Erica - Please see FPC TX responses in your email below (responses in green text):

Karen Olson P.E. | Principal
Zephyr Environmental Corporation
2600 Via Fortuna, Ste 450 | Austin, TX 78746
Direct: 512.879.6618 | kolson@zephyrenv.com
ZephyrEnv.com | HazMatAcademy.com

From: LeDoux, Erica [mailto:LeDoux.Erica@epa.gov]
Sent: Monday, March 17, 2014 3:47 PM
To: Tammy Lasater / FDDE
Cc: Karen Olson; Mary Bachynsky/FPC Environmental Dept.; Eric Quiat; Robinson, Jeffrey; Wilson, Aimee
Subject: RE: Lync Web meeting info for review of FPC TX expansion project calculation workbooks

The work on the draft permit and statement of basis (SOB) is in progress. Presently filling in gaps, confirming information in these documents. FPC will get the opportunity to review the draft permit and SOB when it is placed in concurrence.

FPC TX Response: As we discussed in our March 20, 2014 teleconference, FPC TX believe a more efficient process to develop appropriate permit conditions would allow Region 6 and FPC TX review and discussion prior to the concurrence process. However we understand that is not possible. Therefore, by separate email (for your consideration before distribution of permit conditions for concurrent and to streamline the permit condition review process), FPC TX is providing some general comments on potential permit provisions based on the current publically available permit conditions on EPA Region 6 website for similar plant types.

Please provide the following:

1) The global warming potentials (GWP) have been revised. The final rule published on November 29, 2013 in the Federal Register will be effective for all permits issued on or after January 1, 2014. The methane value was increased from 21 to 25 (times more potent than CO2), the N2O value was decreased from 310 to 298, and the N2O value was decreased from 23,900 to 22,800. Due to the prospective changes in the emissions for methane in the FPC application, please provide an updated emission tables using the new GWPs.

   FPC TX Response: The GHG emission calculations have been revised to use the new global warming potentials. Please note that the other changes were also made in this emission calculation update:

   - Olefins Expansion emission calculations – the emissions from the cracking furnaces, steam boilers and PDH reactors have been grouped to include the emissions from all units as shown in the CO_2 summary (Table A-1). This grouping is consistent with FPC TX's latest representations in the TCEQ permit applications and also consistent with other GHG permits issued by EPA.

- All 3 calculation worksheets (Olefins, LDPE and Utilities) – footnotes have been added to the fugitive piping emissions, intermittent regeneration vent and MSS emissions to indicate that compliance with the design and work practices will be used to demonstrate ongoing compliance. Numeric emission limits are not requested for these sources. This language is consistent with other draft GHG permits issued by EPA (e.g., Occidental Chemical Corporation).

As we discussed, we have set-up the webmeetings for your calculation review on next Monday and Tuesday afternoon. Eric should have sent you the lync connections already. We thought we would send the copies of updated calculations after you have completed your review, in case you find items that need to be changed during your detailed review of the calculations. We hope that is okay.

2) Please provide the supplemental emission data requested below:
   - The speciated composition analysis for the pipeline natural gas to the RTOs (LDPE unit), olefin furnaces, four steam boilers, PDH reactors, flare pilots to the two-staged elevated flares and the low pressure flares.

     FPC TX Response: Per our phone discussions on March 20th, EPA's emission factors for natural gas combustion were used; the natural gas composition was not used in the combustion emission calculations. Therefore we understand nothing further is needed to address this request.

   - The anticipated speciated composition analysis for the blended fuel gas to the olefin furnaces, steam boilers, and to the PDH reactor

     FPC TX Response: A range of compositions exists for the fuel gas streams. The worst-case annual average compositions were selected to calculate the maximum annual GHG emissions from fuel gas firing. Tables A-3A and A-3B of the revised Olefins Expansion emission calculations provide this information.

   - The anticipated speciated composition analysis for the vent stream to the RTOs (LDPE)

     FPC TX Response: A range of compositions exists for the RTO waste gas stream. The worst-case annual average composition was selected to calculate the maximum annual GHG emissions from combustion of the RTO waste gas. Table A-3A of the revised LDPE Plant emission calculations provides this information.

   - The anticipated speciated composition analysis of vent streams to the elevated flares and low pressure flares.

     FPC TX Response: A range of compositions exists for the routine flare waste gas streams. The worst-case annual average compositions were selected to calculate the maximum annual GHG emissions from waste gas flaring. Tables A-5A through A-5C of the revised Olefins Expansion emission calculations and Table A-4A of the revised LDPE plant emission calculations provide this information.

- The anticipated speciated composition analysis for the vent streams due to MSS activities routed to the above mentioned flares.

  FPC TX Response: As we discussed on our 3-20-2014 teleconference, MSS calculations are complex since those calculation are based on equipment specific calculation in which different plant equipment will have a range of compositions. We understood that the following explanation will be acceptable in responding to this question. The MSS-related waste gases to the elevated flare originate from the Olefins expansion (olefins 3 and PDH units) and the LDPE plant. The annual average flow and annual average carbon content for the annual GHG MSS emissions included in the permit application was based on the available process design information. The MSS waste gases from the equipment in these plants have a carbon content that ranges from 0.009 to 0.93 and molecular weights that range from 4 to 210 lb/lbmole.

- The anticipated speciated composition analysis for the piping contents used to calculate the fugitive piping emissions for olefins and PDH units

  FPC TX Response: Again, fugitive emission calculations are also complex as they result from many small piping components with a range of compositions for the fuel gas streams. The piping component fugitive emissions provided in the application were based on the worst-case (maximum) methane and CO_2 content of the Olefins 3 and PDH fuel gas streams as shown in the application calculations.

This information will serve to supplement and support the emission data submitted in application. Please include the MW, concentration, HHV, flow rates, carbon content (lb C/lb constituent). Please provide example calculations on how you went from the speciated data to your emission estimates. Applications for your reference with similar data provided includes: ExxonMobil, Occidental and Dow.

FPC TX Response: The molar composition of each stream (fuel gas, waste gas) and chemical species molecular weights were used to calculate the molecular weight of each fuel gas or waste gas stream. The number of carbon atoms in each chemical species (i.e., molecule) and the stream's molar composition was used to calculate the mass of carbon per mole (of fuel or waste gas). The mass of carbon per mole was divided by the stream's molecular weight to calculate carbon content of the stream.

- The stream molecular weight is calculated as follows:

  $$\bar{MW}_n = \Sigma(MW_i * x_i)_n$$

  where x_i is the mole fraction of component i in the mixture
  The stream heating value is calculated in the same manner as the stream molecular weight.

  Net Heating Value (Btu/scf) = $\sum(LHV_i \times x_i)_n$

  where x_i is the mole fraction of component i in the mixture

- **The component carbon mass is calculated as: number of carbons (in chemical component/species) x 12 g/mol (carbon atomic weight).**

  The fuel carbon mass = $carbon\ mass_i \times x_i$

  where x_i is the mole fraction of component i in the mixture

  Carbon content = sum of the fuel carbon mass (all species) / MW of mixture

3) Please confirm that the blended fuel gas for the olefins furnaces and the steam boilers will still be comprised of the following:
   - Off-gas from the dryer regeneration unit (deethanizer overhead)
   - Off-gas from the chilling train (demethanizer overhead)
   - Off-gas from pressure swing absorption unit

   FPC TX Response: FPC understands, from our March 20, 2014 teleconference, that the purpose of this question is to confirm that these streams are the major contributors to the blended fuel gas to assure that the blended fuel gas carbon content will be less than natural gas for purposes of the Statement of Basis (SOB) not for the purpose of developing a permit condition.

   FPC TX does confirm that the streams from this equipment are the major contributors to the fuel gas and the carbon content will be less than natural gas because it includes hydrogen which has no carbon content.

4) Please confirm that the blended fuel gas for the PDH reactors will still be comprised of the following :
   - Off-gas resulting from the regeneration of the absorbent used in the CO2 removal unit
   - Gas phase from the expander in the cryogenic unit
   - Vent gases leaving the process condensate stripper

   FPC TX Response: Again, FPC understands, from our March 20, 2014 teleconference, that the purpose of this question is to confirm that these streams are the major contributors to the blended fuel gas to assure that the blended fuel gas carbon content will be less than natural gas for purposes of the Statement of Basis (SOB) not for the purpose of developing a permit condition.

   FPC TX does confirm that the streams from this equipment are the major contributors to the fuel gas and the carbon content will be less than natural gas because it includes hydrogen which has no carbon content.

5) The LDPE plant is design to produce how many short tons/year of LDPE? Please confirm 1,750,000 short tons/yr for the olefins plant and 725,000 short tons/yr of polymer grade propylene for the PDH plant?

   FPC TX Response: FPC TX confirms that the production rates of the three plants are:
   Olefins: 1,750,000 short tons per year

PDH: 725,000 short tons per year
LDPE: 626,500 short tons per year (1253 MMlb/year)

6) Was a vapor recovery unit (VPU) considered for the low pressure streams (i.e., API product tanks, spent caustic tanks, spent caustic oxidation unit and the wash oil chemical tanks)? Please supplement the BACT analysis for the low pressure flares with an explanation why this option was eliminated.
FPC TX Response: The tanks are nitrogen blanketed to provide a safe and inert atmosphere in the tanks and the spent oxidation units uses air for the reaction so the vent stream contains the un-reacted oxygen along with all the nitrogen associated with reaction air. A VRU would not be effective controls on the tanks and spent caustic oxidation unit in the Olefins plant because of the vent streams are largely nitrogen with low VOC concentrations and mass. Therefore, it is not practical to recover VOCs from these streams.

Also, please let me know if I can start on Wednesday taking a look at the FPC emission calculation spreadsheets as was discussed using the Lync web meeting.

FPC TX Response: As we agreed upon, the lync web meetings for calculation review set up for next Monday and Tuesday afternoon. You should have received a lync meeting notice from Eric Quiat. Eric will be available to you (at 512-579-3823) during your review to answer any questions you may have.

Thank you,

Erica G. Le Doux, Environmental Engineer
U.S. EPA Region 6
Air Permits Section (6PD-R)
1445 Ross Ave.
Dallas, TX 75202
Office: (214) 665-7265
Fax: (214) 665-6762
ledoux.erica@epa.gov

From: Tammy Lasater / FDDE [mailto:tammyl@fdde.fpcusa.com]
Sent: Thursday, March 13, 2014 3:48 PM
To: LeDoux, Erica
Cc: Karen Olson; Tammy Lasater / FDDE; Mary Bachynsky/FPC Environmental Dept.
Subject: FW: Lync Web meeting info for review of FPC TX expansion project calculation workbooks

Hello Erica,

We are wondering how things are progressing regarding our draft permits.

We had hopes that you would be able to use the Lync Web Meeting format to verify our calculations and move forward to finalize the draft permits.

We are in the process of developing the additional information for CCS and flare gas recovery that you recently requested.

When do you think you will have your first draft of permit conditions for our review and discussion? We are anxious to get to public notice.

Please let us know the status and schedule.

Regards,

Tammy

From: LeDoux, Erica [mailto:LeDoux.Erica@epa.gov]
Sent: Tuesday, February 18, 2014 4:35 PM
To: Karen Olson
Cc: 'Tammy Lasater'; Austin O'Kelly; Eric Quiat
Subject: RE: Lync Webmeeting info for review of FPC TX expansion project calculation workbooks

Got it! I will get back to you all on this. Thank you,

Erica Le Doux

From: Karen Olson [mailto:kolson@zephyrenv.com]
Sent: Tuesday, February 18, 2014 1:49 PM
To: LeDoux, Erica
Cc: 'Tammy Lasater'; Austin O'Kelly; Eric Quiat
Subject: Lync Webmeeting info for review of FPC TX expansion project calculation workbooks

Erica - It was great to talk to you today. We were encouraged that you are working on draft permits for FPC's review/comment and that you are planning for the July 2014 permit issuance date (assuming the cross cutting issues do not cause unnecessary delays). As Tammy requested, if you have any technical issues that you need further explained while you are finalizing the first draft of permit conditions, please email Tammy, Eric Quiat and myself. One of use will be able to make sure you get what you need.

We are happy to help you expedite your final review of the emission calculations. We appreciate your willingness to consider our proposed web-meeting as an alternative to providing you a CD of the calculation workbook. I am providing information below that you can provide to your IT folks. We have used this Webmeeting system with TCEQ and they did not have any IT issues.

To join a Lync Webmeeting, you do not have to download any software to your computer.
All you have to do is:

1. Click on “Join online meeting” link that will come in the meeting invitation

2. Join as “ Guest”

3. When you click to Join online meeting, the program may ask you how you would like to join the meeting.
   There are three options.

   A. The easiest and our recommended option is to choose “Lync Attendee”.

   B. You can also join using one of the following if it is already installed on your computer:
      - “Lync” or
      - “Silverlight” as required for Lync Web App (which requires admin privileges)

   The details about each of these joining options is available if you click on “First online meeting?” (link below). It will give you probably more information than you or your IT folks could possibly want.

I am also including Zephyr’s IT contact so if your IT folks want to talk “IT” language they can talk to Austin O’Kelly at 512-579-3838 or aokelly@zephyrenv.com .

Thanks again. Please let us know how and when you would like to set this up.

Karen N. T. Olson, P.E.
Principal
Zephyr Environmental Corporation
2600 Via Fortuna,
Building One, Suite 450
Austin, Texas 78746

kolson@zephyrenv.com
512.879.6618
512.329.8253 (fax)

Join online meeting
https://meet.zephyrenv.com/kolson/TTYP7HM1

First online meeting?

communication does not constitute a contract offer, a contract amendment, or an acceptance of a contract offer. This communication also does not constitute consent to the use of sender's contact information for direct marketing purposes or for transfers of data to third parties.