



April 9<sup>th</sup>, 2013

Corporation of the Town of Oakville  
1225 Trafalgar Road  
Environmental Policy  
Oakville, Ontario L6H 0H3

Attention: **Mr. Jeffrey Lee, P.Eng., EP**  
**Research Policy Analyst - Air**

Re: **Peer Review of the Health Protection Air Quality By-Law (HPAQB)**  
**Application for Approval Suncor Energy**  
**Phase 2: Peer Review of the Complete Application**

Dear Mr. Lee,

Dillon Consulting Limited (Dillon) has completed the first part of the *Peer Review Phase (2): Review of the Complete Application* of the Health Protection Air Quality By-Law (HPAQB), for the Suncor Energy Products Partnership Inc. (SEPPI) (the Applicant) Application for Approval of the Oakville Distribution Terminal (the Application).

The HPAQB seeks to safeguard the health, safety and well-being of Oakville residents by gathering information on emissions of fine particulate matter (FPM) and its precursors, and regulating major emitters of these pollutants.

An Application package was provided by SEPPI to Dillon on February 22, 2013 and it included:

- A presentation entitled: Oakville Terminal dated September 2012.
- A CD entitled: Suncor Oakville HPAQB Approval dated September 27, 2012.
- A document entitled: Summary of Changes/Improvements Made to Suncor's Oakville Terminal, undated.
- A document entitled: Oakville Health Protection Air Quality By-Law Application for Approval – Revision 1, dated February 19, 2013.
- A set of electronic files including: input, list and output files for the Calpuff Modelling that was completed to support the Application. These files were received February 12, 2013.

Each Phase of Dillon's review was conducted in the context of submission requirements identified within:

- The HPAQB, By-Law Number 2010-035; and
- The "Guidance for Implementation of Oakville Health Protection Air Quality By-Law 2010-035: Sections 5 and 6 and approval requirements for major emitters" v. 5 June 2011.

*Continued . . .*

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Phase 1 of the review was concluded on March 11, 2013.

As per Section 9(2) of the By-Law, the peer reviewer is required to communicate the results of the review in a “peer review report”; which is the first part of *Peer Review Phase (2): Review of the Complete Application*.

Dillon’s peer review findings on the SEPPI Application are summarized in Appendix 1, which provides a comparison of the application materials required versus those supplied by the Applicant and the peer review comments resulting from the review of the emission rate calculations and pollutant dispersion modelling. Appendix 2 provides a summary of the verification of model output results provided by the Applicant.

The findings of the peer review are that further information is required to support the conclusions provided within the Application. The Application indicates that, based on the emission estimates and dispersion modelling analysis, the Suncor Terminal is predicted to not significantly affect the existing air quality in Oakville. This assertion is centered on the modeled predictions that facility induced FPM concentrations are less than the HPAQB threshold of 0.2 µg/m<sup>3</sup> (annual basis). Clarification and/or further information, as per the peer review comments in Appendix 1, are required so that the assessment results can be confirmed.

We also note that the Applicant agreed to provide the mapping graphics requested by the Town in Dillon’s letter of November 15, 2012 as part of the Phase 1 review. These graphics have not yet been received and were therefore not included in this review.

We trust that this satisfies Dillon’s requirements of the first stage of the *Peer Review Phase (2): Review of the Complete Application* of the HPAQB By-Law. Please feel free to contact the undersigned with any questions or clarifications.

Sincerely,

**DILLON CONSULTING LIMITED**

for  
Jennifer Ahluwalia, P.Eng.  
Partner

JA/tlm

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## APPENDIX 1

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## Appendix 1 – Checklist Summary of Application and Peer Review Comments

Application Item	Elaboration of Application Item	Reference Location of Item in Application and Peer Review Comments (if any)
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
2. Introduction	Background to the project.	Section 1.0 (page 1)
3. Facility description	The description must include the following items, together with brief description of the basis for the information provided:	Section 2.0 (page 2)
3.1 Overview	Details of the nature of the facility, including what the facility produces.	Section 2.1 (page 2)
3.2 Location	<ul style="list-style-type: none"> <li>• 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).</li> <li>• 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).</li> <li>• 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.</li> </ul>	Section 2.2 (page 2), Figure 2-1 (page 3) and 2-2 (page 4)  <i><u>Peer review comment(s):</u></i> <i>Concentration and risk contour mapping results not provided.</i>
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 modeling to assess building downwash.	Section 2.3 (page 2), Figure 3-1 (page 19)

Application Item	Elaboration of Application Item	Reference Location of Item in Application and Peer Review Comments (if any)
3.4 Raw Materials, Products and Processes	<ul style="list-style-type: none"> <li>• Identify any raw materials that are relevant to estimating health-risk air pollutant air emissions</li> <li>• Identify all processes (including a simplified process flow diagram) that are relevant to the air contaminants emitted from the facility</li> <li>• Provide the maximum and average daily, monthly and annual process flow-through rates for any processes that may contribute to the major emission</li> <li>• Provide information on the variability of process rates on an annual basis;</li> <li>• Provide the hours of operation (hours/day, days/week, weeks/year) for average and maximum operational activity;</li> <li>• Provide the relationship between the average and maximum process rate(s) and operating conditions/hours of operation;</li> <li>• Information on the variability of production rates around the average;</li> <li>• Set out planned maintenance periods</li> </ul>	<p>Section 2.4 (page 5), Figure 2-3 (page 6)  Section 2.5 (page 7)  Section 2.7.1 (page 8 to 11)  Attachment 3 (Reporting Tables)</p>
3.5 Emission Sources and Processes	<ul style="list-style-type: none"> <li>• Identify all sources (point, fugitive/area, line etc.) at the facility.</li> <li>• Include drawings of the facility and other information (text) to allow identification of all sources and processes at the facility.</li> <li>• 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.</li> </ul>	<p>Section 2.5 (page 7)  Section 3.2.1 (page 15) and Table 3-1 (page 16)  Attachment 3 (Reporting Tables)  Figure 3-1 (page 19)  Table 2-2 (page 12 to 13)</p>

Application Item	Elaboration of Application Item	Reference Location of Item in Application and Peer Review Comments (if any)
3.6 Emission Control Equipment and Procedures and Emissions Monitoring	<ul style="list-style-type: none"> <li>• Summarize all relevant existing emission control devices (on stacks/vents) and emission or pollution prevention practices.</li> <li>• Associate each device/measure with pollutants emitted and emission sources.</li> <li>• Indicate the control efficiency for each device/practice.</li> <li>• Indicate all continuous emission monitoring (CEM) and other monitoring to determine the effectiveness or efficiency of emission control(s).</li> </ul>	<p>Section 2.6 (page 8)  Section 2.8 and Table 2-4(page 14)  Table 2-2 (page 12 to 13)</p> <p><b><u>Peer review comment(s):</u></b>  <i>Control efficiencies for each emission control device and/or pollution prevention practice are not provided however it is acknowledged that this is difficult to provide for the types of sources at the Suncor Terminal.</i></p>
3.7 Identification and Quantification of Substances Released to Air	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Quantify the average and worst-case rates of daily and annual emissions during operations and the operating conditions that lead to these emissions.</li> <li>• Indicate the methods used to estimate and provide detailed calculation and scenario descriptions.</li> </ul>	<p>Section 2.7.1 to 2.7.4 (page 9 to 14)  Table 2-2 (page 12 and 13)  Table 2-3 (page 14)  Attachment 1 (April 29, 2011 Emission Report)  Attachment 2 (Final Effluent Discharge Concentration and Loadings)  Attachment 3 (Reporting Tables)  Attachment 4 (MSDS and Information Sheets)  Attachment 5 (Supporting Information and Emissions Calculations)</p> <p><b><u>Peer review comment(s):</u></b>  <i>In Section 2.7.1.1, related to the average emission scenario (page 9) for Source 11 (Maintenance – Painting of Tanks). Please provide clarification on the number of tanks and if the assumption is that tanks are repainted every 10 years that the average emissions should be based on repainting one tank per year.</i></p> <p><i>In 2.7.1.1, it is not clear whether the daily average was calculated from the annual</i></p>

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		<p><i>average or vice versa. Attachment 5 of the Application states (Source Identification Table) states that the daily scenario is based on annual throughput for each product divided by a number of days in a year. This could not be reproduced in the calculations.</i></p> <p><i>Within the emission calculation methodology presented in Section 2.7.2 (page 11), for Sources 1 to 4, Tanks v. 4.09D was used. The detailed input data for these emission model runs were not provided (e.g. fraction of toluene &amp; xylene in stored liquids, working volume, tank diameters, and other tanks parameters) thus it was not possible to replicate calculations. This information should be provided.</i></p> <p><i>Clarification is also required related to the speciation profile used in the Applicant's analysis for gasoline and diesel / furnace oil. It is indicated that the TANKS model default speciation was used however numerical values defined in the report differ from the default profiles presented in TANKS.</i></p>
4. Evaluation		Section 3.0 (page 15)
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.	Section 3.1 (page 15) CD “Suncor Oakville HPAQB Approval. September 27, 2012, Stantec” (Electronic Files) Additional electronic files received on February 12, 2013

Application Item	Elaboration of Application Item	Reference Location of Item in Application and Peer Review Comments (if any)
4.2 Model Inputs	Indicate that an electronic file with all model inputs and outputs has been provided (see below).	Section 3.2 (page 15) CD “Suncor Oakville HPAQB Approval, September 27, 2012, Stantec” (Electronic Files) Additional electronic files received on February 12, 2013
4.2.1 Facility Emissions Estimate Requirements / Estimation Methods (same as ESDM)	<p>Summarize/tabulate (previously defined) emission scenarios and operating conditions that give rise to:</p> <ul style="list-style-type: none"> <li>• Average and worst-case annual emission rates</li> <li>• Frequency with which emissions within 90% of the worst-case emissions levels may occur (as per s.3.2.1.2)</li> <li>• Variability around the average emission rates</li> </ul>	<p>Section 2.7.1 to 2.7.3 (page 9 to 13) Section 3.2.1 (page 15) Table 3-1 (page 16), Table 3-2 (page 17)</p> <p>CD “Suncor Oakville HPAQB Approval, September 27, 2012, Stantec” (Electronic Files) Additional electronic files received on February 12, 2013</p> <p><b><u>Peer review comment(s):</u></b> <i>Frequency with which emissions within 90% of the worst-case emissions levels may occur and the variability around the average emission rates are not provided. The Applicant states that due to the nature of this facility’s operations this information is not easily determined. The current impact results are not significant so at this time further information is not requested for this item.</i></p> <p><i>However, if on review of the additional information requested in Item 3.7 above it is determined that the current impact results are significant (i.e., impacts are greater than the Town’s 0.20 µg/m<sup>3</sup> (annual) threshold value) then information related to this item will be required.</i></p>



Application Item	Elaboration of Application Item	Reference Location of Item in Application and Peer Review Comments (if any)
4.2.2 Meteorological Data Background Concentrations (ozone, NH3, FPM), Chemical Model(s) Used, Grids Special Receptors Identified	Refer to the model input checklist provided in the Appendix 6.5. Deviations from defaults must be fully explained.	Section 3.2.2 to 3.2.7 (page 18)
5. Mapping	<p>Present these as:</p> <ol style="list-style-type: none"> <li>a) Model numerical outputs must be provided in the form of Summary Values tables as described earlier.</li> <li>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: <ol style="list-style-type: none"> <li>i. The TFI FPM concentration, AND,</li> <li>ii. The cumulative FPM concentration when the TFI concentrations and the background FPM concentration are added.</li> </ol> <p>Resulting in a total of four (4) maps and four (4) values.</p> <p>The following are suggested levels for concentration contours.</p> <ul style="list-style-type: none"> <li>• <math>\leq 0.2 \mu\text{g m}^{-3}</math> increments for the annual predictions of FPM concentrations.</li> </ul> <p>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)</p> <p>In providing the concentration isopleths for the worst-case scenario applicants should indicate (as per s.3.3.3) the frequency with which emissions</p> </li> </ol>	<p>Section 4.0 (page 20 and 21)</p> <p><b><u>Peer review comment(s):</u></b>  <i>It is noted that the Applicant agreed to provide the mapping graphics requested by the Town in Dillon's letter of November 15, 2012 as part of the Phase 1 review. These graphics have not been received yet and so they are not included in this review.</i></p>

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	will be within 90-100% of the worst-case emissions levels.	
6. Health Risk Assessment	<p>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.</p> <p>Results are to be presented as described in section 3.4.</p> <p>For health-risk, provide contour maps of appropriate scale(s) showing risk control at 1 per 1000,000 premature death increments based on the annual predictions of risk within the affected airshed for the average and maximal emission scenario, for:</p> <ol style="list-style-type: none"> <li>i. The TFI risk, AND,</li> <li>ii. The cumulative risk when the TFI concentrations and the background concentrations are added (using the background risk file).</li> </ol> <p>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).</p> <p>In providing the health risk assessment for the worst-case scenario applicants should indicate (as per s.3.4.1 &amp; s.3.4.2) the frequency with which emissions within 90-100% of the worst-case emissions levels may occur.</p>	<p>Not required, the Applicant indicated that impacts are below the Town's 0.20 µg/m<sup>3</sup> (annual) threshold value and so no health risk assessment was conducted.</p> <p><b><u>Peer review comment(s):</u></b>  <i>However, if on review of the additional information requested in Items 3.7 above it is determined that the current impact results are significant (i.e., impacts are greater than the Town's 0.20 µg/m<sup>3</sup> (annual) threshold value) then information related to this item will be required.</i></p>

Application Item	Elaboration of Application Item	Reference Location of Item in Application and Peer Review Comments (if any)
7. Appraisal	<p>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:</p> <ol style="list-style-type: none"> <li>1. List existing emission control technologies</li> <li>2. List all additional control technologies that could be used</li> <li>3. List any existing emission mitigation plans</li> <li>4. List any potential additional emission mitigation techniques</li> <li>5. Eliminate any technically infeasible options and provide the basis for the elimination of the option</li> <li>6. Appraise the effectiveness of the remaining control technologies and mitigation techniques</li> <li>7. Determine costs (capital and annual operating) and the control effectiveness of remaining control technologies and mitigation techniques</li> <li>8. Indicate which control technologies and mitigation techniques will be implemented and provide the rationale for the choice of technologies and techniques</li> </ol>	<p>As is the case for item 6 (Human Health Risk Assessment) the Appraisal is not required.</p> <p><b><u>Peer review comment(s):</u></b>  <i>However, if on review of the additional information requested in Item 3.7 above it is determined that the current impact results are significant (i.e., impacts are greater than the Town's 0.20 µg/m<sup>3</sup> (annual) threshold value) then information related to this item will be required.</i></p>

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8. Additional Information	An application 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.	<p>It is recognized that additional information was provided with the Application document, including:</p> <ul style="list-style-type: none"> <li>• A presentation entitled: Oakville Terminal dated September 2012.</li> <li>• A document entitled: Summary of Changes/Improvements Made to Suncor's Oakville Terminal, undated.</li> </ul>

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**APPENDIX 2**

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## **Appendix 2 - Verification of Model Output Results Produced by the Applicant**

The Applicant supplied CALPUFF input files, output files and list files. As indicated in the list files, the US EPA approved version (Version 5.8) was used for the assessment.

All the settings selected in the CALPUFF input files were verified and are consistent with those required by the Town of Oakville's Guideline.

The review included the input files provided by the Applicant's consultant as well as a live-run of the files within the US EPA version (Version 5.8) of CALPUFF. Dillon was not able to reproduce this modelling run and so discussions were conducted with the Applicant's consultant to understand the nature of possible model modifications that enabled the running of the US EPA version (Version 5.8) with the BPIP-PRIME algorithm. The consultant was not able to provide a detailed description of possible modifications, and as CALPUFF Version 6.42 is backward compatible with Version 5.8 Dillon ran CALPUFF Version 6.42 using the input data provided. It was found that the model results are very close to those presented by the Applicant and are considered reasonable by Dillon. Dillon also extracted predicted concentrations using CALPOST from the output files provided by the Applicant and found that the results presented in the report are consistent with those in the output files.

Dillon verified the modelling results for all scenarios.