

**Addendum to the
Human Health Risk Assessment Plan
for Momentive Performance Materials’
Rotary Kiln and Fixed Box #2 Incinerators**

Prepared for:
Momentive Performance Materials
Waterford, New York

Submitted by:

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November 2011

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1. Purpose and Scope

Momentive Performance Materials (MPM) is in the process of securing a Resource Conservation and Recovery Act (RCRA) permit to combust hazardous waste at its Waterford, NY facility which was formerly owned by GE Silicones. One of the RCRA regulatory requirements involves the development of multi-pathway risk assessments (MPRAs) to evaluate potential risks to human health and ecological receptors associated with facility emissions. On behalf of MPM, TRC Solutions (TRC) issued draft comprehensive human health and ecological risk assessments in October 2007. The New York State Department of Environmental Conservation (DEC) has commented on these assessments.

Separate response-to-comment letters on the human health and ecological MPRAs were provided by TRC to DEC on February 6, 2009. Comments on the ecological risk assessment were minor and straightforward, and MPM proposes to finalize the October 2007 Screening Level Ecological Risk Assessment according to the plan set forth in the February 6, 2009 Ecological Risk Assessment Response Letter (Attachment A). Comments on the human health risk assessment were more extensive, and some issues require further modeling and development. This addendum proposes a scope of work for updating and completing the human health risk assessment (HHRA).

2. Background

This addendum updates the July 2, 2003 “Revised Human Health Risk Assessment Plan for GE Silicones’ Rotary Kiln and Fixed Box (#2) Incinerators” document (TRC, 2003) that serves as the baseline protocol for the multi-pathway human health risk assessment of the hazardous waste incinerators operated by MPM at their Waterford, NY manufacturing facility. The project has evolved since the July 2, 2003 protocol was developed. Important events and milestones over the intervening period include:

1. the U.S. Environmental Protection Agency’s (EPA’s) 2005 finalizing of its *Human Health Risk Assessment Protocol (HHRAP)*, which serves as the principal guidance document for the HHRA;
2. the EPA’s change in late 2005 from ISCST3 to AERMOD as its recommended guideline model for standard dispersion modeling applications of industrial source emissions;
3. the issuance of a draft risk assessment report, last revised in October 2007;
4. the change in ownership of the manufacturing facility from GE Silicones to MPM in 2006; and
5. the exchange of comments and responses on the October 2007 risk assessment report among the DEC, MPM, and TRC.

Some of these factors have had, or will have, various effects on the MPRA estimates. The most significant factor is the switch in the U.S. EPA’s guideline air quality model. The 2007 draft relies on the ISCST3 model as a DEC-approved continuance of earlier work. Recent discussions with DEC, however, indicate that the “grandfathering” period of continued reliance on the ISCST3 model can no longer be justified, and that modeling within the MPRA must be updated with AERMOD. Also, the finalizing of the HHRAP guidance suggested some changes in

procedures and assumptions that have been discussed in comments and responses on the October 2007 risk assessment report.

3. Approach

A series of four steps to update and complete the MPRA follows.

First, the outstanding comments on the October 2007 MPRA will be resolved by adopting changes and conducting additional analyses. Most of the intended actions are described in a letter from Karen Vetrano, TRC, to Deborah Gardell, DEC, dated February 6, 2009. A copy of the letter is provided in Attachment B. Unfortunately, there is no complete written record of the outcome of subsequent negotiations regarding the MPRA. Therefore, MPM proposes to proceed with the MPRA in accordance with proposed changes and supplemental analyses to address the most recent comments on the October 2007 MPRA from DEC, EPA, and the Bureau of Toxic Substance Assessment, New York State Department of Health (DOH).

Second, the results of more recent incinerator performance testing will be used to update emission data within the 2007 MPRA. In particular, stack test results for chlorine will be revised. Test data for additional chemicals of potential concern will be reviewed and used to revise emission estimates if determined to be more relevant than the data used in the 2007 MPRA. Risk estimates will be based on the most appropriate measurements, with variability considered in the assessment of sensitivities and uncertainties.

Third, DEC has requested multi-source modeling because the preliminary chronic inhalation hazard index exceeds the U.S. EPA Region 6 target value of 0.25, mostly because of chlorine. However, the switch to AERMOD will change the air quality modeling results, and emission values will be updated with more recent test results. It is possible that the revised inhalation hazard index will be less than the 0.25 target value. If the revised inhalation hazard index is less than 0.25, multi-source chlorine modeling will not be necessary. However, if the chronic hazard index exceeds 0.25 for the inhalation pathway, and chlorine remains a significant contributor, multi-source modeling will be undertaken to assess cumulative exposure to chlorine exposure.

Fourth, the air quality modeling will be updated from ISCST3 to AERMOD. As much as possible and appropriate, the parameters and assumptions of the dispersion and deposition analysis will be maintained (such as emission source parameters, receptor locations, *etc.*). Meteorological, land use, and topographic data will be used as inputs to the preprocessing programs AERMET, AERSURFACE, and AERMAP per EPA modeling guidance to prepare input files for the AERMOD simulations. To maintain consistency with the USEPA's 2005 HHRAP guidance, gases will be treated as small particles in wet deposition calculations, and dry deposition rates of gaseous pollutants will be estimated as the product of AERMOD's ground-level concentration predictions and user-specified dry deposition velocities (selected per recommendations in the HHRAP guidance)..

4. References

TRC (2003). Revised Human Health Risk Assessment Plan for GE Silicones' Rotary Kiln and Fixed Box #2 Incinerators. Prepared by Karen Vetrano, TRC Environmental Corporation, Windsor, CT, for GE Silicones, LLC, Waterford, NY. July 2, 2003.

U.S. EPA (2005). Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Office of Solid Waste and Emergency Response. EPA530-R-05-006.

Wesely ML, Doskey PV, and Shannon JD (2002). Deposition Parameterizations for the Industrial Source Complex (ISC3) Model. Environmental Research Division, Argonne National Laboratory. ANL/ER/TR-01/003.

Attachment A

Letter (with attachment) from Karen Vetrano, TRC,
to Deborah Gardell, DEC, dated February 6, 2009

Topic: Comments on the Oct 2007 Screening Level Ecological Risk Assessment



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February 6, 2009

Ms. Deborah Gardell, P.E.
Combustion Permitting Section
Bureau of Hazardous Waste Management, 8th Flr.
Division of Solid & Hazardous Materials
New York Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7251

Dear Ms. Gardell,

November
TRC Environmental Corporation (TRC), on behalf of Momentive Performance Materials (MPM), is pleased to provide you with the response to the comments on the Screening Level Ecological Risk Assessment dated ~~September-3~~, 2008. Please note that MPM would appreciate the Agencies' acceptance of all responses prior to revision of the report in order to streamline the report approval process.

Should you have any questions regarding these reports, I can be reached directly at (860) 298-6351 or by e-mail at kvetrano@trcsolutions.com. Thank you.

Very Truly Yours,

TRC

Karen M. Vetrano, Ph.D.
Manager, Risk Assessment & Toxicology

Cc: Chad Niemeyer - MPM
Mike Krall - TRC Austin
Judy Abbot - NYS DOH
Gina Ferreira - EPA
Wilfredo Palomino - EPA (cover letter only)

U.S. ENVIRONMENTAL PROTECTION AGENCY Comments on the Revised Screening Level Ecological Risk Assessment - Rotary Kiln and Fixed Box Incinerator prepared for Momentive Performance Materials (former GE Silicones), Waterford, New York prepared by TRC dated October 2007

General Comments on the Revised Screening Level Ecological Risk Assessment

According to the October 11, 2007 letter from Karen Vetrano to Deborah Gardell regarding USEPA's comment on the evaluation of herbivorous/planktivorous, omnivorous, and carnivorous fish as higher trophic level receptors, these fish were included in the Revised SLERA and no threshold exceedances were noted. It should be noted that there are no EPA-established methods for evaluating these fish as measurement receptors and there is no requirement for evaluating them in the SLERA. This issue also came up during the review of a SLERA for another incinerator in New York State.

For informational purposes only, EPA would like to understand the process used by TRC to determine the fish TRVs present in Table 5-2 of the SLERA and to calculate risks for these fish since the SLERA did include an evaluation of these three fish guilds.

Response: Fish tissue concentrations were calculated as the product of the dissolved phase water column COPC concentration, appropriate bioconcentration factor and food chain multiplier as presented in Section 5.2.2.3. The resulting tissue concentration was compared to TRVs obtained from the following references, in order of preference:

- *Environmental Contaminants in Wildlife: Interpreting Tissue Concentrations. (Beyer, W.N. et al, 1996).*
- *Linkage of Effects to Tissue Residues: Development of a Comprehensive Database for Aquatic Organisms Exposed to Inorganic and Organic Chemicals (Jarvinen, A.W., and G.T. Ankley, 1998).*
- *Guidelines for Interpretation of the Biological Effects of Selected Constituents in Biota, Water, and Sediment (NIWQP, 1998).*

Specific Comments on the Revised Screening Level Ecological Risk Assessment

1. Page 2-5, 1st partial paragraph, 2nd sentence – The TOE factor listed here of 1.74 does not agree with the value shown in Table 2-6 of 1.07E+00. This discrepancy should be corrected.

Response to Comment: Noted. The 1.07 TOE factor is correct, the text will be revised to reflect the correct value. A replacement page reflecting this correction will be provided to the Agency as an insert to the 2007 report.

2. Page 4-17, 3rd bullet – The word “mink” should be replaced by “shrew.”

NYSDEC Comments on MPM's October 2007 Revised Screening Level Ecological Risk Assessment for the Rotary Kiln Incinerator and Fixed Box Incinerator #2

Overall, this is quite a good SLERA. The authors did a particularly good job assessing and describing the ecological communities found near the site, formulating food webs, and identifying endpoint receptors.

DEC concurs with the findings of the SLERA that most receptors will not be impacted by the facilities' emissions. Those few instances where the ESQs were exceeded were adequately deemed not to be significant by the LOAEL evaluation that was conducted and the analysis of uncertainty factors. This was not the approach DEC had recommended, but it is a valid approach.

There is only one concern that DEC notes with the SLERA. In DEC's review of the last revision, we found that for 17 compounds, the SLERA either did not have a TRV for surface water or used a value, primarily from EPA water quality criteria, that was greater than published New York State water quality standards or guidance values (Reference A). My review provided the appropriate value that should be used to replace the value used for a surface water TRV in the SLERA. The authors did not contest this, and in fact, commented that: "The surface water benchmarks have been updated to reflect those presented in this table (Reference B).

An examination of Table 5-2 shows that the changes were not made. The table still lists the same values as were listed originally; none of the 17 were changed. It is impossible to determine whether or not revised values were used in the calculation of ESQs for surface water, and Table 5-2 was simply not updated.

The authors need to revise Table 5-2 and repeat the surface water ESQ calculations based on the revised TRVs.

A table listing the TRVs that need to be updated is attached. This is the same table that appears in References A and B.

Response: The updates were conducted for the 2007 revised report, however they were inadvertently omitted. The revised tables will be provided for agency review as an insert to the 2007 report.

Table 1. Surface Water TRVs used in the MPM SLERA compared to NYSDEC ambient water quality standards and guidance values. All values are in units of ug/L

COPC	SLERA TRV, ug/L	NYSDEC value, ug/L	Source*
Cobalt	23	5	S
Cyanide	NA	5.2	S
Vanadium	20	14	S
2,3,7,8-TCDD (TEQ)	3.8×10^{-6}	3.1×10^{-9} **	S
Ethylbenzene	NA	17	GV
Toluene	NA	100	GV
Xylene (sum of isomers)	NA	65	GV
Acenaphthene	NA	5.3	GV
Anthracene	NA	3.8	GV
Bis(2-ethylhexyl) phthalate	3	0.6	S
fluorene	3.9	0.54	GV
2-methylnaphthalene	NA	4.7	GV
Naphthalene	62	13	GV
Pentachlorophenol	15	6.7 ***	S
Phenanthrene	NA	5.0	GV
Pyrene	NA	4.6	GV
1,2,4-trichlorobenzene	110	5	S

* S- Standard published in 6NYCRR Part 703; GV - Guidance value published in Division of Water TOGS 1.1.1.

** This standard is a standard adopted from the Great Lakes Water Quality Initiative (GLWQI) program for the protection of piscivorous wildlife. The EPA SLERA protocol has a different procedure for evaluating food chain risks for piscivorous wildlife. However, the value here is a promulgated water quality standard, and as such, supersedes EPA's protocol. The SLERA should calculate the ESQ from this standard and at least discuss which method is more appropriate.

*** pH dependent value. Standard calculated using a pH value of 7.0

Response to Comment: Noted. The text will be corrected and a replacement page will be provided to the Agency as an insert to the 2007 report.

3. Page 5-7 and Table 5-2 – According to the October 11, 2007 letter from Karen Vetrano to Deborah Gardell, the New York State surface water ambient water quality standards (6NYCRR Part 703) and guidance values (TOGS) were to be used in the SLERA as TRVs for several chemicals. The text on page 5-7 and Table 5-2 do not reflect the recommended NYS values for surface water TRVs. Please correct this discrepancy and ensure that these TRVs were used in the risk calculations for community and class-specific guild measurement receptors.

Response to Comment: The updates were conducted for the 2007 revised report, however they were inadvertently omitted. The revised tables will be provided for agency review as an insert to the 2007 report.

4. Page 6-11, Section 6.3.3.4, 2nd sentence - The TOE factor listed here of 1.74 does not agree with the value shown in Table 2-6 of 1.07E+00. This discrepancy should be corrected.

Response to Comment: Noted. The 1.07 TOE factor is correct, the text will be revised to reflect the correct value. A replacement page reflecting this correction will be provided to the Agency as an insert to the 2007 report.

Attachment B

Letter (with attachment) from Karen Vetrano, TRC,
to Deborah Gardell, DEC, dated February 6, 2009

Topic: Comments on the Oct 2007 Human Health Multipathway Risk Assessment





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Dear Ms. Gardell,

November

TRC Environmental Corporation (TRC), on behalf of Momentive Performance Materials (MPM), is pleased to provide you with the response to the comments on the Human Health Multipathway Risk Assessment dated ~~September 3~~, 2008. Please note that MPM would appreciate the Agencies' acceptance of all responses prior to revision of the report in order to streamline the report approval process.

Should you have any questions regarding these reports, I can be reached directly at (860) 298-6351 or by e-mail at kvetrano@trcsolutions.com. Thank you.

Very Truly Yours,

TRC

Karen M. Vetrano, Ph.D.
Manager, Risk Assessment & Toxicology

Cc: Chad Niemeyer - MPM
Mike Krall - TRC Austin
Judy Abbot - NYS DOH
Gina Ferreira - EPA
Wilfredo Palomino - EPA (cover letter only)

NYSDEC Comments on the Oct 2007 Revised Multipathway Risk Assessment and Revised Screening Level Risk Assessment (The comment numbers below refer to our previous set of comments dated August 29, 2007)

1. MPM must conduct chlorine stack testing to determine its emission input and emissions of SO_x and NO_x to be used to model impacts. The revised risks assessments must be submitted to the Department within 30 days of receiving the chlorine test results.

Response: MPM has scheduled the chlorine test for the week of February 23, 2009. Additionally, NO_x and SO_x data will be collected at that time and will be included in the revised HHRA.

2. a, b and c:

MPM's justification for not considering emissions of most of the organic constituents in the feed streams in the risk estimate is that these constituents were not detected in the *trial burn feed streams* and that COPCs, in order to be considered in the risk assessment as per USEPA's HRA protocol, have to bioaccumulate or bioconcentrate and they believe that these other organic constituents do not. Please see our response below on these two issues:

Bioaccumulation or bioconcentration criteria for COPCs:

Section 2.3 Identifying Compounds of Potential Concern of the 2005 HHRAP recommends that the risk assessment focus "on compounds that:

- are likely to be emitted because they (or their precursors) are present in the waste feed,
- are likely to be emitted because they are likely reformation products,
- are potentially toxic to humans, and/or
- have a tendency to bioaccumulate or bioconcentrate in food chains."

Please note that each of the criteria is stand alone.

There are no criteria that a chemical must bioaccumulate or bioconcentrate in order for it to be considered a COPC. In fact, none of the six steps of the COPC Identification process illustrated in Figure 2-3 of the 2005 HHRAP mention bioaccumulation or bioconcentration at all. Step 5 of the process asks if toxicological data is available; if it is, then the chemical gets included in the list of COPCs for quantitative evaluation in the human health risk assessment. If the VOC and SVOC constituents that were not originally included in the risk assessment have available toxicological data, they should be included in the multi-pathway risk assessment

Page 2-38 of the 2005 HHRAP states that "we now recommend that a single COPC list apply to **both** indirect **and** direct exposure analysis. We believe that, through the use of computer-based calculations, you can efficiently assess all identified COPCs via both direct and indirect exposure pathways. Savings gained through computer-based calculations will provide for an efficient use of facility and regulatory resources. Assessing the entire list of COPCs - rather

than a subset as previously recommended - may help minimize public concern over the exclusion of some COPCs and reduce confusion for those interested in reviewing the results of the risk assessment." The chemicals identified as COPCs in the risk assessment either detected or non-detected should be evaluated in both the indirect and direct exposure analyses in the risk assessment.

Presence of these non-detect organics in the waste streams: Our August 19, 2007 comment clearly stated that the typical waste analysis of various waste streams (See Tables 2.3-3 to 2.3-10 of the trial burn plan and reports) show organic constituents other than the 9 used in the risk estimate to be present in the waste streams *although they were not detected in the specific TB waste streams* due to their high detection levels used. Since these are potential constituents in the feed streams as seen from the results of past analyses, their potential health impacts must be considered in the risk assessment.

MPM must revise the HRA report to include these non-detects.

Response: MPM will comply with the Agency's request to include the non-bioaccumulative non-detect in the multi-pathway risk analysis. However, MPM proposes a compromise in which these non-detects are evaluated separately as part of the uncertainty analysis. This will satisfy the Agency's request to evaluate these non-detects in the multi-pathway risk assessment and will simplify the analysis for MPM. As requested by the Agency, these non-detects will be carried through the multi-pathway risk analysis at their respective DLs. Their cumulative cancer and non-cancer risks will be added to the cumulative cancer and non-cancer risks of the full Multipathway risk assessment and the results will be discussed in the Uncertainty Analysis.

2d. EPA has informed DEC that our comment 2d is incorrect. "The 2005 HHRAP does not contain any text stating that half the detection limit should be used. Section 2.4 Estimating COPC Concentrations for Non-Detects of 2005 HHRAP should be consulted to determine which detection limits should be used." In addition please make sure the latest update to the emissions are employed. Even though DEC incorrectly requested that half the detection limit be used, emissions in Table 2-3 are about a quarter of the detection limit and some contaminants are missing.

Response: Table 2-3 has been corrected. In addition, silver, bromomethane and 3,4-methylphenol will be added to the COPC list.

3. OK

4. a. Contrary to MPM's response to this comment, even the October 2007 report states: "Fugitive emissions for all volatile organic compounds **that were analyzed for in the waste samples taken during the trial burn** due to elevated detection limits". Hence, presence of these constituents in the feed streams should be considered in the fugitive emission estimates.

*Response: The original MPM response to this comment should have read "The estimated fugitive emissions of all the constituents detected **analyzed for in the waste stream** will be*

carried through the risk assessment” as stated in the report. If the Agency refers to Table 2-4, the VOC constituents analyzed for in the waste feed streams were included in the fugitive emissions evaluation (contrary to the 2006 report which only listed acetone, chloromethane, ethylbenzene, toluene and the xylenes).

4.b: OK

5a: Table Appendix F-1 and F-2 (and thus Table 2-5) still takes into account AWFCOs due to CO only (308 AWFCOS between June 1, 2006 to June 30, 2007). These should be updated taking into account other AWFCOs.

Response: MPM continues to operate all of the Air Pollution Control Devices (APCDs) during all AWFCO's, with the exception of the Ionizing Wet Scrubbers (IWS) during CO excursions greater than 2,500 ppm. This results in a cut-off of voltage to the IWS units to prevent an unnecessary hazard associated with elevated CO concentrations in the units. The methodology for modeling these instances only is the limited ability to control particulate emissions, including metals, during voltage related cut-offs. Therefore, the other instances will not be included in the modeling because the APCDs still retain their ability to control emissions.

5b: OK

5c: OK

5d: ESV openings (Table 2-6): It is not explained why emissions of HCl/Cl₂ only has been considered for ESV openings. This table should also include, at the least, estimates for metals emissions using the data from Appendix F-1 and F-2.

Response: MPM has included a table related to the emissions of metals during an excursion event below. These concentrations will be included in the uncertainty analysis for process upsets.

Metals Release Estimate – ESV Events

	<i>g/hr Loading</i>	<i>grams released</i>
Aluminum	4230	1.987341761
Antimony	15	0.007047311
Arsenic	24	0.011275698
Barium	22	0.010336056
Beryllium	8.5	0.003993476
Cadmium	5.3	0.00249005
Chromium	109	0.051210461
Cobalt	13	0.00610767
Copper	4793	2.251850842
Lead	108	0.050740641
Manganese	83	0.038995122
Mercury	0.029	1.36248E-05
Nickel	94	0.04416315
Selenium	2.9	0.00136248
Thallium	2.7	0.001268516
Vanadium	7.5	0.003523656
Zinc	528	0.248065355

Note: Release calculated using the assumptions of maximum feed rates at 1200 deg. C Upper SCC temperature, 16,631 scfm stack flow, 0.3 in H2O vacuum and an average ESV opening duration of 1.6 seconds.

Also, please provide documentation for the length of ESV valve openings (1 sec seems too short). This could be a print out of the log showing the pressure changes in the kiln and the FBI during an event of ESV opening.

Response: MPM has included a table of the times and dates of the ESV openings during the period of 1/1/04 – 12/31/07 which is relevant to the period of review of the previous risk assessment review.

ESV Duration Table	
Date	Duration
5/4/04	1
6/2/04	3
5/22/05	1
5/24/05	1
5/25/05	1
5/28/05	1
2/21/06	2
9/1/06	2
9/24/06	2
10/28/06	1
10/30/06	1
11/2/06	1
11/4/06	1
3/2/07	2
4/16/07	3
11/12/07	3
Average	<i>1.6 seconds</i>

6. Section 2.5 of the 2005 HHRAP should be consulted to determine the evaluation of contaminants found in the blanks. Compounds considered to be common laboratory contaminants include acetone, 2-butanone (methyl ethyl ketone), methylene chloride, toluene, and the phthalate esters. There is no mention of chloromethane (methyl chloride) as a common laboratory contaminant.

A methodology is provided in this Section for evaluating the presence of common laboratory contaminants in blanks and states that “if compounds considered to be common laboratory contaminants are detected in the blanks, then sample results are usually not considered to be detected unless the concentrations in the sample are equal to or exceed ten times the maximum amount detected in the applicable blanks. If the concentration of a common laboratory contaminant in a sample is less than ten times the blank concentration, then the compound is usually treated as a non-detect in that particular sample.” The concentrations of acetone and methylene chloride found in samples and in the blanks should be compared to each other using the information presented above.

Response: Section 2.5 of the HHRAP also discusses those compounds detected in blanks that aren't normally considered common laboratory contaminants. Instead of the “10x” rule, these compounds follow a “5x” rule in that sample results aren't considered to be detected unless the

concentrations in the sample exceed five times the maximum amount detected in the appropriate blanks. Chloromethane would fall into this category. However, in the 2007 report, acetone, methylene chloride and chloromethane were all listed in Table 2-3 as COPCs and thus were carried through the risk assessment at the reported emission rate with no blank correction.

7. Comment # 43 on MPM trial burn report stated that the results of analyses for phenolic analytes, and analytes that behave similarly to phenolics are not valid because of poor pre-sampling and pre-extraction surrogate standard recoveries. MPM attributes this low recoveries of the surrogates and hence the actual phenolic compound in the feed matrix to be destroyed due to the gas matrix. They also stated that phenols were not seen in the feed streams based on past analyses. Thus, MPM believes that phenol need not be considered in the risk estimate. Please provide documentation for the absence of phenols in the feed streams (at least for those used during the trial burn). These could be past analyses for these waste streams.

Response: MPM will include the non-detected phenolic analytes in the multi-pathway risk analysis. However, MPM proposes a compromise in which the non-detects are evaluated separately as part of the uncertainty analysis. This will satisfy the Agency's request to evaluate the non-detects in the multi-pathway risk assessment and will simplify the analysis for MPM. The non-detects will be carried through the multi-pathway risk analysis at their respective DLs. Their cumulative cancer and non-cancer risks will be added to the cumulative cancer and non-cancer risks of the full Multipathway risk assessment and the results will be discussed in the Uncertainty Analysis.

8. OK; will review the presented data after getting the revised report incorporating the chlorine test results.

9. It is not clear what MPM is trying to convey in response to our request to include detected PCB congeners and those non-detects in the risk assessment estimate. Even if there is not a significant difference in DLs for PCBs and TCDD/TCDF, still these constituents should be included in the risk estimate.

Response: The coplanar PCBs include tetrachlorobiphenyls through heptachlorobiphenyls (see Table 2-5 of the 2005 HHRAP). Of the co-planar PCB congeners that were analyzed for, only PCB 118 (penta-PCB) was detected. In addition, there were detected concentrations of tetrachlorobiphenyls (total), pentachlorobiphenyls (total) and hexachlorobiphenyls (total). These compounds were included as COPCs, however upon further review for this response to comment, it was determined that there would be a double counting of the PCB 118 concentration if the full pentachlorobiphenyl detection is included. Therefore the detected concentration of PCB 118 will be subtracted from the detected concentration of the pentachlorobiphenyl in the revised risk assessment.

Since none of the individual tetra-PCB congeners or the hexa-PCB congeners were detected, the total concentrations of the congener class were used as surrogates and therefore the non-detects of the individual tetra-PCB congeners or the hexa-PCB congeners were not included. Finally, the non-detect PCB 189 was included in the multi-pathway risk assessment. In further

review for this response it was noted that the SQL for total hepta-PCB was greater than the SQL for PCB-189 (a hepta-PCB). Therefore the total hepta-PCB will be included in the revised risk assessment and will replace PCB-189.

10. OK.

U.S. ENVIRONMENTAL PROTECTION AGENCY Comments on the Revised Multipathway Risk Assessment - Rotary Kiln and Fixed Box Incinerator prepared for Momentive Performance Materials (former GE Silicones), Waterford, New York prepared by TRC dated October 2007

General Comments on the Revised Multipathway Risk Assessment

USEPA did not have any comments on the November 2006 Revised MultiPathway Risk Assessment. A brief review of the October 2007 revised report indicates the specific comments listed below.

Specific Comments on the Revised Multipathway Risk Assessment

1. Page 6-2, Section 6.1.1, last paragraph, last sentence – Table 6-4 shows the acute inhalation non-cancer hazard index value of 4.4E-01 not the 1-hr particulate concentration or the NYS 24-hour standard for particulate matter as listed in this sentence. Please correct this discrepancy.

Response: Noted. The text should have been referring to Table D-1f, not Table 6-4. The text will also be revised to reflect that the resultant AHI of 0.46 exceeds the non-cancer target of 0.25.

2. Page 6-4, Section 6.1.4, first sentence – This sentence states that Table 6-4 shows a total AHI of 2.7E-01 when in fact Table 6-4 lists the AHI as 4.4E-01. Please correct this discrepancy.

Response: Noted. The text will be revised to reflect the correct AHI.

3. Page 7-3, Section 7.2.3, 2nd paragraph, last two sentences – These sentences state that the acute HI value was 6.3E-01 attributable to chlorine and particulate matter (1.8E-01). According to Table 7-9, the total AHI is 9.1E-01 with particulate matter contributing an AHQ of 4.6E-01. Please correct these discrepancies.

Response: Noted. The text will be revised to accurately reflect the information in the Table.

**Bureau of Toxic Substance Assessment's Comments on the October 2007 Revised Multipathway
Risk Assessment for Momentive Performance Materials'
Rotary Kiln and Fixed Box Incinerators**

Bureau of Toxic Substance Assessment staff reviewed this revision of the health risk assessment (HRA) in light of the approved protocol, which is based on the US Environmental Protection Agency's (US EPA) 1998 Human Health Risk Assessment Protocol (HHRAP) for Hazardous Waste Combustion Facilities and its 1999 Errata. US EPA finalized this guidance in 2005. In both the 1998 and 2005 guidance, US EPA recommends the use of the most current toxicity values. Thus, our comments on toxicity values reflect US EPA's recommendation.

1. Section 4.1.4 Acute Inhalation Scenario

In our previous comments (on June 13, 2006 and August 24, 2007), we requested that the consultant address acute inhalation exposures to oxides of sulfur and nitrogen. We suggested that Cal EPA acute inhalation values for sulfur dioxide and nitrogen dioxide (660 microgram per cubic meter (mcg/m³) and 470 mcg/m³, respectively) be used. We understand that facility-specific emissions data for these compounds are not available at this time. We suggest that the applicant conduct an assessment of potential health risks associated with the short-term exposure of these respiratory irritants. In the absence of facility-specific emissions data, an assessment can be conducted using emissions data for similar facilities. If future stack testing is planned for this facility, we suggest that the facility-specific emission rates of these compounds be measured and that the risks associated with acute inhalation exposure be evaluated.

Response: MPM has scheduled the chlorine test for the week of February 23, 2009. Additionally, sulfur dioxide and nitrogen dioxide data will be collected at that time and will be included in the revised HHRA.

- 2. Section 6.0: Risk Characterization Acute Inhalation Scenario (Subsection 6.1.4)** Page 6-4 indicates that the total Acute Hazard Indices (AHI) is 0.27, which only slightly exceeds the target AHI of 0.25. This is not consistent with Table 6-4 (*Summary of Acute Inhalation Non-Cancer Hazard Indices*) and Table D-1f in the Appendix (*Acute Inhalation of Ambient Constituents Residential Maximum Concentration Scenario*), which both list the total AHI as 0.44. Please make the appropriate corrections to the tables pertaining to the acute inhalation scenario, and then update the text where necessary to reflect those changes.

Response: The text is a typographical error. The correct AHI is 0.44, with the majority of the AHI attributed to chlorine (AHQ of 0.23). The text has been changed to reflect the tables.

3. Table 5-1: Summary of Toxicity Values Associated with Carcinogenic Effects (Oral)

We previously recommended that the consultant use the cancer slope factor (1.3E-5 per mg/kg/day) listed in the 2005 HHRAP for formaldehyde. This change was made in the current HRA. However, the consultant noted that the 2005 HHRAP erroneously cites the US EPA Integrated Risk Information System (US EPA IRIS) as the source of the cancer potency factor, and that US EPA IRIS does not list an oral cancer slope factor for formaldehyde. We agree that the 2005 HHRAP was in error on this point and accept the consultant's response.

Response: Noted.

4. Table 5-5: Summary of Toxicity Values Associated with Noncarcinogenic Acute Effects (Inhalation)

The acute inhalation exposure criteria value (AIEC) for 1,3,5-trinitrobenzene is listed as 130 mg/m³ in Table 5-5 and the 2005 HHRAP is listed as the source. However, the 2005 HHRAP indicates that the AIEC for 1,3,5-trinitrobenzene is 30 mg/m³. Please correct this table and any subsequent calculations that may be affected. The listing of acute inhalation toxicity values for inorganics, gases/particulates, dioxins, furans, polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs) is missing from the table. However, these values were included in risk calculation tables for the acute inhalation scenario (such as Table D-1f). Please provide the full table (Table 5-5) with the complete set of acute inhalation toxicity values. Further, Table D-1f lists some chemicals twice (e.g., dichlorobenzenes) with different acute air concentrations for each listing. Please list all chemicals once in this table and provide the correct acute air concentrations, toxicity values and hazard quotients.

Response: A production error occurred and the first 2 pages of Table 5-5 were inadvertently left out of the document. A complete Table 5-5 has been included in the revised report. In addition, it appears that the dichlorobenzenes appeared in the VOC analyte list and the SVOC analyte list and were non-detect in both analyses. In order to avoid double counting, the dichlorobenzenes have been deleted from the VOC COPC list and retained in the SVOC COPC list since the SVOCs had the higher SQLs.

**1. Table 7-5: Acute Inhalation of Ambient Constituents with Process Upset Factors Applied
Appendix D-1f: Acute Inhalation of Ambient Constituents with Process Upset and TOE Factors Applied**

We previously recommended that acute inhalation exposures to particulates be evaluated by comparing estimated exposures to the 24-hour National Ambient Air Quality Standard for particulate matter less than 10 microns in diameter (150 mcg/m³). This was done in Table 7-9 (*Acute Inhalation of Ambient Constituents with Process Upset and TOE Factors Applied*), but not in Tables 7-5 and Appendix D-1f, where a different value (380 mcg/m³) was used. Use of the national standard for particulate matter and the acute ambient air concentrations (i.e., C_{acute} values) listed in Tables 7-5 and Appendix D-1f would increase the hazard quotients from 0.18 to 0.46 in each table. The total acute hazard index (AHI) would subsequently increase by 0.28. Please make the appropriate corrections to these tables and any subsequent tables that are affected.

Response: Noted. The change has been made in all appropriate tables.

1. Appendix D-4h: Calculation of Chemical Intakes Subsistence Farmer- Child

We were unable to reproduce the contaminant-specific intakes via dairy ingestion using the information provided in this table for the subsistence farmer-child exposure scenario. We suggest that the applicant verify these intake estimates and modify any other affected calculations as appropriate. We estimate that correcting these calculations will slightly increase the chemical intakes for the child's dairy ingestion exposure scenario, but will not significantly alter the quantitative estimates of risk associated with this pathway, or affect the conclusions of this risk assessment.

Response: Noted, the equation was corrected.

7. Appendix D-4i: Calculation of HQi for Adult Subsistence Farmer

There appears to be a systematic error in the adult subsistence farmer hazard quotients (HQs) for chronic inhalation of volatile organic compounds (from acrylonitrile to vinyl chloride, listed in the table entitled Appendix D-4i). For example, under the adult scenario the hazard quotient for bromoform is $5E-13$ in the table. However, when using the parameters listed in the table for the adult scenario, we calculate a hazard quotient of $3.6E-8$. Please check these calculations and make the appropriate corrections to this table. We also noticed that there may be a rounding issue in the table. The hazard quotient for chlorine is listed as $5E-2$ under the adult scenario, yet the total hazard index for all chemicals is listed as $4.8E-2$. These observations do not significantly alter the conclusions of the risk assessment.

Response: Noted, the equation was corrected. In addition, the presentation of significant digits for the non-cancer HQs has been corrected.

REFERENCES

US EPA (United States Environmental Protection Agency). 1998. Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Office of Solid Waste and Emergency Response. EPA 530D-D-98-001A. July 1998. US EPA (United States Environmental Protection Agency). 1999. Errata to the Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Region 6: Office of Solid Waste and Emergency Response. EPA 530D-D-98-001A. August 2, 1999. US EPA (United States Environmental Protection Agency). 2005. Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Final. EPA 520-R-05-006. Available on-line at:

<http://www.epa.gov/epaoswer/hazwaste/combust/risk.htm>.

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