From: Katie Hill Brandt
To: Cordes, Richard M (MPCA)
Subject: Re: Clarifications and updates on Sanimax calculations
Date: Friday, January 08, 2016 5:06:34 PM
Attachments: RAFVO - Yellow Grease - GB Results.pdf
RAFVO - Tallow - GB Results.pdf

Hi Dick,

I ran through your questions and noted my responses below in **bold**. If you have any further questions, don't hesitate to ask. Thanks!

Here are some observations:

- You refer to an EPA document for emission factor conversions. It's no longer at the link you provide, but I found the document at https://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/output_based_regulations.pdf. There's also a 2014 version of the document at http://www.epa.gov/sites/production/files/2015-07/documents/output-based_regulations_a_handbook_for_air_regulators.pdf. (I prefer that you refer to the more recent document, and I think it's better to link to EPA for an EPA document.)

I will update the reference to the 2014 EPA link.

- You refer to a Santa Barbara County Air Pollution Control District document ("Technical Information and References, Gaseous Fuel SOx Emission Factor"). It's not at the link you provide and I was unable to locate the document. Please update the link or provide another reference.

The updated link is: http://www.ourair.org/wp-content/uploads/sulfur01.pdf. This web page references a commercial propane sulfur concentration of 15 gr/100 scf based on Gas Processors Association Engineering Data Book (Ninth Ed., 1972), Figure 15-50. [I cannot find a free version of the Gas Processors Association Engineering Data Book online.]

- You provide an RAFVO heating value of 127333 Btu/gallon. I am unable to determine the source of this value. Please explain to me where it came from.

Looking back into the project files, we received PTE calculations on January 8, 2013 for the existing facility from MPCA, as part of the Title V renewal application materials. These calculations contained a heating value of 127,333 Btu/gallon for RAFVO, with no source listed. So, we were working under the assumption that this heating value has been used in the past for Sanimax permit actions and was at one point approved by MPCA.

For comparison, I found values from Sanimax Green Bay boiler performance testing (reports attached) of 129,444 Btu/gal (tallow) and 129,977 Btu/gal (yellow grease). 40 CFR 98 Table C-1 lists 0.125 MMBtu/gal for rendered animal fat and 0.120 MMBtu/gal for vegetable oil.

- The calculations omit glycerin as a separate fuel. Based on the memo (*Use of Refined Animal Fats and Glycerin as Boiler Fuels; August 19, 2015 – Revised*), the heat value of glycerin is approximately 6280 Btu/lb (~66,000 Btu/gal).

The original PTE calculations as received from MPCA did not contain glycerin or biodiesel emissions. Since those fuels are currently allowed under the permit (pending initial performance testing), and we are not requesting any changes to the permit conditions for these fuels, we did not add them to the calculations.

Katie Hill Brandt, PE, Environmental Engineer
SEH
3535 Vadnais Center Drive, St. Paul, MN 55110
651.490.2032 direct
612.723.6704 cell
sehinc.com
Building a Better World for All of Us®

From: "Cordes, Richard M (MPCA)" <richard.cordes@state.mn.us>
To: "Katie Hill Brandt (SEH)" <khillbrandt@sehinc.com>,
Date: 01/07/2016 04:06 PM
Subject: Clarifications and updates on Sanimax calculations

Katie –

As I noted in our conversation today, I've been reviewing the calculations for Sanimax again. I believe the most recent version of the spreadsheet that I've received is *Sanimax PTE Calculations_2015.06.01.xlsx* which I received from you on June 1, 2015.

Here are some observations:

- You refer to an EPA document for emission factor conversions. It's no longer at the link you provide, but I found the document at https://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/output_based_regulations.pdf. There's also a 2014 version of the document at http://www.epa.gov/sites/production/files/2015-07/documents/output-based_regulations_a_handbook_for_air_regulators.pdf. (I prefer that you refer to the more recent document, and I think it's better to link to EPA for an EPA document.)
- You refer to a Santa Barbara County Air Pollution Control District document ("Technical Information and References, Gaseous Fuel SOx Emission Factor"). It's not at the link you provide and I was unable to locate the document. Please update the link or provide another reference.
- You provide an RAFVO heating value of 127333 Btu/gallon. I am unable to determine the source of this value. Please explain to me where it came from.
- The calculations omit glycerin as a separate fuel. Based on the memo (*Use of Refined Animal Fats and Glycerin as Boiler Fuels; August 19, 2015 – Revised*), the heat value of glycerin is approximately 6280 Btu/lb (~66,000 Btu/gal).

Thanks.

Richard Cordes, P.E.
Principal Engineer
Air Quality Permit Section
Minnesota Pollution Control Agency
richard.cordes@state.mn.us
Phone: (651)757-2291
Fax: (651)296-8717