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Date: 08/04/2010 04:04 PM
Subject: Re: Fw: Need Clarifications on TCEQ's Response on Southwestern HarringtonStation Permit No. 015

Stephanie,

Please find our response to your clarifications in bold below.

Questions on Response No. 1

1. HS-1: TCEQ's response states best available control technology (BACT) was not triggered for nitrous oxide (NOx) for HS-1. The Table indicates that the permit contains NOx emission limitations based on BACT (2504 lbs/hr and 8744 tpy). Is this in error? Please clarify.

NOX was triggered for Unit 1 during the 1984 permitting action.

2. HS-1: TCEQ's response states BACT was triggered for sulfur dioxide (SO₂). The Table gives a SO₂ emission limitation technology control rate as 1.2 lb/MMBtu based on New Source Performance Standards (NSPS). The Table also gives short and long term emission limitations (1634 lb/hr and 5247 tpy) based on BACT. What is the SO₂ BACT technology control rate (in lb/MMBtu)? Is the NSPS standard the governing technology control rate requirement? Is the NSPS SO₂ limit given more stringent than the BACT limit that was established for the unit?

The NSPS standard of 1.2 lb/mmBtu is the most stringent applicable limit or standard for the particular facility with regard to operation of the facility for SO2. The BACT technology was stated as low-sulfur coal with the NSPS standard given as the applicable emission limitation. See attached Preliminary Determination Summary for PSD-TX-631.

3. HS-1: TCEQ's response states BACT was triggered for carbon monoxide (CO). The Table does not give a CO emission limitation technology control rate for BACT (in lb/MMBtu) although it does give short and long term emission limitations (1634 lb/hr and 5247 tpy). What is the BACT technology control rate (in lb/MMBtu)?

The table lists 0.33 lb/mmBtu as the BACT control rate. It is located on the ninth line down on page 1 of the table that was submitted to EPA on 7/28/2010.

4. HS-2-1: TCEQ's response states BACT was triggered for CO. The Table does not give a CO emission limitation technology control rate for BACT (in lb/MMBtu) although it does give short and long term emission limitations (1915 lb/hr and 5033 tpy). What is the BACT technology control rate (in lb/MMBtu)?

The currently permitted emission rate for CO for HS-2-1 was established by an amendment for a pollution control project (PCP), completed in October, 2008, which decreased oxides of nitrogen, while increasing CO. The State of Texas NSR Permit 3080 was consolidated into State of Texas Permit Number 5129 concurrently with the PCP on October, 2008 and voided. The BACT technology control rate for CO at SPS HS-2-1, on an annual basis, can be determined by the following mass balance equation =

$$((5,033 \text{ tons per year} \times 2,000 \text{ lb/ton}) / 8,760 \text{ hrs/yr}) / 3,830 \text{ MMBtu/hr} = 0.30 \text{ lb/MMBtu}$$

The limitation of 5,033 tons per year is the amount of CO allowed during an annual operating period and the firing rate of 3,830 MMBtu/hr is the firing rate of the boiler at SPS Harrington Unit 2 (HS-2-1) as represented by the applicant and as noted in TCEQ Air Permit Number 5129 Special Conditions.

During the review of the application to increase the allowable emissions for CO, a review was conducted to determine whether BACT was applied. As a part of its BACT review process, the TCEQ

evaluates information from the EPA RACT/BACT/LAER Clearinghouse (RBLC), on-going permitting in Texas and other states, and a continuing review of emission control developments. This process has been characterized as equivalent to EPA's top-down BACT review, and relies on frequent TCEQ reviews of processes which are similar in purpose and requirements. The TCEQ's BACT process also involves review of technological development to establish BACT.

The applicant is proposing to reduce NO_x emissions by adding emission controls to the boiler, which will result in a collateral increase of CO. Also, the BACT analysis for CO was weighed against the reductions in NO_x achieved by this project. In addition, the applicant and TCEQ staff utilized several resources to perform a review of recent permit actions across the country involving CO emissions from PC Boilers for technical developments that may impact BACT. These resources included the RBLC, EPA's National Coal Fired Utility Projects Spreadsheet, as well as a focused study of similar projects. A comparison of the projected annual emission rates for CO for the Harrington Units indicates an annual average CO emission rate lower than many of those rates found in the RBLC for similar units of similar design. In addition, research into the control methods for CO listed in the RBLC indicated there are few technologies, outside of good combustion practices for combustion control, at units similar to these units.

In general, a review of results from available control methods for CO did not reveal significant developments which were more technologically achievable or economically feasible in actual operation for units of this age and configuration than the control method selected by the applicant in the current project. Other methods examined for the reduction and control of CO include oxidation catalysts or catalytic oxidation technology and thermal oxidation, which oxidizes CO to carbon dioxide (CO₂). Oxidation catalysts work on the principle of chemically altering CO to CO₂ as the flue gases flow over a metallic substrate acting as a catalyst. Unfortunately, most of the catalysts used for this process are particularly sensitive to the sulfur in the flue gas from coal-fired power plants and the catalyst is frequently blinded by the high sulfur concentration in coal-fired facilities. Therefore, this treatment does not work well for pollution control projects which these units have undergone. Another option, thermal oxidation, uses heat to convert CO to CO₂. However, this treatment method has the disadvantage of promoting the formation of additional NO_x by the oxidation of N₂, and is counter to the objectives of the NO_x reduction objectives of the PCP projects recently conducted on these units. Therefore, further CO reduction options are limited in the recent permit PCP amendments for these units.

After discussions with the applicant regarding HS-2-1 and given TCEQ's experience in permitting these NO_x reduction projects, 0.30 lb/MMBtu on an annual basis was determined to be BACT for CO this project.

5. HS-3-1: TCEQ's response states BACT was triggered for SO₂. The Table gives a SO₂ emission limitation technology control rate as 1.2 lb/MMBtu based on NSPS. The Table also gives short and long term emission limitations (4151 lb/hr and 18181 tpy) based on BACT. What is the BACT technology control rate for SO₂ (in lb/MMBtu)? Is the NSPS the governing technology control rate requirement? Is the NSPS SO₂ limit given more stringent than the BACT limit that was established for the unit?

The NSPS standard of 1.2 lb/mmBtu is the most stringent applicable limit or standard for the particular facility with regard to operation of the facility. standard for SO2. The BACT section of the issuance letter included the NSPS standard as the applicable emission limitation. See attached issuance letter for Permit PSD-TX-17, July 27, 1977.

6. HS-1, HS-2-1, and HS-3-1: TCEQ states that NO_x was never triggered for these units. The Preliminary Determination Summaries for both PSD permits prepared in 2008 (PSDTX017M1 for HS-2-1 and HS-3-1) and 2009 (PSDTX631M1 for HS-1) referenced NO_x emission limitation technology control rates of 0.225 lb/MMBtu and 0.25 lb/MMBtu, respectively. The Table indicates these values are application representations. What does TCEQ consider the governing NO_x emission limitation technology control rates? The application representations (0.225 lb/MMBtu for HS-2-1 & HS-3-1 and 0.25 lb/MMBtu for HS-1); or the NSPS based limits found in the Table (ranging from 0.2 – 0.7 lb/MMBtu (3-hr. rolling avg.), dependent on the fuel, and 0.4 lb/MMBtu (annual avg.)? Are the application representations the controlling or prevailing limits?

Although, according to state and federal rules, the permittee must meet the applicable NSPS and NESHAP standards regarding emission rates, 30 Texas Administrative Code Chapter 116 indicates that total air contaminants from any of the sources of emissions must not exceed the values stated on the maximum allowable emissions rate attached to the permit. Typically, those rates are derived from representations made by the applicant or determined during the course of permit application review. In addition, the Texas rules and the general conditions of each new source review permit require that if more than one state or federal rule or regulation or permit condition are applicable, the most stringent limit or condition shall govern and be the standard by which compliance shall be demonstrated. The 0.2 lb/MMBtu standard noted in the Table is based on using gaseous fuel as an ignition source, not the PBR PC which is normally fired in the Harrington Station boilers. The most stringent requirement for NOx emissions is 0.20 lb/MMBtu.

Question on Response No. 4

7. Were the emission limitations listed in the Table for HS-1, HS-2-1, and HS-3-1 modified to reflect the increases/decreases allowed under the Permit By Rule 30 TAC § 106.261 (NOx increase of 0.124 tpy, CO increase of 1.761 tpy, and VOC increase 0.028 tpy) and (SO2 decrease of 3.63 tpy)? If not, why not?

Because the burning of the material can occur in all of the units, in none of the units, or in a subset of the units, it is very difficult to estimate a single emission rate limit for the burning of those materials. For SO2, the limitation for burning wood would have to be the same as the MAERT limit since there is the possibility under the permit by rule to burn zero or very little wood. A modified table is attached with new line items to be included for burning of wood. The new line items assume that all material is being burned in each unit for the pollutants that increase. For SO2, the modified limit assumes that none of the material is being burned in the unit. As a result, only the CO limit changes for all units. The increases in NOX and VOC are such that they do not change the overall emission rate because of the significant figures in the MAERT limits except for VOC from Unit 1. The updated table will replace the table in the FOP upon issuance.