Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 15, 2010

TO: Persons on the Attached Mailing List

RE: Docket No. 2009-0179-AIR
Houston Refining, L.P.
Request(s) filed on Permit No. 2167

The above-referenced application and all timely filed hearing requests/requests for reconsideration on the above-referenced application will be considered by the commissioners of the Texas Commission on Environmental Quality (TCEQ) during the public meeting on **February 24, 2010**. The meeting will begin at 9:30 a.m. in Room 201S of Building E, at the commission's offices located at 12100 Park 35 Circle in Austin, Texas.

In accordance with commission rules, copies of the timely hearing requests/requests for reconsideration have been forwarded to the applicant, the Executive Director of the TCEQ, and the Public Interest Counsel of the TCEQ. Each of these persons is entitled to file a formal written response to the hearing requests/requests for reconsideration on or before 5:00 p.m. on **January 29, 2010**. Persons who have filed timely hearing requests/requests for reconsideration may file a formal written reply to these responses on or before 5:00 p.m. on **February 12, 2010**.

All responses and replies must be filed with the Chief Clerk of the TCEQ. Responses and replies may be filed with the Chief Clerk electronically at http://www10.tceq.state.tx.us/epic/efilings/ or by filing an original and 7 copies with the Chief Clerk of the TCEQ. The mailing address of the Chief Clerk is: Office of Chief Clerk, ATTN: Agenda Docket Clerk, Mail Code 105, TCEQ, P. O. Box 13087, Austin, Texas 78711-3087 [Fax number (512) 239-3311]. On the same day any response is transmitted to the Chief Clerk, a copy must also be sent to the Executive Director, the Public Interest Counsel, the Director of the Office of Public Assistance, the Applicant and the requesters at their addresses listed on the attached mailing list. On the same day any reply is transmitted to the Chief Clerk, a copy must also be sent to the Executive Director, the Public Interest Counsel, the Director of the Office of Public Assistance, and other requesters and the applicant at their addresses listed on the attached mailing list.

The procedures for evaluating hearing requests/requests for reconsideration are located in 30 Texas Administrative Code (TAC) Chapter 55, Subchapter F (§§55.200-211) of the commission's rules. The procedures for filing and serving responses and replies are located in 30 TAC Chapters 1 (§§1.10-11) and 55 (§55.209) of the commission's rules. The hardcopy filing requirement is waived by the General Counsel pursuant to 30 TAC §1.10(h). Copies of these rules may be obtained by calling the Office of Public Assistance toll free at 1-800-687-4040.

The commissioners will not take oral argument or additional comment on this matter at the public meeting. Therefore, it is important to address the sufficiency of the requests in timely filed written responses and requesters' replies. At the public meeting, the commissioners may ask questions of the applicant, requesters, or TCEQ staff. The commissioners will make a decision on the request(s) during the meeting and will base that decision on the timely written requests, public comments, any written responses and replies, any responses to questions during the meeting, and applicable statutes and rules. Copies of all timely public comments and requests have been forwarded to the Office of Alternative Dispute Resolution to determine if informal, voluntary mediation might help resolve any dispute.

The attachment to this letter is intended to help you better understand how the TCEQ processes and evaluates hearing requests and requests for reconsideration. To obtain additional information, or to ask questions about anything in this letter, please call the TCEQ's Office of Public Assistance toll-free at 1-800-687-4040.

Sincerely,

LaDonna Castañuela
Chief Clerk

Enclosures: Copies of the Executive Director's Response to Comments, Copies of protestant correspondence to Applicant, Executive Director, Office of Public Interest Counsel, Office of Public Assistance and Alternative Dispute Resolution.

ATTACHMENT

Procedures Concerning Requests for Reconsideration and Requests for Contested Case Hearing

The purpose of this document is to describe commission procedures for evaluating requests for reconsideration and requests for contested case hearing. This document is not intended to be a comprehensive guide to public participation at the TCEQ.

The three commissioners determine the validity of requests for reconsideration and requests for contested case hearing and vote to grant or deny the requests during a public meeting. These public meetings are usually held every other Wednesday in Austin. Prior to the meeting, the following occurs:

1) the written requests are distributed to the executive director, the public interest counsel, and the applicant. These persons may file a response at least 23 days before the meeting;
2) the requester may then file a reply to the responses at least 9 days before the meeting. This is the requester's opportunity to address any deficiencies in the request that have been identified by TCEQ staff or the applicant. The requester must submit any information he or she wishes the commissioners to consider (ex: maps or diagrams showing requester's location relative to the applicant's proposed activities) by this deadline; and
3) the commissioners read the requests, the responses to requests, and the replies, before the public meeting. Then, during the public meeting, the commissioners vote to grant or deny the requests.

Requests for Reconsideration

A request for reconsideration must expressly state that the person is requesting that the commission reconsider the executive director's decision and state the reasons why the commission should reconsider the executive director's decision. The commission will consider a request for reconsideration at a scheduled public meeting and grant or deny the request.

Requests for Contested Case Hearing

A contested case hearing is an evidentiary proceeding, similar to a hearing in civil court. The law allows for holding a contested case hearing on certain types of applications.

A valid request for a contested case hearing must:

1) demonstrate that the requester is an "affected person" with a "personal justiciable interest" related to a legal right, duty, privilege, power or economic interest which would be affected by the application in a manner not common to the general public;
2) if the request is made by a group or association, identify one or more members who

have standing to request a hearing, and the interests the group or association seeks to protect;

3) expressly request a contested case hearing;
4) raise disputed issues of fact that are relevant and material to the commission's decision on the application which were raised during the comment period and not withdrawn prior to the filing of the Executive Director's Response to Comment; and
5) include any other information as specified in public notices.

The commission is authorized to protect human health and safety, and natural resources. The commission cannot address other matters outside the commission's authority, such as the effect of the existence of a proposed facility on nearby property values.

When the commissioners deny hearing requests, they often proceed to vote on approval or denial of the application. Alternatively, they may remand the application to the executive director for final action. If a hearing request is granted and the application is referred to the State Office of Administrative Hearings (SOAH), the commissioners will specify a list of issues which will be the subject of the hearing and an expected date for the SOAH judge's proposal for decision. The SOAH judge will conduct the hearing and submit a proposal to the commission to approve or deny the application.

The Alternative Dispute Resolution Office may contact requesters to determine their interest in informal discussions with the permit applicant and a mediator.

By necessity this document gives a very general description of commission procedures. If you have any questions, please call OPA toll-free at 1-800-687-4040.

MAILING LIST
HOUSTON REFINING, L.P.
DOCKET NO. 2009-0179-AIR; PERMIT NO. 2167

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See attached list of Requesters/Interested Persons.

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TEXAS
COMMISSION
ON ENVIRONMENTAL
QUALITY

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CHIEF CLERKS OFFICE

AIR QUALITY PERMIT NO. 2167

APPLICATION BY	§	**BEFORE THE**
HOUSTON REFINING LP	§	**TEXAS COMMISSTION ON**
HARRIS COUNTY, TEXAS	§	**ENVIRONMENTAL QUALITY**
RN #100218130	§	

EXECUTIVE DIRECTOR'S RESPONSE TO PUBLIC COMMENT

The Executive Director of the Texas Commission on Environmental Quality (commission or TCEQ) files this Response to Public Comment (Response) on the New Source Review Authorization application and Executive Director's preliminary decision. As required by Title 30, Texas Administrative Code (TAC) § 55.156, before an application is approved, the Executive Director shall prepare a response to all timely, relevant and material, or significant comments. The Office of Chief Clerk received timely comments from Mayor Bill White on behalf of the City of Houston and from the Environmental Integrity Project (on behalf of itself and the American Lung Association, Environmental Defense Fund, and Galveston Houston Association for Smog Prevention), hereafter referenced as EIP. This Response addresses all public comments received, whether or not withdrawn. If you need more information about this permit application or the permitting process please call the TCEQ Office of Public Assistance at 1-800-687-4040. General information about the TCEQ can be found at our website at www.tceq.state.tx.us.

BACKGROUND

Description of Facility

Houston Refining LP has applied to the TCEQ for renewal of its flexible permit covering its Houston refinery. The refinery is located at 12000 Lawndale Street, Houston, Harris County, Texas. The facilities at the refinery will emit the following air contaminants: VOC, NO_x, PM_{10}, SO_2, CO, H_2SO_4, H_2S, ammonia, benzene, carbonyl sulfide (COS), carbon disulfide (CS_2) and antimony.

Procedural Background

Air quality permits are required to be renewed every ten years. Houston Refining submitted a renewal application on August 7, 2008, which was declared administratively complete on August 22, 2008. The Notice of Intent to renew the Air Quality Permit was published on September 2, 2008, in the *Houston Chronicle* and September 3, 2008 in *La Voz*. Although the notices provided that the comment period would end on September 18, 2008, the close of the comment period for this application was extended to September 29, 2008 due to the landfall of Hurricane Ike on September 12-13, 2008. Since this application was administratively complete after

September 1, 1999, this action is subject to the procedural requirements adopted in accordance with House Bill 801, 76th Legislature, 1999.

COMMENTS AND RESPONSES

COMMENT 1: A contested case hearing was requested. (City of Houston and EIP) Specifically, the existence and regulation of benzene emissions in the City of Houston continues to present a serious public health hazard to the citizens of Houston. To grant the 18th in a series of permit changes without an evidentiary hearing at which the public can be heard is not in the public interest. The TCEQ is urged to refer this application for a contested case hearing in the public interest to address the unique and significant adverse public health impacts presented by the permit renewal, which deserve the highest level of scrutiny and public participation. The City's request should be given maximum consideration. (City of Houston)

RESPONSE 1: The contested case hearing requests received for this renewal application will be processed in accordance with the Texas Clean Air Act (TCAA) and applicable TCEQ rules. Tex. Health & Safety Code § 382.055, 30 TAC §§ 55.201 – 55.209, 55.211 and 116.312. The TCAA provides that the commission may not hold a contested case hearing for a renewal application where there is no change in the allowable emissions rates or in the emission of any new contaminant, unless the facility is classified as a "poor performer" under the commission's compliance history rules found in 30 TAC Chapter 60. Houston Refining's compliance history rating does not fall in the "poor performer" category. A final determination of whether a contested case hearing will be granted, and, if so, what issues will be referred for the hearing, will be made by the commission in an open meeting.

This permit has been amended and altered (mostly alterations) since the flexible permit was issued, and where public notice requirements were triggered, such as for amendments, Houston Refining provided public notice. By rule, alterations are not subject to public notice.

COMMENT 2: How can the public ensure that the final flexible permit is practicably enforceable if there is no opportunity to comment on the permit itself? The comment period should run for 30 days and should begin when TCEQ has reviewed and developed an analysis of the technically complete permit application. The Federal Clean Air Act's implementing regulations require that the public be given 30 days' notice of the agency's analysis of the effect of construction or modification on ambient air quality, the agency's proposal for approval or disapproval, and in the information submitted by the owners or operators, as well as the opportunity to comment on the permitting agency's determination of whether to grant a permit. (EIP) The public participation requirements for flexible permits do not meet the requirements of 40 CFR Part 51. Notice of the draft permit (including the state's preliminary determination) should be given for Houston Refining's current application, which includes an amendment to the exiting permit through the "rolling in" of the maintenance, startup and shutdown (MSS) permit by rule (PBR). (City of Houston)

RESPONSE 2: A copy of the permit can be found at the TCEQ regional office specified in the notice (Houston) and at the Austin Central Office. Comments regarding the permit are welcome during the comment period specified in the public notice section of the newspaper. In addition, as discussed above, the comment period was extended due to Hurricane Ike's landfall at the time of the close of the comment period. However, it was not extended until technical review was complete. Houston Refining followed the public notice requirements contained in the Texas Clean Air Act and TCEQ rules for a permit renewal application. Tex. Health & Safety Code § 382.056, 30 TAC §§ 39.405, 39.418, 39.602-39.605, and 116.312.

There has been no final determination of whether the current public participation requirements for flexible permits meet the requirements of 40 CFR Part 51.

Finally, the draft renewal permit will not include a consolidation of a PBR for MSS. See also Response 5 for more information about consolidation of PBRs into the renewal permit.

COMMENT 3: EPA has informed Texas that its current public participation rules do not provide adequate notice, referencing a letter from EPA dated August 14, 2006. TCEQ should utilize its authority pursuant to Texas Health & Safety Code § 382.056(p) to provide public notice and opportunity to comment consistent with EPA's requirements in 40 CFR Part 51. (EIP)

RESPONSE 3: Houston Refining followed the public notice requirements contained in the Texas Clean Air Act and TCEQ rules for a permit renewal application. Tex. Health & Safety Code § 382.056, 30 TAC §§ 39.405, 39.418, 39.602-39.605, and 116.312.

COMMENT 4: How is TCEQ ensuring that this facility is in compliance with Clean Air Act requirements that it operate in compliance with a SIP-approved major source permit? (EIP)

RESPONSE 4: As part of the permit review process, the TCEQ is required to determine that the permit meets all applicable state and federal requirements. This is accomplished by reviewing emissions calculations and evaluating the control technology utilized by the facility. Emissions are evaluated to determine if there will be adverse health impacts on the nearby area. A review of the compliance history is evaluated and taken into consideration, as well as comments from any local pollution control offices and the TCEQ regional office to determine if any changes are needed for the renewal. If necessary to avoid a condition of air pollution or to ensure compliance with federal and state air quality control requirements, the commission shall impose as a condition of renewal only those requirements the executive director determines to be economically reasonable and technically practicable considering the age of the facility and the impact of its emissions on the surrounding area. 30 TAC § 116.311(b)

COMMENT 5: Based on the text of the notice, this permitting action includes changing the flexible permit to incorporate various other authorizations and changes, and it is not clear which pre-existing PBRs, alterations and amendments are being incorporated into this permit, and what

the changes to emission factors involve. Therefore, this permitting action would appear to make changes to the primary air authorization for the plant. What alterations, amendments, and PBRs are being incorporated into this permit? Pursuant to what authority does the TCEQ believe these incorporations can be included without the public notice required for amendments? (EIP) The application is deficient because it fails to require identification of the types of modifications authorized pursuant to the permit and therefore is not practically enforceable and fails to protect the national ambient air quality standards (NAAQS). (City of Houston)

RESPONSE 5: The Executive Director disagrees that the application is deficient. The notice is designed to capture all possible incorporations that may be applicable for a renewal application. In this case, no alterations or amendments are being incorporated into this renewal. An amendment was submitted concurrently with this renewal; it does not involve construction of new facilities and will result in an overall decrease in emissions. Specifically, the amendment is needed to update cooling water circulation rates and to add hydrogen sulfide emissions to some storage tanks and ammonia emissions to the flares. PBRs are included in permits when next amended or renewed in two different ways: (1) consolidation by incorporation, which reauthorizes the facility (and the PBR is no longer the authorizing mechanism), and (2) consolidation by reference, which administratively consolidates the PBRs into the permit document. The PBRs that will be included by incorporation in this permit are: eleven PBRs concern the addition or replacement of equipment leak fugitives, six are replacement in kind PBRs for storage tanks, two are replacement in kind cooling towers, and one PBR concerning two sulfur degassing units that are routed to the thermal oxidizer.

There is no requirement that a renewal application separately list any previous modifications. See also Response 6.

COMMENT 6: Which types of authorizations (PBRs, alterations, qualified facilities, etc.) does TCEQ believe can be incorporated into a permit at renewal without triggering amendment requirements? (EIP)

RESPONSE 6: The rule regarding alterations and amendment for flexible permits is 30 TAC § 116.721. In summary, an amendment is required for any change that will cause an increase in emissions, cause a change in method of control in emissions, or cause a change in the character of emissions. Incorporating PBRs, alterations and changes to qualified facilities are not in themselves modifications (as defined in 30 TAC § 116.10(11)), and therefore can be incorporated without triggering public notice.

COMMENT 7: What kind of impacts and/or technology review is required for authorizations that are incorporated into a permit at renewal? (EIP)

RESPONSE 7: A demonstration of best available control technology (BACT) and an impacts evaluation is required for all PBRs that are included via consolidation by incorporation into a permit at renewal or amendment. Only an impacts analysis is required for PBRs that are

referenced into a permit at renewal or amendment. There are two ways PBRs are included in permits: (1) consolidation by incorporation, which reauthorizes the facility (and the PBR is no longer the authorizing mechanism), and (2) consolidation by reference, which administratively consolidates the PBRs into the permit document. As discussed in Response 5, several PBRs will be included in this permit. Generally, it is the permittee's choice whether to consolidate by incorporation or by reference.

COMMENT 8: Are planned SSM emissions being authorized pursuant to this permitting action? If so, pursuant to what authority does TCEQ believe they can be incorporated into the permit without 30 days public notice and comment? (EIP) As part of the review of the renewal application, TCEQ should consider the MSS emissions included in the MSS permit application. The cumulative impact of the MSS emissions is significant and increases the health risk to the exposed population. (City of Houston)

RESPONSE 8: Houston Refining submitted a separate MSS amendment application (amendment to Permit 2167) on January 5, 2007 as part of the incentive provided by 30 TAC § 101.222(h) which affords an affirmative defense for planned MSS emissions for a period of time. That permit amendment went to public notice on April 4, 2007 in the *Houston Chronicle* and *La Voz*. No comments were received regarding that application. The review of that application is ongoing at this time.

The Texas Clean Air Act limits imposing conditions for renewal of a permit to only those requirements the commission determines to be economically reasonable and technically practicable considering the age of the facilities and the effect of its emissions on the surrounding area. The commission may not impose requirements more stringent than those of the existing permit unless the commission determines that the requirements are necessary to avoid a condition of air pollution or to ensure compliance with otherwise applicable federal or state air quality control requirements. See Tex. Health & Safety Code § 382.055. Therefore, the MSS emissions are not included in this permit review.

COMMENT 9: The application is deficient because it does not clearly subject MSS emissions to caps, and therefore the permit lacks practical enforceability and fails to protect the NAAQS. (City of Houston)

RESPONSE 9: The Executive Director disagrees that the application is deficient. As stated in Response 8, Houston Refining submitted an MSS amendment application on January 5, 2007. There is no legal requirement for a renewal application to include an application for emissions from MSS activities, nor is there a requirement that these emissions be subject to an emissions cap. Further, Houston Refining did not request that these applications be combined for application review and permit issuance purposes.

COMMENT 10: Pursuant to Tex. Health and Safety Code § 382.055 (d), the commission is required to review the applicant's compliance history. Houston Refining is required to include in

its renewal application the information listed in 30 TAC § 116.311(a)(2) which concerns whether the facilities are being operated in accordance with all permit requirements and conditions, including representations in the permit application. Houston Refining's practices are insufficient to support a renewal of its application without significant changes. In support of its position, the City cited numerous complaints, notices of violations, and issued and pending Agreed Orders (including penalties assessed) from three governmental agencies (TCEQ, City of Houston Bureau of Air Quality Control and Harris County Public Health and Environmental Services) regarding Houston Refining for the period 2001 - present. A chart regarding a summary of emissions events was also submitted. (City of Houston)

RESPONSE 10: The compliance history rating for regulated entities is established on an annual basis pursuant to the commission's rules in 30 TAC Chapter 60. Compliance history ratings are considered during permit application reviews. The compliance history rating for Houston Refining is 9.22, which is an "average" classification. As part of the application review process, the local TCEQ Regional office and appropriate local city and county programs are provided an opportunity to give input as to whether the facility is operating in compliance with the Special Conditions of the permit, and the conditions can be revised to address any non-compliance issues. At this time, no changes have been identified. In addition, the review process includes evaluating, and, if necessary, updating the current Special Conditions in the permit.

COMMENT 11: Reductions in benzene that are included in the renewal application are not supported by changes in operations, additional environmental controls, or monitoring data. Rather, most of the reductions appear to be based on revised calculations for which there is no supporting information. (City of Houston)

RESPONSE 11: The application proposes substantial reductions to the current flexible permit emission caps, for a total reduction of 1,745 tons per year (tpy) or 15% of current permit allowables of various pollutants; this includes a reduction in benzene emissions of 23.6 tpy (a 41% decrease). The methods for reducing permitted levels of benzene that are represented by Houston Refining include implementing a more stringent fugitive monitoring program, adjusting emissions to the most current factors, improving fittings for floating roofs and removing shutdown equipment. All of these are accepted methods for lowering permitted emissions.

COMMENT 12: The application does not propose verification via direct observation or monitoring of benzene emissions, rendering the permit virtually unenforceable. Direct observation methodologies should be used rather than the use of emissions factors, which, according to studies, result in a drastic undercounting of VOC emissions, including benzene. A direct observation technology method was used at the BP Refinery in Galveston County in 2007. A comment was made that a DIAL[1] technology was deployed at Houston Refining. (City of Houston)

[1] DIAL is an acronym for Differential Absorption Lidar.

RESPONSE 12: Most of the VOC monitoring in the permit is instrument monitoring. As part of updating language in the existing permit, a new up-to-date flare condition is being added. The new condition requires a continuous flow monitor to measure the Btu content of the waste stream in order to assure adequate heating value for VOC combustion. The new condition will ensure full compliance with 40 CFR 60.18 requirements which all flares must meet. In addition, the application includes a change in fugitive monitoring from 28 VHP to 28 MID for all VOC.

The Air Permits Division has no information as to whether Houston Refining has deployed DIAL technology at its plant site. The executive director has not fully evaluated the effectiveness and reliability of using DIAL technology for monitoring emissions (including benzene), and therefore is not requiring the use of such technology in the draft renewal permit.

COMMENT 13: Fence line monitoring is an effective mechanism for identifying emissions that come from many point sources. TCEQ should require monitoring at Houston Refining that is similar to that at Texas Petrochemicals, and require ambient air level commitments before issuing the requested permit to Houston Refining. (City of Houston)

RESPONSE 13: Fence line monitoring is determined on a case by case basis and is not necessarily required for permit issuance or renewal. Fence line monitoring can be included as a permit condition but was not required for this particular permit, nor will it be required as part of this renewal. When permits are issued, an impacts analysis is required; this usually involves full dispersion modeling. (See Response 14). In addition, the voluntary agreement of Texas Petrochemicals was designed to address the unique facts of the particular issues, and the order specifically states that it is not to be cited as precedent in any subsequent action before the TCEQ.

COMMENT 14: The applicant did not submit air dispersion modeling to support its application, and for the TCEQ to use to establish the permit conditions. The TCEQ is authorized to impose additional requirements to ensure compliance with applicable requirements. (City of Houston)

RESPONSE 14: Modeling was performed in the past for increases in emissions or changes in the character of emissions to determine that the emissions from the facilities would not be expected to result in adverse off-property impacts. This renewal application does not involve an increase in emissions, and therefore air dispersion modeling is not required. With regard to the PBRs being included by consolidation by incorporation in this permit, Houston Refining submitted an effects analysis on November 6, 2008. This analysis followed the TCEQ's Modeling and Effects Review Applicability (MERA) reference guide (August 2008). There are substantial decreases in VOC, H_2S and SO_2 that more than offset the increases authorized in the incorporated PBRs. The project will result in reduced ambient impacts for each of these pollutants. With regard to benzene, the proposed reductions satisfy MERA Step 3, and are anticipated to result in reductions in ambient impacts from benzene emissions.

COMMENT 15: Houston Refining claims that there are no schools within 3000 feet of the plant. However, Richey Elementary School is within 3010 feet of the facility. Neither TCEQ nor Houston Refining has conducted the research necessary to enable TCEQ make a determination regarding the health impact of the facility on the students. (City of Houston)

RESPONSE 15: The applicant noted in its application that there are no schools within 3000 feet of its plant. As noted, there is an elementary school about 3000 feet from the plant. When performing an impacts analysis, all sensitive receptors including schools are evaluated regardless of location.

COMMENT 16: Houston Refining failed to include the level of information and underlying data sufficient to justify the projected emissions. As noted throughout the application, Houston Refining references "tests" without any specificity, e.g., "testing of the fuel gas and selected heater exhausts," "testing of the FCCU Wet Gas Scrubber Stack," "emissions test data" and "the best currently available data." TCEQ should require that the application be complete, understandable and supported by verifiable facts. (City of Houston)

RESPONSE 16: The changes in calculation methodology presented by Houston Refining are acceptable to TCEQ. Utilizing test data to get an accurate concentration for contaminant concentration such as benzene has always been accepted by TCEQ. The permit contains continuous emission monitoring (CEMs) requirements for the FCCU wet gas scrubber (NO_x, CO and SO_2), SRU thermal oxidizer (NO_x, CO, PM and VOC). As part of an Agreed Order dated August 19, 2002, Houston Refining is required to install CEMs for the 537 Crude Unit F1 heater (NO_x, CO and O_2). The permit contains a section titled "Continuous Demonstration of Compliance with Emission CAPS" that spells out exactly how all sources covered by the permit are to show compliance with emission caps. Some sources may use actual data (such as CEMs data) while others may use worst case permit representations. In addition, because some of the combustion units at the refinery are subject to NSPS Subpart J, the fuel gas system will be subject to the Subpart J monitoring and testing requirements to verify compliance with the sulfur content of the fuel.

COMMENT 17: The application does not account for emissions from heaters and boilers due to the use of refinery fuel gas. Although the heaters and boilers will be allowed to use refinery gas as well as natural gas, the emission calculations are based on the exclusive use of natural gas. There are 70 of these sources at the refinery, and using the wrong emissions factors results in a very significant under-calculation of potential benzene and other emissions, possibly by as much as 2860%. Houston Refining should provide statistically significant data regarding the benzene content in their refinery fuel gas over time and recalculate the benzene emissions. (City of Houston)

RESPONSE 17: Houston Refining used AP-42 factors for all pollutants from heaters and boilers, except for NO_x. For NO_x, the BACT level at the time the flexible permit was issued was used. In AP-42, only a natural gas factor is provided and that has been accepted by the TCEQ.

In addition, all heaters that are included in the flexible permit have been stack tested in the past. Houston Refining has stated that there is no benzene present in their fuel for heaters and boilers. Houston Refining used 160 ppmv (parts per million by volume) H_2S in the fuel stream to estimate SO2 emissions. This is consistent with NSPS Subpart J standard and is consistent with Special Condition No. 26 which requires that the fuel gas not exceed 0.1 gr H_2S /dscf (which is approximately 160 ppmv).

COMMENT 18: The permit does not include any benzene emissions from flares, and if these emissions have never been permitted, they constitute new sources and must be permitted via an amendment and not by permit renewal. Routine flaring should not be considered BACT because flare efficiency (assumed by TCEQ guidance to be 98% or better) is most likely lower than 98%, especially during periods of high wind speeds and when excessive amounts of steam are added to the flare tip. Flare gas recovery and the use of high efficiency control devices should be considered BACT in lieu of flaring. In addition, flare tip stream rates should be specified relative to waste gas flow rates during certain conditions, and additional flare monitoring and recordkeeping should be required to demonstrate compliance. (City of Houston)

RESPONSE 18: No benzene is represented in the flare emissions. In the past, benzene emissions were represented as being present in the flares; however, none are currently being detected. According to Houston Refining, HRVOC monitors, which are required for the flares, indicate no measurable concentration of benzene. Flaring of emissions is considered BACT for most vent source emissions. The new flare condition will require monitoring the Btu content to the flare and the VOC make-up.

COMMENT 19: The applicant represents no benzene or any VOC emissions from the delayed coker units, and these are known to emit benzene. If these emissions have never been permitted, they constitute new sources and must be permitted via an amendment and not by permit renewal. (City of Houston)

RESPONSE 19: Usually there should be no benzene emissions from the delayed coker unit. The emissions, including benzene, from the coking process are controlled prior to opening the coker drum, and all of the benzene is expected to be vented and controlled throughout this process. If operated properly, the delayed coker unit drum will run at temperatures much higher than benzene's boiling point, flashing off any benzene that may be present. As a result, we do not expect there to be benzene emissions present in the coker drum or in the coke by the time the drum is opened for coke removal. Particulate emissions are controlled with water spray during the coke removal and handling processes. At least 8% moisture content is required for all coke in the coke pit, and testing of the moisture is required three times a week.

COMMENT 20: The tank emissions calculations are not supported because the vapor pressure data is not realistic and there are no benzene emissions associated with certain tanks such as those in distillate, crude, gas oil, naptha, wastewater/slop oil and gasoline service. There is no explanation of the benzene speciation methodology, so it is impossible to understand how the

benzene calculations were made and it is not possible to verify the benzene or other emissions data. If these emissions have never been permitted, they constitute new sources and must be permitted via an amendment and not by permit renewal. In addition, the contents of 46 storage tanks are vaguely described as "chemicals," and it is impossible to determine if there is benzene in these tanks. (City of Houston)

RESPONSE 20: According to the permit renewal/amendment application, there are benzene emissions quantified and represented for distillate, crude, gas oil, naptha, wastewater/slop oil and gasoline tanks. (See page 38 of application). With regard to tanks identified as storing "chemicals," these tanks were originally permitted with the flexibility to store a variety of chemicals, primarily toluene, xylene and benzene. The permit application is being updated to reflect exactly what chemicals were allowed for those tanks.

COMMENT 21: Cooling tower emissions estimates do not follow the TCEQ guidance because the emission calculations were based on an emissions factor for "controlled" cooling tower emissions. There should be cooling tower monitoring records if the cooling towers are controlled. Without monitoring data the "uncontrolled" emission factors should be used. Although a cooling tower monitoring system is represented in the application, it is not described nor is any supporting data provided in the application. Houston Refining uses a very low benzene to VOC ratio for all of its cooling towers. Individual testing and calculations should be required. (City of Houston)

RESPONSE 21: The cooling towers used at Houston Refining are allowed to use a lower emission factor because they are subject to monthly monitoring; see Special Condition No. 25 of the permit. Sampling is used to determine the benzene concentration in cooling tower water. The language presented in Special Condition No. 25 is consistent with language used for other cooling towers permitted by TCEQ. The benzene testing was part of the monthly sampling for total VOC required by the permit. Houston Refining included a spreadsheet in the application that shows each source's contribution to the benzene cap.

COMMENT 22: Calculation of emissions from wastewater appears to be low for benzene and is unsubstantiated. Houston Refining should perform microbiological testing of its wastewater system to demonstrate that the microbes can in fact degrade the benzene in the wastewater, or the represented benzene wastewater emissions should be increased by 13.6 tons per year. (City of Houston)

RESPONSE 22: Special Condition No. 10 G specifies how the wastewater emissions will be calculated and how compliance will be determined. Short term emissions will utilize maximum/design wastewater flow rates, maximum measured or assumed VOC concentrations in wastewater, and applicable control efficiencies. The annual VOC emissions from each wastewater system will be calculated based upon actual annual wastewater flows and wastewater lab analyses. There is no reason at this time to warrant a change in the method of compliance testing such as microbiological testing. Finally, Houston Refining is subject to several

NESHAPS, including BB (concerning benzene transfer operations) and FF (concerning benzene waste operations), as well as the wastewater requirements of MACT CC.

COMMENT 23: The fugitive emissions are not explained in the application, e.g., the benzene percentage in various streams is not explained. The benzene concentrations are unrealistically low, which will result in an underestimation of potential benzene emissions. The benzene content should be based on the incoming crude oil. (City of Houston)

RESPONSE 23: The fugitive emission calculations are on pages 44 through 52 of the application. Fugitive estimates are determined by counting the number of components and then multiplying that count by the appropriate emission factor as determined by the TCEQ Equipment Leak Fugitive Guidance Document; for this site, it is appropriate for Houston Refining to use the Refinery leak factors. All benzene concentration representations are based on Houston Refining's lab test data which is acceptable.

COMMENT 24: Houston Refining did not estimate emissions from the Fluidized Catalytic Cracking unit. If these emissions have never been permitted, they constitute new sources and must be permitted via an amendment and not by permit renewal. (City of Houston)

RESPONSE 24: There are no measurable amounts of benzene present in this unit according to Houston Refining. The FCCU emissions are controlled by a CO boiler followed by a wet gas scrubber. The annual PM emissions for the FCCU are based on testing from the wet gas scrubber stack. The short-term emissions are based on assuming 1 lb PM/lb coke burn-off. All other sources are based on expected stack gas flow rate and concentrations. There is a CEMS on the scrubber stack to demonstrate compliance as detailed in response No. 16. Please note that since this is a flexible permit, the FCCU wet scrubber stack, which is the final emission point for the FCCU, is included in the MAERT VOC CAP and does not have a listed individual limit. This renewal application does not request an increase in benzene emissions from this source. Houston Refining's measured estimates for pollutants from the FCCU scrubber stack, as well as all other pollutants, will be verified during the review process.

COMMENT 25: The permit does not comply with the EPA requirements regarding benzene emissions. Specifically, flexible permits are not in the Texas State Implementation Plan (SIP). Therefore, the permit terms violate federal law and are not federally enforceable. Houston Refining could have sought other, SIP-approved permitting. (City of Houston)

RESPONSE 25: The commenter is correct that EPA has not approved the TCEQ's flexible permit rules. However, it is not clear what EPA requirements regarding benzene emissions the commenter is referring to. The TCEQ is processing this application according to the applicable law and procedures for renewal applications.

COMMENT 26: The application is deficient because it fails to assure compliance with terms and conditions for existing major NSR permit terms, fails to include adequate procedures for

assuring NSR compliance for major modifications, and improperly uses permits by rule to authorize facility changes that may cause an exceedance of a flexible permit. (City of Houston)

RESPONSE 26: The Executive Director disagrees that the application is deficient. Although it is not clear what specific deficiencies the commenter is referring to. The application has been determined to be technically complete. Emissions authorized by PBRs which will be included by consolidation by incorporation to the permit, and therefore no longer authorized under a PBR, will be evaluated for compliance with applicable requirements. TCEQ rules allow use of PBRs at major sites, but cannot be used to circumvent any other requirements, including emission limits in a flexible permit.

COMMENT 27: The application is deficient because it fails to require adequate emission limits, and therefore the permit lacks practical enforceability and fails to protect the NAAQS. Annual limits should be based on a 12-month rolling average and short terms limits should be required. (City of Houston)

RESPONSE 27: The Executive Director disagrees that the application is deficient. The application includes emission limits summarized in the Table 1(a). The current Maximum Allowable Emission Rate Table (MAERT) in the permit specifically requires that annual emissions be based on a rolling 12-month basis. The current MAERT also lists short term limits. In addition, the draft renewal permit will incorporate any emission changes and those emissions will be listed on the MAERT of the permit.

COMMENT 28: The application is deficient because it allows too many dissimilar units to be covered by a single cap, and therefore the permit lacks practical enforceability and fails to protect the NAAQS. (City of Houston)

RESPONSE 28: Emission caps are established for a specific pollutant, regardless of the number or similarity of the facilities which emit that pollutant at a site. Therefore, this application is not deficient with regard to compliance with applicable rules. See 30 TAC §§ 116.711(14) and 116.716. Monitoring and recordkeeping requirements in the permit ensure the facilities and unit-types under the cap meet the applicable emission limit. As discussed in Response 4, the application review includes a determination that all applicable state and federal requirements will be met prior to permit issuance.

COMMENT 29: The application is deficient because it does not include an adequate, replicable standard for monitoring, reporting, recording and testing, and therefore the permit lacks practical enforceability and fails to protect the NAAQS. (City of Houston)

RESPONSE 29: The Executive Director disagrees that the application is deficient. The current permit lists standards for monitoring, reporting, recordkeeping and testing. For example, Special Condition No. 9 states exactly what CEMS monitoring requirements are needed for Crude Unit Heater #1. Calibration specifics are given as well as location and duration for recordkeeping.

Specific monitoring, reporting, recording and testing requirements are also detailed in Special Condition No. 10 for several other sources covered by the permit.

COMMENT 30: The application is deficient because it fails to require an air quality analysis for the existing and any future amendments that increase emission limits, and therefore the permit lacks practical enforceability and fails to protect the NAAQS. (City of Houston)

RESPONSE 30: The TCEQ has determined that this application is technically complete. In addition, the TCEQ prepares a technical review that includes an air quality analysis for initial issuance and amendments of permits. Therefore, because the initial permit and any changes associated with previous amendments have already been reviewed, a new air quality analysis is not usually prepared for a renewal application.

COMMENT 31: The City's facility-specific voluntary benzene reduction plan for Houston Refining, originally published in February 2007, should be considered as part of the permit renewal application. (City of Houston)

RESPONSE 31: Air quality permit renewal applications are reviewed to determine compliance with the applicable law under established agency procedures. See Response 32 for more information regarding the scope of review of a permit renewal application. The City of Houston's benzene reduction plan is not a requirement for which TCEQ must determine compliance, nor does TCEQ have authority to require compliance with the plan. If Houston Refining chooses to include any representations in an air quality permit application filed with TCEQ that it wants to incorporate all or part of a voluntary agreement between it and the City of Houston, we will review that information in the application. TCEQ supports and encourages reductions of air contaminants by all permittees, regardless of whether the action is taken voluntarily by the permittee or as part of a formal agreement between permittees and third parties. As discussed in Response 11, Houston Refining has proposed lowering the benzene emissions as part of this application. However, Houston Refining did not represent that any aspect of the voluntary benzene reduction plan published by the City is part of the permit renewal application, and therefore the plan is not part of the renewal application review.

COMMENT 31: Houston Refining has the 15th largest production volume of the refineries in the United States and emits more benzene in its processes than other refineries in the rest of the country, according to self-reported emissions. These emissions could be an underestimation of actual benzene emissions, and Houston Refining has in its possession more reliable and accurate data on it emissions than what has been reported to EPA and TCEQ. The City requests TCEQ to use this data to conduct a full evaluation of the refinery site and permit. (City of Houston)

RESPONSE 32: While informative to review this comparative information, it is not probative from either a permitting or health effects standpoint to look at emissions per refined output between refineries. In both cases, offsite impacts of a plant's emissions are more important. In the permitting process, petroleum refineries must demonstrate how the best available control

technology (BACT) and/or maximum achievable control technology (MACT) will be met, showing not only that the facility is implementing control technology comparable to that of other petroleum refineries, but also that offsite receptors would not be exposed to unacceptable risk from the proposed emissions. Houston Refining has already included MACT standards in its existing permit; see Special Condition No. 4 of the current permit. Additionally, air modeling and ambient air monitoring verify emissions from these sources remain at acceptable levels. In fact, the only ambient air monitor in the vicinity of Houston Refining with an annual average concentration over the long-term effects screening level (ESL)[2] for benzene is the Galena Park monitor. Although concentrations of benzene are above the long-term ESL, there are other benzene sources in proximity to the monitor that may have a greater contribution to ambient levels than Houston Refining. Moreover, the renewal application for Houston Refining includes significant reductions in the plant's benzene emissions. Because of these reductions, and the plant's compliance with MACT standards, a health effects review for the facility is not necessary at this time. Additional discussion on the applicability of the comparison analysis presented by the City and emissions reporting is available in a February 27, 2008 comment letter to the EPA (TxOGA et al. 2008).[3]

The Texas Clean Air Act limits imposing conditions for renewal of a permit to only those requirements the commission determines to be economically reasonable and technically practicable considering the age of the facility and the effect of its emissions on the surrounding area. The commission may not impose requirements more stringent than those of the existing permit unless the commission determines that the requirements are necessary to avoid a condition of air pollution or to ensure compliance with otherwise applicable federal or state air quality control requirements. See Tex. Health & Safety Code § 382.055. The review of this application has not resulted in such determinations.

COMMENT 33: TCEQ should begin to evaluate permit applications in terms of cumulative toxic emissions from the Houston Refining refinery as well as its contribution to regional toxic emissions from neighboring sources. In addition to Houston Refining, LyondellBassell operates three other plants within Harris County, all of which are significant benzene emitters. All four Lyondell plants emissions account for approximately 33% of all of the benzene air emissions by refineries and chemical companies in Harris County. The City's independent analysis of benzene emissions trends in the Houston area showed little improvement in air quality over the past five, seven, and ten year periods and a ranking of monitors showed Houston's monitors are the third, fifth, and seventh most contaminated sites in Texas. (City of Houston)

RESPONSE 33: Although concentrations of air pollutants in the Houston region are not ideal in every location, it would be incorrect to assume that little progress has been made towards achieving this goal. As outlined in the TCEQ September 29, 2008, interoffice memorandum prepared by Joseph T. Haney, Jr., M.S. entitled, "Health Effects Review of Ambient Air Monitoring Data Collected in TCEQ Region 12 during 2007," a number of areas have

[2] For discussion regarding establishment of ESLs, see Response 36.
[3] A list of all references used in these responses is provided below.

experienced downward trends of ambient levels of air pollutants. In particular, the 2007 average benzene concentration at the Lynchburg Ferry monitor is approximately 37% and 52% less than the reported 2006 and 2005 averages, respectively. At the Milby Park monitor, the 2007 average 1,3-butadiene concentration is approximately 20% and 32% less than the 2006 and 2005 averages, respectively.

While informative to look at various statistics, the most important goal of regulating emissions of toxic substances is to protect human health. Therefore, it is much more important to identify which monitors are, or are not, showing acceptable health risk to the public than to rank and label the "most contaminated" monitored areas. The statistical ranking of sites does not answer the crucial question of whether or not the monitored levels are of health concern. The fact that the three monitors identified as being the "third, fifth, and seventh most contaminated sites" within the City of Houston are below the long-term, health-based ESLs for benzene and 1,3-butadiene makes the City's ranking inapplicable.

COMMENT 34: TCEQ's regulation of single pollutants is ineffective at protecting public health. As an illustration, the City calculated the 95th upper confidence limit of mean concentrations of 1,3-butadiene and benzene at 12 ambient air monitors near Houston and added them together to show that cumulative impacts are over the TCEQ's one in 100,000 risk threshold. (City of Houston)

RESPONSE 34: When using data obtained from TCEQ's automated gas chromatographs (autoGCs), it is scientifically more appropriate to use the arithmetic mean for comparison of yearly averages than the 95th upper confidence limit on the mean. Therefore, using the same monitors as depicted on page 9 of the City's comments, the following table has been constructed using the arithmetic mean.

Annual Average Concentration (ppb_v) of 1,3-Butadiene and Benzene

Site Name	1,3-Butadiene Mean (ppb_v)	1,3-Butadiene Unit Risk Factor (per ppb_v)*	1,3-Butadiene Risk	Benzene Mean (ppb_v)	Benzene Unit Risk Factor (per ppb_v)*	Benzene Risk	Cumulative Risk
Danciger	0.034	1.10E-06	3.74E-08	0.130	7.10E-06	9.23E-07	9.60E-07
Lake Jackson	0.037		4.07E-08	0.159		1.13E-06	1.17E-06
Texas City 34th St.	0.058		6.38E-08	0.255		1.81E-06	1.87E-06
Wallisville Road	0.073		8.03E-08	0.237		1.68E-06	1.76E-06
Mustang Bayou	0.071		7.81E-08	0.301		2.14E-06	2.22E-06
HRM-3	0.191**		2.10E-07	0.659		4.68E-06	4.89E-06
Deer Park 2 (GC)	0.151		1.66E-07	0.466		3.31E-06	3.47E-06
Cesar Chavez	0.242		2.66E-07	0.487		3.46E-06	3.72E-06
Clinton	0.228		2.51E-07	0.559		3.97E-06	4.22E-06
Channelview	0.290***		3.19E-07	0.636		4.52E-06	4.83E-06
Lynchburg Ferry	0.143		1.57E-07	1.51		1.07E-05	1.09E-05
Milby Park	1.04		1.14E-06	0.372		2.64E-06	3.78E-06

*Unit Risk Factors as defined in the 2008 DSD for 1,3-Butadiene found at http://tceq.com/assets/public/implementation/tox/dsd/final/butadiene,_1-3-_106-99-0_final.pdf and the 2007 DSD for benzene found at http://tceq.com/assets/public/implementation/tox/dsd/final/benzene_71-43-2_final_10-15-07.pdf.

**The result is ≤MDL (method detection level).

***Less than 75% of the data is represented.

All values are represented in parts per billion by volume (ppb_v).

As shown above, only one monitoring location (Lynchburg Ferry) just barely exceeds the 1 in 100,000 risk level for either or both compounds. It should also be noted that the Lynchburg Ferry monitor is approximately 9.5 miles northeast of the Houston Refining plant, making it highly unlikely for emissions from the plant to contribute to the levels measured at this monitor based on distance and prevailing wind direction. Therefore, even when considering the cumulative impact of both benzene and 1,3-butadiene, concentrations observed at monitors near Houston Refining show the public is being exposed to levels at or below acceptable health risk levels.

COMMENT 35: Benzene exposure causes bone marrow toxicity, resulting in myelodysplastic disease and various leukemias including AML (Lou Gehrig's disease). (City of Houston)

RESPONSE 35: Benzene has been classified as a Class A carcinogen by the USEPA due to the extent of human occupational worker and animal data indicating a link between exposure and the development of cancer. At sufficiently high doses over an adequate duration, benzene may induce effects such as hematotoxicity (e.g., decreased white and/or red blood cells, platelets, lymphocytes) and contribute to various leukemias. Acute myelogenous leukemia (AML) is the

only leukemia type shown to be definitely associated with benzene exposure. These effects have been found in workers exposed to benzene over long periods and at concentrations much higher than environmental levels encountered by the general population. However, as noted in McGuire et al. (1997), benzene exposure is not known to contribute to Lou Gehrig's disease, also known as amyotrophic lateral sclerosis (ALS).

COMMENT 36: Benzene concentrations at the three closest ambient air monitors to the facility (Cesar Chavez, Milby Park, and Clinton Drive) exceeded the EPA's one in a million cancer risk threshold virtually 100% of the time, and TCEQ's ESL 23-37% of the time during 2007. In addition, mobile monitoring efforts in late 2007 reported downwind concentrations up to 12 parts per billion by volume (ppb_v) from Houston Refining, which is over 8 times the TCEQ's ESL. The reported concentrations in the area of the facility pose an unreasonable risk of cancer to Houstonians. EPA's Integrated Risk Information System (IRIS) classifies benzene as a Class A human carcinogen, which is the highest level of certainty that EPA assigns to toxics. Further, the ESL used by TCEQ is not protective enough of human health because it is at the least protective end of the toxicity range published by EPA, is not an enforceable ambient air standard, and does not address the additive impact of the benzene emissions from the Houston Refining facility and other benzene sources in the area.

Houston Refining and the City of Houston, as parties in a contested case hearing, should present evidence concerning the health effects of the proposed emissions, including various studies by TCEQ and other regulatory bodies, to determine whether the excess cancer risk posed by this facility's toxic emissions poses an unreasonable risk to public health. (City of Houston)

RESPONSE 36: The monitored ambient concentrations of benzene exceeded USEPA's one-in-a-million cancer risk value not only at the Cesar Chavez, Milby Park, and Clinton Drive monitors, but also at every other monitor in the state in 2007. This includes monitors in areas with few or no industrial sources such as Karnack and Kaufman.

The 12 ppb_v monitored benzene level mentioned in the July31, 2008 memorandum by Dr. Valerie Meyers (TCEQ) was an instantaneous measurement taken from a boat in the Houston Ship Channel. This is an area not expected to be frequented by members of the public for any significant period of time. The maximum reported 1-hour value measured downwind of Houston Refining during that trip was 4.1 ppb_v. It is inappropriate to compare these short-term monitored values to the long-term ESL of 1.4 parts per billion (ppb) as was done in the City's comments. The long-term ESL of 1.4 ppb is the lifetime average concentration calculated by TCEQ to correspond to an excess cancer risk of 1 in 100,000. Therefore, comparison of short-term values to a lifetime average comparison level such as the long-term ESL for benzene is entirely inappropriate. It is more appropriate to compare short-term values to the short-term Reference Value (ReV) of 180 ppb.

Section 112(f) of the Clean Air Act requires the USEPA to promulgate risk standards for only those carcinogenic hazardous air pollutants (HAPs) for which MACT standards do not reduce

the risk of cancer to one-in-a-million. Therefore, the one-in-a-million "threshold" is not intended to be used to determine public safety, but rather to allow the USEPA to identify, or focus on, those HAPs that are of more concern to public health (Kelly 1991). Indeed, almost all of the populated areas of the country exceed the one-in-a-million risk level for common HAPs like benzene, often due to benzene emissions from mobile sources (i.e., vehicles). When risk from a carcinogenic HAP exceeds one-in-a-million, the USEPA must evaluate cost-effective pollution control strategies to reduce emissions.

The City's comments discuss a "range of toxicity" associated with benzene-induced cancer and indicate that USEPA's Office of Air Quality Planning & Standards uses the most protective end of the range in screening risk assessments. The range referred to is the range of unit risk factors (cancer potency estimates) given for benzene in USEPA's Integrated Risk Information System (IRIS). The two unit risk factors given in IRIS (and used to calculate air concentrations at various risk levels) are the result of using two different sets of exposure estimates (Crump and Allen 1984, Paustenbach et al. 1992) for the Pliofilm cohort (Rinsky et al. 1981, 1987) in the linear model, as discussed in Crump (1994) and IRIS. The least and most conservative ends of the unit risk factor range provided in IRIS are based on the Paustenbach et al. (1992) and Crump and Allen (1984) exposure estimates, respectively.

The TCEQ long-term ESL of 1.4 ppb is not based on either of the unit risk factors presented in IRIS, but rather an updated biological effects ionizing radiation (BEIR) IV life table analysis by TCEQ as documented in the 2007 Development Support Document (DSD) for Benzene (http://tceq.com/assets/public/implementation/tox/dsd/final/benzene_71-43-2_final_10-15-7.pdf). In short, TCEQ's unit risk factor is based on the exposure estimates of Crump and Allen (1984), the best model fit for acute myelogenous and monocytic leukemia (AMML) as provided in Crump (1994), and an updated BEIR IV life table analysis for a lifetime of exposure. TCEQ used only the Crump and Allen (1984) exposure estimates as it is reasonable that the exposure estimates which correlate best with the worker hematotoxicity data provide the most reliable exposure estimates for use in quantitative risk assessment. The unit risk factor which results is 7.1E-06 per ppb, which TCEQ believes is the most appropriate and scientifically-defensible value available. The intent of the unit risk factor derived in the benzene DSD is to estimate the upper-bound probability of the increased risk of cancer to the population, not to insinuate additional cancer cases. At the TCEQ policy-based excess cancer risk level of 1 in 100,000, the long-term ESL is 1.4 ppb.

The USEPA carcinogenic assessment (USEPA 1998) states that the agency is fairly confident that the risk of leukemia increases at 40 ppm-years (a measure of cumulative dose) of occupational benzene exposure, and that this equates to a lifetime exposure level of 120 ppb. Hence, lifetime exposure at the long-term of 1.4 ppb would be approximately 86 times less than the cumulative exposure level identified by USEPA as being confidently associated with elevated leukemia risk. The long-term health-based ESL developed by the TCEQ is both safe and scientifically-based.

As many have pointed out, the ESLs developed by the TCEQ are not enforceable standards; however, this does not preclude their usefulness as tools in regulating air pollution. The TCEQ uses ESLs in various ways and in various programs in order to proactively assess and manage exposure levels to the public before they become harmful. In the permitting process, ESLs are used as comparison values for modeled worst-case, off-site concentrations to determine potential impacts to neighborhoods. Exceedences of the ESLs would trigger more extensive reviews of proposed emissions and control technology. In addition, the TCEQ uses ESLs to determine Air Pollutant Watch List (APWL) areas of concern. Designation of an APWL area allows the agency to focus resources such as monitoring (both mobile and stationary) and investigations in areas of most concern, in addition to requiring greater emphasis on control technology and a more stringent permit review process. The absence of an ambient standard for chemicals such as benzene is consistent with most other state environmental agencies. In fact, a 2008 survey of state environmental agencies conducted by Dr. Valerie Meyers revealed that only two (Louisiana and Ohio) of the 45 states contacted in the United States actually have an enforceable ambient air quality standard for toxic air pollutants. The rigorous review and state-of-the science with which ESLs are developed allow the TCEQ to apply these comparison values with a sufficiently high degree of confidence, so that the agency as a whole can be certain that public health and welfare are adequately protected, even if the ESLs are not adopted as standards by TCEQ.

The 2006 guidelines for developing ESLs were externally peer-reviewed by world-renowned experts in inhalation toxicology and risk assessment. In the 2006 guidelines, the TCEQ included in its chemical-specific analysis certain adjustments to control for both cumulative (i.e., exposure to multiple airborne chemicals) and aggregate (i.e., exposures of a single chemical from multiple sources) exposures. For those chemicals with a linear dose-response assessment, which typically include carcinogens such as benzene, a risk management goal of 1 in 100,000 is used to limit the theoretical risk of an excess lifetime cancer due to the chemical in the most sensitive portions of the population. For those chemicals with a nonlinear dose-response, which typically include non-carcinogens, a hazard quotient of 0.3 is applied. Because the final long-term ESL for these chemicals is conservative (e.g., theoretical upper bound excess cancer risk), it should be inherently protective of both cumulative and aggregate exposures. Additionally, the TCEQ has an extensive monitoring network with particular focus on APWL areas of concern. The TCEQ monitoring network verifies that the vast majority of the monitors in the state have annual averages that are below the 1 in 100,000 screening level for benzene. Of the monitors with annual averages which exceed the long-term ESL, reported values are below the 1 in 10,000 risk level, which is still considered an acceptable risk by USEPA. Therefore, because of the inherent protectiveness of the ESL and the actual monitoring data verifying acceptable exposure levels, it is not necessary for the TCEQ to further scrutinize the additive impacts of individual sources in an area.

The commission will determine whether to grant the contested case hearing requests, and, if so, the issues to be considered in a hearing.

COMMENT 37: A significant portion of the benzene detected by the monitors located in Houston neighborhoods is attributable to Houston Refining. According to the City's analyses of wind direction and reported concentrations at the Milby Park ambient air monitor, "[w]hen the monitor is downwind of the facility, the concentration [of benzene] exceeds the one in 100,000 cancer risk limit 75% of the time, compared with only 25% of the time when the monitor is upwind of the facility." The TCEQ's toxicology report of July 31, 2008 also attributes high levels of benzene in Galena Park to Houston Refining based on wind direction analysis. (City of Houston)

RESPONSE 37: There are a number of confounding factors behind the wind analysis for the Milby Park neighborhood in the City's comments. First, Houston Refining is located in an industrial area with numerous sources of benzene and 1,3-butadiene. In fact, the Galena Park Air Pollutant Watch List area (APWL1206) is made up of 15 such facilities, many of which are capable of benzene and 1,3-butadiene emissions. Because the Clinton, Cesar Chavez, and Milby Park monitors are not located at Houston Refining's property boundary, it is not possible to determine the specific source and/or contribution of the emissions purely based on ambient monitoring data. Second, in addition to the mobile monitoring trip results mentioned by the City for Houston Refining, mobile monitoring near the fence line of four other facilities near the Galena Park area revealed benzene concentrations that contribute to the ambient levels of benzene at area monitors. Furthermore, benzene concentrations downwind of three of these facilities were higher than those noted near the Houston Refining fence line. As noted in the July 31, 2008, toxicology interoffice memorandum, none of the benzene concentrations observed during the monitoring project were of sufficient concentration to cause short-term, adverse health effects. Third, as mentioned in Response 36, it is inappropriate to compare anything other than long-term monitoring values (i.e., values covering greater than or equal to one year) to the benzene long-term ESL, which is a lifetime average comparison value. The lifetime average concentration is used to calculate excess cancer risk, not the percent of time that short-term values are above a lifetime comparison value. By dividing the annual values into smaller subsets, the City is essentially looking at short-term concentrations of benzene at the monitor. Consequently, the only appropriate comparison value would be the short-term ReV of 180 ppb_v. Finally, when analyzing an entire year's ambient monitoring data, it is scientifically more appropriate to compare the arithmetic mean of the data, rather than the 95^{th} upper confidence limit on the mean, to the long-term cancer-based ESL (1.4 ppb_v for benzene, 9.1 ppb_v for 1,3-butadiene) because the number of samples is representative of greater than 75% of the year. The annual benzene and 1,3-butadiene averages for 2007 at the Milby monitor do not exceed their respective long-term ESLs at a 1 in 100,000 theoretical excess cancer risk level and are protective of human health in the Milby neighborhood, regardless of the wind direction.

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CHANGES MADE IN RESPONSE TO COMMENT

The Executive Director has made no changes to the draft permit in response to public comment.

Respectfully submitted,

TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY

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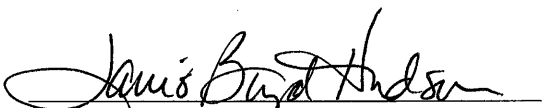
Environmental Law Division



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