COMMENT RESPONSE MATRIX – JART (IN RESPONSE TO COMMENTS RECEIVED AUGUST 23, 2022, NOVEMBER 14, 2022 AND JUNE 1, 2023)

UPPER'S QUARRY

DATE: August 25, 2023

	Comment	Responder	Applicant Response
	Agricultural Impact		
	Regional staff have reviewed the Agricultural Impact Assessment, prepared by Colville Consulting Inc. (dated October 2021) (AIA). Overall, the assessment of impacts to the agricultural system is satisfactory. As the quarry is proposed to be below water rehabilitation to an agricultural state is not possible. There are no outstanding comments or concerns with the AIA.		Noted
	Archaeology		
	As outlined in the introduction of this comment letter a package of Archaeological Assessments were submitted with the applications. The JART is also in receipt of a letter from the Ministry of Heritage, Sport, Tourism, and Culture Industries, dated January 10, 2022. The JART has no additional comments or recommendations beyond those provided by the Ministry.		Noted
Appendix 1: Planning Justification Report & ARA Summary Statement, October 2021, Comments:			
1.	General comment – throughout the report the term 'sterilized' (in regards to urbanization near known deposits of mineral aggregate resources). Consideration should be given to use more appropriate planning terminology.	MHBC	Noted. The use of the term 'resource sterilization' is a term used fairly commonly within the aggregate industry to generally describe when the development of a resource is precluded by another existing land use. For example, aggregate resources that exist under a housing development commonly will not be extracted. However, given this comment, **the word 'sterilized' will be replaced where referenced in the proposed draft wording for the Amendment to the Niagara Region Official Plan (Appendix B of Planning Justification Report)**.
2.	Executive Summary – 5th paragraph – it is stated that this is an 'important provincial source of aggregate'. What is the reference for this? What criteria is this statement based on?	MHBC	In our opinion, the proposed applications aim to protect an "important provincial source of aggregate" for the following reasons: i) Policy 2.5.1 of the PPS states: "Mineral aggregate resources shall be protected for long term use and, where provincial information is available, deposits of mineral aggregate resources shall be identified". ii) Through their borehole testing, WSP confirms in their Water Report (Section 3, Quarry Design Summary) that "approximately 60 million tonnes of high-quality dolomitic bedrock are planned for extraction. The estimated life expectancy of the operational phase of the proposed quarry is 40 and 50 years". iii) The Ministry of Natural Resources (nor MNRF) identified the proposed source of aggregate as a "selected bedrock resource" for many years and prior to 1985[1], which led to their identification in the Niagara Region Official Plan and City of Niagara Falls Official Plan.

[1] Alternative Sources of Sand and Gravel for Niagara, by C. Mirza Engineering Inc., dated June 1985 (Drawing No. 1 Inventory of Bedrock Resources)

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			iv) Further, Policy 2.5.2.1 of the PPS states that "As much of the mineral aggregate resources as is realistically possible shall be made available as close to markets as possible". In this case, the proposed aggregate source is situated immediately adjacent to urban areas and is considered close to market.
3.	Page 2 – 4th bullet point – states that the PPS and Growth Plan permit aggregate extraction in the 'rural area'. This comment is misleading and not correct. Aggregate extraction is not permitted as a right, and there are some areas where extraction is not permitted, between the escarpment and Lake Ontario (Greenbelt Plan) for example. In addition the term 'rural area' is not technically correct. Outside of settlement areas Provincial planning documents use the term 'rural' to describe land that is not 'prime agricultural'. Although the intent is understood, using the term 'rural area' could be confused to be excluding 'prime agricultural' areas.	MHBC	The Planning Justification Report as well as the PPS and the Growth Plan must be read in their entirety. In our view, the statement included in the PJR is correct when considering the fundamental principles of provincial policy and the entirety of the report. The PPS contains the following policies: • 'Rural area" is a defined term in the PPS which includes prime agricultural areas. • "Rural areas are a system of lands that may include rural settlement areas, rural lands, prime agricultural areas, natural heritage areas, and other resource areas. Rural areas and urban areas are interdependent in terms of markets, resources and amenities. It is important to leverage rural assets and amenities and protect the environment as a foundation of a sustainable economy". (1.1.4). • "In prime agricultural areas, on prime agricultural land, e**xtraction of mineral aggregate resources is <u>permitted as an interim use</u> provided that** the site will be rehabilitated… ".(2.5.4.1) • The PJR goes into detail to describe how all of the policy tests are met. • The PJR also sets out clearly that amendments to the Niagara Region Official Plan, the City of Niagara Falls Official Plan and Zoning By-law are required as an initial step. Given the proposed amendments are being made to permit the mineral aggregate operation use, it is clearly recognized that the use is not permitted as of right. The Growth Plan does not contain any policy to the contrary of the above and Section 4.2.8.6 states: • "Except as provided by the policies of this subsection (4.2.8) decisions on planning matters must be consistent with the policies in the PPS that pertain to the management of mineral aggregate resources".
4.	Section 1.0 – 5th paragraph – a timeline of 40 years is stated. In the executive summary a timeline of 30 years is used. Consistent timelines should be used.	MHBC	The Executive Summary will be updated to provide consistent wording with Section 1.0, 5th paragraph.
5.	Page 11 – Phase 5 – after the quarry has been fully rehabilitated to a recreational lake, will public access be permitted?	MHBC	Not contemplated at this time.
6.	Section 4.0 – offsite lands owned by the applicant that are proposed to be used for restoration / enhancement should be designated and zoned as such in the Regional and Local planning documents. This is required to ensure long-term protection of these lands.	MHBC	Amendments to the Official Plan and Zoning By-law are not necessary to provide for compensation. Once established, such features can be designated and zoned for "environmental protection" as part of a municipal comprehensive review. In this case, Walker owns the lands where compensation is proposed and can ensure compensation is implemented.
7.	Section 4.3 – in this section and throughout the report and other aspects of the application a distinction is attempted to be made between significant woodlands that meet 'regional criteria' and significant woodlands that meet 'provincial criteria'. The Regional Official Plan does not make a distinction of this type. A woodland that meets the test of 'significance' is a 'significant woodland' and the policies of the Regional Official Plan apply.	MHBC	Region OP policy can not be more restrictive than Provincial Policy where such policies are directly in conflict with Provincial objectives which aim to protect mineral aggregate resources provided that all tests of the PPS and Provincial Plan policies are met. The Region OP contains definitions and policies that are not consistent with the PPS and Growth Plan relative to significant woodlands.

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			For example, the PPS 2020 and Growth Plan, as amended in 2020, define "significant in regard to woodland" as "an area which is ecologically important in terms of features, such as species composition, age of trees and stand history, functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area, or economically important due to site quality, species composition, or past management history. **These are to be identified using criteria established by the Ontario Ministry of Natural Resources and Forestry**". According to this definition and criteria, Stantec demonstrates that the woodland would <u>not</u> be considered significant. Whereas, the Region OP defines "significant in regard to other natural heritage features and areas" as being "ecologically important in terms of features, functions, representation or amount, and contributing to the quality, diversity, ecological health and integrity of the Core Natural Heritage System". The Region OP goes on to set out criteria for significant woodlands that are different than the criteria set out by the Province in the NHRM. According to this definition and criteria, Stantec concludes that the woodland would be considered significant. Therefore, the distinction is important. In this case, the Region OP has the effect of being more restrictive and directly in conflict with Provincial objectives which aim to protect mineral aggregate resources provided all tests of the PPS and Provincial Plan policies are met. Accordingly, the proposal aims to allow for the resource to be extracted that exists beneath the woodland but also compensate for the loss of the woodland given its regional significance.
8.	Page 19 – Table 1 – states the woodland will be removed because of invasive species and isolation. It is unclear what policy or policy test supports this component of the application.	MHBC	Removal and proposed compensation of the woodland is supported by the Provincial Policy Statement and, more specifically, Policy 7.B.1.31 of the Region's Official Plan and Policy 11.2.30 of the City's Official Plan.
9.	Section 4.3.7 – please include a description of how the environmental monitoring is implemented. What mechanisms are in place to ensure long term implementation?	MHBC	The environmental monitoring program recommended by Stantec will be implemented through the ARA licence. These recommendations will be specifically implemented through the requirements of the ARA Site Plans and specifically Drawing 4 of 6, Report Recommendations, Section E – Natural Heritage, Note 8 (Monitoring Program). While this Note has been intentionally worded broadly, MNRF will require that all detailed recommendations in the Technical Reports relative to monitoring will be addressed in the monitoring plan to be prepared in consultation with all regulatory authorities.
10.	Section 4.4.1 – at the technical meeting the washing of aggregate materials was discussed. It was discussed that an ECA will be required for a range of activities that will occur on the site. Please update this section to reflect that discussion.	MHBC	Section 4.4.3 addresses water management overall and does note that Walker will be required to obtain an Environmental Compliance Approval from MECP relative to the proposed dewatering as well as process water.
11.	Section 4.4.2 – the first paragraph is unclear and slightly confusing. Please review and consider re-working. This issue is an important part of the application.	MHBC	Similar to the above comment, Section 4.4 is intended to provide a summary of the Water Study prepared by WSP, and Section 4.4.2 of the PJR provides a high level summary on the topic of water quantity. As noted in this Section, this matter is addressed in detail in the WSP Water Study Report. With that said, the first paragraph of this Section of the PJR will be updated as follows to provide more clarity: **The proposed quarry will be developed below the natural groundwater table and, in order to maintain dry working conditions, the quarry will operate a dewatering system. Instead of water collecting on the quarry floor, water will be redirected and discharged to the existing watercourse and, once the watercourse is realigned, to the proposed watercourse. In addition, overland surface water flow from upstream catchment areas will be managed by the realigned watercourse and perimeter ditches (where required). Discharge will be controlled by the amount of water being pumped from the quarry. Once the quarry excavation is complete, the dewatering sumps will be decommissioned and the quarry cells will be allowed to fill naturally with precipitation and groundwater recharge. As such, the end used of the quarry**

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			is a series of lakes, a realigned watercourse corridor with enhanced wetlands and woodland areas. Discharge from the lakes to the realigned watercourse will be by gravity (i.e. no pumping) and governed by a constructed outlet. **A Permit to Take Water will be required to dewater the quarry and will include and regulate a detailed water management plan and monitoring program.**
12.	Page 30 – last bullet point before S. 5.1.1. – please provide additional information on how this is implemented / ensured.	MHBC	The requirement for a Water Well Interference Mitigation Plan is set out on the proposed ARA Site Plans (Drawing 4 of 6, Water Study Notes) which will be implemented and regulated by MNRF through the ARA licence.
13.	Section 5.2 – states that 'mitigation measures' and 'best practices' have been included in the ARA site plans. The report only seems to list the mitigation measures. Please also list the best practices for noise mitigation in the PJR.	MHBC	This Section of the PJR will be updated to include best practices as set out in RWDI's Noise and the ARA Site Plans (Drawing 4 of 6, Acoustic Assessment Notes), as follows (**bolded** wording to be added): "RWDI also recommended a number of best practices to minimize potential for construction noise impacts and complaints**, including:** **1. All construction equipment shall meet the sound emission standards defined in MECP Publication NPC-115.** **2. Construction will be limited to time periods allowed by the City's applicable by-laws. If construction activities are required outside of these hours, the licensee will seek permits / exemptions directly from the City in advance.** **3. All internal combustion engines will be fitted with appropriate muffler systems.** **4. The licensee's operating procedures will contain a provision that any initial complaint will trigger verification that the general noise control measures agreed to on this Plan are in effect.** **5. In the presences of persistent noise complaints, all construction equipment will be verified to comply with MECP's NPC-115 guidelines.** 6. **In the presence of persistent noise complaints and subject to the results of a field investigation, alternative noise control measures may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration will be given to the technical, administrative and economic feasibility of the various alternatives".**
14.	Section 5.5. – point #3 – the Region requires that native, non-invasive species be planted on the berms.	MHBC	The addition of "non-invasive" will be added to this point (as follows) as well as the ARA Site Plans (Drawing 4 of 6, Visual Note 3): 3. Where proposed on the VIA Mitigation Plan, trees should be planted as supplementary visual mitigation. Trees are to be planted at a spacing of 5 to 10 m on centre, depending on species. Plantings are to be randomly spaced and staggered up on the berm up to one third of its maximum height to appear more natural, where possible. Planting shall also extend a minimum of 3 m out from the berm towards the road where available space permits. All vegetation is to be selected for wind and salt tolerance, hardiness. Where appropriate, native **non-invasive** species that complement the existing surroundings are to be utilized wherever possible. …"
15.	Section 5.6. – 4th paragraph – it seems that the second half of the paragraph was cut off.	MHBC	This paragraph will be corrected to read as follows: "Haul Route Option 1 was determined to be the preferred option as it utilizes regional roads to access provincial highways and provides the most direct route to/from the quarry. ~~This Route will also be seen as a preferable~~"

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16.	Section 5.9 – state that 84 person-years of employment will be generated. Is this over the existing quarry, or are these jobs transferred from the existing quarry?	MHBC/Prism	Section 5.9 is a summary of the Economics Benefits Analysis prepared by Prism. Prism has verified that 84 person-years of direct employment will be generated at the quarry and that the impact assessment is limited to considering the effects of activities at the proposed Upper's Quarry.
17.	Section 6.0 – it may be helpful to add year to the provincial and municipal planning documents so that readers are confident that the correct / current documents are being referenced.	MHBC	The date of the PPS, Growth Plan and Niagara Region Official Plan documents reviewed is included in the first paragraph of each sub-section. We will update the PJR to add dates for the City of Thorold Official Plan and City of Niagara Falls Zoning By-law, as follows: 6.5 City of Thorold Official Plan (first paragraph to be added): "**The proposed quarry is located adjacent to the City of Thorold and, therefore, regard has been given to the City of Thorold Official Plan and policies associated with the proposed quarry and future development of the adjacent lands. The City of Thorold Official Plan was adopted on April 21, 2015 and was approved by Niagara Region on April 28, 2016**". 6.6 City of Niagara Falls Zoning By-law 79-200 (footnote to be added after By-law 79-200 in first paragraph) "**By-law 79-200 was passed in November 5, 1979 with various amendments made to the By-law since that time (appears to be consolidated to include up to By-law No. 2020-003)**"
18.	Section 6.0 – in the introduction section it may be helpful to state that the application is outside the NEC and Greenbelt Plan area for clarity.	MHBC	The following paragraph will be added to the introduction of Section 6.0: "**The proposed quarry site is <u>outside of</u> the Niagara Escarpment Plan Area and the Greenbelt Plan Area**".
19.	Page 46 – there is a bullet list of the natural features on the site. This does not seem to be a complete list. Woodlands and wetlands are not included on the list.	MHBC	The bullet list of natural features relates specifically to *key natural heritage features* and *key hydrologic features* as defined by the Growth Plan. We have added 'wetlands' to this list as the definition includes '*wetlands*' and does not specifically "*significant wetlands*". While '*woodlands*' are present, the definition of key natural heritage features includes '*significant woodlands*" which are not present on the site by definition of the Growth Plan.
20.	Page 48 – 1st bullet point – see previous comment regarding the use of the term 'rural areas'.	MHBC	See previous response above (under Comment No. 3) regarding the use of the term 'rural areas'.
21.	Page 48 – 7th bullet point – Regional staff do not agree with the opinion that there are no significant woodlands on the site. A woodland that meets the regional criteria for significance is a significant woodland, and the policies of the Regional Official Plan apply.	MHBC	See previous response above (under Comment No. 7) regarding significant woodlands and Regional Official Plan policy.
22.	Page 49 – 1st bullet point – see previous comments regarding the identification of significant woodlands.	MHBC	
23.	Page 50 – 11th bullet point – this statement is unclear. It starts by stating that there are no further concern related to archaeological resources, but goes on to say that additional archaeological assessments are required before development and site alteration may be permitted.	MHBC	The paragraph states: "It has been determined that there are no further concerns for impacts to archaeological sites **within the majority of the proposed licence boundary. Certain areas have been identified on the proposed Site Plans where additional archaeological assessment is required before any development or site alteration may be permitted in those areas**….". Please review the words bolded to help provide clarity.
24.	Page 55 – policy 6.C.2 – This is an incorrect interpretation of Regional Policy. "possible aggregate areas" shown on D4 cannot be used interchangeably with "potential resources area" on D1 and D2. Potential aggregate areas on D4 are intended to apply to only a few small areas in the Region. In these areas a mineral aggregate operation could be considered without the need for a Regional	MHBC	In response to your comment, we will revise the wording of the Comment (as follows). Regardless, it is acknowledged that a Regional Official Plan Amendment is required and this has been reiterated.

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	Official Plan amendment, otherwise a ROPA is required. This designation does not apply for the proposed Uppers Quarry.		*"Comment*: On Schedule D4 (Mineral Resources), only one small area is shown across the Region as 'potential aggregate areas' and the map seems to mainly identify licenced pits and quarries. Therefore, it **is acknowledged that a Regional Official Plan Amendment is required in this case to permit the proposed quarry.** ~~would seem that Policy 6.C.2 is intended to rely on Schedule D1 for 'potential resource areas 'stone' (quarries) and D2 for 'potential resource areas – sand and gravel' (pits)".~~
25.	Page 57 – second to last paragraph – typo	MHBC	We have reviewed this page of the Report (and this page of the PDF) and were not able to identify the typo.
26.	Page 59 – section 6.3.3. – states that "No part of the site is mapped as being within an Environmental Protection Area or Environmental Conservation Area on Schedule C". There are environmental features on the site, including mapped wetlands, woodlands, and as stated further in the section mapped fish habitat. It should be noted that environmental features do not need to be mapped on Schedule C to be protected by the policies of the Regional Official Plan. This is correctly noted in the analysis of 7.B.1.4 on page 62 and 7.B.1.5 on page 64.	MHBC	This statement will be updated in the PJR to address this comment (and Comment No. 29 below) (as follows). The ECA areas identified on Schedule C are very small and seem to correlate with the non-provincially significant evaluated wetlands along the watercourse. Our assessment and/or conclusions do not change as a result. "6.3.3 Natural Environment The proposed quarry site is not within the Natural Heritage System for the Growth Plan or the Greenbelt Natural Heritage System. No part of the site is mapped as being within an Environmental Protection Area ~~or Environmental Conservation Area~~ on Schedule C. **Small areas along the watercourse are mapped as Environmental Conservation Area on Schedule C, which seem to correlate with the location of non-provincially significant evaluated wetlands**. The existing watercourse on-site and a small tributary in the northeast corner of the proposed quarry site is identified as Fish Habitat according to Schedule C (Figure 13)".
27.	Figure #5 – a compensation area is shown in a small triangle next to Beechwood Road. Are those lands owned by the applicant? On Figure #3 (and elsewhere) they are not shown as additional lands owned by the applicant.	MHBC	Yes, the small triangle next to Beechwood Road where compensation is proposed is owned by the applicant. This is already illustrated on the ARA Site Plans. We will update Figures 1 and 3 in the PJR accordingly.
28.	Figure #7 – the woodland appears to be identified on the map, but is not included as part of the legend.	MHBC	The legend of Figure 7 will be corrected as noted (green hatch will be reversed).
29.	Figure 13 – this map shows Schedule C of the ROP. ECA areas along the watercourse are visible. This is contrary to S. 6.3.3 which states there are no mapped ECA lands.	MHBC	The ECA areas identified on Schedule C are very small and seem to correlate with the non-provincially significant evaluated wetlands along the watercourse. Our assessment and/or conclusions do not change as a result.
30.	Draft Regional Official Plan Amendment – offsite lands that are proposed for replacement / restoration should be re-designated as appropriate natural area designations to ensure their long-term protection.	MHBC	See response above to Comment No. 6.
31.	Local Official Plan Amendment - offsite lands that are proposed for replacement / restoration should be re-designated as appropriate natural area designations to ensure their long-term protection.		
32.	Local Zoning By-Law Amendment - offsite lands that are proposed for replacement / restoration should be re-zoned as appropriate natural area designations to ensure their long-term protection.	MHBC	See response above to Comment No. 6.
33.	Appendix J – Page 2 - #22, it has yet to be determined if it will be a joint council meeting. Although that may be an option, 2 separate meetings could be held.	MHBC	We agree to make this change to the PJR to address this comment (as follows). However, given changes made through Bill 23 since this comment was made, this comment may no longer apply. 21. Niagara Region / City of Niagara Falls Council meeting **(one joint meeting or two separate meetings)** to consider ROPA, OPA and ZBA and recommendations for Site Plans

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Appendix 2: Aggregate Resource Act Site Plan, October 29, 2021 Comments:			
1.	We would appreciate if you could provide a separate word document with the list of proposed site plan conditions. On other applications this has greatly facilitated our review.	MHBC	To follow our digital submission, we will submit a copy of the **Site Plan notes in a separate word document for the latest Site Plans. We anticipate submitting this during the week after Labour Day weekend.**
2.	As a general comment it is anticipated that the Integrated Aggregate Operations Section (IAOS) at MNRF will provide detailed comments as part of the ARA review. Please provide IAOS comments when they are available.	MHBC	If MNRF (IAOS now the Aggregates Section) does not provide these to the Region or City directly, MHBC will provide these.
3.	Page 1 – Existing Features - The symbols for "Existing Site Access" and "direction of Surface Drainage" are very similar, it is possible to perhaps change one to a solid arrow to better distinguish the features?	MHBC	Existing Site Access Symbol updated on Drawing 1 of 6 (Existing Features) to be a solid dark hatch.
4.	G. Technical Reports - How does MNRF suggest that any revisions or addendums to the technical reports be reflected on the site plans? Perhaps a note would be helpful to indicate that the application submissions is based on these reports, but note "as revised through agency and peer reviews"?	MHBC	We are not clear on the question. The planning instruments need to be approved before a licence can be issued. The ARA and Planning Act applications are being reviewed concurrently so that, as technical reports are being peer reviewed, revised and finalized, these revisions are taken into account and considered by MNRF.
5.	Page 2 – Operational Plan 100 Year Floodline is labelled on the drawing, please add the symbol to the legend	MHBC	The 100 Year Floodline symbol will be added to the legend on Drawings 2, 3 and 4 of 6 (Operational Plan, Extraction Sequence and Report Recommendations).
6.	The notes indicate that the asphalt plant will remain in Phase 1A through the life of the quarry, however, the sequence of operations and rehabilitation show that this area will be extracted and will be part of the final pond area. Can you provide further details on the asphalt plant area and the apparent inconsistency with the extraction and rehabilitation plans? Would the area around and under the plant be extracted as a final phase? Would the plant be relocated? Does it make more sense to have the plant in Phase 5?	MHBC	As noted on Drawing 2 of 6, Operation Plan, Note I.4, the asphalt plant will be situated on the quarry floor in Phase 1A (in the area identified) and once processing has been relocated to Phase 2A. Therefore, the resource in the location of the asphalt plant will already have been extracted before it is brought on site. However, we will revise the following notes (in **bold**) to be more clear that the asphalt plant will be removed once extraction is complete and prior to final rehabilitation. • Drawing 2 of 6, Operational Plan, Note I.4: "…The asphalt plant will remain for the life of the quarry **until extraction is complete and shall be removed during progressive rehabilitation"**. • Drawing 3 of 6, Extraction Sequence, Note H.2: "….As part of the final operations of the site, remove office/scale house **and scales, asphalt plant and recycled asphalt material** and any other equipment and scrap from the site.
7.	B. Hours of Operation - Suggest adding a note to confirm no operations on Statutory holidays if applicable. City staff have provided further comments on the hours of operation as part of the comments on the Acoustic Assessment.	MHBC	Drawing 2 of 6, Operation Plan, Note B Hours of Operation – will be updated (**bold** added) to specify that: **"No operations shall occur on Statutory Holidays except as noted below"** which refers to an exception for a response to an emergency, which is acknowledged in ARA Policy 5.00.10.
8.	C. Proposed Entrances/Exits - Ideally through the course of the review the entrance locations and permissions to cross the unopened road allowance can be confirmed with the City of Niagara Falls and the Site Plan notes can be modified accordingly. Currently the notes provide for different scenarios pending municipal approvals/permissions.	MHBC	Agreed.
9.	Please confirm whether the residential entrances will be closed off once the structures are removed/demolished.	MHBC	Drawing 2 of 6, Operation Plan, Note E.1 – we have clarified this point by agreeing to revise the Note to read (**bold** added): "All existing structures within the licenced boundary will be demolished **(and any associated residential entrances closed off)** prior to extraction in each extraction area."

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10.	Page 4 – Report Recommendations - Monitoring Program. Is it anticipated that the monitoring program will be developed prior to ARA or municipal approvals? If yes, suggest the Site Plans be updated to reflect the program that is developed through the review of the applications	MHBC	It is agreed that certain parameters required to be included in the Monitoring Program may be developed prior to ARA or municipal approvals and, in general terms, are appropriate to be included on the Site Plan. However, details of the Monitoring Program, subject to approval by the Ministry with input from appropriate agencies, are typically prepared and contained in a separate document referenced on the Site Plan, allowing the document to be amended and updated without necessitating continual Site Plan Amendments.
Appendix 3: Alternative Site Analysis, October 2021 Comments:			
1.	Please include a figure in the report showing the mineral aggregate resources areas in the Study Area. This could be either the ARIP map or Schedule H in the Region's Official Plan.	MHBC	Potential mineral aggregate resource areas are identified on Figure 7 of the Report. Figure 7 overlays the Study Area on Schedule D1 (Potential Resource Areas) of the Region's Official Plan. Given the similar Comment No. 5 below, we will add a **new Figure 6** overlaying the mineral aggregate resource areas in the overall Market Area delineated in the report and wi**ll add a reference to Section 2.1** of the report.
2.	The PPS policy refers the alternative site analysis considering class 4-7 lands. CLI mapping in the report is provided for the 2 alternative sites that are considered in the report. It would be helpful to include a figure showing the CLI mapping in the broader Study Area so that it is easy for the reader to identify any other class 4-7 lands.	MHBC	**A new Figure 9** (Soil Classification Mapping) will be added to the Alternative Site Analysis to show the CLI mapping for the broader Study Area in addition to the subject lands and alternative sites and **added a reference to Section 2.2** of the Report.
3.	The report concludes that the 2 alternative sites considered are not "considered suitable for the development of a quarry". Consider revising this to indicate that the alternative sites are considered "less suitable" than the Uppers site.	MHBC	The PPS test is "other alternatives have been considered by the applicant and found unsuitable" and this is the test that was applied in the Report. We prefer to leave the language as written.
4.	Suggest revising Report Figure 6 to reflect the recently approved ROP (Schedule F – Agricultural Land Base) which is slightly different than the figure shown in the report). In particular, Alternative Site 2 is within the Prime Agricultural Area as depicted in the current ROP.	MHBC	In our view, the applications do not require conformity to the Niagara Region Official Plan (recently approved by the Province) as it was not in-effect or adopted at the time the applications were deemed complete. Furthermore, the Niagara Region Official Plan, as approved, includes a transition policy (Section 7.12.2.5) that makes this clear. With that said, for the purposes of responding to this comment, **we can provide Figures that overlay the Alternative Sites with the revised Schedule F for information purposes.**
5.	There are additional mineral aggregate resources areas (stone resources) identified in the ROP within the market area delineated in the report which have not been considered in the evaluation. Please include the rationale for excluding these areas from the analysis.	MHBC	As noted above, **we will update the Report to include a map showing mineral aggregate resource areas in the overall Market Area (new Figure 6).** However, rationale for excluding areas within the Market Area that are beyond the Study Area was provided in Section 2.1: "The following areas were excluded from the Market Area due to the physical, environmental and planning policy constraints and approval process that apply and make them less suitable in comparison to the subject lands: • Lands designated "Urban Area" in the Niagara Region OP have been excluded; and • Lands designated "Unique Agricultural Area" (i.e. Specialty Crop Lands) in the Niagara Region OP have been excluded". Therefore, despite resources being identified in the above areas, these areas were considered less suitable for the reasons given and were not included in the Study Area.
Appendix 4: Level 1 & 2 Water Study Report, October 2021 Comments:			
	Peer Review (Terra-Dynamics Consulting Inc.) Comments:		

	Comment	Responder	Applicant Response
1.	S. 3.1 Field investigations - The field investigations followed standard acceptable industry practice, however it is recommended borehole logs that are final have the "draft" watermark removed in the report.	WSP	Agreed. Finalized borehole logs (i.e., **Appendix C-1**) are in WSP's response to JART hydrogeological comments dated October 3, 2022.
2.	S. 3.1.1 Water Quality: a. The summary of the 2019 PW1 Pumping Test Discharge as presented on page 55 of Section 4.1.2.2 utilizes values from four different sample dates without explanation of presentation (e.g. pH and calcium from February 22, 2019, hardness, chloride, sodium, boron and iron from February 23, 2019, sulphate and alkalinity from February 24, 2019 and hydrogen sulphide from February 26, 2019), please clarify the data selection procedure for this table. b. The Provincial Water Quality Objective for nickel of 0.025 µg/L is missing from surface water quality table criteria, please add and discuss any exceedances (MECP, 1994).	WSP	a. The table from page 55 of **Section 4.1.2.2** is included in WSP's response to JART hydrogeological comments dated October 3, 2022. The values included in the column representing the 2019 PW1 Pumping Test Discharge are the median concentrations of the seven (7) samples obtained during the pumping test, as shown in **Table D.7.2**. The column title has been clarified as "median" is reproduced in WSP's response to JART hydrogeological comments dated October 3, 2022. b. Agreed. **Table G-1** has been revised to include the PWQO for nickel, please see attached. Only one (1) exceedance of the nickel PWQO was observed during the baseline monitoring period, at DP1 on May 1, 2017. This single exceedance suggests that locally, background nickel PWQO exceedances in surface water are not a widespread or continuous water quality concern.
3.	S. 3.1.2 Groundwater Levels: a. The water levels at groundwater monitoring wells MW5A-GP and MW5AR-GP are different by approximately 3-4 m. Is the difference between two monitors believed related to gas production or another cause? b. Also, it is recommended a different colour line be used for one of the Gasport monitors on Figure E-6 in order to distinguish between locations (Groundwater Hydrograph for Well Nest MW16-5). c. It is recommended, if appropriate, that MW16-6A be listed in Section 2.5.2.4 (Page 30) as having slow water level recovery inhibiting specific interpretation. d. It is recommended to fix what appears to be a typographical error (page 33, Section 2.5.3.1, underlined added here for clarity): "These observations show that an upward vertical gradient between the contact aquifer and the Existing Watercourse exists at MW16-16/DP3 near the south end of the Site, except for the summer months when an upward hydraulic gradient occurs."	WSP	a. Natural gas has been observed at both MW16-5A and MW16-5AR, although qualitatively, a greater amount of gas has been noted by WSP at MW16-5AR. We are unable to provide a definitive conclusion as to the difference in water levels between these two wells based on the available data. However, we would agree that a greater rate of natural gas infiltration to MW16-5AR could be the cause of the elevated water levels. The seasonal water level pattern at MW16-5AR is similar to that of MW16-5A, albeit at a higher elevation. b. Agreed. **Figure E-6** has been revised to distinguish the graph colours for MW16-5A and MW16-5AR, please see attached in WSP's response to JART hydrogeological comments dated October 3, 2022. c. Agreed. The third paragraph of **Section 2.5.2.4** (on page 30) has been revised as follows (underlined for emphasis): *"The majority of the deep bedrock aquifer wells show no response to precipitation events. Long recovery periods of a year or more following sampling are observed at most wells. Following the April 2018 sampling event, groundwater levels in most deep bedrock aquifer wells appear to have stabilized to static conditions and indicate a muted response to seasonal fluctuations observed in the overlying hydrostratigraphic units. Slow water level recovery at MW16-6A, MW16-9A, MW16-10A and MW16-13A inhibits specific interpretation with the available data set."* d. Agreed. The last sentence of the second paragraph of **Section 2.5.3.1** (on page 33) has been revised as follows (underlined for emphasis): *"These observations show that an upward vertical gradient between the contact aquifer and the Existing Watercourse exists at MW16-16 / DP3 near the south end of the Site, except for the summer months when a downward hydraulic gradient occurs."*
4.	S. 3.1.3 Surface Water - The calculation of 35 mm/year of runoff at SW1 for 2017 (page 13, Section 2.3.1) is incredibly low compared to existing reporting for the area (e.g. 288 mm/year and 196 mm/year for NPCA catchments BDSC_BRDC_W100 and W200, respectively, AquaResource Inc. and NPCA, 2009). It is acknowledged that WSP has already provided clarification by email to Terra-Dynamics of the surface water flow measurement challenges at this station that may have erroneously influenced calculation of flows from stage measurements (WSP, 2022). It is recommended that this value be removed given it appears unrealistic. It is also consequently	WSP	Agreed. The fourth paragraph of **Section 2.3.1** (on page 13) has been revised as follows (underlined for emphasis): *"Station SW1 monitors flow along Beaverdams Creek from the east of the Site. None of the flow passing though this station originates from the Site itself, and this station is considered a background / upstream monitoring station for the Beaverdams Creek reservoir / wetland complex present to the north of the Site. The catchment area for this upstream station is approximately 3.26 km2. The hydrograph on **Figure E-26** shows that flow within this upstream branch of the Beaverdams Creek is intermittent, with flow occurring only following large precipitation or melt events. During 2017, the estimated total flow at SW1 is approximately 112,844 cubic metres (m3), with daily average flow rates ranging between*

	Comment	Responder	Applicant Response
	recommended the analyses in the second last paragraph of Section 2.3.1 with respect to Site recharge rates in 2017 be reworded based on removal of this low value.		*150 L/s to no measurable flow. When the catchment area is considered, this results in a total runoff of 35 mm/year. As shown on **Table I-12**, the estimated water surplus during 2017 is about 474 mm. Therefore, a runoff coefficient of 7% is calculated for 2017. WSP has noted that the calculated runoff appears to be erroneously low compared to published NPCA values. WSP attributes this underestimation of flows measured in the field to several factors including vegetative growth, minimal flow gradient and the lack of points of good hydraulic control in the natural channel . Therefore, this calculated runoff value is not considered further in the analysis."* Furthermore, the second last paragraph of **Section 2.3.1** (on page 15) has been revised as follows (underlined for emphasis): *"It is noted that the published runoff values for the study area (AquaResource Inc. and NPCA, 2009) range between 196 mm/year and 288 mm/year. Excluding the erroneous value calculated for SW1, the 2017 runoff amounts calculated for the SW2, SW3 and SW4 catchment areas are between 114 mm/year and 317 mm/year, similar to the published range."*
5.	S. 3.2 Identification of Features - features were adequately identified. However, it is recommended: a. Figures 16 through 21 not truncate well identifiers; b. References to the 'Brown Road Landfill' (Sections 2.4.1, Table C-2, Figure 8 and Figures H-1 and H-4) be changed to the 'Cytec Canada Inc. Welland Plant Site', as the 'Brown Road Landfill' is only a small part of that site; and c. Section H.4.3.1, 3rd paragraph reference Figure 9, not Figure 8, with respect to the Welland Canal.	WSP	a. Agreed. Figures 16 through 21 have been revised, please see attached in WSP's response to JART hydrogeological comments dated October 3, 2022. b. Agreed. Figures 8, H-1 and H-4 and Table C-2 have been revised, please see attached in WSP's response to JART hydrogeological comments dated October 3, 2022. In addition, references to "Brown Road Landfill Site" (two in Section 2.4.1 on page 16 and one in Section 2.4.2.1 on page 19) have been revised to read "Cytec Canada Inc. Welland Plant Site". c. Agreed. The first sentence of the third paragraph of Section H.4.3.1 (on page H-13) has been revised as follows (underlined for emphasis): d. "The Welland Canal is located west of the Site and is shown on the conceptual east-west cross section (Figure 9 of the main report)."
6.	S. 3.3 Monitoring, Trigger Mechanisms and Contingency Plans - The proposed groundwater monitoring and response program is acceptable: a. However, it is recommended that clarification be provided with respect to the specific meaning of the columns "Interpolated" and "Predicted" on Tables 2 and 3 as it is not clear. b. Also, it is acknowledged that WSP (2021a) has stated that "There is currently limited continuous water level data for most private wells", but a specific reason was not provided for the discontinuous hydrographs for private well monitoring locations R1, R2, R3, R4 and R7. Please clarify if these locations are still appropriate for listing on the Proposal Monitoring Program (Table 1) given collection of baseline background water levels appear incomplete.	WSP	a. Interpolated available drawdown was defined earlier in **Section 2.5.4.5** (on page 42), but we agree that a reference should have been included in **Section 5.2.2** for improved clarity. The interpolated available drawdown in the shallow and deep bedrock aquifers was calculated using ArcGIS by subtracting the elevation of the interpolated lower contact of the Gasport member bedrock from the potentiometric surface elevation shown on **Figure 15**. The interpolated available drawdown is shown in **Figure 24** in WSP's response to JART hydrogeological comments dated October 3, 2022. The predicted available drawdown was defined in **Section 4.1.1.1** (on page 51), and again, we agree that a reference should have been included in **Section 5.2.2** for improved clarity. Numerical groundwater modeling was completed to simulate the predicted available drawdown in the shallow and deep bedrock aquifers as a result of the proposed quarry dewatering during the drier summer and fall months as shown on **Figure 26**. Both the interpolated and predicted available drawdown from **Figures 24 and 26** are provided for each well location included on **Tables 2 and 3** reproduced in WSP's response to JART hydrogeological comments dated October 3, 2022. b. We can confirm that R1, R2, R3, R4 and R7 are still equipped with data loggers and are included in the on-going monitoring program. Data logger downloads were only completed at R5, R6, R8 and R12 in July 2020, during the early portion of the Covid-19 pandemic. Data loggers were not downloaded at the remaining private wells at that time in order to limit potential contact between WSP staff and the well owners. The most recent download of all residential wells was completed in August 2022.

	Comment	Responder	Applicant Response
	NPCA Staff Comments:		
7.	Section 2.5.3 Groundwater / Surface Water Interaction – The NPCA offers no objection to the conclusion that the site's surface water features are underlain with a thick layer of silt and clay. As such, the surface water features are not anticipated to be impacted by the quarry dewatering as there is minimal groundwater/surface water interaction occurring.	WSP	Acknowledged.
8.	Section 2.5.3.1 Existing Watercourse and Associated Wetland Complex – The NPCA offers no objection to the conclusion that the site's surface water and wetland features are underlain with a thick layer of silt and clay. As a result, there is minimal groundwater/surface water interaction occurring in these features.	WSP	Acknowledged.
9.	Section 2.6.1 Groundwater Quality – The NPCA offers no objection to the characterization of the quality of the groundwater in the area. Within the shallow overburden, groundwater is fresh and similar in quality to precipitation. Within the bedrock aquifers, the groundwater varies between fresh and sulfur type waters.	WSP	Acknowledged.
10.	Section 2.6.3 Surface Water Quality – The NPCA offers no objection to the conclusion that the ambient surface water quality is generally in poor condition and is typically turbid with elevated nutrient loads.	WSP	Acknowledged.
11.	Section 3.1 Proposed Development Phases – The NPCA has no general objection to the proposed phasing of this development.	WSP	Acknowledged.
12.	Section 4.1.2.1 Impact Assessment Surface Water Flow – The NPCA understands that during the quarry's operational life approximately 50L/s (4,268 cubic meters/day) will be discharged from the quarry into the receiving watercourse. The NPCA will require that an erosion assessment be undertaken in order to determine the impact of these discharge rates and volumes on the receiving watercourse.	WSP	The impacts of future quarry discharge on erosion in the designed watercourse channel are addressed by others (Stantec) in the report accompanying the Licence application.
13.	Section 4.1.2.2 Impact Assessment Surface Water – The NPCA has no objection to the comparison between the quality of the surface water and the local groundwater regime. Staff note that the groundwater contains elevated levels of Hydrogen Sulphide.	WSP	Acknowledged.
14.	Section 4.1.2.2 Impact Assessment Surface Water – Staff have no objection to the conclusion that the proposed quarry discharge into the existing watercourse is predicted to generally improve the surface water quality in the watercourse downstream of the site. However, NPCA staff still remain concerned about the ability of this development to mitigate the elevated levels of Hydrogen Sulphide prior to discharge into the watercourse.	WSP	Acknowledged.
15.	Section 4.2 Final Rehabilitation Conditions – NPCA staff offer no objection to the proposal that the quarry be rehabilitated as a series of lakes from an engineering perspective.	WSP	Acknowledged.
16.	Section 5.1 Proposed Monitoring Program – NPCA staff have no objection to the proposed monitoring plan as described in Table 1 and Figure 29. However, with respect to preventing elevated levels of Hydrogen Sulphide from being discharged for a prolonged period of time into		Paragraph 7 of **Section 5.4** (on page 67 in WSP's response to JART hydrogeological comments dated October 3, 2022) outlines the quarry discharge trigger mechanism with respect to hydrogen sulphide. Routine monthly sampling is recommended, with weekly confirmatory sampling completed in the event of a trigger exceedance. This proposed routine

	Comment	Responder	Applicant Response
	the existing watercourse, Staff would recommend that the Quarry Sump Discharge be sampled at least once a week for this parameter.		sampling frequency for hydrogen sulphide is consistent with the Environmental Compliance Approval for Industrial Sewage Works (ECA) no. 4148-89YHGE for the closest known quarry where hydrogen sulphide is included as a trigger for quarry discharge.
17.	Section 5.4 Discharge Trigger Mechanism and Contingency Plan: a. NPCA has no objection to the proposed trigger concentrations. b. Staff recommend that the trigger mechanism for total phosphorus be added. The trigger concentration should be that the quarry discharge concentration be less than the concentration in the watercourse upstream of the quarry. c. Should monthly sample results indicate exceedances above the trigger criteria, staff would recommend that weekly sampling be initiated until all parameter concentrations fall below the trigger thresholds. d. After 4 weeks of exceedances of the pH, TSS, and oil/grease trigger thresholds, this would initiate a review and redesign of quarry discharge concentrations. There is no timeline provided for implementing these changes. The NPCA recommends adding a timeline and the immediate reduction in quarry discharge until the issue is addressed. e. After 4 weeks of exceedances of the Hydrogen Sulphide trigger threshold, the NPCA recommends that this should initiate a review and redesign of quarry discharge concentrations. There is no timeline provided for implementing these changes. The NPCA recommends adding a timeline and the immediate reduction in quarry discharge until the issue is addressed.	WSP	a. Acknowledged. b. We agree that the proponent should monitor and report on total phosphorus in quarry discharge as per the future Site ECA. We are, however, unaware of any other operating pit or quarry on the Niagara peninsula that has a discharge trigger for total phosphorus as a condition of licence. Given that the upstream and downstream total phosphorus concentrations in the Existing Watercourse, Beaverdams Creek and the Welland Canal south turn basin surface waters generally exceed the Provincial Water Quality Objective (PWQO), we would recommend that total phosphorus not be included in the proposed trigger mechanism for quarry discharge. Because of their ubiquitous nature on the Niagara peninsula, concerns over total phosphorus concentrations should be addressed on an annual basis as part of the proposed routine long term hydrogeological monitoring. c. Agreed. Paragraph 5 of **Section 5.4** (on page 66) has been modified as shown below (underlined for emphasis): *"The monthly sump discharge sample results will be compared with the background conditions in the Existing Watercourse (station SW3) and Beaverdams Creek (station SW1). If parameter concentrations in the sump discharge exceed the above trigger concentrations without a corresponding exceedance in the background surface water, then weekly sampling of the quarry sump will be initiated. Weekly sampling will continue ~~until less than two~~ parameter concentrations in the sump discharge ~~exceed~~ fall below any trigger concentrations."* d. Agreed. Paragraph 6 of **Section 5.4** (on page 66 in WSP's response to JART hydrogeological comments dated October 3, 2022) has been modified as shown below (underlined for emphasis): *"If weekly sampling is required for a period of more than four (4) weeks, contingency measures would be implemented to reduce concentrations in the future quarry discharge within four (4) weeks of receipt of the laboratory results confirming a fourth consecutive trigger exceedance. Trigger exceedances for ~~pH, TSS and total oil and grease~~ all trigger parameters would initiate a review of the design and operation of the quarry discharge system. Where required, improvements would be made to reduce discharge concentrations."* *e.* Agreed. Please refer to the response to comment 17 (d) above.
18	Other General Comments: a. The "study area" needs to be defined as it appears to different than the "site area". This is important because NPCA ambient monitoring is mentioned study area sections 2.6.1 and 2.6.3 and it's not clear what is being referred too. b. Section 2.6.1 Groundwater Quality – This section mentions that the NPCA has completed "on-going ambient monitoring". While the NPCA does have ambient groundwater monitoring program throughout its watershed jurisdiction, there is no NPCA monitoring near the study area of the proposed work. This report should include the monitoring NPCA sites/data that are relevant to this study. NPCA is willing to provide any groundwater data from it's ambient monitoring program to assist. c. Section 2.6.3 Surface Water Quality- This section also mentions that the NPCA has completed "on-going ambient monitoring". It would be helpful to include the NPCA monitoring sites/data or reference to provide context. The NPCA currently has two ongoing water quality monitoring stations in the Beaver Dams/Shriner Creek watershed.	WSP	a. The study area is defined in **Section 1.3,** reproduced below for clarity. *"The study area extends to the Niagara Escarpment brow to the north, the Queenston-Chippewa Power Canal to the east, the Welland River to the South, and the modern Welland Canal to the west. This area roughly coincides with the extent of Figure 1."* b. The text included in the Level 1 and 2 report was a general comment on the regional groundwater quality, rather than refer to specific monitoring stations operated by the NPCA. The second paragraph of **Section 2.6.1** (on page 43 of the Level 2 report) was intended to reference Section 2.4.1 (on page 25) of the Updated Assessment Report for the Niagara Peninsula Source Protection Area (2013). This section notes that NPCA operates 15 monitoring wells as part of the Provincial Groundwater Monitoring Network (PGMN), as shown in Figure 2.11 of the Updated Assessment Report. Figure 2.11 indicates that there are four (4) PGMN wells situated in relatively close proximity to the study area (GA-356-A, GA290, GA362-A and GA362-B). Nonetheless, the second paragraph of **Section 2.6.1** has been modified as shown below (underlined for emphasis): *"On-going monitoring of ambient groundwater quality has been completed by NPCA. ~~Within the study area~~ At various locations throughout the Niagara peninsula, ambient groundwater quality for the contact and shallow bedrock aquifers*

	Comment	Responder	Applicant Response
	The Beaver Dams Creek station is located on the west side of the canal and rated as "Fair" water quality using Canadian Water Quality index based on the last five years (2020-2016) of data. The Shriners Creek station is located on Thorold Stone Road just west of Kalar Road as rated as "Poor" water quality using again Canada WQI (2020-2016 - 5 yrs of data). There is also historic NPCA data (2008-2010) that was generated from the Beaver Dams/Shriners Creek watershed study may provide additional background watershed information. Both of these data sets are available from the NPCA. d. Section 5.4 Discharge Trigger Mechanism and Contingency Plan - NPCA staff would recommend that dissolved oxygen be considered as trigger owing to the potential present of hydrogen sulphide in dewatering discharge. The NPCA has observed DO depletion watercourses downstream of sulphur springs in the Hamilton portion of the NPCA watershed. DO concentrations should meet PWQO before quarry discharge into the receiving watercourse. e. Staff note that the closest NPCA monitoring well to the site is located at Baden-Powell Park. Annual geochemistry and hourly water level elevation data is available as far back as 2015 if there is interest. The data from the Baden-Powell NPCA monitoring well appears to be consistent with the groundwater elevation and chemistry data findings of the report. f. Under Section 2.5.4- NPCA staff agree that the water levels within the Welland Canal that supply the DeCew Falls Water Treatment Plant will not be impacted by the proposed quarry dewatering. g. Under Section 2.5.4.4 – NPCA staff agree that they have identified the groundwater takings surrounding the site that likely have had an impact on the regional potentiometric surface, including the lesser-known impacts from the Welland Canal tunnel dewatering.		*generally meets Ontario Drinking Water Quality Standards (ODWQS) (MECP 2006 and updates) for parameters with health-related standards. Exceptions include sporadic exceedances of some dissolved metals concentrations. Agricultural and / or septic system impacts are also observed regionally, resulting in elevated nitrate concentrations in the groundwater."* c. The text included in the Level 1 and 2 report was a general comment on the regional surface water quality, rather than refer to specific monitoring stations operated by the NPCA. The second paragraph of **Section 2.6.3** (on page 44 of the Level 2 report) was intended to reference Section 2.3.5 (on page 24 of the Updated Assessment Report), in particular, paragraph four. The stations referenced in this section are spread throughout the entire Niagara peninsula as shown in Figure 2.10 of the Updated Assessment Report. Therefore, the second paragraph of **Section 2.6.3** has been modified as shown below (underlined for emphasis): *"On-going monitoring of ambient surface water quality has been completed by the NPCA. ~~Within the study area~~ <u>At various locations throughout the Niagara peninsula</u>, results from over two-thirds of the surface water quality stations operated by the NPCA suggest surface water conditions are poor or impaired, and only 5% of the stations regularly indicate good conditions. The main contaminants of concern are total phosphorus, E. coli, suspended solids and chloride, originating from sources including agricultural activities, poorly maintained septic systems, road salting activities and untreated stormwater runoff from urban areas."* The 2008-2010 Beaverdams Creek / Shriners Creek surface water results were provided by NPCA to WSP following the JART meeting of May 2022. These data can be incorporated into future reports. d. Similar to our response to comment 17 (b) above, we agree that the proponent should monitor and report on dissolved oxygen in quarry discharge as per the future Site ECA. We are, however, unaware of any other operating pit or quarry on the Niagara peninsula that has a discharge trigger for dissolved oxygen as a condition of licence. We would recommend that dissolved oxygen not be included in the proposed trigger mechanism for quarry discharge. Concerns over dissolved oxygen concentrations should be addressed on an annual basis as part of the proposed routine long term hydrogeological monitoring. e. Acknowledged. f. Acknowledged. g. Acknowledged.
Appendix 5: Level 1 & 2 Natural Environment and Environmental Impact Study, October 2021 Comments:			
	General Comments / Summary of Key Concerns		
1.	Site Investigation Methodologies - Clarification is required for various methodologies employed for site investigations and evaluation of significance.		Comments are addressed individually below.
2.	Evaluation of Significant Woodlands - Clarification is required regarding the evaluation of significance and proposed removal and habitat replacement of the significant woodland located on the subject property.	Stantec	S.3.3.1 of the Level 1 & 2 EIS details the methods of evaluation of significance for woodlands, including using criteria from the Natural Heritage Reference Manual (NHRM) and Region of Niagara Official Plan Policy 7.B.1.5. Using the Provincial assessment criteria found in the NHRM guiding document, the woodland is not provincially significant as addressed in section 6.2.1.

	Comment	Responder	Applicant Response
			The woodland criteria found in the Region's OP (Upper tier municipality) suggest the woodland would be assessed as significant as discussed in section 6.2.2. Section 6.2.3 of the EIS indicates that these criteria were used to determine that the woodland on the property meets the criteria of significance of the upper tier municipality but not significant in consideration of the NHRM provincial criteria. The Aggregate Resources of Ontario: Technical Reports and Information Standards, August 2020 states with respect to Natural Heritage Features: *The report must identify any of the following natural heritage features and areas that exist on the site and within 120 metres of the site: a) significant wetlands b) other coastal wetlands in Ecoregions 5E, 6E and 7E, c) fish habitat, d) significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River) e) habitat of endangered species and threatened species, f) significant wildlife habitat, g) significant areas of natural and scientific interest, h) Within the area of one or more provincial plan(s), any key natural heritage features not included in (a) through (g) Where any of the above features or areas have been identified, the report must identify and evaluate any negative impacts on the natural features or areas, including their ecological functions, and identify any proposed preventative, mitigative or remedial measures. The report must also identify if the site or any of the features, included in (a) through (g), are located within a natural heritage system* An evaluation of impacts to the woodland on the subject property and proposed mitigation, including habitat replacement, is provided in S.8.2 of the EIS. In summary, the woodland has been evaluated and noted to offer certain natural environment habitat features as detailed in the EIS. The proposal is to remove the woodland feature as the noted habitat features and function are not considered of a nature that they need to be protected in-situ but rather can be supported through the development of remedial measures, in this case, the restoration of the woodland feature, contiguous with a nearby woodland feature that is within the area encompassed by a portion of the 120 metre Area of Investigation. This approach provides additional ecological diversity (Enhancement) on the landscape in the short and long term. The restoration increases the amount of forest cover in the Region and adds to the existing NHS designation of an adjacent woodland feature and provides equal or a gain in habitat value for both flora and fauna. This scenario offers both considerations to maximizing the local quarry design elements by focusing the impacted area while offering a net gain to the long term landscape ecology of the Region. The remedial measure supports and incorporates the attributes for which the woodland has been identified to exhibit. The applicant (Walker) has demonstrated significant success with this reforestation approach and their on-going commitment to managing reforestation viability, including an extensive reforestation program approved at another quarry Walker owns and operates.
3.	Evaluation of Significant Wildlife Habitat - Clarification is required regarding the assessment of significance for Significant Wildlife Habitat (e.g., given presence of turtle species and habitat for species of conservation concern).	Stantec	S.3.3.3 of the EIS details the methods for evaluation of significance for SWH, and S.3.3.4 details evaluation of significance for Species at Risk and Species of Conservation Concern. S.6.0 details the results of the analysis of significance for Natural Heritage Features, including Species at Risk (S.6.5) and Significant Wildlife Habitat (S.6.7). Appendix B of the EIS provides a detailed habitat assessment for the site. The results of turtle surveys were inadvertently omitted from the NETR report reviewed by JART. Turtle surveys were completed as part of the suite of natural heritage studies conducted on the subject property. Turtle basking surveys were completed on site on April 4, May 3, May 9, May 17 and May 30, 2017 as per the Ecoregion Criteria.

	Comment	Responder	Applicant Response
			A review of the field data confirms that turtles were not observed on site during these specific basking turtle surveys or incidental observations during the suite of other field surveys completed during the active turtle period on the subject property. Complimentary turtle surveys for nesting activity were completed on the subject property June 21, 22, 27 to 30, 2023. One predated turtle nest and a potential disturbed dig site were observed and document in the vicinity of the unnamed tributary within the granular embankment of Uppers Lane Road. The Ecoregion 7 E Schedule Criteria (2015) states "Nesting Areas on the side of municipal and provincial road embankments and shoulders are not SWH'. As such, considering the survey results and location of the observed nests within the road allowance, it is concluded that Significant Wildlife Habitat related to turtles is not recorded on site.
4.	Fish Habitat a. The watercourse that crosses the property, which it is proposed to realign, provides spawning and nursery habitat for Northern Pike (Esox lucius). Adult Northern Pike migrate to the stream to spawn in the spring and then migrate back to downstream habitats. It is not known if Northern Pike migrate upstream past the subject property to spawn farther upstream, but the presence of young-of-the-year individuals in the entire length of the watercourse within the subject property (AECOM, 2010) suggests this may occur. b. The regional significance of Northern Pike spawning in the watercourse that crosses the property has not been assessed but clearly the spawning habitat has significance that extends beyond the immediate study area. The watercourse is accessible to fish from an extensive area of aquatic habitat that is suitable for adult Northern Pike. Investigations to determine the number of Northern Pike that enter this watercourse to spawn and to determine if Northern Pike from the downstream habitats spawn in other locations could provide regional context and allow the scale of potential effects to be assessed.	Stantec	A review of background information on fish and fish habitat for areas outside of the primary study area was undertaken to provide context to the study area observations. The review was summarized in a memorandum to Britney Fricke, re: Information Request for Upper Quarry Natural Environment Report Received from Dougan & Associates March 31, 2022 (June 9, 2022). This memo is attached to this response matrix, along with attachments. The review was completed in response to Item 6 of the memo, as follows: *Response 6* *Based on a review of Ministry of Natural Resources and Forestry (MNRF) as well as Fisheries and Oceans Canada (DFO) GIS platform mapping, there is a general lack of background fisheries data available, particularly Aquatic Resource Area Survey Points, in the general regional area beyond the Study Area. One of the closest watercourses with Aquatic Resource Area Water Line Segment data is Beaverdams Creek. Segment data consist of a species list that includes Fantail Darter, Johnny Darter x Tesselated Darter, Longnose Dace, Northern Hog Sucker, Rainbow Darter, River Chub, Spottail Shiner, Stonecat and White Sucker. The capture location of theses species is not attributed to any specific Aquatic Resource Area survey point and the source of species list is unknown.* *Shriner's Creek is located to the north of Beaverdams Creek. Sparse fish data for Shriner's Creek includes two ARA survey points (Beechwood Road and Garner Road) that yielded Bluntnose Minnow and Largemouth Bass as species captured by DFO at both stations.* *The lacustrine-like lower reaches of Shriner's Creek and Beaverdams Creek are connected to each other via a wide cut extending south to north along the west side of Davis Road (Highway 58) and would provide more substantial and permanent holding water than the many tributaries that feed into both creek systems. The general area features a number of smaller, shallow marshy channels or channel sections that comprise habitat conditions in the upper reaches of these systems or that discharge into either creek at various points along their lengths. The habitat productivity in these shallow marshy habitat systems may be limited by the flashiness of the flow regime that varies on annual basis depending on snow melt and spring precipitation and the onset of intermittent flow conditions. Shallow wetland habitat is available in abundance along the margins of the lower reaches of both Beaverdams and Shriner's Creeks and likely provides a more stable habitat environment on an annual basis given the backwater influence provided by the water levels in the Welland Canal.* The proposed channel realignment has been designed to provide habitat elements specific to the life cycle processes for Northern Pike including an increase in available spawning habitat, improved rearing and refuge habitat provided by a greater number of deeper pools. A net gain in overall fish habitat will be achieved through the habitat design of the new channel and the habitat elements incorporated specifically for Northern Pike are expected to result in a net gain in habitat productivity for the species.
	Detailed Peer Review (Dougan & Associates) Comments:		

	Comment	Responder	Applicant Response
5.	Section 3.2 (FIELD SURVEY METHODS) pg. 3.1 - It is noted in Table 3.1 that no dedicated Turtle surveys were conducted either on the Subject Lands or within the RAA. Given the proximity of larger wetlands to the north and the ability of turtles to move through the landscape while moving from wetland to wetland or in search of nesting habitat, please explain why no surveys were conducted, especially as it relates to potential Species at Risk and the identification of Significant Wildlife Habitat. It is noted that during the technical meeting held on March 30th, 2022, the applicant's consultant confirmed that turtles were observed along the watercourse on the subject property. These records have not been included in the Natural Environment Technical Report and Environmental Impact Study. Please address.	Stantec	The results of turtle surveys not previously documented in the EIS are outlined in response #3 above. In consideration of all field observations, it is concluded that the subject property is not SWH as it relates to turtles.
6.	Section 3.2.3 (Breeding Bird Surveys) pg. 3.5: a. Grassland bird species were surveyed in 2019. However, only eight of the twenty-three point-count stations surveyed for breeding birds in 2017 were surveyed in 2019. Please explain why so few stations were surveyed and how the stations were selected for suitability. It appears that large areas of the subject lands did not receive any coverage. b. Clarify why the 2nd Grassland Bird Surveys were only 1 hr. 16 minutes long when survey 1 and 3 were both close to 2.5 hours in length. Did it have something to do with the fact that the survey conditions were too windy (per Table 3.4)? It also doesn't look like the survey was repeated to ensure the data collected was within accepted standards. Please explain.	Stantec	a. Per S.3.2.3 of the EIS, the 2017 Breeding Bird Survey (BBS) was designed to provide an inventory of breeding birds in the study area, and targeted all habitat types. This study followed established protocols of the Breeding Bird Atlas. The 2019 survey was specifically intended to target suitable habitat for grassland birds, such as the Bobolink, in suitable habitat and where Stantec determined that potential gaps could be identified from the previous effort. Stantec did not identify the requirement to repeat the comprehensive 2017 BBS survey in 2019. b. The 2019 survey dates were shorter in length than the 2017 because there were fewer points assessed during each date. Only the first date of the 2019 survey was significantly longer (2 hours 22 minutes) than the others (1 hour 16 minutes and one hour 28 minutes). This was due to the additional time required to confirm suitable stations and determine access.
7.	Section 3.2.4 (Snake Cover board Surveys) pg. 3.5: a. Did Guelph District MNRF conclude that the survey results from the snake cover board survey would be sufficient to conclusively determine presence/absence? It is our experience that cover board surveys were not acceptable, but rather considered complimentary. b. Did the Guelph District MNRF recommend that the cover boards be checked on a daily or near daily basis, at least in May 2017? Checking on a daily or near daily basis can result in cover boards not being used and therefore negatively affect detectability. Please address. c. According to Table 3.1, 17 surveys were conducted. The March 29 survey date appears to be missing in Table 3.5 below. Please address.	Stantec	a. The Guelph MNRF was provided with the proposed Work Plan for the property in letter of March 2017 and responded to the Letter in June 2017. The MNRF also provided input during a pre-consultation on October 2019. The letter request included a comprehensive table of all species with Element Occurrences (EO) in the area and a determination of whether the species would be a target. Based on the screening two SAR/SOCC snake species were determined to potentially be in the study area. The MNRF was request for confirmation of the included findings, a review of the work plan, and identification of any additional information for the Study Area. The MNRF generally does not comment on protocols that they have no concern with and provided recommendations for additional surveys and associated specific protocols that they feel are insufficient or require great level of effort than those described in the Work Plan. The MNRF did not add any additional recommendations for snake surveys beyond the cover boards noted in the Work Plan. Stantec is cognizant of the use and reliability of cover boards for snakes through experience and our knowledge of the Survey Protocol for Ontario's Species of Risk Snakes (MNRF 2016). We are aware that cover board are not appropriate for all species; however, they are relatively effective for the three species with the potential to occur in this study area. Snake surveys and observations are also conducted as part of all site characterization such as ELC, breeding bird surveys, fish habitat surveys that occur along riparian edges, etc. It is Stantec's experience that these surveys, conducted at different time of the year and times of day, are most instrumental in identifying the presence of various snake species and in combination with NHIC background species information for the area and the noted Artificial Cover (ACO) surveys offer reliable source of data to assess snake habitat and activity on site. The appropriateness of

	Comment	Responder	Applicant Response
			a specific survey methods consider a number of factors including features on site, the known occurrence of the species, and the general habitat of those species and their behavior. b. S.3.2.4 of the EIS identifies that the snake coverboard protocol used was developed in consultation with Guelph District MNRF and under a Wildlife Scientific Collector's Authorization issued by MNRF and WACC. The protocol, including frequency of surveys, was approved by the agency and committee. c. Coverboards were set out on March 29th but no survey was completed; the boards were set and left to blend with emerging vegetation until April 4th (survey 1 in Table 3.5).
8.	Section 3.2.5.1. (Bat Maternity Roost Suitability Survey) pg. 3.8 - The report states that "A survey was completed on April 19, 2017 to identify potentially suitable roost trees." However, both Table 3.1 and 3.6 seem to suggest that this survey was conducted on April 4, 2017. Please clarify.	Stantec	Acknowledged – pg 3.8 should read April 4th, 2017.
9.	Section 3.2.5.2. (Bat Acoustic Surveys) pg. 3.9 - Why were there no ARUs deployed by the treed habitats along the existing watercourse, at the very north end of the subject lands?	Stantec	ARUs were only placed in potentially suitable mature forest habitat. ELC units on the northern portion of the property (SWT, MAM, MAS, CUT, CUM, AG, RES, and REC) do not include treed habitats. Primary purpose of the ARU is to detect area that are Bat maternity roosts.
10.	Section 3.2.5.3. (Bat Exit Surveys) pg. 3.9: a. Please indicate why "Surveying for the presence of Little Brown Myotis and Northern Myotis (MNR, 2013)" was the survey protocol used to conduct exit surveys and please provide a copy for review. Also, please include the reference in Section 13.0. b. Please indicate why the third survey could not be conducted in June when timing is considered most suitable by the Ministry? c. Please indicate why some of the other buildings were not surveyed?	Stantec	a. This is an incorrect reference, the protocol used was MNRF Guelph District's *Use of Buildings and Isolated Trees by Species at Risk Bats: Survey Methodology* (2014). References will be updated. b. While Stantec makes every effort to conduct surveys when species are most likely to be detectable, uncontrollable circumstances such as weather, property access, and scheduling conflicts can influence timing. July is stated as suitable in the referenced protocol, and as weather and other conditions were within acceptable limits this survey date was deemed appropriate. c. Bat exit surveys were only conducted at buildings that were within the project area (i.e. going to be disturbed) and assessed to be suitable for bat roosts (i.e., buildings with suitable entry/exit points and/or loose shingles and siding, etc.) as per S.3.2.5.2
11.	Section 3.2.6.2 (Bat Acoustic Surveys) pg. 3.9 - According to the report, seven ARU's were deployed in 2019. However, according to Figure 7 (Appendix A), only five ARU locations are shown for 2017. Please clarify/revise.	Stantec	Seven 2019 ARU locations are shown on Figure 7 of Appendix A (orange square icons).
12.	Section 3.2.6 Terrestrial Insect Surveys pg. 3.10: a. Please indicate why only two visits were conducted. An earlier visit in June would have helped ensure all potentially occurring species were adequately detected, especially those with earlier flight windows. b. Also, please indicate why the July 5th visit started so early in the morning. Unless it is very hot and humid, most species of butterflies and odonates are not active until mid-morning.	Stantec	a. While June surveys may have more effectively captured species with early flight seasons, such as some Duskywings, these species were not determined to require targeted surveys as they may be presumed present. July and August represent the timings with the highest number of insects in flight, including potentially significant species such as Monarch and Rusty-Patched Bumblebee. b. On July 5th, insect surveys were conducted concurrently with Breeding bird surveys, and then for 3 hours following. Temperature range (20-24C) and light wind speeds were both suitable for conducting insect surveys in this timing window.
13.	Section 3.2.7 Headwater Drainage Feature Assessment pg. 3.10 - Please provide a reference for the headwater drainage features (HDF) guidelines that the timing of site visits is stated to be consistent with. If the reference is to the CVC and TRCA guidelines (finalized in 2014), which are referred to in Section 3.3.5, please explain how the timing of the site visits was consistent with the timing recommended by the HDF guidelines.	Stantec	The Headwater Drainage Feature Assessment (HDFA) was completed using The Evaluation, Classification and Management of Headwater Features Guidelines (CVC and TRCA, TRCA Approval July 2013; finalized January 2014) (the Guidelines) as a tool to examine headwater features on the Subject Property. Table 4 of the Guidelines provides approximate windows for site visits to capture observations associated with time of year. Site Visit 1 is associated with spring freshet conditions and is typically undertaken from late March to mid-April. Site Visit 2 is undertaken after freshet is complete, the melt/thaw interflow has ceased and after the spring rainy period has subsided, preferably after a few days with no precipitation. It should be

	Comment	Responder	Applicant Response
			undertaken before spring vegetation growth is very far advanced, which typically is in the late April to mid-May period but can be undertaken anytime in spring with confidence provided that vegetation growth has not advanced to the point of obscuring observations. HDFA site visits were completed on April 4, 2017 and April 9, 2021 to capture site conditions consistent with Site Visit 1 of the guidelines. An HDFA site visit consistent with Site Visit 2 of the Guidelines was completed on June 22, 2017. While this visit was beyond the typical late April to mid-May window, the fields were tilled and plant growth had not yet advanced to obscure observations of the area examined during Site Visit 1 in 2017. The visit is consistent with the conditions outlined by the Guidelines. Site Visit 3 was not required due to the absence of water during Site Visit 2, and, as per the guidelines, no further investigations are required if this condition is met.
14.	Section 3.3.3 Significant Wildlife Habitat Assessment pg. 3.15 - Please indicate what document was used to assess Significant Wildlife Habitat. The text appears contradictory or unclear. If both were used (i.e., MNR, 2000 and MNRF 2015), please indicate why and what criteria were used to determine when each was applicable.	Stantec	The Ecoregion 7 E Schedule Criteria (2015) is the tool used to assess SWH in the NETR report as document in the assessment Section 6.7 and supporting Appendix B. The Significant Wildlife Habitat Technical Guide, MNR 2000, is considered as supporting information when appropriate.
15.	Section 4.1 Landscape Context pg. 3.18 - The description could be broader and include additional information other than a description of the most common tree species. The Great Lakes Conservation Blueprint for 7E-5 provides a good summary.	Stantec	Noted, landscape context will be expanded to include more information.
16.	Section 5.3.2 Bobolink - Text on page 5.7 indicates that "Bobolink were observed at 7 of the 23 point count locations with a combination of grassland and winter wheat (BBS-1, BBS-2, BBS-3, BBS-7, BBS-9, BBS-10, and BBS-13), as shown on Figure 4, Appendix A". For transparency, please indicate how many Bobolink were recorded in 2017 and what individual fields they were documented in.	Stantec	This information will be provided in a revised NETR report.
17.	Section 5.5.2 Bat Acoustic Surveys - According to the report bat acoustic data was collected at 11 stations on the subject property in 2017. However, 12 stations are shown on Figure 7. Please clarify/revise.	Stantec	To provide clarity 13 ARU units were deployed, the location of these units are illustrated on Figure 7 (Please note one of the thirteen locations is not as visible as the other location SM$-J, please see clip from Figure 7 below. Of these 13 ARU, bats were recorded at 11 of these stations. As noted in the section 5.5.2., " Data could not be obtained from two of 13 stations due to equipment malfunction". As such, 11 detectors from the 2017 suite of ARU's were analyzed and bats were record at all 11 of the ARU's retrieved in 2017.

	Comment	Responder	Applicant Response
			

18.	Section 5.8 Headwater Drainage Feature Assessments pg. 5.11: a. This section states that the headwater drainage features are colour-coded to reflect their management status on Figure 8 (Appendix A) but this does not appear to be the case. Colour-coding would be useful. b. Headwater drainage feature classification, as presented in CVC and TRCA (2014) and Section 3.3.5 of this EIS, is based on up to three site visits with the first typically occurring in late March to early April. A second visit is made during late April to early May if necessary, and a third visit is made during the July-mid-September period if necessary. Please explain how data from a site visit in early April (in two years) and a site visit in late June provides the information required to determine the classifications. c. Please provide the raw field observations, and their date(s), that were utilized to determine the classifications presented in Table 5.5. For example, the hydrology class is based on flow status (flow, standing water, or dry), the feature's physical form, and whether or not there is a wetland upstream. d. It is not unusual for headwater drainage feature classifications to differ among reaches of an HDF. The classifications of upstream reaches can influence the classification of reaches downstream. Please consider whether this is relevant to any of the HDFs in the study area, including feature 11 and features 7, 12, 24 and 25.	Stantec	a. This is a clerical oversight. The figure will be revised to provide the stated colour coding that reflects the management status of these features. b. The requirement for subsequent visits is dependent on the presence of water associated with the feature. Site Visit #1 typically shows flowing or standing water present in association with mapped features. If no feature or water is present at a mapped location during Site Visit 1, no further visits are required. If water is present, Site Visit 2 is scheduled to revisit the feature after freshet is complete, the melt/thaw interflow has ceased and preferably after a few days with no precipitation. It should be undertaken before spring vegetation growth is very far advanced so that the previously observed feature is unobstructed. If no water is present in the feature during Site Visit 2, no further visits are required. If water is present, a third visit is undertaken during the summer dry period (usually in July-August) and if water is present at that time, the feature is considered important with respect to hydrological function. Site Visits 1 (April) and 2 (June) in 2017 captured water present in features during the first visit, necessitating the second visit. No water was present in any headwater feature during Site Visit 2 and no further visits were required. Site Visit 1 undertaken in 2021 examined additional potential headwater features that were previously not assessed in detail, unknown and undetected in 2017. None of the additional features had flowing or standing water associated with them during the visit and so, in accordance with the Guidelines, no subsequent visits were required. c. Field notes can be provided. d. Agree with this statement. Each of the features were walked along their length during each of the site visits to determine as detailed in the Guidelines conditions related to Hydrology, Riparian, Fish and Fish Habitat and Terrestrial habitats. Generally, the hydrology and fish habitat is the same for all on site HDF areas with all features exhibiting relatively low importance for these functions, HDFA #11 traverses the woodland. For this feature Stantec agrees with the peer review comment that this feature could have been split into two reaches, with the upper reach associated with the woodlot. In this case the woodlot reach of the HDF would receive riparian classification of Important Functions and Terrestrial habitat classification of Important Functions based on registering a Marsh Monitoring Protocol call code of 1 (American Toad). As noted, classifications related to hydrology and fish habitat remain the same, as the HDF flows for a very short time in the early spring and is dry by May, as noted in 2017 and 2019 fieldwork. Using the Figure 2 "Linking Classification to Management" flowchart in the Guidelines that provides direction on management options, the woodlot reach would receive from a high level review a management recommendation of Protection based on terrestrial functions only, while the section between the woodlot and the unnamed tributary would still be identified as Mitigation. The guidelines suggest that, 'in the event that a lower level of protection is identified for a segment downstream of a segment with a higher level of protection, the more conservative approach shall be adopted for both segments and the downstream segment should be reclassified to match the upstream segment", namely Protection. However, it is noted that the attributes of the HDF between the woodlot and the existing watercourse do not warrant Protection with respect to any of the four classification functions. The HDFA guideline for a Protection designation states: '***Protection – Important Functions: e.g. swamps with amphibian breeding habitat; perennial headwater drainage features; seeps and springs; SAR habitat; permanent fish habitat with woody riparian cover***'

and ***"Protect and/or enhance the existing feature and its riparian zone corridor, and groundwater discharge or wetland in-situ'***.

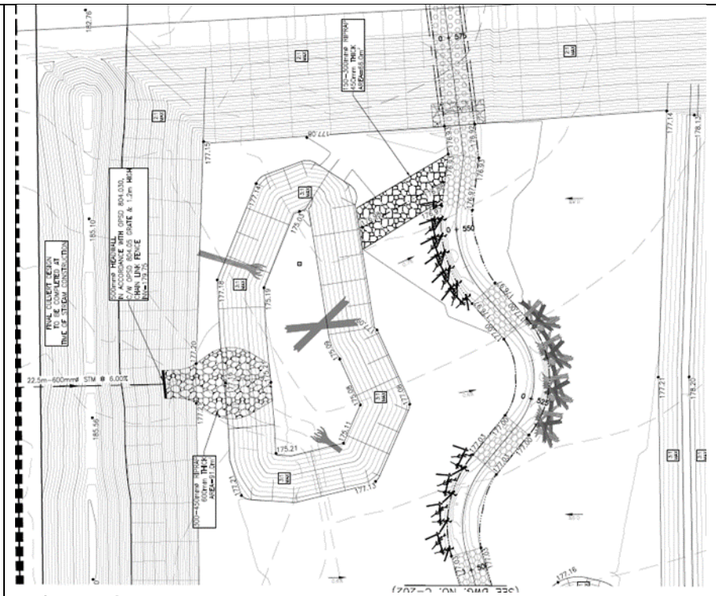
In this Upper Quarry case, the proposed quarry design creates a scenario where the main channel of the unnamed tributary to which HDFA # 11 contributes, is realigned to the west property perimeter (Proposed Natural Channel Design, Appendix E of the NETR/EIS), coincident with the noted upper woodland reach of HDF#11. The Natural Channel Design (NCD) has been designed so that the flow of the HDF #11 that enters the property thought a culvert on Townline Road contributes directly to the new location of the realigned unnamed tributary. As such all flow/ecological contribution from off- site catchment areas enter directly into the creek systems with the new Natural Channel Design Plan. Furthermore, the woodlot portion of HDF #11 is rehabilitated to an enhanced Natural Channel Design (see Appendix E - Upper's Quarry, Niagara: Level 1 and Level 2 Natural Environment Technical Report and Environmental Impact Study) of which most of the HDF rehabilitation is coincident with the existing HDF #11 (in situ). In this manner the contributions of water and nutrients from the woodlot and the riparian and terrestrial attributes that are offered to the unnamed tributary under existing conditions are maintained with the NCD, in the same location. The portion of HDF #11 that is removed is the lower reach, that is, the reach between the woodlot and unnamed tributary that crosses the active agricultural, a plowed field, on the flow path to the unnamed tributary.

The existing contributions that are generated from the upper reaches of the HDF #11 would also be enhanced in the new Natural Channel Design scenario by flowing through productive wetland environments and extensive areas of riparian enhancement along the HDF (see detailed excerpt of NCD plan below). In addition to natural heritage enhancements, the proposed creek restoration/enhancement is also consistent with the other Recommended Management (page 22 of the Guideline) techniques of the HDF guidelines as shown in the table below:

HDFA Guidelines	Proposed Plan/ Guideline Compliance
Maintain hydroperiod; and incorporate shallow groundwater and base flow protection techniques such as infiltration treatment:	The NCD captures the entire period of source flow and hydroperiod of HDF #11 as it incorporates the non-agricultural lands portion of the HDF into the NCD alignment. The CD is designed with offline wetlands along the enhanced NCD, these offer near surface infiltration and polishing.
Use natural channel design techniques or wetland design to restore and enhance existing habitat features, if necessary; realignment not generally permitted	NCD configured to generally provide in-situ enhancement). The NCD provides extensive wetland enhancements including the creation of a number of vernal pool features to support amphibian breeding at the HDF #11location as well as along the length of the NCD
Design and locate the stormwater management system (e.g. extended detention outfalls) are to be designed and located to avoid impacts (i.e. sediment, temperature) to the feature	NCD configuration eliminates the flow path (the lower reach of HDF #11) that crosses open active agricultural lands that are prone to ongoing erosion and sedimentation and potential increases in water temperature as it currently traverses the open canopy of the agricultural field.

In summary the contributions of flow and nutrients, the riparian attributes and the wildlife habitat, especially the amphibian pools, which can be a key function of a HDF-features, are enhanced in place and/or replicated for HDF-#11 under the Natural Channel Design scenario.

			The following are Excerpts from the NETR and NCD figures and plans that illustrate the location of the HDF#11 feature and the location of the proposed NCD and the NCD details that can be further enhanced to incorporate key attributes and functions of interest that may be identified by stakeholders. **Headwater Drainage Feature Excerpt from NETR** **Natural Channel Design (NCD) Overview – Woodlot Area/ HDFA 11 Excerpts**  **Detail NCD**

			
19.	Section 5.9 Fish and Aquatic Habitat – Existing Watercourse pg. 5.14: a. This section refers to Figure 11, but it appears that it should refer to Figure 12.	Stantec	a. This is a clerical error and the section should indeed reference Figure 12.

	b. The watercourse which crosses the subject property, in which Northern Pike spawning has been observed, young of the year Northern Pike have been captured, and other fish species have been captured, should be indicated to be fish habitat on Figure 12. Section 6.6 states that it is considered fish habitat. c. The report states "The seasonal nature and lack of sustained flow, absence of adequate refuge pool habitat and inability to support perennial conditions favourable to fish all reduce the habitat quality of the tributary to a low rating." It should be recognized that Northern Pike often spawn on vegetation that is flooded in the spring in areas that are dry later in the year. It should further be recognized that, although those spawning areas may not be high quality fish habitat in the traditional sense, but they are critical for the Northern Pike populations that spawn there. The AECOM (2010) memorandum describing the 2010 field investigations states "Ultimately, the sensitivity of the fish and fish habitat present can be considered Moderately Sensitive due to the presence of spawning habitat for Northern Pike." Please address the significance of the Northern Pike spawning habitat in this watercourse to downstream fish communities and Northern Pike populations.		b. This appears to have been a mapping oversight and the figure will be updated to colour code the entire length of the existing watercourse as fish habitat. c. The low rating is primarily predicated on the lack of sustained baseflow and limited refuge habitat opportunities when flow conditions become intermittent. It is recognized that the Northern Pike spawning habitat is likely the highest value habitat within the existing watercourse. The proposed channel realignment has specifically focused on increasing the amount of potential Northern Pike spawning habitat so that an overall net gain in habitat is achieved. The design also increases the amount of deeper pool habitat to act as refuge during intermittent flow periods
20.	Section 6.2.1 Assessment Based on Provincial Criteria pg. 6.4 - Clarify the interpretation of the linkage assessment for the woodland located on the subject lands. The NHRM criteria indicates that if a woodland is identified as part of a defined NHS, it would meet the linkage criteria.	Stantec	The NHRM criteria states in its entirety- Table 7-2: Recommended Significant Woodland Evaluation Criteria and Standards, item 2. ECOLOGICAL FUNCTIONS CRITERIA c): Woodlands should be considered significant if they 'are located within a defined natural heritage system or provide a connecting link between two other significant features, each of which is within a specified distance (e.g., 120 m) and meets minimum area thresholds (e.g., 1–20 ha, depending on circumstance)' The woodland does not meet the minimum threshold conservatively of 4 hectares for the Region, as such does not meet the linkage criteria of the NHRM Significant Woodlands.
21.	Section 6.2.2 Assessment Based on Regional Criteria pg. 6.7: a. According to the analysis presented in Table 6.3, "the woodland on the Subject Property along Thorold Townline Road would be considered a Significant Woodland from a policy perspective and would become a regional Environmental Conservation Area, per Policy 7.B.1.4 of the Region of Niagara Official Plan." However, given this status, additional clarification is required to rationalize the recommendation for removal and habitat replacement of this feature. b. Please provide an explanation as to why the wetland feature that crosses the woodland on the site does not meet the definition of watercourse per the Conservation Authorities Act.	Stantec	a. Section 8.2.1 of the EIS provides rationale for removal and replacement of this habitat feature, including an assessment of the woodland's exposure to disturbance, and its size relative to landscape features. Per S.8.2.2, the proposed replacement is anticipated to have an overall net ecological benefit by: i) Increasing the total area of woodland cover in the regional landscape. ii) Improving associated landscape functions such as vegetative linkages and interior forest areas. iii) Improving forest ecological characteristics such as species diversity, age class distribution and structural diversity, while retaining native genetics through seed collection and replanting. iv) Incorporating specific wildlife habitat features for bats, deer and other wildlife, such as bat roosting structures, coniferous tree clusters for cover, browse-tolerant shrubs and mast producing trees. In addition further evaluation and considerations are provide in response #2 and # 20 above. b. S.25(d) of the CAA defines "watercourse" as: "…an identifiable depression in the ground in which a flow of water regularly or continuously occurs". Based on the HDFA provided in S.5.8 of the NETR this feature does not meet the criteria for a watercourse as per S.25(d) of the CAA. In summary the woodland is small, 2ha with a configuration that limits preferred SWH habitat or species protection, is not a bat maternity roost site and has limitation as a deer congregation site or supporting stratum due to its narrowness relative to the abutting busy road traffic, shows notable signs of anthropogenic disturbance from adjacent land uses and represents a seed source for invasive species propagation.

			The restoration opportunity offers a means of enhancing the long term ecological health, integrity and biodiversity of the Region's natural heritage features and contribution to a 'Healthy Landscape' as discussed in response #2.
22.	Section 6.6 Fish Habitat pg. 5.14 - This section describes conditions but does not provide an assessment of the significance of the existing watercourse from a fish habitat perspective. Based on the reported field observations, this watercourse provides spawning and nursery habitat for Northern Pike. Adult Northern Pike migrate into this watercourse to spawn in the spring and presumably migrate back downstream after they have spawned. No investigations were conducted to determine the number of adults moving into the watercourse to spawn or the number of young-of-the-year that move downstream after they hatch. The fact that adults migrate into the watercourse from downstream to spawn indicates that the significance of the watercourse extends beyond the study area. Its significance at a regional scale will depend, in part, on the proportion of regional pike spawning habitat that this watercourse provides.	Stantec	Intrusive surveys to count pike spawning completed during sensitive spawning period is not necessary based on: 1) the potential to inadvertently affect spawning activities or young of the year and 2) the limited effectiveness of the methods available to complete such surveys during spawning periods under spring freshet conditions. In addition, the following considerations associated with the well documented design strategies for spawning habitat and the significant increases in the available pike spawning habitat along the length of the proposed natural channel watercourse precludes the need for individual fish counts. As noted, Section 8.4.1.5 of the Natural Environment Report, the Department of Fisheries and Oceans, the responsible Authority for assessing fisheries impacts from development and the rehabilitation designs of replacement fisheries habitat, have been engaged in Pre-consultation and support the elements of the natural channel designed realignment including spawning habitat. Careful consideration has been given to the sequence of the realignment works with Pike spawning habitat being created not only along the length of the realignment at various locations but also in the transition zone to facilitate the operations phases as it advances and the transfer of flow from the existing system to the new natural channel alignment in a seamless manner respecting the spawning cycle of the migratory pike. The habitat created exceeds the habitat available under existing conditions and provides habitat for various pike life cycle process noted in the NETR report, namely rearing, feeding and nursery habitat. Furthermore, the realignment plan involves implementing a flow regime monitoring review of the created features prior to the removal of the existing system including the proposed grassed meadow floodplain zones that will support pike spawning at several locations. The natural channel design elements, the sequence of construction, and monitoring review of the inundation capacity of the spawning meadow habitat, have been incorporated into the restoration plan to support a successful realignment scenario.
23.	Section 6.7 Significant Wildlife Habitat pg. 6.10 - According to text, Table B-2, Appendix B provides a detailed assessment using the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. a. Re: the discussion about the Turtle Nesting Areas SWH type, it states "Suitable habitat for turtle nesting is present on the road shoulders and in agricultural fields, however anthropogenic features do not qualify as significant wildlife habitat." However, the statement regarding agricultural fields is incorrect. There is no such exemption for agricultural fields. Therefore, given the close proximity of the agricultural fields to the watercourse bisecting the Subject property, and the fact that no turtle nesting surveys were conducted in support of the application, it is premature to conclude that Turtle Nesting Habitat SWH is absent. Please address. b. Re: Terrestrial Crayfish SWH, please indicate whether any dedicated field surveys were conducted in search of terrestrial crayfish burrows. Surveys conducted during the spring, when vegetation is still low and weather conditions are wetter, are most likely to document their presence. c. Re: Eastern Milksnake (Species of Conservation Concern), the assessment is based on cover board surveys conducted in 2017 "and other field investigations in 2012 and 2019". Please	Stantec	a. This statement should be amended to read: "Suitable habitat for turtle nesting is present and has been confirmed during 2023 surveys on the road shoulders, however road shoulders do not qualify as as significant wildlife habitat. The agricultural field showed no signs of nesting activity from the 2023 survey observations which detected turtle nesting on the road shoulder. This may be a result of the site conditions where the agricultural fields are not considered preferred nesting habitat due to the high density of vegetation cover (i.e. winter wheat rotation minimizing the potential for establishing fidelity to nesting area in the fields during peak breeding seasons and low sand and gravel content (often preferred nesting substrate) of the predominantly on-site clayey soils typical of the Haldimand clay plain. These heavy texture soils are often actively cultivated later in the growing season due to wetness and this cultivation is coincident with the early period of turtle nesting period, As such the agricultural fields in this type of soil matrix that are being actively farmed are not preferred habitat for turtles." b. Surveys were conducted across the property, including spring surveys when vegetation was low and water levels high. Although no site visits were conducted specifically to identify terrestrial crayfish burrows, qualified ecologists conducted numerous surveys in suitable areas and at suitable times, and burrows were likely to have been observed as part of the ecological inventory. c. Table B-2 (App B) indicates that Milksnake was not observed during "other" surveys in 2012 and 2019; this refers to fieldwork conducted by Stantec in 2011 and reported in memos referenced as Stantec 2012a-2012f and the lack of incidental observations during these. d. Dedicated surveys were conducted in 2017 and complementary nest activity surveys in 2023 as described in response #3 . The species specific turtle surveys, namely basking surveys were completed on site on April 4, May 3,

	indicate whether the 2012 field investigations are referring to incidental observations? According to Table 3.1 no dedicated field surveys were carried out prior to 2017. d. Re: Snapping Turtle (Species of Conservation Concern), please indicate if any dedicated surveys to document this species along the creek were conducted or whether the statement that "…the species was not observed during the 2017 or 2019 field investigations" was based on incidental observations only. Table 3.1 does not indicate that any dedicated surveys were conducted. e. Re: Common Nighthawk (Species of Conservation Concern), please provide additional justification why suitable nesting habitat is absent in the Study Area. The nesting habitat description provided is misleading. According to Sandilands (2007), in Cadman et al., (2007), "In the agricultural south, it has nested in grasslands, agricultural fields, gravel pits, prairies, and alvars and airports." f. Re: Woodland Vole (Species of Conservation Concern), please provide other justification why suitable habitat is absent in the Study Area. The statement that "There are no records of Woodland Vole in the vicinity of the Study Area" is not satisfactory since "Woodland Voles are an often overlooked member of the fauna, as they are secretive and rarely appear above ground during daylight" (Naughton, 2012).		May 9, May 17 and May 30, 2017. These surveys were not documented in the original EIS submission and can be provided in the revised EIS report. There were no turtles observed during these surveys. The terms of reference indicated that three basking surveys would be completed; however, 5 turtle surveys were completed in 2017. e. Common Nighthawk although record occasionally in agricultural fields are uncommon in these environments. Uppers quarry area is mainly agricultural land and the presence of nighthawk in the peripheral type habitats would not be considered SOCC. This agricultural type of habitat is widely distributed and abundant in the study area and in the Region of Niagara as such these fields would not be considered SWH. f. Survey efforts for Woodland Vole are both labour-intensive and highly disturbing to wildlife. Furthermore, live trapping and pitfall traps (recommended to provide best opportunity for vole detection) are not species-specific, and cause stress, injury, and mortality to small animals indiscriminately. Given the lack of local records, the fact that the project area is at the far northern extent of the species' limit, the small area of potentially suitable habitat adjacent to the roadway, and the questionable quality of said habitat due to the absence of a deep leaf litter and dense herbaceous layer (MNRF 2016 and COSEWIC 2010), targeted surveys for this species were not deemed justifiable. Also based on the preceding information, habitat for this species was considered absent based on the low likelihood of its presence.
24.	Section 6.7 Significant Wildlife Habitat pg. 6.10 - Text on page 6.11 or Table B-2 (Appendix B) does not adequately justify why breeding habitat for Eastern Wood-Pewee is absent on the Subject Property. An Eastern Wood-Pewee was recorded in the woodland along Thorold Townline Road on June 14, 2019, when bat acoustic monitors were deployed but not on June 25, 2019, when monitors were collected. Given that (1) this woodlot was not monitored for breeding birds in 2019, (2) wind speeds exceeded the recommended maximum to document breeding birds for the majority of June 25, 2019, and (3) less time was spent within the woodlot removing the monitoring equipment that setting it up, it is reasonable to assume that the habitat was suitable for breeding. This is consistent with the conservative approach applied to the Breeding Bird Survey methodology (see Section 3.2.3 on page 3.5). Please provide justification to support the position that the woodland along Thorold Townline Road did not provide suitable breeding habitat for Eastern Wood-Pewee in 2019.	Stantec	The justification for Eastern Wood-Peewee absence given in table B-2 and 6.11 was not quoted in full in this comment. The preceding sentence reads: "This species was not detected during three rounds of breeding birds surveys on the Site in 2017 (2 point count stations)." In other words, of five (5) visits to the woodland, including three (3) conducted at two (2) stations following OBBA protocols to determine breeding evidence, Eastern Wood Peewee was observed once incidentally on June 14. Sufficient survey effort to determine likely breeding status was employed, and therefore the assessment that the bird was not breeding on the property is considered appropriate.
25.	Section 8.4.1.4 Fish Habitat – Potential Impacts - Headwater Drainage Features and Catchment Loss – Mitigation - Please provide a description of flow in the realigned watercourse through the site under final rehabilitation conditions relative to flow through the existing watercourse under existing conditions.	Stantec	As noted in Section 9 of the EIS, flows in the existing watercourse are primarily generated from surface run-off contributions generated in its overall catchment and predominantly upstream of the quarry. The proportion of subcatchment represented by the Subject Property is approximately 15% of the total catchment to the existing watercourse. Groundwater contributions have been noted in the creek at the northern limit of the Study Area, however these are relatively minor. The channel is described as a shallow, vegetation-choked system that exhibits intermittent conditions with seasonal changes to summer dry periods. The system is described as flashy responding to precipitation events when an abundance of surplus water flows into the systems causing temporary inundation with a surplus of water passing through the system to the lower reaches. During spring freshet, there is sufficient flow to allow Northern Pike to move to upstream reaches and spawn in the flooded vegetation. The flows recede and the system approaches becoming intermittent. These similar characteristics are expected to continue in the created natural channel design but will be augmented with the addition of quarry dewatering flow during operations. Post-extraction, and during final rehabilitation, 85% of the total catchment contributions will continue, generated from the upstream catchment area as well as from the valley area created for the new channel. The system will respond similar to

			existing conditions, with occasional flushes of water that would pass through to downstream reaches during notable precipitation events and the spring freshet. Once the lake is filled post final rehabilitation, the lake will passively and constantly discharge to the creek immediately downstream of the Quarry Lake at a rate of approximately 12 L/s (page 59 of the WSP Level 2 report). The location of the passive discharge is anticipated to be coincident with the most downstream reach of the realignment. At this point, the watercourse will express permanent flow conditions in the reaches downstream of the quarry lake, rather than the flashy intermittent pulses of flow that occur under existing conditions.
26.	Section 8.4.1.6 Mitigation (for removal of existing watercourse) pg. 8.17: a. The report states, "Beyond the fish habitat just described, a series of wetland pockets and water ponding areas will be incorporated into the floodplain but not connected to the new channel. These areas may provide habitat for breeding amphibians, and there is the potential for fish to enter under flooded conditions and remain there until the next flooding event occurs to allow them to exit." We suggest that it is better if Northern Pike that enter the watercourse to spawn do not become trapped in floodplain ponds, and it is also better if young-of-the-year Northern Pike migrate downstream to permanently wet habitat rather than entering floodplain ponds that they may not escape from. This should be taken into consideration in the final channel design if realignment proceeds. b. The report states (pg. 8.19) "The benefits of increased habitat quality cannot be quantified pre-construction; however, increased habitat diversity should intuitively result in improved quality of habitat and consequently, increased fish productivity. Fish productivity can be confirmed through post construction monitoring." The proposed stream realignment will be subject to a review by Fisheries and Oceans Canada and require a Fisheries Act authorization if it is permitted to proceed. We would respectfully suggest that review should specifically consider the function of the existing watercourse, at a regional scale, as Northern Pike spawning and nursery habitat. That function is relevant to consideration of the elimination of the existing channel and, if that is to occur, the new channel design and the design of the monitoring program. Some design elements that are intuitively appealing may conflict with that function.	Stantec	a. Acknowledged. b. DFO will provide commentary during their review and consideration of monitoring requirements should a Fisheries Act Authorization be required.
27.	Section 11.0 Environmental Monitoring Program pg. 11.1 - The report states "Fish community monitoring will also be completed for the new channel design area every two years as outlined in the DFO Authorization for the watercourse realignment." To the best of our knowledge, a DFO Authorization has not been issued for the watercourse realignment. Therefore, it is premature to refer to a monitoring program outlined in the DFO Authorization. We suggest that, if the creek relocation occurs, monitoring of Northern Pike spawning and recruitment should be conducted in the existing channel to provide baseline information and post-realignment.	Stantec	The statement contains clerical errors. A DFO Authorization has not been issued for watercourse realignment. The statement should have read as "Fish community monitoring will also be completed for the new channel design area in accordance with that determined as satisfactory by DFO should a Fisheries Act Authorization be required for the watercourse realignment."
28.	Appendix E Proposed Upper's Quarry, Natural Channel Design Report – Section 3.4 Aquatic Habitat pg. 3.5-3.6: a. The Natural Channel Design Report states "Habitat conditions for potential usage by spawning Northern Pike were noted to be of marginal quality during that [the March 26,	Stantec	a. The term "marginal" may have been transcribed in error. The statement from the AECOM memorandum (2010) that this was drawn from would be under Section 5: "The initial survey completed in 2008 by AECOM referred to the tributary as having low quality of habitat, and the species sensitivities within the existing features, as extremely low. In light of the fish community survey conducted in May 2010 the sensitivity of fish habitat has changed from low to moderate. The system contains Northern Pike spawning habitat and therefore the scope of a channel design should

	2010] survey." We were unable to find a statement to this effect in the memorandum by AECOM (2010) describing that survey. Please clarify. b. The Natural Channel Design Report states "While spring freshet typically creates conditions that allow for movement of Northern Pike into potential spawning areas, as flows recede and conditions become intermittent, habitat conditions are generally too poor to support various life stages of fish. As the system dries up, refuge pool habitat becomes limiting except for the pool associated with the Upper's Lane culvert. The seasonal nature and lack of sustained flow, absence of adequate refuge pool habitat and inability to support perennial conditions favourable to fish reduce the habitat quality of the tributary to a low rating." It should be recognized that Northern Pike often spawn on vegetation that is flooded in the spring, in areas that are dry later in the year. It should be recognized that, although those spawning areas may not be high quality fish habitat in the traditional sense, but they are critical for the Northern Pike populations that spawn there. The AECOM (2010) memorandum states "Ultimately, the sensitivity of the fish and fish habitat present can be considered Moderately Sensitive due to the presence of spawning habitat for Northern Pike."		reflect these conditions." The Natural Channel Design wording should reflect that fish habitat is of moderate sensitivity. a. The pike spawning habitat is recognized as important in the watershed and sensitive including its contribution to the diversity of Beaverdam's creek. This understanding is best demonstrated in the level of effort and the considerations incorporated into the restoration plan including design elements, sequence of construction, and review and monitoring of the inundation capacity of the spawning habitat. The design elements of the natural channel enhance the spawning habitat by distributing opportunities for spawning at several location along the reach of realignment, creating more spawning habitat. The existing watercourse is not necessarily ideal habitat for young pike (young of the year) as an abundance of important habitat features are lacking. The channel design takes this into consideration and provides structure for protection and for invertebrate production that young pike rely on, refuge pools to provide sanctuary during the characteristically low flow conditions inherent to this flashy system. The natural channel design plan is comprehensive in that it not only includes the spawning habitat that is seasonal in nature but also the habitat for critical life cycle processes such as rearing, feeding and nursery habitat and respects the need to replace and enhance this specialized spawning and rearing environment. The sequence of construction has been established to ensure there is always an available Pike spawning area including in the 'transition zone' which will be enhanced to support fish lifecycle while the existing creek remains active and then forms the lower reach of the created natural design plan when the new reach is ready for transfer of flow. These elements are incorporated into the design to offer a more gradual and effect transfer of flow from one system to the other. Pike are noted to be a course fish with a strong resiliency and adaptable to a variety of conditions and changes. Creation of Pike spawning habitat has been successful completed throughout North America in the range of where Pike are distributed in warm water systems.
	Detailed Comments from NPCA Technical Staff:		
29.	Wetlands: To accommodate the proposed development on site, approximately 7.04 ha of non-Provincially Significant Wetland are proposed to be removed and approximately 11ha of wetland are proposed to be created. While the general idea of Wetland Reconfiguration is consistent with Section 8.2.2.8 of NPCA policy, further details are required to confirm that all criteria has been met to the NPCA's satisfaction. a. A portion of the Beaver Dams Creek Wetland Complex is located on the subject lands. This wetland was evaluated in 2009 and at that time did not meet the criteria required to be Provincially Significant. Data collected for this study should be used to determine if the status of the wetland remains the same or if it should be updated. b. The impact assessment completed for wetlands within the study area has focused on the potential for decrease in hydroperiod as a result of the proposed quarry, however as identified in Section 8.4.1.4 dewatering of the quarry may result in increased hydroperiod to the watercourse. Please revise the impact assessment to account for a potential increase in hydroperiod for wetlands W1A and W1C.	Stantec	a. The EIS has been provided to MNRF for review which is the responsible authority for wetland scoring. The new OWES manual limits the use of complexing. Based on this approach and the natural heritage information collected for the wetlands on the subject property, an OWES evaluation would not generate sufficient points to satisfy the criteria for a provincially significant wetland. At the request of the MNRF, Stantec will complete OWES evaluation using the new evaluation standards for the subject property wetlands. It should be noted that the proposed natural channel realignment and other wetland creation will increase the area of wetland on the local landscape. b. This assessment will be added to EIS, these riparian wetland are subject to regular seasonal fluctuations and are wetland types (marshes) that thrive in a range of moisture regimes, marsh type wetland occur in areas of complete seasonal inundation, as such there is no anticipated loss of wetland type as result of more water inputs during any time of the year c. These wetland type will be revised in the EIS to be Palustrine. This revision does not change the conclusions and mitigation and NCD restoration proposed with respect to wetlands and fisheries. d. (i) It is proposed that a planting plan be developed in consultation with regulatory stakeholders through the permitting stage of the quarry proposal. The planting plan for the wetland zones will include a combination species such as those in the following tables. This plant list will be further refined in consultation with the MNRF and other

	c. Table 8.1 has identified wetlands W2A and W2B as isolated wetlands. Per the information provided in the EIS these wetlands are associated with headwater drainage features. Please review the classification of these wetland units. d. NPCA staff understand that in order to facilitate the construction of the proposed quarry approximately 7.04 ha of wetland is required to be removed. To compensate this loss, it is understood that approximately 11 ha of wetlands will be created within the realigned watercourse area and the southwestern portion of the site. (i) Additional planting details (proposed density, layout etc…) are required for the proposed creation of the thicket swamp, meadow marsh and deciduous swamp proposed in the southwestern portion of the site. (ii) Please identify how wetland hydrology will be maintained and monitored within the proposed swamp features to the satisfaction of NPCA staff. e. Section 12.2 of the EIS identifies that an additional 4 ha of deciduous woodland (swamp) and visual screens along setbacks on the Subject Property are to be created. NPCA staff are unclear how swamps will be established and maintained in the long term. Please provide additional details regarding the proposed enhancement of these areas.		regulatory stakeholders. The density, size, timing, and distribution of planting stock will be detailed as the process of approval advances. The proposed planting list is included in **Appendix A attached** to this response matrix. (ii) The wetland hydrology will be supported in a similar manner as is currently occurring at the existing watercourse, namely the periodic inundation of the wetland areas. The swamp area will receive water from the realigned creek during high water events and water from headwater drainage feature # 7 and #25 which currently contribute to supporting small wetland pockets in that area (Wetland W2A). The grades will also be contoured in manner to support the retention of water in the southwest corner of the quarry property. This design will be implemented in concert with a subsoil horizon with a clay aquitard at depth overlain by a lighter organic substrate that can absorb and retain water in a seasonally perched condition in the southwest corner of the property where the deciduous swamp community is proposed. A surface water monitoring program for the created swamp will be included in the overall water monitoring program for various aspect of the quarry. The monitoring program details and refinements are subject to consultation with regulatory agencies, notwithstanding the monitoring would include installing staff gauges and/or stand pipes in the deciduous swamp for comparison to local wetland features that are functioning in the area. This date will compliment the ecological vegetation monitoring proposed for the entire created creek realignment and adjacent wetland communities. e. Comment e) appears to be similar to comment d (i) and (ii). Items concerning the creation of the deciduous swamp are provided in the responses in (d) which offers an understanding of how water inputs to the area will occur, a comprehensive wetland planting list that can be modified in consideration of stakeholders input and the general method for water regime monitoring in the feature that will compliment an ecological monitoring program.
30.	Watercourses: The main tributary to Beaver Dams Creek is proposed to be relocated to accommodate the proposed development. This channel is impacted by the Regional Storm Flood hazard. While the NPCA is supportive of this idea in principle, the NPCA will require that the channel block be designed to adequately convey the Regional Storm floodplain hazard. In addition: a. Headwater Drainage Feature Reach 11 is associated with wetland W3 and is also found partially within a woodlot, however riparian and terrestrial habitat are classified as limited in Table 5.5. Please revise the evaluation of this reach to reflect the adjacent vegetation communities or provide additional justification for the classification identified in the EIS. b. The development proposal will result in the removal of 25 headwater drainage features; NPCA staff understand that 11 of these features were classified as No Management Required. Mitigation for the loss of these channels is limited to augmenting flows due to the loss of catchment and does not consider the loss of contributary functions such as sediment and nutrients to downstream receptors. Please revise the impact assessment to identify how the loss of these functions will be mitigated. c. NPCA staff note that the outlet from the quarry lake to the realigned watercourse has not been identified on any of the proposed drawings. Please provide a preliminary design and demonstrate that natural channel design principles have been incorporated into the design to the extent practicable.	Stantec	a. See response 18 d concerning Re-assessment of HDF #11. a. The Headwater Drainage Feature Guidelines do not require mitigation for No Management Required scenarios as noted on Page 23, as follows: **F. No Management Required – Limited Functions: e.g. features with no or minimal flow; cropped land or no riparian vegetation; no fish or fish habitat; and no amphibian habitat.** The features that were identified during desktop pre-screening have been field verified to confirm that no feature and/or functions associated with headwater drainage features are present on the ground and/or there is no connection downstream, with the exception of HDF #11 that is discussed in detail in response 18 d. The remaining features are generally characterized by lack of flow, evidence of cultivation, furrowing, presence of a seasonal crop, and lack of natural vegetation. No management recommendations required. Where Mitigation has been determined as the recommended management approach for HDFs, replication of function is the desired outcome. Functions can include flow contributions, contributions of allochthonous materials (leaf litter, detritus, insects, etc.) generally referred to as nutrients and sediment transport. The HDFs that garnered a Mitigation recommendation are all flow paths that flow or exhibit standing water briefly during freshet, do not have associated vegetated riparian conditions and are cultivated over on an annual basis following spring runoff. Their contributory functions are primarily conveyance of a short pulse of water during freshet. No or limited allocthonous inputs occur due to the lack of riparian condition and the contribution of sediment from a cultivated landscape is likely more detrimental than contributory to normal channel fluvial processes. b. Quarry discharge will be designed as part of the ECA process.

31.	Field Surveys: a. As identified in the Terms of Reference Comments NPCA staff expected that a 3-season vegetation inventory would be completed. Per Table 3.1 no site visits were completed to inventory vegetation during the fall season. Please complete the fall vegetation inventory per the comments provided on the ToR. b. NPCA staff understand that Turtle Habitat / Basking Surveys were identified in the Terms of Reference, however do not appear to have been completed. Please complete the appropriate studies as identified in the ToR. c. Fish surveys are typically completed in the spring freshet when water levels are at or close to their peak. The fish survey was completed on June 22, 2017 and was limited to areas where sufficient water was present within the main channel of the watercourse, no fishing was completed within the headwater drainage features. The timing of this survey may underrepresent the usage of HDFs by fish on the subject properties. Please complete a fish survey in the spring to verify the maximum extent of fish usage within the headwater drainage features within the subject properties.	Stantec	a. A vegetation survey was performed on August 25, 2017 by a qualified botanist with experience with regional vegetation characteristics. Based on our knowledge of plant species and growth stages in Niagara, we believe the date is within the acceptable window to inventory late season vegetation such as asters, goldenrod and late season grasses. b. Turtle basking surveys were conducted in 2017, however the details were not published in the EIS. Complimentary turtle surveys were also completed in 2023. The results are outlined in response # 3 and will be addressed in revised EIS report. c. For all HDF assessments carried out for projects, incidental observations of fish would be recorded for every visit undertaken. In most cases, focused fish surveys utilizing techniques such as electrofishing are undertaken during Site Visit 2. The timing of Site Visit 2 is linked more closely to the use of headwater features by fish for life processes such as spawning, rearing or feeding. No water was present in any feature during Site Visit 2 and therefore no formal fish surveys were undertaken.
32.	Ecological Monitoring: A comprehensive monitoring plan is required to ensure that the realigned watercourse and relocated wetlands function as designed. Section 11.0 of the EIS states that details of the monitoring plan will be developed in consultation with the MNRF and documented in a supplementary Upper's Quarry Monitoring Plan. NPCA staff are supportive of the development of a standalone Monitoring Plan and request to be consulted to ensure that NPCA interests are addressed within this plan.	Walker	Walker will consult with NPCA.
33.	General: a. Under the proposed development condition two culverts are proposed. NPCA staff note that these areas will bisect the realigned channel corridor potentially limiting the movement of animals within the realigned corridor. Please explore opportunities to provide enhanced wildlife crossings in these areas to limit anticipated impacts associated with the crossings. b. Drawing 5 of 6 Rehabilitation Plan has identified that side slopes steeper than 3:1 are proposed to be planted with the MTO's Ontario Roadside Seed Mix. Please explore replacing this seed mix with a suitable native seed mix. c. From an ecological perspective NPCA staff's preference is for the Alternative Extraction option which maximizes restoration potential and minimizes the number and size of crossings within the realigned watercourse corridor. Should this option be pursued NPCA staff recommend that additional restoration opportunities be explored within the lake to increase habitat diversity.	Stantec	a. Walker will consider appropriate culverts in order to support wildlife crossings. These enhanced features if technically feasible can be design to support anuran, reptile and small mammal movement and may be supported by directional fencing and habitat refugee features at entry points. b. The wording of Note D.1 (Seeding and Planting) on Drawing 5 of 6 has been replaced with the following, which is similar to what is proposed for a base coverage for the berms: "D. Seeding and Planting 1. Side slopes steeper than 3:1 shall be seeded with a naturalizing mix of **native, non-invasive** wildflowers and grasses to stabilize slopes and minimize mowing and maintenance". c. Noted.
Appendix 6: Acoustic Assessment Report, October 28, 2021 Comments:			
	Detailed Peer Review (Englobe) Comments:		
1.	The Report has taken a very conservative approach. For example: (a) the listed equipment is assumed to be operating at the same time; and (b) the listed equipment is assumed to be operating for a full 60-minutes within any given hour. This can result in unnecessarily onerous	RWDI	Operating times were reviewed with applicant during the preparation of the AAR. Equipment duty cycles and travel frequencies have been incorporated to account for the predicted worst-case operating scenario. There is some conservatism built in to accommodate spikes in demand, however, the conservatism is not excessive. Mitigation options were selected to

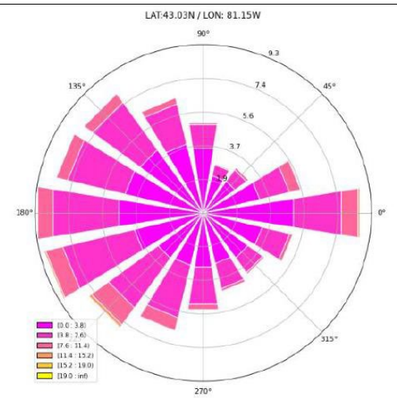
	acoustic mitigation having a negative environmental impact (ex: temporary acoustic barriers). It is recommended that RWDI review the equipment operation scenarios with the applicant in order to ensure, and ultimately confirm, that they are realistic.		carefully balance performance (i.e. off-site mitigation), economics, and operational feasibility. It is not RWDI's intent to provide onerous mitigation as we understand the economic effects on operations, as well as how mitigation may affect operations (i.e. if temporary barriers place additional burden on operators).
2.	A 3-metre tall perimeter berm, shown in Figure 1 of the Report, is listed in Section 6 as part of the noise control recommendations. This 3-metre berm is also featured along the west perimeter of the site, despite there being no noise sensitive points of reception in that direction according to the Report. It is recommended that the Report be updated to increase clarity regarding how or why this perimeter berm has been recommended.	RWDI	The 3-metre berms around the perimeter of the quarry site are intended to provide additional noise attenuation, particularly around the north and south perimeters of the site during sinking cuts and during operations in the areas nearest R1/R6, while also serving to provide for visual screening.
3.	It is assumed that the 3-metre tall perimeter berm (mentioned above) has been taken into account in the CadnaA model while assessing the noise impacts; however, Figures 2a to 2i do not show these berms. Can RWDI confirm that this perimeter berm has been included in the CadnaA model? If it is included, it is recommended that Figures 2a to 2i be updated to show the 3m perimeter berm.	RWDI	Yes, the perimeter berm has been included in the model for all scenarios. Figures 3a – 3n show the sound level contours and the perimeter berm. Figures 2a – 2i focus on the operations.
4.	An 8-metre noise barrier is listed as part of the noise control recommendations in Section 6 and is shown on Figures 2f, 2g, 2i, and 3k to 3n. However, the Report is unclear as to why the barrier is necessary, as there are no noise level predictions showing non-compliance in a scenario which does not include the 8-metre barrier. It is recommended that the report be updated to increase clarity regarding how or why this 8-metre noise barrier has been recommended, which could include CadnaA noise level predictions for a no-barrier condition.	RWDI	The 8-metre noise barrier is required for the processing plant (noted as PP throughout the report). The goal of the report, and the mitigation recommendations is to demonstrate that the site can meet the applicable sound level criteria. We recommend to not provide modelling predictions without the barrier as this will not add value and may set a precedent where unmitigated values should be shown for other operating scenarios and phases.
5.	Section 6 of the Report indicates that the 8-metre noise barrier (mentioned above) "shall extend long enough to shield R4 and R5 from the secondary crushers." It is recommended that the Report be updated such that the 8-metre barrier location and dimensions be given precisely, or that RWDI confirm that WAI's proposed barrier geometry will shield R4 and R5 from noise as modeled in CadnaA.	RWDI	This severely limits the locations of the secondary crushers and may not be practical. The current report language provides some flexibility in the locations of the crushers allowing them to be spaced in a way that promotes optimal site operations. If crushers need to be moved by a few meters, the barrier simply needs to be extended to block the additional line-of-sight to both R4 and R5. Current design protects both. By providing the dimensions of the barrier at this point, will limit operators in the future.
6.	The Report indicates that the ground absorption outside the extraction limits was taken as 0.8. However, it is understood that the ground outside the limits is primarily grass. It is recommended that the CadnaA model's overall ground absorption be increased to 1.0, or for RWDI to provide an explanation in the Report regarding the use of 0.8.	RWDI	A ground absorption of 0.8 was used to account for variances in seasonal ground coverage as in certain seasons, the ground could be dirt with lower absorption performance.
7.	The Report indicates that a max. order of reflection of 1 was used in the CadnaA model. Englobe understands that this can reduce computation time, but 3 is more typically used in our experience. It is recommended that the CadnaA noise level predictions at receptors R1 to R6 be re-computed using a max. order of reflection of 3 in order to compare to the noise level predictions provided in the Report, with the intention of ultimately justifying the use of a max. order of reflection of 1.	RWDI	Order of reflection of 1 is suitable for this environment given the lack of reflective buildings that could influence off-site sound levels. Orders of reflection of 2 and 3 are better suited for denser urban environments where multiple tall reflective surfaces are present. There are a few process buildings, associated with the asphalt plant, that are being modelled and increasing the order of reflection will not have an effect on off-site sound levels as these buildings are small compared to the distances sound has to travel to receptors. Furthermore, perimeter berms are absorptive, and local ground off-site is also highly absorptive. This combination will negate the effects of higher reflection orders.
8.	Plantings should be placed on the 3m noise berms to provide a more attractive appearance.	MHBC (Nick M)	Agreed. The Visual Impact Assessment provides detailed recommendations for plantings and seeding of berms which are set out on the Site Plans and specifically Drawing 4 of 6 (Note G). Generally, the bottom third of the berms identified on the ARA Site Plans will be planted with some staggering to create a more natural look. The remaining portions of the berms will be seeded. Planting consists of a mix of naturalizing vegetation, allowing for fast growth in the short term and then a gradual natural succession to occur.

9.	As part of the submission, the hours of operation for the quarry are 7am-7pm Monday-Saturday. Please note the City's Noise By-law 2004-105, as amended by By-law 2005-73, 2007-28, and By-law 2014-115 only permits noise between 7am-7pm Monday – Friday and 9am-7pm on Saturdays, Sundays and statutory holidays.	RWDI	Noted. This does not affect the predictable worst-case sound levels.
Appendix 7: Air Quality Assessment Report, October 26, 2021 Comments:			
	Detailed Peer Review (Englobe) Comments:		
1.	S. 5.1 INTRODUCTION: a. As the main purpose of the AQA report is to present dispersion modelling results, a short introduction to dispersion modelling would be welcome, including atmospheric processes, modeling objectives and options related to the project. b. The processes and limitations of selecting sensitive receptor locations should be described here based on the project requirements. c. Provide a list of references from the literature for the Best Management Practices Plan for dust. Practices include reducing the traffic, reducing the speed, improving road design, watering the road, covering the road with gravel, increasing the moisture content of the road surface, binding the road particles together, sealing unpaved roads, reducing exposed ground, and slowing the surface wind.	RWDI	a. This is a stylistic preference and has no material effect on the assessment. The report is intended for a qualified and experienced peer reviewer, not the general public. No action required. b. The receptors chosen reflect the closest residences to the site, as shown on the Site Plans. This is consistent with normal practice for ARA License Applications and is described in Section 5 of the Air Quality Assessment. There are no major point sources aside from the hot-mix asphalt ("HMA") plant stack, which is located at the bottom of the excavation. Impacts will be greatest at receptors nearest to the site. Including additional receptors that are further afield provides no useful information. c. RWDI would suggest the following references are appropriate for understanding dust control practices: • Cowherd, C., G. E. Muleski, and J. S. Kinsey (1988). Control of Open Fugitive Dust Sources. United States Environmental Protection Agency, EPA-450/3-88-008. • Fitz, D. R. and K. Burmiller (2000). Evaluation of Watering to Control Dust in High Winds. J. A&WMA, 50, pp. 570-577. • Gillies, J. A., J. G. Watson, C. F. Rogers, D. DuBois and J. C. Chow (1999): Long-term Efficiencies of Dust Suppressants to Reduce PM10 Emissions from Unpaved Roads. J. Air & Waste Manage. Assoc., 49, pp. 3-16. • Heinerikson, A. J., Goodman, A. C., Harrison, D, Pham, M (2007). Modeling Fugitive Dust Sources with AERMOD. Trinity Consultants for National Stone, Sand & Gravel Association (2007). • Local Road Research Board (2009). Best Practices for Dust Control on Gravel Roads. Minnesota Department of Transportation, Research Services Section. • Muleski, G. E. and C. Cowherd (1987). Evaluation of the Effectiveness of Chemical Dust Suppressants on Unpaved Roads. U.S. Environmental Protection Agency, EPA/600/2-87/102. • National Research Council of Canada and Federation of Canadian Municipalities (2005). Dust Control for Unpaved Roads. National Guide to Sustainable Municipal Infrastructure, Issue No. 10. ISBN 1-897094-93-0. • Rosbury, K. D., 1985: Handbook, Dust Control at Hazardous Waste Sites, EPA/540/2-85/003. • United States Environmental Protection Agency (2006). Compilation of Air Pollutant Emission Factors (AP-42), Chapter 13.2.2, Unpaved Roads. • Watson, J. G., J. C. Chow and T. G. Pace (2000). Fugitive Dust Emissions. From Air Pollution Engineering Manual, ed. by W. T. Davis, Wiley and Sons. • Wisconsin Transportation Information Center (1997). Dust Control on Unpaved Roads. Wisconsin Transportation Bulletin No. 13.
2.	S. 5.2 SITE DESCRIPTION & OPERATIONS:	RWDI	a. The figures in the air quality assessment provide clearly identified UTM coordinates for the site, including the map projection, which is NAD 1983 UTM Zone 17N. Google Earth allows users to enter UTM coordinates.

	a. Provide the latitude and longitude of the site to help locate it with a GIS or a geo-browser (e.g., Google Earth): "Upper's Quarry site (43°5'41"N, 79°10'23"W) is located at Upper's Lane and Thorold Townline Road." b. Detail the surrounding lands and building types and explain the potential effect of the quarry operations on those areas. c. Provide a list of the main operations for phases 1A, 2A, 3B, and 5 with their respective potential emission sources.		b. These lands are shown and described on the ARA Site Plans, specifically the Existing Features Plan, which shows all lands within 300 metres of the license boundary. The normal industry practice for conducting these assessments is to consider sensitive receptor locations, such as residences. All other lands surrounding the site are agricultural or open space and are not normally considered in such assessments. c. RWDI agrees that this could have been explained more clearly. There are 5 main phases of operations. Some phases move into different areas over time, as denoted by "A" or "B". Main operations in each of the phases consist of the following: i) Aggregate extraction with processing in a single plant, initially at the top of rock. Plant will move to bottom of quarry in north of Uppers Lane and remain there as extraction moves south of Uppers Lane. ii) Aggregate extraction with processing in a single plant, initially at the top of rock. Plant will move to bottom of quarry in Phase 2A once sufficient area is available. Plant remains here for initial extraction of Phase 3A. iii) Aggregate extraction in Phases 3A and 3B with processing in two identical plants at the bottom elevation of the quarry in Phase 3A area (once sufficient area is cleared). The HMA plant will begin operation at the quarry floor in Phase 1A area. iv) Aggregate extraction in Phases 4A and 4B with processing in two identical plants at the bottom elevation of the quarry in Phase 1A and 4A areas. The HMA plant will continue operation at the quarry floor in Phase 1A area. v) Aggregate extraction in Phase 5 with processing in two identical plants at the bottom elevation of the quarry in Phase 1A and 4A areas. The HMA plant will continue operation at the quarry floor in Phase 1A area.
3.	S. 5.3 HOURS OF OPERATION: a. Hours of operation are the key parameters to estimate emissions and conduct the dispersion modeling study: b. The use of a table would improve the readability of the information provided in this section. c. Provide a list of all the abbreviations given in this section, and more generally in the report.	RWDI	a. Agreed. This was factored into the analysis. b. This is a stylistic preference and has no material effect on the assessment. No action required. c. RWDI apologizes for this oversight. There are indeed two abbreviations that were not previously defined in the report. "AC" refers to asphalt cement. "RAP" refers to reclaimed asphalt pavement. This is sometimes also referred to as recycled asphalt product but is identical.
4.	S. 5.4 OPERATING SCENARIO - This section is too vague and therefore requires clarification: a. The operating scenario should be detailed based on the future operations listed in section 2. b. Explain what "conservative" means in the context of the AQA study. c. Consider one scenario for the short-term activity to evaluate how much emissions would increase and to assess its impact on air pollution in the area surrounding the proposed quarry.	RWDI	a. The maximum operating scenario is one that generates the highest predicted emissions in any given phase of operations (all of which are "future operations"). This is a standard term used in air quality assessments in Ontario and is consistent with standard guidance documents such as MECP Guideline A10, as noted below: "A scenario that, for the relevant averaging period, assumes operating conditions for the facility that would result in the highest concentration of the contaminant at a point of impingement that the facility is capable of." b. "Conservative" is also a standard term used in air quality assessments in Ontario and is consistent with standard guidance documents such as MECP Guideline A10, as noted below: "For the purpose of this Procedure Document the term "conservative" refers to an estimated emission rate that is certain to be higher than the actual emission rate." c. There is no reason to explicitly model these short-term construction impacts. This is normal industry practice, since these short-term construction operations are limited in scale, intensity, and duration. No additional information of value will be generated by this analysis, as these impacts are already well understood by qualified practitioners and are best managed through the implementation of Best Management Practices Plan.

5.	S. 5.5 POTENTIAL IMPACT LOCATIONS: a. Considering receptors farther from the domain is strongly recommended. Plumes emitted by activities at the site may move upward from the source area and then come downward far from the domain, which would increase air pollution at receptors further down. b. Because there are residential buildings on the southeast and west sides of the domain (highlighted in blue in the Figure below), receptors at these locations should be included in the dispersion modeling study. c. Detail the criteria to select receptors for this study. A good practice for locating receptors is to draw 1 and 1.5-km circles over the main activity area and check what potential receptors are inside these circles. 	RWDI	a. The physics of dispersion dictate that impacts from fugitive sources (modelled as volume sources in the dispersion model) decrease with distance. This is especially true for such sources that are below grade. The only exception is the main stack associated with the HMA plant, which is located at the bottom floor of the quarry, over 30 metres below grade, and well over 500 metres from the nearest receptor. Impacts will be greatest at receptors nearest to the site. There is no valid rationale to examine impacts further away than already assessed, as the predicted impacts will be lower than those already predicted. b. See response to comment 5.a. c. See response to comment 5. a.
6.	S. 5.6 IDENTIFICATION OF CONTAMINANTS AND SOURCES: a. List all the permanent/temporary and short-term/long-term emission sources in a table. b. A brief description of Figures 2 to 5 has to be included in this section.	RWDI	a. All of the sources listed will be present over the life of the quarry, with the exception of the asphalt plant. As noted in Section 2, the asphalt plant, which will become operational once Phases 1A and 1B have been extracted to the extent to allow for space for the plant. b. A brief description of Figures 2 through 5 is already included.
7.	S. 5.7 CRITERIA: a. Change the title of this section to “Air Quality Criteria and Standards”. b. It’s common practice to include in the text a table listing the relevant criteria and standards for the air pollutants of concern.	RWDI	a. This is a stylistic preference and has no material effect on the assessment. No action required. b. All relevant criteria are listed at the bottom of Tables 2, 3, 4 and 5.
8.	S. 5.8 EMISSION ESTIMATION: a. US Environmental Protection Agency’s document “AP-42: Compilation of Air Emissions Factors” is the main reference to estimate emissions for this type of AQA study. Therefore, it should be cited in this section, such as (https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors, date of access; US Environmental Protection Agency, year).	RWDI	a. Appendices A through E provide the relevant chapter from the U.S. EPA for each emission estimate. This is a stylistic preference and has no material effect on the assessment. No action required. b. RWDI agrees, this should have been provided. Although an older document, the most comprehensive reference for the chemistry of native dolostone and limestone quarries in Ontario is the 1971 report from what was then the Ontario Division of Mines, “The Limestone Industries of Ontario”, by D. F. Hewitt, as revised by M. A. Vos and D. F. Hewitt. The silica values for native dolostone and limestone in this document correspond to x-ray diffraction testing

	b. Provide a reference for the silica content. Is a silica/PM10 ratio of 10% used to estimate silica concentrations from the PM10 concentrations modeled with AERMOD? c. Detail the mitigation measures included in the emission calculation. "Control efficiency" is an expression used in the Appendices and is the key parameter applied to raw emissions to decrease them. That expression should be explained in this section. d. Watering the unpaved road is an effective control method and is suggested to be used in the project. The "95% reduction control efficiency" as a result of watering could be considered as optimistic since an average efficiency of 75% is considered in the literature (US EPA 1993).		conducted by independent laboratories for RWDI's clients. The vast majority of such despots in Southern Ontario actually contain less than 2% silica, with only a few reports reaching 10%. Thus 10% was used as an upper bound. Based on a recent review of silica data in Ontario by the MECP, a value of 2.72% for limestone and dolostone is recommended when conducting air quality assessments for the aggregate, ready-mix concrete, and hot-mix asphalt industries. c. Control efficiency is also a standard term used in air quality assessments and is consistent with standard guidance documents such as AP-42, which describes "overall emission reduction efficiency". ER is further defined as the product of the control device destruction or removal efficiency and the capture efficiency of the control system. When estimating emissions for a long time period (e.g., one year), both the device and the capture efficiency terms should account for upset periods as well as routine operations. d. This level of control can be achieved with the combination of measures described in the BMPP. Two key references are of note here. Rosbury (1985) summarized results from various studies showing that levels of control as high as 98% were attained in some cases. He went on to prescribe a watering rate that wold achieve near 100% control (approximately 1.7 L/m^2/h). Cowherd, Muleski, and Kinsey (1988) provide an empirical equation for estimating the control efficiency of a watering program, relating the evaporation rate, traffic rate, time between application and water application intensity. This equation shows that 95% control is possible, based on evaporation rates in Southern Ontario, especially when the time between application is reduced to 1 hour and water application intensity is at the recommended 1.5 L/m^2/h. This report also provides the basis for the data presented by the US EPA (2006). These references are listed below. • Cowherd, C., G. E. Muleski, and J. S. Kinsey (1988). Control of Open Fugitive Dust Sources. United States Environmental Protection Agency, EPA-450/3-88-008. • Rosbury, K. D., 1985: Handbook, Dust Control at Hazardous Waste Sites, EPA/540/2-85/003.
9.	S. 5.9 DISPERSION MODELLING: a. Please indicate the date of the version for AERMOD such as "AERMOD version 19191 dispersion model (version date July 10, 2019)". b. How many simulations were conducted? Did you conduct various simulations based on different "control efficiency" values applied to the raw emission inventories? c. Let's assume that the meteorological dataset was obtained from https://www.ontario.ca/page/map-regional-meteorological-and-terrain-data-air-dispersion-modelling. Based on the location and characteristics of the project site, the file "West_Central_Crops", including the "London 1996-2000" dataset, seems to be the dataset required by MECP to run AERMOD. Is it the land use type used in the simulations with AERMOD? d. The wind rose shown below indicates that the prevailing wind direction is mostly between the southwest and the northwest, but it has also a strong component from the east. e. Since AERMOD is not a terrain-following coordinate system code, how was it applied to a domain characterized by the non-flat terrain of a quarry? Was CALPUFF considered for this project as an alternative dispersion model?	RWDI	a. As per the U.S EPA model code system, the AERMOD version code is the version date. 19191 refers to Julian day 191 of 2019, which was July 10, 2019. This is the standard convention for U.S. EPA model version codes (e.g., AERMOD, SCREEN3). b. It is unclear how this is relevant. There were many iterations of the model over the course of the project, as operating scenarios changed, phase boundaries, shifted, and sources were shifted based on operational considerations. As for evaluating the need for control efficiencies, RWDI has sufficient experience that we typically only need a single run to confirm the required control efficiency. We do not run "uncontrolled" simulations, as there is typically no relevance nor value, and only adds time and cost. c. Yes, this should have been noted. The MECP "CROPS" data set for the West Central Region was used, in accordance with MECP Guideline A11. d. CALPUFF is not an approved model in Ontario. AERMOD is the approved regulatory model in Ontario. The MECP only requires the use of CALPUFF in areas along the shore of the Great Lakes. The MECP has requested the use of CALPUFF where site-specific standards are being considered, but this has no relevance for greenfield facilities. e. CALPUFF is not an approved model for use in Ontario without authorization from the MECP. With respect to the non-flat terrain of a quarry, AERMOD does not recognize the sharp vertical walls of the quarry, and therefore would tend to overpredict off-site concentrations due to the phenomenon of pit retention. Pit retention is described by the National Stone Sand and Gravel Association in their document "Modeling Fugitive Dust Sources with AERMOD", published in 2007.

	 f. What are the receptor heights used in the model? It is suggested to use receptors at different heights to see how far air pollutants travel vertically. It has an impact on the horizontal transport of pollutants.		*"A portion of the particulate matter emitted from within a surface mine open pit will remain within the pit while the rest escapes and travels downwind. The tendency for particulate matter to remain within the open pit is referred to as pit retention, where emissions tend to remain would not be considered." (NSSGA, 2007)* This phenomenon is the basis for the development of the OPENTPIT source type in AERMOD, which attempts to account for this effect. RWDI does not use this source type, as it does not allow for the analysis of specific sources to determine which sources require specific levels of control. RWDI's analysis is therefore considered to be conservative, and the non-flat terrain of a quarry is not material to the assessment. f. Receptors were modelled at 1.5 metres above grade to reflect the typical human breathing height. The overwhelming majority of the modelled sources are low-level volume sources located below grade. Sources located at the top of rock during the initial sinking cuts (i.e., portable plant operations only) are at 177 metres above sea level (masl). Sources associated with peak operations, and the asphalt plant, are all located on the quarry floor, at approximately 144 masl. In contrast, the receptors range from 175 to 185 masl. It is therefore very clear that the highest predicted impacts will occur at grade level. No additional heights above grade are necessary to predict the maximum impacts
10.	S. 5.10 LOCAL EMISSION SOURCES: a. "Due to this distance, impacts from this site are not expected to significantly influence the predicted impacts from the extension". The only way to know for sure would be to apply AERMOD with receptors located 2+ km away from the site. b. What is a "suitable background air quality level"?	RWDI	a. There is no need to conduct AERMOD modelling for ground level fugitive sources located over 2 kilometres from the subject site. Anyone familiar with conducting such assessments should know that the impacts from such operations are indistinguishable from background concentrations at distances beyond 500 metres, let alone 2 kilometres. No new or useful information will be provided by such an assessment, nor will there be any material change to the assessment, nor the conclusions, just added time and costs. b. As discussed, since there are no locally significant sources, ubiquitous air quality sources dominate, such as the road network, agriculture, etc. A suitable background air quality level is therefore provided by the nearest air quality monitoring station with the appropriate data sets. As discussed in Section 11, the key exception to this is PAHs, VOCs, and metals, which are not measured at the St. Catharines station.
11	S. 5.11 BACKGROUND AIR QUALITY: a. "Background values were estimated." Confirm this is PM2.5 background data. b. "Nearest" is too vague. It's better to specify the distance between the project site and the closest MECP monitoring station, such as: "St. Catharine's ambient air monitoring station (43°9'36"N, 79°14'5"W) is located 9 km from the proposed Upper's Quarry site". This AQ station is considered an urban site. In general, PM and NO2 levels are expected to be higher at an urban site than in a rural area where Upper's Quarry would be located.	RWDI	a. MECP provides measured values for $PM_{2.5}$, NO_2, and O_3 from the St. Catharines monitoring station, as shown on Table 1. The footnote reference for these should be [1], not [2]. The National Air Pollutant Surveillance program provides measured values for PAHs, VOCs, and metals from the Simcoe monitoring station. b. We apologize for this oversight. It was assumed that expert peer reviewers know the location of the MECP monitoring stations. As per the Air Quality in Ontario Reports, published by the MECP, the St. Catharines monitoring station is located at latitude 43°09'36.2" and longitude -79°14'05.1". The street address is 62 Argyle Crescent, St. Catharines. It is located approximately 8.5 km from the subject site.
12.	S. 5.12 CHEMICAL REACTIONS AMONG CONTAMINANTS: a. No comments on this section.	RWDI	No response required.
13.	S. 5.13 UNCERTAINTIES: a. "… as they are potentially influenced by many factors." Identify which factors are considered here. b. "… to estimate impacts under worst-case weather." Explain what "worst-case" means here. c. Provide examples of a few "assumed mitigation measures".	RWDI	a. RWDI apologizes for the oversight. It was assumed that qualified peer reviewers understand the uncertainties associated with estimating fugitive dust emissions. Factors such as moisture level, wind speed, vehicle speeds, particle sizes, and humidity all factor into the estimates. b. Worst-case in this context means the weather conditions that result in the highest predicted impacts. This is standard terminology in air quality studies.

			c. The assumed mitigation measures are described in Section 15, and further detailed in the Best Management Practices Plan. It is redundant to provide examples here.
14.	S. 5.14 RESULTS: a. In this section, the main results extracted from the tables must be summarized quantitatively. b. "With the addition of background concentrations to benzo(a)pyrene, this contaminant exceeds the AAQC. This is due to the ambient background levels throughout most of Ontario already being above the AAQC.". "Most of Ontario" means that the AAQC is shown to be exceeded at more than one air monitoring site. c. Using a receptor grid instead of discrete receptors would have helped present (i.e., concentration maps) and interpret (i.e., atmospheric dispersion processes) the results calculated with AERMOD.	RWDI	a. This is a stylistic preference and has no material effect on the assessment. No action required. b. Yes. This is correct, and should be common knowledge amongst air quality practitioners in Ontario. Elevated concentrations of benzo[a]pyrene (and benzene) formed the basis for the MECP Cumulative Effects Assessment (CEA) in Air Approvals policy, which came into effect on October 1, 2018. This is described in the MECP "Discussion Paper: Cumulative Effects Assessment in Air Approvals", published in November 2017." "The Ministry analysed the monitoring data available for selected urban communities and identified benzene and benzo[a]pyrene as the two most significant carcinogens, with the highest concentrations measured at stations in the Hamilton and Sarnia areas." In fact, Table 5.1 of the Discussion Paper shows that concentrations of benzo[a]pyrene actually exceed the AAQC at all stations examined (Toronto, 4 locations in Hamilton, Sarnia, and Simcoe). c. This is a stylistic preference and has no material effect on the assessment. No action required. A receptor grid is not necessary to conclude that impacts to nearby sensitive receptors are within acceptable levels. No new or useful information will be provided by modelling over a receptor grid, nor will there be any material change to the assessment, nor the conclusions, just added time and costs.
15.	S. 5.15 RECOMMENDATIONS: a. Would there be a system on-site to alert the quarry's staff/management when fugitive dust events occur? b. How frequently a dust suppressant (e.g., water) has to be applied? The frequency can be linked to the "control efficiency" of the emissions.	RWDI	a. This is specified in the Best Management Practices Plan for the Upper's Quarry. b. Under dry conditions, the capacity to apply water on an hourly basis to all travelled haul routes is required. This is not explicitly stated in the BMPP, which is an oversight, and shall be included. To be sure this is addressed Drawing 4 of 6, Note B.5 (and the PJR) will be updated to add (c) as follows: "**c. Under dry conditions, the capacity to apply water on an hourly basis to all travelled haul routes within the licence boundaries is required.**"
16.	S. 5.16 RECOMMENDED MANAGEMENT PRACTICES: a. Are there recommendations to control benzo(a)pyrene emissions from the operations at the quarry site?	RWDI	a. No. Emissions of benzo(a)pyrene are driven in large part due to the volatility of the asphalt cement manufactured or imported into Ontario. Asphalt cement suppliers work to minimize the volatility of the asphalt cement to reduce product losses. Furthermore, The MECP includes requirements to test the volatility as a normal part of the ECA process.
17.	S. 5.17 CONCLUSION: a. Replace "Section 13" by "Section 15".	RWDI	a. This typographical error is noted. Should the report be re-issued, this will be rectified.
18.	S. 5.18 TABLES a. Correct "Upper's Quarry" in all table captions.	RWDI	a. This is a minor typographical issue and has no material effect on the assessment. No action required.
19.	S, 5.19 FIGURES a. A description of each figure is needed.	RWDI	a. This is a stylistic preference and has no material effect on the assessment. No action required.
20.	S. 5.20 REFERENCES a. Create at the end of the report a section to list all references cited in the report. b. Add "EPA, 1993, Emission factor documentation for AP-42, section 13.2.2, unpaved roads."	RWDI	a. This is a stylistic preference and has no material effect on the assessment. All references are noted in footnotes. No action required. b. Same response as 20.a above.

21.	There are concerns with benzo(a)pyrene exceeding the AAQC guidelines. What is affected by this increase? What are the concerns when benzo(a)pyrene exceed AAQC guidelines?	RWDI	HMA plants are regularly approved by the MECP throughout Ontario with benzo(a)pyrene emissions similar to those from the proposed plant. The only area of Ontario where the MECP has applied additional restrictions on emissions and predicted concentrations of benzo(a)pyrene is in Hamilton, as per the MECP Cumulative Effects Assessment (CEA) in Air Approvals policy. The predicted annual concentrations of benzo(a)pyrene are also two orders of magnitude lower than the ambient background value. These emissions do not result in a material change to overall benzo(a)pyrene concentrations.
Appendix 8: Blasting Impact Assessment, October 2021 Comments:			
	Detailed Peer Review (DST Consulting) Comments:		
1.	The Blasting Impact Assessment under the heading 'Recommendation' provides (11) recommendations as the condition of blasting in the proposed Walkers Aggregates Upper Quarry extraction area. Englobe concurs with these recommendations and suggest the following be addressed: a. Critical conditions recommended by the BIA be included in the final version of the site plan notes; and b. Critical conditions outlined (note D) on the site plan drawings sheet 4 of 6 be judiciously implemented to maintain compliance with the MECP guidelines and regulations	MHBC	The (11) Recommendations in the Blasting Impact Assessment have been incorporated onto the ARA Site Plans, which are regulated the MNRF through the ARA licence. These can be found at: Drawing 4 of 6, Report Recommendations, under Note D. Blasting.
Appendix 9: Traffic Impact Study, October 2021 Comments:			
	Regional Transportation Comments:		
1.	The Region will require the owner/developer to enter a legal agreement with the Region for the required road improvements, maintenance of the road during operation of the quarry and potential reconstruction of the road after the closing of the quarry if the additional lanes are not required.	Walker	Noted.
2.	The TIS hasn't applied any growth rate to the historic traffic volumes dated 2018 and has depended on the increased expected traffic volumes generated from the two background developments (Rolling Meadows and Thorold Townline Road Employment Lands). The Region always requests a growth rate applied to historic traffic counts additional to any background developments.	TMIG	As is typical of quarry applications, the TIS has been under development as part of the multi-year process, and existing TMCs were collected pre-COVID. At the outset of the TIS process, a growth rate was not needed to bring the TMCs to a baseline year. However, to address comments by the Region, the TMCs have been grown to a baseline year of 2023.
3.	For the capacity analysis, existing conditions should represent factored historical counts using a growth rate of 2% per annum (not present it for 2018 counts as shown in the report).	TMIG	2018 TMC data has been updated to reflect 2023 as the baseline year by growing all movements at all study intersections by 2% per annum. All study horizon years were reassessed, and corresponding analysis, results, and recommendations are provided in TYLin's Addendum to the October 2021 TIS.
4.	The Region's TIA Guidelines request using ideal saturation flow rates of 1,750 vehicles per hour per lane, and peak hour factors of 0.92 for all movements. The Region will accept the peak hour factors used, however, the saturation flow rate will need to be revised to the 1,750 as noted in the Terms of Reference.	TMIG	Noted. The ideal saturation flow was adjusted to 1,750 vehicles per hour per lane. Peak Hour Factors used in the October 2021 TIS were maintained.

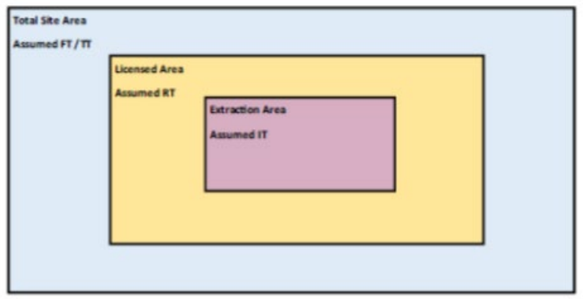
5.	For the capacity analysis, the TIS has assumed various % increase in trucks, however, the existing heavy vehicles used in the assumptions should have been factored by 2% growth rate for 2025 and 2035 future background conditions.	TMIG	Noted. The heavy vehicle volumes from the 2018 TMCs were also grown by 2% to the 2023 baseline horizon, as a component of the overall 2% annual background growth. Of note, TYLin is of the opinion that a 2% annual growth rate applied to 2018 counts to the final 2035 future horizon year, representing 17 years of growth, is unsustainable in addition to the two considerable background developments already accounted for in the TIS. However, TYLin applied background growth beyond the 2023 baseline year by adopting more realistic growth rates used in the 2018 Rolling Meadows Development TIS. The following annual growth rates were applied to grow background traffic beyond the 2023 baseline horizon year: • Highway 20/Lundy's Lane: 1% • Thorold Townline: 1% • Beaverdams Road: 1% • Highway 58/Davis Road: 0.5% • Thorold Stone Road: 1% Although Thorold Stone Road was not a part of the study area in the Rolling Meadows TIS, a 1% growth rate was assumed to match the majority of other roads within the Rolling Meadows study. Heavy Vehicle volumes were also grown beyond 2023 as per the noted growth rates.
6.	The capacity analysis for Thorold Townline Rd at Thorold Stone Rd shows that at 2025 & 2035 Future Total Conditions, the SBTR movement is expected to have v/c ratios more than the Region's thresholds. Although this was observed in the 2025 & 2035 Future Background conditions, the subject development has contributed in worsen the traffic conditions. The TIS should have included any geometric/or other improvement(s) for the Region's review.	TMIG	Noted. TYLin has provided recommended improvements to the intersection of Thorold Townline Road and Thorold Stone Road in the TIS Addendum due to the increased background traffic travelling through the intersection compared to the volumes analyzed in the September 2021 TIS.
7.	The capacity analysis for Thorold Townline Rd at Lundy's Lane shows significant delays by the NBL movement under 2035 Future Total Conditions and has recommended constructing a dedicated SBR turn-lane to improve both SB & NB operations. LOS at these movements are D & E but v/c ratios are acceptable based on the Region's thresholds for v/c ratios.	TMIG	Noted.
8.	The TIS stated that: "A signal warrant was conducted for the intersection of Thorold Townline Road and Beaverdams Road under 2025 Background conditions to confirm if the combined existing and 2025 background traffic would justify the installation of a traffic signal". A signal was found not warranted and the TIS has suggested monitoring the intersection for signalization in 2025.	TMIG	Noted.
9.	The signal warrant analysis should have been done for 2025 Total Conditions and 2035 Total Conditions if it is not warranted under the 2025 Total Conditions considering site trips in the analysis. (Note: The capacity analysis has included the signal option in 2025 Total Conditions and 2035 Conditions and demonstrated operation improvement).	TMIG	Noted. Due to increases in background traffic volumes requested by Region Staff, signal warrant analysis at the intersection of Thorold Townline Road and Beaverdams Road was updated accordingly. The signal warrant was conducted under 2025 and 2035 conditions.
10.	The queueing analysis results shown in Table 7-1 & 7-2 (pages 48 & 50) show that a number of left/right turn-lanes of Thorold Townline Rd intersections would require storage extensions in 2025 & 2035. These are mainly due to background growth.	TMIG	Noted.
11.	A detailed design for the site access at Uppers Lane is found in Appendix E was reviewed by transportation engineering staff and the following comments are to be addressed:	TMIG	Based on comments from the Region and TYLin's experience with other aggregate applications, three alternative conceptual designs have been prepared for the Region's review and are provided as an appendix to the TIS Addendum. a. The conceptual design has been updated to include deceleration length for the southbound left-turn lane for all three design alternatives.

	a. Given the volume of trucks, they should include deceleration length in the southbound left turn lane. b. The northbound deceleration and acceleration lanes extend over 450m. This may result in drivers believing Townline road is 2 lanes in the northbound direction. Unwanted passing may result. This concern should be addressed in the updated TIS. c. There is a vertical curvature south of Thorold Townline Rd & Uppers lane intersection (site access) which might affect the sightline. We need them to carry out a sightline assessment to verify if the NB acceleration lane is required. If sightline is adequate, there is no need for the acceleration lane as drivers might use it for passing. d. Street sweeping as required at the responsible of the Quarry e. Once the quarry has been closed – review of the road design will be reviewed and if modifications are required the reconstruction of the road will be the responsibility of the Quarry/owner. f. An illumination warrant is to be completed g. The functional drawing hasn't shown the opposite existing access for DMZ Paintball, which will be affected by their proposed widening on the west. Future drawings submission should include existing accesses.		b. Noted. The three conceptual design alternatives appended to the TIS addendum address the concerns of the Region that the acceleration and deceleration lanes associated with the quarry have the potential to cause unwanted passing behaviour in the northbound direction. c. TYLin conducted sightline analysis to determine if the vertical curvature near Upper's Lane would impede a driver's line of sight to the south in order to determine if the northbound acceleration lane was required, as per the Region's request. The sightline analysis was completed based on the Thorold Townline Road centreline location and elevations provided to TYLin from MHBC. The location of the centreline was based on drone aerial photography completed by TEC Engineering on January 30, 2020. The elevations of the centreline were based on a topographic survey prepared by TEC Engineering using October 2016 and February 2017 aerial photography. Drawings prepared by TYLin to illustrate the results of the sightline analysis are appended to the TIS Addendum. It was found that drivers of both trucks and passenger vehicles should have adequate sightlines to the south at the existing Upper's Lane location to determine if a large enough gap exists to enter the northbound stream of traffic without a northbound acceleration lane, as per the Region's comment. d. Noted. This can be addressed in the legal agreement(s) to be entered into with the Region and City relative to road improvements. e. Noted. This can be addressed in the legal agreement(s) to be entered into with the Region and City relative to road improvements. f. Noted. This can and will be addressed in the legal agreement(s) to be entered into with the Region and City relative to road improvements. g. The updated conceptual design drawings all include the existing DMZ Paintball access opposite the proposed Upper's Quarry access. Of note, TYLin recommends that Conceptual Design Alternative 3 be adopted as the preferred access configuration, as it allows for the Region's request that the section of the northbound acceleration and deceleration lanes be minimized to address potential passing concerns while still providing an acceleration lane for heavy vehicle traffic to get up to speed and safely merge into mixed traffic. Further details are provided in the TIS Addendum.
	City Transportation Comments:		
12.	Beechwood Road is a City arterial road. It has a planned 26.0 metre right-of-way as identified in the City's Official Plan. Beechwood Road is 20.12 metres wide. Accordingly, a 2.94 metre road widening will be required along the Beechwood Road frontage of the subject lands.	TMIG	Traffic to and from the quarry operation will be directed to Thorold Townline Road from Upper's Lane and will not access Beechwood Road via Upper's Lane. Therefore, there is no change in use of Beechwood Road resulting from the proposed applications to warrant a road widening.
13.	Upper's Lane is a local City road. It has an approximate 8.0 metre right-of-way. Walker Aggregate Inc. owns the parcels of land that abut Uppers Lane on each side of the road, except for the Bible Baptist Church at the southwest corner of Beechwood Road of Uppers Lane. However, the church has driveway access exclusively on Beechwood Road. There is negligible traffic on Uppers Lane.	TMIG	Noted.
14.	If Upper's Lane is to remain a public road allowance, its existing 8.0 metre width will not be adequate to accommodate wider lanes for the expected truck use, and provide the required roadside features (shoulders, ditches, placement of utility poles, etc.). This will need to be evaluated through a detailed design of Uppers Lane. The City standard for a rural road is a minimum 20 metre right-of-way. Any additional road allowance width required will need to be dedicated to the municipality.	TMIG	Any improvements to Upper's Lane will be required for the sole purpose of the quarry and, accordingly, any road improvements along Upper's Lane needed to accommodate quarry traffic can be accommodated on Walker's lands and can be addressed through a future agreement with the City if the quarry is approved.

15.	A daylight triangle measuring 7.0 metres by 7.0 metres will be required on the northwest corner of Beechwood Road and Uppers Lane, over and above the aforementioned 2.94 metre road widening for Beechwood Road.	TMIG	See response to Comment #12.
16.	A transportation assessment study/report is a requirement of a complete application. A traffic impact study prepared by the Municipal Infrastructure Group Ltd. (TMIG), dated October 2021, was submitted with the additional background materials to support this application. The primary traffic impact of the proposed quarry is on the regional road network, specifically Thorold Townline Road & Taylor Roads (RR# 70), Thorold Stone Road (RR #57) and Lundy's Lane (RR# 20) to access Highway 406 via Highway 58 and/or the Queen Elizabeth Way. Two haul routes are described in the traffic report with preference given to the first route which directs trucks exiting the site at some point along Uppers Lane to proceed west to Thorold Townline Road, then north on Thorold Townline Road and either proceeding left towards Highway 58 then onto Highway 406, proceeding through onto Taylor Road with the goal of reaching the Queen Elizabeth Way via the Glendale Avenue interchange, or turning right onto Thorold Stone Road to the Queen Elizabeth Way interchange east of Montrose Road. It is noted that the proposed haul route will not make use of Beechwood Road, but employees will be able to access the site via Beechwood Road is they choose to do so.	TMIG	Noted. Dependent upon the final location of the quarry access and internal communication to staff, employees may be restricted to entering the quarry via Thorold Townline/Upper's Lane, as assumed as part of TYLin's traffic analysis.
17.	The quarry is expected to generate about 100 bidirectional trips in the peak hour, with approximately 90% comprised of truck traffic. The report recommends a southbound left turn lane and a northbound right turn lane on Thorold Townline Road at Uppers Lane. Regional Transportation Staff will provide comments on the expected operation of the study area intersections as each node analysed is under their jurisdiction.	TMIG	Noted.
18.	The truck template shown in the traffic report uses a heavy single unit (HSU) truck, which is a 35-foot cube van, but closely mimics the turning path of a dump truck. Aerial views of the existing quarry show several large truck with trailers that have a combined length of up to 75 feet long. Clarification on the design vehicle to be used in design is requested.	TMIG	Through discussion with Walkers staff, it is TYLin's understanding that the large trucks with trailers (up to 75 feet long) on the aerial views described in the City's comment, are typical of trucks that service the landfill within the immediate vicinity of the existing quarry north of the proposed Upper's Quarry. These longer design vehicles are not the typical vehicles that are expected to service Upper's Quarry.
19.	The report identifies that Uppers Lane is expected to operate satisfactorily as a two-lane road. The travelled portion of the road was measured to be less than 5.0 metres at various points throughout its length, with narrow or non-existent shoulders. The report recommends widening the pavement on Uppers Lane by 1.0 to 1.5 metres between Thorold Townline Road and the quarry entrance, but it will probably need to be even wider (7.0 to 7.5 metres total width, given that the road will need to be designed at a 80 km/h design speed) to meet prevailing road standards. The road appears to be in poor condition for heavy truck traffic; Engineering Staff will provide additional comments on this matter.	TMIG	See response to Comment No. 12 above. Also, this road should not be considered for an 80 km/h design speed, considering it will primarily act as an access to the proposed quarry, not as a through road for public traffic.
Appendix 10: Cultural Heritage, October 2021 Comments:			
	City / Region Staff Comments:		
1.	The City's Heritage Committee has no concerns with the proposed quarry with respect to the property located at 10148 Beaverdams Road.		Noted.

2.	City Planning Staff are continuing to consult with Indigenous groups regarding the assessment. Further comments may be provided at a future date following comments received from the Indigenous groups.		Noted.
Appendix 11: Visual Impact Study, October 2021 Comments:			
	City / Region Staff Comments		
1.	Please provide a rendering of the layout of the quarry that includes a street level visual analysis with berming, noise control and landscaping, once quarry is developed.	MHBC (N. Miele)	Enclosed with submission.
Appendix 12: Economic Benefits Analysis, October 2021 Comments:			
	Detailed Peer Review (Watson & Associates) Comments:		
1.	In general, the report focusses on revenues the municipalities will receive (e.g. property taxes, TOARC fees, etc.). With respect to municipal expenditures, no identification of operating or capital costs have been included. Although this was not explicitly included in the terms of reference submitted as part of the pre-consultation process, consideration should be given to addressing this information to support the decision-making process. Consideration should be given to Regional Official Plan 14.D.5 which states *"…Where an Amendment is proposed to the Regional Official Plan, the Region shall consider the following criteria in evaluating the Amendment…viii. The effect of the proposed change on the financial, health, safety, and economic sustainability of the Region…"* as well as City of Niagara Falls Official Plan policy Part 4 Section 2.6 *"When considering an amendment to the Official Plan, Council shall consider the following matters. …2.6.7 The financial implications of the proposed development..."*	Prism	No significant municipal expenditures in terms of operating or capital costs were identified from the project in other disciplines so the analysis was not included in the document.
2.	With respect to the anticipated tonnage of aggregate to be extracted, the study provides that a maximum of 1.8 million tonnes may be extracted annually, whereas on average the production may equate to 1.3 million tonnes annually. However, through initial conversations, it appears this site may act as a replacement of existing quarry operations at another site owned by the applicant. As a result, it should be identified if the amount to be extracted from the new site is in addition to existing amounts or will replace current levels of extraction.	Prism	This analysis is focused on a single site and does not consider cumulative effects from other existing or potential projects.
3.	With respect to the economic impacts, the employment and salary information appears to have been undertaken appropriately using the Statistics Canada input-output multipliers. However, the calculations should be provided in further detail to allow the JART to review the specifics.	Prism	The overall approach is described under economic impacts, and some additional language has been added to address the question of how regionalization is determined. Presentation of detailed calculations relating to this analysis, however, were considered out of the scope this document.
4.	Additionally, as the new proposed site is located on the border of Niagara Falls and Thorold, the study should includes financial and economic benefits for the City of Thorold as well as the City of Niagara Falls and the Region as per the comments included in the pre-consultation agreement.	Prism	While Thorold will share in the economic effects of the project, estimation of the extent of benefits has not been included because the proposed Amendment applications pertain to lands contained within the City of Niagara Falls, in the Region of Niagara. If necessary, this can be provided.
5.	S. 3.1.1 Aggregate Production - The report provides that the maximum annual extraction limit is 1.8 million tonnes of aggregate, with an anticipated average extraction amount of 1.3 million tonnes annually. However, through initial discussions with the applicant, it appears this new quarry site may be replacing the existing quarry site which is approximately 2.5 km away. As a	Prism	This analysis is focused on a single site and does not consider cumulative effects from other existing or potential projects.

	result, the report should identify if the development of this quarry is a continuation of existing operations or would result in 1.3 million tonnes of aggregate in addition to the current site.		
6.	S. 3.1.2 Employment Impacts: a. The report notes the use of the Statistics Canada Input-Output multipliers. This approach is consistent with best practices in this field. However, the assumptions and approach to the calculations have not been identified. The anticipated construction price for the initial employment impacts has been identified at $23 million, however, the assumption of ongoing revenues has not been provided. Further, if this site will be a replacement for the current site, the report should identify that these operations are a continuation of existing employment levels, with the addition of direct and indirect employment related to construction of the site.	Prism	Expected revenue from production at the site is excluded as it is considered proprietary information.
7.	S. 3.2.2 Assessment Assumptions - In estimating the assessment to be generated from the expansion of the quarry, Prism notes that they used the Income Approach in estimating the assessment, however, no calculations have been provided. Detailed calculations on the Income Approach estimate should be provided to allow the JART to undertake a review of the calculations. Based on the report, the total assessed value is $44.6 million. When applied to the total acres of the property (262.67 acres), the total assessed value per acre is $170,000. This estimate appears exceedingly high. The following provides for a comparison of quarries in various areas of Southern Ontario: **Municipality / Address / Total Assessed Value / Total Acres / Assessed Value per Acre** Niagara Falls — 2841 Garner Road — 4,161,000 — 406.77 — 10,229 Port Colborne — Concession Road 2 — 1,204,000 — 180.83 — 6,658 Lincoln — 3614 Victoria Ave — 2,548,000 — 250.66 — 10,165 Hamilton — 834 Brock Road — 6,061,000 — 666.35 — 9,096 Burlington — 1775 King Road — 1,652,000 — 111.16 — 14,861 *Source: MPAC PropertyLine Databse* As noted in the above sample of quarry properties, the assessed values per acre range from a low of $6,658 to a high of $14,861. Therefore the assessed value of $44,600,000 (or $170,000 per acre) is significantly higher. Rather than taking the Income Approach, in Watson's opinion, it would be more appropriate to undertake a survey of assessed values of quarries. Further, it is most appropriate to review the assessed value of quarry properties in the Region, rather than quarries in other regions. As part of the Assessment Act, section 44 (3) (b) notes that land valuation will have reference to the value of similar lands in the vicinity and make adjustments to maintain equity with these lands. As a result, a survey of quarry properties in the Region should be undertaken in estimating the assessed value. Note that if the assessed value per acre was based on the 2841 Garner Road property (currently owned by the applicant), then the total assessed value would be approximately $1.1 million.	Prism	Estimates of property tax revenue have been amended throughout the document to reflect this analysis and changed to 2022 rates. Note that a range of potential values are now presented to incorporate concerns shown in comment 8. The document now also includes discussion of potential effects on residential price values.

	Additionally, MPAC provides assessment adjustments to residential properties abutting and within 1km of quarries. The proposed quarry may reduce assessed values of residential properties in the area, thus reducing tax revenues. This should be included in the analysis. Finally, the loss of existing assessment and tax revenue should be included in the report.		
8.	S. 3.2.3 Tax Class Assumptions - The analysis assumes that the proposed quarry will be assessed as 100% industrial. This includes the licensed area, extraction area, and remaining areas. In our experience and based on the regulations to the Assessment Act, the industrial assessment (IT) applies to the extraction area, residential assessment (RT) would generally apply to the remaining licensed area, and any remaining lands may be assessed as farmland (FT) and/or managed forests (TT). This is provided in the following diagram:  We would note that this would be a fair assumption as the actual assessment class would depend on the use of the land as per the Assessment Act. For example, use is farming by a bona-fide registered tenant farmer then it might be FT otherwise, if farmed it could be RT at farmland assessment rates. The same would apply for the Managed Forest portions if the owner applies to the Ministry of Natural Resources and Forestry for the TT tax class consideration. The report only provides the total site area and does not identify the licensed area or extraction area. As a result of assuming industrial assessment only, the tax revenue has been overestimated since the tax rate for industrial properties is higher than that of residential and farm/managed forests. This should be recalculated to align with the Assessment Act.	Prism	All treatment of property taxes in the document have been changed to provide a range of values, from a ceiling of 100 % industrial to a floor which has a hybrid of residential and industrial zones. This is done because the final plans for site zoning have yet to be determined.
9.	S. 3.2.4 Annual Aggregate Levy Fees - The report does not provide the details of the calculations for the aggregate licensing fee and is unclear. The aggregate licensing fee identified in the text is the 2020 rate and the percentage allocation to the City of Niagara Falls is incorrect. However, applying the correct percentages and 2022 rates, provides a similar result to that shown in Table 4 of the report. The Government of Ontario website provides the following breakdown of how the fees are allocated: • Aggregate Resources Trust – 3% • Local Municipality (City of Niagara Falls) – 61% • Upper-tier Municipality (Niagara Region) – 15% • Crown (Province of Ontario) – 21%	Prism	Aggregate licence fees have been adjusted to 2022 rates. This analysis is focused on a single site and does not consider cumulative effects from other existing or potential projects.

	Based on the assumption that there will be 1.3 million tonnes extracted annually, the revenues would be as follows (based on 2021 and 2022 rates): **Aggregate Levy Calculations** / **Percentage Allocation** / **2021 Fee/tonne *$0.208*** / **2022 Fee/tonne *$0.213*** Aggregate Resources Trust — 3% — $8,112 — $8,307 Niagara Falls — 61% — $164,944 — $168,909 Niagara Region — 15% — $40,560 — $41,535 Ontario — 21% — $56,784 — $58,149 **Total** — **$270,400** — **$276,900** Further, as the report is unclear if the extraction amounts from this site will be in addition to, or a continuation of, aggregate tonnages currently extracted, it is unclear if this revenue is in addition to the current revenue received or a continuation of revenues already received. This should be clarified in the report.		
10.	City Staff request confirmation if property assessment are adjusted by MPAC in proximity to a quarry, and if so, the impact on property taxation.	Prism	This question is now addressed in the document under property tax impacts.
Appendix 13: City of Niagara Falls Building Department Comments			
	City Building Department Staff Comments:		
1.	All required Building Permits and Demolition Permits (not excluding any federal/provincial/regional/municipal, heritage approval, site-plan control, hydro-corridor, etc…) to be obtained prior to commencement of any construction/demolition/application-submission in accordance with the Ontario Building Act –Applicable Law, to the satisfaction of the Building Services Division and the Fire Prevention Division.	MHBC	To make this clear to the licencee, the following Note has been added to the ARA Site Plans: • Drawing 2 of 6 (Operational Plan), Note E.1 is revised to add the following: "**Prior to erecting or demolishing a building, all necessary Permits shall be obtained by the City in accordance with the Ontario Building Code Act, to the satisfaction of the Building Services Division and the Fire Prevention Division.**"
2.	City, Regional and Education Development Charges (not excluding Parkland Dedication Fee, if applicable) will be assessed during the review of the Building permit(s) application submission.		Noted.
3.	Fire Prevention Division requires assessing the site proposal as it relates to on-site fire-fighting practices, i.e. private fire-route accesses, fire-hydrant locations (private and/or public), fire-department connection(s), etc….		Noted. Addressed in response to Comment No. 1 above.
4.	Building application submission, spatial-separation fire-protection review shall be conducted.		Noted.
5.	Geotechnical Report (not excluding any seismic data/recommendation/groundwater) shall be provided at building application submission.		Noted.
6.	Please be advised, signage may require sign permits. Please telephone Building Services Division – Permit Application Technicians/Technologists at 905-356-7521, Extensions 4213 or 4344.		Noted.
Appendix 14: TransCanada Pipeline Comments			
	Trans Canada Pipeline (TCPL) Comments:		

1.	TCPL requires notification for blasting within 300 metres of their right-of-way (easement). No blasting shall occur until written consent is obtained from TCPL	Walker/MHBC	Walker agrees to notify TCPL prior to blasting within 300 metres of their right of way (easement) and until written consent has been obtained from TCPL. To address this comment and the additional comments made by TCBL, the following updates (in **bold** below) have been made to the ARA Site Plans: • Drawing 2 of 6 (Operational Plan), Note J.1 (Frequency and Timing of Blasts): 10 m has been changed to **300** metres • Drawings 2, 3 and 4 of 6, Trans Canada Blasting Buffer Area has been changed from illustrating 100 metre buffer to a **300 metre buffer** • Drawing 2 of 6 (Operational Plan), added a new sub-heading / section as follows: "**O. <u>Trans Canada Pipeline (TCPL)</u>** **1. The licencee shall notify TCPL if it intends to blast within 300 metres of their right-of-way (easement). No blasting shall occur until written consent is obtained from TCPL.** **2. Any other work (other than blasting) within 30 metres of TCPL's right-of-way requires written consent from TCPL.** **3. Crossing of the TCPL right-of-way with vehicles is not permitted without written consent from TCPL** **4. No material extraction shall be permitted within 40 metres of TCPL's right-of-way without written consent from the Canada Energy Regulator (CER, formerly NEB or National Energy Board).** **5. No buildings or structures shall be constructed anywhere on TCPL's right-of-way. Permanent buildings and structures shall be located a minimum of 7 metres from the edge of the TCPL right-of-way. Temporary or accessory buildings shall be located a minimum of 3 metres from the edge of the right-of-way.** **6. A minimum setback of 7 metres from the nearest portion of a TCPL pipeline right-of-way shall also apply to any parking area or loading area, including any parking spaces, loading spaces, stacking spaces, bicycle parking spaces, and any associated drive aisle or driveway.** • All Drawings (Title Block), Site Plan Acronyms: added "**TCPL - Trans Canada Pipeline**" to list of acronyms
2.	Any other work (other than blasting) within 30 metres of TCPL's right-of-way requires written consent.		Addressed in response to Comment No. 1 above.
3.	Crossing of the TCPL right-of-way with vehicles is not permitted without written consent.		Addressed in response to Comment No. 1 above.
4.	No material extraction shall be permitted within 40 metres of TCPL's right-of-way without written consent from the Canada Energy Regulator (CER, formerly NEB or National Energy Board) a. TCPL does not have the authority to consent to mining within 40 metres of their right-of-way. b. Please refer to: https://www.cer-rec.gc.ca/en/safety-environment/damage-prevention/ground-disturbance/index.html		Addressed in response to Comment No. 1 above.
5.	No buildings or structures shall be installed anywhere on TCPL's right-of-way. Permanent buildings and structures are to be located a minimum of 7 metres from the edge of the right-of-way. Temporary or accessory buildings are to be located a minimum of 3 metres from the edge of the right-of-way.		Not proposed. Further addressed in response to Comment No. 1 above.

6.	A minimum setback of 7 metres from the nearest portion of a TCPL pipeline right-of-way shall also apply to any parking area or loading area, including any parking spaces, loading spaces, stacking spaces, bicycle parking spaces, and any associated drive aisle or driveway.		Not proposed. Further addressed in response to Comment No. 1 above.
7.	TCPL is requesting the following setbacks be implemented through the Zoning By-law Amendment: *No building, structure, parking or loading spaces, or related aisles or driveways may be located closer than 7.0m to the TransCanada pipeline right of way except accessory buildings which may not be located any closer than 3.0 m to the TransCanada pipeline right-of-way.*	Walker/MHBC	This provision will be added to the proposed Zoning By-law Amendment (a new subsection (ii) will be added as follows to Section c.11.6.3(b) of the proposed By-law and subsections will be renumbered). This setback will also be regulated through the ARA Site Plans and Note added (see response to Comment No. 1 above). **(ii) TransCanada pipeline setback No building, structure, parking or loading spaces, or related aisles or driveways may be located closer than 7.0 metres to the TransCanada pipeline right of way except accessory buildings which may not be located any closer than 3.0 m to the TransCanada pipeline right-of-way.**

<u>ATTACHMENT</u>: RESPONSE TO APPENDIX 5: LEVEL 1 & 2 NATURAL ENVIRONMENT AND ENVIRONMENTAL IMPACT STUDY, DETAILED COMMENTS FROM NPCA TECHNICAL STAFF (COMMENT 29)

UPPERS QUARRY WETLAND PLANTING PLAN SPECIES LIST (BY STANTEC)

Appendix A Proposed Planting List	
UPPERS QUARRY WETLAND PLANTING PLAN SPECIES LIST	
SCIENTIFIC NAME	COMMON NAME
TREED DECIDUOUS SWAMP TREES:	
Acer rubrum	Red Maple
Acer x freemanii	Freeman's Swamp Maple
Populus deltoides	Eastern Cottonwood
Populus tremuloides	Trembling Aspen
Quercus bicolor	Swamp White Oak
Quercus macrocarpa	Bur Oak
Quercus palustris	
Salix amygdaloides	Peach-leaved Willow
Thuja occidentalis	Eastern White Cedar
TREED DECIDUOUS SWAMP SHRUBS:	
Cephalanthus occidentalis	Eastern Buttonbush
Cornus obliqua	Silky Dogwood
Cornus sericea	Red-osier Dogwood
Ilex verticillata	Common Winterberry
Lindera benzoin	Northern Spicebush
Ribes americanum	American Black Currant
Rubus pubescens	Dwarf Raspberry
Sambucus canadensis	
Viburnum lentago	Nannyberry
Viburnum opulus var. americanum	Highbush Cranberry
TREED DECIDUOUS SWAMP HERBACEOUS SPECIES:	
Alisma triviale	Northern Water-plantain
Anemonastrum canadense	Canada Anemone
Arisaema triphyllum	Jack-in-the-pulpit
Boehmeria cylindrica	Small-spike False Nettle
Calamagrostis canadensis	Bluejoint Reedgrass
Carex bromoides	Brome-like Sedge
Carex crinita	Fringed Sedge
Carex gracillima	Graceful Sedge
Carex intumescens	Bladder Sedge

Carex lacustris	Lake Sedge
Carex lupulina	Hop Sedge
Carex retrorsa	Retrorse Sedge
Carex stipata	Awl-fruited Sedge
Chelone glabra	White Turtlehead
Elymus virginicus	Virginia Wildrye
Glyceria striata	Fowl Mannagrass
Impatiens capensis	Spotted Jewelweed
Laportea canadensis	Canada Wood Nettle
Leersia oryzoides	Rice Cutgrass
Lilium michiganense	Michigan Lily
Lobelia cardinalis	Cardinal Flower
Lycopus uniflorus	Northern Water-horehound
Matteuccia struthiopteris	Ostrich Fern
Mentha canadensis	Canada Mint
Onoclea sensibilis	Sensitive Fern
Scirpus cyperinus	Common Woolly Bulrush
Scutellaria lateriflora	Mad-dog Skullcap
Sium suave	Common Water-parsnip
Solidago rugosa	Rough-stemmed Goldenrod
Symphyotrichum lanceolatum	Panicled Aster
SWAMP THICKET SHRUBS:	
Cephalanthus occidentalis	Eastern Buttonbush
Cornus obliqua	Silky Dogwood
Cornus racemosa	Grey Dogwood
Cornus sericea	Red-osier Dogwood
Ribes americanum	American Black Currant
Rubus idaeus ssp. strigosus	North American Red Raspberry
Salix bebbiana	Bebb's Willow
Salix discolor	Pussy Willow
Salix interior	Sandbar Willow
Salix petiolaris	Meadow Willow
Sambucus canadensis	Common Elderberry
Spiraea alba	White Meadowsweet
Viburnum dentatum var. lucidum	
Viburnum lentago	Nannyberry
Viburnum opulus var. americanum	Highbush Cranberry
SWAMP THICKET / MARSH HERBACEOUS SPECIES:	

Alisma triviale	Northern Water-plantain
Anemonastrum canadense	Canada Anemone
Asclepias incarnata	Swamp Milkweed
Bidens cernua	Nodding Beggarticks
Bidens frondosa	Devil's Beggarticks
Calamagrostis canadensis	Bluejoint Reedgrass
Carex bebbii	Bebb's Sedge
Carex lacustris	Lake Sedge
Carex molesta	Troublesome Sedge
Carex retrorsa	Retrorse Sedge
Carex stricta	Tussock Sedge
Carex stipata	Awl-fruited Sedge
Carex tribuloides	Blunt Broom Sedge
Carex vulpinoidea	Fox Sedge
Elymus virginicus	Virginia Wildrye
Eupatorium perfoliatum	Common Boneset
Euthamia graminifolia	Grass-leaved Goldenrod
Eutrochium maculatum	Spotted Joe Pye Weed
Glyceria grandis	Tall Mannagrass
Helenium autumnale	Common Sneezeweed
Impatiens capensis	Spotted Jewelweed
Leersia oryzoides	Rice Cutgrass
Lobelia siphilitica	Great Blue Lobelia
Poa palustris	Fowl Bluegrass
Scirpus atrovirens	Dark-green Bulrush
Scirpus cyperinus	Common Woolly Bulrush
Scirpus pendulus	Hanging Bulrush
Symphyotrichum novae-angliae	New England Aster