



NORVAL QUARRY / BRAMPTON BRICK PEER REVIEW - NATURAL ENVIRONMENT

Peer Review of the *Level 1 / 2 Natural Environment Report*
Proposed Norval Quarry, City of Brampton
prepared by Beacon Environmental and dated September 2010

Prepared for:
City of Brampton

June 2011



Norval Quarry/Brampton Brick Peer Review – Natural Environment

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Prepared for:
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EXECUTIVE SUMMARY

This report presents Ecoplans Limited's preliminary peer review findings of the *Level 1 / 2 Natural Environment Report Proposed Norval Quarry City of Brampton* (NER) prepared by Beacon Environmental for Brampton Brick dated September 2010. Some general observations gleaned from the field reconnaissance and a cursory review of relevant sections of Golders' (July 2010) *Level 1 / 2 Hydrogeological Technical Report Norval Quarry Brampton Brick Limited* (HTR) and Long Environmental's (July 2010) *Norval Quarry Site Plan Report* (SPR) are also incorporated. The comments reflect some limited inter-disciplinary discussion with GENIVAR and other members of the Peer Review team, but have been prepared independent of any consultation with agency reviewers or the authors of the NER. The opinions expressed in this peer review (including Appendix A) may be supplemented, reconsidered or otherwise revised by the author(s) due to new or previously unknown information.

Summary of Existing Conditions

Overall, the standard background data collection and field investigation methods appear to have been employed properly subject to responses to a few questions and a general lack of detail. There are some inaccuracies and inconsistencies, which are generally minor, and various gaps or missing information, which are not necessarily critical since the information may in fact exist.

Of primary over-arching concern however, are the general lack of detail in feature descriptions and analysis and associated over-simplifications that lead to various un-substantiated conclusions (some of which require dialogue with MNR). Secondly, as emphasized throughout, relevant data collected and presented by other disciplines (most specifically water resources) are not well integrated into the descriptions or functional analysis of the natural features.

Key gaps include the:

- absence of any discussion or mapping of a Study Area
- weak or missing discussion of off-site features (including off-site wetlands) and absence of mapping
- weak assessment of linkages among on and off-site features/landscape connectivity
- weak and non-integrated discussion of water-interrelationships (and lack of any mention of Key Hydrologic Features) and
- absence of any discussion of functional connectivity/connectivity with KNHF.

Off-site features are only weakly (e.g., off-site wetlands) described if at all (features to west, southwest, downstream). Even on-site linkage functions (e.g., along the main valley) are not thoroughly discussed and in some cases are not even mentioned (e.g., hedgerows, which might contain Butternut).

The apparent lack of integration with the water resources team, as reflected by the very limited cross referencing of information and in a few cases inconsistencies, is a fundamental concern that

carries through the entire NER. As a result, the NER does not present the comprehensive understanding required to assess and address the key potential impacts of the project. Specifically, one of the primary impacts of below-water aggregate extraction is drawdown of the surrounding water table, which could in turn impact natural features that are dependent on water (specifically wetlands and watercourses, and potentially the Fresh-Moist Black Walnut Lowland Deciduous Forest). Without a thorough discussion and understanding of the inter-relationships between the natural features and water, potential impacts cannot be properly identified or addressed/mitigated.

In combination, the limited level of detail of the feature descriptions and weak functional analyses do not provide adequate supporting rationale for the sensitivity analysis and associated conclusions presented in the Existing Conditions sections of the NER. In turn, this information base does not provide a sufficient basis on which to identify or address impacts, or ultimately, to address conformance with related environmental legislation and policies.

Summary of Project Description, Impact Assessment, Mitigation and Monitoring

The project description, impact assessment and mitigation and monitoring discussions are somewhat disjointed (since they are covered in several sections of the NER) and therefore hard to follow. Key pervasive concerns are the lack of any comprehensive recognition or treatment of water-related functions, weak assessment of off-site connectivity, and general lack of detail.

Project Scope and Impact Assessment

There is no clear description of the project (operations, footprint or rehabilitation plan). Other than a discussion of setbacks, which appears to be more a rationalization of the setback reductions required for operational reasons than justification based on feature sensitivity, there is little explanation of any input the ecologists had in developing the excavation footprint. Given that insufficient information is provided to support the contention that feature sensitivity was in fact considered in reducing the setbacks, the stated Greenbelt Plan policy requirements cannot be addressed. A clear description of direct footprint/removal impacts (particularly on ‘non-significant’ features) is missing.

Rehabilitation is only very weakly discussed. There is no clear description of the rehabilitation plan or mention of any role the ecologists had in developing the plan. The NER does not provide any real discussion of the rehabilitation plan from an ecological perspective (e.g., ecological objectives, various vegetation communities and habitat components, how they were selected, how they are intended to function, specific habitat design elements, landscape connectivity and compatibility etc.). No aquatic habitat components are incorporated in the plan despite the central pond/lake feature (and Greenbelt Plan policy).

The impact assessment is incomplete and does not appear to have been founded on a comprehensive understanding of functional inter-relationships between water and natural features. Nor does the assessment reflect a clear understanding as to what exactly the anticipated

changes to water parameters might be, or what those changes mean to dependent natural features. There is no assessment of impacts to KHF (nor are these features even identified). Even if this assessment was presented in the HRT (which it does not appear to be), impacts should be summarized in the NER given the importance of the linkages/connectivity. Potential for impacts on wetlands, both on and off-site, is not well addressed. Landscape connectivity implications are not comprehensively assessed.

Given the limitations in the detail of the information presented, and the very limited and sometimes conflicting analysis of the relationships between natural features and water, it is very difficult to determine if the potential for indirect impacts to water dependent features on and off site was comprehensively identified. Potential impacts to some features do not appear to have been recognized at all (e.g., off-site reaches of Main Tributary). There are also several specific inconsistencies or discrepancies with some of the HRT water-related impact statements.

The discussion of potential water-related impacts to on and off-site wetlands in particular is weak, and there is no mention of the potential for impact to the hydrologic conditions supporting the Fresh-Moist Black Walnut Forest. Potential for impacts to the on-site wetland is initially dismissed, but then addressed by providing for on-going groundwater monitoring and addition of surface water as mitigation if required. Detail as to how this would be undertaken, however, is completely lacking.

There is insufficient information presented to support the conclusion that the off-site wetlands will not be affected. The extent of the drawdown under the wetland unit that appears to be groundwater influenced is unclear. There is no mention of the potential for drawdown below the off-site wetland units that may be predominately surface water fed to induce a higher rate of infiltration and loss of water from the wetland.

There is no assessment of any potential implications of the rehabilitation plan on natural features or identification of any potential for residual effects following rehabilitation, or during ‘lake filling’. The HRT indicates that rehabilitated conditions in water wells will only return to “near-pre-quarrying conditions”, suggesting that there may be residual effects to groundwater levels that support natural features. If pre-quarrying conditions will not be fully re-instated, then clear identification of potential implications on water-dependent natural features is required. The status of various features and components during rehabilitation in general is uncertain (e.g., drainage feature B1 and stockpile, berms, haul road).

Mitigation Measures

The presentation of the mitigation measures is also disjointed given their introduction throughout various sections of the report. The measures that are presented are also sometimes vaguely applied, with insufficient detail and explanation, and without any supporting monitoring or associated response or contingency actions/mitigation measures.

The mitigation measures do not address some of the impacts that have been identified, and only partially address others. In other cases, mitigation appears to be dismissed as being impractical

without any substantive rationale. The gaps and lack of detail in the impact assessment and underlying existing conditions and sensitivity analysis require resolution to determine if additional mitigation is required. These current information deficiencies introduce overall concerns regarding the effectiveness of the mitigation in protecting natural features.

The impact summary table in Section 7.8 introduces new or sometimes conflicting impact and mitigation information relative to the text, and draws conclusions that are not substantiated in the text.

The only real mitigation measure specified in relation to water-related changes is discharge of surface water at the upstream end of the Main Tributary. However, based on our understanding of this tributary and how it functions, and the information presented in the reports, this mitigation approach is not likely to fully protect fish and fish habitat. Variations in groundwater discharge and recharge conditions along the tributary are not recognized, potential for impacts to the upstream reach (or downstream reaches) is not mentioned, and protection of other features (e.g., drainage feature B, downstream reaches of main tributary) is uncertain.

As noted, while potential for impact to the on-site wetland is initially dismissed, the option of discharging surface water if an impact is identified is briefly mentioned. However, there is no detail provided as to how an impact sufficient to trigger mitigation would be determined, where surface water would be introduced to the wetland, or how appropriate volumes would be determined. There is no provision for monitoring off-site wetlands or mitigating any effects should impacts be identified.

There is no mention of the possible need for any mitigation following rehabilitation, or for the continuation of mitigation during the period of 'lake' filling.

In addition to the weak discussion of mitigation measures to protect aquatic habitats, the NER does not present any specific or sufficiently detailed mitigation (or thorough rationale as to why mitigation is not required) to address the following:

- Protection of retained vegetation (particularly within the wooded valley, and the wetland west of the valley) in relation to any hydrologic changes, the haul road crossing etc.)
- Protection of off-site features and functions
- Protection of nesting by migratory bird species
- Protection of aquatic resources from contaminant spills
- Mitigation of potential dust or noise impacts
- Management of wildlife encounters (including the possibility of SAR) during operations
- Additional mitigation that may be required for Butternut in relation to ESA permitting requirements (and associated requirement for MNR delineation of Significant Habitat under PPS and Greenbelt Plan)
- Closure, based on further dialogue with MNR, regarding the Bobolink observations
- Wildlife movement.

Monitoring Measures

There are few if any monitoring measures actually identified in the NER. Most of the monitoring references relate to water quality, flows or water levels (per the HRT), and then only brief mention is made with no clear links to natural features. There are no clear monitoring measures identified specific to wildlife, SAR, significant wildlife habitat, or terrestrial resources in general. The measures noted in the Monitoring column of the summary table (Section 7.8) are often not monitoring measures at all (i.e., most of these measures are recommendations for vegetation planting, not monitoring).

There is no clear explanation as to how the water-related monitoring aspects are linked to the natural features/functions, what specific monitoring will be undertaken, how potential impacts warranting the need for a response action/mitigation will be identified (or conversely what level of change/impact is considered acceptable), and what the response actions to the monitoring findings will be. For example, where adding water to a feature is identified as a mitigation option if an impact is identified, there is no information provided as to how it will be determined when the impact is large enough to trigger this mitigation. We note that the SPR mentions preparation of an Adaptive Management Plan, which is the logical framework for such monitoring. However, the SPR indicates that the AMP will be developed in the future during the permitting process (with the Ministry of the Environmental), which limits any usefulness it might have in helping to demonstrate the effectiveness of the mitigation plan in protecting natural features.

There is no mention of the possible need for any monitoring following rehabilitation, or for the continuation of monitoring during the period of 'lake' filling.

There is no clear identification of any residual impacts (following implementation of the mitigation and monitoring measures) to natural features during operations or rehabilitation, or any discussion of their acceptability or relevance from a policy perspective. There are no clear statements regarding the need for any additional work (from an ecology or related water perspective) or provisions for refinement and further detailing of the mitigation and monitoring plan.

Compliance with Environmental Legislation and Policies

Despite detailing of the policy requirements in Section 2, there is no real analysis of or specific closure on policy aspects. The concluding statement in the NER that "... the quarry operations as proposed, subject to approvals and permits required as part of the operation, can proceed in a manner that is consistent with the relevant policies of the" PPS, Greenbelt Plan, ARA, Region and City OPs and CVC is not substantiated.

In general, conclusions regarding the potential for impacts to significant natural heritage features/functions are not fully substantiated for most legislation (Greenbelt Plan, PPS, ESA or Fisheries Act) based on the information, analysis and mitigation presented in the NER. Nor are

any of the uncertainties or need for further detailing of mitigation and monitoring aspects recognized, or agency review and permitting requirements explicitly specified.

Policy aspects are discussed to some extent in identifying KNHFs and features protected under the PPS, however not all KNHFs are identified (e.g., KNHFs include all fish habitat), and not all impacts to these features are identified or addressed given the gaps and deficiencies in the impact assessment and corresponding absence of mitigation. There is no identification of KHF at all, and no assessment of functional connectivity with KNHFs (or between KNHFs), or how this connectivity will be maintained or restored. Landscape connectivity aspects are not addressed fully during operations or at all in relation to rehabilitation.

Therefore, the various Greenbelt Plan policies relating to connectivity can not be addressed. There is no clear closure on conclusions regarding the drainage feature diversions, enclosure and potential residual impacts to stream flow in relation to the Fisheries Act. The Endangered Species Act requirements (permitting) do not appear to be satisfied for Butternut.

Summary and Conclusion

Overall, there is insufficient detail and analysis presented to support conclusions drawn throughout the NER. Key issues are as follows:

- poorly defined study parameters (e.g., study area, assumptions, multi-disciplinary integration, integration and assessment of rehabilitation)
- weak integration of water resources (surface water and groundwater) information and lack of comprehensive functional connectivity analysis
- weak consideration of linkages among natural features and lack of comprehensive landscape connectivity analysis
- lack of detail regarding impacts, mitigation, monitoring, contingences
- lack of identification of residual effects and their acceptability
- lack of any detailed evaluation with respect to policy requirements.

The above deficiencies undermine the report conclusions and make it difficult for the reader to determine:

- if a thorough impact assessment has been completed
- what exactly the mitigation and monitoring measures are (particularly as they pertain to water, but also as they relate to other aspects that may not be critical but do not receive any real mention, such as wildlife disturbance, movement, noise, dust, edge effects)
- how and when the mitigation and monitoring measures will be implemented
- what the rehabilitation conditions will be and their ecological features and functions, and
- if there are any residual impacts during operations or following rehabilitation, or between excavation or rehabilitation.

It is not possible to consider Beacon's (Sept, 2010) NER as a comprehensive Level 1 and 2 Environmental Impact Assessment under the Aggregate Resources Act (ARA) based on the

information and analysis presented. The report as written does not provide sufficient information to assure the reviewers that important natural environmental features will be protected. As a result, the report does not fully substantiate its main conclusion that *the quarry operations as proposed, subject to approvals and permits required as part of the operation, can proceed in a manner that is consistent with the relevant policies of the” PPS, Greenbelt Plan, ARA, Region and City OPs and CVC.* On this basis, the current version of the NER does not warrant approval under the relevant legislation and should not be deemed acceptable to the City of Brampton

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APPENDICES

APPENDIX A: Summary of Policy Conformity of BeaconEnvironmental’s Level 1 / 2 Natural Environment Report (NER)

A. INTRODUCTION

This report presents Ecoplans Limited's preliminary peer review findings of the *Level 1 / 2 Natural Environment Report Proposed Norval Quarry City of Brampton* (NER) prepared by Beacon Environmental for Brampton Brick and dated September 2010. In addition to the findings of our detailed review of the Natural Environmental Report, the comments incorporate some general observations gleaned from the field reconnaissance and from a cursory review of relevant sections of Golders' (July 2010) *Level 1 / 2 Hydrogeological Technical Report Norval Quarry Brampton Brick Limited* (HTR) and Long Environmental's (July 2010) *Norval Quarry Site Plan Report* (SPR), as well as some limited interdisciplinary discussion with GENIVAR and other members of the Peer Review team. The opinions expressed in this peer review (including Appendix A) may be supplemented, reconsidered or otherwise revised by the author(s) due to new or previously unknown information.

This initial assessment was prepared independent of any consultation with agency reviewers or with Beacon Environmental - the authors of the report. Regarding the latter, it is anticipated that it may be possible to resolve many of the concerns raised in the preliminary review with information that the consultants may already have or can easily obtain. However, based on the information presented therein, it is not possible to consider the NER to be a comprehensive Level 1 and 2 Environmental Impact Assessment as required under the Aggregate Resources Act (ARA).

The report as written does not provide sufficient information to assure the reviewers that important natural environmental features will be protected. As a result, the report does not fully substantiate its main conclusion that *the quarry operations as proposed, subject to approvals and permits required as part of the operation, can proceed in a manner that is consistent with the relevant policies of the PPS*.

The peer review findings are presented generally in accordance with the sections of the NER. Where relevant, overview sections are used to provide a summary of the findings and highlight particular 'gaps', issues and/or concerns.

B. PEER REVIEW FINDINGS- DATA COLLECTION

1. Introduction

The brevity of the introduction makes it difficult to determine exactly what the report is intended to accomplish, referring only to completion of a "Natural Environment Evaluation" conducted to accompany the ARA License application. (The only detailed section pertains to Land Use Designations, which might be better elaborated upon in the Site Plan Report [SPR]). Some additional context, at least in relation to the requirements of Level 1/2 NER under the ARA is provided in the next section (S2 Policy Review), although the difference between a Level 1 and Level 2 study is a bit confusing. There is no mention of below water excavation/extraction or potential implications on natural features.

The second sentence of the introduction lists relevant legislation/policies, however some at least high level context around these policy requirements would be helpful in the introduction section to provide direction and context for the report.

Although the SPR provides information regarding the project overall, and summarizes the various reports and team members, some context would be helpful in the NER. Specifically, the key project team relationships and reliance on their findings should be highlighted (e.g., Golders' and water resources aspects, as well as Todhunter Associates' Vegetation Management Plan and the SPR's Site Plans/Operational plan and Rehabilitation plans), if not in the introduction, then in the methods.

The NER makes no mention of a study area, referring only to the 'subject property'. The area and/or specific natural features that were field surveyed should be clearly identified with supporting rationale (including rationale for excluding features where surveys were not completed; e.g., access restrictions). We note that:

- The SPR report maps 120 and 500m distances from the site and talks about a zone of influence per Region of Peel and Provincial Standards (although those "requirements" do not seem to be specified in the SPR or referred to/used in the NER or HTR).
- The HTR establishes an approximate 700m zone of influence.
- The NER implies that off-site wetlands were investigated, but descriptions are very brief (see also Existing Natural Heritage Conditions section [4.4] below).
- Descriptions and figures imply that field investigations were limited to the subject property only.

There is a general absence of figures (and essentially none showing off-site features) in the NER. We note that there are various figures in the HTR or the SPR that could be used or at least cross referenced to provide a broader landscape context. The inset map on Figure 1 of the NER is not particularly helpful in this regard. Additional specific comments are noted in subsequent sections.

2. Policy Review

Although the Provincial Policy Statement is mentioned in the introductory statements, it is not discussed in the policy review section (S. 2). While we recognize the overlap with the Greenbelt Plan, recognition of the PPS would still appear to be relevant (and we note the PPS is referenced later in the NER). The Migratory Birds Convention Act is not mentioned.

Section 2.6 of the NER states that habitat for Butternut is protected under the Endangered Species Act (ESA). However, although the Act provides protection for the tree itself, habitat for Butternut is not currently protected under the ESA. General habitat protection for Butternut will come into effect June 30, 2013 unless and until a Butternut-specific habitat regulation is in effect. Similarly, habitat of Kentucky Coffee Tree is not currently protected under the ESA. General habitat protection for Kentucky Coffee Tree will come into effect June 30 2013 unless and until a Kentucky Coffee Tree-specific habitat regulation is in effect.

Although some are referenced elsewhere in the NER or other reports, several of the Greenbelt Plan policies that would appear to be relevant to ecology were not re-iterated in the Policy section, specifically:

- 4.3.2.5 d) Aquatic areas remaining after extraction are to be rehabilitated to aquatic enhancement, which shall be representative of the natural ecosystem in that particular setting or ecodistrict, and the combined terrestrial and aquatic rehabilitation shall meet the intent of 4.3.2.5 (c).

- We note also that the policies noted as 4.3.2.5 a) and b) are actually b) and c). The Infrastructure policies under the Greenbelt Plan are not mentioned in Section 2.

We note also that the NER could acknowledge the Greenbelt Plan policies' overarching intent to hold development/site alteration to a higher standard of planning, operation, rehabilitation and restoration than areas outside the Greenbelt that are to be examined in accordance with PPS and municipal policies.

There are a number of relevant regional and area municipal policies (e.g., other features such as woodlands and wetlands, support of Greenbelt policies, requirements for comprehensive environmental studies, particularly at a watershed or subwatershed level), which, while they may be already addressed or encompassed by provincial policy pertaining to aggregate extraction or otherwise addressed through broader planning requirements in the SPR, should at least be noted in the NER. Specifically, the NER should identify relevant policies in S. 4.14 of the Official Plan pertaining to the North West Brampton Special Study Area. The NER should also recognize that the proposal abuts an urban-designated area, for which a subwatershed study (and Landscape Scale Analysis) is now underway, in that these landuse changes and the study findings may have potential implications for the natural features on the Brampton Brick land (see also comments on SPR).

Otherwise, this section provides a reasonable summary of relevant policy and legislation requirements, which, however, are not evaluated in sufficient detail later in the report to address and provide any closure for the project.

3. Methodology

3.1 Background information

Sources appear to be appropriate, although no detail is provided regarding the specifics of the data collection. The NER does not reference several specific sources that should (and may) have been used, such as:

- Historical air photos
- DFO/CVC Species at Risk (SAR) mapping
- MNR NRVIS data layers
- OBBA data records for the most current Breeding Bird Atlas work.

(We note that agency staff are in the best position to identify any specific deficiencies in the reporting of background information [unless the search is repeated by peer reviewer, which it has not been to-date]).

3.3 Field Investigations

General

Field survey dates outlined in Section 3.3.1 generally appear to be appropriate; however there is no detail as to what, when or where information was collected (text or figures) making it difficult in some cases to confirm that field data collection was in fact undertaken properly. There are some gaps in identification of specific data collection protocols that were used to collect and/or analyze data. There is no indication that the data collection was integrated (e.g., fish, benthics, surface water flow/wetland water levels, groundwater levels, water chemistry, and vegetation plots etc.). No detail or rationale is provided around the selection/location of sampling/assessment sites.

Detail regarding assessment of species of conservation concern, general wildlife presence and movement, wetlands, off-site features and landscape connectivity is lacking, leaving the reader with questions regarding due diligence/thoroughness. There is no mention of any assessment of functional connectivity (a pervasive theme throughout the report), creating concerns that a thorough understanding of the inter-relationships between water and natural features was not developed. This understanding is critical to identifying and addressing potential impacts of the project on natural features, and ultimately to assessing compliance with the Greenbelt Plan policies that emphasize connectivity.

The lack of detail and specificity, or in some cases mention, of these various aspects introduces uncertainty regarding (and may ultimately compromise) some of the findings and subsequent impact assessment, mitigation and conclusions, as reflected in the findings in Section 4.

3.3.2 Aquatic Resources

Section 3.3.2 indicates that field assessment was undertaken to assess the parameters detailed in CVC and TRCA's (2009) *Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines (Headwater Guidelines)*. However, there are some inconsistencies and gaps in the data collection, which although not necessarily problematic in the overall analysis, warrant some explanation. For example, the flow definitions presented in the NER are not entirely consistent with those presented in the *Headwater Guidelines*, and do not mention groundwater/surface water relationships. In addition, several of the physical parameters such as channel slope and stability are not mentioned.

While we recognize that several of the parameters may have been addressed in Golders' data collection, these relationships should be identified and other data collection relevant to the headwater feature analysis at least cross-referenced, and preferably integrated in the analysis. Reference to any assessment of physical (fluvial geomorphology and hydrology) functions would be helpful given that the functional analysis framework in the *Headwater Guidelines* does incorporate analysis of a number of hydrologic and fluvial geomorphic/physical parameters.

There is no indication what if any specific protocols were used to assess habitat or undertake the fish community sampling. Therefore it is not possible to verify that the sampling of the intermittent tributaries was conducted under appropriate conditions in the spring to assess seasonal fish use, per the Headwater

Guidelines. Lumping of the sampling and habitat assessment dates together does not enable any general verification that the sampling was at least conducted on appropriate dates.

While the Headwater Guidelines provide for use of more comprehensive field survey protocols such as the Ontario Stream Assessment Protocol (OSAP) where appropriate, the Main Tributary might be better assessed using such protocols rather than just the Headwater Guidelines' framework. There is no indication in the report if other specific protocols were used. Furthermore, the number and locations of the fish sampling stations are not identified, and no discussion is provided as to how the stations were selected, what type of habitat they encompassed, or whether there was any integration with other data collection (e.g., benthics, flow monitoring and water chemistry).

Water Quality – Benthic Macroinvertebrates

The methods section is somewhat vague and requires elaboration and clarification. There is no mention of any standard protocols that were used to collect and analyze the samples (e.g., *Ontario Benthos Biomonitoring Network Protocol Manual* [Jones 2005]). There is no description of how the sampling sites were selected, whether they corresponded with water chemistry monitoring (as reflected in the subsection title) or any other aquatic data collection, or what habitat characteristics were represented. Nor is there any description of what data analysis was undertaken (although several summary metrics are provided in the table in Appendix A).

The subsequent reference in Section 4.1.3 of the NER to the Natural Resource Conservation Service (2008) Technical Note regarding the EPT Index is noted, and the NER text and the SPR refer to this particular index. However, the qualitative rating scale applied does not appear to be that of the EPT Index, as outlined further below. Appendix A in the NER provides an HBI (which we assume to be Hilsenhof Biotic Index), which is more consistent with the rating scale presented in the text.

3.3.3 Vegetation Communities and Flora

The methodology outlined for the floral inventory using “*random sampling within the various vegetation communities*” is vague. It is unclear whether this indicates use of random plots or wandering transects, or how these plots / transects were selected to ensure sufficient coverage and detail. Further, while the NER indicates that the “vegetation units... were *described* [our italics] and mapped ...using the Ecological Land Classification (ELC) system”, it is difficult to verify that the vegetation protocols were used, since no ELC cards were provided and as noted, the existing conditions descriptions are brief (see comments on Section 4.2).

Review of the appended plant list indicates that a reasonable level of survey effort was completed. However, these data would be more useful if they were collected and presented by vegetation community. References that were used to assess species status/rarity in the methods section should be included in the methods section.

Butternut

The assessment of Butternut appears to follow current protocols for data collection, analysis and reporting.

Wetlands

The Methods section indicates that “*General* [our emphasis] surveys of wetlands on subject property were conducted as part of ELC community delineation and mapping”. Given the potential for impacts of the project to the water regimes that support wetlands on and off site, it is more appropriate to conduct relatively detailed surveys of wetland communities.

The level of field survey of off-site wetlands requires clarification. It is unclear whether or not assessment of the off-site wetlands was undertaken, although it is implied to some degree by other statements including the inability to access unit #43. The Methods section refers to assessment of these units “based on potential impacts from quarry operations” per the HTR, which implies an indirect assessment. However it is then stated that “Assessment of wetland communities included information on soil type, vegetation and evidence of seepage”.

Amphibians [and Reptiles/Herpetofauna]

The amphibian calling approach is reasonable, but there is no reference to the actual protocol used (such as CWS, or Marsh Monitoring Protocol), including time spent at each station, or even where calling stations were located (and rationale).

There is no mention of any other typical field survey protocols for herpetofauna (e.g., systematic turning over of logs or rocks or possibly placement/checking of cover boards, nor was a rationale provided for not undertaking such work (e.g., constraints preventing such work, site access limitations, or habitat conditions do not warrant).

The Methods section indicates surveys involved visiting the subject property- were off site wetlands assessed for amphibian breeding?

Breeding Birds

Breeding bird survey dates are appropriate. Additional information on the breeding bird protocol used would be helpful, including referencing OBBA survey protocols or a modified protocol, with rationale. Providing the time periods for each survey would assist in interpreting thoroughness of the protocol. The NER states that all parts of the property were approached within 50 m- what does this mean?

There is no mention in the NER of a pre-survey habitat profiling review for potential presence of SAR. This would help focus field survey efforts and assure the reader that due diligence was implemented. Were breeding birds assessed in off site wetlands (or other habitat features)?

Other Wildlife, including SAR analysis

While we agree that detailed surveys for mammals and other wildlife are not typically undertaken beyond those specified in other sections, some level of specific effort to identify other wildlife use through sign (such as tracks, trails, scat, dens, scrapes) and habitat characteristics/potential in addition to purely incidental observations during other surveys is warranted. There is no mention in the NER field methods section that any effort was made to assess potential wildlife movement (e.g., along the valley or among various habitat units) or other activities (e.g., White-tailed Deer or other winter cover/habitat).

A similar habitat profiling for SAR mammals and insects (at least key groups like Lepidoptera and Odonata) would be helpful as well to document due diligence. It is not clear how SAR records were assessed, and if any records were identified for the subject property or surrounding area, or whether or not potential habitat for any SAR recorded in the surrounding area occurs on-site.

Landscape Connectivity

There is no mention of any assessment of functional connectivity in the methods section, and specifically no mention of the importance of water inter-relationships or integration/collaboration with water resources and other team members.

The landscape connectivity methodology is somewhat vague, and as noted above, there is no specific mention of looking for evidence of wildlife movement, seasonal habitat use or potential or linkage quality (e.g., well-used trails, structure and connection of hedgerows, overall quality of the valley habitat as a linkage– see later comments). Nor are there even any supporting figures showing off-site features. This makes it difficult to assess how connectivity was considered in the local landscape (on and off site).

4. Existing Natural Heritage Conditions

General

The level of detail of the feature descriptions varies somewhat among features, but in general tends to be light. The aquatic descriptions tend to be somewhat more detailed than terrestrial. Wetland descriptions are particularly light. Hedgerows are mapped but not mentioned in the text. The regionally rare species list referenced is not the most current list. There is little discussion of off-site features (and no mapping). There is variable but generally weak discussion of water-related dependencies/sensitivities of natural features (functional connectivity), and weak and in a few cases inconsistent cross-referencing of the water resources information. The level of detail of the descriptions and lack of or weak integration with the HTR does not assure the reader that the authors have developed a comprehensive understanding of the site features and their functions, particularly in relation to water resources aspects, which is fundamental to completion of a comprehensive impact assessment and development of appropriate mitigation.

There are very few figures and in particular none that maps off-site features. The absence of a figure showing off-site features does little to offset the reader's conclusion that little if any off-site feature review was undertaken and the associated assessment of connectivity is incomplete. There are a number

of figures in the HTR that would be useful to include in the NER (or at least specifically reference; e.g., Figures 3.1, G.1, G.2) as well as the Vegetation Management Plan Fig 7 in the Todhunter (2010) report.

There is little information on the few figures that are provided and there are a few minor inconsistencies (e.g., Butternut location mapping in NER and on Site Plans, reach labeling).

Although many of the various inconsistencies, gaps/missing or unclear information, occasional misrepresentations or errors in the descriptions may not ultimately have any bearing on the impact assessment, mitigation and conclusions, this is difficult to determine with the information and analysis presented. Several aspects require specific clarification or further information or analysis to verify that they do not have a bearing on the conclusions. For example:

- the classification of Reach B1, which will be piped
- groundwater inter-relationships with flow in Drainage feature C and wetland hydrology
- groundwater-surface water inter-relationships with flow in the Main Tributary (and Tributary B), and how that groundwater discharge/recharge is distributed along the tributary
- assessment of SAR on and around the site and use of outdated regional vegetation species list
- wetland hydrology (and associated groundwater-surface water inter-relationships) of both on and off-site wetlands
- identification of any hydrologic sensitivities of the Fresh-Moist Black Walnut Lowland Forest
- information on the hedgerows
- additional information/clarification of amphibian habitat
- information on wildlife movement or other activities and habitat potential (e.g., over-wintering).

4.1 Aquatic Resources

4.1.1 Fish and Fish Habitat

Although a reasonable general impression of the existing fish habitat conditions in the various features can be obtained from the text, and the photos are helpful, the descriptions are a bit light, particularly in relation to habitat conditions (and to the considerable amount of text outlined in the Methods section). For example, although creek conditions do vary along the length of the Main Tributary, they are summarized in one short paragraph. The physical descriptions of the channel and habitat conditions are quite general. For example, there is: no recognition of bankfull compared to low flow channel conditions; no reference to relationships between fish habitat elements and fish use; no discussion of up or downstream habitats (other than the Hwy 7 barrier); no real discussion of instream cover or bank conditions; and inconsistent discussion of groundwater indicators and riparian conditions. The substrate mix is described based primarily on the HTR.

Figure 2 does not provide much information. The laneway and culverts described at B1 are not shown, nor is the existing laneway crossing of the Main Tributary. It would also be helpful to map other features discussed in the text (e.g., historical dam, boulders at the path crossing on B1, and ideally key areas of Watercress/groundwater indicators). The drainage feature label mapping is a bit inconsistent with the text (i.e., reaches A3, B3, E3 in the text seem to be mapped as A, B, C).

When groundwater indicators are discussed (e.g. Watercress), the text indicates their presence *may be* indicative of groundwater inputs. Watercress is almost invariably indicative of some level of groundwater influx, at least seasonally. More importantly, if the authors were not sure, the HTR should provide information about groundwater connectivity which could have been cross-referenced (which should be done regardless in the functional assessment).

There are also a few inconsistencies with field observations (e.g., the peer reviewer did not note many “deep pools” along the Main Tributary during the November 2010 field reconnaissance). The upper reach of drainage features B (B1) was flowing during the fall reconnaissance survey, and the presence of Watercress appears to indicate some groundwater influence (We note the NER later notes the associated “seasonally high water table”). Therefore, this feature may support indirect habitat functions for more than just the spring period as the report suggests.

Drainage Features A1 and 2 are more correctly described as vegetated agricultural ditches than swales (which are typically spreading and poorly defined in contrast to the well defined/contained channels in this case). The steep gradient is not noted in descriptions of any of the 3 reaches. While not a prominent function, the vegetation in and along the channels will provide some albeit localized water quality filtration of agricultural runoff and allochthonous inputs, which should be noted in contrast to the strictly agricultural drainage conditions (devoid of vegetation, much more erosive) evident on drainage feature E. While there are references to Golders’ data (e.g. substrates and temperature), the flow aspects in particular are not really integrated. Golders’ temperature data are noted, however the report suggests the composition of the fish community reflects a warmwater thermal regime, which is not supported by the temperature data (that suggest groundwater influence and a cold/coolwater thermal regime more consistent with the presence of Rainbow Trout and Coho found downstream of the barrier at Highway 7). Several questions arise in the review of the text. For example, the boulders at the outlet of the culvert downstream of the path on DFB1 are presented as a barrier to upstream fish movement. If this barrier were removed (which would be reasonably easy), could fish access and use the upstream reach/B1 seasonally? When was DFB1 sampled?

The relationship of B2 to B1-B3 is not entirely clear (i.e., is it tributary to B1-B3)?

The description of drainage feature C is light and there is no photo. Is there one flow path or many? Is there any channel definition? How does it relate to the wetland? The text implies the wetland provides extended contributions to the flow; some explanation of this function in relation to flow characteristics and downstream contributions to the Main Tributary would be helpful. Is there any groundwater connectivity/seasonal groundwater contribution to the flow?

The descriptions of drainage features D, E1 and E2 could better portray the agricultural drainage characteristics of these features, and what appears to be their considerable sediment loading when they do flow. Might these features even be cultivated (which is recognized in the *Headwater Guidelines*)? Are the conditions along the lower section of drainage feature D (mapped as flowing through the valley or adjacent woodland) not quite different than in the upstream section through the field.

There is no discussion of relative abundance of fish or indication of the general productivity of the habitat (a summary of the fish data could be provided in the appendices). Nor is there any assessment of fish use of specific habitat elements or any discussion of specialized habitats (e.g., spawning, nursery, refuge), and lack of potential for any SAR should at least be noted). The NER implies fish mapping may have been done at least for the main tributary but this information is not presented.

4.1.2 Drainage Feature Assessment

Although Table 1 in the NER provides a reasonable summary classification (subject to specific comments below) that support identification of the recommended management level, there is no subsequent assessment of how the specific management recommendations are addressed in each case.

Although we recognize that the distinction between complex and simple contributing habitat is somewhat vague in the *Headwater Guidelines*, the drainage feature A descriptions might imply complex contributing functions (intact vegetation etc.).

As noted, if the boulders at the lane crossing DFB1 were removed and this reach was accessible to fish seasonally, this reach might be considered Seasonal and Conservation 2. The seasonal groundwater function warrants mention in the summary table.

The summary table does not classify drainage feature C (which we assume C was considered complex contributing habitat based on the management recommendation). (See also comments regarding drainage features D and E above).

4.1.3 Water Quality [Macrobenthics]

As noted, Section 4.1.3 of the NER (and the SPR) refers to the EPT Index (per the Natural Resource Conservation Service (2008) Technical Note)- however, the qualitative rating scale applied does not appear to be that of the EPT (See p13 of Technical note for example). Rather, it appears to be that of the HBI (or FBI), which is also more consistent with the text descriptions.

While nothing really hinges on the analysis outcome, since the EPT and HBI qualitative rating scales do show similar trends, the inaccuracies should be corrected in the text. More information and rationale should also provided as to how the data were analyzed, particularly if macrobenthics are to be used as one of the monitoring tools going forward.

4.2 Vegetation

4.2.1 Vegetation Communities

The reader is forced to rely on generally brief descriptions of the vegetation communities to provide all of the relevant information to assess relative importance and sensitivity of the various features. The brevity of the descriptions of the more sensitive and/or 'significant' communities (i.e., wetlands and the Fresh-Moist Black Walnut Lowland Deciduous Forest) provides little supporting detail for the impact assessment discussion to follow. Several potential issues are highlighted below.

The NHIC's (2008) provincially significant ranking (S2/S3) of the Fresh-Moist Black Walnut Lowland Deciduous Forest is highlighted in the introductory paragraph, however the description of this community is again very brief considering its relative significance. In particular, there is no discussion regarding the potential functional sensitivity or relationship of the Fresh-Moist Black Walnut Lowland Deciduous Forest to its hydrologic regime, which warrants mention given the nature of the project. The presence of a mix of wetland and upland ground flora suggests some water-related sensitivity.

The Methods section states that "Assessment of wetland communities included information on soil type, vegetation and evidence of seepage", however soil and seepage information, which would provide potentially useful information pertaining to wetland hydrology, is not presented in any detail in the report.

Although some general statements are provided regarding seepage indicator species for one of the wetlands, they are missing for the other (Cattail Mineral Marsh). Although we recognize that this may be because no indication of groundwater was noted in the latter community, this should be clearly stated. Specific cross-referencing of Golders' findings regarding groundwater and surface water inter-relationships would be useful in the NER. There is no real assessment of the sensitivity or the degree of dependency of the various wetlands on groundwater, or their sensitivity to changes in their hydrologic regimes generally.

Listing species by vegetation community rather than as the single running list provided in Appendix B would have been useful. While not critical provided that key elements, indicator species, species of conservation concern etc. are carried forward into the community descriptions and ultimately the impact assessment, there is little detail provided around these aspects. Of specific note, the reader must rely on the authors' assertions that there are no seepage/groundwater indicator species in certain of the off-site wetlands where no detailed information is provided.

Although mapped on Figure 3, there is no corresponding description of the Hedgerow (which we note will be removed).

4.2.2 Floristics

This section might better be combined with the Rare Species section that follows. The first paragraph indicates that 29% of the species recorded are non-native, leaving the reader with questions regarding the status of the other species.

It appears that the authors are qualifying the relative significance of the Fresh-Moist Black Walnut Lowland Deciduous Forest by stating that "It is unclear how many of the Black Walnuts inhabiting this community are naturally-occurring as opposed to examples of regeneration originating from nearby planted trees". If this is the intent, then further elaboration and rationale are required, as well as discussion and verification with MNR as to the relative significance of this community.

4.2.3 Rare Species

This section states in relation to Endangered and Threatened species in Ontario that "significant portions of their habitat are protected under the Provincial Policy Statement (PPS 2005)". This is not quite

accurate. Rather, the PPS protects *significant habitat of Threatened and Endangered Species*- there is no mention of “portions”. In addition, this section states that “Threatened and Endangered species are also afforded protection under the ARA and the Greenbelt Plan”, however it should be noted that the Greenbelt Plan also provides protection for Special Concern species.

Given the presence of Butternut on the property there is increased potential for it to occur in the hedgerows along the property boundary, but there is no indication that these features were reviewed and no description of their characteristics as noted above.

There are inconsistencies in the mapping of Butternut locations between the NER figures and the Site Plan – Existing Features. The latter maps 11 Butternut locations whereas only 9 are mapped and assessed in the NER. This may relate to the 30m distance mentioned in the text, but this should be noted on the figure as well. The text says Butternut #6, 7, 8, & 9 are retainable whereas the figure maps #2 and not #7 as retainable.

Distribution and Status of the Vascular Plants of the Greater Toronto Area (Varga et. al. OMNR, Aurora District, August 2000) is a more current document than Riley (1989) and should be used for the identification of regionally rare species. Based on a preliminary review of Varga (2000), several species reported from the property would be regionally rare including (but possibly not limited to) *Rhamnus alnifolia* and *Solidago patula*. Although it is recognized that the project is not subject to any policies that require their protection, regionally rare species should be properly identified to assess and address (if warranted) potential impacts.

4.2.4 Off-Site Wetland Communities

There is no mapping of off-site wetland features, except in the HTR (and there the units are not numbered). Three off-site wetlands are briefly described in the NER, but no details are provided as to their location, distance from the site, size, nature of adjoining habitats etc.

As outlined above in relation to the on-site wetland communities, cross-referencing with the HTR findings in relation to groundwater/surface water (or soils information if it was in fact collected) would be helpful rather than relying solely on the presence of seepage indicator species to indicate the underlying hydrology. We note specifically that ‘Jewelweed’ is indicated as a component of several “seepage-fed communities” in the Meadow Marsh/Thicket Swamp/Deciduous Swamp (Note- the ELC identifier is missing for this community), but although noted as occurring in the Green Ash Mineral Deciduous Swamp, the NER states that “None of the species observed are indicators of seepage conditions”.

There is no mention or any mapping or discussion of other/non-wetland off-site features in this section (and subsequent sections refer briefly only to valley related features to the south, with no mention of features to the west at all). The absence of any mapping of off-site features lends support to the impression that these features (and connectivity) were not properly assessed (See also Section 5.7).

Wildlife – General

While specific wildlife groups (amphibians and breeding birds) are reviewed, and a discussion of Significant Wildlife Habitat is presented, at least some general discussion of other wildlife and habitats present on (and surrounding) the property is warranted. There is no mention of reptiles or insects. Amphibian use of off-site wetlands is not mentioned. (See additional comments below regarding habitat use, movement etc.) Potential for other species of conservation concern to be present considering a broader database and a more thorough review of habitat potential is not thoroughly assessed.

4.3 Amphibians

It is puzzling that no breeding amphibian choruses were detected, yet adults and overwintering juveniles were recorded on site (American Toad, Leopard Frog, and Green Frog), indicating or at least suggesting that there is some breeding habitat on site (or possibly upstream or adjacent as well?). Yet, the NER concludes this is not the case, which requires further comment/rationale. For example, some assessment of the floodplain pool (where the Green Frog tadpole was found) as breeding habitat is warranted.

There were no observations of reptiles. While these animals are admittedly somewhat secretive and not always easily detected, opportunities to observe them would likely have been enhanced if a more systematic survey had been undertaken. At a minimum, potential for the presence of at least common species should be recognized. The intent here is to show as much due diligence as possible to provide more support for the NER findings, impact assessment, and conclusions.

4.4 Breeding Birds

There is very brief discussion about three area sensitive species recorded in the wooded valley, with few other details, and a cryptic reference to Cooper's Hawk in the same sentence (which may be an editorial matter). There is no mention in the NER of the sizes (ha) of the habitats where they were observed, including width, and implications on interior habitat (or lack thereof).

Although perhaps not as relevant as amphibians to potential water-related impacts, there is no indication that breeding bird activity in the off site wetlands was assessed.

4.4.1 Rare Species

Coopers Hawk

This species was recorded breeding in a plantation, but no location or other details are provided. The NER states that suitable woodland breeding habitat is present in the area, "although it is not its typical breeding habitat". What does this mean? Is this referring to the wooded valley on site, some other feature, or the plantation? Plantations are not really atypical breeding sites for this species (ref. Cadman et al. 2007 – Atlas of the Breeding Birds of Ontario 2001-2005). In any event, if these statements are to be made, they should be provided in the context of where the bird is breeding, a current understanding of its range of breeding sites, and how that figures into the current site context.

Bobolink

The observation of a (possible) breeding pair on site in 2009 is interesting, and noteworthy now that Bobolink has been proposed for addition to Schedule 1 of the Species at Risk Act (SARA – Threatened) with the consultation period ending in February 2011. The addition of this species appears to have occurred after the date of the NER report. Nevertheless, no details are provided in the report concerning the location of the birds, or the size/nature of the fields they were using (and possibly breeding in?). At a minimum, the observation warrants dialogue with MNR to support the applicant’s conclusions regarding the relative importance of only a single pair of birds or otherwise identify any implications on the project.

Chimney Swift

While we agree that breeding habitat appears most likely to be off site, the NER needs to clearly discount the presence of any potential nest trees and discuss the role (if any) of the site on foraging by this species, any impacts on foraging habitat, and how such habitat (where confirmed) would be replicated in the rehabilitation plan. The habitat interpretations would again benefit from some discussion with MNR.

4.5 Mammals

This section is very brief and would benefit from some additional commentary regarding habitat conditions and potential species use, both on and off-site. We note that there appears to be considerable White-tailed Deer use of some habitats (e.g., northeast wetland, abundant browse, numerous trails) based on the November 2010 field reconnaissance.

5. Summary of Key Natural Heritage Features

This section provides a general summary of the key natural heritage features in relation to the PPS and Greenbelt Plan (identifying Key Natural Heritage Features [KNHF]). This section could have been used to highlight functional sensitivities and identify Key Hydrologic Features (KHF). Comments on specific sub-sections are noted below.

5.1 Wetlands

This section is very brief and makes no mention of any significant or noteworthy elements of the wetland units or their sensitivity (e.g. to hydrological change). There is no mention of the off-site wetlands.

5.2 Significant Portions of the habitat for Endangered Species, Threatened Species and Species of Conservation Concern

While we agree that no technical guidelines are currently available from the MNR to determine significant habitat of Butternut, we are not familiar with the interpretation on page 40 that “*significant habitat is generally regarded as the individual tree and the land area that lies immediately beneath its canopy*”. This limited area would not appear to be sufficient for the maintenance, survival and/or recovery of the population (PPS 2005). There is no reference provided to qualify the statement. We note also that the definition of significant habitat provided in the section for the purposes of the Greenbelt Plan is incorrect as it does not include the words that also identify protection for special concern species.

The interpretations and conclusions regarding the various species require dialogue with MNR for verification; ultimately MNR is responsible for identification of SWH and significant habitat of threatened and endangered species.

5.3 Fish Habitat

This section implies that habitat mapping may have been completed for the Main Tributary (Par. 1), however it is not provided in the NER. This section indicates that the majority of the drainage features on the property do not provide direct fish habitat; however for completeness and consistent with the underlying legislation, their function as indirect habitat should be recognized so that it can be carried forward to the impact discussion. We also note that the definition of KNHF in the Greenbelt Plan includes fish habitat generally. There is no discussion of off-site reaches or their relative importance.

5.4 Significant Woodland

The NER states that the wooded valley meets the minimum size (4 ha) criterion identified by MNR (2008b) and therefore is considered Significant Woodland. However, there is no mention or analysis of whether other criteria are met – not for the purpose of confirming significance, but rather to identify other features / functions that may be sensitive and that perhaps should be considered in the impact analysis.

5.6 Significant Wildlife Habitat

Habitat of Seasonal Concentrations of Animals

While the site does not appear to provide winter deer concentration habitat based on the vegetation and habitat characteristics, this should be clearly stated in the report, with supporting rationale, rather than leaving it up to the reader to try and discern. As noted previously, the presence of trails and fairly concentrated browse activity was noted during the November 2010 reconnaissance survey in some areas (e.g., on-site wetland). Any winter cover functions of the plantation areas should be noted or at least mentioned and dismissed if appropriate.

Breeding amphibians (and presumably reptile concentration habitats; e.g. hibernation) are also cited as a criterion. The report concludes no such habitat exists, but the conclusion warrants further rationalization given incidental observations (see previous comments).

Habitat for Species of Conservation Concern

Bobolink should now be (tentatively pending completion of consultation period) added to this list and addressed, particularly in view of Section 2.1.3 a of the PPS.

As outlined in the methodology comments, elaboration regarding the potential for other species of conservation concern should be provided, referencing background information for the broader vicinity of the property and assessing habitat characteristics generally.

Animal Movement Corridors

The valley is noted as “likely” providing opportunities for animal movement at a local scale. This may warrant more definitive assessment given that this function is later dismissed with respect to mitigation (See Section 7.8).

5.7 Landscape Connectivity

Although the Methods section indicates that a landscape connectivity assessment was undertaken, and there are some references to feature connectivity in various sections, there is no comprehensive assessment of inter-relationships of subject property features with off-site features (either terrestrial or aquatic). The absence of any relevant mapping further undermines the contention that such an assessment was completed.

An assessment of functional connectivity, and specifically, the inter-relationships of natural features with water, is missing. This is particularly odd given that this section specifically refers to the Greenbelt Plan requirement to assess connectivity between Key Natural Heritage Features (KNHF) and Key Hydrologic Features (KHF). There are also gaps in the assessment of connectivity among KNHF on and off-site (e.g., with features to the west, any functions associated with hedgerows).

Therefore the statement that “The proposed pit development will therefore not result in negative impacts to the connectivity of the identified KNHFs” is not fully substantiated. Further, the Greenbelt Plan policy requirements under 4.3.2.3c) cannot be addressed with the current level of existing information reviewed.

6. Project Description

6.1 Project Scope

This section and/or Section 6.2 should include a clear presentation of how the natural heritage feature assessment was integrated into the development of the project footprint, operations and rehabilitation plan. While this integration is inferred in part, more specific description of this process would be helpful. Given the limited description and integrated discussion here and elsewhere, the reader is left assuming that the ecologists had little input to the study area determination, operational plan (other than protection of the main valley and setbacks), water resources data collection and analysis (to ensure natural environmental aspects could be addressed), mitigation/monitoring aspects or rehabilitation plan.

Although this section discusses some footprint aspects (e.g., drainage features diversion and that the valley is protected), there is no clear description of the direct impacts of the project footprint (i.e., there is no summary of all the features that are removed by the footprint regardless of their sensitivity). Section 7 appears to focus only on impacts to “significant features”/KNHF (with the exception of fish habitat impacts, which are more generally described).

It would be helpful to provide some context around the potential implications of groundwater drawdown (and potential surface water changes) on natural features as part of the Project Scope section (or

elsewhere) to set up for the impact assessment. Some explanation of how water-related implications were assessed and any assumptions relevant to the natural features analysis should also be provided.

We note that the HTR establishes an approximate 700m zone of influence (although we presume this is just to the 1m drawdown contour and actual drawdown would extend further, and even at 0.5m or less could potentially have an influence on features depending on connectivity). However this zone of influence does not extend evenly out from the excavation area. It is surmised that the Main Tributary is considered to be a hydrogeologic divide of some sort, which prevents or minimizes the extent of drawdown beyond, and specifically toward the on-site wetland. However, this assumption or any other key water resources assumptions or findings should be specified as part of the impact assessment.

6.2 Excavation Phasing

As a comment, this section does not really discuss excavation phasing. The emphasis is on site drainage and diversion of the drainage features that will be intercepted by the footprint. It would be helpful to note that the associated impacts of the diversions are discussed further in Section 7.6.

6.3 Setbacks

This section states that “Wherever possible a 30m setback from the dripline from the outermost trees is provided” but then goes on to note two areas where the setback is reduced to only 1-2m, required to meet the operational needs, and that the average width of the setback is approximately 15m. Given this range and that the 30m objective does not seem to be met to any large degree, more discussion is required around the rationale for the range of setbacks employed, particularly in the areas where the setback may be substantially reduced. The impression is that the setback reductions were driven primarily by operational requirements. In either case, the potential impacts of this reduction should be recognized before they are dismissed.

While we accept that an average setback width of approximately 15m may in fact be sufficient to protect root systems given the adjacent agricultural landuse, the conclusion that this setback will “also maintain the local hydrological conditions...” requires further specific discussion. This is particularly pertinent given that the main vegetation feature through the site and adjacent to the proposed excavation area is a Fresh-Moist Black Walnut Lowland Deciduous Forest that is rare (S2S3) in Ontario.

Oddly enough, the last paragraph of Section 6.3 outlines the relevant Greenbelt Plan policies that pertain to exceptions to the 30m setback requirement adjacent to a KNHF, that is, *if it can be demonstrated that the water resources system will be protected* (per 4.3.2.5 c) 4.3.2.6 c). However, there is no supporting rationale provided for the proposed setback reductions or any real explanation/demonstration of how the water resources systems will be protected. Although Section 7.2 later indicates that sensitive features associated with the woodland and an understanding of potential hydrological changes etc. were evaluated to determine the width of the Vegetation Protection Zone (VPZ), no supporting evaluation is provided to support this contention.

The setback discussion pertains only to the east side of the valley. Setbacks from ancillary features such as the stockpile, berms and SWM pond to the valley and wetland on the west side of the valley require review. The SWM pond in particular appears very close to the staked dripline.

6.4 Berms

Clarification as to the extent of the berm along the forest edge (e.g., only along a portion of the forest edge) and whether or not berms proposed to control noise and dust impacts will extend along the haul road crossing of the valley (as mentioned in Table 7, although not shown on Figure 4) is required. The extent to which the berms will actually control dust (and even noise) may warrant some mention here or elsewhere. The berms will be vegetated, but recognition of use of native species would be appropriate given their proximity to the natural areas.

Removal of the east berm for shale recovery is identified, however information regarding the long term management of the other berms would be helpful. We note that the berms to the west of the valley do not appear to have been incorporated into the Vegetation Management Plan, despite being surrounded by “areas to be rehabilitated to forest cover” (Figure 5). Might the berms not also provide habitat opportunities, particularly given their long duration of use, anticipated establishment of vegetation cover and surrounding planting areas?

This (or some subsequent) section should also recognize the footprint impacts on the terrestrial features in the northwest portion of the property.

6.5 Haul Road and Stockpile Area

Some description of the existing farm lane and valley and watercourse crossing (referred to as a “bridge” but perhaps better described as a culvert) and mapping of its location on the figure would be helpful. Overlaying of the stockpile area on the features mapping would also be useful.

Further discussion of upgrade works that may be required to the existing watercourse and valley crossing and the associated impacts is required. Are there opportunities to enhance the existing crossing and could these be incorporated during the Detail Design of the haul road? The dimensions of the upgraded haul road are only briefly noted (although we note that conceptually the Site Plans suggest a somewhat wider footprint than 10m). The total length and anticipated overall footprint area of the road through the forest, as well as more detail regarding the extent of the removals required to reconstruct the 15 m stretch of lane should be provided, particularly in light of the Butternut.

While further detailing of the impacts and mitigation measures associated with these works can be provided during Detail Design, further description and justification is probably warranted at this stage given the significance of the valley feature, the potential sensitivity of the local hydrology and sensitivity of the main vegetation community (e.g., Black Walnut Lowland Deciduous Forest, valley slopes/potential impacts on slopes and drainage, etc.). The statement that “Those Butternut occurring within the valley corridor will not be removed...” appears to conflict with Section 7.3, which indicates that three trees will be impacted by the haul road. Furthermore, these three trees are mapped as retainable (consistent with their transplanting recommendation). This section (or some subsequent section) should also recognize the

potential impacts of heavy equipment/truck movement along the haul road (noise, dust, interference with movement) on vegetation and wildlife.

While we agree with the concept of minimizing additional disturbance by using the existing lane, and accept that this may be the only practical option, an assessment of alternatives, or at a minimum an explanation as to why the site cannot be accessed without crossing the valley (e.g., from Hwy 7 to the south) should be provided to justify the proposed crossing in light of the potential impacts (e.g., Butternut removals, disturbance of significant vegetation community, potential impacts to valley linkage function). In light of the above comments, no supporting rationale for the statement that the project/haul road conforms with the Greenbelt Plan's Infrastructure policy (4.2.1.2d) allowance for construction of a new haul road within a KNHF "where there is no reasonable alternative" is provided (par. 2). There is reference in Section 7.3 to the inability to refine the route because of environmental constraints – however these constraints are not specified.

This section also references policy 4.2.1.2 e) that requires that planning, design and construction practices minimize *negative impacts* and disturbance on the features and related functions of KNHF and KHF, and where reasonable, maintain or improve *connectivity*, where crossing or intrusion occurs. However, as above, further rationale is required beyond the fact that the shortest distance and existing lane is used (in part), particularly since the rationale provided also refers erroneously to avoidance of the Butternut. Policies 4.2.1.2 a), b) and c) are not mentioned, and while we accept that they overlap with information provided or reports by others, specific aspects such as the reference in policy b) to minimizing "*negative impacts* and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt" in relation to vegetation, wildlife and the tributary warrant mention in the NER.

Paragraph 4 states that the vegetation displaced by the haul road and stockpile area is not significant, however further rationale for this statement should be provided.

The impacts of piping flow from feature B1 and presumably removing the associated riparian vegetation system under the stockpile area should be described. Regarding groundwater, it appears that discharge occurs along the tributary at least seasonally, but there is no mention of whether or not piping or placement of the stockpile material will affect maintenance of this function.

7. Impact Assessment and Mitigation

7.1 General Measures

This section needs a preamble explaining what this section is intended to present. The section begins with general mitigation measures, which, if the intent of the subsequent analysis is to assess only residual (after mitigation) impacts, may be appropriate. However, the assessment approach is not laid out in this section (or in methods) so it is not clear what impacts are being assessed. (Furthermore, assessing some impacts in the preceding section (which also identifies some mitigation measures) makes it difficult to determine if the impact assessment and mitigation are complete (As noted in comments herein and overview comments in the Executive Summary, these components are not complete.).

The series of mitigation measures provided is very short, and while additional detail is presumably provided in other reports (e.g., HTR, SPR), this should be noted.

7.2 Significant Woodlands/Significant Valleylands

This section re-iterates that the valley will be protected with an average 15 m wide VPZ during extraction, without providing any supporting rationale (see comments in Section 6.3).

7.3 Significant Portions of the Habitat of Endangered Butternut and Threatened Kentucky Coffee Tree

Impacts to 3 Butternuts adjacent to the haul road are identified and transplanting of these Butternuts is recommended. It is not clear whether the MNR has been contacted to confirm whether a permit under the Endangered Species Act is required for the transplant of these Butternuts. Additional details regarding the transplant should also be provided or an explanation of when and where this information will be provided (e.g. development of a plan to tend and monitor these transplants to ensure successful establishment at their new location). Reference to the transplant should also be included in the Vegetation Management Plan.

Measures to protect the Kentucky Coffee Tree seedlings seems reasonable, however, their locations should be shown on the Existing Features map of the Site Plan and if they are to be retained, perhaps specific protection measures (e.g., fencing) are warranted and should be noted on the Operations Plan and Vegetation Management Plan in the Site Plans.

Provision of some rationale for the statement that “Realigning the proposed haul road is not feasible due to other environmental constraints” should be provided to help address the Greenbelt Plan Infrastructure Policies (See also comments in Section 6.5).

7.4 Significant Wildlife Habitat

Further and more specific discussion of the impacts of the haul road (e.g., upgrade requirements and actual footprint of vegetation removal, potential impacts on drainage and local hydrology, extension of berms(?), increased fragmentation, impacts on local linkage functions) of the valley vegetation/habitat and the Fresh-Moist Black Walnut Lowland Deciduous Forest in particular is required to support the statement that direct impacts to this community will be minor (see previous comments).

Potential indirect impacts to the valley vegetation are not mentioned. Given the provincial rarity (S2S3) of the main vegetation community in the valley and directly adjacent to the proposed excavation area, and specifically that a mix of upland and wetland flora are noted in the understory, the tolerance of this community and its flora to the types of potential impacts associated with the potential hydrologic changes should be assessed and addressed if required.

There is only brief mention of potential impacts on wildlife movement along the valley, and simply to state that opportunities exist on a local scale but that no significant impacts are anticipated, and therefore no mitigation will be incorporated. A more detailed review of the “local” linkage/movement functions

and the potential impact of the haul road on these functions should be provided (e.g., potential for mortality, degree of disruption, some context in terms of current Road Ecology principles, rationale as to why crossing options that would maintain movement opportunities for wildlife and vegetation propagules cannot be entertained). Although loader equipment activity is identified as lasting for only about 2 months, the activity period (summer) coincides with the peak period of biological activity.

Based on the foregoing comments, the Greenbelt Plan policy requirement 4.3.2.3 c): *How connectivity between key natural heritage features and key hydrologic features will be maintained before, during and after the extraction of mineral aggregates (emphasis ours) is not addressed.*

7.5 Wetlands

This section is very brief, despite water related impacts to dependent natural features being one of the key potential impacts of excavation. The lack of linkage of the vegetation species list to the wetland units and generally weak descriptions of the wetland features and functions/water connectivity forces the reader to rely on the author's conclusions regarding wetland indicator species and associated sensitivities and water dependencies.

Providing a summary of what the potential impacts on the wetland water regimes actually are rather than simply referring to the HTR and indicating that the "predicted reduction in groundwater contribution to the wetland area onsite... is minimal" would be helpful to assure the reader that the potential for water related changes was specifically identified so that their implications on wetland hydrology, vegetation and functions could be assessed. As we understand it, this conclusion actually requires further substantiation.

While the NER notes that groundwater monitoring at the wetland will continue, with provision of a mitigating supply of surface water to the wetland if required, these brief statements require elaboration. It is not clear what this monitoring will entail, or whether groundwater monitoring alone is sufficient to monitor the overall hydrologic regime. Further, there is no explanation as to exactly how an impact would be identified, how surface water would be supplied to the wetland to mitigate the impact or how the effectiveness of that mitigation would be monitored.

We note that the discussion in the Groundwater and Surface water subsection (7.6.1) under Fish Habitat does indicate that there may be impacts to Drainage Feature C as a result of potential reduction in groundwater inputs to the wetland, however this is not reflected in the wetland discussion.

The assessment of potential impacts to off-site wetlands is weak (limited to 2 short paragraphs) and requires further detailing. There is insufficient information, no specification of the actual impact, and therefore no supporting rationale presented in the NER (or the HTR) to conclude that "these wetlands are primarily surface water driven" and "no impacts are anticipated".

The second paragraph refers to the predicted 1 to 5m drawdown in the two offsite wetlands (#44 and 45). Although these wetlands may be primarily surface water fed as stated, again, there is little information provided in the NER to support this statement or cross referencing of the HTR findings to verify this conclusion. Further, there is no mention of the possibility that accelerated infiltration of water from the

wetland could occur as a result of drawdown implications under the wetland. This aspect requires further review. The 3rd paragraph states simply that wetland #43 is not expected to be impacted, however no explanation is provided. The 1m drawdown curve wraps around the downstream end of the wetland, which may be the basis for this statement, however further explanation would be helpful.

Referring to the HTR figures, we assume that in the case of all of the wetlands (and tributary), the drawdown that would extend beyond the 1m drawdown curve could have some implications on the water regimes of these features depending on the nature of the wetland soils and hydraulic gradient associated with the drawdown. In particular, #43, which does exhibit some groundwater dependencies, could potentially be influenced to some extent. This requires further assessment.

Other General Vegetation and Wildlife Aspects

Although there is some discussion regarding protection of valley vegetation edges in the preceding Setback section, there is no discussion of potential edge impacts or removal of vegetation that extends beyond the main valley. Nor is there any real general discussion of removal impacts on other/non-“significant” vegetation and local habitat (e.g., under the stockpile/Drainage Feature B riparian vegetation, terrestrial features removed by large northwest berm, hedgerow in excavation area, etc.).

There is no real discussion of potential noise, dust and other disturbance-related impacts to wildlife and vegetation in the text (the only mention is a brief point in Table 7 and no supporting rationale is provided) Also additional comments are provided in Section 7.8.

7.6 Fish and Fish Habitat

The preamble section lists what appear to be direct impacts on watercourses and drainage features, and the subsequent sections appear to discuss indirect impacts, however it would be helpful to state this at the outset of the section.

Paragraph 3 of the preamble section indicates that Drainage Feature B1 is *Protection 1*, however we assume that the authors meant *Mitigation 1* (as per Table 1). Per previous comments, given the at least seasonal groundwater influx and potential for seasonal fish use if the boulder barrier at the lane were removed (?), this classification might be *Conservation 1*. This paragraph states that the primary functions of the drainage features will be maintained following piping, which may not be the case for Drainage Feature B1 given the loss of the riparian vegetation and interference with at least the seasonal groundwater discharge along it.

The last sentence of the section does recognize that “there will be indirect loss of habitat due to displacement” of several drainage features. However, elaboration is warranted given that these features are still considered fish habitat. Relevant agency review and legislative requirements (e.g., review by CVC to assess risk to fish habitat and need for authorization under the Fisheries Act) should be noted in this or some subsequent section. Further to comments in Section 4.1.2, additional assessment of management recommendations in the context of the *Headwater Guidelines* and Table 1 summary should be provided here or elsewhere. It would be helpful to the reader if this section cross-referenced the

discussion of indirect/secondary impacts of reduced groundwater contributions to the Main Tributary and several of the drainage features provided later in Section 7.6.1 Groundwater and Surface Water.

7.6.1 Groundwater and Surface Water

The potential implications of the predicted reduction in groundwater contribution to the Main Tributary on fish and fish habitat should be discussed at least briefly before outlining how these impacts will be mitigated. For example, would the 22% and 41% reductions in groundwater contributions to the Main Tributary (without mitigation) equate to a direct loss of these amounts of flow and habitat volume during the baseflow period when flow is generated predominantly by groundwater inputs?

The second paragraph discusses the mitigation of these reductions through reintroduction of quarry water at the upstream property boundary during excavation using average flow numbers, which the next paragraph goes on to indicate that seasonality of stream flow along the Main Tributary will be maintained by pumping surface water in at different rates through the year. Further explanation around the existing flow seasonality, the potential seasonal changes and how the seasonal variation will be maintained is warranted given the emphasis on average flow numbers in the preceding paragraph. (Although we assume seasonal flow information is available in Golders' monitoring data, there is no baseline description as to how flows vary seasonally at present in the NER).

The average flow after rehabilitation is predicted to be slightly higher than the existing total average flow. In this case, further discussion around the seasonality of these flows is required, since following rehabilitation, presumably there will no longer be any opportunity to monitor and supplement stream flows if necessary or adjust flows seasonally through surface water discharge. This is also the only reference to rehabilitation implications on stream flows (and one of the few mentions of rehabilitation conditions in the report). Will the flow regimes in the other drainage features return to pre-excavation conditions?

The potential effects of using surface water to replace groundwater inputs are partially addressed in the Water Quality and Thermal Impacts sections that follow, however potential impacts on flow volumes and habitat area that may occur as a result of how/where that flow is provided are not discussed. Again, the use of "baseline average flows" in identifying mitigation and assessing impacts may be misleading (and if nothing else is a bit confusing). Were the baseline flows measured at the upstream end of the property where flow will be re-introduced? And is this the only monitoring point proposed? Similar to the comments regarding flow seasonality, a discussion of how existing flow conditions change moving downstream would also be helpful in the NER (although again we assume this information is available based on flow monitoring at a number of points along the channel (and mention in the HTR of some seasonal infiltration in the central portion).

More specifically regarding the conclusion that the mitigation will prevent any net loss of direct fish habitat, introduction of all of the flow at the upstream end of the tributary at the edge of the subject property is not likely to fully replicate current flow conditions. Groundwater discharge appears to vary along much of the tributary length through the property, based on the HTR findings and general field observations. Introducing all of the flow at some upstream point could result in higher flow volumes

along the upstream portion of the channel than at present, depending on where the flow is monitored and how the required supplementary volumes are determined. The HTR indicates that in the “central location”, the “stream is losing water to the subsurface” during select periods. Therefore, if flow is only added at one upstream point, flow along the downstream reaches may be lower than at present if there is local recharge through the central section.

Consideration of the implications of reduced flow on specific habitat features during baseflow periods requires some assessment. The importance of the pools as seasonal refuge habitat (summer and winter) in relation to any local changes in habitat volume should be specifically assessed. As noted previously, there did not appear to be a lot of deeper pools based on the November reconnaissance, contrary to the NER description. Pools appeared relatively shallow and the channel is often over-widened. Therefore, especially if there is some baseflow lost in the mid-reaches seasonally, pool/seasonal refuge habitat in particular may become limiting and flow through riffles could restrict movement along the channel at least seasonally. While it appears fish can move through the existing culvert crossing presently, might movement be restricted if there is some baseflow loss in these reaches?

There is no assessment of any potential change to flow (particularly baseflow) contribution to reaches upstream or downstream of the property, or further downstream of Hwy 7. We assume that there is no potential for impacts to the Credit River, however there is no assessment or conclusion presented.

The HTR impact conclusions are not entirely consistent with those of the NER and there are gaps. For example, the conclusions in the HTR indicate that several surface water features in the area may experience a baseflow reduction, although it is not clear if this means before or after the mitigation/surface water discharge to the Main Tributary (Conclusion 16a).

The following point (16b) indicates that even with the mitigation, an *approximate* reduction of <13% may result (note the specific qualifications does not lend any assurance to this prediction) in the tributary reach extending “approximately 250m upstream of the Site that cannot be fully mitigated because of access restrictions (We note that it appears it cannot be mitigated at all if mitigation relies on provision of surface flow discharge at the property boundary). This impact should be identified and the implications of this loss of baseflow on the local habitat conditions should be discussed in the NER.

Reduction in groundwater contribution and surface water in Drainage Feature B in the valley (B3?) is predicted to be similar to that of the Main Tributary. The NER suggests that replenishment of the Main Tributary will also support this reach, however we are not clear how this approach would work given that the “replenishment” of the Main Tributary is surface water supplied at the upstream end of the property. If the suggestion is that flow would be drawn from the Main Tributary, would a greater combined flow not be required to support both features? Again, there is some discrepancy with the HTR conclusion 16)c that states that the downstream portion of Drainage Feature B within the valley will experience a baseflow reduction that may not be fully mitigated under the currently proposed mitigation strategy.

The NER also indicates that the primary functions will be maintained through piping of the tiled flows that feed the upstream end of Drainage Feature B1 to the downstream reach. However, while it may

discharge to the tributary downstream of the pipe, there is no mention of the potential loss of the at least seasonal groundwater influx along the length of the tributary or its implications on downstream reaches. There is no discussion of future rehabilitation of Drainage Feature B1. Will the pipe and stockpile material be removed and an open watercourse re-instated?

The potential for impact to Drainage Feature C as a result of potential reduction of groundwater input to the wetland is noted, however there is no real discussion of the implications on the drainage features or contributions downstream to the Main Tributary. Section 7.5 Wetlands is cross referenced in relation to the potential impacts, however the only discussion in that section is an unsubstantiated statement that the impacts are “minimal”. The mitigation is to monitor and if impacts are identified provide surface water to the wetland: whether this water would also support the flow in Drainage Feature C is not mentioned.

The SPR presents a summary of Golders’ fluvial geomorphological assessment (p30). The associated sediment supply statements are somewhat conflicting- 3rd bullet states- “...the MTC (Main Tributary Channel) supports a substantial fine grain sediment load.... “. But then the 4th bullet summarizing the results of the sediment budget ...”suggests that the proposed development of the site would have a relatively minor effect to the inferred sediment regime at the MTC”, noting a reduction in the inferred sediment of only “approximately 3%”.

There is no comprehensive functional assessment of water inter-relationships / connectivity of watercourse and drainage features beyond a few brief references to groundwater discharge to the main tributary and lower reaches of Drainage Features B and C. The specific requirement of the Greenbelt Plan policies (4.3.2.3c) to maintain connectivity between KNHF and KHF before during and after excavation (noted in S. 2.2 of the NER) is not addressed.

7.6.2 Water quality

The NER indicates that the Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life were used to assess potential impacts to aquatic life. This may warrant further explanation, in that the Provincial Water Quality Guidelines (PWQO) do provide guidelines for aquatic life for at least some parameters. Particularly in the case of Boron where there is a major difference between the guidelines (1500 versus 200 ug/L), and the predicted levels, while lower than the CWQG, are substantially higher than the PWQO *and the existing levels*, further explanation is warranted.

The NER discusses the guidelines for Silver and Chromium and the differences in levels for Rainbow Trout versus Fathead Minnow, noting that the latter are more representative of the warmwater fish community present in the Main Tributary. While we agree that Rainbow Trout are more sensitive than the resident species, we note that Fathead Minnow is one of the most tolerant baitfish species, and would be expected to be more tolerant than Creek Chub. Further, the NER indicates that Rainbow Trout and Coho Salmon are present downstream of Hwy 7. Since impacts to Rainbow Trout at the levels predicted include premature hatching, mortality of larvae and reduced growth rates, further discussion of any potential for impacts to the downstream fish community is warranted.

We recognize that the analysis that was undertaken was conservative, and that there may in fact be no real concerns, however since the contingency mitigation is again water quality monitoring during operations

and post-operations, without any indication of what and how contingency mitigation would be employed should an impact be identified, some additional analysis is warranted.

7.6.3 Thermal Impacts

The thermal assessment appears to indicate that any impacts to the resident fish community are unlikely, and in this case Creek Chub can be used as the indicator species based on the literature cited. Although we accept that impacts do not appear likely based on the analysis presented, and we agree that the fish community is warmwater and not particularly sensitive to potential warming of water temperatures, we note that there are a lot of qualifiers in the impact predictions. As quoted from the HTR wording, ... “conditions are *likely* to *typically* remain below 22.1 degrees...” and “there is a *slight possibility* that the *average* baseflow temperatures *could* increase to *approximately* 27 under *sever* conditions” [italics added]. This wording does not give the reader a lot of confidence in the conclusions.

It may also be more appropriate to assess the potential thermal changes in relation to the existing conditions rather than just in relation to species-specific numbers from the literature. While the report indicates that the predicted maximum temperature lies within the natural range of temperatures for this watercourse (although the thermal regime noted in preceding sections of the NER isn't quite consistent), there is no discussion of expected changes to the thermal regime seasonally.

We also note that loss of groundwater influx and associated thermal moderation during the winter period could have significant impacts on over-wintering habitat. If pools are already slightly shallower due to loss of flow volume, they may be more susceptible to freezing further or to the bed if thermal moderation during the winter (as a result of groundwater influx) is reduced.

While it may be nominal and addressed through discharge along reaches further downstream of the site, the potential for any changes to the downstream thermal regime, which does support species that are more sensitive to warming than Creek Chub (e.g., Rainbow Trout, Coho), is not assessed.

The concluding statement- “No *significant* impacts to aquatic life *are expected* at this temperature under *average* conditions and no mitigation is required” [italics added] is again rather qualified to give the reader a lot of confidence.

7.7 Rehabilitation

This section is brief, with no overall description of the rehabilitation plan or its rationale, and no real discussion of the ecological aspects (e.g., ecological objectives, vegetation community and habitat objectives/rationale, connectivity/compatibility with on and off-site features).

The SPR and Site Plans suggest there is some uncertainty around the final configuration of the Rehabilitation Plan. The SPR suggests some uncertainty in the nature of the final end use (water or fill and agricultural land), and there are uncertainties in the rehabilitation configuration given the implications of using imported fill (which may not be acceptable to approval agencies). There is no mention of interim conditions during the period of ‘lake’ filling/post excavation (or the duration of this period). There is no real discussion of the rehabilitation plan from an ecological perspective or any role the ecologists had in

its development (e.g., ecological objectives, various vegetation communities and habitat components, how they were selected, how they are intended to function, specific habitat design elements, landscape connectivity and compatibility etc.). No aquatic habitat components are incorporated in the plan despite the central pond/lake feature.

Although the reader is referred to the Todhunter report and Vegetation Management Plan regarding rehabilitation, there is only one brief section in this report (2.3). Vegetation species are provided for the vegetation planting zones, however no clear target vegetation communities are identified and the management zones do not reflect standard vegetation community typing. The notes on Sheet 5 of the Site Plans imply that the species were selected to achieve ecological objectives of the different management zones, however these objectives are not identified. The notes on Sheet 7 and text indicate that the woody and ground cover vegetation species replace and enhance pre-development conditions, and are representative of the natural ecosystem ..., consistent with the Greenbelt Plan rehabilitation policies, however no supporting ecological analysis or justification is provided.

Although the rehabilitation plan is focused around a ‘pond’ or lake, there is no discussion as to how it is representative of the natural ecosystem, or alternative rationale for its need in relation to long term groundwater management perhaps. Nor is there any mention of any aquatic communities or potential as fish habitat. The ecological shoreline zone appears to be a meadow marsh community based on the proposed planting, and no aquatic features beyond this edge zone are noted. There is no mention of Greenbelt Plan policy 4.3.2.5 c) that specifies that aquatic areas remaining after extraction be rehabilitated to aquatic enhancement.

There is no assessment of the potential for residual effects following rehabilitation, or for that matter, during the period when the lakes are filling. We note that the HTR conclusion indicates that rehabilitated conditions in water wells will only return to “near-pre-quarrying conditions”, suggesting that there may be residual effects to groundwater levels that support natural features. The HTR goes on to state that baseflow will return to the local watercourses within the drawdown cone and the neighboring wetlands will have a similar base flow. “As such, minimal to no long term impacts from the quarry are anticipated”. However, it seems odd that there would be minimal to no long term impacts on the watercourses and wetlands if well water levels return only to “*near* pre-impact conditions. Either way, somewhat more definitive statements are required.

There are a number of specific unanswered questions in relation to rehabilitated conditions. What happens to the stockpile area? (Note 11 on the Site Plan Sheet 5 indicates simply that it will be compatible with the approved After Use Plan). Will the ‘stockpile be removed and will Drainage Feature B1 be reinstated, and if so how? Are the berms (except for east) intended to become permanent and if so they do not appear to be integrated into the rehabilitation/Vegetation Management Plan, despite the potential habitat opportunities? The rationale for retention of the large visual screening berms is unclear, particularly since the areas around it will be planted with trees. There is no explanation as to why the haul road is maintained in the rehabilitation plan.

There are a number of other Greenbelt Plan policies that pertain to rehabilitation that also do not seem to be specifically addressed, for example:

- 4.3.2.5b) pertaining to rehabilitation of the disturbed area of the site to a state of equal or greater ecological value and for the entire site, maintenance, restoration or the extent possible improvement of the long term ecological integrity.
- 4.3.2.6c) pertaining to maintenance, restoration or the extent possible improvement of connectivity of KNHF and KHF on site and adjacent lands (and related policies in 4.3.2.3c) pertaining to post extraction).

In relation to policy 4.3.2.6b), we are not sure that the interpretation of the area required to be rehabilitated to forest cover is correct (in relation to use of the “license area” and inclusion of the retained valley area, which constitutes the bulk of the area). The Todhunter discussions of this policy in Section 2.3 and the Summary are also somewhat confusing and potentially inconsistent.

7.8 Summary of Impact Assessment and Mitigation

Such a table is useful, particularly given the presentation of impacts and mitigation in different sections (although as noted, the focus on “significant” features and other gaps identified above leaves it incomplete). However, in this case, it is somewhat confusing, and would benefit from clear definition of what is summarized in each column and what each header means. For example, what is the difference between *Possible Effect* (is this potential effect without mitigation?) and *Anticipated Impact*? It might be more useful to separate *Mitigation* from *Rehabilitation*. We note that rehabilitation in the table context is essentially vegetation planting, which isn't necessarily part of the Rehabilitation Plan.

The information in the Monitoring Protocol column does not always seem to pertain to monitoring. For example, under the Significant Woodlands, this column notes the rehabilitation recommendations in the Todhunter report, and the Significant Wildlife Habitat section refers to identifying potential areas for replanting. An additional column (and section in the text) should be added to provide response actions if monitoring identifies an impact. As the only real place in the NER that mentions ecological monitoring aspects, this table requires more detail. A specific monitoring section in the text is warranted as well, given that the NER does not discuss integration of mitigation, monitoring and response aspects.

A lot of the text in the table is somewhat confusing, over-simplified, conflicts with or introduces new information relative to the main text, or ignores certain features or impacts that have been identified previously:

1. The *Anticipated Impact* commentary on *Significant Wetlands* seems a bit simplistic in stating only that there is no impact since there is no excavation west of the valley. This seems to ignore any potential for impact on groundwater or as a result of potential enhanced infiltration. Off-site wetlands are only mentioned in the Mitigation and Rehabilitation column and then only to state that no mitigation is required.

See previous comments (Section 7.5) regarding provision of water to the on-site wetland as direct mitigation. The net effect- “minor impact on ecological function and species occurrence”- needs more explanation; there is no supporting detail in the text either. (See also above comments regarding Drainage Feature C and on-site wetland in Section 7,5).

The monitoring protocol mentions water quality for the first time. Why in the wetland and what parameters? Are there baseline data? There is no indication of what measures would be implemented if water levels are not maintained, other than presumably adding more water. However how and where this water would be added requires detailing, if not in the NER, then in the HTR and/or a specific monitoring and mitigation plan.

2. Re the *Significant Woodland/Valleyland* section, are the 6m high berms noted in the mitigation and Rehab column “to act as noise and visual screens” to be extended through the valley as well (which would presumably be required to mitigate noise and visual impacts but would also increase the footprint impact significantly)? If so is their footprint considered in the vegetation removal impact assessment? The monitoring column refers to replanting, which is not monitoring.

Some comments provided under *Significant Woodlands/Valleylands* occur for the first time here in Table 7 (such as reference to dust, noise, certain haul road impacts, reference to maintaining ecological functions on and off site). This information should be discussed in more detail in the Impact section of the text, to provide a more defensible rationale for the conclusions provided in the table.

3. Similar comments regarding the *Impact and Mitigation* statements to those outlined in the preceding text sections are relevant for the *Fish Habitat* section. The *Net Effects* column states no net loss of fish habitat and no impacts to aquatic life, which is perhaps slightly exaggerated and is inconsistent with the preceding text, which does recognize some loss of indirect habitat and function. The groundwater reductions (and potential implications on fish and fish habitat) discussed previously are not mentioned. Again, continued groundwater and surface water level and fish monitoring is recommended, without any supporting indication as to what would be done if changes are identified or how changes sufficient to trigger mitigation would be identified. We note that fish community monitoring may not be the best monitoring tool, as it is affected by various other factors and distinguishing the cause of the change is not always easy.

Is macrobenthic monitoring proposed? The Methodology sections indicated macrobenthic invertebrate sampling was undertaken “to establish a baseline for future monitoring”.

4. The commentary under *Significant Habitat of Endangered or Threatened Species* needs to be updated to discuss Bobolink (see previous comments).

There is no mention of monitoring of Butternut transplants identified to ensure successful establishment.

5. Under ‘Rare Vegetation Community’ in the *Significant Wildlife Habitat* section, the potential for indirect impacts through changes to the underlying hydrology warrants mention. Again the monitoring comments refer to identifying planting areas rather than any monitoring.

Under ‘Animal Movement Corridor’, more detailed analysis is required in the supporting text to support the brief recommendations and conclusions in the table. We find it very surprising that the Table indicates there is no practical mitigation to address movement functions without any supporting meaningful

assessment of landscape connectivity/movement functions or any supporting rationale as to why provision of a crossing (or some basic mitigation measures etc.) is not practical. We do note that reference to animal mortality on the haul road is provided in Table 7, but this is the first and only time this issue is raised. Further, monitoring of mortality is mentioned in the monitoring column, however the point of this monitoring is unclear if as stated mitigation has already been determined to be impractical.

8. Conclusions

The Conclusion section is very brief (2 par.), comprising two very short paragraphs. Following a brief statement summarizing what is covered in the report, “it is concluded that the proposed Norval Quarry can proceed with minimal acceptable impacts” and that the quarry operations as proposed can proceed in a manner consistent with relevant policies. These concluding statements are qualified by the vague reference in the first case to “appropriate mitigation and operational phasing and monitoring” that is not tied directly to what is laid out in the NER, and that the operations as proposed are “subject to approvals and permits as may be required as part of the operation”. However, for all intents and purposes, the conclusions are not substantiated fully by the information presented in the NER.

Conclusions regarding the potential for impacts to significant natural heritage features/functions are not substantiated for most legislation (Greenbelt Plan, PPS, ESA or Fisheries Act) based on the information, analysis and mitigation presented in the NER. There is no clear identification of any residual impacts to natural features during operations or rehabilitation, or any discussion of their relevance or importance from a policy perspective. There are no clear statements regarding the need for any additional work (from an ecology or related water perspective), provisions for refinement and further detailing of the mitigation and monitoring plan, or agency review and related legislative requirements. Nor are any of the uncertainties or need for further detailing of mitigation and monitoring aspects recognized.

Despite detailing of the policy requirements in Section 2, there is no real analysis of or specific closure on any of the policy aspects. Policy aspects are discussed to some extent in identifying KNHFs and features protected under the PPS, however not all KNHFs are specified and not all impacts to these features are identified or addressed in the impact assessment and corresponding mitigation. There is no identification of KHF at all, and no assessment of functional connectivity with KNHFs (or between KNHFs), or how this connectivity will be maintained or restored. Landscape connectivity aspects are not addressed fully during operations or all in relation to rehabilitation. Therefore, the various Greenbelt Plan policies relating to connectivity can not be addressed. Further, there is no clear closure on conclusions regarding the drainage feature diversions, enclosure and potential residual impacts to stream flow in relation to the Fisheries Act. The Endangered Species Act requirements (permitting) do not appear to be satisfied for Butternut.

Based on the foregoing, the NER does not provide the basis to fully substantiate the conclusion that “... the quarry operations as proposed, subject to approvals and permits required as part of the operation, can proceed in a manner that is consistent with the relevant policies of the” PPS, Greenbelt Plan, ARA, Region and City OPs and CVC. Furthermore, based on our professional review, Beacon’s (Sept. 2010) NER does not fully address these policy requirements, nor provide a comprehensive Level 1 and 2

Environmental Impact Assessment, and therefore does not warrant approval under the relevant legislation and should not be deemed acceptable to the City of Brampton.

APPENDIX A

POLICY MATRIX

SUMMARY OF POLICY CONFORMITY OF BEACON ENVIRONMENTAL'S LEVEL 1/2 NATURAL ENVIRONMENT REPORT (NER)

The following matrix lays out the policies in the key guidelines legislation that pertain to natural features in relation to an aggregate application. There is some overlap. The Provincial Policy Statement (PPS 2005) lays out the policies that are then embodied in other legislation such as the municipal Official Plans and for the most part the Aggregate Resources Act. The Greenbelt Plan builds on the existing policy framework established in the PPS. All policies rely on the PPS definitions where similar terms are used. Therefore, any related policies are either not restated where they duplicate others, or they cross-reference to the more detailed policy. (e.g., PPS related policies that are addressed in more detail by Greenbelt Plan policies).

Legislation / Policy	Relevant policies	Policy Conformity
Planning Act and PPS	2.1 Natural Heritage	<p><i>Comment:</i> The NER does not specifically address the PPS natural heritage or water policies, however this may be in large part because the assessment defaults to the Greenbelt Plan (and supporting technical guidelines). The NER states that "Under the PPS (2005), the identification of significant woodlands, valleylands and wildlife habitat is the responsibility of the planning authorities (in this case, Region of Peel or City of Brampton). However, because the subject property falls within the Natural Heritage System of the Protected Countryside designation of the Greenbelt, the identification of these features is guided by a series of technical Papers recently issued in draft form by the OMNR (2008a, 2008b, 2008c)." While we accept that it is appropriate for the NER to assess the status of the features based on these Technical Guidelines, we assume that verification as to the conclusions of the analysis will ultimately be sought from MNR.</p> <p><i>Conformity:</i> Considering the conclusions below regarding the Greenbelt Plan policies, related PPS policies are also not addressed based on the information and analysis provided.</p>

	<p>2.1.1 Natural features and areas shall be protected for the long term.</p>	<p>Difficult to verify conformity with information provided even pertaining to during excavation given limitations in scope and detailing of impact assessment, mitigation and monitoring measures. Cannot assess conformity after rehabilitation (and during period between completion of excavation and completion of final rehabilitation conditions) given the very limited description of the rehabilitation plan and or lack of assessment of any potential implications on natural features. Therefore policy not addressed based on information provided.</p>
	<p>2.1.2 The diversity and connectivity of natural features in an area, and the long-term <i>ecological function</i> and biodiversity of <i>natural heritage systems</i>, should be maintained, restored or, where possible, improved, recognizing linkages between and among <i>natural heritage features and areas, surface water features and ground water features</i>.</p>	<p>See 2.1.1 Neither connectivity/linkages (among natural features or between natural features and water) nor diversity are well addressed. Absence of any thorough assessment of inter-relationships between natural features and water is a concern, given that one of key impacts of project is drawdown in water table. Inadequate detail in impact assessment and mitigation measures, and very weak supporting monitoring component. Lack of any detail around rehabilitation plan and implications. Not addressed based on information provided.</p>
	<p>2.1.3 <i>Development and site alteration</i> shall not be permitted in:</p> <ul style="list-style-type: none"> a. <i>significant habitat of endangered species and threatened species;</i> b. <i>significant wetlands in Ecoregions 5E, 6E and 7E1;</i> c. <i>significant coastal wetlands.</i> 	<p>Conformity, with respect to 2.1.3a., does not appear to be fully addressed in relation to Butternut. See Greenbelt Plan policy 4.3.2.3 a)ii.</p>

	<p>2.1.4 <i>Development and site alteration shall not be permitted in:</i></p> <ul style="list-style-type: none"> a. <i>significant wetlands</i> in the Canadian Shield north of Ecoregions 5E, 6E and 7E; b. <i>significant woodlands</i> south and east of the Canadian Shield; c. <i>significant valleylands</i> south and east of the Canadian Shield; d. <i>significant wildlife habitat</i>; and e. <i>significant areas of natural and scientific interest</i> <p>unless it has been demonstrated that there will be no <i>negative impacts</i> on the natural features or their <i>ecological functions</i>.</p>	<p>See Greenbelt Plan policy 4.3.2.3 a)iii and b).</p>
	<p>2.1.5 <i>Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.</i></p>	<p>The report commits to obtaining necessary approvals/permits, which will have to include clearance from DFO (as the ultimate regulatory authority). However, we note that CVC will review the project initially in relation to its potential risk to fish habitat/potential to cause “HADD” in relation to impacts on fish habitat as a result of removal of minor drainage features and enclosure of a more substantial drainage feature. The NER does not present any clear analysis regarding the risk to fish habitat/potential for HADD of the project. However, conformity ultimately addressed through agency review process. No significant issues identified to achieving clearance (although expect resolution of details of mitigation/monitoring for Main Tributary will require prior resolution).</p>
	<p>2.1.6 <i>Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.3, 2.1.4 and 2.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.</i></p>	<p>See 2.1.1 and 2.1.2 The report does not provide sufficient evaluation of the <i>ecological function</i> of the <i>adjacent lands</i> to the <i>natural heritage features and areas</i> identified in policies 2.1.3, 2.1.4 and 2.1.5, nor an adequately detailed impact assessment of the proposed excavation on adjacent lands in relation to natural features to demonstrate that there will be no <i>negative impacts</i> on those natural features or on their <i>ecological functions</i>.</p>

	<p>2.2 Water</p> <p>2.2.1 Planning authorities shall protect, improve or restore the <i>quality and quantity of water</i> by:</p> <p>a. using the <i>watershed</i> as the ecologically meaningful scale for planning;</p> <p>b. minimizing potential <i>negative impacts</i>, including cross-jurisdictional and cross-<i>watershed</i> impacts;</p> <p>c. identifying <i>surface water features, ground water features, hydrologic functions</i> and <i>natural heritage features and areas</i> which are necessary for the ecological and hydrological integrity of the <i>watershed</i>;</p>	
	<p>d. implementing necessary restrictions on <i>development</i> and <i>site alteration</i> to:</p> <p>1. protect all municipal drinking water supplies and <i>designated vulnerable areas</i>; and</p> <p>2. protect, improve or restore <i>vulnerable</i> surface and ground water, <i>sensitive surface water features</i> and <i>sensitive ground water features</i>, and their <i>hydrologic functions</i>;</p>	<p>d. These aspects are not identified comprehensively. See 2.1.2 and 2.1.6.</p>
	<p>e. maintaining linkages and related functions among <i>surface water features, ground water features,</i></p>	<p>Not addressed. See 2.1.6 etc.</p>
	<p>f. <i>hydrologic functions</i> and <i>natural heritage features and areas</i>;</p> <p>g. promoting efficient and sustainable use of water resources, including practices for water conservation and sustaining water quality; and</p> <p>h. ensuring stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces.</p>	<p>Not fully addressed. See above.</p>

	<p>2.2.2 <i>Development and site alteration shall be restricted in or near sensitive surface water features and sensitive ground water features such that these features and their related hydrologic functions will be protected, improved or restored.</i></p> <p>Mitigative measures and/or alternative development approaches may be required in order to protect, improve or restore <i>sensitive surface water features, sensitive ground water features, and their hydrologic functions.</i></p>	
<p>Greenbelt Plan</p>	<p>Schedule 4 of the <i>Greenbelt Plan</i> (MMAH 2005) identifies the subject lands as situated within the Natural Heritage System component of the Protected Countryside area. Infrastructure policies under S 4.1.2.2: 4.2.1.2 The location and construction of <i>infrastructure</i> and expansions, extensions, operations and maintenance of <i>infrastructure</i> in the Protected Countryside, are subject to the following:</p>	<p>The NER appears to accept that the Infrastructure policies are relevant to this application based on the statement in Section 5.6.5 that these policies “permit the construction of a new road in KNFH where there are no reasonable alternatives”. However, relevant policies are not comprehensively addressed in the NER as outlined below:</p>
	<p>a) Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such <i>infrastructure</i>;</p>	<p>a) Although this policy is not explicitly identified in the NER, the proposed use of the existing farm lane (and presumably the road system beyond although off site transport is not discussed in the NER) minimizes the amount of Greenbelt and Natural Heritage System traversed/occupied by the haul road, subject to commentary under d).</p>
	<p>b) Planning, design and construction practices shall minimize, wherever possible, the <i>negative impacts</i> and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;</p>	<p>b) Again, this policy is not explicitly noted in the NER. There is some discussion around minimizing effects of the haul road on the existing landscape, particularly by using the existing lane. However, the assessment of the effects of expansion and local re-routing of the laneway are not addressed in any detail, and potential effects pertaining to light intrusion, noise and road salt are not addressed. Conformity is not fully addressed</p>

	<p>c) Where practicable, existing capacity and coordination with different <i>infrastructure</i> services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by Greenbelt and any provincial growth management initiatives are supported and reinforced;</p>	<p>[c] Probably best addressed in SPR].</p>
	<p>d) New or expanding <i>infrastructure</i> shall avoid <i>key natural heritage features</i> or <i>key hydrologic features</i> unless need has been demonstrated and it has been established that there is no reasonable alternative; and</p>	<p>d) As outlined above, the NER relies on the use of the existing laneway to justify crossing the valley and associated KNHFs. However, there does not appear to have been any consideration of options that would not cross the valley and associated KNHF or rationale provided <i>to demonstrate that there is no reasonable alternative</i> (although we note that the end of Section 6.5 refers to the “route selected” implying that there may have been alternatives). While we recognize that use of the existing laneway minimizes effects to KNHF, this assumes that these KNHFs must be crossed by the haul road. Would it be possible for example to use the existing road network around the west and south edges of the site and access the proposed excavation area from the south, and thereby avoid the valley crossing? Therefore, policy conformity not fully addressed since no demonstration <i>that there is no reasonable alternative</i>.</p>
	<p>e) Where <i>infrastructure</i> does cross the Natural Heritage System or intrude into or result in the loss of a <i>key natural heritage feature</i> or <i>key hydrologic feature</i>, including related <i>landform features</i>, planning, design and construction practices shall minimize <i>negative impacts</i> and disturbance on the features or their related functions, and where reasonable, maintain or improve <i>connectivity</i>.</p>	<p>The NER attempts to address this policy by briefly stating that the route selected involves the shortest distance, uses an existing trail to the extent practical and avoids the single living Butternut, and that design considerations can be developed at detail design. However, there are a number of questions and details outstanding around these conclusions as outlined in other sections. Although some mitigation efforts are outlined to minimize effects of the haul road crossing of KNHFs, the potential impacts are not fully identified or addressed in the NER (e.g., Butternut removal, potential impacts on hydrology and other functions of significant vegetation community, effects on wildlife movement function). See also Greenbelt Plan 4.3.2.3 below. Additional information and clarification is required to assess policy compliance.</p>

	<p>4.3.2.3: <i>Notwithstanding the Natural System policies of Section 3.2 of this Plan, within the Natural System policies of section 3.2 of this Plan, mineral aggregate operations and wayside pits and quarries are subject to the following:</i></p> <p><i>a) No new mineral aggregate operation and no wayside pits and quarries, or any ancillary or accessory use thereto will be permitted in the following key natural heritage features and key hydrologic features:</i></p> <p><i>i. Significant wetlands;</i></p>	<p>i. Addressed.</p>
	<p><i>ii. Significant habitat of endangered species and threatened species; and</i></p>	<p>ii. There is no clear demonstration or confirmation from MNR that <i>significant habitat of endangered species and threatened species</i> (in this case Butternut) is not affected (e.g., as a result of removal of trees for the haul road, 3 of which appear to be retainable trees). We are not aware that OMNR may be “regarding” significant habitat of Butternut “as the individual tree and the land area that lies immediately beneath its canopy” as stated in the NER. This requires verification from MNR. The NER states that the single living Butternut is avoided (as rationale for the road crossing location), however Section 7.3 refers to removal and transplant of 3 retainable Butternut. There are also outstanding questions concerning Bobolink (proposed for addition to Threatened status) that require follow-up with MNR. Conformity is not fully addressed.</p>
	<p><i>iii. Significant woodlands unless the woodland is occupied by young plantation or early successional habitat (as defined by the Ministry of Natural Resources). In this case, the application must demonstrate that the specific provisions of policy 4.3.2.5 (c), (d) and 4.3.2.6 (c) have been addressed, and that they will be met by the operation;</i></p>	<p>iii. Portion of woodland removed by the haul road does not appear to meet the definition of early successional or young plantation. Conformity is not fully addressed as outlined below in relation to referenced policies.</p>
	<p><i>b) An application for a new mineral aggregate operation or new wayside pits and quarries may only be permitted in other key natural heritage features and key hydrologic features not identified in 4.3.2.3 (a) and any vegetation protection zone associated with such other features where the application demonstrates:</i></p>	<p>b) Excavation is proposed in the 30m VPZ without verifying whether or not there could be an impact on the hydrology of the Significant Wildlife Habitat (Black Walnut Lowland Deciduous Forest). In addition, the conclusion that the setback to the Significant Valleyland/Woodland/Wildlife Habitat is sufficient is not fully substantiated.</p>

		The potential status of Drainage Feature B1 as a KHF (or its potential as direct fish habitat) is not assessed. Conformity is not fully addressed.
	<i>i. How the Water Resource System will be protected or enhanced; and</i>	i. Protection of the Water Resource System not fully addressed in relation to KNHF or potential KHF noted above. Impacts not fully identified or assessed and as a result mitigation and supporting monitoring measures are not provided. Policy conformity not addressed based on information provided in NER.
	<i>ii. That the specific provisions in 4.3.2.5 (c), (d) and 4.3.2.6 (c) have been addressed, and that they will be met by the operation; and</i>	See 4.3.2.5c, d and 4.3.2.6c, which are not fully addressed.
	<i>c) Any application for a new mineral aggregate operation, or the expansion of an existing mineral aggregate operation shall be required to demonstrate: i. How the connectivity between key natural heritage features and key hydrologic features will be maintained before, during and after the extraction of mineral aggregates;</i>	i. <i>Key hydrologic features</i> are not identified. <i>Connectivity between key natural heritage features and key hydrologic features</i> is not fully assessed, and potential impacts during excavation are not fully identified or addressed. Connectivity following excavation is not addressed; very weak discussion and assessment of any implications of rehabilitation plan in relation to natural features. Policy conformity not addressed.
	<i>ii. How the operator could immediately replace any habitat that would be lost from the site with equivalent habitat on another part of the site or on adjacent lands; and</i>	ii. While the implication is that the vegetation plantings will replace vegetation and habitat, no basis is provided for this conclusion. There is no assessment of the vegetation planting in relation to the specific functions that may be affected or even the specific vegetation that is removed. Overall, there is little indication that the ecologists had any role in developing the vegetation planting plan (or rehabilitation plan).
	<i>iii. How the Water Resource System will be protected or enhanced.</i>	iii. Protection of the Water Resource System not fully addressed in relation to any of KNHF or potential KHF (on or off-site wetlands, Main Tributary, etc.). Potential impacts are not fully identified or assessed. Incomplete mitigation and no substantive supporting monitoring or response actions. Policy conformity not fully addressed based on information provided in NER.

	<p>4.3.2.5: <i>When operators are undertaking rehabilitation of mineral aggregate operation sites in the Protected Countryside, the following provisions apply:</i></p> <p>b) <i>The disturbed area of a site will be rehabilitated to a state of equal or greater ecological value, and for the entire site, long-term ecological integrity will be maintained or restored, and to the extent possible, improved.</i></p>	<p>b) Difficult to verify based on level of detail of description of rehabilitation plan components and associated ecological values. There is very little discussion and no real 'ecological' discussion of the rehabilitation plan, and therefore no analysis as to how the plan will return the disturbed areas of the site to habitats of <i>equal or greater ecological value</i>, or maintain, restore and to the extent possible improve <i>long-term ecological integrity</i> relative to the entire site. Policy conformity not assessed.</p>
	<p>c) <i>If there are key natural heritage features or key hydrologic features on the site, or if such features existed on the site at the time of application:</i></p>	<p>There are some uncertainties regarding the status of KHF since they are not mentioned in the NER or HRT. For example, Drainage Feature B1, which is enclosed under the stockpile, might be considered a KHF (intermittent tributary, potential springs and seepage areas [at least seasonal]). In addition, its potential to provide direct fish use seasonally is not assessed in relation to what appears to be a 'restorable' barrier, if the boulders at the culvert were shifted/removed.</p>
	<p>i. <i>The health, diversity and size of these key natural heritage features and key hydrologic features will be maintained or restored and, to the extent possible, improved to promote a net gain of ecological health; and</i></p>	<p>i. There is some discussion around protection, maintenance and restoration/improvement of some of the <i>key natural heritage features</i>, primarily the main forested tributary valley (in relation to vegetation plantings and buffer enhancements). However explicit discussion in the policy context is not provided. Nor are other <i>key natural heritage features</i> such as the main tributary or on or off site portions of the PSW fully addressed, and there are some uncertainties that these features will be maintained or fully restored. There is no mention of <i>key hydrologic features</i>. Comments pertaining to the haul road are also relevant.</p>
	<p>ii. <i>Any permitted extraction of mineral aggregates that occurs in a feature will be completed, and the area will be rehabilitated, as early as possible in the life of the operation</i></p>	<p>ii. Although not extracted, Tributary B is enclosed under the stockpile and there is no indication as to whether or not this feature will be rehabilitated at all. There is no mention as to whether or not the haul road might be removed following excavation (although it is still shown on the rehabilitation plan).</p>

	<p>d) Aquatic areas remaining after extraction are to be rehabilitated to aquatic enhancement, which shall be representative of the natural ecosystem in that particular setting or ecodistrict, and the combined terrestrial and aquatic rehabilitation shall meet the intent of 4.3.2.5 (c).</p>	<p>There is no mention or discussion of this policy in the NER, and based on the information provided about the rehabilitation plan, it is not clear that the aquatic areas will be rehabilitated to <i>aquatic enhancement</i>, which shall be representative of the natural ecosystem in that particular setting or ecodistrict. There do not appear to have been any aquatic components incorporated. See also 4.3.2.5.(c)</p>
	<p>4.3.2.6: <i>Final rehabilitation in the Natural Heritage System will meet these additional provisions:</i> <i>[a) where no underwater extraction...]</i></p>	<p>4.3.2.6 There is very little discussion of the rehabilitation plan from an ecological perspective, and little detail to indicate that the ecologists had specific input into its objectives or to the selection, design and integration (on or off site) of various habitat elements.</p>
	<p><i>b) Where there is underwater extraction, no less than 35% of the non-aquatic lands of each license is to be rehabilitated to forest cover, which shall be representative of the natural ecosystem in that particular setting or ecodistrict</i></p>	<p>b) According to the area calculations provided in Section 7.7, the forest cover area requirements are addressed. However, the interpretation that the total rehabilitation area includes the retained valley area based on its inclusion in the proposed License area requires verification from MNR. The actual replanted vegetation area is quite small in relation to this overall area. The NER does not specifically discuss whether or not the revegetation plan addresses this policy, nor does it provide any real detail about the revegetation plan. The NER does not provide any indication that the ecologists had a role in development of the rehabilitation plan in order to ensure that it <i>shall be representative of the natural ecosystem in that particular setting or ecodistrict</i>. Conformity requires further review and verification.</p>
	<p><i>c) Rehabilitation will be implemented so that the connectivity of the key natural heritage features and the key hydrologic features on the site and on adjacent lands will be maintained or restored, and to the extent possible, improved.</i></p>	<p>c) There is no comprehensive analysis provided demonstrating that the rehabilitation will be implemented such that <i>connectivity of the key natural heritage features and the key hydrologic features on the site and on adjacent lands will be maintained or restored, and to the extent possible, improved</i>. There is no clear and comprehensive demonstration that the water resource system will be protected or enhanced, and some uncertainty based on the information provided that the characteristics of the key features <i>will be maintained or restored and to the extent possible improved to promote a net gain of ecological health</i>. There appears to be some potential for residual impacts based on the information provided. Further, there is no clear characterization or any real discussion of the existing/pre-quarrying connectivity between <i>key natural heritage features and the key hydrologic features on the site and on adjacent</i></p>

		<p><i>lands</i> to begin with, making it more difficult to assess whether or not connectivity will be restored.</p> <p>Given the lack of ecological detail around the rehabilitation plan, and the absence of any identified aquatic habitat components in the rehabilitation plan, verification that the aquatic areas remaining after extraction are <i>rehabilitated to aquatic enhancement</i> is not possible.</p>
Region of Peel OP	<p>...</p> <p>The subject site is located within the "Conceptual North-South Corridor/Bramwest Parkway Study Area on Schedule "E".</p> <p>The subject site is not in a Core Area of the Greenlands System in Peel on Schedule "A".</p> <p>With respect to the natural environment section 3.3.2.7 of the Official Plan requires that: <i>"...all extraction and processing and associated activities be located, designed and operated as to minimize environmental, community and social impacts"</i>.</p>	<p>Given the deficiencies and uncertainties in the impact assessment, and mitigation and monitoring plans presented in the NER, the project as presently detailed would likely fail to meet the general test of minimizing environmental impacts.</p>
City of Brampton OP	<p>The entire subject property is identified as Shale Resources on Schedule F (Urban Utilities and Resources) of the City of Brampton Official Plan. - Schedule A – 'General Land Use Designations' designates the Credit River tributary on-site as Open Space and as Valleyland/Watercourse Corridor on Schedule D – 'Natural Heritage Features and Areas'.</p> <p>Policy 4.5.7.1 of the Official Plan states that <i>"development and site alteration is generally not permitted within a valleyland or watercourse corridor unless it has been demonstrated that there will be no negative impact on the feature and its functions in accordance with the required studies"</i>.</p> <p>Section 4.5.23 also states that a minimum 10 m buffer to define the limit of development is required from all natural features to be protected.</p> <p>Schedules A and D both identify the subject property as being part of the Provincial Greenbelt/Protected Countryside. For</p>	<p>The assessment of the impacts associated with the 'site alteration' required to upgrade the existing valley and tributary crossing is not detailed/comprehensive enough to clearly demonstrate that there will be no negative impact on the features and functions associated with the valleyland and watercourse corridor.</p> <p>The minimum buffer from all natural features to be protected is <10 (as little as 1-2m in 2 locations, and an average of 15 m making it difficult to determine if there are more than 2 areas where the buffer is <10m) along portions of the retained valley and forest feature. See Greenbelt Plan policy review.</p>

	<p>these lands, applicable policies include the Natural Heritage System, Water Resources Systems, Key Natural Heritage Features and Key Hydrologic Features, and External Connections as provided in the Greenbelt Plan.</p> <p>The creek valleyland is designated on Schedule "A" as Open Space.</p> <p>...</p> <p>Development approval in the North West Brampton Urban Development Area must be preceded by subwatershed studies, terrestrial landscape analysis, determination of natural heritage system, secondary plan, environmental implementation report for block plan areas, block plans, other growth management considerations.</p>	
<p>Endangered Species Act</p>	<p>In the case of Butternut, Section 5(1) of Regulation 242/08 states:</p> <p><i>5. (1) Clause 9 (1) (a) of the Act does not apply to a person who kills a butternut tree that occurred naturally if, in the opinion of a person or member of a class of persons designated by the Minister, the butternut tree is affected by butternut canker to such a degree that it is not necessary to retain the tree at its current location to support the protection or recovery of butternut.</i></p>	<p>There are inconsistencies in the mapping of Butternut locations between the NH report figures and the Site Plan – Existing Features. MNR delineation of Significant Habitat and inconsistencies between the text and mapping. ESA permitting requirements with respect to Butternut need to be addressed.</p> <p>While we agree that no technical guidelines are currently available from the MNR to determine significant habitat of Butternut, we are not familiar with the interpretation in the report (p 40) that refers to habitat being only "<i>the land area that lies immediately beneath its canopy</i>". This limited area might not necessarily be sufficient for the maintenance, survival and/or recovery of the population (PPS 2005). No reference for the interpretation is provided in the NER.</p> <p>Transplanting of several Butternuts that are proposed for removal for the haul road upgrade is identified, however it is not clear whether the MNR has been contacted to confirm whether a permit under the Endangered Species Act is required (and whether associated measures to provide "overall benefit to the species" are also required). No details regarding the transplant are provided (e.g. development of a plan to tend and monitor these transplants to ensure successful establishment at their new location), or an explanation as to when and where this information will be provided. No monitoring is proposed for</p>

<p>CVC – Ontario Regulation 160/06 (2006)</p>		<p>the transplanted trees.</p> <p>NOTE – have not included since as we understand it, a Permit under CVC's Regulation is not required for aggregate extraction that will be approved under the ARA.</p> <p>However, the proponent has consulted with CVC in delineating the top of slope, and presumably will consult with CVC regarding the Fisheries Act and minor drainage feature removals, enclosure of Drainage Feature B1, and water mitigation plan to protect the main watercourse features and associated fish habitat.</p>
<p>Fisheries Act</p>		<p>Minor drainage features that are removed and Drainage Feature B1 that is enclosed are deemed to be indirect fish habitat (although the possibility that shifting the boulders at the culvert might enable seasonal direct use was not assessed). While appearing reasonable, the removal and enclosure effects require review and approval by review agencies (and would benefit from additional detail).</p> <p>The potential impacts of the project to the water system that supports the Main Tributary and associated features are not fully identified by the information provided in the NER, either during excavation or rehabilitation. There appear to be deficiencies in the mitigation and monitoring plan to protect those features based on information provided. Ultimately the implications of the works proposed under the application, the mitigation and monitoring plan for the retained features and any residual implications of excavation on those features in consideration of the proposed mitigation still require review by approval agencies, and would appear to require additional detailing to be acceptable.</p>



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