Review of an Application for s.6 Approval Under the Oakville Health Protection Air Quality Bylaw 2010-035, Submitted by Greif Bros Canada Inc.

Review conducted by:

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Introduction

On February 1, 2010 the Town of Oakville (the "Town") enacted the Health Protection Air Quality (HPAQ) Bylaw 2010-035 to help protect Oakville residents against the harmful effects of airborne $PM_{2.5}$ (Fine Particulate Matter, or FPM).

The bylaw contains two main elements; an air emissions reporting requirement for facilities in Oakville, and a major-source permitting requirement. The permitting requirement, stipulated under s.5 (for proposed facilities) and s.6 (for existing facilities), requires that facilities that are "major emitters" of FPM and precursor substances within Oakville conduct an air quality impact assessment. If the impacts of FPM exceed a town screening threshold, then the facility must conduct a health impact assessment, and also, lower its emissions and/or present its case before the public and Town Council to seek approval for its emissions. The Town requires an assessment of average and maximal impacts of emitted FPM in order to inform Council on the range of impacts expected by such a facility; Council will then take this range of impacts (including any health impacts) into consideration in rendering its decision.

The Applicant is Subject to the Permitting Requirements Under the Bylaw

Greif Bros Canada Inc. (Greif) is an existing operation within Oakville that meets the bylaw definition of a "facility." Also, being a "major emitter," Greif has applied for approval of facility emissions under the Oakville HPAQ bylaw; Grief were aided by consultants Orthech Consulting Inc. (Ortech) and Novus Environmental Inc. (Novus). The Applicant indicated that the facility was a major emitter of directly emitted FPM and volatile organic compounds (VOCs). Therefore, the facility is subject to the permitting requirements under s.6 of the bylaw for those two substances.

The Applicant facility, or any part thereof, is not identified as a sensitive receptor (as per s.3.2.1.4 of the Town Guide); therefore, an assessment of impacts on the facility property as well as a separate assessment of impacts at receptors on the building itself is not required.

Town Guidance Available and Provided

In addition to the bylaw, the Town provides guidance documents to assist applicants in meeting the requirements of the bylaw. Specifically, the "Guidance for Implementation of Oakville Health Protection Air Quality By-Law 2010-035 Section 5 and 6 and approval requirements for

major emitters v. 5 June 2011" (henceforth the "Town Guide") and the "Section 5/6 comments table for focus group."

In addition, the bylaw (s.5.(2)) "encourages a potential applicant to consult with the Town to receive input on whether the facility is likely to be a source of a major emission and, if so, on appropriate methods of addressing application requirements." A pre-application consultation was not held between Greif, Ortech/Novus and Town staff.

Phase 1 Application Completeness Review Conducted

The Application was received by Town staff on 31 October 2012 and the Phase 1 review for Application completeness was initiated. A finalized version of the Application was submitted electronically by Ortech on 31 July 2013 and electronic modelling files were supplied on 31 July 2013. Phase 1 of the review process was completed on 20 August 2013.

Subsequently, an initial technical review of the modelling files was conducted and an initial set of comments and questions was supplied to Ortech. A response to these comments and questions was submitted by Ortech on 2 December 2013. This final review report is based on the responses to these questions, as well as the submitted files dated 31 July 2013.

Summary of Phase 2 Peer Review of Application Documents

Section 9(2) of the Bylaw requires that the reviewer communicate the results of the review based on items 3(a) to (e) of section 6 of the bylaw in a "peer review report." This report constitutes the review report that is "not to exceed 10 pages, excluding appendices, which sets out, in concise, non-technical language the results of the review on items 3(a) to (e), of section 5 or 6 of this by-law."

This section includes a summary of the Phase 2 review but more detail is provided in the Appendices to this report. The Appendices also contain a checklist of application materials required versus those supplied by the Applicant, as well as a review of the pollutant dispersion modelling assessment.

The overall conclusion of the review is that the Applicant has shown that the indicated impacts from the facility are below the Town threshold of 0.2 µg m^{-3} (annual basis) and so there is no requirement for a health impact assessment or any appraisal required for mitigation of emissions.

It should be made clear to all reviewing the application that all of the following documents should be reviewed, and in this order:

1. Application submitted 31 July 2013 (and corresponding modelling files),
2. Information Letter submitted 2 December 2013, and
3. This Final Peer Review Report.

This is necessary in order to ensure that those reviewing the application have a proper understanding of the application and corresponding modeling results. This could be done via a cover letter attached to the front of the application.

Sincerely,

Lucas Neil, Ph.D.
Air Quality Scientist
Airzone One Ltd.

Appendix 1: Provision of Application Material by Applicant

Application Item	Elaboration of Application Item	Applicant Submissions and Commentary
1. Executive Summary	Provide a summary of the application: The proponent, the facility, the project, the conclusions and the bases for the assessment of the application.	Provided (p.7 of Application report).
2. Introduction	Background to the project.	Provided (p.8 of Application report).
3. Facility Description	The description must include the following items, together with a brief description of the basis for the information provided:	
3.1 Overview	Details of the nature of the facility, including what the facility produces.	Provided (p.8 of Application report).
3.2 Location	Provide facility address and at least two separate maps with: (i) the facility's general location in the town; and, (ii) details in the environs within 3 km of the facility (site). All maps must clearly identify the facility and its surroundings. The detailed map(s) should include nearby significant sources (e.g., highways, major roads) of FPM and precursors and sensitive receptors (e.g., health care facilities, schools and residential areas). All maps must be in UTM/WGS84 datum coordinates. These maps may be used to provide base maps for concentration and risk contour mapping results.	Provided (p.8 of Application report).
3.3 Buildings	Provide drawings and other information to identify on-site or off-site buildings that could influence near field plume dispersion (building downwash). The building data must be consistent with that used in dispersion modelling to assess building downwash.	Provided (p.8 of Application report).

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3.4 Raw materials, Products and Processes	(i) Identify any raw materials that are relevant to estimating health-risk air pollutant air emissions;	Provided (p.9 of Application report).
	(ii) Identify all processes (including a simplified process flow diagram) that are relevant to the air contaminants emitted from the facility;	Provided (p.9 of Application report); Process flow diagram provided in Attachment B of Application.
	(iii) Provide the maximum and average daily, monthly and annual process flow-through rates for any processes that may contribute to the major emission;	Provided (Attachment A of 2 December 2013 Information Letter).
	(iv) Provide information on the variability of process rates on an annual basis;	Provided (pp.9-10 of Application report).
	(v) Provide the hours of operation (hours/day, days/week, weeks/year) for average and maximum operational activity;	Provided (p.9 of Application report).
	(vi) Provide the relationship between the average and maximum process rate(s) and operating conditions/hours of operation;	Provided (p.9 of Application report).
	(vii) Provide information on the variability of production rates around the average;	Provided (pp.9-10 of Application report).
	(viii) Set out the planned maintenance periods	Provided (p.10 of Application report).

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3.5 Emission Sources and Processes	(i) Identify all sources (point, fugitive/area, line etc.) at the facility.	Provided (pp.10-11 of Application report).
	(ii) Include drawings of the facility and other information (text) to allow identification of all sources and processes at the facility.	Provided (Attachment B of Application report).
	(iii) Include a table with the identification/ID code, SCC codes and the annual average and maximum emissions of health-risk air pollutants for each source.	Provided (Table 4 of Application report).
3.6 Emission Control Equipment and Procedures and Emissions Monitoring	(i) Summarise all relevant existing emission control devices (on stacks/vents) and emission or pollution prevention practices.	Provided (in Table 5 an Attachment C of Application report).
	(ii) Associate each device/measure with pollutants emitted and emission sources.	Provided (in Table 5 of Application report).
	(iii) Indicate the control efficiency for each device/practice.	Provided (in Table 5 an Attachment C of Application report).
	(iv) Indicate all continuous emission monitoring (CEM) and other monitoring to determine the effectiveness or efficacy of emission control(s).	Provided (on p.13 of Application report).

Application Item	Elaboration of Application Item	Applicant Submissions and Commentary
3.7 Identification and Quantification of Substances Released to Air	(i) Identify all health-risk air pollutants that would be emitted (proposed facilities) or are emitted (existing facilities) above major emission levels – be sure to include relevant speciated VOCs and directly emitted FPM. (ii) Quantify the average and worst-case rates of daily and annual emissions during operations and the operating conditions that lead to these emissions. (iii) Indicate the methods used to estimate emissions and provide detailed calculations and scenario descriptions.	Provided (in Table 6 of Application report). Provided (on p.9 and in Table 4 of Application report). Provided (in Attachment D); however, some clarifications required.
4. Evaluation		
4.1 Modelling Approach and Model Selection	The full model report, and electronic files with all model inputs and outputs, are to be provided as supporting material to the application – see below.	
4.2 Model Inputs	Indicate that an electronic file with all model inputs and outputs has been provided (see below).	Provided with Application.

Application Item	Elaboration of Application Item	Applicant Submissions and Commentary
4.2.1 Facility Emissions Estimate Requirements / Estimation Methods (same as ESDM)	Summarise/tabulate (previously defined) emission scenarios and operating conditions that give rise to: (i) average and worst-case annual emission rates, (ii) frequency with which emissions within 90% of the worst-case emissions levels may occur (as per s.3.2.1.2) (iii) variability around the average emission rates	 Provided (as above) for CALPUFF modelling. Provided (on p.9 of Application report). Provided (pp.9-10 of Application report).
4.2.2 Meteorological Data Background Concentrations (ozone, NH_3, FPM), Chemistry Model(s) Used Species Modelled, Grids, Special Receptors Identified	Refer to the model input checklist provided in the Appendix 6.5. Deviations from defaults must be fully explained.	 Provided (Attachment C of 2 December 2013 Information Letter). See comments below.

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5. Mapping	Present these as: a) Model numerical outputs must be provided in the form of Summary Values tables as described earlier.	Summary Values Table was provided as Table 7.
	b) For FPM, provide concentration contour maps of appropriate scale(s) showing concentration contours within the affected airshed (also identifying the boundaries of Oakville - co-ordinates will be supplied by the Town), for each emission scenario, for: i. the TFI FPM concentration, AND, ii. the cumulative FPM concentration when the TFI concentrations and the background FPM concentration are added, resulting in a total of four (4) maps and four (4) values. The following are suggested levels for concentration contours: • ≤ 0.2 µg m^{-3} increments for the annual predictions of FPM concentrations. Concentration contour maps should be superimposed on suitable base maps (base maps which also show the locations of sensitive receptors) and locations of maxima (as per the Summary Values table). In providing the concentration isopleths for the worst-case scenario, applicants should indicate (as per s.3.3.3) the frequency with which emissions will be within 90-100% of the worst-case emissions levels.	Provided as Figures 1 to 4.

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6. Health Risk Assessment	Assessments of the public health effects due to the increment caused by the proposed (or existing facility) are required if an affected airshed is formed as a result of facility emissions within the boundaries of the town. Results are to be presented as described in Section 3.4. For health-risk, provide contour maps of appropriate scale(s) showing risk contours at 1 per 100,000 premature death increments based on the annual predictions of risk within the affected airshed for the average and maximal emission scenario, for: i. the TFI risk, AND, ii. the cumulative risk when the TFI concentrations and the background concentrations are added (using the background risk file). The boundaries of Oakville should be clearly identified based on co-ordinates that will be supplied by the town. Risk contour maps should be superimposed on suitable base maps which show the locations of sensitive receptors and locations of maxima (as per the Summary Values Table). In providing the health risk assessment for the worst-case scenario, applicants should indicate (as per s.3.4.1 & s.3.4.2) the frequency with which emissions within 90-100% of the worst-case emissions levels may occur.	The Applicant indicated that impacts were below the Town's 0.2 µg m^{-3} (annual) threshold value and so no health risk assessment was conducted.

Application Item	Elaboration of Application Item	Applicant Submissions and Commentary
7. Appraisal	Appraise any measures available to the facility that would reduce risks to public health (if an affected airshed is created within the boundaries of the town), including the costs and other implications of implementing such measures, including: 1. List existing emission control technologies. 2. List all additional control technologies that could be used. 3. List any existing emission mitigation plans. 4. List any potential additional emission mitigation techniques. 5. Eliminate any technically-infeasible options and provide the basis for the elimination of the option. 6. Appraise the effectiveness of the remaining control technologies and mitigation techniques. 7. Determine costs (capital and annual operating) and the control effectiveness of remaining control technologies and mitigation techniques. Indicate which control technologies and mitigation techniques will be implemented and provide the rationale for the choice of technologies and techniques.	The Applicant indicated that no affected airshed was caused and therefore no significant health impact. No Appraisal was provided.
8. Additional Information	An applicant may wish to supply additional information if: it seeks an approval on the basis that the public interest favours allowing the major emission of the facility to occur.	No additional information was provided.

Appendix 2: Detailed Technical Critique of Application for Approval

Specific to All CALPUFF Runs

Application Item 4.2.2: Model Grid Size:

The Applicant used EPA default 25x25 grid, 4 km grid size, instead of Town default 100x100 grid, 1 km grid size. The sampling grid can be nested to create additional receptor points (sampling nodes) throughout the meteorological grid. While the sampling grid can be a nested grid of the meteorological grid, it is expected to have little impact on the results. The Applicant is not required to change this option.

Application Item 4.2.2: Deposition:

The Applicant did not invoke deposition, which is the EPA default method. Section 3.2.1.3 of the HPAQB guidance document provides non-EPA default options as determined by the Town of Oakville. The implication of this guidance is that all other variables and options should be set to EPA default values. By not invoking deposition the Applicant will be assuming a worst-case scenario with regards to deposition; therefore, the Applicant is not required to change this option.

Specific to Mesopuff CALPUFF Runs

Application Item 4.2.2: MESOPUFF Chemistry:

The Applicant included SO_2 and NOx in the FPM model, and invoked the MESOPUFF chemistry module, despite not being a major emitter for either contaminant. Analysis of these emissions was not required. However, since this provides a conservative estimate of air-borne concentrations of FPM, the applicant has chosen to leave this setting. The Applicant is not required to change this option.

Application Item 4.2.2: Wind Speed Profile:

The Rural Wind Speed Profile (variable PLX0) was used instead of the default Urban Wind Speed Profile. The CALPUFF model uses the PLX0 variable regardless of the dispersion option selected. Therefore the Applicant's explanation of use of a non-Town-default Wind Speed Profile is not applicable. However, given the modelling scenario, this variable is not expected to have a significant impact on the results. The Applicant is not requested to provide further explanation for the deviation.

Application Item 4.2.2: Plume Path Coefficients:

The default values for the Plume Path Coefficients (variable PPC) were not used. While the Applicant's explanation for the use of non-default options is not fully rationalized, they are not required to submit further explanation as this variable is not expected to have a significant impact on the results in this scenario.

Application Item 4.2.2: Background Ozone:

The Applicant used non-Town default values for background ozone (variable BCKO3). The Applicant used a background value of 40 ppb (default = 80 ppb). The background values are used within CALPUFF to replace missing data points within the ozone background data file (ozone.dat). Therefore, the BCKO3 values will have an impact on model results. However,

given the completeness of the provided background ozone file, the non-default value of 40 ppb is expected to have little impact on the modelling results in this particular case.

Application Item 4.2.2: Stack Diameters:
The stack diameters for sources S11-20 to S11-25 are set to 0.001 m in the model, but are listed as 0.1 m in the report dated 31 July 2013. The Applicant corrected the typos in the model and updated the model results, which were presented in the 2 December 2013 information letter.

Application Item 4.2.2: Emission Rates:
Emission rates for sources S11-1 to S11-25 entered into the model did not match the calculated emission rates listed in the report date 31 July 2013. The Applicant corrected the typos in the model and updated the model results, which were presented in the 2 December 2013 information letter.

Specific to SOA CALPUFF Runs

Application Item 4.2.2: BPIP:
The Applicant invoked BPIP-Prime building downwash, which is not the Town-default method. The Applicant did not provide adequate explanation for the deviation. However, the Applicant corrected the modeling as part of the results presented in the 2 December 2013 information letter.

Questions Specific to CALPOST

Application Item 4.2.2: Discrete Receptor Settings:
The Applicant did not have CALPOST set to select all discrete receptors (variable NDRECP). The Applicant corrected this error in the model and updated the model results, which were presented in the 2 December 2013 information letter.

Appendix 3: Verification of Model Output Results Produced by Applicant

The modelling files of the Applicant were reviewed and, except for the notes commented on in Appendix 2, are considered complete. The Applicant's results from the 2 December 2013 information letter could be duplicated. Therefore, this updated modelling is considered acceptable.