Technical Summary Report

(by the Joint Agency Review Team)

Milton Quarry East Extension

July 2023

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1. TECHNICAL REVIEW BY THE JOINT AGENCY REVIEW TEAM

The review of proposals for new or expanded mineral aggregate operations within Halton Region occurs through a joint agency work program detailed in the Halton Consolidated – Streamlined Mineral Aggregate Review Protocol. The Protocol, often referred to as the JART Protocol, was originally developed through an extensive, consultative process between Halton Region, Niagara Escarpment Commission (NEC), local municipalities, Conservation Authorities, the Ministry of Natural Resources and Forestry (MNRF) and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). The Protocol was first approved by Halton Regional Council on January 31, 2001. It was most recently updated in February 2020.

In Halton Region, a Joint Agency Review Team ("JART") is formed to complete technical review of proposals for new or expanded mineral aggregate extraction. Per step 6 of the Halton Consolidated – Streamlined Mineral Aggregate Review Protocol, the Chair of a JART will co-ordinate agency comments where possible and, with JART members' assistance, produce a JART Report or Reports consolidating and summarizing this work. As Chair of JART for the proposed expansion to the Milton Quarry, Halton Region has prepared this Technical Review Summary Report ("JART Report" or "this Report") with input from the other public agencies.

1.1 PURPOSE OF REPORT

This technical report details the structure of JART, and the work undertaken by the team on the review of the quarry expansion proposed by Dufferin Aggregates, a division of CRH Canada Group Inc. ("Dufferin" or "the proponent") to the southeast of the "extension" component of its Milton Quarry operation in the Town of Halton Hills. It includes a consolidated description of the proposal shared by the agencies. The summary of the technical work undertaken includes initial responses of the various agencies and an overview of technical findings arriving from the work of the technical reviewers. This technical work is to be used by the various participating agencies to inform the production of planning opinions and recommendation reports to the Councils, Boards, and Commission, as applicable.

The applicant and Ministry of Natural Resources and Forestry will be provided a copy of this Report.

The Report will also be provided to the Niagara Escarpment Commission, Halton Regional Council, Town of Halton Hills Council, and the Board of Conservation Halton for information.

1.2 LIMITATIONS OF THE REPORT

This Report does not make a recommendation on the proposal itself. It is a distillation of technical review completed since the relevant applications were filed in December 2021.

The contents of this report are based upon technical review of information submitted up to June 16, 2023, to complete the second technical submission started by Dufferin. Technical review is generally based upon the documents listed in Section 2.5 of this report, public input, and working meetings with the applicant. Any revisions to the Dufferin proposal to address remaining issues in this report or any other objector concerns will require review—and may necessitate updated analysis to be completed through JART or by the individual agencies.

1.3 JOINT AGENCY REVIEW TEAM (JART) MEMBERSHIP

Throughout the review of the proposal, agency leads for the JART were:

- Halton Region, as lead agency: Joe Nethery (Chair), Janice Hogg
- Niagara Escarpment Commission: Lisa Grbinicek, Joe Muller
- Town of Halton Hills: Greg Macdonald, Jeff Markowiak
- Town of Milton: Stirling Todd, Mollie Kuchma, Jessica Tijanic
- Conservation Halton: Leah Smith, Jessica Bester

JART was supported by a number of agency staff, including Leila Mirriahi, Betty Pakulski, Alina Korniluk, Jacek Strakowski, Lisa Jennings, Jennifer Young, Maureen Van Ravens, Kevin Okimi, Jeff Jelsma, Kate Sapozhnikova, Matthew Roj, Ivan Drewnitski, Karen Bannister, and many others.

Halton Region retained peer review support in the following areas of focus. Note that peer reviewers did review in multiple issue areas to ensure integration of reports—in particular, with respect to hydrogeology and the natural environment:

Table 1: Technical Peer Reviewers Retained by Halton Region for JART Support

Agricultural Impact Assessment	AgPlan Limited: Michael K. Hoffman
Air Quality	Gray Sky Solutions: Dr. Andrew Gray
Archaeology and Cultural Heritage	Archaeological Services Inc.: David Robertson Rebecca Sciarra
Blasting	Englobe: Ray Jambakhsh and James Hicks
Financial Impact	Watson & Associates: Gary Scandlan Daryl Abbs
Hydrogeology	S.S. Papadopulos & Associates, Inc.: Christopher Neville Norbert Woerns
Karst Topography	Daryl Cowell
Natural Heritage	North South Environmental: Sarah Mainguy Matrix Solutions Inc.: Arnie Fausto
Noise	Valcoustics Canada Ltd.: John Emeljanow
Surface Water Assessment	Scheckenberger & Associates Ltd.: Ron Scheckenberger
Traffic	CIMA Canada Inc.: Jaime Garcia

Halton Region additionally retained Nick McDonald (Meridian Planning Consultants Inc.) to provide support to the land use planners on the relevant policies and structure to consider in undertaking a land use planning analysis. Planning analysis was to be undertaken by agency planning staff based upon the technical review undertaken and summarized in this report.

1.4 Timeline of Applications

On November 12, 2020, a pre-consultation meeting was held with representatives from Dufferin Aggregates and staff from the Region, the Town of Halton Hills, the Town of Milton, Conservation Halton, and the Niagara Escarpment Commission. A pre-consultation meeting is required in advance of the filing of Regional and Town of Halton Hills Official Plan Amendment applications. During this meeting, the various approvals and amendments required to permit the quarry expansion were identified, including an amendment to the Niagara Escarpment Plan, a Niagara Escarpment Development Permit, Provincial approval under the *Aggregate Resources Act*, and *Planning Act* approvals—specifically, Regional and Local Official Plan Amendments.

Terms of Reference for the technical studies needed were required by the agencies at the pre-consultation meeting. Those arrived in early 2021.

On December 20, 2021, Dufferin submitted the following applications for the proposed quarry expansion:

- An *Aggregate Resources Act* licence application for the proposed extensions issued by the Ministry of Natural Resources and Forestry, with future potential applications to amend the licence for the current operation (integration of the separate extensions as a single operation).
- A Niagara Escarpment Plan Amendment to re-designate the proposed expansion land to permit mineral aggregate extraction, and a Development Permit to ultimately permit the development.
- An amendment to the Halton Region Official Plan to re-designate the proposed expansion land to permit mineral aggregate extraction.
- An amendment to the Town of Halton Hills Official Plan to re-designate the proposed expansion land to permit mineral aggregate extraction.

On January 18, 2022, Halton Region's Chief Planning Official and Town of Halton Hills staff deemed the *Planning Act* applications complete. The Niagara Escarpment Plan Amendment process was initiated through a staff report received by the Niagara Escarpment Commission on April 21, 2022. The Ministry of Natural Resources and Forestry deemed the *Aggregate Resources Act* applications complete on January 28, 2022.

1.5 JART Work Program

Initial conversations around forming a JART for review began following initial inquiries by Dufferin to discuss a potential proposal for quarry expansion on these lands in summer 2020. Dufferin requested a preconsultation meeting, which was led by the Town of Halton Hills, on November 12, 2020. Staff from the Niagara Escarpment Commission, Halton Region, the Town of Halton Hills, the Town of Milton, and Conservation Halton all attended this meeting.

The application went through two complete technical circulations with JART agencies: a first circulation from January 2022 that fully completed in November 2022 (most work was complete by September 2022), and then a second circulation arriving in stages from October 2022 through to March 2023. Review of the second technical circulation was completed in June 2023. Review involved detailed assessment of the submitted reports, internal discussion meetings to review findings, and discussion meetings with the proponent to work through issues. The consolidated comment tables are attached as a series of appendices to this report.

Throughout the application review process with JART, multiple site visits occurred to better understand the area's context. The site visits enabled JART to assess the application in more detail through closer investigation. The following focused site visits and field work occurred:

- **June 20, 2022**
  - Intent: General site orientation, visiting and observing the features of the proposed expansion lands, and receiving a tour of the current site and operation.
  - Attendees: Dufferin, JART staff and peer reviewers.
- **June 21, August 8 and 10, 2022**
  - Intent: Review woodland and wetland boundary staking.
  - Attendees: Dufferin, JART staff and peer reviewers.

In addition to the above focused visits, some agency staff and peer reviewers completed their own independent site visits and area scans. There were also multiple working meetings with Dufferin, typically focused on individual issues or thematic areas.

The Halton Consolidated – Streamlined Mineral Aggregate Review Protocol and associated work program is adaptable and meant to be flexible rather than prescriptive. It is based upon agreement by agency staff to work together as much as possible. The processing of each application will vary depending on the type and scale of the application under consideration as well as its location and predicted impact. The work program also is flexible to respond to shifting needs or requirements during technical review.

1.6 Letters of Objection to the *Aggregate Resources Act* Licence Application from the Agencies

Letters of Objection were provided by the JART agencies in May 2022, within the initial 60-day review window. Concerns identified in these letters were informed by the preliminary review of technical reports and studies submitted in support of the application by staff and retained consultants.

The Niagara Escarpment Commission's objection letter of April 25, 2022, contained the following categories of issues:

- Insufficient assessment and discussion of cumulative impacts of the expansion of extraction and post extraction rehabilitation, including the framework identifying baseline conditions for lands and hydrology.

- The need for more comprehensive assessments of key natural heritage features and key hydrologic features, the maintenance and enhancement of connectivity between these features, and mapping and interpretation of the features, including:
    - Evaluation of additional potential wetlands for significance and inclusion in the Provincially Significant Wetland (PSW) Complex.
    - Justification for proposed buffer widths between sensitive and significant natural heritage and hydrologic features, and construction of proposed infrastructure within these buffers.
    - Confirmation from the Ministry of the Environment, Conservation and Parks and other agencies confirming work to date documenting Species at Risk and habitat are sufficient or require additional work.
- The scope of the karst assessment undertaken for the proposal needs to be expanded to include potential contingencies in the Addendum Adaptive Management Plan.
- The Visual Impact Assessment requires clarifications and additional information including supplementary and revised viewpoints, and needs to address impacts to the Niagara Escarpment Plan open landscape character and gaps in the policy analysis.
- Further assessment of archeology, built heritage and cultural heritage landscapes is needed, in addition to Indigenous consultation.
- The proposed perpetual active water management scenario, under Part 2.9.11 j) of the Niagara Escarpment Plan, requires a comprehensive justification documentation of extent to which it will be required.
- The rehabilitation plan for the proposed expansion entails substantial soil importation, which requires further information and justification of how this results in an outcome representative of the existing ecodistrict and how the shallow lake, cliff and island features are compatible with adjacent rehabilitation efforts.

The Niagara Escarpment Commission also noted the *Aggregate Resources Act* application was premature because, under Section 24 (3) of the *Niagara Escarpment Planning and Development Act*, no permits may be issued nor approval, permission or decision authorized under any *Act* prior to a Development Permit being issued under the *Niagara Escarpment Planning and Development Act*. Further, those permits and approvals must be consistent with the issued Development Permit.

Halton Region's Letter of Objection, dated May 6, 2022, raised 29 distinct issues, categorized under the following nine thematic groupings:

- Mapping of some key features does not reflect standard practice; and feature staking has not been undertaken to confirm boundaries.
- The potential effects of the operation of the proposed pit and quarry on the natural environment have not been adequately addressed, including effects upon key natural features, cumulative impacts, and the proposed Adaptive Management Plan not including all monitoring requirements necessary to ensure mitigation of impacts.

- The potential effects of the operation of the proposed pit and quarry on nearby communities have not been adequately addressed, including human health, air quality, and noise and vibration effects.
- The suitability of the progressive rehabilitation and final rehabilitation plans for the site have not been adequately addressed.
- The potential effects on ground and surface water resources including on drinking water sources and private wells have not been adequately addressed.
- The potential effects on agricultural lands have not been adequately addressed.
- Detailed consideration should be given to planning and land use matters, including conformity with Provincial and Regional plans and policies.
- Haulage routes and effects related to truck traffic have not been adequately addressed.
- Considerations remain with respect to the applicant's existing licence and how expansion plans are considered and accommodated by those licences.
- Other, miscellaneous concerns related to fees and the *Aggregate Resources Act* review process, the plan drawings and notations, and public engagement.

The Town of Halton Hills' Letter of Objection, dated April 25, 2022, indicated several concerns with the proposed *Aggregate Resources Act* licence application broadly summarized as follows:

- At the time of the Letter of Objection that the review of the technical submission materials addressing both the *Aggregate Resources Act* Licence Application and applications under the *Niagara Escarpment Planning & Development Act and Planning Act* was still under way and had not advanced sufficiently for a recommendation to be made.
- At the time of the Letter of Objection, the initial technical review had determined a number of deficiencies having to be addressed through resubmissions of these technical materials.
- That the Town of Halton Hills cannot decide on an amendment to the Town of Halton Hills Official Plan under a decision has been made on the proposed amendment to the Niagara Escarpment Plan and Region of Halton Official Plan. Therefore, it would be premature to approve an *Aggregate Resources Act* Licence when the principle of land use has not been determined.

On April 20, 2022, the Town of Milton issued a Letter of Objection in response to the Notice of Application for a Licence to the Ministry of Northern Development, Mines, Natural Resources and Forestry to expand the existing Milton Quarry East. In summary, the Town of Milton objected to the application for the following reasons:

- Evaluation of the many technical studies to support the application had not been completed.
- Outstanding concerns regarding truck traffic on Town of Milton roads had not been addressed.
- Outstanding questions on how the proposed extended licenced area will impact rehabilitation of the existing licenced area remained unanswered.

Conservation Halton issued a Letter of Objection dated May 4, 2022. Among other things, Conservation Halton objected to the application for the following reasons:

- Insufficient detail was provided to determine what impacts the proposed quarry may have on the surrounding water resources, and natural heritage features functions and areas and whether the proposed mitigation measures would ensure that the features and their functions would not be impacted over the long term.
- Limited discussion about the potential cumulative impacts of the proposal.
- The wetlands in the study area needed to be staked by Conservation Halton to establish limits and setbacks.
- Target levels for wetlands in the zone of influence required further discussion.
- Proposed mitigation measures for wetlands in the zone of include did not fully consider impacts to ecological and hydrological functions.
- The complexity of the proposed water management system for mitigation and monitoring of features required detailed review.
- It was unclear if the existing groundwater and surface water monitoring network and proposed monitoring program would be sufficient to ensure no groundwater impacts to wetlands and other natural features.
- Confirmation was required about potential hazardous lands (e.g., karst) near the brow of the Niagara Escarpment and in proximity to the expansion.

It was also identified that Conservation Halton has existing agreements with Dufferin for the existing *Aggregate Resources Act* licenced areas related to the future land conveyance, long term operation of the water management system and implementation of the Adaptive Management Plan. Any amendments to these agreements would require separate discussions with Conservation Halton outside the JART application review processes.

These initial responses were supplemented with a full set of technical comments from JART provided in installments from August 2022 to December 2022.

The agencies also explained that a Joint Agency Review Team (JART) was formed to coordinate the assessment of the application by Halton Region, the Town of Halton Hills, Town of Milton, the Niagara Escarpment Commission and Conservation Halton, and to contribute effectively to MNRF's decision.

Copies of Dufferin's initial submission cover letter and the original Letters of Objection are provided as Appendix A to this report.

1.7 Reply Letters of Objection and Confirmation of Objections from Agencies

Dufferin has not yet provided reply letters of objection to the agencies (and other public objectors). Receiving that letter will initiate the formal reply period under the *Aggregate Resources Act* where objectors would need to indicate if the resolution was satisfactory or if the objection remained (and what might be required to resolve the recommendation).

Once that letter is issued, the agencies will review its content and provide a reply, if appropriate.

1.8 PUBLIC MEETINGS AND SESSIONS

The Ministry of Natural Resources and Forestry released a bulletin titled, *Resuming aggregate application timelines and public consultation under the Aggregate Resources Act (Post COVID-19)* in August 2020. Prior to that, the Ministry of Natural Resources and Forestry had suspended all application review timeframes in alignment with Provincially-issued emergency orders related to COVID-19. As part of responding to the end of the Province's emergency order O.Reg. 73/20 on September 11, 2020, the Ministry made a modification to its consultation requirements. Notwithstanding this Provincial change, the municipalities required Dufferin, at the preconsultation meeting, that Dufferin host a virtual public information session. Dufferin held a Public Information Session on April 7, 2022, as required by Halton Region at the pre-consultation meeting. The Public Information Session was attended by representatives of the applicant, JART staff from each agency and one resident. The applicant provided a presentation that was followed by a question-and-answer period. There was one clarification question raised by agency staff and no comments made by the public.

Halton Region hosted its statutory public meeting under the *Planning Act* on May 17, 2023. A statutory public meeting is required by legislation to be held with respect to applications for amendment to an official plan to give the proponent and the public an opportunity to make representations in respect of the proposal. The stream of the Statutory Public Meeting was viewed by 49 members of the public (through YouTube and Zoom), with four delegates. Issues raised include well water concerns; noise, blasting and vibration concerns; and protection of the natural environment.

The Town of Halton Hills held its Statutory Public Meeting on February 13, 2023. One delegate presented to Council and six written submissions were received prior to the meeting. Comments raised include impacts to homes related to nuisance effects (effects cites were noise, blasting and vibration), flooding and water storage, and inspection of the operation.

The Niagara Escarpment Plan Amendment application seeks to both redesignate lands from Escarpment Rural Area to Mineral Resource Extraction Area and apply a special policy for continued use of existing infrastructure used in the current operation. At its meeting on April 21, 2022, the Niagara Escarpment Commission adopted the staff recommendation to circulate the proposed amendment for comments from the public, non-governmental organizations (NGOs), and partner agencies including municipal, provincial, and federal organizations.

The proposed amendment was posted on the Environmental Registry of Ontario on September 1, 2022, with a request for comments by October 31, 2022 (a 60-day commenting period). Two agencies (Halton Region and Conservation Halton) comments were received through the Registry posting, in addition to two objections and one query through direct emails to the NEC. The objections submitted directly to the Niagara Escarpment Commission have subsequently been withdrawn.

On September 1, 2022, the Niagara Escarpment Commission circulated the Proposed Amendment and requested comments from relevant Indigenous communities, Ministries, affected municipalities, interested parties, neighboring property owners and the public. The proponent also posted a notice at the site with specifications provided by the Niagara Escarpment Commission, for comments to be filed by

October 31, 2022. Notices were also placed in the Milton Champion and Georgetown Independent Free Press newspapers on September 22, 2022, requesting comments by October 31, 2022. The Niagara Escarpment Commission Public Interest Advisory Committee (PIAC) will convene on August 30, 2023, to provide their advice on the Proposed Amendment to the NEC.

1.9 Public Input Received

Public input related to the proposal was welcomed and encouraged at any time during the application review process. JART staff was monitoring and facilitating four active application streams with consultation expectations, in addition to Provincial consultation requirements through the Environmental Registry of Ontario. As part of its mandate, the JART received and considered public input to explore the range of technical issues and impacts related to the proposal.

Technical information provided by the public was shared with technical reviewers and the applicant for consideration in their respective reviews. Content received by the various commenters was provided as part of staff reports (Region and municipalities) and consultation reporting requirements (NEC). Public input was catalogued, summarized, and consolidated with materials received through statutory public consultation into a complete record of public comments received by each agency and placed before the respective Councils, Boards, and the Niagara Escarpment Commission.

JART technical reviewers considered submissions as part of their review of the application. The final technical comment summary tables are attached as various appendices to this report.

Halton Region received two written comments on the proposed Regional Official Plan Amendment, as well as the four delegations received at the Public Meeting.

The Niagara Escarpment Commission received two responses through the Environmental Registry of Ontario posting of the NEP Amendment application from two JART partner agencies (Halton Region and Conservation Halton). Two objections received directly by the NEC were later withdrawn. An additional party made a direct inquiry to the NEC about the Amendment appeal process but did not submit an objection.

The Town of Halton Hills received written correspondence from six residents. Two of the residents sought additional information for clarification and to add their names/address to the consultation mailing list. Four residents residing on 15 Side Road expressed concerns regarding ongoing impacts to their homes related to nuisance effects from the existing quarry (noise, blasting and vibration impacts) and concerns that the quarry expansion could exacerbate these issues.

The Town of Milton received no public submissions.

Concerns raised in public submissions received by the agencies included:

- Protection of the natural environment.
- Well water concerns.
- Noise, blasting and vibration concerns.

- Air quality concerns.
- Traffic and road condition concerns.

JART also facilitated a number of technical working sessions with Dufferin and its consultant team.

Individual agencies will be providing public comment records to their respective Councils, Board, and Commission in accordance with typical reporting procedures.

2. DESCRIPTION OF THE PROPOSAL AND APPROVALS REQUIRED

Dufferin is applying for a Class A (Quarry Below Water) licence under the *Aggregate Resources Act*, which is known as the Halton Hills Quarry extension application. If approved, this would expand the Milton Quarry by extending the licence and extraction areas to the southeast of the "extension" quarry component at the north. No maximum annual tonnage is proposed.

2.1 LOCATION

The existing Milton Quarry (*Aggregate Resources Act* Licences #608621 and #5481), operated by Dufferin Aggregates, is located between Sixth Line Nassagaweya and Regional Road 25, straddling the Milton and Halton Hills municipal boundary. The Cox Tract Regional Forest is bounded to the north and south by the quarry. Operations on site began in 1962. The entire operation consists of the Main Quarry and North Quarry (*Aggregate Resources Act* Licence #5481), where excavation is effectively complete, and the Extension areas (*Aggregate Resources Act* Licence #608621 and #5481), where excavation began in 2012 and continues today. In total, an area of 552 hectares is licenced by the Ministry of Natural Resources and Forestry.

In total, approximately 30.2 hectares of land are proposed to be redesignated in the Niagara Escarpment Plan, Halton Region Official Plan, and the Town of Halton Hills Official Plans to permit the extraction of mineral aggregates on these lands. Of the approximately 30.2 hectares of land, approximately 15.8 hectares would be under active extraction. Remaining licenced lands would include all lands that are a component of an aggregate operation required as conditions of the licence, such as berms or ponds or restoration areas.

Extraction in the northern extension lands commenced in 2007 with Phase 1 (East). West Cell (Phase 2) extraction above the water table began in fall 2012. Extraction below the water table in the West Cell began in June 2013 and had since been completed. Lake filling commenced in the West Cell in mid-2021. Extraction below the water table in East Cell (Phase 3) began in 2017 and continues.

Extraction in the Main and North Quarries as well as the West Cell of the Extension has largely been completed, aside from some remnant material in the Main Quarry, where ongoing clean-up of remaining reserves continues until rehabilitation is complete within the processing area.

The various approvals and agreements related to aggregate extraction at the Site have resulted in the development of an environmental monitoring program and the construction and operation of a Water Management System that supports aggregate extraction activities and facilitates water storage/handling, mitigation of water related environmental features, and long-term rehabilitation. The proposed extension area contains and/or is adjacent to features regulated by Conservation Halton. There is one regulated wetland (Wetland U1) within the proposed licence area, all other wetlands and Provincially Significant Wetlands are adjacent to the proposed licenced area along with the Tributaries of Sixteen Mile Creek. There are no wetlands or watercourses within the proposed limit of extraction.

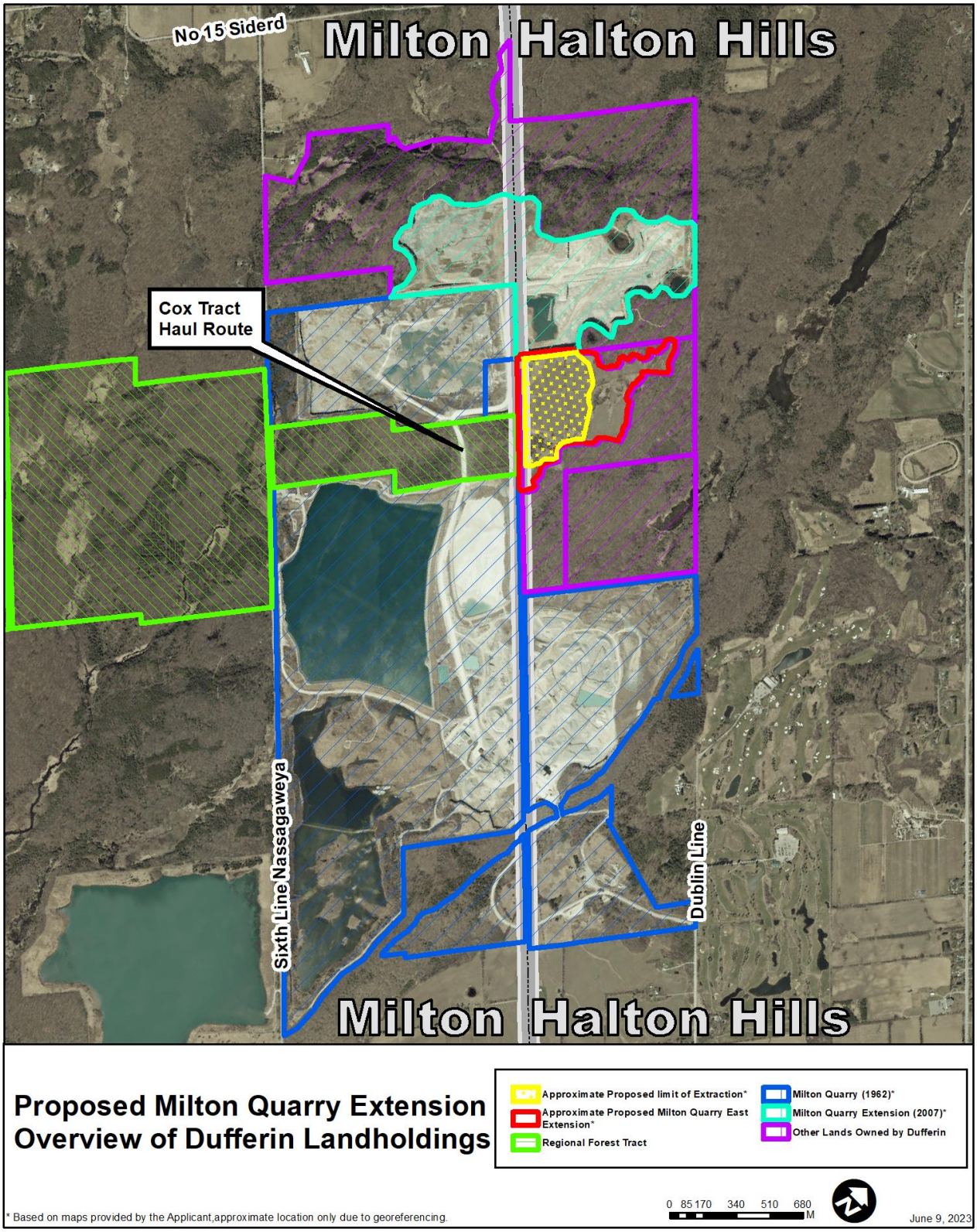

Figure: *Existing Milton Quarry complex and surrounding areas*

2.2 Surrounding Land Uses

The Milton Quarry complex is immediately surrounded on all sides by forest/natural heritage system, with the Niagara Escarpment located along the eastern edge of the existing quarry. Recent expansions have been set back a considerable distance from the escarpment face. This includes the Britton Tract and Cox Tract Regional Forests, with a haul route connecting the northern Milton Quarry Extension through the Cox Tract. North of the quarry are rural residential and agricultural uses. The haul route for Milton Quarry goes south to Dublin Line (through the "Dufferin Gap" in the escarpment), where land uses include rural residential uses, agricultural uses, and a golf course. Trucks then use James Snow Parkway to their final destination, with predominantly employment lands uses along this route.

2.3 Approvals Required and Current Applications

As detailed in Section 1.2, of this report, the following approvals are required to facilitate the proposed quarry expansion:

- A Niagara Escarpment Plan Amendment to re-designate the proposed expansion lands to permit mineral aggregate extraction, and a Development Permit to ultimately permit the development.
- An amendment to the Halton Region Official Plan to re-designate the proposed expansion lands to permit mineral aggregate extraction.
- An amendment to the Town of Halton Hills Official Plan to redesignate the proposed expansion lands to permit mineral aggregate extraction.
- A licence for the new site issued by the Ministry of Natural Resources and Forestry (*Aggregate Resources Act* Licence).

A corresponding amendment to the site plan for the current operation is anticipated to allow for the integration of the entire site as a single operation. For example, processing of mineral aggregate resources extracted in the extension is proposed to occur in the existing processing areas in the original quarry. As of the date of this report, an application for the amendment has not yet been filed.

2.4 Conservation Halton's Review Role

Conservation Halton is a member of JART but is not a decision-making body with respect to the applications. Conservation Halton reviewed the applications based on its responsibility to comment on risks related to natural hazards, including the prevention or mitigation of those risks, and based on its delegated responsibility to represent the Province on the natural hazard policies of the Provincial Policy Statement (PPS Sections 3.1.1 through 3.1.7) per O.Reg. 686/21. Conservation Halton also reviewed the applications to ensure that they aligned with Conservation Halton's regulatory requirements under O.Reg. 162/06 (e.g., natural hazard or wetland related policies and requirements).

The proposed extension lands contain and/or are adjacent to features regulated by Conservation Halton under O. Reg. 162/06. Conservation Halton regulates all watercourses, valleylands, wetlands, Lake Ontario and Hamilton Harbour shoreline, hazardous lands, as well as lands adjacent to these features. Conservation Halton regulates a distance of 15.0 metres from the greater of the flooding and erosion hazards associated with watercourses part of major valley systems, which includes the Tributaries of

Sixteen Mile Creek, 120.0 metres from Provincially Significant Wetlands and wetlands greater than 2 hectares in size and 30.0 metres from wetlands less than 2 hectares in size. Conservation Halton has Board approved regulatory policies that guide the administration of Conservation Halton's regulation entitled, *Policies, Procedures and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document*. Conservation Halton's regulation applies prior to an *Aggregate Resources Act* licence being granted and once it is surrendered or revoked, or for lands outside of a licenced area.

Prior to the introduction of Bill 23 by the Province in fall 2022, Conservation Halton also provided technical advisory advice through the JART on natural heritage and water resources matters through the technical review process. However, on January 1, 2023, *Ontario Regulation 596/22: Prescribed Acts – Subsections 21.1.1 (1.1)* and *21.1.2 (1.1)* of the *Conservation Authorities Act (O.Reg. 596/22)* came into effect. As a result, conservation authorities are no longer able to provide technical review services for planning and development applications that were previously provided under Memorandums of Understanding with municipalities (e.g., technical reviews related to natural heritage and select aspects of stormwater management). However, to facilitate the review to the other JART members, Conservation Halton has reviewed the most recent submission (i.e., Dufferin's second submission).

O.Reg. 596/22 does not affect Conservation Halton's mandatory programs or services. As part of Conservation Halton's review of the most recent submission to JART, Conservation Halton has focused its responses to comments related to natural hazards, and wetland matters, per *Ontario Regulation 686/21* and *Ontario Regulation 162/06*.

2.5 Reports Submitted in Support of the Application

Dufferin submitted the following reports in support of the proposal and during the technical review:

- Agricultural Impact Assessment, DBH Soil Services Inc., November 4, 2021.
- Archaeological Assessments: Stages 1 and 2, Golder Associates Ltd., April 30, 2021; Stage 3, Golder Associates Ltd., April 30, 2021.
- Cultural Heritage Impact Assessment, MHBC Planning, December 2021.
- Level 1 and 2 Natural Environment Technical Report (NETR) and Environmental Impact Assessment (EIA), Goodban Ecological Consulting (GEC) Inc., December 2021 (revised January 2023).
- Fiscal Impact Study, Altus Group, November 15, 2021.
- Air Quality Assessment, RWDI, November 16, 2021.
- Geology and Water Resources Assessment, GHD Ltd., December 2021.
- Planning Justification Report and *Aggregate Resources Act* Summary Statement, MHBC Planning, December 2021.
- Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report, Goodban Ecological Consulting (GEC) Inc., December 2021.
- Traffic Impact Study/ Haul Route Assessment, The Municipal Infrastructure Group (TMIG) Ltd., October 2021 (revised April 2023).
- Public Consultation Strategy, Dufferin Aggregates, December 2021.

- Aggregate Resources Act Site Plans, MHBC Planning, December 2021 (revised July and September 2022).
- Addendum to Updated Adaptive Environmental Management and Protection Plan (AMP), GHD Ltd., Goodban Ecological Consulting (GEC) Inc., December 2021.
- Noise Impact Study, Aercoustics Engineering Ltd., December 7, 2021 (revised October 27, 2022, and March 14, 2023).
- Progressive and Final Rehabilitation Monitoring Study, MHBC Planning, December 2021.
- Blast Impact Analysis, Explotech Engineering Ltd., November 25, 2021.
- Visual Impact Assessment, MHBC Planning, November 2021 (revised October 2022).

Many of the reports were prepared as comprehensive studies covering both the existing site and the proposed site plan amendment, not solely the expansion area. The reports were reviewed comprehensively to produce comments for all applications.

Additional information was received from Dufferin throughout the technical review process, in the form of replies to JART comments, addendum reports, memoranda, and email correspondence. This information was used as the basis for technical discussions between JART staff and peer reviewers and Dufferin. References to this updated information are found throughout the technical review summaries in Section 3 and the detailed appendices to this report. These items are listed below (noting that all individual correspondences may not be reflected in this list):

- **Winter 2022**
  - Geology and Water Resources Clarification Memorandum, Quarry Lake Filling Time Calculation – GHD, February 2022.

- **Spring 2022**
  - Dufferin Traffic Safety Analysis Letter – The Municipality Infrastructure Group (TMIG), March 2022.
  - Traffic Impact Study Synchro Files, The Municipal Infrastructure Group Ltd., March 2022.
  - Dufferin Presentation to JART: Milton Quarry East Extension Water Resources and Water Management System, Dufferin Aggregates and GHD, May 16, 2022.

- **Summer 2022**
  - JART Woodland Boundary Review Memorandum – August 8 & 10, 2022 Site Visits, Goodban Ecological Consulting (GEC) Inc., August 30, 2022; and
  - MQEE Wetland Boundary Review Memorandum – August 10, 2022, Site Visit, Goodban Ecological Consulting (GEC) Inc., August 29, 2022.
  - Revised Air Quality Modelling – RWDI, August 2022

- **Fall 2022**
  - March 2021 Vibration Summary – Explotech Engineering Ltd., April 2021 (provided September 2022).
  - Dufferin Response to JART Archeology Comments –Golder Associates Ltd.., October 2022.

- Dufferin Response to JART Blasting Comments – Explotech Engineering Ltd., December 2022.
- Dufferin Response to JART Agriculture Comments – DBH Soil Services, November 2022.
- Dufferin Response to JART Cultural Heritage Comments – MHBC Planning, October 2022.
- Dufferin Response to JART Visual Impact Comments – MHBC Planning, October 2022.
- Dufferin Response to JART Traffic Comments – The Municipality Infrastructure Group (TMIG), December 2022.
- Traffic Impact Study Synchro Files, The Municipal Infrastructure Group Ltd., December 2022
- Dufferin Response to JART Air Quality Comments – RWDI, November 2022.
- Dufferin Response to JART Financial Impact Comments – Altus Group, December 2022.
- Dufferin Response to JART Geology and Water Resources Comments – GHD, January 2023.
- Dufferin Response to JART Noise Comments – Aercoustics Engineering Ltd., November 2022.

- **Winter 2023**
  - Dufferin Response to JART AMP Comments – GHD and Goodban Ecological Consulting (GEC) Inc., January 2023.
  - Dufferin Response to JART EEP Comments – Goodban Ecological Consulting (GEC) Inc., January 2023.
  - Dufferin Response to JART Natural Environment Comments – Goodban Ecological Consulting (GEC) Inc., January 2023.
  - Dufferin Response to JART Progressive and Final Rehabilitation Comments – MHBC Planning, January 2023.
  - Dufferin Responses to JART Groundwater Modelling Comments – GHD, January 2023; and
  - Responses to Air Quality Comments – MECP Environmental Assessment Branch, RWDI, February 2023.

- **Spring 2023**
  - Geology and Water Resources Clarifications Memorandums:
    - Memorandum 299, Supplemental Monitoring Wells and Triggers, GHD and Goodban Ecological Consulting (GEC) Inc., March 3, 2023.
    - Memorandum 298, Cumulative Dewatering Influence, GHD, March 3, 2023.
    - Memorandum 300, Potential Influence of MQEE in Absence of Mitigation, GHD, March 3, 2023.
    - Memorandum 301, Evaluation of Passive MQEE Mitigation, GHD, March 3, 2023.
    - Memorandum, 302, Water Budget Drought Scenarios, GHD, March 3, 2023.
    - Memorandum, 303, Wetland U1 Hydrogeology, GHD, March 3, 2023.
  - Dufferin Response to JART Traffic CIMA+ Interim Comments – TYLin, April 2023.
  - Traffic Impact Study Synchro Files, The Municipal Infrastructure Group Ltd., April 2023

2.6 NIAGARA ESCARPMENT PLAN AMENDMENT AND DEVELOPMENT PERMIT

The Niagara Escarpment Plan Amendment application seeks to both redesignate lands from Escarpment Rural Area to Mineral Resource Extraction Area and apply a special policy for continued use of existing infrastructure used in the current Dufferin Aggregates Milton Quarry operation. At its meeting on April 21, 2022, the Niagara Escarpment Commission circulated the proposed amendment for comments from the public, Indigenous communities, and partner agencies including municipal, provincial, and federal organizations.

The proposed amendment was posted on the Environmental Registry of Ontario on September 1, 2022, with a request for comments by October 31, 2022 (a 60-day commenting period). As noted above in Section 1.9, a total of two comments were received through the Registry posting.

On September 1, 2022, the Niagara Escarpment Commission circulated the Proposed Amendment and Development Permit Application, requesting comments from relevant Indigenous communities, Ministries, affected municipalities, interested parties, neighboring property owners and the public. The proponent also posted a notice at the site with specifications provided by the Niagara Escarpment Commission, for comments to be filed by October 31, 2022. Notices were also placed in the Georgetown Acton Independent and Milton Canadian Champion newspapers on September 22, 2022, requesting comments by October 31, 2022. The Niagara Escarpment Commission Public Interest Advisory Committee (PIAC) will convene on August 30, 2023, to provide advice on the proposed Niagara Escarpment Plan Amendment.

Objection letters were received from the Region of Halton, Town of Halton Hills, Town of Milton, and Conservation Halton. In January 2023 correspondence the Ministry of the Environment, Conservation and Parks identified the need for further testing sites and data related to air quality, noise, surface water and ground water, for further review and commenting on provision of this supplemental information.

In October 2022 correspondence, Halton Regional staff identified numerous concerns with the application, concluding that the application as submitted does not have appropriate regard for the development criteria listed in Part 26. 2.7, 2.8, 2.9 of the Niagara Escarpment Plan, or support objectives listed in Policy 1.9.1 of the Niagara Escarpment Plan. In separate correspondence from October 2022, both the Town of Halton Hills and Town of Milton staff observed that further studies and data were outstanding and until these shortfalls were addressed, the applications could not be supported based on the data provided to date.

In October 2022, Conservation Halton staff identified that clarification was needed regarding the potential impacts the proposed quarry may have on the surrounding wetlands including the Halton Escarpment Provincially Significant Wetlands and sensitive surface water and groundwater features. Further, there would be a need to expand the existing groundwater and surface water monitoring network and proposed monitoring program to ensure the protection of Conservation Halton's regulated wetlands form and function. It was also identified that additional information was needed regarding the continued operation of the water management system post extraction of the expansion area. It is anticipated that NEC staff

will report on the proposed Niagara Escarpment Plan Amendment and Development Permit Application to the Niagara Escarpment Commission on September 21, 2023.

2.7 The Planning Policy Framework

The following provincial and regional policies must be considered when reviewing the proposal:

- The Provincial Policy Statement (PPS, 2020) contains policies for managing and protecting natural resources including the following relevant areas to the proposal: Natural Heritage, Water, Agriculture, Mineral Aggregate Resources, and Cultural Heritage and Archaeology. It also requires that development be directed away from areas of natural hazards where there is an unacceptable risk to public health or safety or of property damage, and to not create new or aggravate existing hazards. Further, the PPS requires rehabilitation of man-made hazards such as mineral aggregate operations prior to permitting future development on these sites in order to protect public health and safety. (At the time this report is being published, a draft new Provincial Policy Statement is being consulted on by the Province of Ontario. It remains in consultation status.)
- The subject lands are within the Niagara Escarpment Plan Area under the Greenbelt Plan (2017) to which the policies of the Niagara Escarpment Plan apply as well as the Parkland, Open Space and Trails policies of the Greenbelt Plan.
- The subject lands are located within the Escarpment Rural Area land use designation in the Niagara Escarpment Plan (2017). As a Provincial land use plan, the Niagara Escarpment Plan guides land use planning decisions within the Plan area and takes precedence over the Provincial Policy Statement and the Greenbelt Plan to the extent of any conflict. Municipal Official Plan policy must not conflict with the Niagara Escarpment Plan and no development approvals can be given, including an *Aggregate Resources Act* licence until the Niagara Escarpment Commission has issued a Development Permit.
- A Place to Grow: The Growth Plan for the Greater Golden Horseshoe, as amended by Amendment 1 (2020) provides policies for growth management and environmental protection. This Plan defers to either the Greenbelt Plan or the Niagara Escarpment Plan where similar or overlapping matters are addressed. (At the time this report is being published, the Province of Ontario is consulting on combining the Growth Plan and the Provincial Policy Statement into one standalone document. This proposal remains in consultation status only.)
- The Halton Region Official Plan (2022, as amended up to and including ROPA 49) includes requirements for amending the Official Plan as well as policies for the protection of the Agricultural System and Agricultural Area, Mineral Resource Extraction Areas, and the Natural Heritage System.
- The Halton Hills Official Plan was adopted by Halton Hills Council in 2006 and came into force upon approval by Halton Region in 2008. The Halton Hills Official Plan includes policies to address the protection of natural heritage and agricultural areas as well as policies to both protect mineral resource extraction areas for potential future extraction. The Official Plan also includes a range of policies and criteria to evaluate new and expanded quarries.

3. Overview of Technical Findings by the Joint Agency Review Team

JART planners worked with the applicant and their consultants through two circulations of updated plans and responses to technical review comments (through the consolidated comment tables and memoranda or letters as required). These technical comments expanded upon the initial Letters of Objection provided by the agencies in spring 2022. The work was supported by subject matter experts retained by Halton Region and the Town of Halton Hills (see Section 1.1 of this report) and technical staff from the public agencies.

The full record of consolidated technical comments is attached as individual appendices to this report. Below is a summary of the retained consultant's findings and opinions.

3.1 Agricultural Impact Assessment (AIA)

Michael Hoffman (AgPlan Limited) was retained by Halton Region to provide a review of the Agricultural Impact Assessment prepared by DBH Soil Services Inc.

Detailed technical comments and proponent replies are provided in Appendix B to this report.

3.1.1 Review Methodology

The peer review included:

- A review of published literature on soils, soil capability; soil rehabilitation, generally, as well as specifically to, post extraction aggregate operations.
- Reference to existing policy and guidelines.
- Comparison of the submitted Agricultural Impact Assessment and the original Terms of Reference.
- Aerial photo interpretation.
- A site visit.
- Reviews of replies to questions posed in the peer review.
- Personal communication with Ministry of Agriculture, Food and Rural Affairs staff.
- Meetings with DBH and Dufferin.

3.1.2 Original Findings

The peer reviewer sought some additional information to support Halton Region and Niagara Escarpment Commission reporting requirements:

- Soils and capability information from the Halton published soil survey, which is presented at an inappropriate regional scale given the relatively small size of the proposed excavation area (Agricultural Impact Table, Row 1).
- Does not address information in reports by other disciplines which provide descriptions of soil layers which include reference to colour, soil texture, and other characteristics; which are different from the series called Dumfries loam. The Dumfries series is the predominant soil on the site (90.5% of the site as outlined by DBH Soil Services). Soil descriptions given by other disciplines suggest that soils other than Dumfries may be present on the site. It may also be

indicative of higher quality soil capabilities on site than previously known (Agricultural Impact Table, Row 1).

- Clarifications were requested on surface soil stoniness conclusions drawn (Agricultural Impact Table, Row 2).

3.1.3 No Changes through JART Review

Following a dedicated site visit, further discussions, and additional information provided by DBH Soil Services Inc., the issues identified above were resolved. The proposed site is relatively poorer agriculturally due to its separation distance (isolation) from surrounding areas in agricultural use, poor access to the site makes use of large farm machinery equipment more difficult, and the relatively small area available for agricultural use in the context of the aforementioned separation distance and poor access. No changes were made to the proposal based on this component of the review.

3.1.4 Professional Opinion

Michael Hoffman and NEC staff had all comments addressed, and no technical issues remain.

3.2 Air Quality Assessment

Dr. H. Andrew Gray (Gray Sky Solutions) was retained by Halton Region to conduct a review of the Air Quality Study prepared by RWDI.

Detailed technical comments and proponent replies are provided in Appendix C to this report.

3.2.1 Review Methodology

Dr. Gray reviewed the Air Quality Study, which after initial conversations was updated to include model results in summary tabular form aligning with the report findings. RWDI revised its modeling for both Scenario 1 (SC1) and Scenario 2 (SC2) for the proposed extension. Dr. Gray received a set of revised modeling files on September 30, 2022, and a revised Appendix F on October 2, 2022. Because the revisions were substantial and new data produced, the original findings are based upon this September/October 2022 work.

3.2.2 Original Findings

Comments on the 2022 Air Quality Assessment included:

- Modelled particulate concentrations in operating Scenario 1 (SC1) were higher after the updated analysis. A number of model inputs also changed between analyses without explanation, or may have been included incorrectly (Air Quality Table: Rows 1, 2, 3, 4, 7, 10, 12 and 13).
- It is unclear as to why the revised modeling had increased emission rates for four of the SC1 HAUL and four of the Scenario 2 (SC2) HAUL sources and decreased emission rates for all four SC2 TLOAD sources, which resulted in a 3.5% increase in overall (all source) PM10 emissions for SC1 and a 71.0% overall PM10 emissions increase for SC2 (without the LOAD10 source, which appears to have been incorrectly included in SC2, the overall increase in PM10 emissions would have been 42%) (Air Quality Table: Row 9).

- A continued recommendation to use site-specific meteorological data, which can be custom produced by the Ministry of the Environment, Conservation and Parks, as well as different adjacent land use factors thought to be more relevant to the context and supportive of including appropriate levels of sensitivity analyses (Air Quality Table: Rows 3, 6, 10, 11).

Adjusting various parameters to more accurately reflect local conditions, according to Dr. Gray, resulted in dozens of exceedances of Total Suspended Particulate (TSP) standards, by over triple the standard.

3.2.3 Summary of Changes through JART Review

It was through Dr. Gray's review that the Air Quality Assessment required revision and rework. Many of the points raised by Dr. Gray were also found and supported by the Ministry of the Environment, Conservation and Parks, who undertook review independent of JART (though conversations between Dr. Gray, JART staff, and the Ministry did occur). The Ministry of the Environment, Conservation and Parks ultimately required updated analysis aligned with Dr. Gray's requests to support Dufferin's future Environmental Compliance Approval (ECA). Dufferin chose to undertake that additional work.

As of the date of writing this report, that updated report has not yet arrived. It will form a critical component of the final technical review and land use planning analysis.

3.2.4 Professional Opinion

The September/October 2022 data does not demonstrate that air quality impacts from the expansion are appropriately addressed. However, the anticipated summer 2023 update should demonstrate that total particulate matter will likely not exceed Provincial air quality criteria. Addressing the points raised by Dr. Gray and similar points raised by the Ministry of the Environment, Conservation and Parks will be important to demonstrating this conclusion.

3.3 Archaeology and Cultural Heritage

Archaeological Services Inc. (ASI) was retained by the Region of Halton to conduct peer reviews of the Cultural Heritage Impact Assessment (December 2021) prepared by MHBC and Stage 1-3 Archaeological Assessments prepared by Golder Associates Ltd. Additional review of the Cultural Heritage Impact Assessment was provided by Town of Halton Hills and Niagara Escarpment Commission staff.

Detailed technical comments and proponent replies are provided in Appendix D to this report.

3.3.1 Review Methodology

For the purposes of completing these peer reviews, the following technical work has been completed:

- Review of the Cultural Heritage Impact Assessment, Stage 1 and 2 and Stage 3 Archaeological Assessments, and Traffic Impact Study.
- Review of the existing conditions of the lands proposed for licensing based on review of high resolution ortho-imagery and a site visit (guided tour of the existing licenced area and the area proposed for licensing).
- Review of relevant guidance documents, terms of reference documents, policies, legislation, and cultural heritage impact assessment requirements.

3.3.2 ORIGINAL FINDINGS

The Golder Stage 1-2 report for the Milton Quarry East Extension was accepted into the Public Register on June 29, 2021, without technical review, while the Stage 3 report was accepted on July 2, 2021, following technical review. One Euro-Canadian archaeological site AjGx-306 was subject to Stage 3 archaeological assessment but it was concluded that it was not of cultural heritage value or interest. The reports and their recommendations meet the technical requirements of the Province's 2011 Standards and Guidelines for Consultant Archaeologists. The Cultural Heritage Impact Assessment was appropriately spatially scoped and presents all sections generally required of this type of technical study.

The Cultural Heritage Impact Assessment prepared generally presents appropriate background data, site survey information, and historical research results and outputs to identify known or potentially significant built heritage resources and cultural heritage landscapes. However, given that the report acknowledges that results of archaeological investigations suggest the former presence of buildings and human occupation at the site, it was recommended that the range of historical maps reviewed should make an effort to present cartographic renderings of the site from the early twentieth century. Presentation of these supplementary maps would assist in presenting a more complete understanding of the site's evolution with respect to land use activities that occurred at the site during the late nineteenth and early twentieth centuries. Alternatively, documenting the property's chain of title, tax assessment records, agricultural returns, and or census data would also result in a more definitive understanding of what occurred on the property during the late nineteenth century and early twentieth century and whether there is additional evidence indicating that structures were constructed during this period. This exercise could further resolve conflicting statements that suggest the property never had structures despite the results of archaeological investigations recovering materials related to Euro-Canadian land use activities, including food and beverage-related and structural-related artifacts. The supplementary information and analysis may also provide additional context to further understand how and why a former farm lane is evidenced on the lot and provide additional data to support the conclusion there are no significant cultural heritage landscapes located on the subject site.

The Cultural Heritage Impact Assessment report concludes that the subject lands are not considered a cultural heritage landscape because: they have not been demonstrated to be valued to the community; the site's historic integrity has been altered; and given that no buildings remain on the site. These conclusions are premature based on the data and analysis presented in the report. There is no documentation in the Cultural Heritage Impact Assessment that agencies such as the Niagara Escarpment Commission, Town of Halton Hills Heritage Planner or representatives of the local Municipal Heritage Advisory Community were contacted to establish whether these lands have been defined as being a potential cultural heritage landscape of significance to a community. Additionally, the report does not evidence through historical map and aerial photograph reviews or comparative data, that the identified landscape features have been substantively altered.

3.3.3 Summary of Changes through JART Review

Additional working meetings were held with Dufferin's team, JART peer reviewers and staff. Upon discussion and collective review of available information, the Cultural Heritage Impact Assessment was updated to address peer review comments, and following receipt of a revised report, it was determined that the Cultural Heritage Impact Assessment adequately addressed cultural heritage issues.

3.3.4 Professional Opinion

The lands proposed for extraction do not represent a resource of cultural heritage value or interest according to the evaluation criteria set forth in the Standards and Guidelines (Section 3.4.2, Standard 1a and Table 3.2). The conclusion that site AjGx-306 has been sufficiently documented and that no further archaeological assessment is required is appropriate. With the completion of the Stage 3 archaeological assessment, all archaeological concerns with respect to the proposed Milton Quarry East Expansion application have been addressed, subject to the limitations noted on page vi of the Stage 1-2 report and page iv of the Stage 3 report.

All issues related to cultural heritage were adequately addressed by Dufferin.

3.4 Blast Impact Assessment (BIA)

Englobe Corp. (Englobe) was retained by Halton Region to carry out a comprehensive peer review of the Blast Impact Analysis, dated October 25, 2021, prepared for CRH Canada Group Inc., with respect to the proposed Milton Quarry East Extension application for aggregate extraction, and provide blast consulting services to Halton on required basis for the subject project. This comprehensive technical peer review was conducted in accordance with report formatting guidelines outlined in the Aggregate Resources Policies and Procedures Reference Manual.

Detailed technical comments and proponent replies are provided in Appendix E to this report.

3.4.1 Review Methodology

This review was limited to the scope of Explotech's blast induced vibrations and overpressure assessment based on the Ministry of Environment, Conservations and Parks Model Municipal Noise Control By-law NPC 119, governing blasting in mines and quarries in the province of Ontario.

In preparation for this comprehensive technical peer review, a site visit was conducted on March 11, 2022, to verify the existing site conditions and surrounding properties referenced in the Blast Impact Analysis. In addition, the following information have been reviewed:

- Blast Impact Analysis – Milton Quarry East Extension, dated October 25, 2021.
- Ministry of the Environment Conservation and Parks Model Municipal Noise Control Bylaw (NPC 119).
- Draft Site Plan Drawing Sheets 1 to 4 – MHBC Planning, January 2022 (revised July 2022).
- Aggregate Resources Reference Manual.

3.4.2 Original Findings

The Blast Impact Analysis generally describes that the extraction will initially commence in Phase 1 as a continuation of the existing Milton Quarry which eliminates the need for a sinking-cut to establish a new free-face, and retreat in a southerly direction. The existing maximum rock elevation (extracted from the site plan drawing) is generally in the order of 345.0 masl, and the final quarry floor is in the order of 302.5 masl to 304.0 masl. The extraction in Phase 2 will commence at the interface of Phase 1 utilizing the existing free-face and retreat in the general easterly direction to the maximum depth of final quarry floor. Although it is not mentioned in the Blast Impact Analysis, Englobe assumes that the extraction will be carried out in multiple lifts (benches). According to Explotech's vibration and overpressure prediction calculation the maximum recommended blast-hole depth is 18.6 metres, whereas the maximum depth of excavation is 42.5 metres.

In order to mitigate the potential vibration and overpressure on surrounding existing sensitive receptors, the Blast Impact Analysis uses a well-known predictive model developed by the US Bureau of Mines (USBM) prediction formula or Propagation Law to predict vibration and overpressure levels at various standoff distances from the proposed blast site for given blast design parameters to be employed at the proposed quarry. Explotech has used vibration and overpressure data generated during their site-specific attenuation study carried out in October 2020. For all blasting operations, Explotech recommends that routine vibration and monitoring of all blasts be conducted at the closest sensitive receptor.

3.4.3 Summary of Changes through JART Review

Explotech has requested two additional notes for the *Aggregate Resources Act* site plan additional to seven recommendations made by Dufferin:

1. Critical conditions outlined in note C, sheet 2 of 4 of the site plan drawing be judiciously implemented to maintain compliance with the Ministry of the Environment, Conservation and Parks' guidelines and regulations (Blasting Table: Row 1).
2. The recommended blast hole depth must be limited to 18.6 metres. The maximum single bench height shall not exceed 25.0 metres in accordance with the requirements of the *Occupational Health and Safety Act* and the Regulation for Mines and Mining Plans, Section 89(a) (Blasting Table: Row 1).

3.4.4 Professional Opinion

Explotech has reviewed blasting practice and blast design parameters currently employed at the existing Milton Quarry bordering the proposed East Extension extraction zone. Based on Explotech's calculations and verified by Englobe, the blast design parameters currently employed at the existing Milton Quarry will remain compliant with the Ministry of the Environment, Conservation and Parks' guideline limits, should the same blasting practice be employed at the proposed East Extension extraction area. This is conditional upon all Explotech recommendations being implemented, plus the additional two items above.

3.5 FINANCIAL IMPACT ASSESSMENT

Watson & Associates Economists Ltd. (Watson) undertook an initial peer review analysis of the file and provided comments. This report was also reviewed by Watson to determine the accuracy of the information presented and to confirm the report met the requirements of the JART.

Detailed technical comments and proponent replies are provided in Appendix F to this report.

3.5.1 REVIEW METHODOLOGY

When conducting a financial impact analysis, the methodology Watson uses involves an operating and capital cost/revenue analysis. The operating portion of the analysis involves calculating the Town's and Region's tax and non-tax expenditures and revenues with the addition of the proposed quarry expansion. Note that for the purposes of the analysis, utilizing Financial Information Return data is reasonable as it provides the most up to date data on actual spending and revenues received for the municipalities. The data for population and employment is based on the applicants' assumptions (identified through the economic impact analysis discussed subsequently). The evaluation, revenues, and expenditures attributable to the development are estimated on an incremental basis. That is, revenue and expenditure dollars are assigned to the project, only in accordance with anticipated variations it would create from the base year, if it had been built out, as of that time. Sunk costs are ignored, and service levels are planned as remaining generally constant.

The impacts on services may be identified through other submitted studies (e.g., roads and water changes or issues which may have a financial impact) or through an analysis of the operating budget.

The methodology Watson utilizes in conducting financial and economic impact analyses was used to peer review the Altus Report. This methodology has been utilized by the firm in conducting similar analyses, is considered best practice in municipal finance, and has been tested as the Ontario Land Tribunal (formerly, Local Planning Appeal Tribunal and Ontario Municipal Board). Since 1989, Gary Scandlan (Watson) has undertaken over 175 municipal financial and economic impact assessments.

3.5.2 FINDINGS

The fiscal impact study prepared by Altus focuses on revenues the municipality will receive (e.g., property taxes, The Ontario Aggregate Resources Corporation [TOARC] fees). With respect to operating expenditures, the approach taken is based on incremental assessment rather than incremental employment. Further, the relative share of non-residential expenditures is based on the amount of non-residential assessment relative to residential assessment as opposed to the split of population versus employment (Financial Table: Row 1).

With respect to the anticipated tonnage of aggregate to be extracted, it is unclear whether the amount utilized in the analysis is in addition to the current extraction amount, or the total tonnage to be extracted. If the amount utilized is not additional to the existing amount (i.e., the new extraction amounts will replace the existing), this would imply that the revenues identified are not incremental to existing revenues. If the argument of the applicant is that without the quarry extensions, the revenue would no longer be provided to the Town and Region, the fiscal impact study should also include a scenario which identifies the fiscal impact of this option. Further, as the expansion is located in Halton Hills, if the tonnage

is a replacement of existing extraction amounts, then Halton Hills will receive aggregate revenues, and Milton may lose aggregate revenues (Financial Table: Row 1).

General Assumptions

It was unclear if the average extraction amount of 5.5 million tonnes per year will be in addition to current extraction levels or replacing some portion of the existing extraction amounts. Based on Section 3 of the Traffic Impact Study/Haul Route Assessment (included as part of the Applicant's submission package), it is stated that, "the extension is not projected to increase production as per input from the project team". Whether the tonnage is incremental or is replacing existing extraction amounts should be clarified in the analysis. It is also stated that the main processing plant may have to be removed, which would reduce annual extraction amounts to 2,000,000 tonnes. Similarly, clarification on whether this tonnage is incremental, or part of the existing extraction amounts is needed (Financial Table: Row 2). A note that this issue is discussed further in Section 3.5.4 below.

The Financial Information Return data and tax rates utilized in this report are based on 2019 data. Given that 2021 data is now available, it is suggested that the most recent information be used to update the analysis (Financial Table: Row 2).

The rehabilitation of the site and long-term monitoring of the water supply, along with any related costs such as pumping, would be the financial responsibility of the applicant. Although this is a cost to be funded by the applicant, should the applicant no longer own/maintain the property in the future (e.g., through bankruptcy or other means), the costs may be borne by the municipality. The applicant may note that agreements will be pursued with landowners. Until these agreements are in place, the applicant should provide further details on how they will ensure the public does not bear the cost burden. At a minimum, an estimate of the rehabilitation costs and long-term monitoring and pumping costs should be identified in the financial impact analysis to provide the municipalities with an estimated cost that may be incurred in the future (Financial Table: Row 3).

Assessment Assumptions

Depending on the estimated assessed value per acre, Watson's methodology results in less assessed value gain than forecasted by Altus—potentially a loss of $867,600 in assessed value, or up to a gain of $53,910 in assessed value, both of which are lower than Altus' calculated gain of $302,250 in assessed value (Financial Table: Row 4).

Tax Class Assumptions

The assumption for the quarry expansion was that the area proposed for extraction would be taxed at the industrial rate and the remaining lands would be taxed 50% at the farmland rate and 50% at the managed forest rate. The peer reviewer notes this assumption as fair. However, Altus applied a higher Managed Forest tax rate to the entire area. A tax class application suggested by Waterson results in revenues between 55% and 71% lower than calculated by Altus—a loss between $20,000 and $25,000 (Financial Table: Row 5).

3.5.3 Results of Analysis

It would appear that the net fiscal impact on the municipal budgets may be less positive than what has been identified in the Altus report. As noted, commentary should also be provided on the overall net fiscal impact for the Region and the Town of Halton Hills:

1. Altus' report assumed an increase in tax revenue of $10,616 for the Town of Halton Hills. Watson assesses there would be a decrease in property tax revenue relative to this amount (Financial Table: Row 8).
2. Altus' Report assumed incremental aggregate levy revenues of $697,840 for the Town of Halton Hills. This is based on an extraction amount of 5,500,000 tonnes. It is unclear if this tonnage is incremental to what is currently being extracted from the existing quarry and what these impacts are on the Town of Milton (Financial Table: Row 8).
3. It appears the increase in operating expenditures was understated. This increase in operating expenditures should have a larger impact on the overall fiscal position of the Town (Financial Table: Row 8).

Other issues include the incorporation of any social or environmental impacts on cost; a full demonstration that there will be no public costs associated with the proposal throughout extraction, complete rehabilitation, and any long-term mitigation and monitoring; and clarifications around the proposed production volume (maximum 5.5 million tonnes per year) and current volumes (typically 2 million tonnes per year) (Financial Table: Row 11).

3.5.4 Summary of Changes through JART Review

Based on the feedback provided by Watson, Altus provided an updated analysis which addressed the majority of the comments:

- **General Assumptions**: The revised analysis prepared by Altus clarified that the analysis is to be assessed relative to no further quarry operations. Therefore, incremental revenues should be considered an extension of current revenues. Additionally, it was noted the annual extraction amounts may be 2.00 million tonnes rather than 5.5 million tonnes. As such, the revised study provided a sensitivity analysis for both annual extraction scenarios (Financial Table: Row 10).
- **Use of 2019 Financial Data**: The financial information return (FIR) data and tax rates utilized in the initial report were based on 2019 data. Given that 2021 data was available, it was initially suggested that the most recent information be used to update the analysis, however, as noted by the applicant, these years may be impacted due to COVID-19. As a result, utilizing the 2019 information is a reasonable approach (Financial Table: Row 2).
- **Assessment and Tax Class Assumptions:** The revised report provided a sensitivity analysis showing Watson's approach as compared to Altus' approach, as was suggested (Financial Table: Row 5).
- **Long-term Monitoring and Mitigation:** The terms of reference for the fiscal impact report requests the following: "to identify the potential cost of any long-term monitoring and mitigation on the site and the responsibility for that monitoring and the liability to any public authority or

agency associated with that responsibility". No estimates of the potential costs were provided, however, they should be provided to complete the financial analysis (Financial Table: Row 11).

3.5.5 Professional Opinion

Although the financial impact had been overstated, the revised analysis utilized Watson's assumptions to provide a sensitivity analysis. Although no detailed operating analysis was presented for the Region, similar to with the Town, if the Altus assumptions were utilized, the incremental operating expenditures would be minimal relative to the incremental tax revenue and a minor positive impact to the budget would be realized. However, no estimates of the potential Long-term Monitoring and Mitigation costs were provided as per the Terms of Reference (Financial Table: Rows 8, 9 and 11).

3.6 Geology and Water Resources

Norbert Woerns was commissioned to review technical reports related to hydrogeology—primarily, the Geology and Water Resources Assessment Report prepared by GHD. A focused supplemental review was requested of the 5-year Adaptive Management Plan review and a recent 2021 Annual Water Monitoring Report. The primary purpose of this review was to provide an assessment of the effectiveness of the existing Water Management System as it may apply to the proposed extension. Additional support comes from Christopher Neville with S.S. Papadopulos & Associates, Inc. (modelling focus, see Section 3.7) and Daryl Cowell (karst focus, see Section 3.8). Technical review by Conservation Halton staff was also provided.

Ron Scheckenberger, previously with Wood Environment & Infrastructure Solutions Inc. and now with Scheckenberger & Associates Ltd., was retained to conduct a peer review of the surface water assessment aspects of the application. Conservation Halton staff also conducted a review of the report from a natural hazard perspective and as it relates to wetlands. The Natural Hazards review is summarized in Section 3.11 of this Report.

Detailed technical comments and proponent replies are provided in Appendix G to this report.

3.6.1 Review Methodology

Hydrogeological documentation was reviewed for appropriateness of methodologies used in the investigations, completeness of the investigation and analysis, and consistency between the report conclusions and recommendations and the field data. The documentation was also reviewed to ensure it aligned with the terms of reference prepared by Dufferin in support of their studies, with comments incorporated into the first round of technical review.

The surface water review focused on matters associated with surface water management including potential issues associated with flooding, erosion, water quality and water balance to sensitive features. Clearly many of these items cross disciplines, hence required integrated discussion amongst the JART team members. The review also considered the Pre-consultation notes, and the amended Terms of Reference, followed by the reports cited above. Due to the emphasis on surface water management, the focus was on the information contained in the Geology and Water Resources Assessment Report, December 2021. A site visit was also held summer 2022, with Dufferin staff in attendance.

Peer reviewers and agency technical staff reviewed the various reports cited and other supporting documentation. Peer reviewers and agency technical staff reviewed the updated iterations of the site plan, undertook a site visit, and participated in meetings with both JART and the proponent.

3.6.2 Original Findings

The initial review focused heavily on existing conditions in the quarry, and working to identify conditions before the initial quarry development and cumulative effects of quarry operations in this area. Understanding the overall historic effects of decades of extraction in this area, and if historic monitoring data, are necessary to understand and support a variety of proposed mitigation and protection measures, including on-site water management strategies and well water both upgradient and downgradient (Geology and Water Resources Table: Rows 2, 3, 5, 23, 24, 25, 31, 32, 36, 49, 53, 57, 63, 64 and 75).

From a surface water perspective, the Applicant noted no surface water features in the proposed extraction area; only a small wetland pool (U1) located east of the extraction area. Also, the Halton Escarpment Wetland Complex is of interest due to its reliance on groundwater (not surface water). The Scope of work for surface water and hazard lands included:

- Ten new staff gauges in wetlands.
- Groundwater-surface water interaction evaluation.
- Topographic delineations.
- Hazard land review.

Dufferin reported that its plan was to assess the impacts of changes in catchment runoff (i.e., reduction in runoff to downstream areas). The Terms of Reference though provided no details on the approach (only back reference to the Adaptive Management Plan) and also no details on the baseline conditions for comparison and the planned mitigation. This was noted as needing to be more fulsome for a Terms of Reference for an impact assessment. Further it was noted that based on a review of available hazard mapping, there were none within the proposed extraction area.

From the review of available information, it was apparent that the surface water assessment for the proposed extension was to be predominantly focused on the surface water/groundwater assessment and associated mitigation rather than a stand-alone surface water analysis. This approach was largely due to the limited on-site natural resources and Dufferin's planned mitigation strategy. Other issues raised in the initial review include the following (noting that Appendix G contains the full table):

1. A request for detailed discussion with respect to the possible change in vulnerability of the Amabel Aquifer within the proposed extension area between existing conditions and proposed post rehabilitation conditions, with a focus on reducing the vulnerability of the aquifer and post rehabilitation conditions should be included (Geology and Water Resources Table: Rows 7, 47, and 74).
2. Identification of the impacts of the existing approved quarry operations on the proposed extension with and without mitigation as part of a cumulative effects analysis. This is required to provide a means for evaluating the effectiveness of the current and proposed mitigation measures. It would also provide a means of evaluating the degree of enhancement achieved

through the proposed mitigations for the proposed extension (Geology and Water Resources Table: Row 55; Progressive and Final Rehabilitation Plan Table: Row 4).

3. Clarification as to how water quality and quantity monitoring will occur if the proposed expansion is approved, and how the effects of new/different groundwater into the system will affect water quality in the recharge water system and extent of wetland enhancement (Geology and Water Resources Table: Rows 7, 12, 36, 37, 39, 47 and 51).
4. Clarification on delineation of surface water and groundwater divides, interactions of the two systems, and the season and conditions represented in baseline surface water and groundwater data (Geology and Water Resources Table: Rows 8, 9, 17, 18, 20, 25, 29, 59, 66, 67, 68 and 76).
5. A request for discussion of existing down-gradient groundwater or surface water users below the escarpment and the impact the existing Milton Quarry may have had on possible down-gradient groundwater and surface water users/receptors and the possible impact the proposed extension may have on these users (Geology and Water Resources Table: Rows 26 and 30).
6. Concern about locations and insufficient number of monitoring and trigger wells and their effectiveness to guide mitigation and ensure no impacts on downgradient groundwater receptors. Additional monitoring and target levels were required to ensure there would be no negative impacts to the regulated wetlands hydrologic functions (Geology and Water Resources Table: Rows 33, 34 and 56).
7. A request to review Dufferin's Spill Response Plan (Geology and Water Resources Table: Row 41).
8. Clarification on lake filling timelines associated with rehabilitation, and implications on continued use or necessity on the Water Management System being operational (Geology and Water Resources Table: Rows 44, 45, 46, 50, 52 and 71).
9. A request for calculations to demonstrate that severe drought conditions (and other climate change scenarios) would not result in adverse down gradient impacts or reducing the required 700,000 m^3/yr discharge to the Hilton Falls Reservoir Tributary should be provided (Geology and Water Resources Table: Rows 62, 65 and 72).
10. The extent to which the exposed vertical quarry walls impact the local groundwater table is questioned, and if measures will be incorporated to minimize lowering of the local groundwater table to reduce or eliminate the need for ongoing water management (Geology and Water Resources Table: Row 55; Ecological Enhancement Plan Table: Row 3).

There was also considerable discussion, including working meetings and through the proponent's written responses, as well as internal JART discussions on the performance of the Water Management System to date. Halton Region and Conservation Halton technical staff routinely access data from Dufferin and are of the opinion that the Water Management System generally performs as intended and designed.

3.6.3 Summary of Changes through JART Review

The hydrogeological peer review has been an iterative process. A site visit was completed on June 20, 2022. Documents were reviewed with initial comments provided. Dufferin responded to the JART comments by providing clarifications of its analysis through a number of meetings and two slide presentations presented by GHD on May 16 and June 30, 2021. Additional clarification and analysis was provided by GHD/GEC through a series of Technical Memoranda issued March 3, 2023.

Dufferin proposed as part of the proposed extension to artificially maintain water levels in Wetland U1. Since there has been no traditional surface water assessment (hydrology) using continuous simulation or design events nor any hydraulic evaluation of the water levels and velocities in the outlet channel, it is suggested that these investigations be completed to inform the planning and management of the feature (Wetland U1). It was suggested that this be conducted as a form of sensitivity analysis to ensure there are no risks of flooding or erosion. A worst-case analysis was considered appropriate using detailed topography/bathymetry of the wetland and the channel extended to downstream Wetland W36 (Geology and Water Resources Table: Row 79).

Subsequent to the comments provided by JART in January 2023, Dufferin representatives engaged with JART (Scheckenberger & Associates Ltd.) regarding the request for numerical modelling and assessment of impacts associated with the planned artificial filling of the U1 wetland and potential for flooding and erosion off-site, towards Wetland 36. To this end, a supplemental Technical Memorandum was provided (dated March 3, 2023) titled Supplemental Assessment of Wetland U1 Hydrology (Geology and Water Resources Table: Row 79).

Dufferin representatives reaffirmed that no flow has been observed in the discharge channel over the 2019 to 2022 monitoring period. Dufferin Representatives suggest there is about 600.0 m^3 of available storage in Wetland U1 at a depth of about 0.6 metres. The objective of the assessment was to determine if artificial filling of the wetland at the on-set of a major storm could have adverse impacts when compared to existing conditions in terms of flooding and erosion (Geology and Water Resources Table: Row 79).

Dufferin suggested that under the proposed Water Management System, the U1 wetland would be artificially filled to about 400.0 m^3 at an elevation of 338.0 metres in the spring. Dufferin noted that the Water Management System shuts off during storms based on water level feedback through a programmable logic controller, hence not contributing additional flows into the system (Geology and Water Resources Table: Row 79).

A PCSWMM Hydrologic/hydraulic model was prepared for the Wetland U1 catchment in order to determine inflow, routing and outflow hydrographs. Notably the extraction proposes a drainage area reduction from 10.5 hectares to 6.3 hectares. The system was assessed for the 100-year event under three storm durations (3, 6 and 12 hour) and two temporal distributions (Chicago for the 3 hour and SCS for the 6- and 12-hour events). Three (3) scenarios were assessed including Pre-development with the wetland empty, post development with the wetland empty and post development with the wetland full (per the Water Management System prescribed storage). The comparison of flow rates for the pre-development empty and post-development full condition are very similar or slightly less than existing conditions, hence Dufferin concluded no off-site impacts in terms of erosion or flooding (Geology and Water Resources Table: Row 79).

Notwithstanding, Dufferin conducted a further erosion potential assessment of the receiving water feature draining from Wetland U1 to the south. This assessment demonstrated that the calculated velocity under a 100-year event was below the stable or permissible velocity associated with the existing channel based on its current configuration and cover (Geology and Water Resources Table: Row 79).

In terms of the number and locations of monitoring and trigger wells, subsequent technical discussions were held between JART and Dufferin's consultants. To address the issues raised by JART, GHD and Goodban Ecological Consulting Inc. prepared a technical memorandum, *Supplemental Monitoring Wells and Triggers*, dated March 3, 2023. The memorandum was reviewed to ensure the proposed supplemental monitoring and mitigation was satisfactory and included within the Addendum to the Updated Adaptive Management Plan (Geology and Water Resources Table: Rows 30, 33, 34, 35, 56; Adaptive Management Plan Table: Rows 12 and 14).

3.6.4 Professional Opinion

GHD and GEC responded to a number of issues identified above and provided some clarification with additional information to the JART Comment Summary Table. A number of the above initially identified issues have been addressed although a few of the major issues noted above would benefit further resolution and additional information.

The identification and analysis of other practical and feasible alternatives should be considered to reduce the amount of continuous pumping to maintain groundwater levels and water levels and hydroperiods of wetlands of concern with respect to the proposed extension.

There is concern the long-term dissolution process on the dolostone bedrock has not been adequately accounted for with regard to the impact on long-term Water Management System operations.

3.7 Groundwater Modelling

S.S. Papadopulos & Associates, Inc., (SSP&A) was retained to provide an independent peer review of the hydrologic/hydrogeologic modelling prepared by CRA, in addition to the Geology and Water Resources Assessment Report prepared by GHD. Conservation Halton staff also reviewed the modelling. JART staff also benefitted from data reporting on Dufferin's existing Water Management System.

Detailed technical comments and proponent replies are provided in Appendix H to this report.

3.7.1 Review Methodology

In addition to the Geology and Water Resources Assessment Report and hydrologic/hydrogeologic modelling, SSP&A reviewed technical memoranda, the site plans as updated, and responses and clarifications provided by Dufferin.

During the peer review, SSP&A has also consulted guidance documents on groundwater modelling and model reviews, including:

- Anderson *et al.* (2015). Applied Groundwater Modeling.
- American Society for Testing and Materials (ASTM) groundwater modelling guidance documents (2010, 2013, 2014, 2016).
- Spitz and Moreno (1996) textbook, A Practical Guide to Groundwater and Solute Transport Modeling.
- Wels *et al.* (2012) Guidelines for Groundwater Modelling to Assess Impacts of Proposed Natural Resource Development Activities, prepared for the British Columbia Ministry of the Environment.

- Reilly and Harbaugh (2005) United States Geological Survey Guidelines for Evaluating Groundwater Flow Models.

SSP&A has also reviewed documents on the state of the practice of coupled and integrated groundwater/surface water modelling, including the following summaries of intercomparisons of integrated surface water/groundwater models published in the peer-reviewed literature:

- Delfs *et al*. (2021), "An inter-comparison of two coupled hydrogeological models."
- Haque *et al*. (2012), "Surface and groundwater interactions."
- Kollet *et al*. (2012), "The integrated hydrologic model intercomparison project."
- Maxwell *et al*. (2012), "Surface-subsurface model intercomparison."

3.7.2 Original Findings

The groundwater modelling for the proposed extension has been conducted to support the assessment of the proposed extension of the existing Water Management System required to remain protective of bedrock groundwater resources in the area surrounding the Milton Quarry and the proposed extension. The groundwater modelling is documented in the *Geology and Water Resources Assessment* Report (Appendix F). During the review it was found that the documentation of the modelling was self-contained, clear, and generally sufficient. A meeting was held with the Dufferin groundwater modelling team, and it was confirmed that the modelling results reported in Appendix F were reproducible (Water Modelling Table: Row 11).

Some omissions in the documentation were identified and requests for clarification were presented in preliminary peer review report of March 8, 2022. Peer review comments were compiled in the JART Comment Table on Groundwater Modelling in May and July 2022. With the exception of one comment, all comments were resolved in the JART Comment Table of January 2023. This exception is discussed in detail in Section 3.7.4 (Water Modelling Table: Row 24).

The groundwater model extends to natural hydrologic boundaries and includes appropriate representations of the primary processes affecting groundwater flow. The model is regional in scale but is relatively highly resolved around the existing phases of the quarry and the proposed extension. The model represents flow in the bedrock with the equivalent porous medium (EPM) approach. Although the groundwater flow in the bedrock is through discontinuities in the rock (i.e., joints, bedding planes and fractures), discrete fractures are not represented with the EPM approach. Considering the scale of the Milton Quarry, the EPM approach is appropriate and has been adopted for other quarries close to the Niagara Escarpment (for example, the Acton Quarry). The model has been calibrated to groundwater levels from dedicated monitoring wells and to measured groundwater flows (Water Modelling Table: Rows 7 and 33).

It is particularly important to note that the development of the groundwater model of the Milton Quarry and its surroundings has followed a logical evolution of refinement and updating from 2000 through 2021. As indicated in Appendix F, the modelling has been accepted as it has progressed. The 2000 modelling and its related results were reviewed and accepted by the JART and all the agencies responsible for the review and approval of the Milton Quarry Extension. The review of the 2011 Pre-extraction model found

the model to be suitable and appropriate for its intended use. No concerns were identified regarding the modelling conducted to support the 5-Year Adaptive Management Plan Review (Water Modelling Table: Row 19).

3.7.3 Summary of Changes through JART Review

No changes to the proposed extension have been made in response to the JART review of the groundwater modelling. However, in response to peer review comments, Dufferin prepared several important supplements to the modelling documentation.

In an e-mail response dated July 22, 2022, GHD, included supplements to Appendix F of the *Geology and Water Resources Assessment Report*. The material included in the attachment to the e-mail is *Dufferin Milton Quarry JART Comments - Geology and Water Resources.pdf*. The supplements included an expanded version of Table F6.3, a corrected Table F7.1, and figures of water level elevations for Wetlands V2, W7 and W8 for calendar year 2017. The response also included supplementary Figures 4, 5, and 6 corresponding to more detailed views around the East Extension for Figures F7.4, F7.5, and F7.6, respectively, and supplementary Figures 7, 8, and 9 corresponding to more detailed views around the East Extension for Figures F7.1, F7.2, and F7 (Groundwater Modelling Table: Rows, 7, 8, 9, 12 and 13).

To clarify the analysis of final lake filling, Memorandum 294 was prepared, *Clarification of Quarry Lake Filling Time Calculation* (GHD, February 14, 2022).

On September 21, 2022, GHD prepared a detailed explanation of the predicted groundwater flow directions from the North Quarry at final rehabilitation.

Row 24 of the Water Modelling Comment Table reads:

> Whether or not this is regarded as a remote possibility, we consider it appropriate to ask, what are the likely impacts if the [proposed extension] proceeds but the existing mitigation measures are not extended? The results of additional analyses will assist the JART in understanding the nature of the additional responsibilities and in understanding why the additional mitigation measures proposed for the [proposed extension] are required.

Although Dufferin responded that the recommended additional analyses were not relevant, an extensive discussion was included in Memorandum 300, *Potential Dewatering Influence of the MQEE in the Absence of Mitigation* (Water Modelling Table: Row 24).

3.7.4 Professional Opinion

The modelling that has been conducted meets the objective of supporting the assessment of the extensions of the existing Water Management System required to remain protective of bedrock groundwater resources in the area surrounding the Milton Quarry and the proposed extension. The groundwater modelling has been conducted to a technical level that is consistent with the state of the practice. Close matches to multiple sets of observations have been achieved, confirming that the model can be used reliably to predict changes arising from development of the proposed extension lands. The results of the predictive analyses are reasonable, and, in the peer reviewer's opinion, it is unlikely that an

independent analysis of groundwater flow would yield substantively different results (Water Modelling Table: Rows 9, 22, 27 and 28).

In evaluating the results of modelling conducted for the proposed extension, it is essential to bear in mind that the analyses incorporate three key assumptions:

1. In the analysis of the full development (approved quarry plus the proposed extension) it is assumed that all existing mitigation measures are operating successfully to mitigate impacts. The pre-existing mitigation measures include the diffuse discharges around the East Cell (V2, W7, W8) and the system of recharge wells started in 2007.
2. It is assumed in the analysis that prior to commencement of extraction, the existing Water Management System will have been extended around the proposed extension. Diffuse discharge at wetlands U1 and W36 will be added, along with a network of recharge wells around the south and east buffers of the proposed new extraction area.
3. There will be active water management in perpetuity is planned for the Milton Quarry, regardless of whether the proposed extension proceeds.

These assumptions are balanced by the consideration that the proposed development of the proposed extension represents the expansion of an extensive existing quarry where mitigation measures have been demonstrated to be successful. The Water Management System would be expanded to add the proposed extension to the existing system and rehabilitation measures (Water Modelling Table: Rows 26, 27, 28 and 36).

It is important to note that the performance of the proposed mitigation relies on the proven Water Management System and Adaptive Management Plan and does not rely on modelling or simulated results. This has not precluded a detailed review of the modelling; the peer review of the model is important in and of itself because the model represents a synthesis of the understanding of site conditions. It is recognized that it is ultimately the protective provision of the Adaptive Management Plan along with the associated approvals and legal agreements that ensure that the long-term conditions are achieved that result in suitably protective groundwater conditions or cause any appropriate mitigation/rehabilitation refinements to occur to ensure the water resources are maintained as proposed (Water Modelling Table: Row 11).

Although not referred to in the water modelling conducted for the proposed extension, there is evidence at the site that provides insights into the likely impacts of proceeding without mitigation measures. The hydrographs attached to Memorandum 298 demonstrate that in the absence of mitigation, bedrock groundwater levels at the proposed extension at locations affected by the quarry development would likely decline on the order to 4.0 to 8.0 metres, with larger declines at some locations (groundwater levels at the MW4 series monitoring wells declined by 12.0 to 14.0 metres between 1996 and 2004). In his letter of March 6, 2023, Norbert Woerns identified the impacts at the MW4 series, but he also identified impacts at monitoring locations DW114, DW119, DW120 and DW121 (Figures D11 to D14 of Appendix D of the GWRA Report). Although the modelling conducted for the proposed extension does not consider impacts in the absence of mitigation, on further reflection and focus on the observations at the site, there are

sufficient data to provide an impression of the potential magnitudes of those impacts (Geology and Water Resources Table: Row 32; and Water Modelling Table: Rows 24, 27 and 28).

Dufferin indicated in a presentation on June 30, 2022, that Conservation Halton will inherit all aspects of the Water Management System, including the future modifications and additions that will be required for the proposed extension. This is reiterated on page 2 of Memorandum 300. It is important to identify the additional elements of the Water Management System that are currently envisaged to be inherited with the proposed extension lands. Referring to the second of the two attached figures, reproduced from Figure 7.5 of the GWRA, the mitigation measures for the proposed extension will include an additional 46 recharge wells. Referring to Table F7.1 of the GWRA, the total recharge flows are predicted to remain similar between the approved quarry at full extraction and the approved quarry and expansion lands at full extraction (Water Modelling Table: Rows 9 and 24).

3.8 Karst Hydrogeology

Daryl Cowell was retained to contribute to a technical review of a component of the hydrogeology, specifically focussing on potential karst issues. Conservation Halton also reviewed the studies to ensure the regulatory requirements under O.Reg. 162/06 in terms of natural hazards: potentially hazardous karst (i.e., unstable bedrock) are met (see Section 3.11, Natural Hazards).

Detailed technical comments and proponent replies are provided in Appendix I to this report.

3.8.1 Review Methodology

Technical reviews are based on Mr. Cowell's professional training and work in the area of karst hydrogeology including undergraduate and a Master's studies, and karst field and research work conducted over an approximately 50-year career. Mr. Cowell's opinion is informed by this knowledge and experience of potential karst features and processes on the site and immediate surroundings that could impact significant surface water features due to extended dewatering of the proposed two extensions.

3.8.2 Professional Opinion

Mr. Cowell agreed with the submitted reports and that there are no karst hazards or significant karst issues on site or applicable to this application (Geology and Water Resources Table: Row 1).

3.9 Natural Environment– Terrestrial

North-South Environmental Inc. was retained to review technical reports, with a focus on terrestrial habitat associated with the quarry expansion. Conservation Halton also reviewed the technical reports with a focus on regulated wetlands. Review in this discipline was informed by collaboration and discussion with JART's groundwater and surface water experts.

Detailed technical comments and proponent replies are provided in Appendix J to this report.

3.9.1 Review Methodology

The Natural Environment Report, the Ecological Enhancement Plan, the Progressive and Final Rehabilitation and Monitoring Study, and the Adaptive Management Plan Addendum were reviewed, along with the site plans at various stages of review. Subsequent to the review of these documents, reviewers conducted three site visits to review the site's features. This included reviewing the staking on the western part of the proposed extension and discussing the proposed removal of Woodland A and Woodland B, reviewing the woodland dripline on the northern, eastern and southern portions of the proposed extension and delineating the Conservation Halton regulated wetland in the centre of the proposed extension area (Wetland U1). JART technical staff subsequently reviewed two memoranda that were prepared by Goodban Ecological Consulting (GEC) Inc. that described the revised wetland delineation (MQEE Wetland Boundary Review – August 10, 2022) and dripline staking (JART Woodland Boundary Review – August 8 & 10, 2022).

Review compared the methods and protocols used by Dufferin's consultants to protocols recommended by appropriate sources accepted as best practice within the Province of Ontario. North-South Environmental Inc. undertook this assessment of method and protocols utilizing experience obtained over 30 years of consulting practice in Ontario, with an understanding gained of standard practice during field surveys, analysis and reporting for private, municipal, provincial, and federal clients.

Review in this discipline was informed by collaboration and discussion with JART's groundwater and surface water experts.

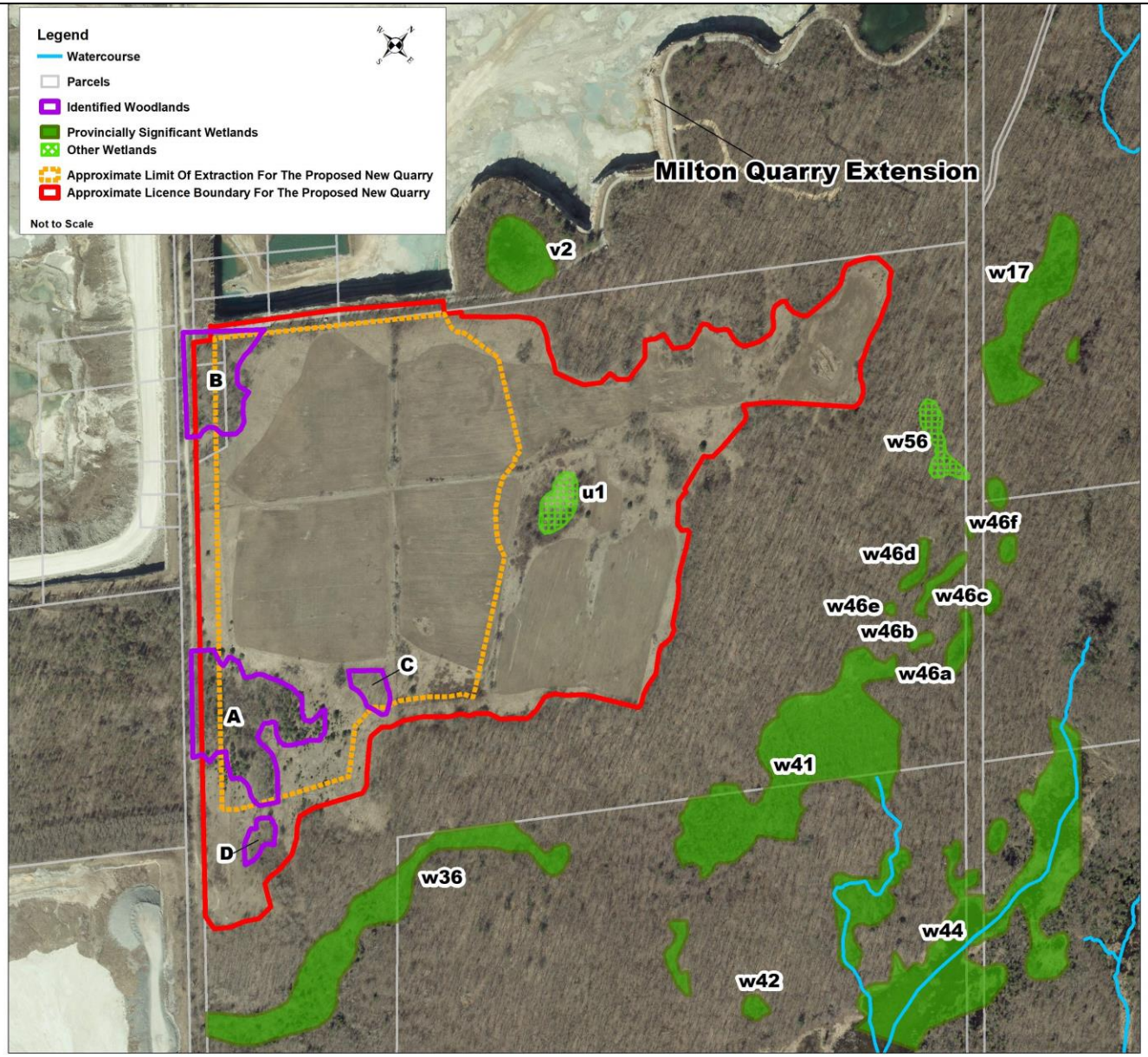

Figure: *watercourses and wetlands in or near to the proposed extension.*

(This map has been prepared to help with geographic location identification for the reader.)

3.9.2 Original Findings

The mitigation of impacts on natural features/areas and future rehabilitation works are dependent on a functioning water management system for the long-term. A large and important population of Jefferson Salamanders ("salamander") resides in close proximity to the proposed licence area. An agreement with a public agency for the long-term ownership and management of the water management system is critical (Natural Environment Table: Rows 17 and 18).

A number of additional issues remained based upon initial review:

- Some elements of site characterization required clarity or update, including habitat identification, feature locations and boundaries, and associated analysis of those items to ensure the impacts of extraction are minimized (Natural Environment Table: Rows 4, 6, 8, 9, 10, 11, 13, 14 and 15); Ecological Enhancement Plan Table, Rows 2, 4). JART comments focused on a range of species, both faunal and floral, and habitats.
- Additional detail of cumulative impact analysis should be provided that examines the potential interaction between the change in groundwater regime, increase in drying winds and ambient light as a result of removal of vegetation and extraction activities, and invasion of non-native species. These cumulative impacts particularly should be examined for the period between extraction and rehabilitation as well as post-rehabilitation (Natural Environment Table: Row 16).
- Some wetlands are within the historic zone of influence of the Main, North Quarry and East Cell. As a result, there was concern that the proposed extension may cause additional impacts within its zone of influence. Additional monitoring and target levels were required to ensure there would be no negative impacts to the regulated wetlands form and functions (Natural Environmental Table: Row 25, Geology and Water Resources Table: Rows 30, 33, 34, Adaptive Management Plan Table: Row 12).
- Seasonal pumping with quarry water will be used extensively for mitigation prior to rehabilitation, should there be reductions in water levels in salamander breeding wetlands. It is understood that the water management system has been highly effective in the past. However, there is evidence that high conductivity, which can be found in quarry discharge, can impair amphibian larval development. It should be clarified whether water monitoring includes monitoring of parameters related to ecological function. For example, if quarry water continues to be used to mitigate impacts on vernal pool hydroperiod, it should be confirmed that discharge water conductivity (and other parameters that could affect amphibian breeding such as pH) will not change with excavation in the extension, and/or that it will be monitored for potential changes in conductivity, pH and other parameters that could affect amphibian breeding, with appropriate actions if mitigation indicated a potential adverse impact (Natural Environment Table: Row 18).
- Some detail on compensation for Eastern Meadowlark and Bobolink habitat in accordance with requirements under the Environmental Site Assessment should have been included, as this habitat is to be removed (Natural Environment Table: Row 19).
- The extraction footprint encroaches slightly on a Jefferson Salamander movement corridor (Natural Environment Table: Row 11).

- Additional, detailed justification on buffer reductions is required to a Significant Woodland on the southwest side of extraction, and adjacent to Wetland V2 (Natural Environment Table: Rows 20 and 21).
- Long-term monitoring plans and commitments should be described (Natural Environment Table: Row 22 and 23).
- Linkage to the Cox Tract should be enhanced by connecting it to the forests to the east (Natural Environment Table: Row 12).
- Confirm the boundary limits of Wetland U1 and significant woodlands within the licence area. (Natural Environment Table: Row 28).
- Following the August 2022 site visits, there was disagreement that ash should be excluded from the definition of a woodland because ash, like many other tree species prone to disease, is still a tree species, and that many of the functional attributes of a woodland are present even when the woodland is dominated by young saplings (Natural Environment Table: Row 15).
- The success of the Ecological Enhancement Plan will be determined partly by whether non-native invasive species out-compete native species used for enhancement over the long term. It will also be determined by the survivability of planted species. While it is not expected that a highly detailed invasive species management plan be prepared at this stage, the framework of a management plan, and a proposed time frame for long-term monitoring, should be proposed (Ecological Enhancement Plan Table: Rows 1 and 5).
- Additional comments around potential restoration areas and intersectionality with the extended Water Management System and moisture regimes in the adjacent natural heritage features (Ecological Enhancement Plan Table: Rows 6, 7 and 11).

3.9.3 Summary of Changes through JART Review

Through further discussion and rationalization from Goodban Ecological Consulting (GEC) Inc. in association with review of features in the field, a number of issues were clarified and resolved. Buffers were adjusted following dripline staking of significant woodlands and wetlands in the vicinity of extraction. Woodlands A and B also did not meet the definition of Significant Woodlands according to Regional criteria, even with the inclusion of ash trees (Natural Environment Table: Rows 7, 13, 14, 20, 21, 26, 27 and 28; and Adaptive Management Plan Table: Row 6).

The extraction limit was adjusted to correspond with the 50 metres buffer from the boundary of Wetland U1, which was staked in the field with agencies, and re-drawn on the site plans. Boundaries of Significant Wildlife Habitat for Area-sensitive Breeding Bird Species were re-drawn to include the woodland to the east in its entirety. Boundaries of Significant Wildlife Habitat were re-drawn including all woodlands within a 230.0 metre radius from the boundary of the amphibian pond as required by the Significant Wildlife Habitat Ecoregion Schedules for Ecoregion 6E. Adjusted (and decreased) limits of extraction were drawn that reflected the staked boundaries of features and their buffers (Natural Environment Table: Rows 13, 14, 27 and 28).

It was agreed through discussion with JART members that it would be difficult to pinpoint the timing of the groundwater drawdown in Wetland U1, but that the wetland had a surprising diversity and abundance

of amphibians given how little water was present in the most recent surveys. The drawdown may have begun in the later stages of the East Extension and continued as this area was extracted, but was not monitored as it occurred at a time when the land was not owned by the current proponents. All agreed that it would be beneficial to begin water management in this wetland as soon as possible after obtaining approvals (Natural Environment Table: Rows 10 and 33).

As a result of subsequent technical discussions between JART and Dufferin's consultants, GHD and Goodban Ecological Consulting Inc. prepared a technical memorandum, *Supplemental Monitoring Wells and Triggers*, dated March 3, 2023. The memorandum was reviewed to ensure the proposed supplemental monitoring and mitigation for Wetlands 41 and 46 was satisfactory and included within the Addendum to the Updated Adaptive Management Plan (Natural Environment Table: Rows 25; and Adaptive Management Plan Table: Rows 12 and 13).

Rationale was provided to explain that there is likely little movement of amphibians through the Cox Tract because there is no amphibian breeding habitat there. This was confirmed through a visit by North-South Environmental staff. Connections to forests to the east will be reestablished and enhanced during rehabilitation (Natural Environment Table: Rows 3 and 12).

The potential occurrence of bat hibernation habitat within 500.0 metres of the quarry extension was investigated by GEC through examination of areas of caves, mine shafts, underground foundations and karst features. No features of this type were found (Natural Environment Table: Row 4).

The proposed rehabilitation includes features that are not typical of the vegetation/landform units that represent this Ecodistrict. However, it was pointed out that some of the suggested communities would be very difficult to restore, and rationale was provided for the proposed communities in terms of their practicality, and presence in this section of the Niagara Escarpment (Natural Environment Table: Row 24).

Lastly, rationale was provided to explain that cumulative impacts have been effectively managed through the water management system, and will continue to be managed that way. In addition, invasive species (one of the aspects of cumulative impacts) will be monitored through an invasive species monitoring program (Natural Environment Table: Row 16).

Bat snag density surveys were completed using 25.0 centimetre diameter at breast height (d.b.h.) as the cut-off for potential maternity roost trees. However, there is ample evidence that trees less than 25.0 centimetre d.b.h. can provide roosting habitat for bats, and so the results of bat habitat surveys should be re-calculated to include bat habitat trees at least to 10.0 centimetre d.b.h. However, this would likely not affect the boundaries of Significant Wildlife Habitat for bat nursery colonies Natural Environment Table: Row 5).

One outstanding issue identified was that Black Ash, recently designated an endangered species under the Endangered Species Act, should be monitored in Wetland W41, where it has been identified that there may be changes in the groundwater table and where water management (i.e., addition of water to the wetland if there is evidence it is drying prematurely) may be conducted if needed. It is understood that Black Ash is endangered due to a pest, but maintenance of habitat for all populations is important, and

the appropriate hydrological regime for this species should be maintained, as it may not survive inundation to the same extent as Jefferson Salamander (Natural Environment Table: Rows 6, and 15).

Lastly, water quality monitoring of quarry water used for discharge is proposed that primarily monitors parameters related to human health. Parameters (and thresholds) related to ecological health should also be monitored. It is understood that water quality for the water management system that maintains Jefferson Salamander breeding habitat has never been a concern with previous extensions. However, water quality should be monitored for ecological health as a precautionary measure (Natural Environment Table: Rows 7 and 18).

3.9.4 Professional Opinion

The clarifications and revisions made to the Site Plan have largely resolved the concerns identified by the reviewer. The few remaining points related to monitoring of Black Ash and ecological aspects of water quality used for water management can likely be fully resolved through commitment to additional monitoring (Adaptive Management Plan Table: Row 8).

The proposed monitoring and mitigation measures to be included in the Addendum to the updated Adaptive Management Plan for the wetlands are satisfactory (Adaptive Management Plan Table: Rows 8 and 9).

The use of perpetual water management to mitigate the predicted hydrological and hydrogeological changes in Jefferson Salamander breeding ponds is a critical issue. It is the most important method proposed for mitigating what would otherwise be significant impacts to Jefferson Salamander habitat in an important part of this endangered species' population. Water management has been effective in the past, but should continue to be closely monitored. As noted above, agreements for maintaining water management must be effectively constructed so management continues to mitigate impacts for the foreseeable future (Natural Environment Table: Row 18).

3.10 Natural Environment– Fish, Aquatic Habitat, and Jefferson Salamander

Matrix Solutions was commissioned to review technical reports, with a focus on fisheries and aquatic habitat associated with the quarry expansion. As surface and groundwater disciplines are interrelated with fisheries and aquatic habitat, comments from surface water and the geology and water resources specialties were noted through discussions and provided as additional explanation (where warranted).

Detailed technical comments and proponent replies are provided in Appendix K to this report.

3.10.1 Review Methodology

In addition to review of submitted technical reports and the site plan in the context of Provincial, Regional and local policy, a series of working meetings were also held with the JART blasting peer reviewers to examine potential interaction between blasting and Jefferson Salamander activity.

3.10.2 ORIGINAL FINDINGS

The proposed extension of the Milton Quarry, referred to as the Milton Quarry East Extension (MQEE), represents a proposed extraction area of approximately 16.0 hectares bounded by the existing East Cell to the north, the existing North Quarry to the west, and the existing Main Quarry at some distance to the southwest and south. The expansion footprint will be primarily within large open fields that do not appear to contain fish habitat. Future ecological enhancement and rehabilitation plans for the proposed extension include a deep lake which would be contiguous to the larger lake envisioned for other parts of the quarry area.

Review of the Natural Environment Technical Report and the Adaptive Management Plan provide a comprehensive understanding of issues related to fish habitat. Based on the limits of the extraction area in relation to distance to the nearest fish habitat, it is evident that fish habitat issues are not of major concern in relation to the proposed extension. The background review reveals Jefferson Salamander and Unisexual Ambystoma (Jefferson Salamander Dependent) populations utilizing breeding ponds within the licenced area of the proposed extension. These breeding ponds have been described as Wetland U1 and Wetland V2 in the Natural Environment Technical Report (Natural Environment Table: Rows 34 and 35).

The Blast Impact Analysis, Milton Quarry East Extension, Part of Lots 11 and 12, Concession 1 Town of Halton Hills (Explotech, 2021) provides locations of sensitive receptors and estimates of potential impacts from blasting. The Blast Impact Analysis was based on the Ministry of Environment, Conservation and Parks Model Municipal Noise Control By-law (NPC119) with regard to Guidelines for Blasting in Mines and Quarries. Based on review of this report, a listing of the closest sensitive receptors has been provided, along with the distances from the edge of the licenced area of the proposed extension. The sensitive receptors are defined as the addresses of residential dwellings in close proximity to the proposed extension. Guidelines for blasting do not include ecological receptors. Mapping provided in the Natural Environment Technical Report shows blasting and excavation activities occurring in distances estimated to be within the range of 50.0 to 70.0 metres known salamander breeding ponds (Blasting Table: Rows 2, 4; and Natural Environment Table: Rows 34).

Although the function of Salamander Breeding within wetlands U1 and V2 is documented in the Level 1 and 2 Natural Environment Technical Report, the Environmental Impact Analysis does not discuss the potential impacts to Jefferson Salamanders and unisexual Ambystoma at all life stages and their habitat in relation to blasting activities. By extension, other animals using the wetlands U1 and V2, such as amphibians may also be impacted by blasting. Observations taken by GEC noted no mortalities associated with blasting effects on Jefferson Salamanders and unisexual Ambystoma populations and other amphibians utilizing vernal pools within proximity to blasting. It is understood that GEC has been monitoring the Milton Quarry for several years and has never encountered amphibian mortalities during investigations of vernal pools. GEC has mentioned that if Salamanders were to be killed (as observed during a flash freeze event), their bodies would be easily detectable within the vernal pool environment. GEC's observations reveal populations of salamanders in areas known to have been in close proximity of blasting events from existing licenced areas of the quarry and have relocated salamanders from areas affected by the blasting impact zone. However, these observations are not tied directly to specific blasting events (Natural Environment Table: Rows 34, 35; Blasting Table: Row 4).

Monitoring of amphibians through call counts further suggest that amphibian populations remain viable within areas where blasting was carried out around licenced areas of the quarry, but these observations do not indicate any further biological effects with respect to these populations (such sublethal effects or injuries). There is a lack of literature on the effects of blasting in quarries in general, with most studies centered primarily on fish affected by underwater blasting events. The Federal Department of Fisheries and Oceans (DFO) provides guidelines for the use of underwater explosives based on distances through various rock substrates. Based on guidelines applicable to fish habitat, the wetlands U1 and V2 may be potentially exposed to high levels of blasting (Blast Impact Table: Rows 2, 4, 6, 7 and 8).

Since ecological receptors are not recognized by existing guidelines, the use of blasting in terms of the blasting loads in proximity to ecological receptors has no defined limits. As blasting and extraction activities approach a distance setback where there may be potential impacts to the wetland habitat in U1 and V2, supplemental monitoring may reveal further information with respect to these wetlands (Blast Impact Table: Row 4).

A number of questions of clarification were also asked about how the Water Management System and rehabilitation plans were designed to consider Jefferson Salamander habitat and movement patterns (Ecological Enhancement Plan Table: Rows 8, 9, 10).

Dufferin will need to apply for an *Endangered Species Act* 17(2)(c) "Overall Benefit" Permit or receive other authorization from the Ministry of Environment, Conservation and Parks as a portion of the proposed extraction area may be identified habitat for Jefferson Salamander and Unisexual Ambystoma (Jefferson Salamander dependent population) and the proposed Water Management System footprint will be partially located in the regulated habitat (per Section 15.2 of the Natural Environment Technical Report). Dufferin recognized this requirement in its submitted Planning Justification Report as well (Section 6.5 of the Planning Justification Report) (Natural Environment Table: Rows 11, 34).

3.10.3 Professional Opinion

Although GEC's observations have suggested that amphibian populations remain viable under various exposure to historical quarry blasting events and that no mortalities have been observed, there are no direct observations linking amphibian mortality during specific blasting events. Review of the site plan indicates that records of the blasting events will be kept and monitored, with respect to human residence receptors. As it is understood that GEC already monitors the herpetofauna within Wetlands U1 and V2 within the Milton Quarry as part of the Wetland Ecology Monitoring Network in the Adaptive Management Plan (Section 13.1.4 in the Level 1 and 2 Natural Environment Technical Report), information linking specific blasting events to amphibian monitoring will provide additional supplementary information specific to blasting concerns related to these wetland habitats (Blasting Table: Row 4).

Since ecological receptors are not recognized by existing guidelines, the use of blasting in terms of the blasting loads in proximity to ecological receptors has no defined limits. As blasting and extraction activities approach a distance setback where there may be potential impacts to the wetland habitat in U1 and V2, supplemental monitoring may reveal further information with respect to these wetlands (Blasting Table: Rows 2 and 4).

The peer reviewer is recommending that Dufferin collect additional information to provide further clarity on the effects of blasting on herpetofauna populations during the operational phase of the proposed extension. This effort is intended to supplement the ongoing wetland monitoring already being undertaken and is intended to be during the period when blasting and extraction occurs close to Wetland U1 and V2. The following parameters are suggested:

- Monitoring will be conducted during the spring months to coincide with GEC's Vernal Pool monitoring activities. The monitoring is suggested will encompass the periods when adult salamanders are actively using the vernal pools and wetland ponds and coincident with periods of blasting activities within 70.0 metres of the edge of the western boundary of Wetland U1 and Southern Boundary of V2.
- The suggested monitoring duration will be approximately mid-March to the end of April which may be adjusted earlier or later depending on spring thaw weather events during the given year when blasting events are scheduled in relation to salamander breeding and migration.
- The monitoring should be conducted within 24 hours after each blasting event.
- During monitoring, the qualified person should attempt obtain the following information if possible: weather conditions, available records of explosives used during the blasting event (including timing, blasting loads, duration of the blasting, animal mortalities observed, total number of herpetofauna observed.
- The qualified person conducting the monitoring should provide a summary report of observations from the year that the blasting monitoring took place.
- Detailed photographs of mortalities observed during the monitoring program should be provided as much as possible.
- Should blasting and extraction proceed outside of the salamander breeding and migration period, amphibian monitoring according to the established protocol described in the Adaptive Management Plan such as amphibian call counts and salamander egg surveys may be substituted along with collection of site information.

It is recognized that Dufferin has invested a great deal of effort to maintain and enhance water resources and related ecological features as identified in the Adaptive Management Plan Addendum. A modification to the ongoing proposed Wetland Ecology Monitoring to address the effects of blasting on the two wetlands closest to the extraction limit will provide additional supplementary information to evaluate these effects (Blasting Table: Row 4).

At the time of writing of this report, JART is awaiting a response from Dufferin on these recently delivered points.

3.11 NATURAL HAZARDS

Conservation Halton reviewed the applications to confirm the following:

1) That the proposed extraction area was located outside of hazard lands (including flooding and erosion hazards and hazardous karst) and the associated regulatory allowances.

2) That the technical studies demonstrated that, as a result of the proposed extraction any risks related to natural hazards (flooding and erosion hazards as well as hazardous lands) are addressed, as necessary, including the prevention or mitigation of those risks.
3) That the technical studies demonstrated that there would be no risk to public health or safety or of property damage, and that the proposal will not create new or aggravate existing hazards.

3.11.1 Review Methodology

Conservation Halton reviewed the following documents as part of the Natural Hazard review:

- Geology and Water Resources Assessment Report, prepared by GHD.
- Addendum to Updated Adaptive Environmental Management and Protection Plan, prepared by GHD and GEC.
- Site Plan prepared by MHBC.

3.11.2 Professional Opinion

Dufferin demonstrated that the proposed extraction areas will be located outside of hazard lands as well as Conservation Halton's regulatory allowances. The proposed extension is more than 780.0 metres from any Sixteen Mile Creek tributaries and its associated flooding and erosion hazards. Further hazardous karst was not identified within the proposed licence area. As a result, Conservation Halton staff is satisfied that any risks related to natural hazards (flooding and erosion hazards as well as hazardous lands) are not anticipated and, that there should be no risk to public health or safety or of property damage, and that the proposal will not create new or aggravate existing hazards (Geology and Water Resources Table: Rows 22 and 28).

Development of the proposed extension will not prevent the provision of the required 700,000 m^3/year to the Hilton Falls Reservoir (Geology and Water Resources Table: Rows 22, 28 and 58).

3.12 Noise Impact Study

Valcoustics Canada Ltd. conducted a peer review of the Noise Impact Study for the Dufferin Aggregate Quarry Extension, prepared by Aercoustics Engineering Ltd., dated December 7, 2021, revised October 27, 2022, and March 14, 2023.

Detailed technical comments and proponent replies are provided in Appendix L to this report.

3.12.1 Review Methodology

A preliminary review of the original (i.e., December 2021) Noise Impact Assessment was completed to identify any missing information to confirm that the submission was complete from a noise perspective. A detailed review of the original Noise Impact Assessment and relevant supporting information (Site Plans, Traffic Study) was completed. As part of this review, there was a preliminary discussion regarding the report, the assessment method and findings/recommendations with the author. The findings and recommendations of the Valcoustics Canada Ltd. peer review were included as part of the JART comments provided to the proponent.

In response to these comments, Aercoustics Engineering Ltd. prepared an updated Noise Impact Assessment (October 2022 Report) and provided responses to the peer review comments in the JART Comment Summary Table. Upon review of this updated information, a meeting with the proponent team was held to discuss outstanding issues with the submission. Independent of JART's review of the noise submission, the Ministry of Environment, Conservation and Parks completed a review of the original Report and provided comments in a letter dated January 4, 2023.

Aercoustics Engineering Ltd. prepared a further updated Noise Impact Assessment (dated March 2023) and provided separate response letters to the JART and Ministry of the Environment, Conservation and Parks peer reviews. The updated report and response letters have been reviewed and our findings and recommendations are provided herein.

Aspects considered during the peer reviews were:

- An audit review of the acoustical calculations.
- Area visits to review existing conditions in the area and to confirm the noise sensitive receptor locations.
- Review of supporting information to confirm consistency with the noise impact assessment.
- Confirmation of the noise criteria applied at the receptor locations.

3.12.2 Original Findings

The peer reviewer identified a number of issues with the originally prepared study. Many of these have been addressed through the updated noise studies and responses. There remain some items that require additional clarification. However, most of the remaining issues could be resolved by inclusion on the *Aggregate Resources Act* site plan:

1. The limitation on site preparation and rehabilitation to weekday daytime hours and not on statutory holidays, plus the encouraged use of broadband alarms, are not included on the site plan (Noise Table: Row 8).
2. Clarification is required on if processing of extracted materials can only be done in either the East Cell or main plant, but not both simultaneously (Noise Table: Rows 3 and 17).
3. In the equipment/operation lists in the Report, haul trucks travelling between the location of extraction and the Main Plant are not included in the "scenario 2" assessment. Since it possible there could be shipping from the East Quarry and also haul trucks moving material to the Main Plant, confirmation that the haul trucks are included in the noise assessment is needed (Noise Table: Row 10).
4. The noise report should clearly outline the location of all existing berms on the entire site and that these existing berms are consistent with what has been accounted for in the Noise Impact Study. The Report should also clearly outline which berms must remain in place as part of the proposed extension (Noise Table: Row 4).
5. If temporary stockpiles are to be used as a noise mitigation measures, guidance on how they are to be deployed and maintained (are minimum heights and extents required) should be provided in the Noise Impact Study and translated onto the site plan (Noise Table: Row 15).

6. The statement that, “noise controls presented in this report do not replace existing noise controls for extraction in other areas of the quarry” should also include processing, transport and shipment off-site, and not just extraction. (Noise Table: Row 28).
7. The shipping truck route(s) must account for the predictable worst case noise impacts at the indicated receptors. Of particular concern are potential impacts on R4, R5 and R6 (Noise Table: Row 19).
8. The Noise Impact Study should include a mitigation recommendation that the portable processing plants in the Main Plant be in locations consistent with what is shown on Figures 7a and 7b of the March 2023 Noise Impact Study (Noise Table: Row 29).
9. Noise Control Recommendation 3 should be clear that both reference source levels and sound levels at the receptors will be measured as part of the noise monitoring (Noise Table: Row 30).
10. Noise Control Recommendation 14 (for both Scenarios 1 and 2) must be clear that quarry refers to the entire Milton Quarry and not just the East Quarry Extension and that there is to be no other equipment operating other than what is listed unless the other equipment is being used for a construction activity (Noise Table: Row 31).

3.12.3 Summary of Changes through JART Review

The biggest concern with the original noise study was that only the East Extension was being assessed and not the entire site as is required by the noise guidelines. This has been addressed through the updates and the final mitigation measures will ensure the sound emissions from the entire facility are in compliance with the applicable sound level limits at the noise sensitive receptor locations. All of the required noise mitigation measures and operational restrictions need to be included in the Site Plans (Noise Table: Rows 3, 8, 15, 16, 23, 26 and 32).

3.12.4 Professional Opinion

At present the above items in Section 3.12.2 need to be addressed before the peer reviewer agrees that the facility can operate in compliance with Ministry of the Environment, Conservation and Parks noise emission limits.

3.13 Progressive and Final Rehabilitation Plan and Ecological Enhancement Plan and Rehabilitation Plan Report

As part of its application, Dufferin has proposed the rehabilitated quarry would be partially filled as a lake and including various small shoals, islands, and sloping work to create a diverse, small landscape. The Progressive and Final Rehabilitation Plan and Ecological Enhancement Plan are summary documents that contain information already contained in the various reports prepared by Dufferin. Therefore, comments provided in this summary may be replicated elsewhere in this report.

Review in this matter was informed by collaboration and discussion amongst peer reviewers and applicable agency staff. Reviewers assessed whether the Progressive and Final Rehabilitation Plan was comprehensive, and appropriately derived from the findings of the reports.

Detailed technical comments and proponent replies are provided in Appendix M and N to this report.

3.13.1 Original Findings

Comments are organized by technical area.

Natural Heritage and Ecology

The rehabilitation plan aims to create a lake, islands, and cliffs in place of the current landscape that includes meadow, thicket and small patches of woodland. The restoration is to enhance Niagara Escarpment biodiversity. However, the peer reviewer states Policy 2.9.11 of the Niagara Escarpment Plan emphases rehabilitation that is representative of the natural ecosystem in the area. The lakes, shoals and islands would not be characteristic features, and does not draw upon a long list of representative vegetation species. It is understood that there are no alternatives to a rehabilitation plan for a quarry on the Niagara Escarpment other than a large lake of some kind. However, it should be demonstrated that the rehabilitation plan is composed of communities as consistent as is feasible with the characteristic vegetation communities of the Niagara Escarpment (Natural Environment Table: Row 24).

The success of the Ecological Enhancement Plan will be determined partly by whether non-native invasive species outcompete native species used for enhancement over the long term. It will also be determined by the survivability of planted species. While it is not expected that a highly detailed invasive species management plan be prepared at this stage, the framework of a management plan, and a proposed time frame for long-term monitoring, should be proposed. Fundamentally, without long-term monitoring of non-native species in place, the forests, islands and wetlands in the proposed rehabilitation plan will become dominated by non-native invasive species, most likely Common Reed, Common and Glossy Buckthorn and Reed Canary-grass (Ecological Enhancement Plan Table: Rows 1, 2, 4, 5; and Progressive and Final Rehabilitation Table: Row 3).

Hydrogeology

The need for pumping and diffuse discharge requirements post-rehabilitation after lake filling will be determined from groundwater and surface water monitoring data collected during and following lake filling. It is presumed that if target groundwater levels in trigger wells are achieved from lake filling, then artificial groundwater recharge and potentially diffuse discharge into wetlands can be discontinued. It is not clear that the target groundwater levels in trigger wells, which are based upon existing impacted conditions, will be adequate for maintenance of water levels within the wetlands. It is also not clear how the effects of a future climate will impact the decision-making process for cessation of ground water recharge wells and diffuse discharge into wetlands. The decision-making process regarding post-lake filling pumping of recharge wells and diffuse discharge into wetlands should be more clearly defined in the Adaptive Management Plan (Progressive and Final Rehabilitation Table: Row 4).

There are also concerns with respect to the proposal to extend the current Water Management System, which requires perpetual pumping, to the proposed extension lands, instead of pursuing more passive means of water management (Progressive and Final Rehabilitation Table: Row 4).

Vertical quarry bedrock walls are less supportive of passive mitigation. A more desirable approach to mitigation should be considered (Ecological Enhancement Plan Table: Row 3).

3.13.2 Summary of Changes through JART Review

Additional monitoring was proposed as a result of the JART review. The revised Adaptive Management Plan did address some of these issues: GHD prepared Technical Memorandum 301 (March 3, 2023) providing an analysis of the impact of a passive measure using a grout curtain in place of the proposed mitigation measures for maintaining groundwater levels. However, there is uncertainty behind the parameters used and completeness of analysis (Ecological Enhancement Plan Table: Row 3).

As noted in Section 3.9, the vegetation communities proposed in the rehabilitation plan are characteristic of the present-day landscape of this part of the Niagara Escarpment. The communities proposed are as diverse as possible, given the practical constraints posed by the quarry environment (Ecological Enhancement Plan Table: Row 2).

It was clarified in both the Geology and Water Resources and Adaptive Management Plan Addendum reports that the diffuse discharge into U1 and W36 (similarly to V2, W7 and W8) will be required post-lake filling as these wetlands will be several metres above the final lake level. Potentially, seasonal recharge well use may be required to maintain groundwater levels east of the proposed extension to maintain groundwater levels for the downstream wetlands (W41, W46). (Adaptive Management Plan Table: Row 12).

Additional clarification was provided by GEC regarding the monitoring program that provided further detail on specific items related to the function of the future habitat proposed during future rehabilitation. Items related to future salamander movements, use of access roads, future water levels in relation to future fish habitat associated with the lake creation and salamander habitat were satisfactorily addressed through review comments (Ecological Enhancement Plan Table: Rows 7, 8, 9 and 10; and Blasting Table: Row 4). (Additional monitoring has also been proposed with respect to salamander habitat associated with blasting, as discussed in detail in Section 3.10.4.)

A non-native invasive species plan was prepared that addressed the potential for non-native species to overcome efforts to restore a diversity of vegetation to the rehabilitated quarry (Ecological Enhancement Plan Table: Row 1).

3.13.3 Professional Opinion

The evaluation of alternatives to the proposed mitigation measures (i.e., diffuse discharge to wetlands and recharge wells) for post closure has not completely investigated all alternates to increase passive management of water on site. Uncertainty in the analysis provided leaves this assessment incomplete (Progressive and Final Rehabilitation Table: Row 4).

There were no remaining outstanding ecological concerns related to the rehabilitation plan, except that it was requested that an additional diversity of tree species be used for restoration of buffers and other disturbed areas, rather than the current intensive focus on birch and cedar (Ecological Enhancement Plan Table: Row 4).

No outstanding issues remain with regard to aquatic habitat (Ecological Enhancement Table: Rows 7, 8, 9, 10 and 11).

3.14 TRAFFIC IMPACT STUDY (TIS)

CIMA Canada Inc. was retained to provide peer review support related to the Traffic Impact Study and Safety Analysis Letter. To this purpose the following guidelines were considered as part of the review:

- Region of Halton's Transportation Impact Study Guidelines (January 2015).
- Region of Halton's Access Management Guidelines (January 2015).
- Region of Halton's Highway Dedication Guidelines (undated).
- Region of Halton's Aggregate Resources Reference Manual – Regional Official Plan Guidelines (undated).
- Transportation Association of Canada's Geometric Design Guide for Canadian Roads (2017).

Detailed technical comments and proponent replies are provided in Appendix O to this report.

3.14.1 REVIEW METHODOLOGY

In May 2021, CIMA Canada Inc. (CIMA+) completed a Terms of Reference peer review for the Milton Quarry East Extension Traffic Impact Study, and provided comments related to items benefitting from additional review. In response to CIMA+'s comments, The Municipal Infrastructure Group Ltd. (TMIG) provided updates as part of the Dufferin Aggregates Milton Quarry Traffic Impact Study Update dated October 2021, which were not originally included during the initial review.

In March 2022, CIMA+ was requested by the Region to provide a detailed peer review of the Dufferin Aggregates Milton Quarry East Extension the Traffic Impact Study, dated October 2021; in conjunction with the Safety Analysis Letter dated March 2022 as prepared by TMIG.

Findings and recommendations of CIMA+ peer review were included as part of the JART comments provided to the proponent. In response to these comments, TMIG (now TYLin) provided updates as part of the Dufferin Aggregates Milton Quarry Traffic Impact Study Addendum & Response dated April 2023.

In May 2023, CIMA+ was requested by the Region to undertake a review of the provided documentation based on the list of comments provided by TYLin via the updated Traffic Impact Study, JART and additional attachments.

Elements considered as part of the peer reviews included the following:

- Determination of guidelines, policies, manuals, bylaws, and procedures that the practitioner needed to consider for the preparation of the documentation under review.
- Confirmation that adequate explanation about assumptions made for the preparation of the documentation under review were included and referenced.
- Confirmation of the adequate use of software default values.
- Confirmation of the consistency between information provided along the document(s) and any appendices or software outputs included supporting recommendations and findings.

3.14.2 Original Findings

Additional intersections were requested to be included in the study: No. 5 Sideroad at James Snow Parkway, and the quarry site access onto Dublin Line. A comparative analysis of the existing and future haul routes was requested, to compare future traffic operations for both the existing haul route and modified haul route to determine the impacts to traffic operations of modifying the haul route versus maintaining the existing haul route. Queuing impacts were also requested to be investigated at turning points (Traffic Table: Rows 2 and 14).

3.14.3 Summary of Changes through JART Review

The responses provided answered a number of questions, with some details around data discrepancies to be explained. The safety analysis examined a number of operational concerns, but a further collision analysis for study area intersections and mid-blocks was requested.

3.14.4 Professional Opinion

As part of the last iteration of the documentation provided by the proponent, most of the issues identified through technical review have been identified and addressed. As part of concluding technical review, there remains a need to resolve some of the minor operational details resulting from data discrepancies outlined above, and if corresponding amendments to the site plan notes are required. The following issues remain outstanding:

1. Complete the necessary changes to Figures 3-3 and 5-8 to clarify the truck volumes considered as part of the traffic distribution (Traffic Table: Row 22).
2. Complete the necessary changes to Figure 5-12 to address the observed trip distribution disparities between the two haul routes (Traffic Table: Row 16).
3. Clarify the number of quarry trucks involved in the collisions identified in Table 7-1 and &-2 to confirm the validity of the appropriateness of the route (Traffic Table: Row 21).

3.15 Visual Impact Assessment (VIA)

MHBC Planning was retained by Dufferin to prepare a Visual Impact Assessment for Dufferin's proposed Halton Hills quarry extension. NEC's Landscape Architect completed a technical review of the report.

Detailed technical comments and proponent replies are provided in Appendix P to this report.

3.15.1 Review Methodology

NEC staff completed a review of the Visual Impact Assessment submitted as part of the above noted application within the framework of the Niagara Escarpment Plan policies.

3.15.2 Original Findings

Review of the original Visual Impact Assessment by Niagara Escarpment Commission staff identified the need for further documentation and refinement including amended and additional viewpoints with supplementary and edits to labeling, more comprehensive inventory and analysis of visual impacts and mitigation in relation to Niagara Escarpment Plan policies, and clarification of terminology (Visual Impact Assessment Table: Rows 1, 2 and 3).

3.15.3 Summary of Changes through JART Review

These matters as outlined in 3.15.2 were addressed in the October 2022 resubmission (Visual Impact Assessment Table: Rows 1, 2 and 3).

3.15.4 Professional Opinion

No outstanding issues remain with respect to the Visual Impact Assessment and Niagara Escarpment Commission staff concur with the proponent that the landscape character requirements of the Niagara Escarpment Commission have been addressed (Visual Impact Assessment Table: Rows 1, 2 and 3).

3.16 Adaptive Management Plan (AMP or AMP Addendum)

Multiple reviewers reviewed the draft Adaptive Management Plan Addendum—it is proposed to add the recommendations of this Plan into the existing framework and agreement on site. Review in this matter was informed by collaboration and discussion amongst peer reviewers and applicable agency staff. Therefore, comments provided in this summary may be replicated elsewhere in this report.

Detailed technical comments and proponent replies are provided in Appendix Q to this report.

3.16.1 Original Findings

Comments are organized by technical area. Together, all peer reviewers were looking for an updated site plan that confirmed various setbacks and mitigation measures to be used to minimize environmental impact. All parties were looking for an updated Adaptive Management Plan Addendum to confirm updated monitoring requirements.

Natural Heritage and Ecology

A number of technical comments were raised in the initial review of the proposed Adaptive Management Plan.

1. The combined width of the buffer and the disturbance zone should be clarified for the significant woodland on the southeast side of the study area. The use of the word “generally” implies that there are some areas where the watermain may be installed within the buffer. Any reduction in buffer width should be explicitly shown and justification provided. The location of the access road in this area should also be clarified (Adaptive Management Plan Table: Row 6).
2. Section 2.3 states that groundwater levels are likely to be kept at higher levels than prior to extraction. Target levels should be set to maintain habitat for Black Ash and other wetland tree species, in addition to breeding habitat for amphibians. Likewise, Wetland W41 should also include dedicated monitoring of Black Ash, a Species at Risk (Adaptive Management Plan Table: Rows 7 and 8).
3. Monitoring of vegetation should be conducted in all restored areas, including those around recharge well and feeder line installation areas (Adaptive Management Plan Table: Row 9).
4. The response actions and contingency measures within the supplementary monitoring plan should include proposed surface water target levels for a number of wetlands to ensure effective mitigation measures are in place in the event of an undesirable influence on wetland hydroperiods

and impact on wetland ecological functions during and post quarry operations (Adaptive Management Plan Table: Row 12).

HYDROGEOLOGY

1. There were multiple questions around how the water level targets were selected, and how the Water Management System was performing based on these targets and overall system goals, how that framework would extend to the proposed expansion lands, and how new trigger/monitoring wells contribute to the expanded system (Adaptive Management Plan Table: Rows 2 and 10).
2. Water quality sampling should be continued and augmented as required during site operations and a post-closure period. Water quality targets/triggers should be established (Adaptive Management Plan Table: Row 10).
3. The response action plan for groundwater and surface water is focused on meeting target water levels when water levels drop below target levels. There is no discussion on addressing the impact of major storm events and excessively high groundwater and surface water levels (Adaptive Management Plan Table: Row 11).

SURFACE WATER

1. A question was posed as to the potential for the Water Management System to have unintended off-site impacts due to the artificial filling of U1 during an extreme event. The Adaptive Management Plan proposes to set target water levels which will be used to maintain the range of preferred water levels and hydro-period in the affected wetlands (ref. U1) (Adaptive Management Plan Table: Row 12).

3.16.2 SUMMARY OF CHANGES THROUGH JART REVIEW

As a result of Conservation Halton comments and technical discussions between Conservation Halton and Dufferin consultants, GHD and Goodban Ecological Consulting (GEC) Inc. prepared a technical memorandum Supplemental Monitoring Wells and Triggers, dated March 3, 2023, to address concerns in terms of potential impacts to wetland hydrologic functions. Conservation Halton reviewed the memorandum to ensure the proposed supplemental monitoring wells and response action water triggers for Wetlands 41, 46 as part of the Adaptive Management Plan requirements are satisfactory. The two proposed monitoring well locations for wetlands 41 and 46 and the establishment of water level response triggers and actions are to be implemented as part of the Adaptive Management Plan addendum to ensure there will be appropriate response mechanisms to address any potential negative impacts to wetland hydrological functions and provide the typical response and contingency measures (Adaptive Management Plan Table: Row 12).

3.16.3 PROFESSIONAL OPINION

Comments were largely resolved through discussion and clarification from GEC. One outstanding comment remains: dedicated monitoring for Black Ash should be conducted as described in Section 3.9 (Adaptive Management Plan Table: Row 8).

Per comments made in Section 3.6 of this report, alternatives to supporting more passive water management designs have not been fully considered (Adaptive Management Plan Table: Row 4).

The proposed monitoring and mitigation measures to be included in the Addendum to the updated Adaptive Management Plan for the wetlands are satisfactory (Adaptive Management Plan Table: Rows 8 and 9).

Subject to the Adaptive Management Plan establishing appropriate water level targets (seasonal/high) which do not consume more of the available storage than cited in the updated assessment (ref. Less than 400.0 m^3 per March 2023 Technical Memorandum), off-site impacts during major storms would not be anticipated (Adaptive Management Plan Table: Rows 10 and 11).

4. Conclusion and Next Steps

After considerable effort, JART has completed its technical review of the plans, studies, reports, and comments provided by Dufferin.

Every attempt has been made to ensure a thorough and comprehensive analysis. The detailed record of JART's work is contained in the various appendices to this report. JART notes again that any changes to the proposal or advancement on the issues above will require further investigation.

We note that the majority of peer reviewers and technical staff are generally satisfied with the information provided by the proponent, provided the proposed design measures and monitoring programs are secured.

Conservation Halton staff is satisfied that any risks related to natural hazards (flooding and erosion hazards as well as hazardous lands) have been addressed.

4.1 Summary of Remaining Issues

In other issue areas, a number of technical issues remain with the proposal as currently designed:

Air Quality Assessment

Dufferin is currently completing an update to its Air Quality Assessment in response to comments from both Provincial staff and JART. The update, if done correctly using the parameters requested by both Provincial staff and JART's peer reviewer, will likely demonstrate that emissions from the operation meet Provincial standards and appropriately minimize any adverse effects. Any recommendations coming from this study need to be incorporated onto the *Aggregate Resources Act* site plan.

Geology and Water Resources, Including Perpetual Pumping

Dufferin proposes to extend the existing Water Management System to encompass the proposed extension. This solution does require continued energy and investment into the system, as well as long-term operating costs. If this technical solution is proposed, those issues need to be appropriately addressed to eliminate costs to the taxpayers.

On-going monitoring should continue to validate that the Water Management System for Wetlands U1 and W36 is effective in enhancing wetland performance while not causing an off-site impact in terms of erosion and flooding to downstream features (in particular, Wetland W36).

The identification and analysis of other practical and feasible alternatives should be considered to reduce the amount of continuous pumping to maintain groundwater levels and water levels and hydroperiods of wetlands of concern with respect to the proposed extension.

There is concern the long-term dissolution process on the dolostone bedrock has not been adequately accounted for with regard to the impact on long-term Water Management System operation.

Jefferson Salamander Monitoring and Blasting

Due to lack of literature information and targeted efforts to address blasting impacts to wildlife habitat, the peer reviewer is recommending that Dufferin collect additional information to provide further clarity on the effects of blasting on herpetofauna populations during the operational phase of the proposed extension. This effort is intended to supplement the ongoing wetland monitoring already being undertaken and is intended to be during the period when blasting and extraction occurs close to Wetland U1 and V2.

Noise Impact Study

All of the required noise mitigation measures and operational restrictions identified in the study need to be included on the Site Plan and associated notes.

Traffic Impact Study

Some data clarification is required to support future conditions conclusions by Dufferin. The collision analysis needs to clarify the number of quarry trucks in collisions to confirm the validity of the appropriateness of the haul route. The traffic distribution used to determine the effects of the alternative haul routes should be confirmed and presented in the corresponding figures.

Progressive and Final Rehabilitation Plan

The evaluation of alternatives to the proposed mitigation measures (i.e., diffuse discharge to wetlands and recharge wells) for post closure has not completely investigated all alternates to increase passive management on water on site.

The decision-making process regarding post-lake filling pumping of recharge into wetlands should be more clearly defined in the Adaptive Management Plan.

The additional elements of the Water Management System need to be incorporated and recognized by the various agreements and control mechanisms for the entire quarry.

There were no remaining outstanding ecological concerns related to the rehabilitation plan, except that it was requested that an additional diversity of tree species be used for restoration of buffers and other disturbed areas, rather than the current intensive focus on birch and cedar.

Adaptive Management Plan (AMP or AMP Addendum)

Alternatives supporting more passive water management designs have not been fully considered.

Subject to the Adaptive Management Plan establishing appropriate water level targets (seasonal/high) which do not consume more of the available storage than cited in the updated assessment (Less than 400.0 m^3, per March 2023 Technical Memorandum), off-site impacts during major storms would not be anticipated.

Dedicated monitoring for Black Ash should be conducted.

Aggregate Resources Act Site Plan and Notes

The site plan and associated notes require a final audit to ensure all technical matters are appropriately addressed.

4.2 Additional Research Areas

A number of technical areas generated greater amounts of public interest relative to other issue areas. The technical reviewers have provided the following additional information for consideration.

4.2.1 Well Water Concerns

JART has received considerable feedback about concerns over potential impacts on well water and drinking water in the area. The intent of the Water Management System is to mitigate against such a risk, and continue to ensure water is available in the area.

In the event of an issue with wells and water supplies, if the quarry is suspected of causing the issue, Dufferin's representatives have indicated they will take inquiries from residents and investigate if required.

If a water source is impacted by any individual (quarry or otherwise), that party would be responsible to repair or remedy the situation on any affected downstream user.

Residents with complaints about any licenced mineral aggregate operation should be forwarded to the Natural Resources Information Support Centre (1-800-667-1940 or NRISC@ontario.ca), who will direct the complaint to the appropriate enforcement team.

4.2.2 Blasting and Vibrations

Analysis of the blasting plans for the proposed extension is provided in Section 3.4 of this report. At the Halton Region Statutory Public Meeting, Dufferin indicated willingness to provide measuring equipment on properties to determine vibration levels on a property. Similar to the well concerns above, Dufferin's representatives have indicated they will take inquiries from residents and investigate if required.

Residents with complaints about any licenced mineral aggregate operation should be forwarded to the Natural Resources Information Support Centre (1-800-667-1940 or NRISC@ontario.ca), who will direct the complaint to the appropriate enforcement team.

4.2.3 Contact with the Proponent

Multiple public comments mentioned interactions with Dufferin as something JART should be mindful of in reviewing the proposal. Dufferin does maintain a community liaison contact who is available to address neighbour inquiries.

The Area Operations Manager for Dufferin is also available to field quarry inquiries or complaints related to the current operation at (905) 467-1727.

Any inquiries regarding the Milton Quarry East Extension application should be directed to Kevin Mitchell, Dufferin's Director of Property, Planning and Approvals, at (416) 788-0015.

4.3 Future Use and Reliance on this Report

JART member agencies will use the completed JART technical report to support the preparation of planning opinions on Dufferin's proposal.

Technical conversations may continue with the proponent by individual agencies to address the remaining issues. This work, or any revisions to the Dufferin proposal to address any other objector concerns, will require review and may necessitate updated analysis to be completed.

JART wishes to thank all those who have participated and provided input, including the proponent and members of the public, into the various application processes.