Subject: DNREC-AQM responses to Valero's comments/questions presented in review committee meeting on August 23, 2006.

Notes:
(1) AQM's responses are provided below in blue color, immediately following Valero's individual comments/questions.
(2) Unless otherwise indicated, all materials referred to in AQM responses are available at http://www.awm.delaware.gov/Info/Regs/AQMPlansRegs.htm, link to Reg. 1142. Sec. 2.

Delaware City Refinery Comments for the August 23, 2006 Heater/Boiler NO_x RACT Rule Development Committee Meeting

General Comments/Questions:

1) There appears to be an inaccurate representation in the July 19th committee meeting minutes regarding John Deemer's comments about NOx controls on the Coker CO boiler. The minutes erroneously suggest Valero is intending to install additional NO_x controls on this source. What the minutes should have reflected is that Valero recently installed SNCR controls on this source and that we are currently optimizing these controls to maximize NO_x reductions.

AQM Response: Please check with John Deemer regarding the accuracy of the minutes, page 2 lines 6, 7 and 8. As agreed upon in 08/23/06 meeting, Valero will provide comments on Meeting 4 (July 19th) minutes by Thursday, August 31st.

Valero still maintains that no additional NOx controls are needed on the Coker CO Boiler beyond the SNCR that was recently installed. Cost for installation of this technology exceeded 6 millon dollars.

AQM Response: This same position was stated by John Deemer, and is reflected in the Meeting 4 minutes (see page 2 line 11).

AQM has the following comments and questions: (1) As we discussed in the meeting of 08/23/06, the installation of SNCR on the coker CO boiler has in fact gained no significant NOx reduction. (2) John Deemer stated in the July 19th meeting that the cost-effectiveness data for installing LoTOx control on the coker boiler was based on estimates of installing LoTOx on the cracker boiler. Valero has not provided justification for it being not feasible to further control the coker boiler, based on coker specific data. (3) As we discussed in the 08/23/06 meeting, the CO boilers are significant sources of NOX emissions, and AQM does not agree that the fact that SNCR has been installed on the Coker CO boiler alone is rationale that no additional NOx controls are needed on the coker boiler.

2) The slide presentation from the March 15 meeting indicates that "*previous 'zero-out-modeling' shows that the Delaware emissions alone can cause exceeding the federal ozone standards in Delaware and the downwind states*." Valero would like to know when this "previous" modeling was completed and whether it included all of the current "on-the-books" controls (e.g., Valero's agreement to reduce FCCU CO Boiler NO_x to <20 ppmv by May 2009 and the significant NO_x reductions the refinery is/has made to its heaters and boilers under the EPA Section 114 agreement, etc.)? Valero believes that any modeling used to predict future attainment status should be inclusive of these on-the-book reductions in order to determine the reductions required to meet

the Federal NAAQS. This will enable the Department to assess the current level of reductions required and better assess what remaining reductions are realistically available from the Delaware City Refinery as well as from other sources in the state.

AQM response: The FCCU CO Boiler's planned reduction for 2009 was not included in the zero-out modeling, as that modeling was based on Delaware's 2002 emission inventory. The purpose of the zero-out modeling was not to demonstrate attainment, but rather to evaluate how DE emissions alone could affect DE air quality and the air quality of down-wind states. The major conclusion of the zero-out modeling was what AQM stated in the cited slide presentation (i.e., *that the Delaware emissions alone can cause air quality problems in Delaware*).

AQM agrees with Valero that any modeling used to predict future attainment status should be inclusive of all on-the-book reductions. This is exactly what is being done by the OTC modeling committee, of which DE is a part. The latest modeling excursions (completed in April 2006, as 2009 Base Case) demonstrated that all "on-the-books" controls, which include the FCCU boiler 2009 reductions, are not enough for the Philadelphia-Wilmington-Atlantic City ozone non-attainment area to attain in 2009, and that additional NOX and VOC reductions are needed. We explained this in the March 15 meeting. Please review carefully section 3.(1) on page 1 of Meeting 1 Minutes.

Regarding "better assessing remaining available reductions at the Refinery and from other sources in the state", this was discussed in some detail during the first 3 meetings. Please review AQM slide presentations and meeting minutes. In particular: Meeting 1 slides #10-13, #16, minutes page 2 paragraph 3; Meeting 2 minutes, page 5 paragraph 3; Meeting 3 slides #8-9, minutes page 4 paragraphs 1 and 2; Meeting 4 minutes (draft) page 2 paragraph 3, and page 3 paragraphs 2 and 3.

3) The March 15 Meeting minutes indicate that all ambient monitoring stations within Delaware are showing attainment and that it is the out-of-state monitors that are indicating non-attainment design values. If this is correct, could you please explain: 1) what NO_x reduction measures the other states possessing these non-compliant monitors are doing and whether Delaware is in dialogue with these states on this issue; 2) whether Delaware's proposed heater and boiler rule NO_x reduction requirements are more stringent than what the non-compliant states are proposing; 3) whether a multi-state emissions cap-and-trade program has been considered and whether DNREC believes it would provide a more cost-effective approach for reducing regional NO_x levels.

AQM response: Regarding Delaware monitors showing attainment and out-of-state monitors showing non-attainment, please review Meeting 1 minutes, page 1, last paragraph. Valero's statement that "all ambient monitoring stations within Delaware are showing attainment and that it is the out-of-state monitors that are indicating non-attainment design values" is not accurate. The context for this statement is that the modeling, being conducted with all controls that would produce emission reductions in 2009 from a 2002 base year, predicts non-attainment in 2009 in the non-attainment area which Delaware is part of. The March 15 Meeting minutes does not have any indication or implication that Delaware monitors are currently showing attainment of the 8-hour ozone standard.

Regarding the 3 questions: (1) The Philadelphia-Wilmington-Atlantic City ozone non-attainment area includes 4 states (MD, DE, PA, and NJ). Delaware is working with the other 3 states, and all other OTC states, to develop controls that lead to attainment within the entire OTR. This includes both regional applicable measures, and state specific measures.
(2) Delaware's proposed heater and boiler rule NOx reduction requirements are comparable to those required by other states. Please see regulations for TCEQ Houston-Galveston Area, SCAQMD and San Joaquin Valley APCD that AQM presented on July 19, 2006.
(3) DE will be participating in the federal Clean Air Interstate Rule (CAIR) trading program, and is currently working with other OTR states to develop a more stringent "CAIR+" cap and trade program. DE is also working on regulations in addition to the cap and trade programs to facilitate actual reductions within the State of DE. These additional regulations include our power plant and refinery NOx regulations, which will be used to support both our attainment and RFP plans, as well as our maintenance plans once attainment is reached.

4) Has it been established that the particular monitoring stations showing non-compliant design values (> 85 ppb) are in fact downwind of the Valero refinery and are substantially affected by refinery emissions? Can you provide the location(s) of these monitors? Have the effects of mobile source emissions on these particular monitors been evaluated?

First, it must be pointed out again that the attainment or non-attainment cases of monitoring stations in our discussion are modeling-based predictions, not the current monitoring status. In fact, most (if not all) monitoring stations in the OTC area, including Delaware, have indicated violations of the 8-hour ozone standard in 2006.

The latest modeling results (April 2006) indicated that several monitoring stations, in Philadelphia County, PA, Burlington County and Ocean County, NJ, would still show non-attainment in 2009, and all of these monitors are downwind of Valero's facility. Modeling with an updated version of inventory is ongoing by the OTC, and will be completed later this year.

In addition, in both PA and NJ's CAA Section126 petition for upwind states NOx reductions, Delaware was included as one significant contributing state to PA/NJ non-attainment status. This conclusion is also consistent with EPA's CAIR modeling. Considering that the refinery represents a significant portion of Kent/New Castle NOx emission, it can be reasonably stated that the emissions from the refinery are "substantially" affecting the downwind non-attainment monitors.

The mobile source emissions on those particular monitors have been always included in the attainment modeling.

5) The slide presentation from the March 15 meeting indicates that "*SIP modeling to determine how much more VOC/NO_x reductions are needed for the Philadelphia CMSA to attain in 2010 will be completed very soon.*"

- Did this modeling get completed?

The final round of modeling, using emission inventory version 3, has not been finished (the April 06's run was based on emission inventory version 2). Please note, however, that the modeling will not be complete until a scenario is run that demonstrates attainment (i.e., SIP attainment modeling must demonstrate attainment).

- If so, is it available for review?

When it is finished, it will be available for public review. If Valero is interested in reviewing and commenting on OTC's modeling work, please contact OTC or look at OTC website for relevant information.

- Did it support the need to reduce the proposed heater/boiler NO_x requirement from 0.04 lb/MMBtu to 0.03 lb/MMBtu?

Please review the proposed regulatory language. The proposed regulatory language does not "reduce the proposed requirement from 0.04 lb/mmBtu to 0.03 lb/mmBtu." Rather, the proposed standards include a 0.04 unit specific limit as daily standard, and a 0.03 lb/mmBtu group average as an annual standard. As indicated above, attainment modeling conducted to date does not include enough reductions to demonstrate attainment. More reductions are needed, and DE and other states are seeking those in the regulation of other source categories (e.g., power plants, ICI boilers, AIM coatings, Consumer Products, Gas Cans, asphalt paving, etc.).

- If not, then what is the basis for the proposed reduction?

It is not a "reducing from 0.04 to 0.03" change. Therefore, this question is N/A.

- Has DNREC calculated the TPD reduction that a limit of 0.03 lb/MMBtu would provide, relative to 0.04 lb/MMBtu?

The actual average TPD reduction would be increased proportionally.

- If Valero contributed 8.7 TPD to the 2002 baseline (as noted in the March 15 slide presentation), then what exactly is the TPD level of reductions being sought from the refinery?

As indicated in Table 1 of Meeting 4 Handout, the weighted average rate for the affected units in 2002 is estimated about 0.2 lb/mmBTU. If the proposed 0.04/0.03 lb/mmBTU is adopted for non-CO units, and considering 20/40 ppm limit for CO boilers, we are expecting 5-6 TPD NOx reductions

6) Valero questions whether the targeted initiatives being proposed for reducing NO_x within the state are equitable and cost-effective.

- Has the state looked at the cost-effectiveness of achieving early reductions from mobile sources through more stringent speed limits or re-timing of traffic lights?

Cost and reduction estimates from the mobile sources have been always looked at by the state. The major task-taker for these estimates is DelDOT, which takes significant efforts on the travel-demand modeling and MOBILE emission modeling, and DNREC is closely cooperating with DelDOT. There is no estimate on re-timing traffic lights. For the speed-limit issue, a preliminary study two years ago indicated that reducing speed limit from 65

mph to 55 mph on I-495 would likely produce relatively insignificant NOx reduction (in one-tenths magnitude). DelDOT anticipates that any reduction of the speed limit may need Delaware legislative approval.

- Is it equitable that the proposed rule for EGF's allows a two-stage phase in period for NO_x reductions (0.15 lb/MMBtu required by Jan. 1, 2009 and 0.125 lb/MMBtu required by Jan. 1, 2012) whereas the refinery rule requires 0.03 lbs/MMBtu to be achieved by December 31, 2008?

First, in 08/23/06 meeting, we explained why we would need a Dec. 31, 2008 compliance date (For EGUs, the proposed compliance date of Jan. 1, 2009 is essentially the same as Dec. 31, 2008). Second, as we discussed in 08/23/06 meeting, we would consider a phase-in option in the case-by-case provision in this regulation, and are open to discussion with Valero if it could provide rationale, and indicate how far beyond 12/31/2008 some units would need.

- Can Delaware demonstrate that the refinery is not disproportionately carrying the reduction load, relative to EGF's and other industries (i.e., what exactly is the TPD and percent reductions being required of EGF's versus the refinery)?

The 2002 NOx emission from Valero's refinery was 10.5 TPD (please see Meeting 1 slide 16). If we could expect 5-6 TPD reduction, the reduction would be 50-60%. In comparison, Delaware EGU's 2002 NOx emission was 44 TPD, and we are expecting about 25 TPD reductions, which is about 56% reduction. Therefore, we believe that the reduction percentages are compatible, and demonstrate that the refinery is not disproportionately carrying the reduction load. Also, EGUs are being subject to a multi-p regulation which regulates SO2 and Hg reductions in addition to NOX, in the 2009 to 2012 timeframe.

- What is the basis for the EGF emission limits?

The power plant EGUs are coal-fired and residual oil-fired units. The proposed emission limits for EGUs are based on the application of BACT (i.e., SCR for NOX and FGD or low sulfur oil for SO2).

- What does the Department consider as cost effectiveness? Cost figures between the EGFs and refinery sources differ significantly.

There are no hard guidelines for cost-effectiveness. NOx offset credits have traded for about $10,000 per ton, which can be a cost indicator. Also, the proposed controls in the EGU regulation reflect BACT levels.

7) The meeting minutes to the July 29th meeting indicate that "*the NO_x trading program (Reg 39) expires in 2008, its affected units will be subject to RACT level controls only, and that is why we are proposing this beyond-RACT rule*." Could Delaware use the multi-state CAIR Rule to achieve the desired reductions (we understand that participating states can choose to include non-EGF units in their CAIR programs), thereby providing a more cost-effective, regional-based cap-and-trade approach for achieving emission reductions?

AQM response: It is true that the federal multi-state CAIR rule is a regional-based cap-and-trade approach. However, EPA's CAIR modeling results indicated that the cap-and-trade approach would not produce significant NOx reductions in Delaware (EPA predicted NOX emissions in DE would increase under CAIR because DE units would increase their capacity factor, and would buy credits instead of making reductions). In addition, the federal CAIR Rule does not affect the heaters and boilers being covered in this proposed regulation. Including the refinery boilers and heaters in a multi-state cap-and-trade program would not necessarily yield reductions in DE. This is the same reason that we are developing our power plant regulation – to ensure that the reductions actually occur in Delaware.

8) Has the state fully explored whether a cap-and-trade program encompassing multiple industries (e.g., the EGF's and refineries) would be feasible and more cost-effective?

See the response to 7) above.

9) Can the Department provide the basis for selecting the emission limits that have been included in sections 2.3.1.1 and 2.31.2 of the rule? Has this determination been based on an evaluation of all of the state NO_x sources and available emission reductions at the DCR? Was the cost effectiveness of controlling these sources included in this determination similar to an EPA Top Down BACT analysis?

AQM response: (1) This was discussed in the 08/23/06 meeting (please see the upcoming Meeting 5 minutes). (2) The answer is yes. We explained this in the previous meetings already. Please review, in particular, Meeting 3 presentation and minutes. In addition, we considered the limits and data from other states who have adopted similar rules. (3) The answer is no, because this is not a BACT determination.

10) The proposed compliance date of 12/31/08 is unreasonable. Typically facilities subject to new regulations are given a reasonable period of time, often three years or longer, to take the necessary steps to comply with the new requirements (e.g. selecting vendors, ordering equipment, and scheduling installation). Valero requests that a three year implementation schedule be included in this rulemaking, with a provision for a case-by-case determination for a longer period. Numerous factors may impact the ability to meet the proposed requirements by 12/31/08 (i.e., engineering, contracts, labor, vendors/supplies, permitting, turnaround schedule, impact on operations, etc).

AQM response: We understand Valero's desire for a later compliance date. However, due to the CAA requirement on RFP (reasonable further progress) emission reduction and our needs to fulfill our SIP planning tasks, we are limited in our ability to delay the compliance date. However, as discussed at the 08/23/06 meeting and in our responses to 6) above, we will consider a phase-in option on a case-by-case basis which could extend the compliance date for individual units if warranted. Please note that this issue was not brought up by Valero during the first four committee meetings, which is the reason it has not been considered to date.

11) Valero respectfully requests a sixth meeting regarding this rulemaking to allow time to thoroughly evaluate the comments provided herein.

AQM response: At the 08/23/06 meeting the committee members agreed that this sixth meeting be a public workshop in September. After review of these comments we see nothing that would necessitate a change to this plan. We have checked availability of our

resources and figured out that the workshop will be likely scheduled for October 5th. We will inform all parties when the date and time are finalized.

Specific Comments on the Draft Rule:

1) Valero proposes that Section 2.3.1.1 be changed to allow compliance with the 0.04 lb/MMBtu limit to be based on a 24-hour average of all affected sources (based on heat input using an equation similar to the equation in Section 2.3.1.2). Without this change, cost-effective averaging (e.g., discretionarily over-controlling large sources, while adding no additional controls to smaller sources) will not be possible.

Allowing compliance with the 24-hour limit to be averaged over all affected sources is consistent with California's Bay Area NO_x RACT Rule (Regulation 9) and provides a more cost-effective approach for achieving desired reductions.

AQM response: We believe that the annual average provision and the case-by-case determination provision of the rule have already provided necessary flexibility. However, we will still consider a daily average provision for the 24-hour limitation if sufficient rationale is provided by Valero.

2) Valero proposes that the language of Section 2.3.1.3 should more clearly allow a source for which controls are technically infeasible and/or not cost-effective to be wholly excluded from the regulation through the case-by-case determination approval process.

AQM response: During our review of other states' boiler/heater regulations with equal or tighter limits, we have not seen cases that have excluded any unit due to technical infeasibility or cost-ineffectiveness. However, we will leave this issue open for further discussion, if Valero could provide additional reasoning to its proposal. Please also see our response to Valero's next comment

3) Valero proposes that the last sentence of Section 2.3.1.3.2 (requiring that all case-by-case determinations to be included in the annual average rate limitation of Section 2.3.1.2) be deleted. The current language would preclude a source from demonstrating cost-ineffectiveness for purposes of excluding a source from the control requirements. (i.e. As John Deemer has previously indicated, the reformer is more like a reactor than a heater or boiler and it would incur enormous cost for relatively little NO_x reduction (a cost effectiveness of > $100K/ton). Inclusion of this source in the annual average rate limitation would make it difficult for the refinery to meet the annual average limit for all sources and would reduce the overall cost effectiveness).

AQM response: We understand that the 500-burner reformer (37-H-1) is different from other heaters at the refinery. However, the committee has not been convinced that this unit should be excluded from the regulation or the annual average provision. In addition to questioning the validity of the cost-effectiveness number for ULNBs by a committee member (see Meeting 4 minutes, page 3 line 32, page 4 line 44), the committee has asked Valero if other control options and related costs were considered, in particular, the end-of-pipe controls (see AQM's request for additional information, 07/25/06, and upcoming Meeting 5 minutes). Valero has not provided satisfactory answers to these questions

raised by the committee. The 2002 actual emission rate of 37-H-1 was 0.06 lb/mmBTU (see Meeting 4 handout, Table 1). We suggest that Valero carefully evaluate all feasible control options for this heater as well as control options for the other units to fully use the flexibility being provided by Section 2.3.1.3.2. The flexibility of this provision must be interpreted as to ensure that if a particular unit can not be controlled as economically at the required level as other unit(s), then another unit must be controlled at a level to offset the rate difference due to the less-stringent control at the said particular unit.

4) Valero proposes that the words "…commits to…" in Section 2.4.1.2 be changed to instead read "…estimates..." Valero believes it is inappropriate for the regulation to require enforceable commitment dates for the completion of engineering and the awarding of contracts. The rule should instead focus on ensuring that final compliance is achieved by the required date (e.g., meet limits by x date; submit permit application y days before planned start of construction - to allow DNREC y days to review and approve application; compliance test source within 60 days of startup following installation of controls; and submit test results within 45 days of completion of testing).

AQM response: We agree. The wording will be changed to "…plans to…" in the next draft of the regulatory language.

5) The requirement for maintaining compliance records for 5 years in Section 2.4.2.7 does not belong under the initial compliance certification provisions of Section 2.4.2. It should be broken out as a stand-alone provision.

AQM response: We agree with this comment. We will propose a stand-alone provision for this requirement.