Gravel WATCH ONTARIO

Feb 2, 2025

Submission to ERO: 019-9388
Town of Caledon- Approval to amend a municipality's official plan

Gravel Watch Ontario (GWO) is a province-wide coalition of citizen groups and individuals that acts in the interests of residents and communities to protect the health, safety, quality of life of Ontarians and the natural environment in matters that relate to aggregate resources. Formed in 2003 we have over 20 years of experience assisting both communities and government agencies in matters related to aggregate.

GWO appreciates the opportunity to comment on ERO 019-9388 Town of Caledon- Approval to amend a municipality's official plan.

We commend the Town of Caledon for acknowledging that aggregate operations have a wide scope of negative impacts on human health and communities in general. The majority of our response will be in regard to air quality due to the size and scope of the document. Before we dive deep into that topic, we want to briefly communicate our overall impression of the document.

- GWO supports, in principle, that contemporary regulatory standards and modern policy be applied across all aggregate operations and sites, and that better than minimum standards or minimum levels of mitigation be achieved to minimize social, economic and environmental impacts from mineral aggregate extraction.
- To conform with the D6 Guidelines for Class III industrial operations (see GWO comments ERO 019-2785 Land Use Compatibility), the area of influence (AOI) for a licenced aggregate operation be defined as 1,000 meters and that sensitive receptors and potential impacts on the natural, agricultural or built environment be identified and addressed within the area of influence (AOI). While we agree with the changes to "areas of influence" in this amendment, **the plan should also protect existing sensitive receptors from new pits and quarries.**
- The Senate of Canada has recently released a report "Critical Ground: Why Soil is Essential to Canada's Economic, Environmental, Human, and Social Health" detailing the status of soils across the country. We would encourage the Town to review that report to strengthen the amendment's policies on soil movement and rehabilitation.
- We have an overall concern that the OP Amendment mixes Zoning and ARA regulated items. According to the ARA, Zoning must be in place before a license can be issued. This allows for focus on the planning decision under the Planning Act (i.e. is this a good place for a pit/quarry or not, will it create an incompatible land use or not, is ground water threatened by this proposal or not, etc…).
- Throughout this Caledon OP Amendment there are references to the "Site Plan". This provides an opportunity for us to raise an issue we have recognized across the province. While the site plan is cited for planning purposes, the fact the Ministry of Natural Resources fully manages the site plan after licensing means that any notes, details, etc… included in the Site Plan can be altered, deleted, or otherwise amended. This renders its use as a planning instrument under the

planning act moot. Therefore, while making a planning decision the Town should not rely on notes and conditions cited on the site plan and should instead structure its OP and zoning regulations to decide if the site is appropriate for aggregate extraction under the Planning Act without condition. Only after this has occurred should the Aggregate Resources Act application process be entered.

Air Quality Comments

Before a new aggregate extraction facility is permitted to operate, the proponent requires a municipal zoning bylaw approval according to the Planning Act, and, if the bylaw is approved, a licence to operate according to the Aggregate Resources Act, issued by the Ministry of Natural Resources.

The zoning bylaw approval requires that the proponent prepare and submit several study reports supporting the application, documenting how the proposed operation would be compliant with all legal, regulatory and policy requirements. The bylaw review and approval process requires that the proponent demonstrate that:[1]

> 5.2.4.1 Development applications to permit a new mineral aggregate operation, expand an existing operation, or increase the depth of extraction, will only be permitted where the following studies have been submitted to the satisfaction of the Township, the Region or the appropriate agency having jurisdiction over the issue addressed by the study:
>
> a) noise, dust and vibration studies demonstrating that the proposed operation is appropriately designed, buffered and/or separated from any surrounding sensitive land uses to prevent any adverse effects.

The licence approval in turn requires that the proponent develop and follow a Best Management Practices Plan (BMPP) for dust.

The Auditor General of Ontario in their December 2023 Report "Value-for-Money Audit: Management of Aggregate Resources" found that:[2]

> "The Ministry did not have effective systems and processes in place to ensure compliance with the Aggregate Resources Act and aggregate-related regulations, policies and approvals, nor to oversee aggregate development and operations in a manner that minimizes adverse impacts on the environment.
>
> The limited number of experienced inspectors who play a front-line compliance role, and the infrequency with which aggregate operations are inspected, raise significant concerns that non-permissible activities will remain unchecked - perhaps for years on end. The intention of the

[1] Excerpt from the Township of North Dumfries Official Plan. Similarly, studies of hydrology, transportation impacts, environmental impact, archeological and/or heritage impacts, and rehabilitation are required. Such requirements are generally specified in other municipal official plans across the province.
[2] https://www.auditor.on.ca/en/content/annualreports/arreports/en23/AR_mgmtaggregates_en23.pdf

self-compliance approach is to encourage operators to proactively self-identify, disclose and rectify any issues of non-compliance. The success of this approach rests upon the premise that operators who fail to self-disclose issues of non-compliance (that are subsequently identified through complaints or Ministry inspections) will be more harshly penalized than those that do. Through our audit, however, we have found that this was not the case.

We also found that the Ministry was not ensuring that land from which aggregates are fully extracted is rehabilitated effectively and in a timely manner. The number of sites that have remained dormant and unrehabilitated for more than 10 years, and in some cases for over two decades, challenges the notion within the Provincial Policy Statement that aggregate extraction is an interim use of land. This has also given rise to public concerns that more than enough aggregate sites have already been approved, and there is no need to issue more approvals for extraction. Also feeding into these concerns, the Ministry did not have reliable data about supply and demand, further compounding perceptions of an oversupply. Finally, we found that the Ministry was missing opportunities to increase the use of recycled aggregate, which can be an effective way to reduce the need for new or expanded pits and quarries and limit impacts on the environment."

The following are some observations from a review of a few dust study reports (i.e. Air Quality Impact Assessment Reports – AQIARs) submitted in recent years in support of new aggregate operations, as a preamble to our more specific comments on the ERO posting.

Preparation of AQIARs involves the following steps:

- Identifying contaminants of potential concern (COPC) and estimating emission rates considering onsite control by means of the BMPP,
- Dispersing emissions of COCP in the atmosphere using models and meteorological and terrain data sets provided by the Ministry of the Environment,
- Establishing the existing baseline air quality at the proposed site,
- Combining the modelled and baseline concentrations and comparing the total annual mean and 98th percentile against Ambient Air Quality Criteria (AAQC),
- Concluding whether there would be adverse health effects by comparing predictions to the AAQC, and
- Sometimes, for example when community groups raise concerns, preparing and submitting a Human Health Impact Risk Assessment.

We offer the following comments on this methodology based on a review of the key references underlying the approach.

Emissions and Baseline Concentrations

COPC emissions from proposed pits include:

- Dust from aggregate extraction, processing, onsite storage, loading and transportation to market and operation of diesel equipment, including tire debris and heavy metals,
- NOx and polyaromatic hydrocarbons (PAH) from diesel equipment, and
- Vapours from diesel fuel and dust suppressant chemicals.

US EPA references are used extensively to estimate emissions.[3] [4] EPA provides equations for the various activities, along with adjustable parameters and levels of confidence (excellent to poor) of the estimates depending on, among other things, the number of tests used in deriving the factors and the extent to which the proposed site has been characterized, for example the silica content and moisture of the bulk aggregate.[5] Proponents in Ontario usually use the EPA typical values for these parameters in the equations instead of measuring the values of the aggregate to be extracted. This introduces significant uncertainty in the estimates.[6]

Proponents also use US EPA references in developing the BMPP and invariably conclude that the onsite dust control efficiency is as high as 90 – 95%. Environment Canada's National Pollutant Release Inventory (NPRI)[7] also specifies equations for calculating dust emissions from unpaved roads which are well below 90% and instead vary from 55 to 80%, depending on the dust attenuation technique used. This suggests that proponents may be underestimating emissions from unpaved roads by 2 – 4.5 times. Similar uncertainties are introduced in estimating dust emissions from other sources such as storage piles which are constantly being worked (processed aggregate dropped from conveyors and removed for transport to market). Some proponents assume efficiencies of 80% for these operations whereas EPA states that[8] watering is useful mainly to reduce emissions from vehicle traffic in the storage pile area. Continuous chemical treating of material added to the pile is required to achieve any control from this source. It is not clear the extent to which Ontario operators follow this practice.

The baseline concentration of a COPC at a proposed site is made up of a truly regional background and contributions from non-subject local sources which have not dispersed sufficiently to blend into the regional background (see references at footnotes 6 and 9).[9] Proponents do not measure existing baseline concentrations of COPC at the proposed site and, instead, rely on government data collected at the nearest Air Quality Health Index (AQHI) monitoring station.

[3] https://www3.epa.gov/ttnchie1/ap42/ch11/final/c11s19-1.pdf
[4] https://www3.epa.gov/ttnchie1/ap42/ch11/final/c11s1902.pdf
[5] https://www.tandfonline.com/doi/pdf/10.3155/1047-3289.59.11.1287
[6] https://www.iaia.org/downloads/Guiding%20Principles%20for%20Air%20Quality_2_1.pdf
[7] https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/report/sector-specific-tools-calculate-emissions/road-dust-unpaved-surfaces-guide.html
[8] https://www.epa.gov/sites/default/files/2020-10/documents/13.2.4_aggregate_handling_and_storage_piles.pdf
[9] https://open.alberta.ca/publications/air-quality-model-guideline-2021

The AQHI Network measures O3, PM2.5, NOx, SO2 and CO. Proponents estimate PM10, Total Particulate Matter (TPM) and silica from the measured PM2.5 using conversion factors developed by analysing US urban monitoring data.[10] These conversion factors are very imprecise and furthermore, results of a similar analysis of Canadian data[11] are not used.

The subject of baseline concentrations is addressed in Guidelines for Air Quality Dispersion Modelling in British Columbia[12] which recommends three approaches in decreasing order of preference:

- a network of long-term ambient monitoring stations near the source under study.
- long-term ambient monitoring at a different location that is adequately representative, and
- modelled background.

The above indicates that estimates of emissions and baseline air quality at a proposed new aggregate facility can be very imprecise. To reduce this uncertainty proponents can monitor baseline concentrations at the proposed site, characterize the silica and moisture content of the aggregate resource, the silt content of nearby haul roads, etc. This is not usually done. Considering such uncertainties, proponents should evaluate potential adverse effects using conservative assumptions, not the most optimistic values mentioned in the literature.

Dispersion Calculations

The dispersion models and the weather and terrain data sets used by proponents are generally accepted. However, the application of the model and data sets as well as the post-processing to derive the annual mean and 98th percentile values need to be done by competent individuals (see reference at footnote 9 for the required competencies).

Assessment of Health Effects

Some of the COPC are carcinogenic; this includes PM2.5, specifically crystalline silica and Diesel PM, and PAHs. These substances are referred to as non-threshold substances for which the appropriate tool for determining possible health effects is a Quantitative Human Health Impact Risk Assessment QHHIRA).[13] [14] QHHIRAs evaluate short- and long-term risks to people living near the proposed facility (e.g. cancer risk over decades of exposure, as well as shorter-term effects on sensitive individuals – the young and elderly, asthmatics, etc.) As mentioned earlier, this is not the general practice in Ontario.

[10] https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.files/fileID/13226
[11] https://hero.epa.gov/hero/index.cfm/reference/details/reference_id/82846
[12] https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/bc_dispersion_modelling_guideline.pdf
[13] https://publications.gc.ca/site/eng/9.870475/publication.html
[14] https://eupha.org/repository/sections/HIA/Human%20Health%20Ensuring%20Protection%20Main%20and%20Appendices.pdf

Occasionally, when proponents prepare an HHIRA they use the health risk-based threshold method. A more appropriate method for carcinogenic COPC is a quantitative risk assessment.

Ontario's Ambient Air Quality Criteria website[15] states that: "Since AAQC are based on a review of scientific information about the effects of contaminants on health and the environment, they may be modified from time to time based on new or relevant scientific information." The current values for PM2.5 are the same as the Canadian Air Quality Standards (CAQS) for 2020, that is 8.8 ug/m3 annually and 27 ug/m3 over 24h. The CAQS for O3, NO and SO2 are scheduled to be lowered in 2025 but not PM2.5.[16] The World Health Organization (WHO) also issues Air Quality Guidelines[17] for PM2.5; their guideline values for PM2.5 are 5 ug/m3 annually and 15 ug/m3 over 24h.

It appears that based on current evidence, PM2.5 should not exceed 5 ug/m3 annually and 15 ug/m3 over 24h to protect against adverse effects but, given the existing annual background levels in Ontario (6 – 9 ug/m3 annually across Ontario)[18] and elsewhere in Canada, governments are reluctant to adopt more stringent requirements.

Health Canada published the Health Impacts of Air Pollution in Canada 2021 Report[19] which estimated that 15,300 premature deaths occur annually in Canada due to exposure to air pollution. This is equivalent to 42 premature deaths per 100,000 Canadians.

[15] https://www.ontario.ca/page/ontarios-ambient-air-quality-criteria
[16] https://ccme.ca/en/air-quality-report
[17] https://www.who.int/news-room/feature-stories/detail/what-are-the-who-air-quality-guidelines
[18] https://www.ontario.ca/document/air-quality-ontario-2022-report/10-year-trends-and-annual-results#:~:text=%E2%82%85%20annual%20means%20across%20Ontario%2C%202013%2D2022&text=This%20is%20a%20line%20graph%20showing%20the%20trend%20of%20fine,over%20this%2010%2Dyear%20period.
[19] https://www.canada.ca/en/health-canada/services/publications/healthy-living/health-impacts-air-pollution-2021.html

Recommendations for Government

Based on the above discussion we recommend that:

- The Ministry of Municipal Affairs and Housing support the air quality section of Caledon's Official Plan amendment,
- The Ministry of Natural Resources implement the recommendations of the December 2023 Auditor General's report on aggregates, and
- Both ministries request support from the Ministry of Environment, Conservation and Parks, and the Ministry of Health, for municipalities in:
    - Specifying to proponents that the determination of potential adverse effects of dust (and fly-rock, noise, and vibration) emissions on ambient air quality and health effects be done considering the recommendations in this submission,
    - Reviewing and endorsing AQIAR and HHIRA reports on behalf of municipalities and citizens,
    - Studying the cumulative impacts of aggregate operations at a location in the province with a cluster of other gravel operations, other industrial and transportation sources and a significant population,
    - Implementing Caledon's other proposed policies related to:
        - Monitoring and adaptive management,
        - Operational design, air quality and land use compatibility,
        - Blasting and fly-rock,
        - Social and impact assessment, and
        - Community engagement.
- The Ministry of Municipal Affairs and Housing acknowledges in their Oct 4th letter "The Town is supported, where appropriate, to go beyond the minimum standards set out in the PPS and provincial plans; however, it is important to recognize that the province maintains its regulatory role through the ARA on rehabilitation standards and practices". Due to the "Site Plan" being under control of Ministry of Natural Resources after the license is issued, we recommend Municipalities adopt and Ministry of Municipal Affairs and Housing approve the use of a separate planning document to allow the appropriate Planning Act related conditions of Zoning approval to be recorded in a manner that cannot be modified via an amendment under the Aggregate Resources Act.