Texas Commission on Environmental Quality (TCEQ) Response to Public Comments Received on the Proposed Development Support Document for Styrene August 7, 2008

The public comment period for the proposed Development Support Document (DSD) for styrene ended in March 2008. The American Composites Manufacturers Association (ACMA), National Marine Manufacturers Association (NMMA), Styrene Information and Research center (SIRC), ISP Synthetic Elastomers LP (ISP), TOTAL Petrochemicals (TOTAL), Firestone Polymers (Firestone), Owens Corning, and International Institute of Synthetic Rubber Producers, Inc. (IISRP) submitted comments. The Toxicology Section (TS) of the Texas Commission on Environmental Quality (TCEQ) appreciates the effort put forth by these commentators to provide technical comments on the proposed DSD for styrene. The goal of the TS and TCEQ is to protect human health and welfare based on the most scientifically-defensible approaches possible (as documented in the DSD), and evaluation of these comments furthered that goal. A summary of comments from each commentator is provided below, followed by TCEQ responses. The full comments are provided in Appendices. Comments on issues that suggest a change in the DSD are addressed whereas comments agreeing with TCEQ's approach are not. TCEQ responses indicate what changes, if any, were made to the DSD in response to the comment.

Upon further review, the TS found that the odor thresholds reported by Leonardos et al. (1969) did not meet the criteria accepted by the American Industrial Hygiene Association (AIHA) and USEPA Review Committees. Additionally, the TS reviewed the Dravnieks (1974) article and failed to verify the odor threshold values which were cited by AIHA (1989) and USEPA (1992). Therefore the reported odor thresholds values by Leonardos et al. (1969) and Dravnieks (1974) that were presented in Table 4 of the proposed styrene DSD are not presented in the revised DSD (Section 3.2.1 Odor Perception). The final DSD presents an odor-based ESL of 110 µg/m^3 (25 ppb).

American Composites Manufacturers Association (ACMA) Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

I. The Current Styrene ESL of 110 µg/m^3 is Unworkable (See Appendix 1, Page 2-10 for details)

Comment No. 1:
The ACMA commented that it has been demonstrated that the current styrene ESL of 110 µg/m^3 cannot be met by virtually any Texas composites industry manufacturing facility. The modeling results performed by both the TCEQ modeling staff and AMCA modeling demonstrated that no typical Texas composites can meet the values in Table 1 of the proposed Standard Permit.

TCEQ Response:

This Response to Comments addresses comments directly regarding the proposed DSD for styrene. The above comment is best addressed by the TCEQ's Standard Permit Rule Team. Therefore, no response is provided here.

Comment No. 2:
The ACMA commented that TCEQ has overlooked the unaffordability of air pollution control equipment in setting the current styrene ESL. The ACMA stated that lowering the styrene ESL, as has been proposed, merely would extend the prospect that even smaller composites manufacturers would not be able to comply with this ESL, and as a result, would be forced to install capture and oxidation control equipment to satisfy the lower styrene ESL. The ACMA further commented that US EPA's MACT-related decision on the affordability of air pollution control equipment is an independent, reliable resource that should guide and persuade TCEQ in setting the styrene ESL.

TCEQ Response:
When developing chemical-specific ESLs, the TS follows TCEQ's 2006 regulatory guidance document, *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* (RG-442) to ensure that the derived ESLs are scientifically valid and protective of the general public. For the derivation of toxicity values, the TS does not consider factors such as control costs, economic impact, and attainability, although these issues could affect risk management decisions in the use of ESLs.

Comment No. 3:
The ACMA commented that (1) the current styrene ESL, coupled with TCEQ permitting practices and the discretion of the permitting staff to require air pollution control equipment at Texas composites industry plants, has stifled the industry and threatens to contract the industry in the future; (2) the Texas composites industry has experienced stagnation since 2000 due to the current styrene ESL and the TCEQ permitting decisions to impose unaffordable air pollution control measures in certain circumstances; (3) the styrene ESL sets the stage for permitting decisions by increasing or decreasing the discretion of the TCEQ permitting staff; (4) lowering the ESL will create further fear and an erosion of confidence in the Texas regulatory climate for the composites industry; and (5) the ACMA believes that increasing the styrene ESL to a level that is consistent with a scientific, protective approach and that many of the composites industry can meet with good ventilation practices reduces that fear and encourages a positive business climate.

TCEQ Response:
When developing chemical-specific ESLs, the TS follows TCEQ's 2006 regulatory guidance document, *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* (RG-442) to ensure that the derived ESLs are scientifically valid and protective of the general public. ESLs are used in the air permitting process to evaluate the protectiveness of chemical-specific emissions for a facility undergoing air permit reviews. They are comparison levels, not ambient air standards. When the TS conducts ESL reviews for air permits, the TS must follow the Effects Evaluation Procedures, as described in the Appendix C of TCEQ's 2001 *Modeling and Effects Review Applicability: How to Determine the Scope of Modeling and*

Effects Review for Air Permits (RG-324) to ensure that operations of a proposed facility would not be detrimental to public health.

Regarding the TCEQ permitting decisions comment: The comment is best addressed by the TCEQ's Air Permits Division staff. Therefore, no response is provided by the TS.

Comment No. 4:
The ACMA commented that Texas is the only state in ACMA's 35-state survey that has an ESL-equivalent based on odor, with the possible exception of Arkansas whose ESL-equivalent is 13 times greater than the Texas ESL. The ACMA disagreed with the explanation by TS for use of odor data to set an ESL because the Texas Clean Air Act (TCAA) requires the TCEQ to protect public health and welfare. The ACMA contended that those other 34 states do not condition issuance of air permits based on odor; and neither the TCAA nor regulations promulgated pursuant to that law define "public welfare" to include odor. The ACMA further commented that even if protection of public welfare in Texas has to address odor problems, it does not require the elimination of odors as part of the air permitting process. The Enforcement Division is capable of addressing styrene odors should they be confirmed.

TCEQ Response:
TCEQ development of odor-based ESLs is based on directives from Sections 382.0518 and 382.085 of the Texas Health and Safety Code (THSC) that specifically mandate the Texas Commission on Environmental Quality (TCEQ) to "conduct air permit reviews of all new and modified facilities to ensure that the operation of a proposed facility will not cause or contribute to a condition of air pollution." In addition, Section 382.003 of the THSC defines air pollution as "air contaminants that: (a) are or may tend to be injurious to or adversely affect human health or welfare, animal life, vegetation, or property; or (b) interfere with the normal use and enjoyment of animal life, vegetation, or property." Moreover, according to Section 382.002 of the THSC, the empowers of the Commission, including the issuance of air permits, are used for "controlling or abating air pollution and emissions of air contaminants, consistent with the protection of public health, general welfare, and physical property, including the esthetic enjoyment of air resources by the public and the maintenance of adequate visibility."

In response to the THSC mandate, TCEQ has historically considered odor, and its potential to create a condition of odor nuisance, in the development of short-term ESLs (< 1 hour). Odor-based ESLs are useful tools used for addressing the commission's mandate to protect public welfare and public enjoyment of air resources. ESLs, along with other data, are used during an effects review to determine emission limits and controls found in a permit. Appropriate application of odor-base ESLs is intended to help prevent nuisance odors and is used in setting control and setback requirements.

Any additional concerns regarding TCEQ's interpretation and enforcement of the TCCA should be addressed to the TCEQ Environmental Law Division and Enforcement Division.

Comment No. 5:

The ACMA commented that TCEQ has ample reason to fairly promote and not discourage the Texas composites industry. The ACMA stated that the current TCEQ's styrene ESL discourages economic development.

TCEQ Response:
The comments are not directly relevant to the proposed styrene DSD. Therefore, no response is provided by the TS.

II. Lowering the Styrene ESL is Unsupported and Unsupportable (See Appendix 1, Page 10-12 for details)

Comment No. 6:
The ACMA commented that the TS has taken the position that lowering the styrene ESL is necessary and advisable because it will eliminate a presumably large number of styrene odor complaints. The ACMA contended that the large majority of composites industry plants do not have a history of odor complaints. The ACMA stated that the TS' underlying premise that lowering the odor-based ESL will lower the number of styrene odor complaints is illogical.
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TCEQ Response:
ESLs are not developed in response to odor complaints, but rather to ensure consistency with TCEQ's 2006 regulatory guidance document, *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* (RG-442), that underwent external scientific peer review and two rounds of public comment. Furthermore, development of styrene's odor-based ESL included a comprehensive literature search, consideration of all available styrene odor studies, and selection of the appropriate odor detection threshold among the studies that meet the American Industrial Hygiene Association and USEPA odor evaluation criteria. Upon further review, the TS has determined to use the van Doorn et al. (2002) study as the basis for a styrene odor-based ESL of 110 $\mu g/m^3$ instead of the previously proposed level of 73 $\mu g/m^3$ which was based on the Stalker (1963) data. The final DSD has been revised accordingly.

Comment No. 7:
The ACMA disagrees with the reports concerning alleged styrene odor detection by TCEQ Mobile Monitoring staff while conducting ambient air monitoring in the past. Specifically, the ACMA disagrees with the statement in the proposed styrene DSD that TCEQ air mobile monitoring staff members have reported styrene odors at measured levels as low as 10 ppb. The ACMA believes that such a level is even lower than the lowest odor detection threshold measured in a laboratory setting.

TCEQ Response:
The odor detection threshold of 17 ppb by Stalker (1963) is not the lowest odor detection threshold measured in a laboratory setting, but rather it is the lowest concentration at which 50% of the odor panel detected the odor. Therefore, it is expected that some (but less than 50%) of the individuals on the odor panel were able to detect the odor at concentrations less than 17 ppb. The available laboratory data do not negate reports of individuals detecting styrene odor at levels as low as 10 ppb.

Comment No. 8:
The ACMA commented that the TS is not legally compelled to lower the styrene ESL because the TCEQ 2006 ESL Guidance (RG-442) is not a rule. The decision to lower the styrene ESL is entirely discretionary. The ACMA stated that it is an unnecessary, arbitrary, and unwarranted exercise of TCEQ discretion and use of TCEQ resources to lower the styrene ESL.

TCEQ Response:
The above comment is not directly relevant to the proposed styrene DSD. Nevertheless, the TS concurs with the ACMA that the ESL Guidance is not a rule. It is regulatory guidance for the TS staff to develop ESLs and other toxicity benchmarks for the evaluation of air permit reviews and air monitoring data and to ensure that the derived ESLs are scientifically valid and protective to the general public. Upon further review, the TS has determined to set the styrene odor-based ESL at 110 $\mu g/m^3$ based on van Doorn et al. (2002) study and not to lower the odor-based ESL to the previously proposed level of 73 $\mu g/m^3$ which was based on the Stalker (1963) data.

Comment No. 9:
The ACMA commented that there is no practical support for lowering styrene ESL in the proposed DSD. The ACMA stated that styrene odor perception is addressed in one paragraph of six lines, and a single table, Table 4 in the proposed DSD. In addition, Table 4 does not identify all styrene odor detection threshold studies and is therefore incomplete.

TCEQ Response:
The TS appreciates the ACMA's comment and acknowledges the Odor Perception Section of the proposed DSD was not fully discussed, and there is no explanation and justification for choosing the Stalker (1963) odor data for the proposed odor-based ESL at 73 $\mu g/m^3$. Upon further review, the TS has decided to finalize the styrene odor-based ESL at 110 $\mu g/m^3$ based on van Doorn et al. (2002) study and not to lower the odor-based ESL to the previously proposed level of 73 $\mu g/m^3$ which was based on the Stalker (1963) data. Consistent with TCEQ's 2006 ESL Guidance (RG-442), it was not the TS's intention to identify all styrene odor threshold studies in Table 4 but rather to identify only those studies that met the criteria accepted by the AIHA and USEPA.

III. Styrene Odor should be Addressed locally and Through Enforcement, Where Appropriate (See Appendix 1, Page 13-16 for details)

Comment No. 10:
The ACMA stated that since the odor of any chemical from a specific source that affects the local community is a local issue, it should be addressed through enforcement, where necessary, and not in an inordinately restrictive statewide permitting process. The ACMA further stated that the TCEQ enforcement process is an effective, tested, scientifically credible means of addressing confirmed nuisance styrene odor complaints, and deserves TCEQ priority. The ACMA commented that there is no public policy justification for lowering the styrene ESL when the enforcement process is reasonable, readily available, and works.

TCEQ Response:

The TS appreciates the above comments. However, these comments are not directly relevant to the proposed styrene DSD and therefore no response is provided. These comments are better addressed by TCEQ Environmental Law, Enforcement, and Air Permits Divisions.

Comment No. 11:
The ACMA stated that the emphasis on a local, complaint-based approach to nuisance odor is strongly supported by the US EPA. The ACMA commented that the conclusions from a US EPA Report to Congress entitled: "Regulatory Options for the Control of Odors" (see Appendix 1, Page 14-16 for details) serve to discount the validity of TCEQ's permitting/ESL approach and to endorse the approach provided in the TCEQ's Enforcement Division's Nuisance Odor Enforcement Guidance.

TCEQ Response:
The TS appreciates the above comments. However, these comments are not directly relevant to the proposed styrene DSD and therefore no response is provided. These comments are better addressed by TCEQ Environmental Law, Enforcement, and Air Permits Divisions.

Comment No. 12:
The ACMA stated that it strongly suspects the few confirmed styrene odor complaints in the TCEQ's database arising from composites facility operations are traceable. It further stated that it prefers to support the use of good ventilation practices to proactively address odor issues.

TCEQ Response:
The TS appreciates the above comments. However, these comments are not directly relevant to the proposed styrene DSD and therefore no response is provided. These comments are better addressed by TCEQ Environmental Law, Enforcement, and Air Permits Divisions.

IV. If TCEQ Persists in Relying on Odor Detection Threshold data, it is obligated to do so in a Scientifically Credible Manner (See Appendix 1, Page 16-21 for details)

Comment No. 13:
The ACMA commented that 1) the science of detecting odors has not progressed to the same level of scientific and statistical verifiability as health effects sciences, such as animal toxicity testing; 2) scientific studies confirm that odor perception is highly subjective and that anticipation, mood, and bias can play significant roles; and 3) odor detection thresholds measured in the laboratory in a single study are a very weak basis for any standard or guideline for acceptable ambient exposure. The ACMA further recommended that the TCEQ should recognize the overall quality of odor threshold detection studies and not use odor threshold data in a manner other than simply the lowest data point for setting the styrene ESL.

TCEQ Response:
The DSD was not revised based on this comment. The TS appreciates the above comments. As described in the TCEQ 2006 *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* (RG-442), the TS agrees with Drs. Dalton and Jacquot's comments on the overall qualities in the area of odor detection studies (see Appendix 1, Page 16-18 for details).

It is important to note that ESLs, including odor-based ESLs, are intended to be guidelines and not strict standards. ESLs are used in the air permitting process to evaluate the protectiveness of chemical-specific emissions for a facility undergoing air permit reviews. The TS is inclined to conservatively set ESLs at the low end of reported scientifically valid toxicity or odor data. If predicted airborne levels of a chemical exceed its ESL, adverse or welfare effects would not necessarily be expected to result, but a more in-depth review would be triggered. For example, when applying the odor-based ESL in an air permit application review, consideration of the nature of the odor, the surrounding land use, the frequency of odor-based ESL exceedance, and the odor complaint history at the site, all play a role in allowing off-site concentrations that exceed the odor-based ESL. For these reasons, after identifying all scientifically valid and acceptable odor studies, the TS sets the odor-based ESL for styrene (or any other odorous constituent) based on the lowest odor study which meets the acceptability criteria by the AIHA and USEPA.

Comment No. 14:
The ACMA commented that the TS's arbitrary selection of one or more of the reported studies that provided lower odor detection thresholds would arbitrarily and unscientifically elevate the standing of these low-threshold studies. The TS should use a weight of evidence approach to set the styrene ESL. A "weight of evidence approach' is one that, in a transparent and scientifically defensible manner, uses all reasonably available data. The ACMA further suggested that the TS should rely on a weight of evidence approach-based odor detection threshold proposed by Drs. Dalton and Jacquot of the Monell Chemical Sense Center (see Appendix 1, Page 18-19 for details) in setting a styrene odor-based ESL. A mean odor detection threshold of 1,212 $\mu g/m^3$from 12 studies was reported by Drs. Dalton and Jacquot. The ACMA recommended that the TS set the styrene odor-based ESL at 1,200 $\mu g/m^3$.

TCEQ Response:
The DSD was not revised based on this comment. The TS recognizes that a 50% odor detection threshold means that some people are expected to smell the chemical at concentrations less than that threshold. This fact along with the use of ESLs as guidelines (not standards) justify the typical selection of the lowest threshold identified by odor studies that meet the USEPA and AIHA criteria. The TS has decided to finalize the styrene odor-based ESL at 110 $\mu g/m^3$ based on van Doorn et al. (2002) study and not to lower the odor-based ESL to the previously proposed level of 73 $\mu g/m^3$ which was based on the Stalker (1963) data. We have provided the rationale for setting the styrene odor-ESL at the current level in the revised DSD.

Comment No. 15:
The ACMA commented that the TS's approach to setting a styrene odor-based ESL is flawed because the odor-based portion of the TS's ESL Guidance did not receive approval from its external peer review committee (see Appendix 1, Page 19-21 for details). The ACMA further proposed that the TS be required to convene an external expert panel, follow the recommendations of Drs. Dalton and Jacquot, and be required to obtain concurrence by the panel on the establishment of a styrene odor detection threshold.

TCEQ Response:

The DSD was not revised based on this comment. The comment appears to largely be a belated comment on TCEQ RG-442 (Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors) which was available for public comment in April 2005 and May 2006. The TCEQ Responses to Peer Review Report including the responses to Dr. William Cain's written review of odor-based ESLs was available in November 2006 (see TCEQ Responses to Peer Review Report, Page 21-22 for details). The document is available from: http://www.tceq.state.tx.us/files/Responses%20to%20Peer%20Review%20Report.pdf_4049099.pdf. Therefore the above comment will not be addressed in this Response to Comments on the January 2008 Proposed Styrene DSD. The TS does not plan to convene additional external expert panel on the establishment of odor-based ESLs.

V. TS Should Increase the Styrene ESL to 1,200 µg/m^3 (See Appendix 1, Page 21-24 for details)

Comment No. 16:
The ACMA commented that increasing the styrene ESL to 1,200 µg/m^3 is supported by, and very conservative relative to, actions taken by other states. The ACMA stated that TCEQ's comparison to South Coast Air Quality Management District is invalid.

TCEQ Response:
The TS appreciates the above comments. However, the comment is not relevant to the proposed styrene DSD and therefore no response is provided.

Comment No. 17:
The ACMA commented that TCEQ's contrast between the supposed regulations of odor in Arkansas to the Texas styrene ESL is invalid, and in fact is supportive of ACMA's proposal of a styrene ESL of 1,200 µg/m^3. The ACMA stated that a styrene concentration of 1,200 µg/m^3 is highly protective of public health. It further stated that for protecting against odor problems, the styrene concentration of 1,200 µg/m^3 is conservative by a factor of at least 5, given that the difference in laboratory and real world odor.

TCEQ Response:
The DSD was not revised based on this comment. The TS appreciates the above comments. Please see the Response to Comments No. 4 and 13 above. Nevertheless, upon further review, the TS has determined to set styrene odor-based ESL at 110 µg/m^3 based on van Doorn et al. (2002) study instead of the previously proposed level of 73 µg/m^3 which was based on the Stalker (1963) data. The proposed DSD has been revised accordingly.

National Marine Manufacturers Association (NMMA) Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

Comment No. 18:
NMMA commented that the TCEQ proposal takes what is already an unachievable odor-based fence line emission limit at 110 µg/m^3 and lowers it to an even more unachievable standard of 73

$\mu g/m^3$. NMMA recommended that the TCEQ review the fence line limits set by other major boat manufacturing states and adopt a standard of > 1,200 $\mu g/m^3$ which is achievable and protective to human health.

TCEQ Response:
The DSD was not revised based on this comment. The TS appreciates the above comments, please see the Response to Comment No. 2, 4, 13 and 17 above. Nevertheless, upon further review, the TS has determined to set the styrene odor-based ESL at 110 $\mu g/m^3$ based on van Doorn et al. (2002) study instead of the previously proposed level of 73 $\mu g/m^3$ which was based on the Stalker (1963) data. The proposed DSD has been revised accordingly.

Comment No. 19:
In a meeting with TCEQ staff on April 8, 2008, NMMA recommended that TCEQ provide some clarification in the DSD that the proposed styrene odor-based ESLs are strictly guidance values and are not be constructed as permit limitations or enforceable fence line limits. It further recommended that TCEQ add language that informed engineers that these ESLs are guidance for evaluating odor, and that TCEQ set the enforceable fence line limits be based on human health and safety, feasibility and then odor on a case by case basis.

TCEQ Response:
The TS appreciates the above recommendations. As described in the TCEQ 2006 *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* (RG-442), the ESLs, including odor-based ESLs, are intended to be guidelines and not strict standards. ESLs are used in the air permitting process to evaluate the protectiveness of chemical-specific emissions for a facility undergoing air permit reviews. The TS is inclined to conservatively set ESLs at the low end of reported scientifically valid toxicity or odor data. If predicted airborne levels of a chemical exceed its ESL, adverse or welfare effects would not necessarily be expected to result, but a more in-depth review would be triggered. For example, when applying the odor-based ESL in an air permit application review, consideration of the nature of the odor, the surrounding land use, the frequency of odor-based ESL exceedance, and the odor complaint history at the site, all play a role in allowing off-site concentrations that exceed the odor-based ESL. The ESLs are not to be used in setting permit limitations or enforceable fence line limits.

TOTAL Petrochemicals (TOTAL)
Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

Comment No. 20:
TOTAL commented that the proposed odor-based ESL for styrene should be withdrawn and reevaluated because the Commission has not developed a scientifically sound basis for establishing a criterion for styrene's odor properties. It further commented that the proposed DSD fails to demonstrate an adverse effect on public health. The lack of correlation between odor and health risks is well understood and has been summarized by the USEPA in its 1992 publication *Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990.*

TCEQ Response:

The TS agrees that there are differences between odor and direct toxicity. Consequently, TCEQ's 2006 regulatory guidance document, *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* (RG-442) describes development of different values to address odor, health, and vegetation. Toxicity data on health endpoints are not considered in the development of odor-based ESLs. Rather, health-based Reference Values and ESLs are developed separately from odor-based ESLs, as appropriate, and are discussed in Sections 3.1 and 4.1 of the Styrene DSD. Odor-ESLs for specific odorous contaminants, including styrene's proposed odor-based ESL, include a comprehensive literature search, consideration of all available styrene odor studies, and selection of the appropriate odor detection threshold among the studies that meet the American Industrial Hygiene Association and USEPA odor evaluation criteria.

Regarding the scientific basis for styrene's odor-based ESL comment: Please see the Response to Comment No. 6.

Regarding the public health and/or welfare comment: It is important to note that ESLs, including odor-based ESLs, are intended to be guidelines and not standards. For example, when applying the odor-based ESL in an air permit application review, consideration of the nature of the odor, the surrounding land use, the frequency of odor-based ESL exceedance, and the odor complaint history at the site, all play a role in allowing off-site concentrations that exceed the odor-based ESL. Styrene is odorous at a concentration much lower than at a concentration which could cause an adverse health effect. Because of this, if the permit applicant's predicted or monitored styrene concentrations are allowable from an odor perspective, they are allowable from a health perspective as well. Styrene's odor-based ESL is considered a useful tool in the air permit review process, and addresses the Commission's mandate to protect public welfare and public enjoyment of air resources.

Comment No. 21:
TOTAL commented that the proposed DSD fails to demonstrate an adverse effect on public welfare. More than just a detection of odors is required to find an adverse effect on public welfare. Measured odor thresholds for a single substance can vary widely. Odor reactions are highly subjective. Odor perceptions, particularly in communities can be the result of combined exposure to odors. Generally accepted and objective criteria for odor in communities are non-existent.

TCEQ Response:
Please see the Response to Comment No. 20.

Comment No. 22:
TOTAL also agrees with the comments submitted by the ACMA concerning the proposed lowering of the ESL for styrene.

TCEQ Response:
Please see the Response to Comment No. 1 – 17 above.

Styrene Information and Research center (SIRC)
Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

Comment No. 23
SIRC strongly endorses the comments submitted by the ACMA concerning the severe negative impacts that a proposed ESL of 73 µg/m^3 for styrene would have on the Texas Composites industry, as well as options for other approaches to setting appropriate styrene ESL.

TCEQ Response:
Please see the Response to Comment No. 1 – 17 above.

Comment No. 24:
SIRC is encouraged by a recent discussion between the TCEQ and ACMA on the application of the ESL for enforcement purpose. SIRC concurs with the ACMA in supporting for the approach taken by other states in dealing with nuisance odor problems on a case-by-case basis, and not through the use of a state-wide limit (see Comment No. 10 and 11).

TCEQ Response:
Please see the Response to Comment No. 10 and 11 above.

ISP Synthetic Elastomers LP (ISP)
Comments Regarding the TCEQ Development Support Document for Styrene ReV and ESL Values

Comment No. 25:
ISP stated that it generally supports the use of ESLs as a conservative screening tool in the permitting process and the methodology employed by the TCEQ in developing the proposed styrene DSD. In particular, the proposed DSD provides extensive narrative of TCEQ's analytical approach, references for key data and assumptions, and provides clear and useful summary tables of the proposed ESLs and ReVs.

TCEQ Response:
The TS appreciates ISP's support for the use of ESLs in the permitting process and acknowledgment that the TCEQ has provided much clearer documentations for the development of styrene's ESLs and ReVs.

Comment No. 26:
ISP commented that the TS should consider the more recent odor data to set its odor-based ESL for styrene. ISP indicated that its review of the reported eight different odor threshold values (see Table 4 of Section 3.2.1 of the proposed DSD) reveals an approximate 100-fold difference between the lowest (73 µg/m^3, Stalker 1963) and highest (8,100 µg/m^3, Dravnieks 1974) odor threshold values. ISP further stated that if one only considers odor threshold values gathered from the most recent five studies there is only an approximate two-fold difference between them. The mean odor threshold from these five studies is 165 µg/m^3. ISP commented that the more recent data may have benefited from the use of more developed analytical techniques, and would provide more consistency among the results obtained and provide a more representative basis

than the earlier studies that resulted in a much wider variation in odor threshold values. ISP further proposes that the odor-based styrene ESL be set either at 150 µg/m^3 based on the most recent study (Nagata 2003) or at the current level of 165 µg/m^3. ISP believes that either proposed value is better supported by the weight of available data.

TCEQ Response:
The TS appreciates and concurs with ISP's comment and suggestion. Upon further review, the TS has determined to set the styrene odor-based ESL at 110 µg/m^3 based on van Doorn et al. (2002) study and not to lower the odor-based ESL to the previously proposed level of 73 µg/m^3 which was based on the Stalker (1963) data.

Owens Corning
Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

I. Lowering the ESLWould Harm Texas Industry

Comment No. 27:
Owens Corning concurs with the ACMA's comments that lowering the ESL would have a significant adverse impact on Texas industry. Owens Corning stated that ESLs are purportedly intended to be conservative evaluative tools. However, in practice odor-based ESLs are applied quite rigidly by the agency. As a result, odor-based ESLs become quasi-permit limits, preventing companies from locating in Texas or expanding existing operations.

Owens Corning commented that except for Texas, health-based thresholds are commonly used in other states to determine allowable styrene emissions. It stated that styrene standards in other states range from 17 to 195 times greater than the ESL proposed in the DSD (see Appendix 1, Comments by ACMA). The current ESL is already much lower than essentially everywhere else in the United States. Owens Corning believes that any further reduction in the ESL would unnecessarily add to the regulatory burden faced by Texas composite manufacturers and could force manufacturers to relocate outside of Texas.

TCEQ Response:

The TS appreciates the above comments. However, these comments are not relevant to the proposed styrene DSD and therefore no response is provided. These comments are better addressed by TCEQ Environmental Law, Enforcement, and Air Permits Divisions.

Comment No. 28:
Owens Corning commented that the proposed DSD provides only the most cursory evaluation of the proposed odor-based ESL. That "evaluation" contains only five lines of text and simply states that there have been a number of acceptable styrene odor studies and that the ESL will be set based on a study conducted in 1963. While the proposed DSD presents the results of the other, more recent studies in a table, it completely fails to compare or analyze those studies, or to explain why those studies are not being used as the basis for setting the ESL.

TCEQ Response:

Please see the Response to Comment No. 9 above.

II. TCEQ is Under no Legal Obligation to Lower the Styrene ESL

Comment No. 29:
Owens Corning commented that ESLs are not ambient air standards and are not specifically required by either the Texas Clean Air Act, or TCEQ's rules. Accordingly, TCEQ has a great deal of discretion in establishing and implementing ESLs. Owens Corning commented that the TS is not legally compelled to lower the styrene ESL because the TCEQ 2006 ESL Guidance (RG-442) is not a rule. Rather, the guidance establishes *non-binding* procedures that the agency can use to evaluate ESLs. It does not in any way *mandate* that TCEQ lower the ESL for styrene.

TCEQ Response:
The above comment is not relevant to the proposed styrene DSD. Nevertheless, the TS concurs with the Owens Corning that the ESL Guidance is not a rule. It is a guideline for the TS staff to use when developing ESLs and other toxicity benchmarks for the evaluation of air permit reviews and air monitoring data and to ensure that the derived ESLs are scientifically valid and protective to the general public. Upon further review, the TS has determined to set the styrene odor-based ESL at 110 $\mu g/m^3$ based on van Doorn et al. (2002) study and not the previously proposed level of 73 $\mu g/m^3$ which was based on the Stalker (1963) data.

III. The ESL Guidance Does Not Support Lowering the Styrene ESL

Comment No. 30:
Owens Corning stated that the procedures for setting odor-based ESLs, as described in Section 1.6.2.2 of the ESL Guidance (RG-442), note that the practice of choosing the lowest odor detection level is only a *general* policy and that, despite that policy, TCEQ is directed in the guidance to consider newer and better studies. Owens Corning further stated that the proposed odor-based styrene ESL of 73 $\mu g/m^3$ was based on the lowest detection level reported in a study (Stalker 1963) conducted 45 years ago. The TS did not consider substantial evidence of a higher odor threshold in other seven newer and potentially better studies as listed in the Table 4 of the proposed DSD.

Owens Corning commented that TCEQ has provided no justification in the DSD to explain why the seven studies conducted after the Stalker (1963) study should be excluded in favor of a 45 year old study. This lack of any explanation gives the appearance that TCEQ's decision is arbitrary. Owens Corning stated that the current ESL of 110 $\mu g/m^3$ is lower than or equal to odor thresholds identified by all of the studies except for the 1963 Stalker study. Moreover, the current ESL is set at a level that is nearly identical to the detection level (107 $\mu g/m^3$) reported in the 2002 van Doorn study. Owens Corning believes that the current ESL of 110 $\mu g/m^3$ is quite conservative therefore the ESL Guidance does not support lowering the current ESL.

TCEQ Response:

The TS appreciates the Owens Corning's comment and acknowledges the Odor Perception Section of the proposed DSD was not fully discussed, and there is no explanation and justification for choosing the Stalker (1963) odor data for the proposed odor-based ESL of 73 $\mu g/m^3$. Upon further review, the TS has decided to set the styrene odor-based ESL at 110 $\mu g/m^3$ based on van Doorn et al. (2002) study and not the previously proposed level of 73 $\mu g/m^3$ which was based on the Stalker (1963) data. We have provided the rational in the revised DSD.

Comment No. 31
Owens Corning disagrees with the statement in the proposed styrene DSD that TCEQ air mobile monitoring staff members have reported styrene odors at measured levels as low as 10 ppb. It seems impossible for the human nose to detect a styrene odor at that level, much less to identify it as styrene. Owens Corning commented that there is no evidence to support this anecdotal comment, nor is there any evidence that the measurement was at all based on approved protocols. Accordingly, the statement should not be used to justify the proposed 73 $\mu g/m^3$ ESL for styrene.

TCEQ Response:
Please see the Response to Comment No. 7 above.

IV. Lowering the ESL is Unnecessary

Comment No. 32:
Owens Corning commented that TCEQ does not have a "No Odor" policy and is not charged with preventing the emission of all odors. Owens Corning stated that the definition of "air pollution" in the TCAA and TCEQ's comment (see Appendix 6 for details) makes clear that odors must reach some threshold level before they constitute "air pollution" that is subject to regulation. The current ESL, however, is set at a level at which most people would not even detect, let alone recognize, the odor of styrene. This level is well below the threshold for causing "air pollution."

TCEQ Response:
We agree that TCEQ does not have a "No Odor" policy; this is clearly demonstrated by the fact that an odor-based ESL is only a guideline value and not a standard and is typically equal to a 50% odor detection concentration which is odorous at least to 50% of the individuals on the odor panel from which the threshold was determined. Also, please see the Response to Comment No. 2, 3 and 4 above.

Comment No. 33:
Owens Corning commented that the existing comprehensive nuisance process, *Odor Complaint Investigation Procedures* (September 17, 2007), can adequately handle odor complaints. It further stated that that there are not widespread styrene odor problems in Texas and that any lowering of the styrene ESL has virtually no possibility of further reducing any odor problems.

TCEQ Response:

It is unclear how this procedure could be used in the permitting process. The existing comprehensive nuisance process is currently used after a complaint is made rather than as an effort to avoid a complaint. The odor-base ESL is intended to prevent the odor problem from occurring and is used in setting control and setback requirements. It is not a compliance standard.

V. Conclusion

Comment No. 34:
Owens Corning commented that the current ESL for styrene is adequately protective of human health and the environment. It stated that given that TCEQ's own guidance (MERA Guidance, RG-324) directs that the Air Permits Division staff may have little discretion in issuing permits where modeling shows potential emissions greater than odor-based ESL limits, TCEQ should not move to lower the styrene ESL in the absence of compelling reasons to do so. Owens Corning commented that the odor-based ESL for styrene should not be reduced below 110 $\mu g/m^3$.

TCEQ Response:
Please see the Response to Comment No. 3 above.

Firestone Polymers, LLC (Firestone)
Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

I. TCEQ's DSD Does Not Provide Support for Lowering the Styrene ESL

Comment No. 35:
Similar to the Comment No. 27 and 28 by Owens Corning above.

TCEQ Response:
Please see the Response to Comment No. 27 and 28 above.

Comment No. 36:
Firestone stated that it utilizes styrene in its styrene butadiene synthetic rubber manufacturing operations in Orange, Texas. Styrene emissions are predominantly from fugitive sources at this facility. Firestone commented that modeling impacts for fugitive styrene emissions might not meet the proposed odor-based ESL of 73 $\mu g/m^3$ and could lead to stringent fugitive controls or termination of planned modifications or expansion at the plant. Firestone requests that the ESL remain at 110 $\mu g/m^3$.

TCEQ Response:
The TS appreciates Firestone's comment. However, the comment is not relevant to the proposed styrene DSD. Nevertheless, upon further review, the TS has determined to set the styrene odor-based ESL at 110 $\mu g/m^3$ based on van Doorn et al. (2002) study instead of the previously

proposed level of 73 μg/m^3 which was based on the Stalker (1963) data. The proposed DSD has been revised accordingly.

II. TCEQ is Under No Legal Obligation to Lower the Styrene ESL

Comment No. 37:
Similar to the Comment No. 29 by Owens Corning above.

TCEQ Response:
Please see the Response to Comment No. 29 above.

III. The ESL Guidance Does Not Support Lowering the Styrene ESL

Comment No. 38:
Similar to the Comment No. 30 and 31 by Owens Corning above.

TCEQ Response:
Please see the Response to Comment No. 30 and 31 above.

IV. The TCEQ's Nuisance Process is Equipped to handle Odor Complaints

Comment No. 39:
Similar to the Comment No. 32 by Owens Corning above.

TCEQ Response:
Please see the Response to Comment No. 32 above.

V. Conclusion

Comment No. 40:
Similar to Owens Corning's comment above (Comment No. 33).

TCEQ Response:
Please see the Response to Comment No. 33 above.

International Institute of Synthetic Rubber Producers, Inc. (IISRP) Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

Comment No. 41:

IISRP is concerned about the fact that the TS proposed to lower the ESL on the basis of odor as compared to a health-based approach. It is also concerned about its members will be negatively impacted by reducing the styrene ESL from 110 µg/m^3 to 73 µg/m^3.

TCEQ Response:
The TS has decided to set the odor-based ESL at 110 µg/m^3 based on the van Doom et al. (2002) study instead of the previously proposed level of 73 µg/m^3 which was based on the Stalker (1963) data. Odor-based ESLs are developed under TCEQ's 2006 regulatory guidance document, *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* (RG-442), that underwent external scientific peer review and two rounds of public comment., Development of styrene's odor-based ESL included a comprehensive literature search, consideration of all available styrene odor studies, and selection of the appropriate odor detection threshold among the studies that meet the American Industrial Hygiene Association and USEPA odor evaluation criteria. For the derivation of ESLs, the TS does not consider factors such as control costs, economic impact, and attainability, although these issues could affect risk management decisions in the use of ESLs.

Comment No. 42:
IISRP commented that it is difficult to understand why the TS opts to use a 45 year old study (Stalker 1963) as a basis for lowering the ESL as compared to more recent and better documented studies cited in the DSD. The TCEQ has not provided any justification in the DSD to explain why the seven more studies are discounted in favor of a 45 year old study.

TCEQ Response:
The TS appreciates the IISRP's comment and acknowledge the Odor Perception Section of the proposed DSD was not fully discussed, and there is no explanation and justification for choosing the Stalker (1963) odor data for the proposed odor-based ESL at 73 µg/m^3. Upon further review, the TS has determined to set the styrene odor-based ESL at 110 µg/m^3 based on van Doorn et al. (2002) study and not the previously proposed level of 73 µg/m^3 which was based on the Stalker (1963) data. We have provided the justification in the revised DSD.

Comment No. 43:
IISRP supports the technical basis from comments provided by the ACMA and other organizations.

TCEQ Response:
Please see the Response to Comment No. 1 – 17 above.

APPENDIX 1

American Composites Manufacturers Association (ACMA) Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

GUIDA, SLAVICH & FLORES
A PROFESSIONAL CORPORATION
The Environmental Law Firm℠

February 6, 2008

Via E-mail: tox@tceq.state.tx.us and Via Federal Express

Toxicology Section, MC 168
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. F
Austin, TX 78753

Attn: Dr. Michael Honeycutt

Re: Public Comment on Proposed Lowering of Styrene ESL on behalf of the American Composites Manufacturers Association

Dear Dr. Honeycutt:

Thank you for this opportunity to submit public comments on behalf of our client, the American Composites Manufacturers Association, including its Texas member companies (ACMA)[1] concerning the Toxicology and Risk Assessment (TARA) group's January 17, 2008 proposal to lower the Effects Screening Level (ESL) for styrene (Styrene ESL) from 110 ug/m^3 to 73 ug/m^3.[2]

[1] The American Composites Manufacturers Association is the national trade group for the composites industry. Its members include small and medium-sized companies that use combinations of thermoset plastic resin, glass fiber and other materials to make underground gasoline storage tanks and pollution control equipment, wind turbine blades, modular tub/shower units and bathroom vanities, ballistic panels and armor for military vehicles, fiberglass boats, automotive, truck and motor home components, window lineal and ladder rail, bridge decks and concrete reinforcing bars, playground equipment, components for commercial and military aircraft, signs and building fascia, and thousands of other composites products, as well as the suppliers of raw material to this industry. The more than 150 composites manufacturing companies in Texas directly employ over 7,500 workers and have combined annual sales revenue of more than $950 million.

[2] In 2007, ACMA informally submitted materials to TARA on this subject. AMCA is now formally submitting those materials for the record in this proceeding. The content of those materials is not reiterated in detail in this letter, but nonetheless should be considered public comments. The documents provided in Attachment 1 are: (A) *Composites Manufacturing Plants subject to the TCEQ Styrene ESL Cannot Comply with the ESL Levels through the use of Capture and Control*, ACMA, February 7, 2007; (B) *TCEQ ESL Policy Adversely Affects Texas' Economy*, ACMA, February 7, 2007; (C) May 29, 2007 letter from ACMA (John Schweitzer) to TCEQ (Michael Honeycutt) with Attachments: (1) *Comparison of State Ambient Limits for Styrene*, by Engineering Environmental Consulting Services (EECS), as of May 29, 2007, (2) *Styrene Toxicology Summary*, by the Styrene Information and Research Center (SIRC), and (3) *Review of Styrene Odor Threshold Values in Air*, Pamela Dalton, Ph.D. and Lawrence Jacquot, Ph.D., Monell Chemical Senses Center, May 22, 2007 (hereinafter Dalton and Jacquot); (D) May 28, 2007 ACMA Public Comments (Howard L. Gilberg) Concerning Proposed Repeal of Permit by Rule 30 TAC 106.392 and Proposal to Adopt Standard Permit for Thermoset Resin Facilities with Attachments: (1) TCEQ Odor Complaint Investigation Procedures, January 3, 2005, (2) *Comparison of State Ambient Limits for Styrene*, by Engineering Environmental Consulting Services (EECS), as of May 29, 2007, (3) May 29, 2007 letter from ACMA (John Schweitzer) to TCEQ (Michael Honeycutt) with Attachments cited in Item C. of this footnote, (4) *Air Permit Technical Guidance for Coatings Sources: Fiber Reinforced Plastics and Cultured Marble Operations*, TCEQ, October 2000 (collectively hereinafter ACMA Public Comments on Proposed Standard Permit); (E) ACMA (John Schweitzer) letter to TCEQ (Becky Southard), December 7, 2006, and (F) *The Composites Industry in Texas*, ACMA, July 2005. It is our intention that the content of all of the attached documents are deemed public comments as well as the content of this letter. We appreciate TARA's intention to respond publicly and in writing to each of the comments submitted on TARA's Styrene ESL proposal, including these comments.

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Our comments are provided in detail below, but in summary:

- TCEQ recently proposed to *reduce* the ESL (community exposure limit used in certain air emission permit application reviews) for styrene from 110 ug/m^3 to 73 ug/m^3. Styrene is an irreplaceable chemical used in the composites industry, which employs many Texans and makes many important products.
- TCEQ's Styrene ESL policy is designed to prevent styrene odor complaints, of which there have been very few. Texans are clearly not at risk for health effects from styrene exposure.
- Since early 2007, ACMA has been working with TCEQ to *increase* the Styrene ESL.
    - The majority of composites plants could not meet the current Styrene ESL if so required, yet the industry has a very low incidence of reported odor problems.
    - TCEQ's current policy has stagnated the industry in Texas, and has forced costly investment by companies to solve non-existent odor problems.
    - No other state employs a similar approach.
- TCEQ is under no legal requirement to reduce the Styrene ESL, and has provided only the most meager and non-scientific support for the proposed change.
- The few industry styrene odor problems are best solved through local enforcement action.
- ACMA's recommended Styrene ESL of 1200 ug/m^3:
    - is scientifically credible and defensible.
    - conservatively protects against odor problems.
    - is achievable by industry using affordable and proven practices.
    - amply protects public health.
    - supports employment and economic development.

Our detailed comments follow.

1. <u>The Current Styrene ESL of 110 ug/m^3 is Unworkable</u>.

A. It Has Been Demonstrated That the Current Styrene ESL of 110 ug/m^3 Cannot Be Met By Virtually Any Texas Composites Industry Manufacturing Facility.

1. TCEQ Modeling Results.

In March and April 2006, the TCEQ modeling staff, at the request of the TCEQ's Standard Permit development staff and in coordination with the TCEQ's toxicology staff,

essentially documented that no composites (thermoset resin) facilities can meet the current Styrene ESL of 110 ug/m^3.[3]

TCEQ's stated goal in developing this Standard Permit was to allow only those composites facilities that could meet the current Styrene ESL to avoid the NSR permitting process. To achieve this goal, the agency created a matrix found in Table 1 of the proposed Standard Permit. Table 1 provides a numerical peak building height and corresponding maximum styrene (and related compounds) emissions rate for those facilities that the agency concluded will meet the current Styrene ESL. By default, TCEQ defined those composites facilities that will not meet the current Styrene ESL: those with peak building heights and corresponding maximum styrene (and related compounds) emissions rates not falling within the values in Table 1.

In fact, there is virtually no composite facility in Texas that meets the values in Table 1, and therefore, using TCEQ's approach, there is virtually no composite facility in Texas that meets the current Styrene ESL. This is consistent with our understanding from the field. Just as important, potential new composites facilities in Texas would be constructed and operated in much the same manner as existing facilities. They too would not meet the Table 1 values, and again according to TCEQ's approach, none of these facilities would meet the current Styrene ESL. ACMA filed public comments to this effect in response to the proposed Standard Permit in May 2007.[4]

2. ACMA Modeling.

The foregoing TCEQ conclusions were confirmed by modeling on typical Texas composites facilities performed as part of an ESL feasibility study conducted for ACMA by Engineering Environmental Consulting Services (EECS).[5]

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[3] TCEQ Memorandum from Lori Wilson and Beth Echels, Emissions Banking/Modeling Team, to Eddie Mack, Combustion/Coatings Team, March 13, 2006; *Request for Comments to Toxicology & Risk Assessment Section*, April 4, 2006. Dr. Lee of the TARA staff responded and certified the toxicology response. The documents cited in this footnote are provided in Attachment 2.

[4] See ACMA Public Comments on Proposed Standard Permit, *supra* at note 2.

[5] *Feasibility of Achieving the TCEQ Short-term ESL Styrene Limit using Atmospheric Dispersion or Add-on Controls for Small and Medium Composite Facilities*, Robert A. Haberlein, Ph.D., EECS, February 4, 2008, p. 9-15, provided in Attachment 3 and hereinafter identified as *Haberlein Study*.

B. TCEQ Has Overlooked the Unaffordability of Air Pollution Control Equipment in Setting the Current Styrene ESL.

1. The Real, Unaffordable Cost of Satisfying the Styrene ESL.

If TCEQ were to require composites facilities to meet the current or a proposed lower Styrene ESL as part of the permitting process, there is one way, and one way only, for all but the very small minority of composites manufacturers to assure compliance with that requirement: the installation of equipment to capture and then oxidize virtually all of the styrene emitted during the fabrication and curing of composite products. The operating and capital costs of such capture and oxidation control are far beyond anything the large majority of composites manufacturers can afford under any imaginable scenario. Lowering the Styrene ESL, as has been proposed, merely would extend the prospect that even smaller composites manufacturers would not be able to comply with this ESL, and as a result, would be forced to install capture and oxidation control equipment to satisfy the lower Styrene ESL.

The economic consequences of TARA's current and proposed Styrene ESL, as applied or threatened by the TCEQ Permitting Division, create a "virtual ban" on expansions of existing composites facilities and construction of new facilities in Texas. If existing facilities were literally required to meet the current (or the proposed new) Styrene ESL, Texas would find most of its composites facilities forced to move out of state or shut down, and the Texans working at those facilities would lose their jobs.

The *Haberlein Study* confirms this conclusion. According to the study, the annual operating costs associated with the most cost efficient and effective capture and oxidation control equipment for a small and medium composites manufacturing plant are, in today's dollars, approximately $443,000 and $1.37 million, respectively.[6] Energy costs are expected to rise precipitously, if unpredictably, over at least the useful life of this equipment, which will increase these already unaffordable, extraordinary annual operating costs. Very few Texas composites manufacturers earn this much money in a single year, particularly in the current economic recession, and they are unlikely to do so in the future.

The capital costs associated with purchase and installation of this capture and oxidation control equipment at a small and medium composites manufacturer are approximately $872,000 and $1.74 million, respectively.[7] The cost for all of the production equipment at many composites manufacturing plants in Texas is less than these amounts.

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[6] *Id.* at 23-30.

[7] *Id.*

Financing is an important economic limitation as well. These small and medium composites businesses have dollar-limited credit facilities. In fact, very few, if any, could obtain financing to purchase this air pollution control equipment, even if the annual operating costs were manageable in some financial sense. Financing for the capital cost might be available if the business had adequate current cash flow to manage the operating costs, but few composites companies, if any, do. Margins and cash flow management requirements driven by the market leave composite plants with no real fiscal options, if faced with compliance with the current or a proposed lower ESL.

Finally, financing the capital cost of air pollution control equipment will be deducted from the business' total available credit. The remaining limited credit facility is not sufficient to expand the business to provide the cash flow necessary to pay the annual operating cost associated with the air pollution abatement equipment.

Under these circumstances, it is inexplicable to ACMA why a business would purchase pollution abatement equipment with costs that approach or exceed the cost to build its entire manufacturing operations when it has the option to close its business in Texas and move it to another jurisdiction without the threat of a capture and oxidation control requirement.

Note that the composites industry *continues to be* willing to invest in site-appropriate ventilation control, as discussed below, which while typically incapable of meeting the current Styrene ESL, *is* effective in preventing odor problems.

2. US EPA's MACT-Related Decision on the Affordability of Air Pollution Control Equipment Is an Independent, Reliable Resource That Should Guide and Persuade TCEQ in Setting the Styrene ESL.

In 2000, as EPA was developing the NESHAP for composites manufacturing (later promulgated as 40 CFR 63 Subpart WWWW), the agency conducted an extensive review of the affordability of air pollution controls and oxidation equipment. In its final NESHAP, EPA limited requirements for air pollution control and oxidation equipment to those plants where the same would be reasonably affordable, i.e., new plants making small parts with total HAP emissions of 100 tons per year or more.[8]

One of the studies submitted to EPA for its analysis was prepared by the consulting firm Environomics, commissioned by ACMA.[9] This report considered the affordability of

[8] ACMA is unclear whether an existing continuous lamination/casting plant is in operation in Texas. Should one or more be in operation, the MACT standards for the composites industry, 40 CFR 63 Subpart WWWW, would require those operations to install air pollution control and oxidation equipment, irrespective of their level of styrene emissions.

[9] *Affordability of Capture and Control, An Evaluation of the Existing Facilities Subject to EPA's Proposed Requirement,* Environomics, 2000, provided in Attachment 4.

EPA's draft proposed MACT capture and oxidation control requirement for composite manufacturing operations.

For ten representative plants for which detailed financial and operating information was available, Environomics carefully studied three measures of control affordability: Total Annual Cost as a Percent of Revenue; Total Annual Cost as a Multiple of Profit; and Total Capital Investment Cost as a Multiple of Historical Capital Investment Levels. Environomics found that "6 to 8 or more" of the ten representative plants were more likely to close than pay the costs of capture and oxidation control, and that controls posed at least an "affordability concern" for nine of the ten plants. Finally, Environomics determined that these conclusions were also very likely to apply to 29 out of a larger group of 34 composites plants for which less financial and operating data were available.[10] The composites plants which were the subject of the Environomics affordability assessment were very representative of typical composites industry plants in Texas.

3. TCEQ's Economic Judgment in its BACT Coatings Guidance Should be Applied to its Setting of the Styrene ESL.

Styrene emissions from almost all composites plants in Texas do not exceed 80 tons per year. TCEQ's Coatings Section policy states that coatings sources (including composites plants) with VOC emissions of less than 80 tons per year are not required to undergo BACT analysis. The Coatings Section policy rightly presumes that it is unaffordable for coatings sources with VOC emissions of less than 80 annual tons to install and operate oxidation control equipment. TCEQ should acknowledge the economic judgment in its own guidance and adopt it in setting the Styrene ESL.

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[10] TCEQ's routine air permit processing procedures include a Best Available Control Technology (BACT) analysis. A BACT analysis includes a calculation of the cost of pollution control equipment and a comparison to the amount of a specific pollutant abated by that equipment. The resulting faction is denominated in cost in dollars of pollution control equipment per ton of pollutant removed. This figure is then compared to agency guidelines to determine whether the pollution control equipment under consideration is affordable and should be required in the issued permit. The *Haberlein Study*, *supra* note 5, at 26, concluded that the cost per ton of styrene emissions abated, using the most efficient and effective control and oxidation equipment is $18,656 for a small composites manufacturing plant, and $17,998 for a medium composites manufacturing plant. *Id.* at 30. These costs are well in excess of that which would trigger the imposition of air pollution control equipment requirements based on a BACT analysis.

While the conclusions of the *Haberlein Study* support ACMA's position concerning the economic unreasonableness of air pollution control equipment in the composites industry, ACMA's superseding position is that the BACT analysis is not the correct perspective on the situation because the large majority of composites facilities in Texas are unable to either afford or to finance either the capital costs or the operating costs, or both, most probably associated with the installation and operation of control and oxidation equipment.

C. The Current Styrene ESL, Coupled with TCEQ Permitting Practices and the Discretion of the Permitting Staff to Require Air Pollution Control Equipment at Texas Composites Industry Plants, Has Stifled the Industry and Threatens to Contract the Industry in the Future.

1. TCEQ Permitting Decisions.

The Texas composites industry has experienced stagnation since 2000, even as the industry nationally has grown at a healthy pace. To ACMA's knowledge, there have been no new composites plants located in Texas, and no expansions to existing operations. An important, if not the primary reason for this situation is the current Styrene ESL and the TCEQ Permitting Division's reaction to new facilities that cannot satisfy that ESL.

The stagnation begins with actual permitting activities; specifically the agency's handling of the permit renewal process. The permit renewal process has not historically been a process in which the Permitting Division imposes or even considers imposing additional air pollution control requirements, unless the facility proposes changes to its operations or unless there have been confirmed public complaints or enforcement issues. ACMA understands that the renewal process for some composites facilities that meet none of these criteria has nevertheless been an opportunity for the Permitting Division in some cases to impose requirements for expensive taller stacks to increase dispersion, even though in the large majority of these cases the source has had no history of odor complaints. (ACMA understands that after installing these taller stacks in order to renew their permits, the sources still do not satisfy the styrene ESL, sometimes by a wide margin.)

The composites industry acknowledges and accepts that the Permitting Division has the discretion in certain well-defined circumstances to impose these requirements; in cases, for example, where there has been a history of odor complaints. If the Permitting Division is imposing costly air pollution control measures in the permit renewal context in the absence of odor complaints, however, it is a reasonable concern on ACMA members' part that TCEQ has the will to impose these or more costly controls in other, more common contexts as well.

If TCEQ's and ACMA's data is correct that most composites facilities in Texas can not meet the current Styrene ESL, each of these facilities is subject to the Permitting Division's discretion in certain circumstances to impose unaffordable air pollution control measures. Stagnation of the Texas industry has resulted from business' reaction to avoid those circumstances and ones like them. Business self-preservation drives these decisions.

Those circumstances are clearly present in the case of <u>proposed new</u> composites plants and <u>proposed expansions</u> to existing plants. The industry's concern is that in either case, permits may not be granted, <u>unless</u> the applicant agrees to install capture and oxidation control

equipment. The market response has taken two predictable paths. First, proposed new facilities simply do not submit applications: they locate in other states. This is discussed further below.

Second, existing facilities with thoughts of a production expansion reject those thoughts if they plan to stay in Texas. They do not apply for permit approvals, and some have closed their businesses and opened new, expanded facilities outside the state. These businesses realize that, if their current operations do not satisfy the current Styrene ESL (or twice that ESL in certain circumstances) as projected by TCEQ's modeling or otherwise, and that a production expansion is one of those circumstances in which the TCEQ permitting staff has the discretion to require unaffordable air pollution control equipment, filing a permit application creates an unacceptable level of risk, not only for the proposed expansion but to the unaltered existing business as well.

Stagnation has grown out of the individual business' reaction to TCEQ permitting actions and threatened possible actions. The threat of such action by the Permitting Division has been enough to drive these decisions. A lower ESL will tragically ensnare those few very small facilities that currently can satisfy the ESL with the same problem.

2. TARA's Role in Setting the Styrene ESL.

TARA's decision on the Styrene ESL clearly is at the heart of the matter. It is no response from TARA that the regulatory decision to impose or to not impose air pollution control and oxidation equipment requirements as part of a site-specific permit process ultimately rests with the TCEQ's permitting staff and is outside TARA's purview. TARA's Styrene ESL sets the stage for permitting decisions by increasing or decreasing the discretion of the TCEQ permitting staff.

While ACMA recognizes that the imposition of air pollution control equipment requirements is not an inevitable outcome, the reaction of the market makes it is clear that lowering the ESL will create further fear and an erosion of confidence in the Texas regulatory climate for the composites industry. The converse is also true. Increasing the Styrene ESL to a level consistent with a scientific, protective approach that many of the composites industry can meet with good ventilation practices reduces that fear and encourages a positive business climate.

3. Texas is THE Issue.

If Texas' Styrene ESL and permitting process were essentially duplicated by other state permitting programs, ACMA would have little issue with the TCEQ. The situation would be addressed by ACMA as a national one. The problem for the Texas composites industry and the state of Texas is that this is a Texas issue, and only a Texas issue. The other 34 states surveyed by EECS either have no ESL-equivalent or an ESL–equivalent many times (as much as 200

times) higher than the current Texas ESL, and, maybe most critically, air permits for new and expanding composites facilities are readily attainable.[11]

Possibly the best practical argument in favor of the development in Texas of a realistic Styrene ESL is that fact that 34 state's toxicology experts cannot be wrong when they rely on health-based data and set their ESL-equivalents accordingly. Texas is the only state in ACMA's 35 state survey that has an ESL-equivalent based on odor, with the possible exception of Arkansas whose ESL-equivalent is 13 times greater than the Texas ESL.[12] ACMA believes there is a reason for the other states' reliance on health-based data and a disregard, except in Texas, for odor-related information. Styrene-related health effects data is scientifically current and credible because it can and has been objectively determined and is statistically verified. Odor complaints and odor detection threshold-related information does not hold the same weight in the scientific community or with the 34 states choosing to regulate styrene on an ESL-like basis.

ACMA has been offered an alternative explanation by TARA for the use of odor data to set its ESL: the wording of the Texas Clean Air Act which admittedly requires the agency to protect public health and welfare. ACMA disagrees with this explanation on several levels. First, the clean air acts of the other 34 states in the EECS survey, almost without exception, require protection of public welfare as does Texas, yet those states do not condition issuance of air permits based on odor. Second, neither the Texas Clean Air Act nor regulations promulgated pursuant to that law define "public welfare" to include odor. TCEQ's predecessor agencies informally created this approach. It is outmoded, at least in the case of styrene.

Further, even if protection of public welfare in Texas has come to mean addressing odor problems, it does not require the elimination of odors as part of the air permitting process. The Enforcement Division is capable of addressing styrene odors should they be confirmed. In our view, "public welfare" is not limited to odor concerns. Achieving a balance between a low rate of nuisance odor problems and a healthy economic climate can be best achieved through the site-specific enforcement process. Public welfare also includes protection of Texans' jobs and Texas employers, and encouraging new employers and jobs to locate in Texas as part of a balance of public welfare concerns and opportunities. While ACMA acknowledges TARA's toxicological expertise, ACMA asks that TCEQ as an agency consider and find persuasive the numeric ESL-equivalent standards established by air pollution control agencies around the country.

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[11] *Comparison of State Ambient Limits for Styrene*, by Engineering Environmental Consulting Services (EECS), as of May 29, 2007, provided in Attachment 5. The survey data represent those states for which information on permitting policies was readily available, either through Internet searches or from the experience of industry consultants.

[12] Please refer to discussion on page 23 of these public comments.

4. TCEQ has Ample Reason to Fairly Promote and Not Discourage the Texas Composites Industry.

The Texas composites industry provides over 7,500 jobs to Texans and close to $1 billion in annual revenue. It produces products important to Texas' programs and environmental goals. For example, wind turbine blades promote alternative energy, underground fiberglass tanks reduce subsurface soil and groundwater pollution and improve septic system performance, lighter, more durable and stronger bridge and road infrastructure products are supported and specified in increasing numbers by TxDOT, and many products are produced that support defense and homeland security programs.

It is in Texas' self interest to promote and not discourage expansion of these businesses and to attract new businesses to the state. The current TCEQ's Styrene ESL discourages economic development.

2. Lowering the Styrene ESL is Unsupported and Unsupportable.

The current ESL has played havoc with all but the smallest composites manufactures in Texas, as described in our first comment. Based on agency air dispersion modeling, their long term economic viability would be jeopardized if the TECQ Permitting Division were to require composites facilities to meet the current Styrene ESL. Lowering the Styrene ESL expands that jeopardy to include virtually all of the very small composites manufacturers that can meet the current ESL. In fact, given their size, and the capital and operating costs associated with capture and oxidation control equipment, these facilities may be in greater jeopardy.

A. The Number of Documented Styrene Odor Complaints is Meager; Their Elimination is Not Feasible Nor a Basis for Lowering the Styrene ESL.

TARA has taken the position that lowering the Styrene ESL is necessary and advisable because it will eliminate a presumably large number of styrene odor complaints. It is neither necessary nor advisable. According to the agency's website, Texas has experienced very few styrene odor complaints. Between 2003 and about the beginning of 2007, there were but two enforcement actions taken by the agency concerning confirmed nuisance styrene odor from a composites industry manufacturing facility. These enforcement actions are not indicative of a widespread trend of the type that might support broad agency action, like lowering the Styrene ESL.

The number of styrene-related nuisance odor enforcement actions increased to a paltry number in 2007 from two in the preceding four years. Coincidence or not, this increase occurred only after ACMA pointed out in this Styrene ESL process the general absence of enforcement actions in the past. As before, these activities related to a very small handful of composites industry manufacturing facilities. No industry-wide trend emerged. TCEQ handled these odor

situations through the local enforcement process, as ACMA endorses. ACMA supports the initiation of enforcement action on a case-by-case basis where justified by the evidence.

ACMA strongly suspects these few incidents are traceable either to inadvertent human error or outmoded ventilation practices, or both, and represent little more. No trend is present.

ACMA's repeated requests for evidence of the supposedly abundant styrene odor complaints have gone unanswered, except for anecdotal information concerning alleged styrene odor detection by TCEQ employees. A summary statement to this effect is made on page 11 of the TARA's proposed *Styrene Development Support Document*, Section 3.2.1, Jong-Sung Lee, Ph.D., January 2008 (hereinafter *Proposed DSD*) that styrene odor was measured at 10 ppb, a level even lower than the lowest odor detection threshold measured in a laboratory setting.

TARA's table of odor and health complaints indicates six monitoring trips with 14 different time observations in one of those trips. The reports of styrene odor detection, throat irritation and headaches are completely inconsistent with scientifically credible data. Throat irritation effects for styrene have not been reported in controlled exposure studies or workplace evaluations at levels at or below 10 ppm.[13] TCEQ field staff reported irritation purportedly attributable to styrene in the ambient air at exposures levels as much as 1,000 times lower. Similar issues are present with respect to the levels at which TCEQ field staff reported a higher incidence of headaches.

More to the point, ACMA is troubled by the notion that the number of odor complaints should dictate a lowering of the Styrene ESL. Decreasing the Styrene ELS will not reduce odor complaints for several compelling reasons.

First, the large majority of composite industry plants do not have a history of odor complaints. The affordable ventilation technologies used by most plants effectively prevent odor problems, whether or not the plants' air dispersion modeling satisfies the Styrene ESL. This is borne out by TCEQ's own odor complaints database, as discussed previously. There are almost no styrene odor complaints from the Texas composites facilities to be reduced.

Second, ACMA believes that the few industry sources that had confirmed odor complaints might readily address them through the use of effective ventilation controls. ACMA supports enforcement action to require the use of improved ventilation where there is a history of odor complaints. Decreasing the Styrene ESL is at best a very indirect and blunt method of achieving this aim, and realistically would cause further stagnation of the industry without necessarily any improvement in air quality or odor reduction.

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[13] Draft Toxicological Profile For Styrene, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, September 2007. See www.atsdr.cdc.gov/toxprofiles/tp53.html.

Finally, as TCEQ is aware, the scientific literature supports the fact that many odor complaints are unrelated to the presence in air of substances that would actually result in nuisance odor. Complaints can be related to disgruntled employees, mistaken identification of odors, and other factors.

ACMA finds TARA's underlying premise that lowering the ESL will lower the number of styrene odor complaints is illogical.

B. TARA is Not Legally Compelled to Lower the Styrene ESL.

TARA's de facto position seems to be that it is legally compelled by its *Guidelines to Develop Effects Screening Level, Reference Values and Unit Risk Factors,* RG-442, November 2006 (hereinafter *ESL Guidance*), to lower the styrene ESL. ACMA disagrees. There is no legal, technical, or practical requirement for TCEQ to lower the Styrene ESL. The fact that TARA finalized the *ESL Guidance* does not compel lowering the Styrene ESL because legal precedent holds that agency guidance is not legally enforceable on either the regulated community or on the agency, and because that guidance provides no direction on any specific air pollutant.

The decision to lower the Styrene ESL is entirely discretionary. TCEQ has what ACMA believes is an effective and practical means of addressing those few styrene odor complaints reflected in the TCEQ's online database through its enforcement process. TCEQ has previously determined that the odor of styrene is merely "Unpleasant". What then warrants the exercise of agency discretion to lower the Styrene ESL? It is an unnecessary, arbitrary, and unwarranted exercise of agency discretion and use of agency resources to lower the Styrene ESL.

C. There is No Practical Support for Lowering Styrene ESL in the Proposed Development Support Document.

Proposed DSD is 19 pages, exclusive of its bibliography. Of that, styrene odor perception is addressed in one paragraph of six lines, and a single table, Table 4. In other words, TARA's explicit publicly available support for the proposed lowering of the Styrene ESL is limited to six lines in the *Proposed DSD*. TARA essentially ignores the rest of the *Proposed DSD*.

The six lines offer no support. In addition, Table 4 does not identify all styrene odor detection threshold studies and is therefore incomplete.

In summary, the economics of the current and a proposed lower Styrene ESL make no sense. Maintaining or lowering the Styrene ESL is bad public policy because to satisfy these ESLs, all but the very smallest of Texas composites plants could be forced to install capture and oxidation control equipment. For this reason, and others discussed in greater detail below, ACMA proposes establishing an ESL that the regulated community can meet using good ventilation practices that do not involve the purchase or installation of capture and oxidation equipment.

3. Styrene Odor Should be Addressed Locally and Through Enforcement, Where Appropriate.

The macro issue for ACMA presented by the TARA styrene ESL proposal is whether those few confirmed styrene odors from Texas composites plants are most effectively addressed through the TCEQ's enforcement process or through permitting process' modeling/ESL regime. ACMA is of the view (and that view is held by many, many states) that since the odor of any chemical from a specific source that affects the local community is a local issue, it should be addressed through enforcement, where necessary, and not in an inordinately restrictive statewide permitting process.

A. Odor is a local issue.

Odor is a local issue. By this, we mean that whether or not a plant creates a nuisance odor problem – whether or not community members unacceptably suffer from bad smells due to a plant's operations – is a function of many site-specific variables, none of which can be best regulated from a distance, for example by the ESL policy. These local factors include land use, topography, population density, and prevailing meteorology. Local individualized sensitivity to odor is also a local factor, since issues such as community organizing and advocacy can have a role – odor complaints can result from issues unrelated to the presence of chemicals in the air. Local, too, is the design of site-appropriate ventilation controls, which while seldom effective in meeting the current styrene ESL, are effective in preventing nuisance odor problems.

Styrene has a distinct odor and to some members of the public, that odor may be objectionable. The issue of styrene odor should not be discounted or disregarded. At the same time, the issue should not be overstated. ACMA supports the TCEQ's Enforcement Division's position that the odor of styrene is minimally objectionable. Styrene odor is deemed "Unpleasant" by the TCEQ, "Unpleasant" being the second-lowest of TCEQ's Enforcement Division's nuisance odor categories.[14]

The TCEQ enforcement process is an effective, tested, scientifically credible means of addressing confirmed nuisance styrene odor complaints, and deserves TCEQ priority. Its *Nuisance Odor Enforcement Guidance* is consistent with national practices and odor science. In addition, TCEQ boilerplate air permit special condition language includes an obligation to abate odors:

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[14] *TCEQ Odor Complaint Investigation Procedures*, January 3, 2005, at 15 (hereinafter *Nuisance Odor Enforcement Guidance.*

> Emissions from the facility shall comply with 30 TAC 101.4 regarding nuisance. Complaints from affected persons of nuisance odors from the facility verified by the TCEQ or any air pollution control agency with appropriate jurisdiction shall be the basis for requiring prompt remedial action to eliminate such odors.[15]

The point of that language is to assure enforcement is an available option in the event odor becomes a problem in a specific situation.

There is no public policy justification for lowering the Styrene ESL when the enforcement process is reasonable, readily available, and works.

B. The Emphasis on A Local, Complaints-Based Approach to Nuisance Odor is Strongly Supported by US EPA.

In the 1977 amendments to the Clean Air Act, Congress directed US EPA to undertake a detailed review of the use of regulations to require control technologies to address odor problems. EPA commissioned a study of the subject from the National Academy of Sciences and on the basis of that study and its own analysis, EPA sent a Report to Congress.[16] This seminal work has provided the basis for EPA's consideration and possible regulation of odor since 1980.

This National Academy of Sciences report provides strong support for ACMA's position stated above. The following text is from the EPA report's Executive Summary:

> Reactions to odor depend heavily, however, on local values and individual aesthetic judgments. The absence of any meaningful data that relate ambient odor levels (or odorant concentrations) to community annoyance levels will likely frustrate any attempts to establish general nationwide ambient odor regulations for the foreseeable future. Indeed, since odor perception is quite subjective, nuisance law, initiated by citizen complaints, appears to be an appropriate mechanism for dealing with odor problems.[17]

and,

> The relationship between ambient odor levels (or odorant concentrations) and odor annoyance thresholds for different communities or zoned areas must be

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[15] TCEQ air permit.

[16] *Regulatory Options for the Control of Odors*, US Environmental Protection Agency, 1980, provided as Attachment 6.

[17] *Id.* at 2.

> determined prior to establishing ambient odor type standards. This step might be accomplished by determining both the dose-response relationships that equate community annoyance with odor intensity and the degree of unpleasant character of a particular odor. However, for some odorants such relationships may be impossible to develop.[18]

and,

> In conclusion, federal regulatory involvement in odor control does not appear to be warranted. This conclusion is based on the following considerations:
>
> 1. Odors are not caused by a single pollutant, but rather are a subjective effect which may result from different combinations of numerous odorants. Thus, it is very difficult to associate any specific health or welfare effect to a given "odor concentration". As a result, the available data are not sufficient to support the establishment of a primary or secondary ambient air quality standard for odors.
>
> 2. Other problems which limit or preclude setting of national ambient air quality standards for odors or, developing State Implementation Plans for odors include:
>
>   a. Techniques used to measure odors are considered generally inadequate for regulatory purposes.
>
>   b. Reliable procedures for relating ambient odor levels to the extent of community annoyance do not exist.
>
>   c. Community tolerances or odor annoyance levels vary widely.
>
> 3. Use of best control technology for new or existing sources of odors under Section 111 of the Act also has problems:
>
>   a. It would require best controls nationwide, even though a source type may be a problem only in certain areas or situations.
>
>   b. It does not guarantee that community odor annoyance levels will not be exceeded, especially where fugitive odor sources are involved or when multiple odor sources are located in close proximity to one another.
>
>   c. Assessing and/or regulating all odor source categories would require an inordinate expenditure of Federal, State, and local control agency resources which are already fully extended to meet other Clean Air Act requirements.

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[18] *Id.* at 4.

4. Local and state odor control procedures appear to be generally adequate and are probably more cost effective than a uniform national regulatory program under the Clean Air Act.[19]

All of these EPA conclusions serve to *discount* the validity of TCEQ's permitting/ESL approach to odor, which is of the type of regulatory response that EPA rejected, and to *endorse* the approach provided in the TCEQ's Enforcement Division's Nuisance Odor Enforcement Guidance.

C. ACMA Proposes the Use of Good Ventilation Practices to Proactively Address Styrene Odor Issues.

Styrene odor is an important issue for the ACMA and its members, many of whom live in the very communities that the Texas Styrene ESL is intended to protect. ACMA strongly suspects the few confirmed odor styrene complaints in the agency's database arising from composite facility operations are traceable either to inadvertent human error or outmoded ventilation practices, or both, and represent little more. ACMA supports good ventilation practices that require a reasonable economic commitment by its members. The design of effective ventilation practices depends on local conditions, such as distance to the nearest neighbor, terrain topography, and surrounding land use.

Texas composite facilities have a wide spectrum of available ventilation options that range from wall-mounted exhaust fans to very tall exhaust stacks. Any one or more than one of these options should be sufficient to prevent nuisance odors in any particular location. As shown in ACMA's modeling, the elimination of wall-mounted ventilation systems in favor of roof-mounted systems can lower the modeled maximum ground level styrene concentration from a typical composites plant by as much as two orders of magnitude.[20]

4. If TCEQ Persists in Relying on Odor Detection Threshold Data, It is Obligated to do so in a Scientifically Credible Manner.

A. The Overall Quality of Odor Threshold Detection Studies Argues Against Choosing a Single Study as the Sole Basis for Setting the Styrene ESL.

The science of detecting odors in general and styrene odors specifically has not progressed to the same level of scientific and statistical verifiability as health effects science, such as animal toxicity testing. In a review conducted for ACMA, odor experts Pamela Dalton and Laurence Jacquot of the Monell Chemical Senses Center reported:

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[19] *Id.* at 5.

[20] *Haberlein Study*, *supra* note 5, at 13 and 15.

> Although odor thresholds have been measured and reported for more than a hundred years, even now no single methodology has been uniformly adopted for measuring olfactory sensitivity in humans. It is not uncommon to find reported odor thresholds in the literature for a single compound to vary by more than an order of magnitude and in this regard, styrene is no exception. The variation in thresholds among studies can be traced to differences in odor presentation method, panel composition and size, and/or procedures for analyzing the stimulus concentration and calculating the threshold.[21]

Odor detection threshold studies of styrene (or any other compound) are not a measure of the ability to detect styrene specifically. They are studies to determine the presence of a compound other than what the studies' participants perceived to be "clean air." This measurement is of a perception of odor, not a physical property of the subject chemical, and the odor threshold is established at that level where the test subjects correctly identify the presence of an unidentified chemical 50 percent of the time. Scientific studies confirm that odor perception is highly subjective and that anticipation, mood, and bias can play significant roles.

In addition, these studies suffer from the problem of determining accurately exactly how much of a chemical a test subject is exposed to each time a data point is collected. For example, a chemical is introduced in the general vicinity of the test subject, but what is the concentration of the chemical that is actually inhaled by the subject? There is also the usual problem of determining that one's test subjects are representative of the general population and are not either more sensitive or less sensitive, in this case, to odors. This is not a sensitivity that is easily determined.

This is why, as even TARA acknowledges, there is a very high variability, ranging over several orders of magnitude, among individuals in the area of odor detection.

> The reported odor threshold data differ considerably. It is not uncommon for reported odor threshold values to range over several orders of magnitude for the same chemical.[22]

Finally, once one has determined an odor detection threshold among a particular set of test subjects in a study in a laboratory, there is still the challenge of extrapolating these results to the real world situation of people exposed to odors smelled in their neighborhood. For example, the laboratory air is filtered, and the test subject is told to expect to detect an odor. In the outside

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[21] Dalton and Jacquot, *supra* note 2.

[22] *Guidelines to Develop Effects Screening Level, Reference Values and Unit Risk Factors,* RG-442, Texas Commission on Environmental Quality, November 2006, at. 8.

world, there are many competing sensations and any chemical needs a stronger signal in order to be detected. In short, odor detection thresholds measured in the laboratory in a single study are a very weak reed upon which to base any standard or guideline for acceptable ambient public exposure.

The *ESL Guidance* provides TCEQ with the latitude to not use odor threshold data or to use it in a manner other than simple selection of the single lowest data point. ACMA recommends TCEQ recognize and use this latitude in the case of styrene.

B. Texas Should Use a Weight of Evidence Approach to Set the Styrene ESL.

Of the reported odor threshold studies found by Dalton and Jacquot to meet certain requirements for scientific credibility, the reported styrene odor detection thresholds ranged from 73.6 ug/m^3 to 8530 ug/m^3.[23] Arbitrarily selecting one or more of the reported studies because they provide data at the low end of the range, and then using these studies in a regulatory context, as TARA's odor ESL policy would dictate, arbitrarily and unscientifically elevates the standing of these low-threshold studies.

TARA should follow the advice of Dalton and Jacquot in setting the Styrene ESL using a weight of evidence approach:

> While it may be tempting to assume the lowest value in a data set is the most protective, there are compelling reasons to seek a 'weight of evidence' approach with regard to convergence of threshold data values across laboratories and methods. Indeed, depending on the test panel composition (gender and number) a very low average threshold may occur as a function of having selected a small number of extremely sensitive and well-trained individuals for participation. When we consider studies where a larger number of individuals are tested, the average thresholds are typically higher and may be more representative of the general, naïve population.[24]

A "weight of evidence approach" is one that, in a transparent and scientifically defensible manner, uses all reasonably available data. The approach provided in TARA's *ESL Guidance* can not be considered a weight of evidence approach because it uses only those studies with lower reported odor detection thresholds, without providing a scientifically credible reason why those studies may be more predictive of community odor problems than studies with higher thresholds.

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[23] Dalton and Jacquot, *supra* note 2, at Table 7.

[24] Dalton and Jacquot, *supra* note 2, at 13.

A scientifically defensible weight of evidence odor detection threshold for styrene begins with assembling all of the studies of styrene odor threshold detection that meet minimum scientific criteria for quality. TCEQ lists eight studies in its *Proposed DSD*, the scientific credibility of which ACMA does not dispute for purposes of this specific discussion. Dalton and Jacquot also list eight studies in their review of styrene studies.[25] When duplications are eliminated, there are 12 studies whose odor detection thresholds range over two orders of magnitude. This broad range illustrates the scientific challenge and danger of relying on only the lowest reported value as the correct value for an ESL for styrene, as the TCEQ suggests. The mean of these studies' odor detection threshold values is 1212 ug/m^3.

If TARA persists in resetting the Styrene ESL on the basis of odor threshold data, then it should rely on this weight of evidence approach. That approach leads to a new Styrene ESL of 1200 ug/m^3.

C. TARA's Approach to Setting a Styrene Odor-Based ESL Is Flawed Because the Odor-based portion of TARA's *ESL Guidance* Did Not receive Approval from Its External Peer Review Committee.

To develop the *ESL Guidance*, TARA contracted with Toxicological Excellence for Risk Assessment (TERA) to convene a panel of independent experts ("the TERA Panel") to review TARA's proposed approach to setting ESLs. The TERA Panel's findings and recommendations to TCEQ regarding the ESL program were published (hereinafter TERA *Panel Report*).[26]

It is clear from the TERA *Panel Report* that there was never a "meeting of minds" between the TERA Panel and TARA staff regarding the objectives of the odor detection threshold-based ESLs. The TERA Panel's comments clearly show that the TERA Panel members believed in error that odor was being used in the context of the ESL program as an indication of *toxicity*. There is no indication that the TERA Panel understood that the purpose of establishing odor detection threshold-based ESL is to prevent nuisance odor complaints. For example, the TERA *Panel Report* reads:

> The panel discussed the approaches to setting odor ESLs described in [TARA's draft] document and suggested alternative acute endpoints that are *more closely tied to health effects* than odor.

and,

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[25] Dalton and Jacquot, *supra* note 2, at Table 7.

[26] *Report of the Peer Review Meeting on Development of Effects Screening Levels, Reference Values, and Unit Risk Factors for the Texas Commission on Environmental Quality*, Toxicology Excellence for Risk Assessment, October 12, 2005.

> Reviewers noted that there is not a good toxicological basis for establishing screening levels based on odorant properties, especially because the ability to detect or perceive an *odor does not typically map with levels associated with toxicity.*[27] (emphasis added)

ACMA does not believe that TARA clearly communicated to the TERA Panel that TARA intended to employ odor detection threshold-based ESLs to significantly reduce, if not to entirely prevent, nuisance odor complaints. It seems very unlikely, and there is no record to show, that Panel members understood that TARA's intended approach would effectively prevent construction of production capacity, and create uncertainty for existing plants, in an industry such as composites where there is no significant history of odor complaints, and where controls to meet an odor detection threshold-based ESL established using TARA's overly conservative and non-scientific process are not affordable and would harm to employment and economic activity.

Even if ACMA is mistaken in this assertion, the TERA Panel expressed clear concern with TARA's procedure for setting odor-based ESLs, concerns which the agency has still not addressed:

> [P]anel members were concerned about the variability of [odor] data and suggested that the document should include more text devoted to what attributes help standardization of testing.[28]

TERA enlisted the assistance of Dr. William Cain, of the Chemosensory Perception Laboratory at the University of California, San Diego, an academic odor expert, to review the draft *ESL Guidance* with regard to odor. In his analysis, he states:

> These data lead me to believe that the EPA/AIHA set is [sic] systematically overestimates threshold concentrations and has many values that are incorrect by substantial factors. In light of these new results, I certainly question the use of the EPA/AIHA values at all and believe that new data gathering is probably the only way to fix the problem.[29]

TARA staff has informally stated that these comments were addressed and resolved verbally with the panel members in summary meetings between TARA and the TERA Panel, and the TERA Panel members indicated agreement with TARA's position by nodding their heads. ACMA's understanding, based on discussions with TERA management, is that substantial

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[27] *Id.* at 30.

[28] *Id.* at 30.

[29] *Id.* at Appendix D.

disagreement remains between the TERA Panel and TARA with regard to TARA's approach to odor. This opaque process excluded stakeholders, including ACMA.

TARA staff won approval within the agency for the adoption of the *ESL Guidance* (despite publicly announced valid TERA Panel concerns), giving the impression that its goal was merely to provide narrative form to past internal agency ESL-setting practices. TARA's Styrene ESL proposal here is contrary to this impression.

Given the impact of the current and proposed lower odor detection threshold-based Styrene ESL on the composites industry, and its understanding of an ongoing disagreement between TARA and TERA, ACMA believes that prior to finalizing an odor-based ESL, TARA must finalize the TERA process in a manner that is transparent and satisfies minimal scientific standards for external peer review. It is clear that TARA's Styrene ESL policy, at least, would not meet with the approval an external expert review panel.

As noted previously, Dalton and Jacquot recommend specific procedures for setting scientifically credible and effective weight of evidence-based odor detection threshold limits. Should TARA continue to insist, despite our contrary arguments above, on the use of odor as a basis for state-wide permit review, ACMA proposes that TARA be required to convene an external expert panel, follow the recommendations of Dalton and Jacquot, and be required to obtain concurrence by the panel on the establishment of styrene odor detection threshold limits.

5. TARA Should Increase the Styrene ESL to 1200 ug/m^3.

A. Increasing the Styrene ESL to 1200 ug/m^3 is Supported by, and Very Conservative Relative to, Actions Taken by Other States.

In recent communications, TCEQ has offered: "far more styrene emissions are permitted in Texas than in any other state. According to the 2005 Toxics Release Inventory, Texas facilities emit over 1-½ times as much styrene as the next highest state. . . ". ACMA does not believe this is what this inventory reports.

According to the 2005 Toxics Release Inventory, the following calendar year releases of styrene in pounds by state were reported:

State	2005 TRI Reported Styrene Releases (total point source and fugitive air releases)	ESL Equivalent
Tennessee	5,425,702	None
Indiana	5,348,808	None
Texas	5,347,861	110 ug/m^3
Florida	4,455,558	None
Georgia	3,489,804	12,500 ug/m^3

ACMA is unclear how TCEQ understands these release figures to bear on this Styrene ESL discussion.[30] What these statistics do point out is that none of these states, except Georgia with its ESL-equivalent of over 100 times greater than Texas', conditions issuance of air permits on satisfying an ESL-equivalent.

From the experience of its members, in fact, ACMA can accurately report that these states regulate odor effectively at the local level through their enforcement mechanisms. Odor is a concern and is regulated. ACMA's proposal to increase the Styrene ESL to 1200 ug/m^3 is extraordinarily conservative relative to each of these states.

ACMA would expect that Texas, a major oil refining and petrochemical producing state, to have higher absolute emissions of a variety of petroleum-related air pollutants, including styrene. Texas properly controls styrene emissions through the same BACT and MACT requirements applied in these states, as well as through it enforcement program. Texas is rightly proud of its petroleum and petrochemical industries and their role in meeting the energy needs of America. Millions of jobs across Texas and this country, and billions of dollars in economic impact, arise from these activities.

1. TCEQ's Comparison to South Coast Air Quality Management District (SCAQMD) is Invalid.

ACMA is frustrated with TARA's comparison of the Texas Styrene ESL to South Coast Air Quality Management District (SCAQMD) actions in recent agency communications.[31] As a matter of public policy, Texas should not be regulating air emissions from its industrial base as the South Coast Air Quality Management District regulates air emissions from its base. Most of Texas is rural, whereas the SCAQMD jurisdiction is highly urbanized. More critically, Texas' air quality problems, including those in its non-attainment areas, have never been as bad as those the Los Angeles area has experienced for over 40 years. The Los Angeles area's air quality problems are recognized as by far the worst in the United States, and among the worst in the world. Equating Texas' air quality issues with those of Los Angeles for these purposes as justification for a lower Styrene ESL is unreasonable.

TARA has recently stated that "SCAQMD staff reported that more than 90 percent of styrene sources have controls, and that small styrene-emitting facilities typically use thermal combustion devices." ACMA's members' experience and the evidence is otherwise. The most recent SCAQMD survey available to ACMA found about 80 composites plants subject to

[30] And if divided by the surface area of each state, the styrene emissions in Texas appear even less significant.

[31] ACMA's previously reported state ESL-equivalent research did not include local regulatory requirements that may exist and may be more or less stringent than state requirements. ACMA was unfamiliar with SCAQMD's informal policy: it is not on its website and to AMCA's knowledge, it had not been applied to a composites plant within the SCAQMD's jurisdiction.

SCAQMD's jurisdiction. Of these, about ten percent use air pollution control equipment. Of these ten, ACMA is able to confirm that only one of these plants installed air pollution control equipment to address styrene odor. The remainder installed air pollution control equipment to address MACT or then-new SIP VOC regulatory requirements. Each of the latter group of sources had uncontrolled VOC emissions of 20 tons per year or more.

2. TCEQ's Contrast Between the Supposed Regulation of Odor in Arkansas to the Texas Styrene ESL is Invalid, and in Fact is Supportive of ACMA's Proposal of a Styrene ESL of 1200 ug/m^3.

TARA recently responded to ACMA's data on concentration limits enforced by other states by noting that Arkansas has a relevant odor-based provision on the subject. ACMA had previously determined, through the EECS study, that Arkansas has a health effects-based ESL-equivalent in its regulations. ACMA has carefully examined the Arkansas regulatory website and has been unable to discover any reference to the odor-based policy, either directly or in the published permitting procedures and policy. Consultants who assist industry members in Arkansas with air emissions permits report that they have never encountered an odor-based policy in the state.

At most, possibly, Arkansas has an informal policy not generally available to the public on the agency website that is based on odor. Perhaps the Arkansas odor-based screening limit is employed only in cases where sources have a history of odor complaints; since the large majority of composites plants operate without causing nuisance odor problems; this would explain why the industry has been unaware of an Arkansas odor-based policy.

Setting aside for the time a debate over which of the Arkansas references is most like Texas' ESL (ACMA is convinced it is the one based on health effects), it is indisputable that each Arkansas numeric (2,130 ug/m^3 and 1,361 ug/m^3) is materially higher than Texas Styrene ESL of 110 ug/m^3.

In ACMA's view, the status of styrene in Arkansas air permitting supports the conservation nature of ACMA's request for a Texas Styrene ESL of 1200 ug/m^3. ACMA's Texas members would be well satisfied with 2,130 ug/m^3 or 1,361 ug/m^3 as presented by Arkansas's approach.

A. A Styrene ESL of 1200 ug/m^3 is Highly Protective of Public Health.

On several levels, the Styrene ESL value proposed by ACMA is very conservative.

The *Proposed DSD* implies clearly that if TCEQ were to base the Styrene ESL on health effects data, the Styrene ESL would be set at 6,500 ug/m^3.[32]

In addition a Styrene ESL set at 1200 ug/m^3 would be lower, and in some cases substantially lower than all of the health effects-based ESL-equivalents in 34 other states.

Although ACMA believes that Texas should use health effects data because of its scientific superiority, and should recognize the decisions on 34 other states who regulate styrene based on health effects data, and base its Styrene ESL on health effects, ACMA is prepared to accept an ESL 1200 ug/m^3.

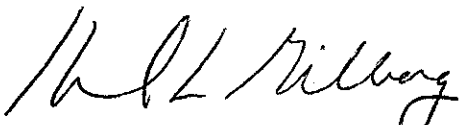
B. For Protecting Against Odor Problems, a Styrene ESL of 1200 ug/m^3 is Conservative by a Factor of at Least 5, Given the Difference in Laboratory and Real World Odor Perception.

As described above, it is common practice in setting a regulatory limit based on odor detection threshold data to take into account the differences in odor perception in the controlled environment of a study and the uncontrolled environment of an ambient air exposure. Dalton and Jacquot recommend multiplying a laboratory odor detection threshold, such as the styrene mean of 1200 ug/m^3, by a factor of 5-8 to translate laboratory findings into a meaningful limit in the real world.[33]

ACMA's proposal of 1200 ug/m^3 ignores this conversion, and is therefore quite conservative.

Thank you for this opportunity to submit these public comments.

Very truly yours,



Howard L. Gilberg
Direct Dial: 214.692.7121
E-mail: gilberg@guidaslavichflores.com

Enclosures
HLG:dlm
A918-01652.1866 v

[32] Proposed Styrene Development Support Document, Jong-Sung Lee, Ph.D., January 2008, at Table 1.
[33] Dalton and Jacquot, *supra* note 2, at 13.

INDEX OF ATTACHMENTS
PUBLIC COMMENTS ON PROPOSED LOWERING OF STYRENE ESL
AMERICAN COMPOSITES MANUFACTURERS ASSOCIATION

1.A. *Composites Manufacturing Plants subject to the TCEQ Styrene ESL Cannot Comply with the ESL Levels through the use of Capture and Control*, ACMA, February 7, 2007.

1.B. *TCEQ ESL Policy Adversely Affects Texas' Economy*, ACMA, February 7, 2007.

1.C. May 29, 2007 letter from ACMA (John Schweitzer) to TCEQ (Michael Honeycutt) with Attachments:

- **1.C.(1)** *Comparison of State Ambient Limits for Styrene*, by Engineering Environmental Consulting Services (EECS), as of May 29, 2007.
- **1.C.(2)** *Styrene Toxicology Summary*, by the Styrene Information and Research Center (SIRC).
- **1.C.(3)** *Review of Styrene Odor Threshold Values in Air*, Pamela Dalton, Ph.D., and Lawrence Jacquot, Ph.D., Monell Chemical Senses Center, May 22, 2007.

1.D. May 28, 2007 ACMA Public Comments (Howard L. Gilberg) Concerning Proposed Repeal of Permit by Rule 30 TAC 106.392 and Proposal to Adopt Standard Permit for Thermoset Resin Facilities with Attachments:

- **1.D.(1)** TCEQ Odor Complaint Investigation Procedures, January 3, 2005.
- **1.D.(2)** *Comparison of State Ambient Limits for Styrene*, by Engineering Environmental Consulting Services (EECS), as of May 29, 2007.
- **1.D.(3)** May 29, 2007 letter with its Attachments provided as Attachment 1.C. of these public comments.
- **1.D.(4)** *Air Permit Technical Guidance for Coatings Sources: Fiber Reinforced Plastics and Cultured Marble Operations*, TCEQ, October 2000.

1.E. ACMA (John Schweitzer) letter to TCEQ (Becky Southard), December 7, 2006.

1.F. *The Composites Industry in Texas*, ACMA, July 2005.

INDEX OF ATTACHMENTS (*continued*)

2. TCEQ Memorandum from Lori Wilson and Beth Echels, Emissions Banking/Modeling Team, to Eddie Mack, Combustion/Coatings Team, March 13, 2006; and *Request for Comments to Toxicology & Risk Assessment Section*, April 4, 2006.

3. *Feasibility of Achieving the TCEQ Short-term ESL Styrene Limit using Atmospheric Dispersion or Add-on Controls for Small and Medium Composite Facilities*, Robert A. Haberlein, Ph.D., EECS, February 4, 2008.

4. *Affordability of Capture and Control, an Evaluation for the Existing Facilities Subject to EPA's Proposed Requirement,* Environomics, 2000.

5. *Comparison of State Ambient Limits for Styrene*, by Engineering Environmental Consulting Services (EECS), as of May 29, 2007.

6. *Regulatory Options for the Control of Odors*, US Environmental Protection Agency, 1980.

APPENDIX 2

National Marine Manufacturers Association (NMMA) Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

National Marine Manufacturers Association

January 23, 2008

Toxicology Section, MC 168
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. F
P.O. Box 13087
Austin, TX 78711-3087

RE: TCEQ Development Support Document for Effects Screening Level- Use of Odor ESL for Air Permit Reviews

Dear Sir / Madam:

The National Marine Manufacturers Association (NMMA) appreciates the opportunity to provide comment to the Texas Commission on Environmental Quality (TCEQ) regarding its proposal to lower the Effects Screening Levels (ESL) for styrene odor, specifically the recommended use of this guidance for evaluation of air permit reviews (fence line limits) at boat plants.

With over 1,700 members, NMMA is the nation's leading recreational marine industry association, representing boat builders, engine manufacturers and marine accessory manufacturers. NMMA members collectively produce more than 80 percent of all recreational marine products made in the United States. With more than 13 million registered boats and 73 million boaters nationwide, the boating industry contributed more than $39.5 billion in retail sales and services in 2006 and generates nearly 400,000 jobs.

Texas is home to approximately thirty boat builders, including some of the nation's leading boat brands. Tige Boats, Skeeter Boats, and Valiant Yachts are all significant, nationally-known Texan recreational boat builders. There are also many small business Texas boat builders, such as New Water Boat Works and Shallow Sport Boats. Altogether, Texas boat builders provide almost 2,000 high-paying manufacturing jobs in the state. In addition to the impact of boat manufacturing to the state's economy, recreational boating is also very popular in Texas and contributes to the state's economy by producing jobs, generating tax revenues, generating sales and services in tourism and hospitality industries, and brings people out for family recreation on the water. According to 2006 NMMA Recreational Boating Statistical Abstract,

444 North Capitol Street, NW, Suite 645
Washington, D.C. 20001
202.737.9750 Fax 202.628.4716
nmma.org

APPENDIX 3

TOTAL Petrochemicals (TOTAL)
Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

TOTAL PETROCHEMICALS

Via e-mail: tox@tceq.state.tx.us

March 17, 2008

Attn: Dr. Michael Honeycutt
Toxicology Section, MC 168
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. F
Austin, Texas 78753

Re: Public Comment on Proposed Lowering of the ESL for Styrene

Dear Dr. Honeycutt:

Thank you for this opportunity to submit public comments on behalf of TOTAL Petrochemicals USA, Inc. concerning the Toxicology and Risk Assessment (TARA) group's January 17, 2008 proposal to lower the Effects Screening Level (ESL) for styrene from 110 ug/m^3 to 73 ug/m^3.

The proposed odor-based ESL for styrene should be withdrawn and reevaluated because the Commission has not developed a scientifically sound basis for establishing a criterion for styrene's odor properties. The proposed DSD fails to demonstrate an adverse effect on public health. The lack of correlation between odor and health risks is well understood and has been summarized by the US EPA in its 1992 publication *Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990.*

The proposed DSD for styrene also fails to demonstrate an adverse effect on public welfare. More that just a detection of odors is required to find an adverse effect on public welfare. Measured odor thresholds for a single substance can vary widely. Odor reactions are highly subjective. Odor perceptions, particularly in communities, can be the result of combined exposure to odors. Generally accepted and objective criteria for odor in communities are non-existent.

For the reasons presented above, TOTAL believes that the proposed odor-based ESL for styrene should be withdrawn and reconsidered on the basis of a more thorough scientific evaluation of the odor-related properties of styrene that are relevant to the potential adverse health and welfare effects on the local community. TOTAL also agrees with the comments submitted by the American Composites Manufactures Association (ACMA) concerning the proposed lowering of the ESL for styrene. TOTAL respectfully submits these comments for consideration by the TCEQ on the proposed revisions to the ESL for styrene. If you have any questions concerning these comments, please contact me at 713-483-5046.

Sincerely,

Jason Sanders

Jason T. Sanders
Supervisor - Environmental

TOTAL

TOTAL PETROCHEMICALS USA, INC.
1201 Louisiana St., Ste 1800 - Houston, TX 77002
P.O. Box 674411 - Houston, TX 77267-4411

APPENDIX 4

Styrene Information and Research center (SIRC)
Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

Styrene Information and Research Center (SIRC)
1300 Wilson Boulevard, Suite 1200, Arlington, Virginia 22209
(703) 741-5010 Fax (703) 741-6010 Website www.styrene.org

March 13, 2008

Via E-Mail: tox@tceq.state.tx.us and Via DHL Express

Toxicology Section, MC 168
Texas Commission on Environmental Quality
12100 Park 35 Circle, Building F
Austin, TX 78753

Attn: Dr. Michael Honeycutt

Re: Public Comment on Proposed Lowering of Styrene ESL in Support of Comments by the American Composites Manufacturers Association

Dear Dr. Honeycutt:

The Styrene Information and Research Center[1] (SIRC) is pleased to submit comments in response to the Toxicology and Risk Assessment (TARA) group's January 17, 2008 proposal to lower the Effects Screening Level (ESL) for styrene (Styrene ESL) from 110 µg/m^3 to 73 µg/m^3.

In particular, SIRC strongly endorses the comments submitted to the Texas Commission on Environmental Quality (TCEQ) on February 6, 2008 by the American Composites Manufacturers Association (ACMA), which outline the severe negative impact that a styrene ESL of this level would have on the Texas composites industry, and the virtual inability for any composites facilities to achieve a 73 µg/m^3 ESL.

SIRC supports TCEQ's efforts to enhance its ESL program, to ensure the protection of the citizens of Texas. However, SIRC would urge that TCEQ carefully consider the points outlined in the ACMA comments regarding both the impact a lower ESL would have on the ability of the Texas composites industry to exist, as well as options for other approaches to setting an appropriate styrene ESL.

We are especially encouraged by a discussion on the application of the ESL for enforcement purposes, as we understand was mentioned in recent communication between TCEQ and ACMA. Such distinctions in the specifics of when, how, and where the ESL would be enforced would be of great benefit to the composites industry, in understanding the true potential use and impact of ESLs on their industry.

This approach is supported by the findings of the National Academy of Sciences in their report entitled *Odors from Stationary and Mobile Sources*[2] prepared under contract with the U.S. Environmental Protection Agency (EPA) as a basis for EPA's *Report to the Congress* on this

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[1] The Styrene Information and Research Center's (SIRC's) mission is to evaluate existing data on potential health effects of styrene, and develop additional data where it is needed. SIRC has gained recognition as a reliable source of information on styrene and helping ensure that regulatory decisions are based on sound science. For more information, visit http://www.styrene.org.

[2] National Academy of Sciences, Odors from Stationary and Mobile Sources, Washington, DC 1979

topic. The Academy panel addressed in detail the difficulties of determining odor thresholds. Fundamental to these difficulties is the fact that the threshold is not based on a measurement of a physical attribute of the chemical, but rather on the reaction of human subjects in a laboratory setting to exposure to various samples. Within that laboratory setting, the determination of the odor threshold of a chemical is influenced greatly by the choice of the test subjects in terms of their sensitivity, the decision criteria that the subjects adopt and, under certain common test scenarios, the anticipation of an odor rather than a perception of the odor, resulting in false positives.

The panel concluded, "Unless all the factors that affect the values of odor thresholds are standardized, widely different thresholds are likely to be reported for the same samples by different groups." (p. 158)

Consequently, among other recommendations, the NAS concluded the use of a single number to regulate emissions on the basis of odor threshold was problematic and that:

> "Exemptions for industries in areas far from population centers or in cases of excessive economic impact of odor abatements should be considered." (p. 8)

EPA's *Report to Congress*, based on the NAS report, provides strong support for the approach taken by other states in dealing with nuisance odor problems on a case by case basis, and not through the use of a state-wide limit.

SIRC representatives have supported ACMA's efforts to address the proposed styrene ESL, and have participated in meetings with TCEQ staff to discuss the styrene health effects data. We would be happy to offer any support or references relative to styrene health and environmental effects that would assist TCEQ in its further assessment of an appropriate styrene ESL.

Thank you very much for your consideration of SIRC's comments, as well as for your thoughtful assessment of ACMA's input regarding an appropriate styrene ESL and the subsequent use of that number relative to composites and other styrene-using facilities in Texas.

Very truly yours,

Jack Snyder
Executive Director
Styrene Information & Research Center
1300 Wilson Boulevard – Suite 1200
Arlington, VA, 22209
(703) 741-5010
E-mail: Jack_Snyder@styrene.org

APPENDIX 5

ISP Synthetic Elastomers LP (ISP)
Comments Regarding the TCEQ Development Support Document for Styrene ReV and ESL Values

ISP ELASTOMERS
1615 Main Street • PO Box 667 • Port Neches, TX 77651 • Tel: 409-722-8321

March 14, 2008

TCEQ Toxicology Section
MC-168, P.O. Box 13087
Austin, Texas 78711-3087

Re: Proposed Styrene Development Support Document

To Whom It May Concern:

ISP Synthetic Elastomers LP (ISP) is pleased to provide this letter commenting on TCEQ's proposed January, 2008 Styrene Development Support Document (DSD). ISP commends TCEQ on its continued efforts to employ sound scientific principles in refining its approach for the development and application of ESLs and ReVs, and on its outreach to the public and the regulated community to solicit input on these matters.

ISP owns and operates two manufacturing facilities in Texas that operate under authority of various New Source Review (NSR) air quality permits. The ESLs for styrene and various other constituents play an important role in the NSR permitting for these sites in that they are tools used by TCEQ to ensure that ISP's plants are operated in a manner that is protective of human health and the environment. Accordingly, ISP has kept abreast of TCEQ's efforts with regards to updating its ESLs and has provided comments to TCEQ on earlier occasions for constituents other than styrene that were undergoing ESL review.

ISP has two primary comments at this point in time. First, ISP would like to state our general support of the methodology employed by TCEQ in developing the Proposed Styrene DSD. As mentioned in our earlier comments on other constituents, ISP supports the use of ESLs as a conservative screening tool in the permitting process but believes clearer documentation on the basis used to develop ESLs and ReVs, and the roles each of these values plays in TCEQ's air quality control program would be useful. Based on our review of the proposed DSD, we believe TCEQ has indeed provided much clearer documentation on these matters. In particular, the proposed DSD provides extensive narrative of TCEQ's analytical approach, references for key data and assumptions, and provides clear and useful summary tables of the proposed ESLs and ReVs.

Though we generally support the overall approach being used by TCEQ, we also have a second more specific comment dealing with the actual value being proposed for the short-term ESL. More specifically, though we agree with the concept that multiple sources of information should be considered in TCEQ's analysis, we disagree with the short-term ESL that is being proposed as discussed in more detail below.

A review of Table 4 of Section 3.2.1 of the proposed January, 2008 DSD reveals that TCEQ considered the results of eight different odor threshold values published over a 40 year period (1963 – 2003) that meet criteria accepted by the American Industrial Hygiene Association (AHIA) and the USEPA. Review of this information reveals an approximate 100-fold difference in the lowest odor threshold value (73 $\mu g/m^3$, Stalker, 1963) versus the highest (1,800 $\mu g/m^3$, Dravnieks, 1974). Note that both the highest and lowest values were obtained in the first 11 years of the 40 year study period. If, on the other hand, one considers data gathered over the most recent 24 years of the study period there is only an approximate two-fold difference between the lowest (107 $\mu g/m^3$, van Doorn, 2002) and the highest (220 $\mu g/m^3$, Hellman and Small, 1973, 1974) odor threshold values. It is ISP's belief that the more recent data, which includes data from most of the studies conducted, provides more consistency in the results obtained and may have benefited from the use of more developed analytical techniques, provides a more representative basis than the earlier studies that resulted in a much wider variation in odor threshold values using a minority of the studies conducted.

The mean odor threshold from the five studies conducted over the 1969 through 2003 time period is 165 $\mu g/m^3$. Based on this data, and the information provided in the above paragraph, ISP proposes that the short-term Styrene ESL be set

at 150 $\mu g/m^3$. This value is equal to the odor threshold obtained in the most recent study (Nagata, 2003) but is still somewhat below the mean value from the five studies conducted from 1969 through 2003. A secondary alternative would be to not change the current short-term ESL, which at 110 $\mu g/m^3$ is within 3% of the lowest value from the five studies conducted over the 1969 through 2003 time period. We believe selection of either of the above values (150 $\mu g/m^3$ or 110 $\mu g/m^3$) is better supported by the weight of available data, and is much preferred to the more simplistic approach of simply establishing a proposed ESL based on the lowest and oldest value considered in the study.

ISP appreciates TCEQ providing the opportunity to comment on this important initiative and we look forward to further updates concerning the proposed Styrene DSD.

Sincerely,

Matt Tokheim

Matt Tokheim
Environmental Manager
PO Box 667
Port Neches TX 77651

APPENDIX 6

Owens Corning
Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

March 13, 2008

Via E-Mail: tox@tceq.state.tx.us and U.S. Mail

Dr. Michael Honeycutt
Toxicology Section, MC 168
Texas Commission on Environmental Quality
12100 Park 35 Circle, Building F
Austin, Texas 78753

Re: Comments on the Development Support Document for Styrene

Dear Dr. Honeycutt:

Owens Corning appreciates this opportunity to provide comments on TCEQ's proposed Development Support Document ("DSD") for styrene, which recommends lowering the effects screening level ("ESL") for styrene from 110 $\mu g/m^3$ to 73 $\mu g/m^3$. While Owens Corning supports TCEQ's efforts to periodically revisit ESLs, we believe that, in this instance, lowering the styrene ESL is not supported by the scientific evidence and is not required by TCEQ procedure or Texas laws or regulations. Simply put, the styrene ESL should not be lowered.

Owens Corning operates a fiberglass manufacturing facility in Amarillo, Texas that produces textile and reinforcement fiberglass. The Amarillo facility is large and produces a wide array of product lines. The facility uses styrene as a source material and would be adversely affected by a lowering of the styrene ESL. Owens Corning also provides millions of pounds of glass fiber to a number of smaller composite manufacturers located throughout Texas that are also affected by this proposal to lower the styrene ESL.

I. Lowering the ESL Would Harm Texas Industry

As explained in detail by the American Composites Manufacturers Association's ("ACMA") comments, lowering the ESL would have a significant adverse impact on Texas industry. While ESLs are purportedly intended to be conservative evaluative tools, in practice odor-based ESLs are applied quite rigidly by the agency. TCEQ's modeling and effects review guidance even explains that for odorous constituents there "may be very little flexibility in approving GLCs above the ESL," noting there is more flexibility in approving ground level concentrations ("GLCs") for constituents with health-based ESLs.[1] As a result, odor-based ESLs become quasi-permit limits, preventing companies from locating in Texas or expanding existing

[1] *See* TCEQ, *Modeling and Effects Review Applicability*, RG-324 at 28 (October 2001).

operations.

A lower styrene ESL would not only increase costs for Texas composite manufacturers, but could fundamentally threaten the economic viability of composite manufacturing in Texas. Unlike Texas, health-based thresholds are commonly used in other states to determine allowable styrene emissions. In fact styrene standards in other states range from 17 to 195 times *greater* than the ESL proposed in the DSD.[2] This illustrates that the current ESL is already much lower than essentially everywhere else in the United States. Any further reduction in the ESL would unnecessarily add to the regulatory burden faced by Texas composite manufacturers and could force manufacturers to relocate outside of Texas.

Despite the potential impact of TCEQ's decision on Texas composite manufacturers, the proposed DSD provides only the most cursory evaluation of the proposed odor-based ESL. That "evaluation" contains only five lines of text and simply states that there have been a number of acceptable styrene odor studies and that the ESL will be set based on a study conducted in 1963. While the proposed DSD presents the results of the other, more recent studies in a table, it completely fails to compare or analyze those studies, or to explain why those studies are not being used as the basis for setting the ESL.

II. TCEQ is Under No Legal Obligation to Lower the Styrene ESL

ESLs are chemical-specific air concentrations that are used to evaluate the potential for effects to occur as a result of exposure to constituents in the air. These concentrations are used in TCEQ's permitting process to evaluate the potential for a source to cause or contribute to a condition of air pollution. ESLs are not ambient air standards and are not specifically required by either the Texas Clean Air Act, or TCEQ's rules. Accordingly, TCEQ has a great deal of discretion in establishing and implementing ESLs.

In 2004, TCEQ documented and submitted its methodology for developing ESLs for peer review by Toxicology Excellence for Risk Assessment ("TERA"), a nonprofit scientific peer review organization. As a result of TERA's review, TCEQ made a number of changes to its methodology for developing ESLs. TCEQ's revised and current methodology is contained in its November 2006 guidance document, RG-442, *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* ("ESL Guidance"). It is this guidance that TCEQ has used as the basis for proposing to lower the styrene ESL to 73 $\mu g/m^3$.

Importantly, however, the ESL Guidance document is not a rule that was promulgated pursuant to the procedures in the Texas Administrative Procedure Act.[3] Accordingly, the guidance cannot create legal obligations. Rather, the guidance establishes *non-binding* procedures that the agency can use to evaluate ESLs. It does not in any way *mandate* that TCEQ lower the ESL for styrene.

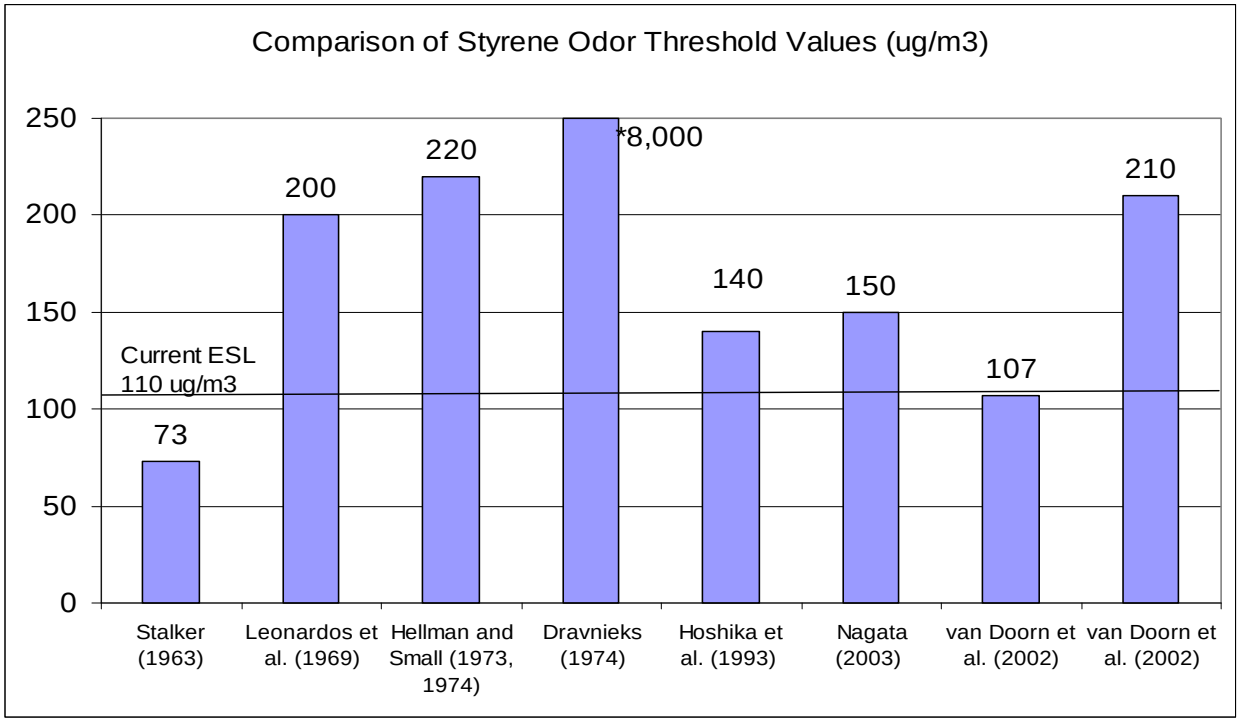
III. The ESL Guidance Does Not Support Lowering the Styrene ESL

In fact, in this case the ESL Guidance does not even support lowering the styrene

[2] *See* attachment 5 to comments submitted by the ACMA.
[3] Tex. Gov't Code Chapter 2001.

ESL. Section 1.6.2.2 of the ESL Guidance establishes the procedures for setting odor-based ESLs. That section specifies that: *"[i]n general*, the $^{acute}ESL_{odor}$ is set at the lowest acceptable 50% detection threshold."[4] This general rule of thumb, however, is modified by the requirement that "[a]ny updated and/or better study is considered when developing an odor-based ESL."[5] That modifying provision serves an important function in that it precludes TCEQ from utilizing findings from older studies as new studies are published that change our understanding of the proper odor detection levels for a constituent.

This modifying provision is particularly important in the context of the styrene ESL. Table 4 of the proposed DSD presents a comparison of odor detection studies for styrene. That table identifies eight studies that satisfy the specified criteria accepted by the American Industrial Hygiene Association and endorsed by the ESL Guidance. These studies reveal odor-detection values ranging from 73 μg/m^3 to 8,000 μg/m^3 as indicated in chronological order in the table, below.



The table illustrates that the first study, *conducted 45 years ago*, yielded the lowest detection level. However, every single study that was conducted thereafter identified significantly higher detection levels. Under this scenario, the general policy of choosing the lowest study would inappropriately find TCEQ utilizing the first study despite substantial evidence of a higher odor threshold in newer and potentially better subsequent studies.

It is for this reason that the ESL guidance notes that the practice of choosing the lowest odor detection level is only a *general* policy and that, despite that policy, TCEQ is

[4] ESL Guidance at 9 (emphasis added)
[5] *Id.* at 8.

directed in the guidance to consider newer and better studies. It is this consideration of newer studies that balances the desire to be conservative with the desire to make decisions on the best evidence.

The current ESL of 110 µg/m^3 is lower than or equal to all of the studies except for the 1963 Stalker study. Moreover, the current ESL is set at a level that is nearly identical to the detection level (107 µg/m^3) reported in the 2002 van Doorn study. Because the current ESL matches the results of this recent study and is still quite conservative, Owens Corning believes that the ESL Guidance does not support lowering the current ESL. Certainly TCEQ has provided no justification in the DSD to explain why the seven studies conducted after the Stalker study should be excluded in favor of a 45 year old study. This lack of any explanation gives the appearance that TCEQ's decision is arbitrary. In light of the fact that the ESL Guidance directs that new and better studies be considered and the practical effect that the ESL will have in setting enforceable permit limits, TCEQ must, at the very least, explain its basis for not relying on these seven newer studies.

Moreover, as apparent support for lowering the styrene ESL from 110 to 73 µg/m^3 the proposed DSD states that "TCEQ air mobile monitoring staff members have reported styrene odors at measured levels as low as 10 ppb."[6] There is no evidence to support this anecdotal comment, nor is there any evidence that the measurement was at all based on approved protocols. Accordingly, this comment should not be used to justify the proposed 73 µg/m^3 ESL for styrene. In fact, as discussed below, it seems impossible for the human nose to detect a styrene odor at that level, much less to identify it as styrene.

IV. Lowering the ESL is Unnecessary

A. The Current ESL is Quite Conservative

The current ESL is sufficiently conservative to capture any potential impacts associated with styrene emissions. First, TCEQ's current styrene ESL is an odor-based ESL, rather than a health-based ESL such as is used in many other states. These health-based ESLs range from 1,704 µg/m^3 to 21,500 µg/m^3 -- levels that are 17 to 195 times greater than TCEQ's current ESL of 110 µg/m^3.[7]

Secondly, TCEQ's general practice of setting odor-based ESLs based on *detection* levels, rather than *recognition* levels provides an additional level of conservatism. Detection thresholds are set at the concentration at which 50 percent of the test subjects can detect (but not necessarily identify) the odor. Recognition levels are set at the concentration at which a specified percentage (usually 50 percent) of the subjects can both detect and identify the source of the odor. By definition, detection levels should be lower than recognition levels. This is the case for styrene, where approved studies cited in the proposed DSD reported recognition levels ranging from 400 µg/m^3 to 640 ug/m^3, approximately four to six times greater than TCEQ's current ESL for styrene.

Finally, the fact that the current ESL is well on the low end of detection levels

[6] Proposed DSD at 11.
[7] *See* attachment 5 to comments submitted by the ACMA.

identified in approved studies, provides another indication of the conservative nature of the current ESL. As noted above, the current ESL is set at a level roughly equivalent to a 2002 study and is lower than all but the oldest of the other seven studies cited in the proposed DSD.

B. TCEQ Does Not have a "No Odor" Policy

TCEQ is not charged with preventing the emission of all odors. TCEQ articulated this position in response to comments in rulemaking governing confined animal feeding operations as follows:

> The commission disagrees with the presumed opinion that these regulations should allow "no odors." The Texas Health & Safety Code §382.085 allows for air contaminants to be emitted, but only at levels that do not cause or contribute to a condition of "air pollution."[8]

The TCAA defines "air pollution" as the presence of air contaminants in concentration and duration that:

> (A) are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation, or property; or (B) interfere with the normal use or enjoyment of animal life, vegetation, or property.[9]

This definition and TCEQ's comment makes clear that odors must reach some threshold level before they constitute "air pollution" that is subject to regulation. The current ESL, however, is set at a level at which most people would not even detect, let alone recognize, the odor of styrene. This level is well below the threshold for causing "air pollution."

C. The Existing Nuisance Process Can Adequately Handle Odor Complaints

TCEQ has a comprehensive nuisance process that is well-equipped to deal with localized odor concerns. Section 101.4 of the General Rules provides that "[n]o person shall discharge from any source whatsoever one or more air contaminants or combinations thereof, in such concentration and of such duration as are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation, or property, or as to interfere with the normal use and enjoyment of animal life, vegetation, or property."[10] To enforce that rule, TCEQ has detailed procedures for dealing with and investigating odor complaints.[11] Under these procedures, TCEQ evaluates odor complaints and, where appropriate, requires actions to address the cause of the odors.

In the case of styrene, there have been few odor complaints requiring

[8] 23 *Tex. Reg.* 9361 (Sept. 11, 1998).
[9] Tex. Health & Safety Code § 382.003(3).
[10] 30 TAC §101.4.
[11] *See* TCEQ, *Odor Complaint Investigation Procedures* (September 17, 2007). These procedures, which require the agency to evaluate complaints against the two part standard for air pollution (presented above) further supports the position that TCEQ does not seek to prevent the emission of all odors. *Id.* at 4.

enforcement.[12] Between 2003 and 2007, there were only two styrene enforcement actions taken by the agency regarding styrene odors from composites industry manufacturing facilities.[13] However, based on our review there were more than 120 total enforcement orders entered over that time period dealing with violations of section 101.4. This suggests that there are not widespread styrene odor problems in Texas and that any lowering of the styrene ESL has virtually no possibility of further reducing any odor problems. This is especially true given that the isolated styrene enforcement cases, in all likelihood, consisted of instances where the facility was causing emissions well in excess of the current ESL.

V. Conclusion

The current ESL for styrene is adequately protective of human health and the environment. It is consistent with the agency's ESL guidance documents and there is no need—nor justification provided—to lower the ESL to match a 1963 study. TCEQ has not provided any evidence of problems with the current ESL or evidence of pervasive styrene odor-nuisance problems. Given that TCEQ's own guidance directs that the Air Permits Division staff may have little discretion in issuing permits where modeling shows potential emissions greater than odor-based ESL limits, TCEQ should not move to lower the styrene ESL in the absence of compelling reasons to do so. Those are not found in the proposed Document Support Document. The ESL for styrene should not be reduced below 110 $\mu g/m^3$.

* * * *

Owens Corning appreciates the opportunity to comment on the proposed DSD for styrene. If, after reviewing these comments, you have any questions, please call me at (806) 670-1653.

Sincerely,

Art Richards
Plant Leader

[12] The Amarillo plant has used styrene in its manufacturing facility for more than 30 years without receiving a single styrene odor complaint.
[13] *See* ACMA comments at 10.

APPENDIX 7

Firestone Polymers, LLC (Firestone)
Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

Firestone Polymers

Firestone Polymers, LLC
a Delaware limited liability Company
5713 FM 1006
P. O. Box 1269
Orange, TX 77630

March 12, 2008

VIA ELECTRONIC MAIL
Certified Mail: 7004-1350-0004-6090-2214

Dr. Michael Honeycutt
Toxicology Section, MC 168
Texas Commission on Environmental Quality
12100 Park 35 Circle, Building F
Austin, Texas 78753

Re: Comments on the Development Support Document for Styrene

Dear Dr. Honeycutt:

Firestone appreciates the opportunity to provide comments on TCEQ's proposed Development Support Document ("DSD") for styrene, which proposes to lower the effects screening level ("ESL") for styrene from 110 $\mu g/m^3$ to 73 $\mu g/m^3$. Firestone utilizes styrene in its styrene butadiene synthetic rubber manufacturing operations in Orange, Texas. There is potential for trace amounts of styrene emissions from fugitive piping components and from two small storage tanks. Lowering the ESL could impact Firestone's ability to modify or expand its operations in the future. Firestone requests that the ESL remain at 110 $\mu g/m^3$.

I. TCEQ's Development Support Document Does Not Provide Support for Lowering the Styrene ESL

The proposed development support document (DSD) provides only a cursory discussion of the proposed odor-based ESL. Five lines of text simply state that there have been a number of acceptable studies and that the ESL will be set based on the study conducted in 1963. While the proposed DSD presents the results of the other, more recent studies in a table, it completely fails to compare or analyze those studies, or explain why the 1963 standard is being chosen as the basis for the ESL.

ESLs are purportedly intended to be conservative evaluative tools. However, in practice odor-based ESLs are applied quite rigidly by the agency. TCEQ's modeling and effects review guidance even explains that for odorous constituents there "may be very little flexibility in approving GLCs above the ESL," noting there is more flexibility in approving GLCs for constituents with health-based ESLs.[1] As a result, odor-based ESLs take on the effect of quasi-permit limits, potentially preventing companies from locating in Texas or expanding existing operations. Texas industry deserves more of an explanation that a simple listing of studies as a justification for lowering an ESL that is likely to have a big impact on companies.

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[1] *See* TCEQ, *Modeling and Effects Review Applicability*, RG-324 at 28 (October 2001).

In Firestone's case, styrene emissions are predominantly from fugitive sources. Screen modeling is likely to be quite conservative and could lead to modeled exceedences of a lower ESL standard. Performing more detailed site wide modeling would be very expensive and still might not meet 73 µg/m³. This could lead to stringent fugitive controls or termination of planned modifications or expansions at the plant. This seems unnecessary, when there have been no nuisance complaints about styrene odors associated with normal manufacturing operations at the Orange plant.

II. TCEQ is Under No Legal Obligation to Lower the Styrene ESL

TCEQ's revised and current methodology for evaluating ESLs is contained in its November 2006 guidance document, RG-442, *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors* ("ESL Guidance"). The ESL Guidance document is not a rule that was promulgated pursuant to the procedures in the Texas Administrative Procedure Act.[2] Accordingly, the guidance cannot create legal obligations. Rather, the guidance establishes *non-binding* procedures that the agency can use to evaluate ESLs. It does not in any way *mandate* that TCEQ lower the ESL for styrene.

III. The ESL Guidance Does Not Support Lowering the Styrene ESL

The ESL Guidance does not support lowering the styrene ESL. Section 1.6.2.2 of the ESL Guidance establishes the procedures for setting odor-based ESLs. That section specifies that: "*[i]n general*, the $^{acute}ESL_{odor}$ is set at the lowest acceptable 50% detection threshold."[3] This general rule of thumb, however, is modified by the requirement that "[a]ny updated and/or better study is considered when developing an odor-based ESL."[4] This modifying provision is particularly important in the context of the styrene ESL. Table 4 of the proposed DSD presents a comparison of odor detection studies for styrene. That table identifies eight studies that satisfy the specified criteria accepted by the American Industrial Hygiene Association and endorsed by the ESL Guidance. These studies reveal odor-detection values ranging from 73 µg/m³ to 8,000 µg/m³.

The ESL guidance states that the practice of choosing the lowest odor detection level is only a *general* procedure and that TCEQ should consider newer and better studies when setting ESLs. The current ESL of 110 µg/m³ is lower than or equal to all of the studies except for the 1963 Stalker study. Moreover, the current ESL is set at a level that is nearly identical to the detection level (107 µg/m³) reported in the 2002 van Doorn study. Because the current ESL matches the results of this recent study and is still quite conservative, Firestone believes that the ESL Guidance supports maintaining the current ESL. Certainly TCEQ has provided no justification in the DSD to explain why the seven studies conducted after the Stalker study should be excluded in favor of a 45 year old study.

As apparent support for lowering the styrene ESL from 110 to 73 µg/m³ the proposed DSD states that "TCEQ air mobile monitoring staff members have reported styrene odors at measured levels as low as 10 ppb."[5] There is no evidence to support this anecdotal comment, nor is there any evidence that the measurement was at all based on approved protocols. Accordingly, this comment cannot be used to justify the proposed 73 µg/m³ ESL for styrene. In

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[2] Tex. Gov't Code Chapter 2001.
[3] ESL Guidance at 9 (emphasis added)
[4] *Id.* at 8.
[5] Proposed DSD at 11.

fact, based on the same studies TCEQ is citing as authority, it seems impossible for the human nose to detect a styrene odor at that level, much less identify it as styrene.

IV. The TCEQ's Nuisance Process is Equipped to Handle Odor Complaints

TCEQ has a comprehensive nuisance process that is well-equipped to deal with localized odor concerns. Section 101.4 of the General Rules provides that "[n]o person shall discharge from any source whatsoever one or more air contaminants or combinations thereof, in such concentration and of such duration as are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation, or property, or as to interfere with the normal use and enjoyment of animal life, vegetation, or property."[6] To enforce that rule, TCEQ has detailed procedures for dealing with and investigating odor complaints.[7] Under these procedures, TCEQ evaluates odor complaints and, where appropriate, requires actions to address the cause of the odors and assesses penalties as necessary.

A review of TCEQ's nuisance complaint data base indicates that very few styrene odor complaints have been lodged with the agency in recent years. This is evidence that the permitting process based on the current ESL is adequately addressing the potential for styrene odors.

V. Conclusion

The current ESL for styrene is adequately protective of human health and the environment. It is consistent with the agency's ESL guidance documents and there is no need—nor justification provided—to lower the ESL to match a 1963 study. TCEQ has not provided any evidence of problems with the current ESL or evidence of pervasive styrene odor-nuisance problems. Given that TCEQ's own guidance directs that the Air Permits Division staff may have little discretion in issuing permits where modeling shows potential emissions greater than odor-based ESL limits, TCEQ should not move to lower the styrene ESL in the absence of compelling reasons to do so. Those are not found in the proposed Document Support Document. For all these reasons, Firestone requests that TCEQ retain the current ESL for styrene at 110 $\mu g/m^3$.

Firestone appreciates the opportunity to comment on the proposed DSD for styrene. If, after reviewing these comments, you have any questions, please call me at (409) 883-1776.

Sincerely,

Greg DeFrates
Factory Manager
Orange Plant

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[6] 30 TAC §101.4.

[7] *See* TCEQ, *Odor Complaint Investigation Procedures* (September 17, 2007). These procedures, which require the agency to evaluate complaints against the two part standard for air pollution (presented above) further supports the position that TCEQ does not seek to prevent the emission of all odors. *Id.* at 4.

APPENDIX 8

International Institute of Synthetic Rubber Producers, Inc. (IISRP) Comments Regarding the TCEQ Development Support Document for Styrene ESL Values

International Institute of Synthetic Rubber Producers, Inc.

Via email: tox@tceq.state.tx.us 11 March 2008

Toxicology Section, MC168
Texas Commission on Environmental Quality
121 Park 35 Circle, Bldg. F
Austin, Tx 78753

Attention: Dr. Michael Honeycutt

Re: Public Comment on Proposed Lowering of Styrene ESL

Dear Dr. Honeycutt:

Thank you for the opportunity to submit comments on behalf of members of the International Institute of Synthetic Rubber Producers, Inc. We are an international trade association representing the interests of more than 40 corporations engaged in the production of synthetic rubber, three of which are located in Texas. Each of these is significant consumers of styrene and each will be negatively impacted by reducing the ESL of styrene from 110 µg/m³ to 73 µg/m³.

We have reviewed the comments provided by American Composites Manufacturers Association plus other organizations and we support the technical basis for their comments.

Of particular concern is the fact that TARA is lowering the ESL on the basis of odor as compared to a health based approach. Odor is not an indication of toxicity. This is supported by TARA's own panel of experts in their report to the TCEQ.[1]

In addition we find it difficult to understand why TARA opts to use a 45 year old study (Stalker 1963) as a basis for lowering the ESL as compared to more recent and better documented studies cited in the Development Support Document (DSD). The TCEQ has not provided any justification in the DSD to explain why the seven more recent studies are discounted in favor of a 45 year old study.

The production of synthetic rubber is in a closed process. Styrene is received via pipeline, railcar or other closed vessel and is transferred to other closed vessels on site. The polymerization process is closed (under pressure) and the recovery process is also closed. The only potential for styrene losses are fugitive emissions or via accidental releases.

The synthetic rubber industry operates under Maximum Achievable Control Technology or MACT under the NESHAP provisions of the 1990 Clean Air Act Amendments. Fugitive emissions are managed under the Hazardous Organic NESHAP or HON where leak detection and repair programs are in place. There is no cost effective technology to further reduce

[1] *Report of the Peer Review Meeting on Development of Effects Screening Levels, Reference Values , and Unit Risk Factors for the Texas Commission on Environmental Quality,* Toxicology Excellence for Risk Assessment, October 12, 2005

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emissions at synthetic rubber plants from either point or fugitive sources. Yet a very stringent lower ESL will mean that it will be increasingly difficult to permit synthetic rubber manufacturing operations--even though styrene odor complaints around SR plants have been limited to only one isolated incident.. So the lower ESL would have a big impact on IISRP members, esp. given that the ESL guidance says that permit engineers will have limited discretion to permit operations that show modeled emissions in excess of the ESL.

The IISRP appreciates the opportunity to have provided our comments.

Sincerely,

James L. McGraw
Managing Director & CEO
IISRP

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