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January 29, 2021

Garett Stevenson, BES, RPP, MCIP
City of Kitchener
200 King Street West
PO Box 1118
Kitchener, ON N2G 4G7
T: 519.741.2200 ext. 7070
E: Garett.Stevenson@kitchener.ca

Re: Peer Review of Documents Prepared by Trinity Consultants
City of Kitchener Crematoria
RWDI Reference No. 2100787

Dear Mr. Stevenson,

RWDI was retained by the City of Kitchener to conduct a peer review of a Land Use Compatibility Study prepared by Trinity Consultants. This will be to support an Official Plan Amendment and Zoning Bylaw Amendment application to permit an expansion of an existing funeral home, as well as a new crematorium/cremator on site. We understand that the initial application has been recently revised and now requests to permit a cremator used on site.

Specifically, the peer review will address (and provide commentary on) the Land Use Compatibility Study, as well as the conclusions of the ESDM and AA reports. We will provide our professional opinion on the following items:

- What industrial facility class would the proposed crematorium/cremator be considered by the MECP D-series guidelines.
- What would an appropriate setback for a crematorium/cremator exhaust stacks from a property zoned or used for residential purposes.
- What site specific studies should be prepared to evaluate any potential adverse impacts of the proposed crematorium/cremator on site.

We were also retained to provide comment on the following documents:

- Emissions Summary and Dispersion Modelling (ESDM) Report prepared by Trinity; and,
- Acoustic Assessment Report (AAR) also prepared by Trinity.

Air Quality

Land Use Compatibility Study

The Land Use Compatibility Study is generally acceptable, with one key exception. In Section 7.1.1, the Land Use Compatibility Study states the following:

> Based on Trinity's experience in permitting and conducting air quality testing and monitoring at crematoriums using the FT-III cremator, Trinity has not detected odour or observed smoke from the cremation units inside the building or from the exhaust stacks in the outdoor environment.

There is no quantitative evidence to support this statement, in either the Land Use Compatibility Study or the ESDM Report, which is discussed below. The use of emission factors for specific contaminants such as particulate matter (e.g., smoke) addresses this issue with respect to the ESDM report and the associated requirements under O. Reg. 419/05 and MECP Guideline A10. This does not deal with odour, however.

Odour measurements should be provided for the cremation units, based on similar units installed elsewhere, or testing performed by the manufacturer. Qualitative statements such as those in Section 7.1.1 do not provide comfort that adverse effects due to odour will be avoided.

We do agree with the classification of the operation as a Class 1 industry under MECP Guideline D6. The minimum set back distance of 20 metes from sensitive receptors (e.g., residences) recommended in MECP Guideline D6 is met. The ESDM report does partially satisfy the need for technical study when there are sensitive receptors within the influence area of 70 metres specified in the guideline.

As noted above, however, odour must still be assessed quantitatively before we can reach the same conclusions as the Land Use Compatibility Study.

Emission Summary and Dispersion Modelling Report

There are a number of inadequacies and errors noted in the ESDM Report, which are covered in the following sections.

Appendix B: Site Plans

The Site Plans provided in Appendix B do not meet the requirements set out in O. Reg. 419/05: Local Air Quality and MECP Guideline A10: Procedure for Preparing an ESDM Report. Sources of contaminant are not clearly identified, nor are coordinates provided, and no building heights are provided. Site plans that meet the regulatory requirements are mandatory and must be provided. Based on the site plans provided, the dispersion modelling assessment cannot be reviewed.

Appendix E: Natural Gas Combustion

Appendix E notes that factors for liquefied petroleum gas were considered for the comfort heating equipment, which is not appropriate for natural gas-fired heating equipment. Emissions were not actually calculated however, so there appears to be no impact on the conclusions of the assessment.

Appendix E: Combustion of Casket and Body

The particulate matter (PM) emission factor for Combustion of Casket and Body noted in Appendix E does not match the values on Table 2.3-2 of Chapter 2.3 of the AP-42 emission factors. Also, the column heading at the right of this table indicates "Natural Gas Combustion Emissions per Retort", which does not appear to be correct.

The conversion from Maximum Hourly Bodies Cremated to Maximum Weight of Body Per Hour appears to be incorrect. The calculations use a conversion rate of 1000 lbs/ton, which is incorrect. This does lead to a significant overprediction however, which is conservative.

Appendix E: Grinder Unit

The throughput of 100 lbs/hr provided for the Grinding Unit in Appendix E does not match the hourly throughput provided in the Combustion of Casket and Body (120 lbs/hr).

Appendix G: Dispersion Modelling Files

The information provided in Appendix G is completely insufficient to determine whether or not the modelling assessment was conducted in an appropriate manner. The electronic input and output files should be provided to provide certainty that the modelling meets the requirements of MECP Guideline A11: Air Dispersion Modelling Guideline for Ontario.

Appendix H: Manufacturer's Specifications

No specifications are provided for the Facultative Technologies Model FT III DE Cremator. Based on a review of the Facultative Technologies website, the burner ratings used in the calculations do appear to be correct, however this information should be included in the ESDM Report.

Noise

Land Use Compatibility Study

We do not agree with the classification of this facility as a Class I facility. Figure 6-1 of the acoustic assessment report demonstrates that sound levels at the property line will range from approximately 50 to 60 decibels. Sound at these levels is clearly audible. Since it is anticipated that the facility will be audible at the property line, the facility would be classified as a Class II facility.

Despite the classification, the Acoustic Assessment Report demonstrates that with mitigation and with the proposed setbacks, sound levels from the facility meet the requirements of NPC-300. The conclusions of the land use compatibility study, with respect to noise emissions, therefore, remain the same regardless of the classification of the facility.

Section 7.2.2 of the Land Use Compatibility Study states that a detailed sound monitoring program is proposed and will be used to supplement the AAR that will be submitted to the MECP. It's not clear what the impetus for conducting this study is or what the expected outcome is. Should the mitigation recommendations in the AAR be modified as a result, it is recommended that the revised AAR be reviewed to ensure that the modified recommendations don't impact the conclusion of the Land Use Compatibility Study.

Acoustic Assessment Report

In general, we are in agreement with the acoustic assessment report, prepared by Trinity Consultants and dated October 6, 2020. A detailed review of the modelling has not been undertaken at this time, so these findings represent a high-level review for major deficiencies.

Sound Data

The sound power levels used in the modeling for the acoustic assessment report are largely based on manufacturer data. While this is common practice when sources of noise cannot be measured, it leads to increased uncertainty in the assessment results. Greater certainty could be achieved by measurement of sources; however, this is not required. Sound power levels used in the modeling appear to be in line with expected sound levels for these types of equipment. This applies to both the cremator and to existing sources at the site.

Model Configuration

The model configuration used in the acoustic assessment report included conservative modeling options. Ground absorption of zero, and two orders of reflection both produce conservative results (i.e. higher impacts).

Mitigation

The acoustic assessment report states that mitigation is required to achieve compliance at receptors to the south west. The report recommends a barrier located along the property line. Based on the calculations provided in the acoustic assessment report, the barrier reduces sound levels to comply with NPC-300. This is an appropriate means of reducing Sound levels at these points of reception.

Conclusions

The report concludes that the facility will meet the requirements of NPC-300 with the installation of a noise barrier. Based on the details presented in the report, it appears that this is an appropriate conclusion.

Conclusions

The ESDM report is incomplete, and the missing information prevents us from completing our review at this time. Until appropriate site plans and dispersion modelling files are provided, no conclusions can be reached about the validity of the ESDM report.

A high-level review of the Acoustic Assessment Report shows some conservatism, but generally accepted sound power levels for sources and modelling methodology.

If the AAR is revised as alluded to in section 7.2.2 of the Land Use Compatibility Study, we recommend that that the revised AAR be reviewed to ensure that the results of the Land Use Compatibility Study are not affected.

As noted above, we are generally in agreement with the conclusions in the Land Use Compatibility Study. However, odour must still be assessed quantitatively before we can confirm that we agree with the conclusions of the study.

Yours truly,

RWDI AIR Inc.

Melissa Annett

Melissa Annett, d.E.T.
Senior Project Manager, Principal

MEA/kta

Attach.

Garett Stevenson

From: Kristen Barisdale <kbarisdale@gspgroup.ca>
Sent: Saturday, April 10, 2021 10:53 AM
To: Garett Stevenson
Cc: Henry Walser
Subject: [EXTERNAL] FW: Henry Walser - Peer review - updated EDSM Report

Good morning Garett,

Below is the response from Trinity Consultants as it relates to the peer review comments provided earlier this year.

I wanted to draw to your attention that additional information and material noted in the Trinity document and response below is based on compliance source testing conducted in 2019 at Families First Funeral Home & Tribute Centre in Windsor, Ontario as they are currently using the same cremation units proposed for Walser Funeral Home.

Further to our brief conversation earlier this week, I am preparing a covering letter and brief planning opinion letter to proceed with the OPA/ZAB with the cremation unit removed at this time. I am hoping to have it to you earlier next weeks.

Let us know if you have any questions. Thanks!

GSP Group and Hilton Landmark offices are currently closed. I am working remotely. Please contact me using email and/or cellphone.

Kristen Barisdale, MCIP, RPP
Associate – Senior Planner

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From: Henry Walser <hwalser@henrywalser.ca>
Sent: Friday, April 2, 2021 4:23 PM
To: Kristen Barisdale <kbarisdale@gspgroup.ca>
Subject: Henry Walser - Peer review - updated EDSM Report

Hi Kristen,

Follow this link for the Air Quality Assessment (EDSM Report) - Updated version with Source Testing Results - https://files.trinityconsultants.com/link/ygxmT8MxJ3uaBNRV4szLTm

Below is Trinity's responses to the Peer Review.

The Emission Summary and Dispersion Modelling (ESDM) Report was updated to address and incorporate the peer review comments. In addition to addressing and incorporating the peer review comments, the following key modifications were incorporated as part of this ESDM Report:

- All emissions, with the exception of nitrogen oxides, carbon monoxide and sulphur dioxide, have now been estimated using source testing results from compliance source testing conducted in 2019 at Families First Funeral Home & Tribute Centre in Windsor, Ontario. Families First Funeral Home & Tribute Centre uses a Facultatieve FT III Cremator, which is identical to the cremation unit proposed to be installed at HWFH.
- The previous ESDM Report had assessed the proposed installation of two cremation units. However, based on updated business forecasting by HWFH, HWFH is proposing to install one cremation unit, rather than two cremations units.
- The previous ESDM Report had assessed a highly conservative emissions scenario of 2,920 cremations per year based on the cremations unit operating continuously throughout the year. The updated ESDM Report has been revised based on the cremation unit handling a maximum of 1,500 cremations per year.

The updated ESDM Report and the air dispersion modelling files can be downloaded using the following link:

https://files.trinityconsultants.com/link/MPnfGhGhz3ItLokB1NFbVT

Please see below for the comments from the Peer Reviewer, in orange, and Trinity's response to the peer review comment, in blue.

Comment #1:

Land Use Compatibility Study

In Section 7.1.1, the Land Use Compatibility Study states the following:

Based on Trinity's experience in permitting and conducting air quality testing and monitoring at crematoriums using the FT-III cremator, Trinity has not detected odour or observed smoke from the cremation units inside the building or from the exhaust stacks in the outdoor environment.

There is no quantitative evidence to support this statement, in either the Land Use Compatibility Study or the Emission Summary and Dispersion Modelling Report. The use of emission factors for specific contaminants such as particulate

matter (e.g., smoke) addresses this issue with respect to the ESDM report and the associated requirements under O. Reg. 419/05 and MECP Guideline A10. This does not deal with odour, however.

Please provide odour measurements for the cremation units, based on similar units installed elsewhere, or testing performed by the manufacturer.

Response to Comment #1:

The ESDM Report has been updated to address this comment and includes the calculation of odour emission rates using odour results from compliance source testing conducted by Wood EIS in 2019 at Families First Funeral Home & Tribute Centre in Windsor, Ontario which uses a Facultatieve FT III Cremator, identical to that proposed to be installed at HWFH. The calculated odour emission rates were modelled using AERMOD air dispersion model with a factor of 1.65 to convert the modelling results from 1-hour to a 10-minute time-averaging period, in accordance with MECP guidelines. The calculation of the odour emission rates for the Facility using the source testing results are provided in Appendix E of the ESDM Report. A summary of the odour model input and outputs are provided in Appendix G of the ESDM Report, with the maximum odour impacts at the sensitive receptors summarized in the Emission Summary Table in Appendix F of the ESDM Report.

Relevant pages of this stack testing report to support the odour emission calculations are provided in Appendix I.

Based on odour concentrations lower than 1 OU at all points at or beyond the Facility's property line, odour from the cremation unit is not expected to cause an adverse impact at the sensitive receptors.

Comment #2:

Emission Summary and Dispersion Modelling Report – Appendix B: Site Plans

The Site Plans provided in Appendix B do not meet the requirements set out in O. Reg. 419/05: Local Air Quality and MECP Guideline A10: Procedure for Preparing an ESDM Report. Sources of contaminant are not clearly identified, nor are coordinates provided, and no building heights are provided. Site plans that meet the regulatory requirements are mandatory and must be provided. Based on the site plans provided, the dispersion modelling assessment cannot be reviewed. Please provide site plans that meet the regulatory requirements.

Response to Comment #2:

A site plan has been provided as Figure B1 in Appendix B of the updated ESDM Report. The scaled site plan includes the property boundaries, UTM coordinates, location of the stacks and building and gable heights. The site plan was created using the AERMOD model layout and provides and the required information.

Comment #3:

Emission Summary and Dispersion Modelling Report – Appendix E: Natural Gas Combustion

Appendix E notes that factors for liquefied petroleum gas were considered for the comfort heating equipment, which is not appropriate for natural gas-fired heating equipment. Emissions were not actually calculated however, so there appears to be no impact on the conclusions of the assessment. Please confirm and update as needed.

Response to Comment #3:

Confirmed and updated. Please refer to the updated ESDM Report.

Comment #4:

Emission Summary and Dispersion Modelling Report – Appendix E: Combustion of Casket and Body

The particulate matter (PM) emission factor for Combustion of Casket and Body noted in Appendix E does not match the values on Table 2.3-2 of Chapter 2.3 of the AP-42 emission factors. Also, the column heading at the right of this table indicates "Natural Gas Combustion Emissions per Retort", which does not appear to be correct. Please update and confirm as needed.

The conversion from Maximum Hourly Bodies Cremated to Maximum Weight of Body Per Hour appears to be incorrect. The calculations use a conversion rate of 1000 lbs/ton, which is incorrect. Please update and confirm as needed.

Response to Comment #4:

The updated ESDM Report has been revised to calculate PM emissions using results from the source testing conducted in 2019 at Families First Funeral Home & Tribute Centre in Windsor, Ontario which uses a Facultatieve FT III Cremator, identical to that proposed to be installed at HWFH.

Comment #5:

Emission Summary and Dispersion Modelling Report – Appendix E: Grinder Unit

The throughput of 100 lbs/hr provided for the Grinding Unit in Appendix E does not match the hourly throughput provided in the Combustion of Casket and Body (120 lbs/hr). Please update.

Response to Comment #5:

The throughput of 100 lbs/hr is a 24-hour time-averaged throughput. Based on 8 cremations per day with each cremation consisting of a 300 pound body, the total mass throughput is 2400 lbs over 24 hours, which corresponds to the stated throughput of 100 lbs/hr. The updated ESDM Report has been revised to provide clarification.

Comment #6:

Emission Summary and Dispersion Modelling Report – Appendix G: Dispersion Modelling Files

The information provided in Appendix G is completely insufficient to determine whether or not the modelling assessment was conducted in an appropriate manner. The electronic input and output files should be provided to provide certainty that the modelling meets the requirements of MECP Guideline A11: Air Dispersion Modelling Guideline for Ontario. Please update.

Response to Comment #6:

The dispersion modelling files, and the updated ESDM Report, can be downloaded using the link provided above.

Comment #7:

Emission Summary and Dispersion Modelling Report – Appendix H: Manufacturer's Specifications

No specifications are provided for the Facultative Technologies Model FT III DE Cremator. Based on a review of the Facultative Technologies website, the burner ratings used in the calculations do appear to be correct, however this information should be included in the ESDM Report. Please update.

Response to Comment #7:

Please refer to Appendix H of the updated ESDM Report for the manufacturer's specification for Facultative Technologies Model FT III DE Cremator.

Comment #8:

Noise

Section 7.2.2 of the Land Use Compatibility Study states that a detailed sound monitoring program is proposed and will be used to supplement the AAR that will be submitted to the MECP. It's not clear what the impetus for conducting this study is or what the expected outcome is. Should the mitigation recommendations in the AAR be modified as a result, the City will require a review of the revised AAR to ensure that the modified recommendations don't impact the conclusion of the Land Use Compatibility Study. Please provide.

Response to Comment #8:

Due to unsuitable weather over the winter months and COVID restrictions, a background noise monitoring program could not be completed. The intention of the proposed background noise monitoring program had been to evaluate the existing background sound levels. The mitigations identified in the Acoustic Assessment Report

(AAR) have not changed. The AAR, and the ESDM Report, will be submitted to the Ministry of the Environment, Conservation and Parks (MECP) as part of the application for an Environmental Compliance Approval (ECA).

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May 26, 2021

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Re: Peer Review of Documents Prepared by Trinity Consultants
City of Kitchener Crematoria
RWDI Reference No. 2100787

Dear Mr. Stevenson,

RWDI has reviewed the responses, updated ESDM report and dispersion modelling fields provided by Trinity Consultants Ontario Inc. via e-mail from Henry Walser Funeral Home Ltd. on April 2, 2021. The following sections provide a synopsis of our review.

Air Quality

Land Use Compatibility Study

The air quality issues raised previously with respect to the Land Use Compatibility Study have been addressed with the updated ESDM Report and the associated source testing information.

Emission Summary and Dispersion Modelling Report

The updated ESDM report provides the necessary clarifications and information required to complete our review. There are no longer any outstanding material issues with the assessment. With the source testing information and odour analysis provided, and the move from two cremation units to a single unit, we are satisfied that the proposed facility will be in compliance with the appropriate benchmarks, and does not pose a significant risk with respect to air quality. This statement is based on the stipulation that the unit continues to function optimally. Periodic source testing should be conducted to ensure that this is the case.

We have noted several minor issues in the ESDM report, which are provided below for informational purposes only.

Appendix E

The source description for the High Speed Cremulator (HSC) has numerous typographical errors, making it difficult to follow, but the calculations themselves appear reasonable.

Appendix F

The title of the table in Appendix F refers to Mount Pleasant Group of Cemeteries, Mount Pleasant Crematorium (Toronto, Ontario). This does not appear to affect the analysis, as the dispersion factor used was for distances of 20 metres or less, which is conservative.

The conversion from the 1-hour dispersion factor to 24-hour, 30-day and annual averaging periods is not shown but does follow the formula presented in MECP Guideline A11.

The screening of contaminants using this methodology requires that like sources of emissions also be included. Emissions of total suspended particulate from the Grinder unit were not included. While this error was noted in our review, it does not change the outcome of the assessment. Furthermore, despite being deemed insignificant, emissions of total suspended particulate were still carried forward to the dispersion modelling analysis, rendering the point moot.

Noise

Land Use Compatibility Study

We do not agree with the classification of this facility as a Class I facility. Figure 6-1 of the acoustic assessment report demonstrates that sound levels at the property line will range from approximately 50 to 60 decibels. Sound at these levels is clearly audible. Since it is anticipated that the facility will be audible at the property line, the facility would be classified as a Class II facility.

Despite the classification, the Acoustic Assessment Report demonstrates that with mitigation and with the proposed setbacks, sound levels from the facility meet the requirements of NPC-300. The conclusions of the land use compatibility study, with respect to noise emissions, therefore, remain the same regardless of the classification of the facility.

Section 7.2.2 of the Land Use Compatibility Study states that a detailed sound monitoring program is proposed and will be used to supplement the AAR that will be submitted to the MECP. It's not clear what the impetus for conducting this study is or what the expected outcome is. Should the mitigation recommendations in the AAR be modified as a result, it is recommended that the revised AAR be reviewed to ensure that the modified recommendations don't impact the conclusion of the Land Use Compatibility Study.

Acoustic Assessment Report

In general, we are in agreement with the acoustic assessment report, prepared by Trinity Consultants and dated October 6, 2020. A detailed review of the modelling has not been undertaken at this time, so these findings represent a high-level review for major deficiencies.

Sound Data

The sound power levels used in the modeling for the acoustic assessment report are largely based on manufacturer data. While this is common practice when sources of noise cannot be measured, it leads to increased uncertainty in the assessment results. Greater certainty could be achieved by measurement of sources; however, this is not required. Sound power levels used in the modeling appear to be in line with expected sound levels for these types of equipment. This applies to both the cremator and to existing sources at the site.

Model Configuration

The model configuration used in the acoustic assessment report included conservative modeling options. Ground absorption of zero, and two orders of reflection both produce conservative results (i.e. higher impacts).

Mitigation

The acoustic assessment report states that mitigation is required to achieve compliance at receptors to the south west. The report recommends a barrier located along the property line. Based on the calculations provided in the acoustic assessment report, the barrier reduces sound levels to comply with NPC-300. This is an appropriate means of reducing Sound levels at these points of reception.

Conclusions

The report concludes that the facility will meet the requirements of NPC-300 with the installation of a noise barrier. Based on the details presented in the report, it appears that this is an appropriate conclusion.

Conclusions

The air quality concerns raised previously with respect to the ESDM report and Land Use Compatibility Study have been addressed. This statement is based on the stipulation that the unit continues to function optimally. Periodic source testing should be conducted to ensure that this is the case.

A high-level review of the Acoustic Assessment Report shows some conservatism, but generally accepted sound power levels for sources and modelling methodology.

If the AAR is revised as alluded to in section 7.2.2 of the Land Use Compatibility Study, we recommend that that the revised AAR be reviewed to ensure that the results of the Land Use Compatibility Study are not affected.

Yours truly,

RWDI AIR Inc.

Melissa Annett

Melissa Annett, d.E.T.
Senior Project Manager, Principal

MEA/kta

Attach.