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May 21, 2013 **XCG File No. 5-2298-06-01**

Sent via Email: jlee@oakville.ca

Mr. Jeffrey Lee
Research Policy Analyst - Air
Environmental Policy
Town of Oakville
1225 Trafalgar Road
Oakville, ON L6H 0H3

Re: Peer Review – Phase 2 Review of Complete Application - Bronte Asphalt Plant Oakville Health Protection Air Quality By-Law Application for Approval

Dear Mr. Lee:

XCG Consultants Ltd. (XCG) has completed the Phase 2 Review of the Oakville Health Protection Air Quality By-Law (HPAQB) Application for Approval (Version 3), submitted by Dufferin Construction Company, a division of Holcim (Canada) Inc. (Applicant), for the Bronte Asphalt Plant located at 731 Third Line in Oakville, Ontario (the Facility).

Based on XCG's review, the Application has generally been prepared in accordance with the Town's document "*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*." The primary findings of the Phase 2 Review are presented below in tabular form in Table 1. Detailed comments are provided in Attachment A. Based on the findings there are a few points of clarification that should be addressed by the Applicant in the final document. However, these findings are not significant and will not change the overall assessment.

Based on the modelling results, the Facility does not significantly affect air quality in the existing airshed as the facility induced Fine Particulate Matter (FPM) concentrations are less than 0.2 micrograms per cubic metres annually, the criterion defined by the Oakville Health Protection Air Quality By-Law.

If you require any further clarification, please contact the undersigned at 519-741-5774.

Respectfully submitted,

XCG CONSULTANTS LTD.

Pamela Cameron

Pamela Cameron, B.A.Sc., P.Eng., EP(CEA), QPRA
Associate

Attachments: Table 1
Attachment A – Detailed Comments

TABLE

Table 1 Findings of the Phase 2 Review

Application Item	Elaboration of Application Item	Phase 2 Review Comments
1. Executive Summary	Provide a summary of the application: the proponent, the facility, the project, the conclusions, and the basis for the assessment of the application.	Included (p. i. of Application report)
2. Introduction	Background to the project.	Included in Section 1 of 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.	Included in Section 2.1.
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 kilometres of the facility (site). All maps must clearly identify the facility and its surroundings. The details 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.	Included in Section 2.2 and Figures 1 and 2. Figure 2 shows the land use zoning within a radius of approximately 1.5 km of the facility. Although this figure does not show the full 3-kilometre radius required by the By-Law, the zoning map clearly shows the presence of residential zoning within 450 metres of the facility. School zoning is present within 1 km of the facility. **The final document should show the 3-kilometre radius as required.** XCG has noted that The Sanctuary Church is located at 2009 Wyecroft Road, Oakville. This church is located in a commercial building located approximately 100 metres west of the facility. It does not appear that this church offers any day care activities, and is therefore not considered sensitive. Sources of FPM have been identified as the QEW, and other major arterial roads, as appropriate.
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.	Included description in Section 2.3. Figure 4 is an aerial photograph with emission sources identified. Figure 5 is an aerial photograph with building locations highlighted and maximum building heights noted. The maximum building heights noted on Figure 5 are consistent with the heights used in the dispersion modelling.

Table 1 Findings of the Phase 2 Review (Cont'd)

Application Item	Elaboration of Application Item	Phase 2 Review Comments
3.4 Raw Materials, Products, and Processes	• Identify any raw materials that are relevant to estimating health-risk air pollutant air emissions; • Identify all processes (including a simplified process flow diagram) that are relevant to the air contaminants emitted from the facility; • Provide the maximum and average daily, monthly and annual process flow-through rates for any processes that may contribute to the major emission; • Provide information on the variability of process rates on an annual basis; • Provide the hours of operation (hours/day, days/week, weeks/year) for average and maximum operational activity; • Provide the relationship between the average and maximum process rate(s) and operating conditions/hours of operation; • Information on the variability of production rates around the average; and • Set out the planned maintenance periods.	Included description in Sections 2.4, 2.7, and 2.8. Simplified Process Flow is included as Figure 3. Table 3 – Summary of Daily and Annual FPM Emission Rates. Provides a summary of the daily and annual average and worst case (maximum) FPM emission rates. The results presented in Table 3 are consistent with the daily and annual average emissions and daily and annual worst case emissions as calculated in Appendix C. (**Note the text in Section 2.6 incorrectly references Table 2 rather than Table 3.**) **The selection of the quantity of recycled concrete received (MH_03) on an average basis as defined in Appendix C of the report is unclear. XCG provides additional details in Attachment A below. Additional justification/explanation is required**. Table 4 – describes variability on an annual basis including a discussion of monthly variability. Table 5 and discussion pg. 9 – provides the basis of the average and maximum process rates. Hours of operation are provided. Other required information such as production schedule variability is provided.

Table 1 Findings of the Phase 2 Review (Cont'd)

Application Item	Elaboration of Application Item	Phase 2 Review Comments
3.5 Emission sources and processes	• Identify all sources (point, fugitive/area, line etc.) at the facility; • Include drawings of the facility and other information (text) to allow identification of all sources and processes at the facility; and • 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.	Included description in Sections 2.5 and 2.6. Table 1: Sources of FPM. Table 2: Summary of Daily and Annual FPM Emission Rates. Table 11, Table 12, and Table 13 show source type used for modelling, list of point sources, and virtual sources. Emission source locations are shown on Figure 4 (Identifiers included in Appendix C.). All of the final modelled sources are shown on Figure 4. There are some interim source identification names that are not shown on the Figure (e.g. BP-02, HMA Load Out, RH-01 to RH-11, etc). These sources are modelled using one of the final modelled source identifications as summarized Appendix C. Tables in Appendix C show required data for each source.
3.6 Emission control equipment and procedures and emissions monitoring	• Summarize all relevant existing emission control devices (on stacks/vents) and emission or pollution prevention practices; • Associate each device/measure with pollutants emitted and emission sources; • Indicate the control efficiency for each device/practice; and • Indicate all continuous emission monitoring (CEM) and other monitoring to determine the effectiveness or efficacy of emission control(s).	Included description in Section 3 of text; specifically in Section 3.1.3, which includes Table 6 – Emission Control Practices. Other information provided in Table 7: Typical Control Efficiencies of Fugitive Dust Management. Appendix C includes the emission control/emission factors used for each source. **The emission control factors for the crushing and screening activities include the use of two control efficiencies. As discussed in more detail in Attachment A, it seems inappropriate to apply an additional control efficiency of 90% for applying a water spray during the crushing operation. This would affect sources RCC_01 and RCC_02. Please provide further justification or explanation.**
3.7 Identification and quantification of substances released to air	• 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 volatile organic compounds (VOCs) and directly emitted FPM; • Quantify the average and worst-case rates of daily and annual emissions during operations and the operating conditions that lead to these emissions; and • Indicate the methods used to estimate emissions and provide detailed calculations and scenario descriptions.	Included in Section 4, FPM only. Methods of estimation are summarized in text and referenced in Appendix C. Average and worst-case daily and annual emissions are summarized in text (Table 2) and details are included in Appendix C. **As discussed in Attachment A, there are several points for clarification in regard to the assumptions for the calculations of the average and worst case emissions from various sources. These points of clarification are for clarity purposes and will not significantly impact the results of the modelling.**

Table 1 Findings of the Phase 2 Review (Cont'd)

Application Item	Elaboration of Application Item	Phase 2 Review Comments
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.	Provided and discussed in Sections 5.1/5.2 and also Appendix D (provided on CD). XCG confirmed the modelling approach was appropriate and reproducible.
4.2 Model Inputs	Indicate that an electronic file with all model inputs and outputs has been provided (see below).	The complete electronic file with all model inputs and outputs was provided on compact disc (CD).
4.2.1 Facility Emissions Estimate Requirements/ Estimation Methods (same as ESDM)	Summarize/tabulate (previously defined) emission scenarios and operating conditions that give rise to: • Average and worst-case annual emission rates; • Frequency with which emissions within 90% of the worst-case emissions levels may occur (as per s.3.2.1.2); and • Variability around the average emission rates.	Included in Section 2.8, and summarized in Section 6. Section 6 includes a discussion of the frequency at which the facility would operate within 90% of the worst case emissions (less than 5% of the time). The discussion is supported by the previous production data and the conservative assessment of maximum condition. Section 2.8 shows the variability around the average production rates. The Batch Plant has had less than 10% variability in production between 2009 and 2011. The more variable portion of the operations is the recycle crushing operation. The recycle crushing operation contributes to a relatively small amount of emissions and therefore this variability will not significantly impact the overall facility emissions.
4.2.2 Meteorological Data Background Concentration s (ozone, NH3, FPM,), Chemistry model(s) used Species modelled, Grids, Special Receptors Identified	Refer to the model input checklist provided in Appendix 6.5. Deviations from defaults must be fully explained.	Section 5.3 summarizes model inputs and states that no non-default options were used.

Table 1 Findings of the Phase 2 Review (Cont'd)

Application Item	Elaboration of Application Item	Phase 2 Review Comments
5. Mapping	Present these as: a) Model numerical outputs must be provided in the form of Summary Values tables as described earlier. 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.	The Application indicated that the impacts were below the reporting threshold of 0.2 µg/m^3 and so no health risk assessment or mapping was completed.

Table 1 Findings of the Phase 2 Review (Cont'd)

Application Item	Elaboration of Application Item	Phase 2 Review Comments
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 to 100% of the worst-case emissions levels may occur.	Not Applicable.

Table 1 Findings of the Phase 2 Review (Cont'd)

Application Item	Elaboration of Application Item	Phase 2 Review Comments
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. 8. Indicate which control technologies and mitigation techniques will be implemented and provide the rationale for the choice of technologies and techniques.	Not Applicable
8. Additional Information	An applicant may wish to supply additional information if: it seeks an approval on the basis that the public interest favors allowing the major emission of the facility to occur.	None provided.

ATTACHMENT A

DETAILED TECHNICAL CRITIQUE OF APPLICATION FOR APPROVAL

ATTACHMENT A DETAILED TECHNICAL CRITIQUE OF APPLICATION FOR APPROVAL

3.4 RAW MATERIALS, PRODUCTS, AND PROCESSES

The Applicant has assumed that the amount of recycled concrete received on-site by truck and stored in outdoor storage piles prior to transfer to the asphalt batch plant was equivalent to the quantity of material crushed. The maximum quantity of the crushed concrete received at the plant was assumed to be 50 percent of the crusher capacity as discussed in Section 2.8 of the Application and as shown in the Tables in Appendix C. This maximum value of recycled concrete received (Material Receipt MH_03) was assumed to be 72,964 tonnes/year, which does not match the maximum amount of material assumed to be crushed in a year. When calculating emissions from crushing (RCC-001) a maximum value of material crushed was assumed to be 145,927 tonnes/year. Thus, it is unclear if the maximum condition assumed for crushed concrete receipt (MH_03) is sufficiently conservative, since the Applicant has indicated that maximum rate of crushing is145,927 tonnes/year. Please provide further justification/explanation.

The overall contribution of this source (MH_03) to the facility emissions is relatively small. XCG ran the model assuming that the maximum recycled concrete received was equal to the total maximum material crushed (145,927 tonnes/year). The resulting total maximum FPM emission did not significantly increase.

3.6 EMISSION CONTROL EQUIPMENT AND PROCEDURES AND EMISSIONS MONITORING

Appendix C – Activity - Emissions from Recycle Crushing Operations

The Applicant has applied emission factors from the US EPA AP-42 Section 11.9.2 Crushed Stone Processing and Pulverized Mineral Processing for Primary Crushing. The specific emission factors were taken from Table 11.19.2-1. The emission factor used were for Tertiary Crushing (controlled), 0.00005 kg/Mg PM-2.5, and for Screening (controlled), 0.000025 kg/Mg PM-2.5. As noted in the document (see Table 11.19.2-1 note b), controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. As such, it appeared that an emission control factor for the use of a wet suppression system is already included in the controlled emission factors selected by the Applicant. XCG also reviewed the USEPA AP-42, "Background Information for Revised AP-42 Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing", dated May 12, 2003 and confirmed that the study site did have wet suppression in operation during the study and that as such "controlled" emission factors were prepared as a result of the study. Therefore, it seems inappropriate to apply an additional control efficiency of 90 percent for applying a water spray during the crushing operation. This would affect sources RCC_01 and RCC_02. Please provide further justification or explanation.

The overall contribution of these sources (RCC_01 and RCC_02) to the facility emissions is small and even without the additional 90 percent control efficiency will not contribute to an increase in the average and maximum emission estimates.

3.7 IDENTIFICATION AND QUANTIFICATION OF SUBSTANCES RELEASE TO AIR

Appendix C - Activity - Emissions from Material Transfers – Material Receipt

The applicant has applied an emission factor calculated in accordance with US EPA AP-42, Section 13.2.4 Aggregate Handling and Storage document for emissions occurring during material transfer and receipt as shown in the Tables in Appendix C. The quality rating noted by the Applicant is a Quality Rating A. It is noted that the moisture content of recycled concrete (6.2 percent) is outside of the range of source conditions that were tested in developing the emission factor equation. Therefore, the quality rating is required to be dropped to a level B. The emission factor is still considered reasonable and conservative, as increased moisture should reduce fugitive emission further.

Appendix C – Activity – Emissions from Dryer Stack – Batch Plant

The Applicant indicates that the Emission factor for the emissions from Hot Mix Asphalt plant dryers/screens/mixer was taken from USEPA AP 42 11.1 Table 11.1-14. This reference is incorrect and should refer to Table 11.1-2 Summary of Particle Size Distribution for Batch Mix Dryer, Hot Screens, and Mixers. The calculations have used the appropriate emission factor and noted the appropriate Quality Rating E.

Appendix C – Activity - Emissions from Recycle Crushing Operations –Diesel Generator

The Applicant has applied emission factors from the Tier II Emission Standards for Non-Road Diesel Engines in order to calculate PM-2.5 emissions from the diesel generator used in the crushing operation. These emission factors seem appropriate for the engines and horsepower rating information provided. The applicant has calculated worst case emissions assuming that the generator operate 10 hours per day for 60 days per year. The Applicant has identified that crushing activities only occur for a maximum of 60 days per year. The average PM-2.5 emissions from the generators have been calculated assuming that the generator operate 10 hours per day for 41 days per year. No justification has been provided for the selection of the average number of days that the crusher is operated. This assumption does not seem unreasonable; however, some additional explanation of the selection of the average number of days of crusher operation should be provided. Since the generator is a significant source of PM-2.5, the **average** concentration of FPM emitted from the facility may be impacted. This however, would not change the conclusion that the facility meets the Oakville Health Protection Air Quality By-Law criterion of 0.2 micrograms per cubic metres annually under worst case conditions.

Appendix C – Activity - Emissions from Support Operations - Welding

The Applicant has applied an emission factors from the UEPA AP42 12.19 Electric Are Welding document. The emission factor selected seems appropriate for the welding rod noted (i.e. E7018). The process description in the table included in Appendix C is partially obstructed. The actual number of hours per day that the welding rod is assumed to be used has not been provided. Please clarify in the final version of the report.

Appendix C – Model Input Parameters

The Applicant has prepared a summary of the model input parameters for the point sources and volume sources; including the average and maximum emission rates as calculated in Appendix C. XCG was unable to replicate the average and maximum emission rates in the units grams per second (g/s) for the sources that were identified to operate for 12 hours per day (i.e. MH_01, MH_02, MH_03, MH_04, MH_05, BP_01, BP_02, and RCC_03). The average and maximum emission rates could be replicated for the remaining sources which were identified to operate for 10 hours per day and 24 hours per day. Since the values calculated by Golder were slightly higher (more conservative) then the values produced by XCG, no further modelling is considered necessary. Golder should review the calculations completed and provide comment as necessary.

4.2.1 FACILITY EMISSIONS ESTIMATE REQUIREMENTS/ ESTIMATION METHODS

The Applicant modelled the emissions by splitting the sources into three main groups (the Batch Plant, Material Handling, and Recycle Crushing. They calculated the concentrations from each of the three main groups and that calculated a total concentrations resulting from combining the three source groups using a utility tool (Calsum). This procedure was used for both the average and maximum emission rates. XCG replicated the modelling using this method and found no issues with the modelling methodology. The emission estimates calculated by the Applicant were confirmed by the XCG model run.