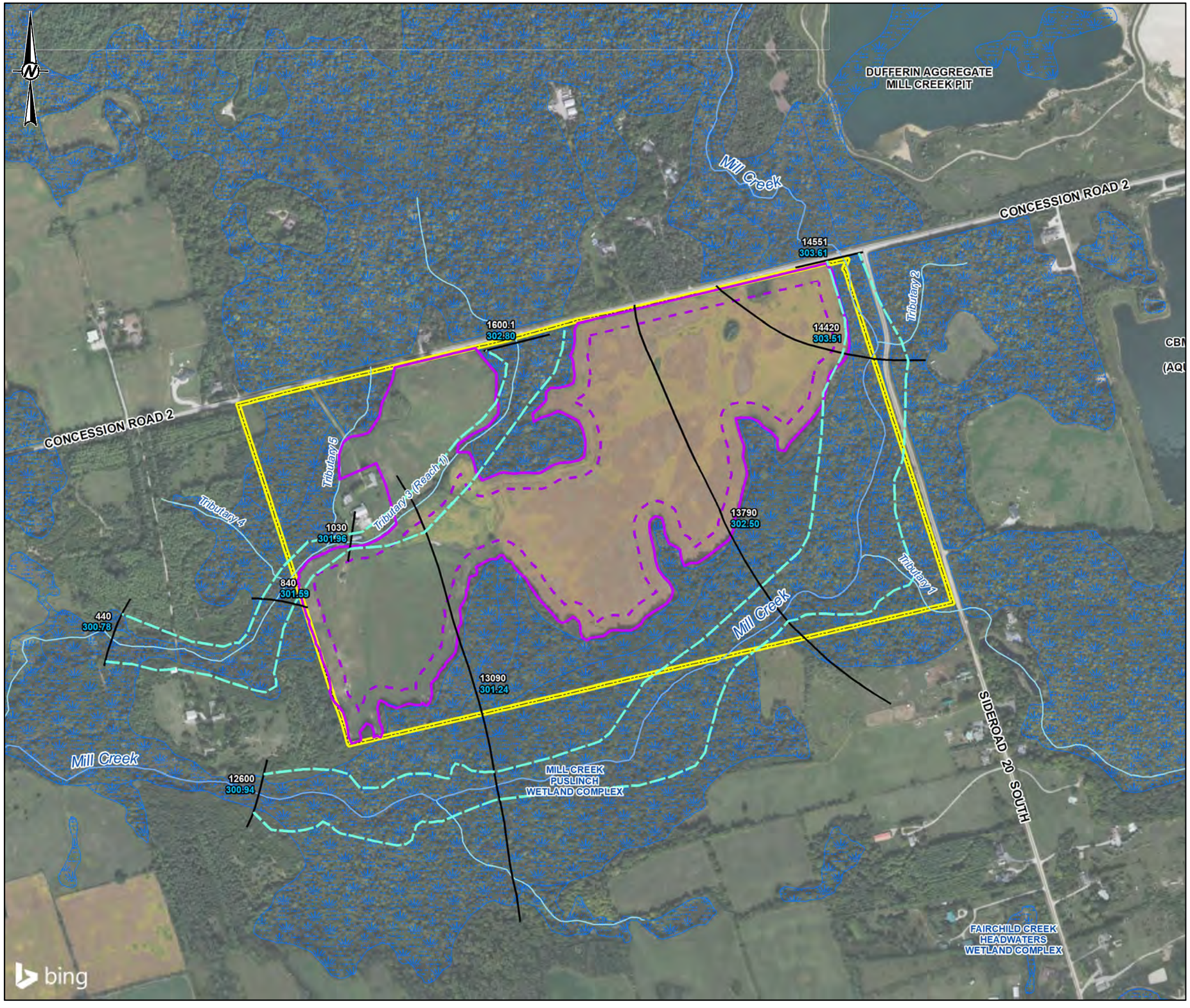

LEGEND

- CROSS-SECTION
- FLOODPLAIN EXTENT
- WATERCOURSE
- ROAD
- PROVINCIALLY SIGNIFICANT WETLAND (EVALUATED)
- PROPERTY BOUNDARY
- LICENCE BOUNDARY / SITE BOUNDARY
- PROPOSED EXTRACTION AREA

0 100 200 300 400

1:7,500 METRES

REFERENCE(S)

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© 2025 MICROSOFT CORPORATION © 2025 MAXAR ©CNES (2025) DISTRIBUTION AIRBUS DS IMAGE SEPTEMBER 2016
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
ABERFOYLE SOUTH LAKE PIT

TITLE
STORM FLOOD ELEVATION MAP - 100 - YEARS FLOOD LEVELS (CGVD2013)

CONSULTANT

YYYY-MM-DD	2025-01-23
DESIGNED	ST
PREPARED	KP
REVIEWED	AS
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
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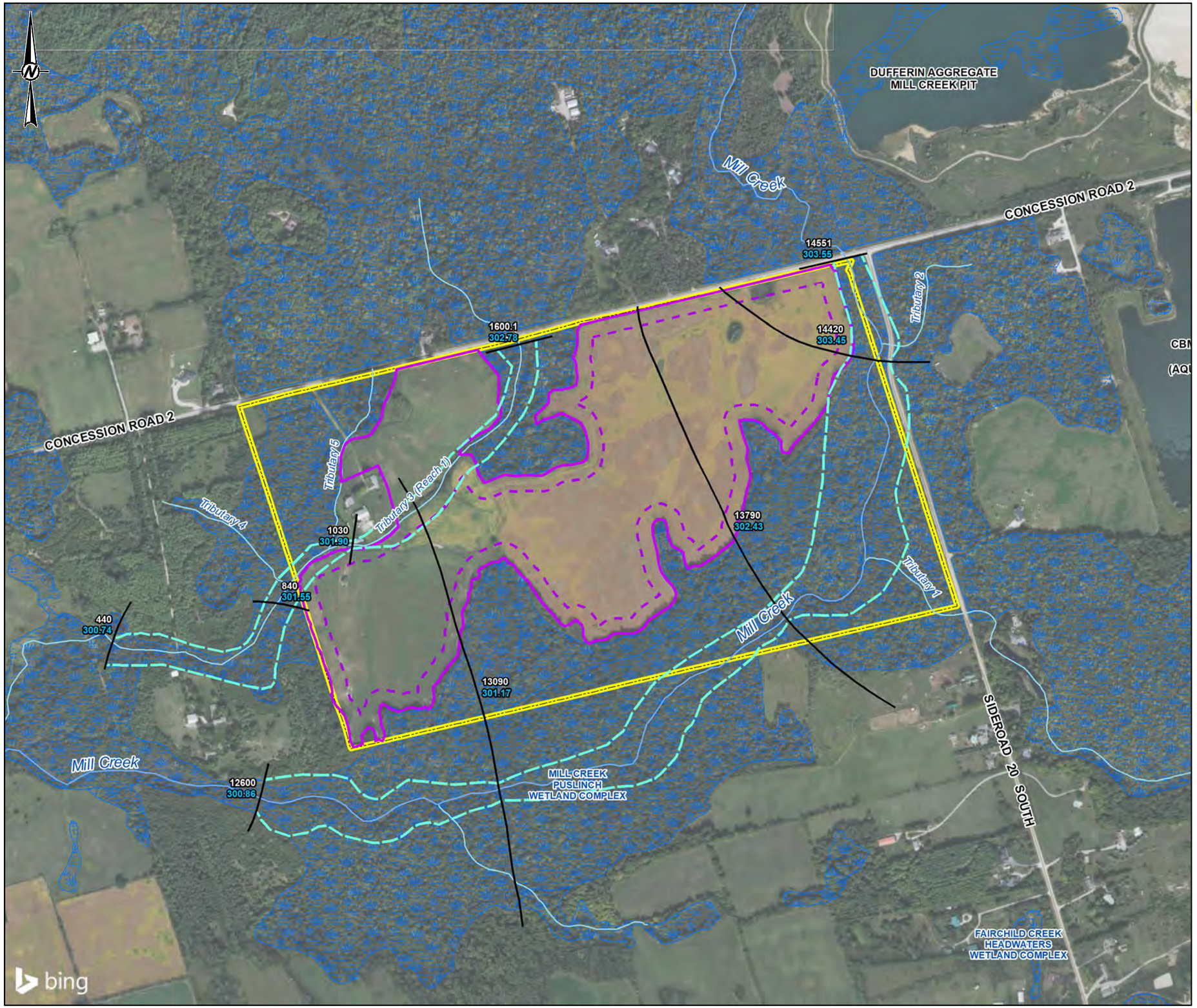

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- FLOODPLAIN EXTENT
- WATERCOURSE
- ROAD
- PROVINCIALLY SIGNIFICANT WETLAND (EVALUATED)
- PROPERTY BOUNDARY
- LICENCE BOUNDARY / SITE BOUNDARY
- PROPOSED EXTRACTION AREA

0 100 200 300 400

1:7,500 METRES

REFERENCE(S)

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3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
ABERFOYLE SOUTH LAKE PIT

TITLE
STORM FLOOD ELEVATION MAP - 50 - YEARS FLOOD LEVELS (CGVD2013)

CONSULTANT

YYYY-MM-DD	2025-01-23
DESIGNED	ST
PREPARED	KP
REVIEWED	AS
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
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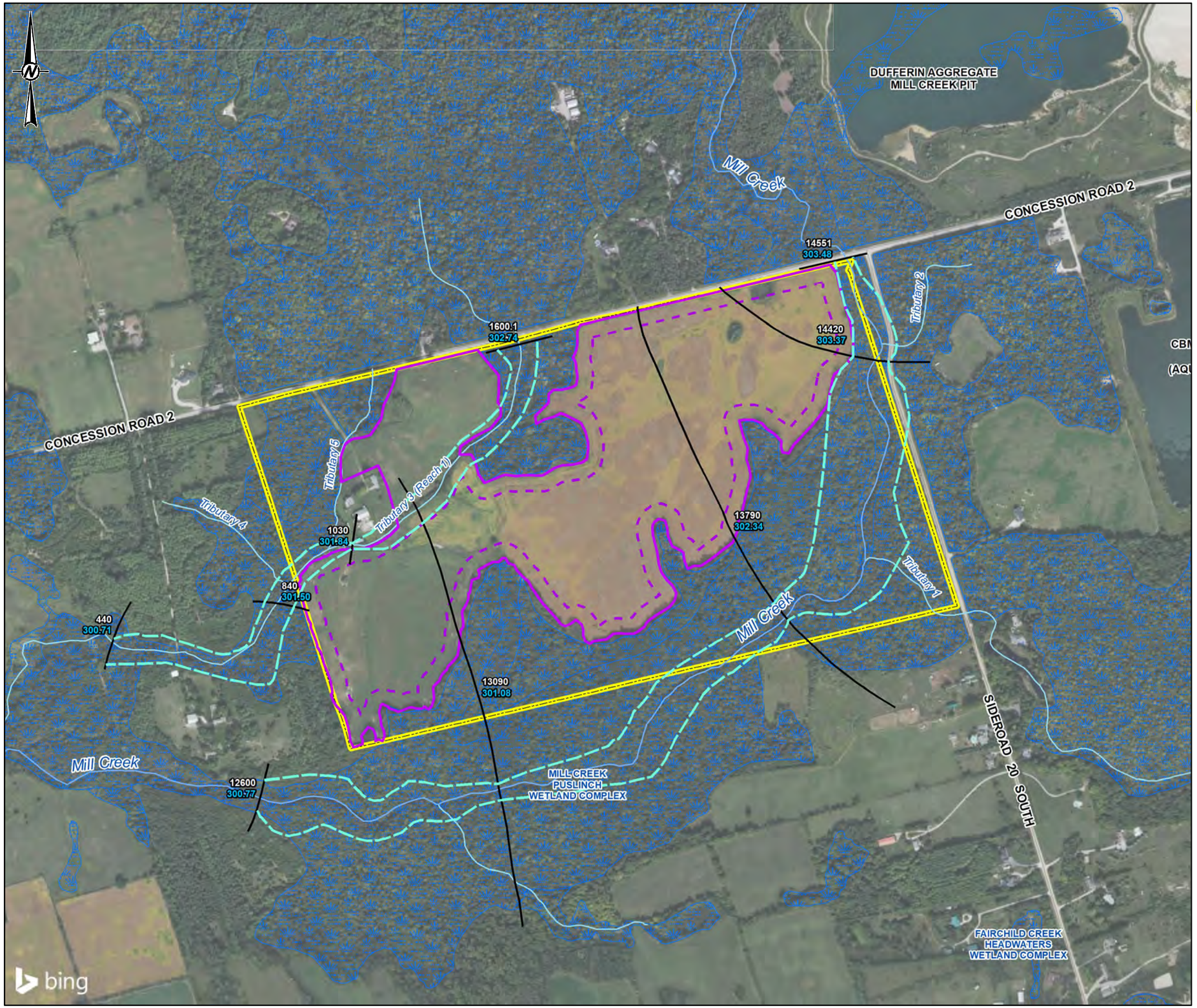

LEGEND

- CROSS-SECTION
- FLOODPLAIN EXTENT
- WATERCOURSE
- ROAD
- PROVINCIALLY SIGNIFICANT WETLAND (EVALUATED)
- PROPERTY BOUNDARY
- LICENCE BOUNDARY / SITE BOUNDARY
- PROPOSED EXTRACTION AREA

0 100 200 300 400

1:7,500 METRES

REFERENCE(S)

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   © 2025 MICROSOFT CORPORATION © 2025 MAXAR ©CNES (2025) DISTRIBUTION AIRBUS DS IMAGE SEPTEMBER 2016
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
ABERFOYLE SOUTH LAKE PIT

TITLE
STORM FLOOD ELEVATION MAP - 25 -YEARS FLOOD LEVELS (CGVD2013)

CONSULTANT

YYYY-MM-DD	2025-01-23
DESIGNED	ST
PREPARED	KP
REVIEWED	AS
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
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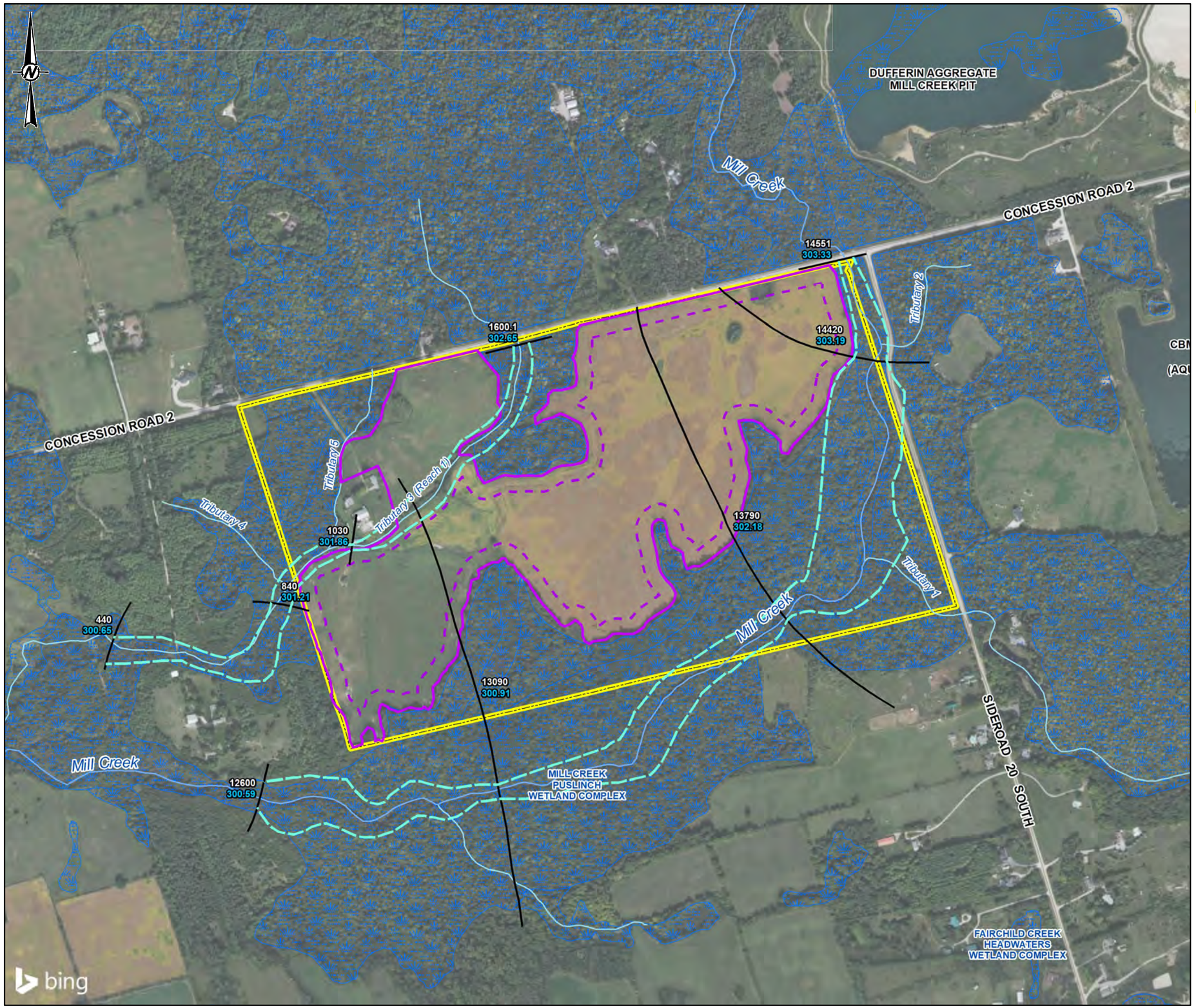

LEGEND

- CROSS-SECTION
- FLOODPLAIN EXTENT
- WATERCOURSE
- ROAD
- PROVINCIALLY SIGNIFICANT WETLAND (EVALUATED)
- PROPERTY BOUNDARY
- LICENCE BOUNDARY / SITE BOUNDARY
- PROPOSED EXTRACTION AREA

0 100 200 300 400

1:7,500 METRES

REFERENCE(S)

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2. IMAGERY SOURCE: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

IMAGE SEPTEMBER 2016
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
ABERFOYLE SOUTH LAKE PIT

TITLE
STORM FLOOD ELEVATION MAP - 10 - YEARS FLOOD LEVELS (CGVD2013)

CONSULTANT

YYYY-MM-DD	2025-01-23
DESIGNED	ST
PREPARED	KP
REVIEWED	AS
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
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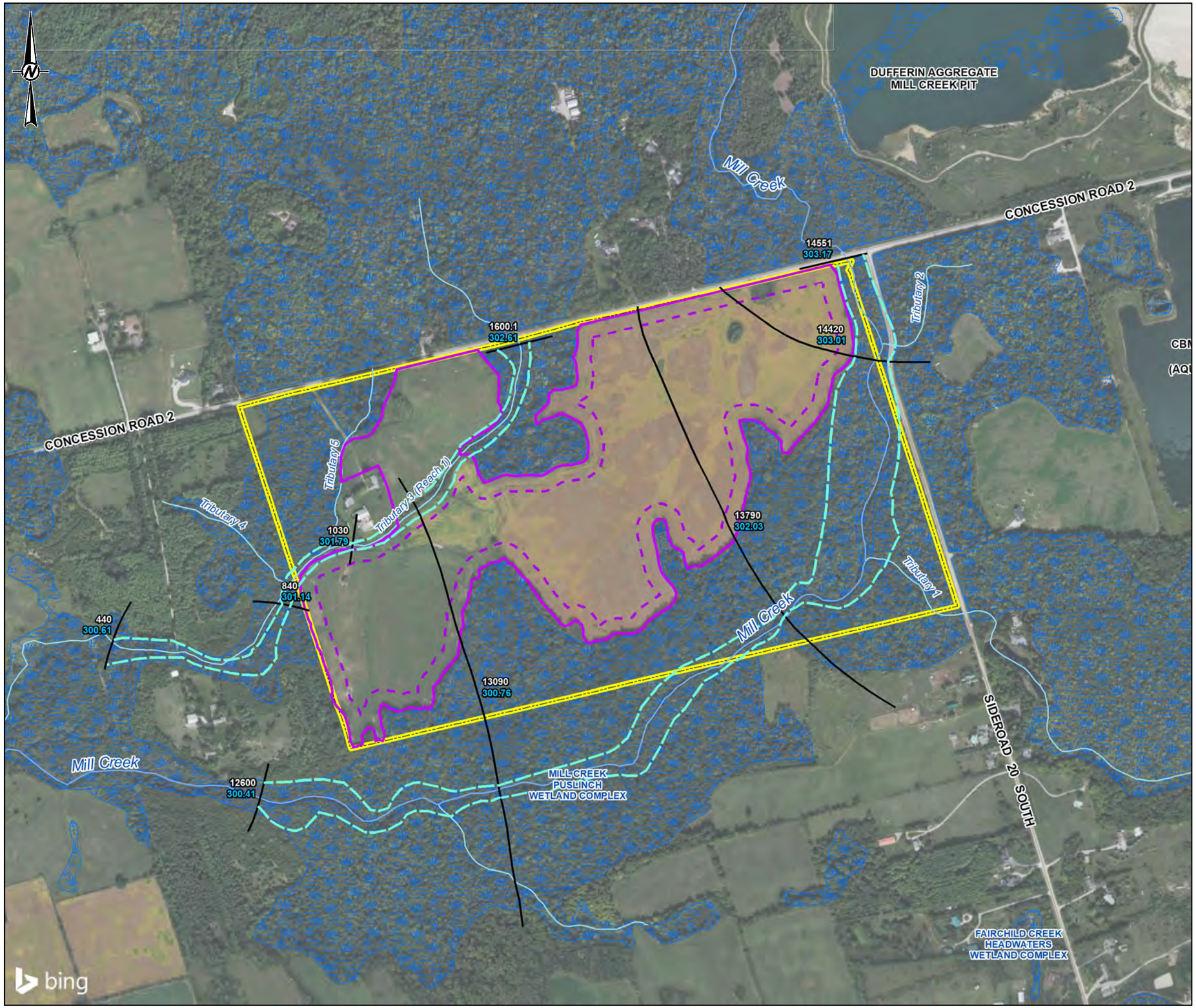

LEGEND

- CROSS-SECTION
- FLOODPLAIN EXTENT
- WATERCOURSE
- ROAD
- PROVINCIALLY SIGNIFICANT WETLAND (EVALUATED)
- PROPERTY BOUNDARY
- LICENCE BOUNDARY / SITE BOUNDARY
- PROPOSED EXTRACTION AREA

0 100 200 300 400

1:7,500 METRES

REFERENCE(S)

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IMAGE SEPTEMBER 2016
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
CBM AGGREGATES, A DIVISION OF ST. MARYS CEMENT INC. (CANADA)

PROJECT
ABERFOYLE SOUTH LAKE PIT

TITLE
STORM FLOOD ELEVATION MAP - 5 - YEARS FLOOD LEVELS (CGVD2013)

CONSULTANT

YYYY-MM-DD	2025-01-23
DESIGNED	ST
PREPARED	KP
REVIEWED	AS
APPROVED	HM

PROJECT NO.	CONTROL	REV.	FIGURE
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SITE PLANS

Please see Current Site Plan