Erica,

Please find responses in green text below to your April 9th email questions on the PDH and LDPE permit applications.

We understand that these are the last outstanding questions that you have for the GHG permit applications. Please let us know if you need anything else.

Regards,

Eric Quiat P.E. | Project Engineer
Zephyr Environmental Corporation
2600 Via Fortuna, Ste 450 | Austin, TX 78746
Direct: 512.579.3823 | equiat@zephyrenv.com
ZephyrEnv.com | HazMatAcademy.com

From: LeDoux, Erica [mailto:LeDoux.Erica@epa.gov]
Sent: Wednesday, April 09, 2014 12:19 PM
To: Karen Olson; Eric Quiat; 'Tammy Lasater'
Cc: Robinson, Jeffrey; Wilson, Aimee
Subject: Formosa GHG Application

The BACT analysis for the PDH reactors compares the reactors to the Celanese methanol reformer. Please provide some details on the PDH reactor design and/or technology that can be included in the statement of basis to explain further why it is more appropriate to compare the Formosa PDH reactor to a methanol reformer and not another PDH reactor. (PL Propylene is an earlier application and more recent Enterprise and C3 Propylene). Typically EPA has issued for these PDH reactors a output based limit (i.e., lb CO2e/MMBtu), are there reasons why Formosa didn't propose this type of BACT limit in addition to the exhaust temperature.

FPC TX Response: We considered the PDH reactors reference above but determined it was not appropriate to compare the FPC TX PDH reactors to the other PDH reactors (referenced above) for the BACT analysis because their fundamental design is different and it is not possible to make an "apples to apples" BACT comparison. The FPC TX PDH process design involves direct fired heat input in the reactor (with the associated combustion products and energy recovery as described in Section 6.6 of the Olefins Expansion GHG permit application). The other PDH reactor designs (referenced above) do not include direct firing but rather rely on separate feed heaters.

The Celanese methanol reformer was used for the comparison since it is a similar type and size chemical reactor with direct heat input in the reactor and heat recovery.

The maximum stack temperature proposed for the FPC TX PDH reactors is proposed as a GHG BACT limit to ensure that the units' heat recovery elements function as proposed. This is consistent with the Celanese methanol reformer BACT.

The comment period just ended for the Enterprise PDH reactor application and only one comment was received. The comment is the following: "Why is Enterprise being allowed to construct a PDH plant that uses a highly polluting technology for PDH when there is lesser polluting (lower GHG's and no chrome catalyst) technology available?" Would you provide the type of catalyst to be used for the Formosa PDH reactors and also the evaluation and/or selection process performed that compared PDH technologies leading to Formosa choosing the propose PDH design the focus being GHG emissions, energy recovered and/or energy efficiency. This can be presented in table form as was submitted in the comparison data for the responses for LDPE.

FPC TX Response: Attached, please find a summary describing the major environmentally-related attributes considered by FPC TX during the PDH process license selection process. The information presented in this table is FPC TX's best assessment of the critical environmental attributes for the selected PDH process license.

Lastly, in ExxonMobil's LDPE application it includes the use of approximately 35 process analyzers. Will Formosa LDPE utilize process analyzers? If so, where will the vent streams be directed after the analyzers (i.e., back to the process, some type of destruction device, etc) If analyzers are utilized and if directed to a destruction device (RTO, flare, other type) , this information needs to be communicated and emissions should be accounted because of the potential for GHG emissions due to combustion.

FPC TX Response: Regarding the LDPE plant query in your last paragraph below, the LDPE plant will be equipped with process analyzers that will vent to the Olefins 3 elevated flare waste gas header. The waste gas contributions from the LDPE analyzer vents are accounted for in the GHG emission calculations for the LDPE plant.

Thank you, Erica

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