

Illinois Environmental Protection Agency  
Bureau of Air, Permit Section

Project Summary for an Application from Phillips 66 Company for  
Revisions to the Construction Permit for the  
"Tier 2" Low Sulfur Gasoline Project at the  
Wood River Refinery in Roxana, Illinois

Site Identification No.: 119090AAA  
Permit No.: 01120044

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Important Dates:

Application Received: August 29, 2013  
Public Comment Period Begins: January 17, 2014  
Public Comment Period Closes: February 16, 2014

**I. INTRODUCTION**

Phillips 66 Company operates the Wood River Refinery located in Roxana. The Wood River Refinery has requested a revision of its Tier 2 Project permit to account for additional sulfur dioxide (SO<sub>2</sub>) emissions at units combusting refinery fuel gas, which results from other sulfur compounds in the fuel gas besides hydrogen sulfide. The application for revision shows that the Tier 2 Project still would not be a major project for purposes of New Source Review.

The Illinois EPA has reviewed the request and made a preliminary determination that it meets applicable requirements. Accordingly, the Illinois EPA has prepared a draft of the revised air pollution control construction permit that it would now propose to issue for this project. However, before issuing this revised permit, the Illinois EPA is holding a public comment period to receive written comments on the proposed issuance of this revised permit and the terms and conditions of the draft of the revised permit.

**II. BACKGROUND INFORMATION**

The Wood River Refinery was issued a construction permit for the Tier 2 Project on June 13, 2002. That project addresses changes to equipment to enable the refinery to produce low sulfur gasoline as required by the federal regulations for "Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements" (See also 40 CFR 60 Parts 80, 85, and 86). The refinery has reduced sulfur in the fuels, in part, by desulfurization of various sulfur containing intermediate streams involved in the production of gasoline. Various hydrotreating techniques are used to enable the desulfurization to occur.

**III. PROJECT DESCRIPTION**

Historically, the Wood River Refinery calculated SO<sub>2</sub> emissions from the affected combustion units based solely on the hydrogen sulfide concentration of their refinery fuel gas. The revised permit would provide for an increase in SO<sub>2</sub> emissions for affected combustion units, i.e., the Low Sulfur Gasoline (LSG) Flare, Boiler 17 and Heater HM-1, that combust refinery fuel gas. These increases account for sulfur compounds in the refinery fuel gas besides hydrogen sulfide.

**IV. EVALUATION OF THE CHANGE IN EMISSIONS**

The requested revision would only affect SO<sub>2</sub> emissions. Accordingly, only SO<sub>2</sub> emissions are addressed in this project summary. When the

permit was initially issued, Madison County was designated attainment<sup>1</sup> for SO<sub>2</sub>, so the application compared the project emission increases with the major modification thresholds in the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. This comparison showed that the project was not a major modification. This comparison was updated for the revised permit and continues to show that the project is not a major modification. A summary of this comparison follows:

Summary of SO<sub>2</sub> Emissions Changes for the Project (Tons/Year)

Item of Equipment	Initial	Revised
Boiler 17 (add'l steam load)	2.89	26.40
Heater, HM-1 (add'l steam load)	0.17	1.60
Charge Heater, F-1	0.06	0.10
LSG Flare	18.06	3.00
Sulfur Recovery Unit	6.81	6.81
Total Increases:	27.99	37.91
Significance Threshold:	40	40
Greater Than Significant?	No	No

For Boiler 17 and Heater HM-1, the change in emissions calculation basis to account for all sulfur compounds in the refinery fuel gas being combusted rather than only hydrogen sulfide results in higher calculated SO<sub>2</sub> emissions. Accordingly, Wood River Refinery has requested higher SO<sub>2</sub> emission limits resulting in a larger increase in emissions compared to the permit as initially issued. For the HCNHT Charge Heater F-1, only a negligible increase is being requested as this heater does not burn refinery fuel gas. For the LSG Flare, a lower SO<sub>2</sub> emission limit is being requested as this flare is now connected to a flare gas recovery compressor, which will recover a portion of the gases that would have otherwise been sent to the flare. No change in emissions is expected at the sulfur recovery unit as this unit does not combust refinery fuel gas.

The results of this comparison show that the change in emissions for this proposed revision will still be less than significant, i.e., an increase of only 37.91 tons of SO<sub>2</sub> per year compared to the 40 tons of SO<sub>2</sub> per year significant emission rate for SO<sub>2</sub>.

**V. CONTENTS OF PERMIT**

The conditions of the proposed permit contain limitations and requirements to assure that this project would not be a major modification pursuant to the PSD rules.

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<sup>1</sup> Although the attainment status for PM<sub>2.5</sub> has changed (Madison County is now designated as nonattainment for the annual PM<sub>2.5</sub> National Ambient Air Quality Standard with SO<sub>2</sub> being a precursor), the application appropriately evaluated the change in SO<sub>2</sub> emissions against the applicable rules in place at the time the permit was initially issued.

For SO<sub>2</sub> emissions, this means limiting the operation of the affected heaters, boiler and flare so that the potential emissions, when compared with the units' actual emissions, will not result in a significant increase in emissions. For Boiler 17 and the Alky HM-1 Heater, new limits are not placed on these units as these units are neither new nor modified, however, the permit identifies the additional utilization of the units and the corresponding changes in emissions. For the F-1 Charge Heater, the potential emissions of SO<sub>2</sub> will be negligible, i.e., less than 0.1 ton/year and the permit will require records sufficient to document this. For the LSG Flare, the permit limits the quantity of gas burned as well as the emissions of SO<sub>2</sub> from the flare. For all units except the F-1 Charge Heater, which has only negligible emissions of SO<sub>2</sub>, records are required for the sulfur content of the fuel gas that addresses all sulfur compounds in the fuel gas, based on a combination of continuous monitoring for hydrogen sulfide and periodic sampling and analysis for other sulfur compounds.

**VI. REQUEST FOR COMMENTS**

It is the Illinois EPA's preliminary determination that this application for revision of the construction permit meets all applicable state and federal air pollution control requirements, subject to the conditions proposed in the draft of the revised permit. Comments are requested by the Illinois EPA on this proposed issuance of a revised permit.

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