Illinois Environmental Protection Agency
Bureau of Air
July 2007

Responsiveness Summary for Public Comments and Questions on the Coker and Refinery Expansion Project at the Wood River Refinery in Roxana, Illinois and the Wood River Products Terminal in Hartford, Illinois

Facility Identification and Application Nos.:

Refinery: 119090AAA, 06050052

Terminal: 119050AAN, 06110049

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DECISION

On July 19, 2007, the Illinois Environmental Protection Agency (Illinois EPA) Bureau of Air issued a construction permit to ConocoPhillips for the Coker and Refinery Expansion Project at its Wood River Refinery at 900 South Central Avenue in Roxana and the Wood River Products Terminal at 2150 South Delmar in Hartford. The Bureau of Air has also issued this summary to address questions relevant to the issuance of the air permit and other questions and comments raised during the comment period. Questions relating to the Bureau of Water permit will be addressed in a separate Responsiveness Summary when the Bureau of Water takes final action on the revised NPDES permit.

Copies of the permits can be obtained from the contact listed at the end of this document. The permits and additional copies of this document can also be obtained from the Illinois EPA website www.epa.state.il.us/public-notices/.

BACKGROUND

ConocoPhillips operates the Wood River Refinery located in Roxana, Illinois to produce a variety of petroleum products for distribution in the St. Louis, Chicago, and Indianapolis Metropolitan areas and throughout the Midwest. Wood River is positioned by refining capacity and by geographical location to process the growing volumes of heavy crude oil from Canada.

On May 15, 2006, the Illinois EPA, Bureau of Air received an application from ConocoPhillips for a Coker and Refinery Expansion (CORE) Project. The CORE Project entails installing facilities to increase both the total crude processing and percentage of heavier crude at the Wood River Refinery in order to increase the supply of petroleum products to the Upper Midwest. In order to handle the increased product throughput, ConocoPhillips is also proposing certain changes at the Wood River Products Terminal (also owned by ConocoPhillips). The Illinois EPA is considering ConocoPhillips's CORE project and the changes to the Wood River Products Terminal to comprise a single larger project for the purpose of the federal rules for Prevention of Significant Deterioration (PSD) and the state rules for Major Stationary Sources Construction and Modification (MSSCAM).

COMMENT PERIOD AND PUBLIC HEARING

The Illinois EPA Bureau of Air evaluates applications and issues permits for sources of emissions to the atmosphere. An air permit application must appropriately address compliance with applicable air pollution control laws and regulations before a permit can be issued. Following its initial technical review of ConocoPhillips' application, the Illinois EPA Bureau of Air made a preliminary determination that the applications met the standards for issuance of a construction permit and prepared draft permits for public review and comment.

ConocoPhillips requested that the Illinois EPA hold a public hearing on the CORE Project. This hearing also addressed ConocoPhillips's application for revision and reissuance of its National

Pollutant Discharge Elimination System (NPDES) permit to allow increased wastewater discharges from the Wood River Refinery due to the CORE project. The public comment period opened with the publication of a hearing notice in the Alton Telegraph on March 24, 2007. The hearing notice was published again in the Alton Telegraph on March 31st and April 7, 2007. The public hearing was held on May 8, 2007, at the Hartford Elementary School in Hartford. The purpose of this public hearing was to accept oral comments into the written hearing record and answer questions about the proposed project. The written comment period remained open until June 15, 2007.

AVAILABILITY OF DOCUMENTS

The construction permits issued to ConocoPhillips and this responsiveness summary are available on the Illinois Permit Database at www.epa.gov/region5/air/permits/ilonline.htm (please look for the documents under All Permit Records (sorted by name), PSD/Major NSR Records). Copies of these documents may also be obtained by contacting the Illinois EPA at the telephone numbers listed at the end of this document.

APPEAL PROVISIONS

The construction permits being issued for the proposed project grants approval to construct pursuant to the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. Accordingly, individuals who filed comments on the draft permit or participated in the public hearing may petition the U.S. Environmental Protection Agency (USEPA) to review the PSD provisions of the issued permit. In addition, as comments were submitted on the draft permit for the proposed project that requested a change in the draft permit, the issued permit does not become effective until after the period for filing of an appeal has passed. The procedures governing appeals are contained in the Code of Federal Regulations (CFR), “Appeal of RCRA, UIC and PSD permits,” 40 CFR 124.19. If an appeal request will be submitted to USEPA by a means other than regular mail, refer to the Environmental Appeals Board website at www.epa.gov/eab/eabfaq.htm#3 for instructions. If an appeal request will be filed by regular mail, it should be sent on a timely basis to the following address:

U.S. Environmental Protection Agency
Clerk of the Board, Environmental Appeals Board (MC 1103B)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460-0001
Telephone: 202/233-0122

COMMENTS & QUESTIONS WITH RESPONSES BY THE ILLINOIS EPA

General

1. People have catalytic converters on their cars. ConocoPhillips should put catalytic converters on its operations.

   The various emission units at the refinery are and will be equipped with appropriate equipment to control emissions of different pollutants. This control equipment does not include catalytic converters like those used on automobile engines. Catalytic converters are specifically designed to control certain pollutants as present in the exhaust from gasoline-fueled engines. The types of control equipment that are used on different emission units at the refinery depend on the particular emission characteristics of the units. For example, the emissions of nitrogen oxides (NO_x) from the Fluidized Catalytic Cracking (FCC) Units will be controlled by selective catalytic reduction (SCR) systems, which use ammonia and a catalyst bed to control emissions. NO_x emissions from heaters and boilers will be controlled with ultra low NO_x burners that minimize the formation of NO_x.

2. What is the current conventional crude distillation capacity of the refinery?

   The current conventional crude distillation capacity is 306,000 barrels per day.

3. What is the current output of diesel fuel from the refinery?

   ConocoPhillips indicates that the output of diesel fuel is approximately 70,000 barrels per day, all of which is low sulfur diesel.

4. What will be the cetane level of the ultra-low sulfur diesel fuel after the proposed project is complete? Is the cetane level dependent on renewable diesel production?

   At the public hearing, ConocoPhillips indicated that the cetane level of low sulfur diesel, currently at 48, is not expected to change. The specification for low-sulfur diesel is a minimum cetane level of 42. The cetane level of low sulfur fuel produced by the refinery is not dependent on renewable diesel production.

5. Are future projects expected to reduce aromatic content and increase cetane to meet the new USEPA regulations?

   The Illinois EPA is not able to predict the outcome of future projects at the refinery.

6. Is gasoline output with the proposed project dependent on the ethanol addition to meet the minimum octane requirements?

   According to ConocoPhillips, the refinery has the ability to make gasoline blendstocks that do not require ethanol addition. However, one of the advantages of

the project is the ability to make more "reformulated blendstock." This is the gasoline blendstock that is prepared for use with 10 percent ethanol.

7. What is the maximum vapor pressure specification for gasoline in summer months?

   As explained by ConocoPhillips at the public hearing, there is no longer a vapor pressure specification. Reformulated gasoline has what is termed a "VOC limit," which is an equation that incorporates variables such as the actual distillation points of the blend, the sulfur content, etc.

8. What is the cap on vapor pressure of gasoline?

   As explained by ConocoPhillips at the public hearing, since reformulated gasoline is now required, there is no longer a cap on the vapor pressure of gasoline. The actual vapor pressure for the reformulated gasoline blendstock produced by the refinery is now about 5.5 Reid vapor pressure (RVP). In the past, when the vapor pressure was capped, the RVP was 8.0. The reason that reformulated blendstock has to be lower than 5.5 RVP is because blending ethanol with gasoline elevates the vapor pressure, which must be compensated for by a lower RVP in the gasoline blendstock.

9. Will the proposed project enable ConocoPhillips to remove pentanes during the summer to allow ethanol blending? Also, if pentanes are taken out, where are they stored?

   The new coker gas plant will improve the separation of pentanes from the gasoline blendstock. These pentanes are stored and blended into conventional gasoline for use in attainment areas.

10. How much natural gas does the refinery use today compared with how much it will use after the proposed project? Will hydrogen be produced from natural gas?

    The main source of fuel for use in the refinery is refinery fuel gas produced as a byproduct of refining operations. According to ConocoPhillips, the refinery would typically use about 40 million standard cubic feet of natural gas per day after the proposed project, which is what it currently uses. The proposed hydrogen plant will use refinery gas as a feedstock. The need for hydrogen is minimized by the using of coking as an initial cracking process. As related to minimization of flaring, use of natural gas to supplement the fuel supply to the refinery is desirable as it provides the necessary flexibility to be able to consistently recover waste gas for use as fuel.

11. Rather than flaring waste gases, ConocoPhillips should capture the energy value of waste gases by capturing them and using them as fuel.

    These recovery systems are already in place at the refinery. For example, the majority of fuel gases used in the refinery, which are used as fuel in the heaters and boilers, comes from recovered process gas.

12. I am concerned about benzene releases from the refinery.

A variety of federal regulatory programs currently in place are acting to reduce releases of benzene from the refinery. In addition, USEPA is adopting regulations to reduce the benzene emissions from automobiles and other gasoline powered vehicles, which would require a significant reduction in the benzene content of gasoline.

13. I am concerned about the amount and quality of wastewater discharged from the refinery.

Comments and questions about wastewater discharges will be addressed by the Illinois EPA's Bureau of Water when it takes final action on ConocoPhillips' application for a revised NPDES permit for the Wood River Refinery.

14. We are running out of gas. We've reached maximum production, and we've got to find the gas or the petroleum and we have to use it at the same time. We have to conserve. It doesn't make sense to use it up as fast as we can because we have children and grandchildren to think about. The other thing that's a reality is the problem of global warming issue that we all have to deal with. I hope that ConocoPhillips will look into using renewable sources of energy at this refinery. Are there any plans to try to use solar panels or wind or electricity generated from the river as part of the proposed project?

As discussed by ConocoPhillips at the public hearing, ConocoPhillips has a technology group that is looking into alternative sources of power, but at this point in time they do not fit into this particular project.

15. What additional safety measures can be taken by ConocoPhillips to assure the safety of the workers and the surrounding community should a major incident occur? What warning alert system is in place for the surrounding communities in the event of a chemical leak, explosion or toxic release? A full emergency community alert system should be in place that includes a telephone warning system and community warning signals that distinguish whether residents should evacuate or seek cover inside, with the environmental standards.

ConocoPhillips indicates that worker safety is always a concern, both to protect individual workers from accidents and to prevent incidents. Work to improve worker safety, including safety awareness, safety compliance and operational and process changes to improve safety, occur on an ongoing basis. These actions also reduce risks for nearby residents. The refinery does have a community alert network, by which it can quickly contact area residents by phone in the case of an emergency.

16. The draft permit does not address new equipment and process changes for production of renewable diesel fuel from animal fats and vegetable oils, as recently announced by ConocoPhillips. If this activity is going to occur at the Wood River refinery, why is there nothing in the permit application and the draft permit relating to these plans?

The production of renewable diesel fuel is not addressed by the application for this permit or the permit itself because renewable diesel fuel is not part of the CORE project that is being addressed. ConocoPhillips has not announced specific plans for the Wood River refinery in this regard. If ConocoPhillips decides to produce renewable diesel fuel at the Wood River refinery, a separate construction permit would be required for the new equipment and process changes that would be involved with the project. The changes in emission that would accompany the project would be addressed during the processing of that application.

Air Pollution

17. How many odor complaints were received due to the Wood River refinery during the last three years, and what was the nature of them? What evaluations and equipment improvements have been carried out in order to eliminate odor complaints? Have evaluations been performed to eliminate odor complaints in the new project?

Five odor complaints have been received by the Illinois EPA in the past three years due to "refinery-type" odors. Three were petroleum odors in the Hartford area. One was a sulfur odor in the South Roxana area. One was a pungent type odor in the Wood River area.

The refinery was granted a construction permit in May 2006 to replace a ground level flare with an elevated flare. The use of an elevated flare as opposed to a ground level unit will reduce any potential for odor associated with the operation of this flare.

Additional odors are not anticipated to result from this project. One of the principal concerns for odors is emissions of hydrogen sulfide (H_2S). The control equipment in place today and the proposed controls in this project will result in minimal emissions of H_2S. If odors do occur, the Illinois EPA will investigate and take appropriate action for each odor complaint that it receives. If equipment is not being operated properly, the solution is obvious. If equipment is operated properly but nuisance odors occur, further investigation would be needed to determine what should be done to alter the operation to mitigate or eliminate such odors.

18. When the wind blows from that direction where I live, about a half mile away, I smell the coker when it rains. The crude oil odor is so bad. Is it going to be worse?

Although there have been a handful of complaints due to refinery type odors, none have been related to the operation of the existing coking unit. Operation of a second coking unit is not expected to generate additional odors at the refinery.

19. I live about three miles downwind of the refinery and I have had asthma all my life. I cannot imagine what it would be like to have more particles in the air.

While the project itself will have emissions of particulate matter, they will be more than offset by the reductions in emissions of particulate matter from existing units, so there will be a net decrease in particulate matter emissions. (Refer to the Attachments to the permit that address emissions of particulate matter.

New Source Review

BACT/LAER

20. Can the Illinois EPA provide a listing of the emission units that ConocoPhillips purchased from Premcor?

Appendix C of the Consent Decree contains a list of assets ConocoPhillips purchased from Premcor. This Consent Decree can be found on the internet at http://www.epa.gov/compliance/resources/decrees/civil/caa/conocophillips-cd.pdf.

21. What does "lowest achievable emission rate" mean?

The lowest achievable emission rate is the most stringent emission limit derived from either (1) the most stringent emission limitation contained in the implementation plan of any state for such class or category of source; or (2) the most stringent emission limitation achieved in practice by such class or category of source.

22. ConocoPhillips should invest up front in better control technology at the refinery.

ConocoPhillips is required to upgrade emission control technology on various units at the refinery pursuant to the Consent Decree, which requires upgrades of control equipment s on boilers and heaters, the sulfur recovery plants, and catalytic cracking units. All units at the refinery must comply with applicable federal NESHAP standards. For new and modified units affected by the proposed project, in addition to complying with federal NSPS standards, ConocoPhillips must implement Best Available Control Technology (BACT) for emissions of carbon monoxide (CO) and the Lowest Achieve Emission Rate for emissions of volatile organic material (VOM).

23. If this project is approved, ConocoPhillips should be required to use the best available emission control technology, regardless of the cost. It should also not be able to do any emissions trading. ConocoPhillips can afford to do everything possible to reduce the emissions from the refinery after this project and it should be required to do that.

This project is subject to New Source Review for emissions of VOM and CO. Accordingly, ConocoPhillips must implement the Lowest Achievable Emission Rate (LAER) for VOM emissions and the Best Available Control Technology (BACT) for CO emissions. LAER does not consider cost of controls unless the cost of maintaining a particular level of control would be so great that a project could not

be built or operated at any location or reasonable set of circumstances. Cost factors can be considered in a BACT determination, to the extent allowed by USEPA rules and guidance. Cost was not a significant factor in the determinations of BACT and LAER made for the proposed project.

24. The CO emission limit proposed in the application as BACT for flaring, 0.37 lbs/million Btu, would not be enforceable. There is no practical method to enforce this limit, which by its nature is an emission factor and not a measurement. ConocoPhillips also has not proposed any method to verify compliance with this limit. It would be very convenient for ConocoPhillips to have a BACT limit that by definition is met independent of how much CO a flare emits, with the calculated emissions always being equal to the limit.

As noted by this comment, the CO emission limit proposed by ConocoPhillips as BACT for flaring is a USEPA emission factor and was not intended to be enforceable in the same manner as a more traditional emission limit. Instead, the proposed CO emission limit was intended to serve as a representation of the CO emissions of a properly operated flare. However, as implied by this comment, proper operation of a flare should be directly addressed by specifying the particular work practices that must be implemented for the flare. It would be poor regulatory practice to rely on a emission limit to implicitly require proper operation of a flare as specific practices for proper operation can readily be set. In addition, setting BACT solely in terms of an emission limit would not act to require practices to prevent and minimize flaring.

25. The CO emission limit proposed in the application by ConocoPhillips as BACT for flaring, 0.37 lbs/million Btu (proposed on page 7-9 of the application) was correctly rejected by the Illinois EPA. Setting BACT as this emission limit would not serve to reduce CO emissions by reducing the amount of flaring that occurs. While it does not appear that the Illinois EPA has applied this limit as BACT, it is what ConocoPhillips proposed. In case the Illinois EPA is still considering this limit or has somehow included it in its calculations underlying other limits in the draft permit, the Illinois EPA should reject such a notion. The proposed limit is actually a USEPA emission factor for CO emissions expressed in terms of the fuel value of the waste gas that is flared. This factor has nothing to do with BACT. Such a limit would allow unlimited hours of routine flaring at this rate, and by definition is not the best available technology but is instead an average or typical CO emission factor for flaring.

The issued permit does not set BACT for CO in terms of this emission rate proposed by ConocoPhillips. BACT for CO is set in terms of work practices to minimize CO emissions, consistent with the general approach taken in the draft permit. These work practices have been further developed as a result of further review by the Illinois EPA in response to other public comments.

26. Project VOM flaring emissions do not meet LAER requirements. The Project Summary for the proposed project prepared by the Illinois EPA incorrectly implies that the main source of VOM from flaring is the pilot flame, so that this should be the main focus of

the LAER evaluation and no other source of flare emissions need be evaluated for LAER.[1] However, the largest contributor to VOM emissions from flaring is the waste gases that are flared, since a percentage of the VOM is not destroyed and is emitted. Flares are typically considered to have a VOM destruction efficiency of 98% with good combustion conditions, with 2% of VOM routed to the flare being emitted. This is a significant percentage given the nature and magnitude of flaring that can occur at a refinery. Therefore the statement above that "since flares themselves are VOM control devices, no additional control of the VOM that is generated through the combustion of pilot fuel gas is necessary" is doubly inaccurate. LAER requires measures to prevent flaring events entirely, rather than allowing flaring, which still emits VOM to the atmosphere.

The statement in the Project Summary addressed by this comment was not intended to have the further meaning claimed by this comment. Indeed, the statement is fully consistent with the further discussion in the comment, as it addresses waste gases, rather than the pilot flame, as the principal contributor to CO and VOM emissions from flaring and the appropriate focus of a BACT and LAER evaluation for flaring.

27. The draft permit would set "blended limits" on emissions from new flares and other units so that separate BACT and LAER limits for flaring would not be set. In particular, Condition 4.7.6 of the draft permit, which should address only flaring, would set emission limits for the Delayed Coker Unit Flare (DCUF) that may also address other operations related to the new coker. The limits that are set for the new Hydrogen Plant (HP2) would address the Hydrogen Plant Heater (HP2 H-1), the associated Cooling Water Tower (CWT 24) and, fugitive emissions, as well as the flare (HP2F). The scope of these limits obscures exactly how much emissions of CO and VOM would be allowed for flaring with BACT and LAER. The application must provide a clear and complete project description and the permit must set limits for the individual emission units to ensure that each unit meets BACT and LAER.

The permit does not set "blended" limits for the permitted annual emissions of the flare for the new Delayed Coker Unit and this flare's permitted emissions of CO and VOM are set by Condition 4.7.6.

While blended limits are set for the permitted annual emissions of the flare for the new Hydrogen Plant, the flare is permitted to emit up to the limits in Condition 4.7.6. However, separate, lower limits are also set in Condition 4.1.6 for the process heater for the plant, Heater HP2 H-1. Condition 4.6.6 sets a limit on the VOM emissions of Cooling Water Tower 24, allowing only minimal VOM emissions. The emissions of the flare by itself are expected to be no more than the difference in these limits. For example, the expected annual emissions of CO would be no more

[1] "The RBLC database states for past permits that since flares are themselves VOM control devices, no additional control of the VOM from the combustion of pilot fuel gas is necessary. Therefore, no additional VOM control technologies are necessary for the two new flares." Project Summary, page 19.

than 36.2 tons.[2] While annual CO emissions could be greater (but in no case more than 147.9 tons as limited by Condition 4.7.6), this could only occur with circumstances that acted to lower CO emissions of the process heater. This approach has been taken for the new Hydrogen Plant given the nature and design of the unit, which generates a low VOM content, byproduct waste gas stream that is normally used as fuel in the unit itself.

28. The BACT/LAER evaluation for flaring did not evaluate the most stringent technologies available, which prevent entire flaring events and achieve the maximum degree of CO and VOM emission reductions. In this regard, the application incorrectly indicates that there are no "technically feasible CO control options" for the flares. (See Sections 7.3 of the application.) Other refineries have equipment and practices that minimize flaring emissions by minimizing flaring. Such approaches were not evaluated for the project. Preventing flaring events completely or minimizing the quantities of gases flared is the best method to prevent both VOM and CO emissions and all other flaring emissions (including carbon dioxide (CO_2)). Such methods were not evaluated in the application for the proposed project.

The BACT/LAER evaluations for the proposed project for flaring was made based on the features in the design of the new Delayed Coker Unit that will act to minimize flaring and in the context of existing requirements that address flaring at the Wood River refinery. In particular, the Consent Decree also includes requirements related to hydrocarbon flaring events, as is relevant to emissions of CO and VOM from flaring. The cause of significant hydrocarbon flaring incidents must be investigated, including performance of root cause analyses, steps must be taken to correct the conditions that cause such incidents, and the number and extent of such incidents must be minimized. Detailed reporting is also required for these incidents. Provisions have been included in the issued permit that make similar requirement applicable for the new flares that would be installed with the proposed project.

29. Additional evaluation of BACT and LAER is needed for venting of pressure relief devices to gas recovery systems (while adding sufficient compressor capacity so that this does not cause additional flaring).

Pressure relief devices are addressed by the provisions for flaring, as they are mechanisms through which waste gases are vented from process units at refineries for recovery or flaring.

30. The annual VOM emission rate from flaring achieved by Shell, Martinez, should be used as the basis to set a LAER limit for the proposed project. This results in a LAER limit for the Wood River refinery of 5.9 tons/year, given that the Wood River refinery is about four times larger than the Martinez refinery.[3] Shell states in its Flare Minimization Plan that it has been able to achieve low flaring emissions including emergencies in a safe

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[2] 147.9 tons (overall limit on CO emissions) – 111.7 tons (limit on heater CO emissions) = 36.2 tons (remainder available for flare).

[3] (385,000 barrels per day (bpd) projected for ConocoPhillips)/(98,500 bpd Shell Martinez) x 1.5 tpy = 5.9 tpy

manner. Nothing in the BAAQMD flare rule with its requirement for a Flare Minimization Plan (FMP) causes any compromise in safe refinery operations, which allow flaring in a true emergency. However, the FMP does require rigorous monitoring, reporting, planning, and evaluation of flare events, and equipment improvements so that methods and equipment are in place to prevent emergencies and minimize flaring. These methods make the refinery safer by minimizing emergency shutdowns and reducing repeated flaring emissions.

The information cited in this comment does not support setting a LAER requirement for the Wood River refinery that is expressed in terms of annual emissions. As noted by the comment, the relevant BAAQMD regulations do not prohibit flaring, as flaring is an appropriate action to address disposal of process gas in emergencies. Likewise, Flare Minimization Plan prepared by Shell Martinez indicates that none of the procedures that are part of that plan would restrict access to the flares when flaring is viewed as necessary for personnel or equipment safety, which further necessitates flaring by operators without hesitation when warranted for safety. Setting a limit in terms of annual emissions of flaring, in the manner proposed by this comment, would potentially act to prohibit flaring when it was appropriate. It would set an absolute, enforceable limit on the extent of flaring that could occur at the refinery independent of the actual circumstances at the refinery in a particular year.

31. Additional evaluation of LAER is required for fugitive emissions for the refinery as a whole to provide baseline and future conditions with increased capacity, which will likely lead to increases in fugitive emissions. Information on frequency of inspection of valves, flanges, pumps, and compressors for leaks and information on any past violations at the refinery involving these operations should be provided. Lists should be provided including the numbers of all types of valves, flanges, pumps, and compressor seals.

LAER for VOM emissions due to component leaks is appropriately addressed by reliance upon and reference to the provisions of the NESHAP for Petroleum Refineries that address components leaks. The NESHAP provides a comprehensive approach to this source of emissions for very effective control of emissions. It requires implementation of a Leak Detection And Repair (LDAR) program to identify and repair leaking components in a timely manner. As certain types of service and applications are more likely to have components that experience frequent leaks and require repairs and follow-up monitoring if conventional types of fittings are used, the NESHAP leads to use of "advanced fittings," as discussed in this comment, in those applications. This is because of the stringent definition of the NESHAP for a leaking component. At the same time, advanced fittings are not required in circumstances in which they might actually lead to increased emissions, as advanced fitting are not as reliable under certain types and conditions of service.

The Consent Decree addresses VOM emission from existing components at the refinery, as it requires enhancements to the LDAR Program for existing components. These enhancements should act to significantly reduce the VOM

emissions from leaking components at the existing process units at the refinery.

Tables C-3a and C-3b of the application provide a listing of the various types of components to be installed, type of service for each components, quantity of each component type, and the area (process unit) in which the components would be installed.

32. Additional evaluation of LAER is required for VOM emissions from wastewater treatment tanks and ponds, including evaluation of upstream controls to prevent contamination of wastewater that leads to emissions of hydrocarbons and wastewater containing hydrocarbons and other pollutants and enclosure of any open wastewater systems, and data on concentration of hydrocarbons (lighter products and heavy diesel-range) and other contaminants in the wastewater.

LAER is appropriately set for wastewater treatment plant operations. Pollution prevention techniques are well established to prevent avoidable contamination of wastewater. As such contamination does occur and is inevitable give the nature of petroleum refining. The initial focus for control of emissions of VOM and other volatile pollutants from wastewater is containing such materials with the wastewater. This enables emissions of these materials to be controlled in the initial treatment units, which are designed to separate volatile material from the wastewater, rather than being lost directly to the atmosphere from the drain system as wastewater is being transported to enclosed treatment units. The VOM emissions from the initial treatment units are then readily controlled as the emissions are combustible. The VOM emissions generated as a byproduct of subsequent treatment units are also readily controlled as units are enclosed and the bulk of the gas stream is methane produced from anaeraobic wastewater treatment.

Data on the presence of hydrocarbons in the wastewater would not be useful, as it would not directly correlate with the potential VOM emissions from treatment plant operations. In particular, the presence of product materials should be expected to reduce VOM emissions as VOM emissions would dissolve in such compounds and then be readily removed in the oil water separators.

33. LAER for VOM emissions for the new storage tanks should require that tanks be equipped with unslotted guidepoles, rather than slotted guidepoles. Unslotted guidepoles should also be installed on existing storage tanks. This is because slotted guidepoles have a significant contribution to the VOM emissions of a floating roof tank.

Slotted guideposts that are closed at the top and equipped with sleeves and wipers, as would be used for the new tanks, do not contribute significantly to the VOM emissions from a floating roof tank. The use of unslotted guideposts and appropriately equipped slotted guideposts, cannot be distinguished for purposes of control of VOM emissions, based on USEPA emissions estimation methodology for tanks. In part, this is because slotted guideposts eliminate the need for separate fittings on a tank for sampling and level measurements, which also contribute to

VOM emissions. As a result, the net effect of use of slotted guideposts is not significant.

34. Additional evaluation of LAER is required for existing storage tanks at the refinery, which will have increased throughput due to the project, which should be upgraded to BACT. The application should have listed all storage tanks for an evaluation of baseline conditions including tank type, product, throughput, information on tank fittings and controls, past violations, tank degassing procedures, tank cleaning procedures, etc.

The existing tanks for which LAER requirements have not been set are not subject to LAER because they are not being physically modified and will not experience a change in the method of operation. The application does addresses increases in VOM emissions at existing tanks that will potentially occur due to increases in the throughput of these tanks as a result of the project.

AIR QUALITY ANALYSIS AND EMISSION OFFSETS

35. Has there been an evaluation by the Illinois EPA of cumulative impacts of this project in conjunction with the other nearby sources such as US Steel in Granite City?

This project will potentially result in an increase in emissions of CO that would qualify as significant under the federal rules for Prevention of Significant Deterioration (PSD). The air quality impact analysis performed for CO emissions for the proposed project shows that air quality for CO will not be significantly impacted by the project. Modeling of other PSD pollutants was not performed or required for the proposed project as emissions of these other PSD pollutants will either decrease or not increase significantly with the project as compared to the applicable PSD significant emission rate. Accordingly, air quality for these PSD pollutants will improve or not change significantly.

The role of the Wood River refinery in regional air quality for ozone and $PM_{2.5}$, for which the Greater St. Louis area is also currently nonattainment, will be addressed by the Illinois EPA and the Missouri Department of Natural Resources. This will occur during the air quality analysis that will be part of the development of the plans to bring the area into attainment with the National Ambient Air Quality Standards for ozone and $PM_{2.5}$.

36. Through emission offsets, clean air in St. Louis is being traded for dirty air in Roxana.

The offsets for emissions of VOM required for the proposed project do not trade clean air in one location for dirty air in another, as both St. Louis and Roxana are located in the Greater St. Louis area. This is because the ozone in the ambient air is not emitted from sources but is formed in the atmosphere from photochemical reactions of precursor compounds, i.e., VOM and NO_x, in the presence of sunlight. High ambient levels of ozone that exceed the National Ambient Air Quality Standard may occur many miles downwind from a collection of sources at which

precursor compounds are emitted. Long range transport of precursors is also important for ozone air quality as transport affects the levels of precursors in the air entering urban areas. Given these circumstances, the Greater St. Louis area is a single nonattainment area, with an overall problem with nonattainment of the ozone air quality standard. Given the nature of the problem, it is not possible to distinguish or differentiate the effects on ozone air quality from emissions of VOM in Roxana from those in St. Louis.

Incidentally, the planned offsets also satisfy applicable regulatory requirements. Illinois' rules governing major modifications in nonattainment areas, which reflect the provisions of the Clean Air Act, require emissions offsets for VOM to be obtained from within the same nonattainment area as a proposed project. The emission offsets planned for this project clearly meet this requirement.

37. What is the name of the source providing the VOM emission offsets for this project?

The offsets will come from JW Aluminum Company, which is located just southwest of downtown St. Louis.

38. What is the status of the Premcor Consent Decree and how is it managed with the Consent Decree for ConocoPhillips?

The Consent Decree previously signed by Premcor (99-87-GPM) has effectively been incorporated into the new Consent Decree with ConocoPhillips (H-05-0258) as is shown by the provisions in the new decree addressing the Distilling West FCC Unit.

39. Credits for something that was required under a consent decree should not be available for use in a netting or offset transaction.

The relevant provision of the Consent Decree that addresses the ability to utilize credits for the proposed project is Paragraph 262(d). This paragraph provides that if ConocoPhillips has a single project that involves installation of Consent Decree controls as well as other construction that would occur at the same time and be permitted as a single project, ConocoPhillips can utilize the emissions decreases from the installation of controls required by the Consent Decree for that project.

40. How is each unit purchased from Premcor taken into account in the netting analysis?

The permit for the project includes information showing how each unit is or is not used in the netting exercise for the proposed project. (Refer to the permit, Table III in Attachments 2 through 8.)

ANALYSIS OF ALTERNATIVES

41. Pollution prevention methods and project alternatives to coking, which would avoid the various impacts from coking, should have been publicly evaluated.

There are not "pollution prevention methods" available to ConocoPhillips that would avoid the need for coking. While the heavy stream of material that will be coked could be sold as asphalt, the markets for asphalt are both limited and seasonal. If this stream were sold as asphalt, this stream of material also would not be available to be refined into gasoline and diesel fuel, which are the products of the refinery for which consumption is increasing.

Coking is a modern crude oil processing technology that is routinely used at refineries for the purposes and in the circumstances in which ConocoPhillips would use it. The reasons why this technology is used in particular situation relate to well-recognized factors that affect decisions by any refinery with respect to process equipment. These include availability and cost of crude oil for the refinery given its location, the amounts of different products that consumed by local markets, the value of different products, the type of processing that is needed to produce different products given the nature of the crude oil supply, the reliability, yield, energy consumption and other demands of different processes, the capacity and capability of existing equipment at a refinery, the ability to meet or supplement the demand for certain products by other means, competition from other companies to meet the demand, etc. Given the common use of coking processes to crack heavy petroleum streams distilled from crude oil or bitumen, it is not necessary for ConocoPhillips to reveal the specific evaluations and business decision-making that led up to the proposed project.

42. Why shouldn't the refinery use a hydrocracker in conjunction with the delayed coker?

The primary conversion processes commonly evaluated are non-catalytic (e.g., delayed coking) and catalytic (e.g., hydrocracking). A refinery must generally determine which process is more advantageous based on criteria such as the composition of crude oil supply that is available for the refinery, operating and maintenance needs, frequency of start-ups, and markets for different products. Because the Wood River refinery is an existing refinery, ConocoPhillips must also consider which process will better handle the various products and intermediates from either the catalytic or non-catalytic process considering the existing processing equipment at the refinery. Of particular relevance is the fact that this refinery currently operates a delayed coker, which means that the proposed second delayed coker could be installed to be directly integrated with the existing downstream process units. Considerable improvements over the years have also been made to the safety of delayed cokers through the automatic unheading of coke drums. The Illinois EPA has determined that there is no reason to believe that the proposed coker is any less sophisticated or "modern" given the current configuration of the refinery and the types of crude slates which would be processed at the refinery. Also relevant for this choice is the energy balance and products of the refinery. The hydrocracking process is dependent upon the use of hydrogen, where as coking cracks hydrocarbons without need for hydrogen. Coking does produce a solid by-product for which there must be a suitable market.

43. If there were a cleaner feedstock available from Canada, it might lower emissions and require less water and wastewater and cleaning of pipelines and less processing at the Wood River refinery. It seems like a cleaner feedstock might reduce the environmental impact of the entire process from the start of the pipeline to the activities at the Wood River refinery.

The transportation process for this new supply of crude oil versus transport of partially refined products will not result in any additional energy impacts or cleaning. When the material is received at the refinery, all of the non-petroleum materials will be processed in the refinery just as existing crude is processed. For example, water will be extracted in the process, and it will be handled through the wastewater treatment plant consistent with typical refinery practices.

44. At the oil sands deposit in Alberta, Canada, state-of-the-art refining technology is being used to process some of bitumen, with a high-percentage conversion to light crude called synthetic crude oil, which is put into light products. In contrast, delayed coking is an older technology, which has been the subject of OSHA and USEPA safety warnings. Why is ConocoPhillips installing a delayed coker unit when it could use modern technology, like in Canada? Also, why couldn't the crude oil undergo hydrocracking in Canada before it is shipped? My understanding is that it could and the Wood River refinery would have more usable product and less coke and it would have less wastewater because too cut all that coke out and use voluminous amounts of water, which would help with the cone of depression and help with the discharges.

The refining of bitumen that takes place in Canada is performed because the bitumen recovered from oil sands is very viscous and cannot be directly shipped by conventional pipelines. It must generally either be blended or diluted with lighter petroleum products or processed or "upgraded," with the resulting material is generally referred to as "synthetic crude oil." This upgrading is performed using standard refining processes, including delayed coking followed by hydrocracking, as will also be performed with modern equipment at the Wood River refinery. The extent of processing that occurs in Canada is dictated by the need to produce a synthetic crude oil that is sufficiently liquid that is can be shipped by pipeline. It is more economical for existing refineries, which are closer to markets and have facilities to make a range of final products, to then complete the processing of the synthetic crude oil, rather than duplicate those facilities in Canada. Other factors also act to influence the extent of initial processing of the bitumen that is performed in Canada, e.g., the availability of natural gas to make the hydrogen needed for hydrocracking and the absence of local markets for petroleum coke.

45. Can a cleaner grade of crude oil be transported from Canada to the Wood River Refinery by using upgraded technology in Canada?

Production of a cleaner grade of crude oil in Canada would necessarily entail "full refining" of the crude oil in Canada. While it would be possible to construct a new

refinery in Canada at the source of the crude oil, it is more cost effective and efficient to pipe crude oil to existing refineries that already have the facilities to process material to supply the demands and environmental specifications for local markets.

46. Other refineries that process heavy crude have or have plans to build a facility to gasify the crude to make hydrogen and electricity for the refinery. From the perspective of national energy security, wouldn't it be better than the use of the natural gas, as proposed, and wouldn't that create more local jobs and wouldn't that be a higher value use of coke?

The Illinois EPA is not aware of any refineries that have facilities to gasify petroleum coke to directly produce hydrogen or that plan to construct such facilities. Certain refineries do have facilities to gasify petroleum coke to produce fuel gas, which can then be used as fuel in process units or in a cogeneration facility or used as a feedstock to produce hydrogen. A hydrogen plant is being developed to use pitch as a feedstock. However, steam methane reforming, as used at the Wood River refinery, using fuel gas or natural gas as a feedstock, is commonly used to produce hydrogen at refineries.

Most of the fuel combusted at the Wood River refinery is not natural gas as suggested by this comment. Rather, the primary fuel at the refinery is fuel gas that is a byproduct from certain refining processes. The gasification of petroleum coke would greatly increase the magnitude, duration and cost of expanding the Wood River refinery. It is also unclear what operational benefit would be derived from such effort as the refinery will produce sufficient refinery fuel gas and hydrogen for its operations without a gasification unit. Operation of a coke gasification unit would also add another element of complexity to the operation and management of the refinery. As gasification of petroleum coke is believed generally desirable, it is certainly possible for another company to pursue development of a new source specifically for that purpose, relying on ConocoPhillips and other refineries to provide its feedstock.

47. Some of the negative impacts of the use of petroleum coke as fuel in a boiler are its high sulfur content, which potentially contributes to higher emissions of sulfur dioxide (SO_2) and sulfuric acid mist from the boiler, the combustion characteristics of the coke, which potentially increases NO_x emissions, and the heavy metals in the ash.[4]

Use of petroleum coke as a fuel in a boiler generally poses emissions issues that are similar to those that are posed by use of high-sulfur coal in the boiler. That is, the boiler must be equipped with appropriate control systems for emissions of PM, NO_x and SO_2, as needed to comply with applicable emissions standards that apply to the boiler. While the trace levels of certain metals in petroleum coke, such as vanadium and nickel, are higher than in coal, emissions of these metals are controlled along

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[4] *Challenges and Economics of Using Petroleum Coke for Power Generation*, World Energy Commission, http://www.worldenergy.org/wec-geis/publications/default/tech_papers/17th_congress/1_2_26.asp

with the PM and they end up in the ash. On the other hand, since the mercury content of petroleum coke is much lower than that of coal, use of petroleum coke does not pose the same concerns for mercury impact as the use of coal.

48. The analysis of alternatives to the proposed project should have considered the broader impacts on the United States of using crude oil from Canada. At a minimum, these impacts include the overall impacts additional energy use, additional hydrogen use, additional flaring, increases in refinery accidents, additional use of coke as fuel in power plants, impacts of new pipelines and pipeline accidents, and potential on impacts on regional air quality due to changes in vehicle fuels. These impacts and long-term implications are severe when considering added emissions criteria pollutants, toxic pollutants and greenhouse gases, as well as destruction of land and water resources, and impacts on people, plants, and wildlife.

It is beyond the scope of the analysis of alternatives for the proposed project to consider the impacts on the United States from using Canadian crude oil, as recommended by this project. The United States obtains crude oil from various oil fields, both domestic and foreign, with a variety of impacts associated with the production and transportation of that crude oil. While purchase of foreign crude oil reduces the environments impacts on the United States from oil production, it has economic impacts on the United States and the world economy. Use of domestic crude oil reduces those economic impacts but has environmental impacts. In some cases, those impacts can be severe. For example, the Exxon Valdez oil spill involved transportation of crude oil by tanker from Alaska.

GLOBAL WARMING

49. Condition 2.5 in the draft permit states that the Illinois EPA has broadly considered alternatives to the proposed project, as required by 35 IAC 203.306. However, the Illinois EPA was premature in finding that it has considered alternatives to the project. The high energy use of the project and resultant emissions of greenhouse gases should have been considered pursuant to 35 IAC 203.306, as a major environmental and social cost of the project. Alternatives to the project that would avoid severe project energy use and emissions of greenhouse gases should be evaluated, as required by 35 IAC 203.306. At a minimum, this cost of these impacts should be identified and evaluated, so that alternatives can be seriously evaluated.

Alternatives to the proposed project were reasonably analyzed. While there are theoretically alternatives to this project that would avoid the proposed project, these alternatives can be readily dismissed. For example, the existing motor vehicle fleet could be replaced with electrical vehicles, with electricity supplied by wind-based power plants. Not only is this not something that ConocoPhillips would undertake, but it is not something that could be undertaken as an alternative to the proposed project as it responds to needs for conventional fuels in the immediate future.

On a more realistic level, the continuing and increased demand for fuels in the

markets served by the Wood River refinery could potentially be met by refineries other than the Wood River refinery. However, importation of fuel to the Midwest from other locations would not eliminate the emissions from some similar project, as such project would still occur elsewhere to meet the public demand for fuels and changes in the global supplies of crude oil. As emissions of criteria pollutants affect air quality on a regional scale and greenhouse gases are of concern on a global scale, relocation of the project would be of uncertain benefits environmentally. Moreover, importation of fuels would certainly have significant impacts on residents of the greater St. Louis area as it would affect the cost and availability of fuels in the area. It could also have negative environmental effects as it would affect the availability of reformulated gasoline for the area, which the Wood River refinery produces as the local refinery serving the area. In summary, the proposed project is a reasonable proposal by ConocoPhillips for the Wood River refinery to continue in its historic role in supplying fuels to the Greater St. Louis area and the Midwest. While the refinery has impacts on the environment, those impacts are significantly outweighed by the benefits currently being provided for society of the fuels that the refinery produces.

50. In 2006, Governor Blagojevich announced a climate change initiative by the State of Illinois to address emissions of greenhouse gases, which will build on Illinois' role as a national leader in protecting public health and the environment. This initiative marks the beginning of serious efforts by Illinois to address global climate change and builds on steps that Illinois is already taking to lower emissions of greenhouse gases, such as providing incentives for energy efficiency and encouraging the use of wind power and biofuels.

Governor Blagojevich has instructed the Illinois Climate Change Advisory Group, which he has convened for this initiative, to evaluate a full range of policies and strategies to reduce Illinois' emissions of greenhouse gases. Accordingly, the Advisory Group is focused not only on the facilities that supply fuel and energy, but also on the facilities and people of Illinois who use that fuel and energy. This is critical as significant reductions in emissions of greenhouse gases requires comprehensive actions to reduce energy consumption, including significant improvements in the energy efficiency of transportation, heating, cooling, and lighting, machinery and appliances, etc. While facilities that produce fuels and energy, e.g., petroleum refineries, can <u>and do</u> make improvements to reduce the energy consumed in their operations, these reductions are not sufficient to roll back emissions of greenhouse gases. As related to emissions of greenhouse gases from "crude oil," a reduction in the usage of gasoline and other petroleum products usage is needed.[5] Thus the focus of efforts in Illinois to reduce emissions of greenhouse gases from use of petroleum-based fuels must be to actually reduce the usage of such fuels. This will also provide other benefits such as stabilizing fuel prices, maintaining and improving air quality, and reducing traffic congestion. The

[5] While renewable fuels, i.e., ethanol and biodiesel, can be substituted for some fuel, the extent of such substitution that is feasible is relatively minor in terms of the overall emissions of greenhouse gases attributable to use of petroleum-based fuels.

activities of the refineries that supply fuels are a secondary consideration in these efforts, both due to the lesser magnitude of their emissions and their role in meeting Illinois's current needs and demands for fuels.

51. The U.S. Global Change Research Program published a report on impacts of climate change in the Midwest,[6] which finds that, higher summer temperatures and resultant increased air pollution in the Midwest will result from climate change. This is because hotter summers could act to increase the formation of ground-level ozone, which is formed through reactions of precursor compounds energized by sunlight on hot days. As major urban areas in the Midwest are currently nonattainment for ozone, climate change is making it more difficult to attain and maintain compliance with the ozone air quality standards. The report also found that heat-related deaths in the region due to climate change will increase, and the report as a whole found many other severe impacts due to climate change. The public is relying on the Illinois EPA to seriously evaluate alternatives to the proposed project that will not only protect public health from traditional air pollutants, but also from greenhouse gases, whose effect is to exacerbate air pollution and threats to public health.

As observed by this comment, global warming potentially has myriad negative impacts on human health and welfare and the environment, both directly and indirectly. However, it is also obvious that the challenge of global warming will require a comprehensive regulatory approach in the United States, which is ultimately imposed by Congress on a national level. Until specific regulations are put into place by the appropriate state or national authorities, ad-hoc actions to compel individual action on global warming through conventional environmental permitting programs are capricious. Even if such actions were taken, they would probably provide only illusory benefits, as they would be limited in their scope to new projects. They would not reach or affect existing sources, which contribute the majority of emissions of concern. Such actions might also have a stifling effect on the continuing development and deployment of new technology to improve energy efficiency and reduce emissions of greenhouse gases, as such actions would stifle innovation or discourage capital investment.

52. The application for the proposed project does not contain information for emissions of CO_2, methane[7] and other greenhouse gases from the new and modified heaters that are part of the project, which could be readily calculated by ConocoPhillips. The analysis of alternatives to the project should have reviewed the environmental and social impacts of emissions of greenhouse gases, which requires a quantification of these emissions, in order to demonstrate that the benefits of the project will outweigh its environmental and social impacts, as required to comply with Illinois regulations. A full review of project

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[6] Climate Change Impacts on the United States, The Potential Consequences of Climate Variability and Change, Overview: Midwest, by the National Assessment Synthesis Team, US Global Change Research Program, 2000, http://www.usgcrp.gov/usgcrp/Library/nationalassessment/7MW.pdf, (The U.S. Global Change Research Program (USGCRP) is a government research program codified by Congress in the Global Change Research Act of 1990.) Full webpage: http://www.usgcrp.gov/usgcrp/Library/nationalassessment/overviewmidwest.htm

[7] Many emissions points in the refinery emit methane, which is a potent greenhouse gas, 20 times stronger than CO_2, and a major component of the fuel gas used at refineries. Illinois' definition of VOM excludes methane.

alternatives should have also included prevention and/or mitigation of emissions of greenhouse gases. Estimates of CO_2 emissions were provided by ConocoPhillips for another recent proposal to expand its refinery in Rodeo California.[8] It showed that the increase in emissions of greenhouse gases would be larger than many of the decreases in emissions from California's Early Action measure, effectively wiping out decreases made in other sectors. Estimating emissions of greenhouse gases from the proposed project just makes good sense since the project will set refinery practice and the environmental impacts of the refinery for decades.

The important greenhouse gas emitted from processing of crude oil and use of petroleum refineries is CO_2. This is because CO_2 is the product of combustion when carbon, which makes up the bulk of crude oil, is burned. This is different from methane and other greenhouse gases, which are pollutants in the more traditional sense, as they are contaminants and processes may be manipulated or controlled to reduce the formation of these materials. For example, the trace levels of emissions of methane that accompany combustion of any fossil fuel can be minimized by good combustion practices. In contrast, CO_2 is the unavoidable product of combustion of carbon, as is desirable as it represents complete combustion of that carbon to CO_2, rather than CO.

As already discussed, use of petroleum-based fuels directly leads to emissions of greenhouse gases. The magnitude of this contribution is large, with activities related to use of petroleum products currently contributing about 45 percent of the CO_2 emissions of the United States. As observed by this comment, emissions of CO_2 can be readily calculated from information on the type and amount of fuel that is being burned. Emissions of CO_2 associated with use of crude oil can be roughly estimated using a factor of 1000 pounds of CO_2 per ton of crude oil consumed. Accordingly, as this project involves a nominal increase in the annual capacity of the Wood River refinery of about 27 million barrels, the project potentially involves handling crude oil that could annually contribute as much as about 12.5 million metric tons of CO_2 emissions to the atmosphere.[9] As the majority of these emissions would occur when gasoline, diesel and other petroleum products produced by the refinery are used, the split between consumption/emissions at the refinery and consumption/emissions of the users of fuels is of uncertain significance. Reductions in these emissions will require improvements in energy efficiency by the users as fuels so that less fuel is consumed on a regional, national and international level.

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[8] ConocoPhillips is pursuing permit for a major expansion at its refinery in Rodeo California. For that project, ConocoPhillips provided an estimate of the CO_2 emissions increases, about 1.25 million metric tons per year. This is a large increase, as it is more than 1 % of the comprehensives inventory for emissions of greenhouse gases prepared by the BAAQMD for the entire Bay Area, which addresses emissions from industrial sources, cars, trucks, ships, building heating, etc. The proposed project at the Wood River refinery represents a much larger refinery and expansion (up to 385,000 bpd, compared to the Rodeo 76,000 bpd refinery) and involves heavy crude oil, which requires more processing than lighter crude oil. CO_2 emissions will be much higher for the proposed project than for the ConocoPhillips Rodeo refinery, which are already extremely large.

[9] While 12.5 million metric tons may see like a large number, global emissions of CO_2 are measured in terms of billions of metric tons per year.

53. ConocoPhillips has publicly announced plans to reduce emissions of greenhouse gases. In 2006, ConocoPhillips became the first major US oil company to join the US Climate Action Partnership. James Mulva, ConocoPhillips' chairman and chief executive has been reported as saying that "Voluntary programs are not going to meet the challenge of climate change," … "The longer we wait - two or five years or more from now - it won't be mitigation, it will be adaptation."[10] Unfortunately, the proposed project is moving in the opposite direction, with more energy-intensive processing of very heavy Canadian crude oil.

In actual fact, ConocoPhillips went on record supporting mandatory, national regulations addressing greenhouse gas emissions. This is consistent with its participation in the US Climate Action Partnership, which is a diverse group of businesses and environmental leaders that have come together to call for mandatory action on climate change, endorsing a comprehensive approach involving phased targets for reduction of emissions of CO_2 accompanied by a range of policy approaches. ConocoPhillips should be praised for its endorsement of regulatory action to address global climate change, especially when certain other companies would prefer to ignore global warming. However, ConocoPhillips corporate position on climate change is not inconsistent with the current project, which would meet a need for fuel in the immediate future using an existing refinery.

54. Global warming is a scientific fact that is now accepted worldwide. The United States is far behind Europe in what it has done with alternative energy and energy conservation and ConocoPhillips is not helping. If ConocoPhillips wants to expand and get more energy, why doesn't it invest in some new alternative energy methods instead of investing in continued use of crude oil to produce fuels. Instead of building a new coker, why doesn't it put other processes at the refinery?

ConocoPhillips is pursuing the current project because its primary business is supplying petroleum based fuels, products for which there is both an ample need and even greater demand. As observed by this comment, the United States is far behind Europe and many other developed nations in actions that would reduce the demand for the petroleum-based fuels that ConocoPhillips produces. Other countries also provide stronger support for the development of alternative energy technologies, as will be critical to rollback emissions of greenhouse gas emissions.

55. Emissions of greenhouse gases should be monitored and measured. How much methane and CO_2 would be released by uncontrolled pressure-relief devices? How much $C0_2$ will be released by the hydrogen plant?

Treating emissions of CO_2 and other greenhouse gases as regulated air pollutant, as is effectively being requested by this comment, would be inconsistent with current Illinois law. In particular, CO_2 is a compound that is present in the earth's

[10] "ConocoPhillips: The anti-Exxon: The Texas-based oil company breaks with he other U.S. majors to support mandatory national regulation of greenhouse as emissions," *Fortune*, Marc Gunther, April 11, 2007, http://money.cnn.com/2007/04/10/news/companies/pluggedin_gunther_conocophillips.fortune/index.htm

atmosphere, occurring both naturally and as a product of fossil fuel combustion. CO_2 in the atmosphere has not been commonly regarded as an air "pollutant." Indeed, the ecosphere depends upon the presence of CO_2 emissions to support green plants. Historically, CO_2 in the ambient atmosphere has not been considered harmful to humans or the environment.

At the same time, the Illinois EPA is working to develop requirements for tracking and routine reporting of emissions of CO_2, and perhaps other greenhouse gases in Illinois in the near future. This activity would be comprehensive, as it would address all significant stationary sources of these emissions. Improved tracking of emissions of such emissions is important in conjunction with Illinois' current initiative to reduce emissions of greenhouse gases.

56. What energy efficiency evaluations were carried out for this project, if any?

ConocoPhillips indicated that is has an "energy action checklist" that sets energy standards that every new construction project must meet. For example, new process units must be designed so that the temperature of the final product is such that all usable heat energy has been recovered. This checklist is ConocoPhillips' way of evaluating proposed projects for energy efficiency.

57. How much additional methane will be emitted by flaring due to the proposed project?

Emissions of methane from the refinery from flaring should be decreasing due to the various measures that are being implemented to minimize flaring.

Air Permitting

FLARING

58. The proposed project will entail construction of two new flares and increased use of existing flares. These flares are subject to BACT for CO emissions and LAER for VOM emissions. However, the draft permit would not require BACT or LAER for flaring.

The existing flares are not subject to BACT or LAER because they are not being physically modified and will not experience a change in the method of operation. This is because they will be in the same service, with the same process stream and function, as at present. Indeed, due to the requirements of the Consent Decree it is appropriate to anticipate that emissions of the existing process flares at the refinery will be declining. The issued permit includes additional requirements as part of BACT and LAER for the new flares in response to public comments.

59. The application does not include emissions information related to flaring from the project or from contemporaneous projects over the last five years, which should have been provided. Not only is there a large potential to emit at the new flares, but emissions at existing flares will increase due to the project because of increased production at the

refinery. The application is not complete without this information and must be supplemented.

The application does include emissions information for new, modified and debottlenecked flares and for any increases in flaring and flaring emissions associated with contemporaneous projects.

60. USEPA prohibits routine flaring and requires preventative measures to minimize SO_2 emissions from flaring. A USEPA Enforcement Alert[11] warns that frequent, routine flaring, which may cause excessive, uncontrolled SO_2 emissions, is not considered "Good Pollution Control Practice," and may violate federal regulations adopted pursuant to the Clean Air Act. Unfortunately, none of these requirements are met by the proposed project. The application failed to provide the necessary analysis on available methods, such as having sufficient compressor capacity to rigorously prevent and minimize entire flaring events and thus achieve maximum controls and lowest emissions from flaring. Such methods minimize emissions of all pollutants from flaring, and are used at other refineries.

As already explained, the Wood River refinery is subject to requirements to minimize flaring as it contributes to SO_2 emissions. Incidentally, while expressing concerns about excessive flaring, the USEPA confirmed that the proper use of flaring is a good engineering practice, as flaring destroys hazardous and objectionable gases by burning those gases. Flaring also prevents injuries to employees, fires and explosions, and damage to equipment.

61. The application incorrectly states that there is no way to reduce CO emissions from flaring and at the same time control VOM emissions, assuming that either VOM waste gas must be flared or else directly emitted.[12] However, recovery of waste gas back to a refinery's fuel gas system acts to prevent both VOM and CO emissions from flaring.

This statement was made in the context of the Wood River refinery, where measures to reduce hydrocarbon and thus VOM emissions from flaring by minimizing and eliminating such events are in place. Given that such measures are in place, the flaring events that actually do occur must generally be considered unavoidable, as indicated in the application. (Certainly, any further discussion about whether a particular flaring event was avoidable will occur after the event has occurred.)

62. CO emissions from flaring are related to combustion efficiency, which varies. If the combustion efficiency of a flare were 100%, there would be no CO emissions from the flare. Flare combustion efficiency varies according to the quality of the gases burned, the

[11] USEPA Enforcement Alert, Vol. 3, Number 9, October 2000
http://www.epa.gov/compliance/resources/newsletters/civil/enfalert/flaring.pdf

[12] "No process changes that would reduce the CO emissions exist. Since the flares serve as VOM control devices in an 8-hour ozone non-attainment area, their operation is necessary. Therefore, no CO control technologies exist for the new flares." Application, page 7-9

capacity of the flare, how well the flare mixes the fuels and air, flare exit velocity, wind conditions, etc. Combustion efficiency can vary from low, down to only 60% or less of VOM combusted to very high, over 99% efficiency. Regulators in Texas and California use destruction efficiencies down to 93% when calculating flare emissions when waste gas sent to a flare has a low Btu content instead of the 98% more commonly used in emission calculations. Many studies show that efficiency can be very low, down to even 30%. The ratios of emitted CO, CO_2, VOM, etc., also vary. Choosing USEPA's CO emission factor, which relates to average or typical conditions, for BACT for a flare would be unsound.

It is common practice to conservatively calculate VOM emissions from flaring using a minimum level of destruction efficiency so as to overstate VOM emissions. This level of combustion efficiency is 98 percent, which USEPA indicates is the minimum level of destruction efficiency that will generally be achieved when a flare is operated to comply with 40 CFR 60.18, as is required for flares at the Wood River refinery. Similar approaches are taken for emissions of other pollutants from flaring that are affected by destruction or combustion efficiency of the flare. While the destruction efficiency for flaring that does not comply with 40 CFR 60.18 may be lower than 98%, as discussed by this comment, this is not relevant to the flares at the Wood River refinery. In addition, this comment does not identify a method by which the effect of normal variation in destruction efficiency of a flare and its effect on VOM emissions could be readily determined in practice or show that such a method is needed.

63. The flare associated with the new hydrogen plant would not be "assisted" with either introduction of air or steam. Steam or air-assisted flares are considered basic to provide good mixing in a flare and maintain combustion efficiency. Non-assisted flares should not be considered to meet BACT requirements.

The waste gas from the hydrogen plant that would be flared, which should only occur during upsets or emergencies given the nature of hydrogen plants, is expected to be low-Btu gas, which is primarily CO and CO_2 and has a low VOM content. As the heat content of the waste gas is between 200 and 300 Btu per SCF, use of steam or air assist is not required for effective combustion, as reflected in USEPA's regulations for proper design and operation of flares.

64. There are many proven approaches for reducing the number of flaring episodes and the quantity of waste gas flared and thus reducing all flaring emissions. They include: 1) Having sufficient compressor capacity, including redundant compressor capacity to recycle waste gases to the refinery fuel gas system (especially important when the refinery is being expanded so that more waste gases may be produced); 2) Managing depressurization during unit shutdowns so that the gas recovery system is not overwhelmed; 3) Constructing stronger process vessels to increase working pressures to enable containment of process gases during shutdown rather than flaring; 4) Implementation of detailed procedures to diagnose and eliminate unnecessary flaring, and 5) Fixing equipment that repeatedly malfunctions and causes unnecessary "emergency"

flaring. A plan for minimizing flaring and root cause analysis for flaring activity that does occur are keys to preventing unnecessary flaring. These approaches are used at existing refineries and have been shown to lower the number and magnitude of flaring events. An analysis of such approaches was not provided for the proposed project and the draft permit would only superficially address these approaches to reducing flaring and flaring emissions.

As generally observed by this comment, there are many ways to reduce emissions from flaring. For the new process flare systems at the refinery, the various approaches to minimization of flaring and flaring emissions discussed in this comment are required as appropriate for the particular process units that are served by the flare system. This has been clarified in the conditions of the issued permit for flaring. The one exception is constructing stronger process vessels. This has not been identified as a reasonable or recommended approach to reducing flaring emissions. It would pose operational concerns as it would implicitly entail operation of process vessels at higher pressures. In addition, careful management of depressurization of vessels during unit shutdowns appears to be very effective in minimizing and eliminating shutdowns as a contributor to flaring.

65. The SCAQMD and the BAAQMD have both identified adequate compressor capacity for recovery of waste gas as being effective in minimizing flaring events and their associated emissions. This approach was not evaluated for the proposed project for BACT and LAER.

The new flare system for the new Delayed Coker Unit will include redundant waste gas compressors, as currently used at the Shell, Martinez refinery. A condition has been included in the issued permit requiring this as an element of BACT and LAER for this new flare system. The flare for the new hydrogen plant does not handle a waste gas that is suitable for recovery for use in the refinery fuel gas system.

66. Without rigorous monitoring, adequate compressor capacity, process control, and appropriate permit conditions, significant flaring can be expected at the Wood River refinery with the proposed project.

The extent of future flaring at the Wood River refinery is minimized by operational and economic incentives to maintain stable process operation with consistent product yields and to recover waste gas that is produced for use as fuel. ConocoPhillips also has a stated objective of minimizing its CO_2 emissions. Accordingly, it is unclear to what extent, if any, the permit must mandate particular action by ConocoPhillips to prevent significant flaring at the refinery in the future. Nevertheless, the issued permit mandates that ConocoPhillips take particular actions to minimize flaring, consistent with the actions that have been taken at and required of other refineries.

67. Without adequate compressor capacity, significant flaring can be expected at the Wood River refinery with the proposed project. The application does not provide information

for the nine existing flares in different areas of the refinery for baseline compressor capacity or the amount, if any, that this capacity would be increased with the proposed project. As found by the BAAQMD and SCAQMD, compressor capacity is key in preventing flaring. It allows the refinery to consistently recover waste gases for use as fuel, rather than flaring these gases with associated emissions. Adding compressor capacity, as discussed in its Flare Minimization Plan, enabled Shell, Martinez to reduce flaring, including emergency flaring, to very low levels compared to other refineries in the Bay Area. The Tesoro, Avon refinery (previously Tosco), also in the Bay Area, which had the worst flaring record prior to the BAAQMD rulemaking, reduced its emissions greatly by adding compressor capacity.

Adequate compressor capacity is only one approach to minimizing flaring. Whether other approached are adequate for the existing flares at the Wood River refinery or additional waste gas compression capacity will have to be installed at the refinery is not a matter that can be determined at this time as measures to reduce emissions from existing flares are ongoing. Whether additional compressor capacity should be installed for existing flare systems at the refinery is a matter that is appropriately dealt with in the context of the Consent Decree.

68. At the refineries in the Bay Area, flaring, including emergency flaring, was also further reduced after adoption of rules for flaring by the BAQMD, showing the feasibility of controlling flaring through prevention mechanisms. The principles and equipment used by refineries in the Bay Area must be applied with specificity to the proposed project.

For the flare for the Delayed Coking Unit, for which BACT and LAER are required, the issued permit requires that ConocoPhillips implement the measures similar to that specified by the BAAQMD to reduce flaring. These are preparation of and operation pursuant to a Flare Minimization Plan and performance of "root cause analyses" for significant flaring incidents. In this regard, the BAAQMD's flaring rules put into place certain administrative requirements whose purpose is to lead to reduction in flaring and flaring emissions. The rules do not identify or prescribe specific measures that refineries must use to reduce flaring. Thus, while the Delayed Coking Unit will have a gas recovery system with redundant compressor capacity as already discussed, this is not a measure that is mandated by the BAAQMD rules.

The BAAQMD's rules for flaring at petroleum refineries do not address flaring at wastewater treatment plants. At wastewater treatment plants, flares serve as control devices for the emissions from certain units and do not handle waste gas streams as are potential present with the operation and upset of process units at a refinery.

69. A detailed evaluation[13] of the refineries in the Bay Area, which reviewed data reported by the refineries and their Flare Minimization Plans, found that the dirtiest refinery processes caused more flaring, with more emissions, than other refinery processes. This

[13] "Flaring Prevention Measures," Communities for a Better Environment (CBE), Greg Karras, April 2007

is directly applicable to the Wood River refinery, which is expanding its dirtiest refining processes.

This evaluation found that certain refining processes had the <u>potential</u> to generate more emissions from flaring. Accordingly, it recommended that these particular processes be subject to especially thorough review with appropriate actions implemented to minimize flaring associated with these processes.

70. The application failed to evaluate LAER achieved in practice by refineries that rigorously implement approaches to minimize flaring. Shell has documented its approaches for minimizing flaring and achieving very low flaring emissions at its refinery in Martinez, California, in the Flare Minimization Plan for this refinery[14] required by BAAQMD rules. BACT and LAER for flaring at the Wood River refinery should be at least as stringent as the equipment and practices in place at the Shell Martinez refinery. Even before adoption of the BAAQMD rules, the Shell Martinez refinery did not have large flaring events compared to the large and routine flaring events, with substantial emissions, at other refineries in the Bay Area. The Shell Martinez refinery has continued to exhibit very low flaring emissions compared to other Bay Area refineries. The Flare Minimization Plan for the Shell Martinez refinery should be evaluated and the approaches applied to Wood River refinery in detail to satisfy BACT and LAER requirements.

In response to this comment, the Flare Minimization Plan prepared by Shell Martinez has been closely reviewed. The issued permit requires a Flaring Minimization Plan for the new coker flare being constructed as part of this project (coker flare) that address the various approaches that have been taken by Shell Martinez to reducing flaring, as presented in the Flare Minimization Plan for that refinery.

71. Shell, Martinez has two waste gas recovery compressors for dedicated use in its Delayed Coking Area, with each compressor having enough capacity to handle gases from this area when one of the compressors is out of service. ConocoPhillips should do the same.

As previously discussed, the flare system for the new Delayed Coker Unit will include redundant waste gas compressors, like the system at the Shell Martinez refinery. In this regard, Shell Martinez, with its Delayed Coker Unit that was installed in the mid-1990's, also provides anecdotal evidence that operation of a modern Delayed Coker Unit does not significantly contribute to flaring emissions, given Shell Martinez's excellent record on minimizing flaring emissions as cited by

[14] Shell's Flare Minimization Plan for the Martinez refinery indicates that "As the refinery already has very significant capital infrastructure for flare gas recovery in place, procedural modifications can be used to achieve much higher returns on a $/ton emissions reduction basis. New refinery procedures described in this Flare Minimization Plan address actions to further minimize flaring during process upsets and additional planning requirements for maintenance and turnaround activities. Careful planning of any activity with the potential for flaring is the most successful minimization approach that has been employed at SMR. Procedures for reporting and investigating all flaring provide means to learn from unanticipated events. The result of this work will be further reductions in flaring." Excerpt from the Shell Martinez Refinery, Flare Minimization Plan, Redacted Version, Revised March 25 2007, submitted to the Bay Area Air Quality Management District

this commenter.

72. The Shell Martinez Refinery Flare Minimization Plan emphasized the importance of thorough root cause analysis of flaring incidents to avoid similar events in the future and reduce emissions from flaring emissions. This measure is needed for the proposed project due both to the large increase in refinery capacity and the refinery's history of flaring.

The issued permit requires that root-cause analyses be performed for the new flare for the Delayed Coking Unit for any significant flaring incident for hydrocarbons.

73. Operational monitoring for waste gas that is flared is important to provide accurate data for emissions from flaring and to provide a factual basis for evaluation of the number and nature of flaring events and their associated emissions and to perform root cause analyses for flaring. Monitoring devices are available to track the flow of gases to a flare. Monitoring for the concentration of VOM and sulfur compounds in waste gases, in combination with records for pilot and purge gas flow, is needed to provide good information on the waste gas burned by a flare and the accompanying emissions.

The issued permit requires continuous monitoring to identify when waste gases are flared. This requirement is accompanied by requirements for monitoring or instrumentation to reasonably determine the amount of gas that is flared, requirements for sampling and analysis of waste gas or maintenance of records for the composition of the gas, and requirements for monitoring or records related to fuel usage for the pilot and venting of purge gas to the flare.

74. The draft permit would only superficially address monitoring for flaring. Despite readily available monitoring devices and a Consent Decree that addresses excessive flaring at the wood River refinery in the past, it is surprising that the draft permit does not contain requirements for monitoring of flow or composition of waste gas going to the flare. BACT and LAER for flaring necessitate operational monitoring in order to minimize emissions. As monitoring of flaring has been successfully implemented pursuant to applicable regulations at many California refineries, this work provides a ready-made solution for deficiencies in the application for the proposed project, with proven methods that can be included directly into the permit.

In particular, rigorous operational monitoring should be required for flaring as specified by the rules of the SCAQMD and BAAQMD. The Flare Monitoring Rule, Regulation 12-11,[15] which was adopted by the BAAQMD in 2003, shows that issues related to operational monitoring for flaring have been worked out, including verification of gas flow and analysis for hydrocarbons and sulfur content of waste gas. This rule was adopted following input with manufacturers of monitors, refineries and the public. Each requirement of this rule should be incorporated into the permit for the proposed project. These measures are needed for the proposed project due both to the large increase in refinery capacity and the refinery's history of flaring. The Texas Commission on

[15] BAAQMD Regulation 12 Rule 11, http://www.baaqmd.gov/dst/regulations/rg1211.pdf

Environmental Quality also found that accurate emissions data must first be collected in order to then be able to identify and develop options for controlling refinery flaring, which emphasizes the importance of operational monitoring as part of flare emission control.[16] The Shell Martinez Refinery Flare Minimization Plan also emphasized the importance of monitoring.

The issued permit includes an appropriate level of specificity for operational monitoring for flaring. As the fundamental objective for flaring is to minimize and eliminate flaring, it is not appropriate for the permit to include the detailed requirements for operational monitoring present in the BAAQMD's Flare Monitoring Rule. Given the very low level of flaring that should occur in the future at the Wood River refinery, a simpler approach to operational monitoring at the refinery should be established, as compared to the circumstances of the refineries in California that led to the BAAQMD and SCAQMD adopting their Flare Monitoring rules several years ago. Accordingly, the issued permit sets the purposes that must be fulfilled for the operational monitoring for flaring, i.e., collection of data to identify when waste gases are flared and in what quantity. The permit does not prescribe what monitoring techniques must be used and how monitoring must be conducted.

75. In 2006, the BAAQMD adopted additional requirements for reporting of flaring at refineries in its rules for Flares At Petroleum Refineries, Regulation 12-12. The provisions of this rule should also be included in the conditions of the permit for the project.[17]

The issued permit includes appropriate provisions for reporting related to flaring. Given the nature of the Illinois EPA's procedures for review of reports from sources, detailed reporting related to flaring associated with this project will be more efficiently and effectively handled if it occurs in conjunction with routine quarterly reporting, rather than as stand-alone reports for significant flaring events. Provisions for prompt reporting upon occurrence of certain flaring events are appropriately set in the Clean Air Act Permit Program (CAAPP) permit for the refinery.

76. The monitoring conditions in the draft permit for flaring, which only reiterate federal

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[16] TCEQ Master Control Strategy List, Point Sources, page 5, September 7, 2005 http://www.nctcog.org/trans/air/sip/future/lists/TCEQ-oint%20Source%20List.pdf

[17] Reportable Flaring Event: Any flaring where more than 500,000 standard cubic feet per calendar day of vent gas is flared or where sulfur dioxide (SO_2) emissions are greater than 500 pounds per day. For flares that are operated as a backup, staged or cascade system, the volume is determined on a cumulative basis; the total volume equals the total of vent gas flared at each flare in the system. For flaring lasting more than one calendar day, each day of flaring constitutes a separate flaring event unless the owner or operator demonstrates to the satisfaction of the APCO that the cause of flaring is the same for two or more consecutive days. A reportable flaring event ends when it can be demonstrated by monitoring required in Section 12-12-501 that the integrity of the water seal has been maintained sufficiently to prevent vent gas to the flare tip. For flares without water seals or water seal monitors as required by Section 12-12-501, a reportable flaring event ends when the rate of flow of vent gas falls below 0.5 feet per second. http://www.baaqmd.gov/dst/regulations/rg1212.pdf

requirements for monitoring of flares and which were in place in the past when ConocoPhillips had excessive flaring, are vaguely stated.

The monitoring requirements of the applicable federal rules for flaring are appropriately incorporated by the permit by reference to those rules. These requirements address proper operation of a flare for effective destruction of organic constituents in waste gas and effective combustion as related to generation of CO.

77. The Wood River refinery has a major potential for emissions from flaring.[18] Baseline flaring emissions and compressor capacity at the refinery must be provided to the public, and potential increases from flaring must be evaluated in light of this information about other refineries. However, the application did not provide information on existing or waste gas compressor capacity or information on root causes of past flaring at the refinery, or the volume, duration, and emissions of individual flaring events. Without monitoring of the volume and composition of waste gas sent to the flare, and without designing sufficient gas recovery capacity, increased and poorly quantified flaring will occur at existing flares at the refinery with this project.

Under the Consent Decree, ConocoPhillips must prepare and submit its Compliance Plan for Flaring Devices, which will address the existing flares at the Wood River refinery, by December 31, 2007 [Paragraphs 141 and 142 of the Decree]. ConocoPhillips must also use flow meters or reliable flow estimation parameters to determine the emissions from flaring [Paragraph 165].

78. The permit should require ConocoPhillips to develop and implement a flare minimization plan to capture waste gas for use as fuel, rather than flaring it, so that flaring emissions are reduced.

Waste gas is routinely captured for use as fuel rather than being flared. For existing process units, requirements for minimization of flaring are established by the Consent Decree. The Decree requires ConocoPhillips to develop a plan that includes steps to correct the conditions that cause or contribute to excessive Acid Gas Flaring and Hydrocarbon Flaring.

As part of this project, ConocoPhillips will be installing redundant waste gas recovery compressors for the new Delayed Coker Unit, each of which is designed for 100 percent of routine gases from the unit. The issued construction permit also requires ConocoPhillips to develop and implement a Flaring Minimization Plan for the new Coker Unit and the new Hydrogen Plant.

[18] Although it is unlikely that the Wood River refinery performed as well as the average Bay Area refinery before the Bay Area reductions occurred (since USEPA found that excessive flaring was occurring), if the Wood River refinery had performed as well per barrel of crude oil processed, baseline emissions of Total Organic Carbon (TOC) for the refinery would be about 1898 tons per year. Furthermore, the proposed project represents a l26% increase in refinery capacity (306,000 to 385,000 bpd). Flaring emissions will likely increase more than 26% because the refinery is increasing production in the most intensive part of the refinery, with higher-sulfur inputs. With a 26% increase on top of base TOC emissions 1898 tons per year, TOC emissions from flaring at the Wood River refinery would increase by almost 500 tons per year, even using conservative assumptions that could underestimate flaring.

79. What monitoring devices with what detection limits are currently installed to measure flow and composition of waste gases for each existing flare at the refinery? What specific monitoring devices will be installed for the new flares?

The existing flares must be operated to comply with the requirements of the New Source Performance Standards (NSPS) and/or National Emission Standards for Hazardous Air Pollutants (NESHAP) for flares. The NSPS and NESHAP require monitoring for a pilot flame be present in a flare at all times that waste may be sent to the flare, which ensures that any waste gases that are sent to the flare will be ignited and combusted. They do not require other monitoring. Under the Consent Decree, ConocoPhillips must be able to reasonably determine flow and H_2S content of waste gas.

The issued permit requires that monitoring and recordkeeping be implemented for new flares to be able to determine flow and composition of waste gas. Use of specific monitoring devices is not required and can be addressed in the processing of a revised Title 5 permit (Clean Air Act Permit Program Permit) to address the proposed project.

80. How many flaring events due to upsets occurred at the Wood River refinery during the last three years.

There were ten events in 2005, ten events in 2006, and four events in 2007. The majority of events occurring in 2005 were attributable to problems with the startup of the gas compressor on the distilling west coker. The majority of events for 2006 were attributable to power outages. Power outages also contributed to events. Power outages affect both the process unit and the waste gas system, as they rely upon availability of electrical power. ConocoPhillips indicates that it is working with Ameren to improve the reliability of the power supply for the refinery.

81. How many flaring events resulted in visual smoking and what evaluations were performed to determine the associated emissions of particulate matter and polycyclic aromatic hydrocarbons?

There were seven events in 2005, seven events in 2006, and one event in 2007. Specific evaluations were not conducted to quantify emissions of particulate matter or polycyclic hydrocarbons. Such evaluation was not considered necessary given the duration of events and the composition of the refinery's waste gas streams, which do not contain significant levels of aromatic hydrocarbons.

82. How much SO_2, VOM, PM, NO_x, CO, and CO_2 is emitted from the existing flares affected by the project? Is that listed somewhere and should it be part of the permit?

Table C-1 of the application contains the baseline annual emissions of CO, NO_x, and VOM for the existing flares affected by the project. The annual emissions, based on

24 consecutive months of actual emission data are: 7.8 tons of CO, 3.6 tons of NO_x, and 3.4 tons of VOM. The emissions of PM and SO_2 were not quantified as they would be minimal given the nature of the gas streams being flared. Historically, emissions of CO_2 from the refinery have not been quantified. The increases in emissions at these flares are addressed in Attachment 1 of the permit.

83. What is the destruction efficiency assumed for calculating flaring emissions and what is the basis of this figure?

For purposes of calculation emissions, properly operated flares are assumed to achieve 98 percent destruction efficiency for VOM and CO contained in the waste gas. This conservative level of performance is based on information on USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42. Actual destruction efficiency could be significantly higher.

84. How much compressor capacity for recovering waste gases is being installed for each of the new flares for the project? What calculations were performed to ensure the compressor capacity will be sufficient to eliminate all routine flaring?

Redundant compressors are being installed on the new coker flare. Each compressor is designed to route 100 percent of the projected flow of waste gas from the coke unit to the fuel gas recovery system.[19] The adequacy of the recovery system in practice will be addressed by the required Flaring Minimization Plan. Other flares which would handle gases from the existing flare gas recovery system are not affected by this project.

CRUDE OIL SUPPLY

85. The proposed project would involve modifications and expansion for the purpose of processing less-expensive, heavier crude oil, with resultant increased local and global pollution and hazards, that will be locked in for decades. The proposed project represents a major new direction in U.S. refinery operations with modifications to process heavy Canadian crude oil recovered from oil sands. This project is a test case of this trend for use of heavier crude oil with higher energy use. Processing of oil sands has impacts in Canada, including degradation of pristine boreal forest and impacts on plants and wildlife Canada. This project requires careful evaluation due to its nature and its long-term implications.

It is beyond the scope of the Illinois EPA's review of the applications for the proposed project to formally consider the various impacts in Canada from the recovery and processing of crude oil from oil sands. This is a matter that is appropriately considered and addressed by the federal and provincial governments of Canada as they regulate this activity. However, as this comment observes, the recovery of crude oil in Canada is accompanied by environmental impacts, as is the

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[19] ConocoPhillips indicates that the gas flow rates of process units were modeled at maximum design rates of units plus an engineering safety factor using computer simulation software for petroleum refining processes.

recovery of oil from other locations. These impacts are lowered as the consumption of crude oil is reduced.

86. What evaluations of heavy-metals, such as lead and mercury, in the heavy crude oil have been performed? Will mercury and lead be emitted from the refining process? What measurements are planned for the future for heavy metals in coke to be manufactured and what will be done because of the increase in these heavy metals? What practices will be used to ensure that these increases of heavy metals do not escape into the environment?

Heavy metals, which are present in parts per million and billion levels in crude oil, have not been identified as a special concern for crude oil.[20] Loss of metals to the environment is controlled by the general nature of refining operations and the emission control practices and add-on control equipment implemented for certain units. As an operational matter, there are also production consequences as metals can poison catalysts used in refining operations. USEPA and the American Petroleum Institute are currently engaged in studies on the heavy metal contents in various crude oils, to further improve the understand the relationship between metals in the crude oil supply, the operation of refining units, and the metals content of products and environmental discharges.

87. The heavy crude oil that will be used at the Wood River refinery will be very cheap. ConocoPhillips stands to make a lot of money from this project and it can afford these enhanced environmental controls without sacrificing jobs. Often with increased environmental controls, there might actually be opportunity for more jobs because of the workers that are needed to operate and maintain of these controls.

Heavy crude oil is not cheap. It is only less expensive when compared to lighter crude oil. The lower cost of heavier crude oil is accompanied by additional expenses for investment in the facilities needed to be able to process the heavier material. It is also accompanied by shifts in the amount of different products that can be made and the revenue stream for a refinery. The quality of different products may also be affected so that additional effort may be needed to adapt and enhance certain process units to maintain product quality. As Canada has ratified the Kyoto protocol, the cost of heavy crude from Canada may increase due to the costs of mitigating emissions of greenhouses associated with the extraction and initial processing of crude oil from oil sands. Accordingly, this project is the result of a complex business decision by ConocoPhillips. One of the elements that must go into this business decision is a recognition that the Wood River refinery will have to operate in compliance with environmental requirements, with a workforce that is able to properly operate and maintain environmental control systems. This is an essential aspect of the proposed project irrespective of the cost of compliance.

88. Processing of heavier crude oil (with longer hydrocarbon molecules and higher sulfur content) means more refining to produce gasoline and diesel, and to remove sulfur. This

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[20] According to information provide by ConocoPhillips, the lead and mercury content in the expected crude slate is approximately 3 ppm and 7 ppb respectively.

will increase the potential for upset conditions and associated emissions due to the higher temperatures and pressures needed to process heavier crude oil.

The refinery currently processes heavy crude oil, so that the proposed project would not represent a significant change to the overall operation of the refinery. While the project involves installation of a second Delayed Coker Unit to have more capacity to crack the heaviest stream from crude oil, the new cracking units would be designed for this purpose and include appropriate features to maintain safe operation. Accordingly, an increase in upsets should not be expected with the proposed project.

89. ConocoPhillips has applied for authorization to operate during breakdowns when pollution control equipment does not work. This undermines the effective control of emissions, which will be especially important when processing heavier crude oil, which is likely to increase process upsets at the refinery.

ConocoPhillips request for authorization for excess emissions during malfunction and breakdown addressed possible exceedances of a generic state emission standard for SO_2 emissions. Under state rules, ConocoPhillips must obtain "prior authorization" for exceedances of the state standard as it must show that continued operation with excess emissions may be necessary to protect personnel or equipment. This also enables a permit to be prepared with conditions that appropriately address the possibility that such continued operation with excess emissions may occur. However, whether ConocoPhillips actions to avoid malfunctions and reduce emissions in the event of a malfunction are still subject to scrutiny by the Illinois EPA and USEPA as to whether the particular event was avoidable and good air pollution control practices were followed. In contrast, the federal NSPS state that the otherwise applicable standard simply does not apply during malfunctions. The appropriateness of actions taken by a source relative to malfunction are only subject to after-the-fact review as to whether it was avoidable and good air pollution control practices were followed.

DELAYED COKING

90. Coking is a high temperature and pressure process for the heaviest fraction of crude oil handled by a refinery. Emissions of particulate matter, other criteria pollutants, toxic heavy metals, and greenhouse gases can be extreme, especially considering fugitive emissions and accidental releases. These should all have been evaluated. This is especially necessary given the proposed use of crude oil from Canadian oil sands, which is particularly heavy, so this project results in a large amount of coking and energy use. Data on the carbon content of the crude oil supply to the refinery and the range of sulfur, heavy metals, selenium, and other contaminants contained in the crude oil and impacts of these pollutants should have been provided by ConocoPhillips.

Emissions of PSD/NSR pollutants from coking are addressed in the application, including emissions from both routine operation and emergency flaring. Emissions

of heavy metals have not been identified as a particular concern for coking units as fine material is not entrained in a gas stream during the coking process. While USEPA has adopted NESHAP standards for emissions of metal hazardous air pollutants from catalytic cracking and catalytic reforming units, it has not adopted similar NESHAP standards for coking. Moreover, these NESHAP for these catalytic process units set a number of alternative standards that apply either to total particulate emissions or nickel emissions, a single heavy metal. Emissions of greenhouse gases associated with coking are better addressed in terms of the overall energy consumption and emissions of a refinery[21] or in terms of the total emissions of greenhouse gases associated with the crude oil that a refinery processes.

91. An evaluation is needed for the impacts of increased coking at the refinery on wastewater. This is especially true given the planned use of crude oil from Canadian oil sands.

The impacts on the wastewater treatment plant have been addressed by the air permit as further shown in Section 4.10 of the permit. The wastewater treatment plant will require modifications to accommodate an increase in wastewater flow and solids and organic loading due to increased refining operations and to treat the wastewater from the scrubbers on the FCC Units. These modifications will have emission consequences and are appropriately limited by this section of the permit.

92. An evaluation is needed for the impacts of increased coking at the refinery on soil contamination. This is especially true given the planned use of crude oil from Canadian oil sands.

This project should not contribute to soil contamination at the refinery. Soil contamination at refineries is generally the result of historic refinery design and operating practices. As such spills occurred, lighter materials typically are of particular concern for contamination. As spills of material now occur at the refinery with the potential for soil contamination, such spills must be investigated and either remediated or appropriately contained pending remediation in the future.

93. Because of employee accidents associated with Delayed Coker Units, a Chemical Safety Alert (Hazards of Delayed Coker Unit (DCU) Operations, August 2003) was jointly issued by USEPA, the Occupational Safety and Health Administration (OSHA), the U.S. Department of Labor, and the Chemical Emergency Preparedness and Prevention Office. This alert found that Delayed Coker Units are increasing in use due to their ability to process lower quality crude oil, as higher quality crude becomes less available to refiners. The alert found that these units have hazards that must be addressed by the operators of the units, listing the various process steps and the specific hazards that are posed.

[21] The quantity and quality of the intermediate streams produced by an initial conversion process, like coking, has implications for the amount of energy consumed by downstream process units at a refinery. The product slate of a refinery is also relevant for a meaningful assessment of the energy efficiency of a refinery.

While this Chemical Safety Alert identified potential safety hazards for workers from delayed coking units, it also described actions that could be taken to minimize those risks. ConocoPhillips indicates that the new Delayed Coker Unit is being designed with features, such as mechanical interlocks and an automated remote drum unheader, to address the dangers that may be posed by older coker unit and help prevent accidents. Similar upgrades are planned for the existing coker unit during a future maintenance turnaround at the refinery. In the meantime, a manual safety procedure involving multiple signatures as cross-checks is being used to prevent incidents. That procedure was enhanced this spring and ConocoPhillips indicates that it has been very effective. The Illinois EPA will be examining the effectiveness and the adequacy of the measures currently being implemented by ConocoPhillips and the measures that are planned. This will occur as part of the Illinois EPA's investigation into recent releases that have occurred from the existing coker unit at the refinery.

94. The new coking unit, which will process the heavy crude, is going to produce petroleum coke. Given USEPA's and Illinois' new rules on mercury emissions from coal fired power plants, what will ConocoPhillips do with the petroleum coke if power plants can not use it? Do all the coal-fired power plants around use it or just a few or some?

There is no reason to believe that coal-fired power plants will no longer use petroleum coke from the refinery. Additionally, the market that the refinery chooses to sell products to has no impact on its ability to comply with the applicable regulations.

Incidentally, the new coker will not directly process heavy crude oil. The function of the new coker unit is to further process more of the bottom fraction of crude oil, which is currently produced at the refinery and sold as asphalt. The coker unit will convert this bottom fraction into petroleum coke, a solid fuel material, and a liquid stream that can be further processed into higher value petroleum products.

95. I am concerned about coking because of past releases from the coker units at the refinery, which released material that caused damage to homes and property. As part of this project, is ConocoPhillips taking into consideration that according to an August 2003 document prepared by the USEPA and OSHA, delayed coker units have been found to cause frequent and severe accidents. Considering the past violations at the refinery, will employees be safe and nearby residents be safe given the hazards associated with these units? What steps will be taken to ensure the safety of employees?

The past releases appear to have been caused by operator error. As part of this project, safety interlocks will be installed on the new coking unit to prevent similar releases from the new unit. ConocoPhillips indicates that the new coker unit will have all of the latest safety features for a coking unit, including automated equipment, interlock valves, enhanced instrumentation and other safety systems.

96. What measures have been evaluated to eliminate fugitive dust from coking during the

manufacture, storage and transportation of petroleum coke due to the project? Have there been recent violations at the refinery involving these operations.

With appropriate housekeeping practices, the handling of petroleum coke is not a significant source of fugitive dust. The coke is cut out of the coke drums with water jets, which wets the surface of the coke preventing dusting. Thereafter, fugitive dust can be readily controlled by appropriate handling practices with application of additional water or other dust suppressant as needed to control fugitive dust. Given these circumstances, the handling of coke by ConocoPhillips has not posed any concerns for compliance.

EMISSIONS

97. A full evaluation is needed for emissions $PM_{2.5}$ from the project, including secondary formation of $PM_{2.5}$ caused by SO_2 and NO_x emissions from the project.

The general effect of the changes occurring at the refinery, including the proposed project, is to reduce its contribution to the levels of $PM_{2.5}$ in the ambient air and to improve air quality. This is because the net effect of these changes is to reduce emissions of direct PM. Emissions of precursors to $PM_{2.5}$ are also reduced as emissions of emissions of SO_2 are substantially reduced. (Emissions of NO_x would not increase significantly, even with the permitted increase in production.)

As the Greater St. Louis area is currently designated nonattainment for $PM_{2.5}$, the Illinois EPA and the Missouri Department of Natural Resources must develop and implement attainment plans to bring the area into attainment of the National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$. This will provide a comprehensive evaluation of local and regional emissions of direct $PM_{2.5}$ and precursors to $PM_{2.5}$, including emissions from the Wood River refinery, as necessary to assure that the compliance of the NAAQS for $PM_{2.5}$ is achieved and maintained throughout the area.

98. This provision of the Consent Decree purporting to allow use of emission reductions as part of projects at the refinery is contrary to the Clean Air Act and thus invalid.[22] Section 173(c)(2) of the Clean Air Act expressly prohibits the use of emissions reductions required by the Act as offsets. ConocoPhillips cannot be allowed to use emission reductions required by the Consent Decree as offsets for this project because these reductions are required by the Clean Air Act.

Section 173(c)(2) of the Clean Air Act, which deals with emission offsets for major projects in nonattainment areas, is not relevant to the permitting of the proposed project for emissions of SO_2. Not only will the proposed project occur in an

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[22] Paragraph 262(d) of the Consent Decree provides that "…utilize emissions reductions from the installation of controls required by this Consent Decree in determining whether a project that includes both the installation of controls under this Consent Decree and other construction that occurs at the same time and is permitted as a single project triggers major New Source Review requirements.;"

attainment area for SO_2, and not in a nonattainment area, but the decreases in SO_2 emission are being used for purposes of "netting" to demonstrate that the proposed project is not a major project. The emissions decreases are not being used as emission offsets, which would entail a transfer of emission reduction credits from one source to another, as is occurring for the proposed project for emissions of VOM.

99. If the emission decreases from the installation of scrubbers on the FCC Units were not credited against the proposed project, the project would have a significant increase in SO_2 emissions and be a major modification for emissions of SO_2 under the PSD rules. The addition of the scrubbers to the FCC Units results in decreases in SO_2 emissions of 5,909.6 tpy from FCC 1 and 5,221.9 tpy from FCC 2 (total 11,132 tpy). If these decreases were not credited towards the project, the project would have a net SO_2 decrease of only 36 tpy.[23] When increased SO_2 from flaring, missing from the application, are included, hundreds of tons per year more emissions are added with the proposed project. While these emissions can be prevented with BACT for new and existing flares that will handle the additional waste gases due to the proposed project, the project would increase SO_2 emissions by more than 40 tpy as currently proposed. This triggers PSD for emissions of SO_2, requiring BACT for emissions of SO_2 from new and modified emission units.

As this comment confirms, at most only a fraction of the decrease in SO_2 emission from the installation of scrubbers on the FCC Units is needed to ensure that the proposed project is not a major project for emissions of SO_2. Accordingly, assuming for purposes of argument that even most of the decrease in SO_2 emissions from installation of scrubbers on the FCC Units could not be relied upon for the permitting of the proposed project, the remaining decreases would still be sufficient for the project not to be a considered a major modification for emissions of SO_2.

In addition, the refinery is subject to requirements, as touched upon by this comment, that act to prevent increases in SO_2 emissions due to increased flaring at existing flares in conjunction with this project. In particular, the Consent Decree includes requirements to investigate the cause of flaring incidents that contribute to SO_2 emissions, including performance of root cause analysis, to take steps to correct the conditions that cause such incidents, and to minimize the number and extent of such incidents. These requirements are accompanied by provisions for detailed reporting for significant flaring incidents with estimates of SO_2 emissions, the root cause analysis and the corrective action plan. Stipulated penalties apply if an incident resulted from careless operation, failure to operate in accordance with good engineering practice, or failure to follow written procedures. A condition has been included in the issued permit that makes clear that these practices, other than stipulated penalties, are also applicable for the new flare that would be installed with the new Delayed Coking Unit.

100. In order to clearly evaluate the proposed project and alternatives, the project should be assessed without the SO_2 emission decreases from the scrubbers on the FCC Units

[23] 11,168 tpy - 11,132 tpy = 36 tpy

(11,132 tons), which are not allowable under the Clean Air Act, and separately from offsets from other projects (3,165 tons). In this light, the proposed project by itself will result in an annual SO_2 emissions increase of 3,129 tons.

This comment reflects an incorrect evaluation of the proposed project for emissions of SO_2. The project is only being permitted for 1548 tons per year of "new" SO_2 emissions. The project also will only be accompanied by an emissions decrease of 1,554 tons per year from other contemporaneous projects. However, these decreases by themselves would still be sufficient for the project to net out of PSD review for emissions of SO_2. The installation of the scrubbers on the existing FCC Units will provide a further decrease in emissions of SO_2 of at least 11,132 tons per year. In summary, there will be a substantial decrease in refinery's SO_2 emissions from current levels after the proposed project is complete. These circumstances do not necessitate an alternative formulation of the extent of those decreases to assess the effect of the project or consider alternatives to the proposed project.

101. To the extent the decreases in SO_2 emissions listed for other "Contemporaneous" projects were or will be carried out pursuant to the Consent Decree or are otherwise required by the Clean Air Act, they are not allowable for offsets. The Illinois EPA must provide a detailed evaluation of this issue and historical review of reasons for these contemporaneous projects in order to address the potential improper use of offsets by ConocoPhillips for this project.[24]

The emissions decreases for Contemporaneous Projects are itemized in Table C-12 of the application. These decreases occurred with and were relied upon for other projects at the refinery. Their circumstances of these past decreases are identical to the future emissions decreases that will occur at the FCC Units with installation of scrubbers. Incidentally, the amount of these decreases is only about 1,580 tons.

102. The current SO_2 emissions of the Wood River refinery are very high compared to those of refineries in Texas and California. The touted 11,168 ton reduction in annual SO_2 emissions that will accompany the proposed project is long overdue and is improperly being used to cover up the increases in SO_2 emissions that actually result from the proposed project, when SO_2 emissions should have been reduced separately, on its own merits. For example, the baseline annual SO_2 emissions of the Wood River refinery, with a current capacity of about 306,000 bpd, are about 11,468 tons, which is almost 8 times higher than the emissions of BP's South Coast refinery when adjusted for capacity.[25]

Emission of SO_2 should not be compared as simply as suggested by this comment.

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[24] Appendix C of the application shows the total use of 3,165 tpy of SOx offsets, i.e., 1,580 tpy of offsets from contemporaneous projects of at startup of "FCCU-3 and DU-2 LC Startup" and 1,585 tpy of additional offsets when the project is completed.

[25] In 2005, the average SO_2 emissions reported for the 28 refineries in Texas were 1,985 tons, for a total 52,868 tons. In 2005, the average SO_2 emissions for the five refineries in the San Francisco Bay Are were 2532 tons, for a total of 12,662 tons. In the South Coast area (Los Angeles area), the average SO_2 emissions of seven refineries were 683 tons, for a total of only 4779 tons. The largest capacity California refinery, the BP South Coast refinery with a capacity of 260,000 barrels per day (bpd), emitted only 1221 tons of SO_2 in 2005.

This is because of the various factors that affect SO_2 emissions of a refinery. These factors include location and access to different sources of crude oil, the nature of crude oil that a refinery is capable of processing, the nature of the refining processes at the refinery, age of the units at a refinery, and a number of other factors.

103. The total SO_2 baseline emissions of the Wood River refinery are not provided in the application (Table C-1, proposed Project Emission Increases Summary, Appendix C 5)[26] There may be additional significant SO_2 emissions from facilities at the refinery that are not included in this listing, which should be provided to the public as part of the application and for consideration of alternatives to the project.

The application was appropriately prepared to address the existing emission units at the refinery that are affected by the proposed project. Information on the total baseline emissions of SO_2 of the Wood River Refinery is available from the Annual Emission Reports submitted by ConocoPhillips for 2004 and 2005, which indicate annual SO_2 emissions of about 12,500 tons. It is not necessary to include data in the application for baseline emissions for existing units that are not affected by this project. In fact, the majority of the emissions of the refinery are addressed in the application, since the project includes changes at existing process units at the start of the refining process.

104. Even after the emissions decreases with the project are achieved, with control of SO_2 emissions of the FCC Units, the total annual SO_2 emissions for the various operations at the Wood River refinery listed in the application are 1891 tons (Appendix C Table C-1). This Table does not provide total SO_2 for all refinery units, only emissions from the units in the project, so the total for the refinery may be even higher. When compared to the average SO_2 emissions for refineries in other regions, the Wood River refinery will still have more SO_2 emissions than the typical refinery in Texas, (1786 tpy)[27] or California (1,607 tpy). It will also have higher emissions than the largest California refinery (BP with 1,221 tpy). Accordinglly, the Wood River refinery cannot be considered to provide the best control for emissions of SO_2, or even the average rate of control, after the proposed project.

It is wholly inappropriate to compare the future <u>permitted</u> SO_2 emissions of the Wood River refinery, as set by the permit, to the <u>actual</u> emissions of other refineries. The permitted emissions of the refinery, as set by the permit, incorporate safety factors to account for normal variation in the operation of processes and control measures as related to emissions. After the proposed project is completed, it is expected that the actual SO_2 emissions from the Wood River refinery will consistently be significantly lower than the permitted emissions, with actual SO_2

[26] The total of emissions listed for the units at the refinery after the project in Appendix C, Table C-1 is not provided, only the change in emissions. However, the column entitled "Potential/Projected Actual Emission Rate (tons/yr)" provides emissions expected after the CORE Project for individual units, which totals on the Table to 1891 tons/yr.

[27] The refinery in Texas that emitted 11,786 tons of SO_2 in 2005 is not typical and is an outlier compared to the other Texas refineries.

emissions that coincidentally are equal to or less than the "average" refineries discussed in this comment.

The actual SO_2 emissions of other refineries are also not indicative of the amount of SO_2 emissions that those refineries are allowed to emit by applicable emissions standards and permits. Accordingly, their actual SO_2 emissions do not provide a meaningful reference for whether the SO_2 emissions of the Wood River refinery would be well controlled in the future. In this regard, the Consent Decree, which addresses existing emission units, and the federal New Source Performance Standards, which will address new and modified units at the refinery, can be considered to require very good control of the SO_2 emissions of the refinery in the future.

105. The decreases in the SO_2 emissions of the FCC Units are required by a Consent Decree with the USEPA, the State of Illinois and other states that address the Wood River refinery and other refineries operated by ConocoPhillips.[28] Therefore ConocoPhillips cannot take credit for these decreases for permitting the proposed project. In particular, the Consent Decree requires ConocoPhillips to install certain emission controls at the Wood River refinery, including scrubbers on the FCC Units, which provide most of the SO_2 emissions decreases. The Consent Decree also states that ConocoPhillips may not take credit for reductions required by the Consent Decree.

The provisions of the Consent Decree with respect to "use" of emission reductions are more involved that indicated in this comment. The ability of ConocoPhillips to use emissions decreases that result from actions under this decree is a matter that is addressed by the actual terms of the Consent Decree, which allow use of the emission decreases for permitting of the proposed project. (Paragraph 262(d) of the Consent Decree). The provisions of the Consent Decree that address use of emission decreases were negotiated by ConocoPhillips, the USEPA and other parties to the Decree, as the Decree constitutes a negotiated settlement of alleged violations on the part of ConocoPhillips.

106. The SO_2 limits for the FCC Units proposed in the draft permit do not represent BACT and should be lower. The draft permit would require the FCC Units to meet limits of 25 ppmvd SO_2, 365-day rolling average, and 50 ppmvd, 7-day rolling average, both at 0% O_2, pursuant to Paragraphs 57 and 60 of the Consent Decree. A study by the USEPA, the University of Texas, and the Texas Commission on Environmental Quality reviewing the emission rates achieved in practice found that the Valero refinery in Corpus Christi, Texas met a 20 ppm limit in 2003. This limit should be required for this project.

This comment does not support setting lower SO_2 limits for the FCC Units. The proposed project does not trigger a requirement for BACT for emissions of SO_2. In addition, these comments suggest that a stringent level of control for SO_2 emissions

[28] United States of America and the States of Illinois, Louisiana and New Jersey, Commonwealth of Pennsylvania and the Northwest Clean Air Agency v. ConocoPhillips Company; Civil Action No. H-05-0258, entered by the District Court for the Southern District of Texas on January 27, 2005 (Consent Decree)

is already required by the Consent Decree. The study cited by this comment shows actual SO_2 emissions at 20 ppm in a particular year, which is consistent with an emission limit set at 25 ppm, to provide a safety factor for normal variation in operation of an FCC Unit and its SO_2 emission control systems.

107. It is not clear whether there is a net reduction in emissions from this project, as ConocoPhillips claims. With all of the netting and all of the debottlenecking and all of the problems that are involved, there is going to be an increase in emissions. I don't want the netting to be "smoke and mirrors." I want there to be an actual decreases in emissions.

The project will result in a net increase in emissions of some regulated pollutants (e.g., VOM, CO, and PM). For pollutants for which there is net decrease in emissions(e.g., NO_x and SO_2). In order for emissions decreases to be considered creditable for purposes of a netting exercise, they must be actual decreases in emissions.

108. What will be the increase in emission of H_2S from the proposed project, in pounds, from both the Wood River and the Distilling West facilities?

There will be at most a minimal increase of H_2S as a result of this project. Most of the H_2S and other sulfur compounds will be recovered by the new sulfur recovery units as elemental sulfur. The H_2S in the tail gas from the Sulfur Recovery Units is converted to SO_2 in the oxidizers. The H_2S in the fuel gas system will be converted to SO_2 through combustion in the heaters or other combustion devices.

109. An evaluation is needed for emissions and impacts of the project on the public from odors, including odors due to flaring, fugitive H_2S emissions from higher sulfur products at the refinery, and other sources of emissions.

This project will not be significant for emissions of H_2S. This is because streams with potentially significant levels of emissions of H_2S will be combusted, either as fuel gas or by flaring, converting the H_2S to SO_2. Overall, the emissions of H_2S from the refinery should be decreasing because of improvements being made pursuant to the Consent Decree.

OTHER

110. The D.C. Circuit Court recently vacated the Boiler MACT Rule, which means there is no industry standard and permits require individual MACT analyses for any boilers that were subject to this rule.[29]

While the D.C. Circuit Court recently issued an order finding that the "Boiler MACT Rule" should be vacated, the Circuit Court has not yet issued a final mandate to vacate this rule. In the interim, the Boiler MACT Rule remains in

[29] http://pacer.cadc.uscourts.gov/docs/common/opinions/200706/04-1385a.pdf.

effect. When and if a final mandate is issued, the Illinois EPA would proceed as instructed by USEPA for this unusual development with respect to this rule. This could necessitate ConocoPhillips having to obtain a revised construction permit for the boilers and steam generating units that would have otherwise been subject to the Boiler MACT Rule. A case-by-case MACT determination might also have to be made through an appropriate revision of the CAAPP permit for the refinery, so as to address existing boilers at the refinery, independent of the proposed project.

111. How many pressure-relief devices at the refinery vent to the atmosphere and what monitoring devices are used to determine whether these devices have vented? How many pressure-relief devices from the new project will vent to the atmosphere? What monitoring devices will be used to determine whether they have vented?

While many of the pressure relief devices vent to the existing vent gas recovery system, which routes discharges to the fuel gas system, there are certain pressure relief valves that vent directly to the atmosphere to protect equipment and workers from catastrophic failure. There are no new hydrocarbon pressure relief valves as part of the proposed project. Pressure relief valves are recognized as potential sources of emissions due to leaks and are addressed by the Leak Detection and Repair (LDAR) program that ConocoPhillips must implement under state and federal rules. For pressure relief valves, this program requires measurements with a portable organic vapor analyzer whenever a valve opens. These measurements are used to confirm that the valve has properly resealed after the event was over or that the new rupture disk was properly installed over the pressure relief valve.

112. Will the valves for the proposed project be leakless bellow valves? How many new compressors and pumps will have double seals and how many will not?

ConocoPhillips is not planning to use bellow valves. Bellows valves and certain other "leakless" equipment can have significant emissions when failures occur. In particular, bellow valves are not reliable in “aggressive” service. This type of equipment is also not available for all situations in refinery operations.

All new pumps in light liquid service in the new units will be equipped with double seals. It is anticipated that the definition for a leak set as LAER could be met with control technologies such as dual or mechanical seals.

113. Has the Illinois EPA analyzed how the proposed changes to federal New Source Performance Standards (NSPS) for petroleum refineries, which will be applicable to this project, affect the permit?

Many of the amendments and new rules[30] were driven by the control technologies required by USEPA’s New Source Review Consent Decrees for various refineries. Although these rules are not expected to be adopted until 2008, the proposed project

[30] On April 30, 2007, the USEPA proposed amendments to the current NSPS for Petroleum Refineries (40 CFR 60 Subpart J) and a new NSPS for units including FCC units, coking units, and sulfur plants. (40 CFR 60, Subpart Ja).

will be designed comply with these new and revised NSPS standards, which are consistent with the stringent emission limits set in the ConocoPhillips Consent Decree.

114. The Endangered Species report submitted by ConocoPhillips is inadequate because they used what appears to be an inappropriate model for the deposition modeling and the follow-up evaluation – using one for hazardous waste incineration facilities rather than for the refining of crude oil from Canadian tar sands. In addition, the data used in the model appears to for the existing supplies of crude oil.

The analysis for impacts of the proposed project on threatened and endangered species was properly prepared. Deposition modeling was conducted with an appropriate model. While the specific model was originally developed to address deposition associated with hazardous waste incineration, it is also suitable for addressing deposition of emissions from other types of sources. This is because there is nothing unique about how deposition occurs from a hazardous waste incinerator as compared to how deposition occurs from other types of sources. The data used in the analysis that reflected "current" composition of certain emissions was appropriate given the very conservative nature of the particular data. In addition, the analysis showed very low potential impacts so that the precision of this data was not a critical element for the conclusion of the analysis.

Existing Groundwater Contamination

115. Will the cone of depression under our towns get larger with the additional groundwater that will be pumped and used for the proposed project?

The proposed project will not expand the cone of depression as the pumping rate will not increase with this project. The cone of depression is the intentional result of actions taken to prevent the migration of existing soil contamination under certain areas of the refinery. By pumping groundwater from under the refinery and maintaining a cone of depression, groundwater flows toward the refinery, rather than away from the refinery, which prevents the spread of contamination. Collected groundwater is then treated to remove contamination.

116. Is there a reason that that contamination is not being remediated in another way instead of just pulling the water down far enough so it is not coming into contact with contaminated soil? Given ConocoPhillips stated goal of protecting the local community and the environment, it should find another approach to the contamination instead of wasting this much groundwater, which could be otherwise be used for productive purposes.

Equilon Enterprises LLC d/b/a Shell Products US is required by a RCRA permit issued by the Illinois EPA, Bureau of Land to maintain a gradient control under the refinery. This is done by maintaining a cone of depression that prevents contamination from migrating off-site. ConocoPhillips is maintaining the cone of depression for Equilon, as it is required to do under a contract with Equilon. When

the RCRA permit was issued, this approach was determined to be an acceptable approach for containing contamination. This approach is both feasible and cost-effective as it does not disrupt the operation of the refinery. The groundwater that is pumped is productively, as it is one of the sources of water for the refinery

117. How is the groundwater contamination in the Hartford area, where a layer of oil floats on the top of groundwater, being addressed?

The groundwater contamination in the Hartford area is being remediated by the Hartford Working Group under an Administrative Order on Consent from USEPA (No. R7003-5-04-001). The Hartford Working Group is a consortium of the companies that have been found to be responsible for this contamination and are subject to this Order. ConocoPhillips is not one of these companies.

Compliance

118. It is the responsibility of the Illinois EPA to review and grant the construction permit not only for what complies with the Clean Air Act and Illinois' regulations but also how it impacts the people who live here. The Illinois EPA has discretion. The Illinois EPA can be permissive and relax requirements or it can require the best technologies and actual pollution reductions. The Illinois EPA can require strict controls and monitoring and can enforce compliance and prosecute violations.

The Illinois EPA's action on the application for the proposed project is constrained by applicable laws and regulations. The Illinois EPA does not have the authority to relax requirements as suggested by this comment. Likewise, the Illinois EPA does not have the authority to arbitrarily set requirements for control of emissions that are more stringent than allowed under applicable regulations and permitting programs. The Illinois EPA has used the discretionary authority that it does possess to set stringent requirements for the proposed project, accompanied by rigorous requirements for monitoring. The Illinois EPA also enforces compliance and, with the assistance of the Office of the Attorney General, prosecutes violations.

119. The Wood River Refinery has a history of noncompliance with environmental regulations as does ConocoPhillips. ConocoPhillips was sued by the USEPA and the State of Illinois for violating the Clean Air Act. It is the subject of a Consent Decree that requires it to do certain things by certain dates so that their facilities comply with the law. It has asked for more time to comply with certain requirements.

The request for extension does not apply to the Wood River refinery. ConocoPhillips has requested for some of its other refineries that were affected by a hurricane, which prevented them from meeting the schedule in the Consent Decree.

120. The proposed project requires evaluation of the commitment of ConocoPhillips to clean up emissions of the refinery due to past violations independent of this expansion.

ConocoPhillips has been fulfilling its obligations under the Consent Decree to resolve alleged emission violations at the Wood River refinery.

121. ConocoPhillips was out of compliance wit the Clean Air Act for the last twelve quarters.

The ECHO database does indicate that the refinery has allegedly been out of compliance with the Clean Air Act. However, the Illinois EPA is not aware of current violations of applicable air pollution control laws or regulations. It is believed that the noncompliance that underlies the data in the ECHO database is historic noncompliance, which has been legally resolved with the Consent Decree.

Public Participation

122. It has been my experience with other public hearings on construction permit applications that I ask questions at the hearing, and if the Illinois EPA staff does not know the answers, then I don't get the answers until after it is all over. I have no opportunity to comment on the answers. The Illinois EPA should find some way of putting the answers on the record so that I can then submit and extend the comment period so I can comment on the answers. I do not expect all the answers to be available at a public hearing, but it would be very helpful if I would be able to have the answers and then be able to comment on them.

The procedures for public comment periods and public hearings do not accommodate the continuing exchange or dialog on draft construction permits requested by this comment. The Illinois EPA staff responds to questions at public hearings on construction permits as it is able to do so. However, the primary purpose a public comment period, including a public hearing is to obtain input from the public on the Illinois EPA's preliminary decisions that a proposed project is entitled to a construction permit.

123. More detailed data must be provided by ConocoPhillips, rather than requiring the public to effectively provide the analysis by pulling together this information. An evaluation is needed for many of the issues raised at the public hearing that were not answered at the hearing. The public brought up key environmental and health issues and questions about basic data and impacts of the project. The transcript shows that many of these issues were not evaluated. There should be a follow-up on all questions evaluated.

This Responsiveness Summary provides the Illinois EPA's follow-up to the various issues and questions raised at the hearing and in written public comments. As explained in response to various comments, comments did not identify issues that required submittal of more data or performance of additional analyses by ConocoPhillips.

124. There are many additional clear hazards from this project, but the application failed to provide basic information for public analysis, and the time for public review was short considering the fact that the public had to assemble much basic data. The Illinois EPA

should re-evaluate the project taking into account these additional issues and re-open the comment period.

The public comment period, which lasted over 80 days, provided a reasonable amount of time for the public to review the application for the proposed project and submit informed comments. The public comments do not raise any issues whose nature is such that they warrant preparation of a new draft permit by the Illinois EPA and re-opening of a public comment period. While various concerns are raised about the proposed project, the comments do not show that the project, as currently proposed by ConocoPhillips, would pose significant hazards to the public or should not be permitted.

Other Comments

125. Fuel efficiency standards for vehicles need to be increased. We also need to move past fossil fuels and develop electric cars and wind and solar energy. As Senator Obama has stated, for the sake of our security, our economy, our jobs and our planet, the age of oil must end in our time.

126. There are a lot of health problems in this area. Many of our children have asthma. We do not need any more particulate matter or ozone in the air.

127. ConocoPhillips should operate its heating and cracking units more efficiently.

128. It is important to work to devise credible, practical, cost-effective approaches to address the emissions of greenhouse gases at the national and at the international level, given the global nature of climate change. ConocoPhillips should strive to do this for this project.

For Additional Information

Questions about the public comment period and permit decision should be directed to

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