From:	Dave Jordan
To:	Jones, Dave F (DEC)
Cc:	Ted Hartman (Ted.Hartman@nutrien.com); Frederick Werth; Simpson, Aaron J (DEC)
Subject:	RE: Information Request for Agrium US Inc."s Kenai Nitrogen Operations Construction Permit Application AQ0083CPT07
Date:	Wednesday, January 8, 2020 12:19:36 PM
Attachments:	image001.png OAQPS Control Cost Manual oxidizersincinerators_chapter2.pdf

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Dave,

The cost spreadsheet provided on August 9, 2019 is consistent with the final cost analysis performed for the original PSD permit. This cost analysis was provided to ADEC in September 2014 to correct errors contained in the original cost spreadsheet for estimating the costs of an oxidation catalyst control system to control CO and VOC emissions from the Solar Turbines/Waste Heat Boilers and from the Package Boilers. The capital cost figures contained in the original cost analysis for the original PSD permit was based on a vendor quote for a different application and was not specific to units at KNO. The revised cost analysis provided in September 2014 (and updated in the e-mail sent on August 9, 2019) is based on control cost estimates performed using the OAQPS cost equations. A copy of the most current OAQPS cost estimating document for incineration is attached. This document may be found at https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution#cost.

The following is provided in response to your specific questions:

1. As noted above, the original capital cost estimate was a vendor-specific quote for a different application that is not applicable to the KNO equipment of concern. The corrected spreadsheet uses Equation 2.37 that appears on page 2-43 of the attached document to compute the capital cost for the oxidation catalyst control system. The capital cost computed using this equation is in 1999 dollars, so in the 2014 spreadsheet this value was adjusted by a value of 9437/6059, which is the Engineering News Record Construction Cost Index for 2013 (9437) divided by the Engineering News Record Construction Cost Index for 1999 (6059). For the 2019 cost spreadsheet, the computed capital cost for 2013 was adjusted by 8.5% to account for inflation between 2013 and 2019.
2. The natural gas cost figures for the oxidation catalyst are based on the thermal energy required to raise the flue gas by the necessary temperature for the catalytic oxidizer. This calculation is provided on the worksheet labeled “Fuel Usage” in the workbook, and is based on the air flow rate for each of the emission units being evaluated. The electricity usage is computed using the power consumption equation that appears at the bottom of page 2-49 of the attached OAQPS cost manual document.

Please let me know if you have any additional questions regarding these cost calculations.

David Jordan, P.E.
Partner

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From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Monday, January 6, 2020 7:47 PM
To: Dave Jordan <Dave.Jordan@erm.com>
Cc: Ted Hartman (Ted.Hartman@nutrien.com) <Ted.Hartman@nutrien.com>; Frederick Werth <Frederick.Werth@nutrien.com>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>
Subject: RE: Information Request for Agrium US Inc.'s Kenai Nitrogen Operations Construction Permit Application AQ0083CPT07

Dave,

I am back in the office from vacation and have had a chance to review the questions raised in your previous email. You are correct that the draft Construction Permit AQ0083CPT07 and the TAR that I sent to Agrium on December 6, 2019 for technical review did not include the revised cost analyses for the turbines/waste heat boilers and package boilers that was provided to the Department in an e-mail sent on August 9, 2019. I will include the applicable cost information in the permit documents prior to the public comment period. However, I have reviewed the cost calculations for the installation of oxidation catalysts on the package boilers and turbines/waste heat boilers provided in the August 9, 2019 submission under the MS Excel spreadsheet titled *Cat Ox Cost Analyses 8.9.19.xlsx (attached)* and have the following questions.

1. For the package boilers and turbines/waste heat boilers, how did the total capital investment costs increase so dramatically in the revised August 9, 2019 spreadsheet compared to the original application submission provided on May 21, 2019 titled *Attachment C BACT Appendix B Cost Estimates.xlsx* (attached). The reference for these cost estimates in the original spreadsheet state, "Vendor provided in 2013 – Adjusted for 8.51% inflation" while the reference for these cost estimates in the new spreadsheet states, "Calculated in 2013 – Adjusted for 8.51% inflation". Please provide vendor data in support of these changes or detailed justifications and calculations.

2. For the package boilers and turbines/waste heat boilers, please provide a detailed justification for the utilities costs located in the annual costs section of the new spreadsheet.

Please provide this information along with any comments from the technical review of the permit documents by January 10, 2020, or let us know if you need additional time or have any questions.

Regards,

Dave Jones
Env. Engineering Assistant I
ADEC – Air Quality – Juneau
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From: Jones, Dave F (DEC)
Sent: Tuesday, December 10, 2019 9:49 AM
To: Dave Jordan <Dave.Jordan@erm.com>
Cc: Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Ted Hartman (Ted.Hartman@nutrien.com) <Ted.Hartman@nutrien.com>; Frederick Werth <Frederick.Werth@nutrien.com>
Subject: RE: Information Request for Agrium US Inc.'s Kenai Nitrogen Operations Construction Permit Application AQ0083CPT07

Dave,

Message and attachment received, thanks for the initial review of the permit. I'll take a look at the TAR and get back to you.

Thanks,

Dave Jones
Env. Engineering Assistant I
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From: Dave Jordan [mailto:Dave.Jordan@erm.com]
Sent: Monday, December 9, 2019 10:19 AM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Cc: Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Ted Hartman (Ted.Hartman@nutrien.com) <Ted.Hartman@nutrien.com>; Frederick Werth <Frederick.Werth@nutrien.com>
Subject: FW: Information Request for Agrium US Inc.'s Kenai Nitrogen Operations Construction Permit Application AQ0083CPT07

Dave,

We have received and are reviewing the draft permit and TAR for the Agrium KNO PSD permit. Thank you for providing these documents, and we will get back to you with comments as soon as possible.

One item I wanted to ask about that I noticed based on my initial review was the discussion of BACT for CO for the Solar Turbines/Waste Heat Boilers and Package Boilers that appears in Section 4.0 of the TAR (beginning on page 34 of the document). The document contains references to the oxidation catalyst cost analyses that were provided with the original application on May 21, 2019. In response to questions from ADEC regarding the oxidation catalyst cost calculations contained in the application, we provided revised cost analyses for the Solar Turbines/Waste Heat Boilers and Package Boilers in an e-mail sent August 9, 2019. I have forwarded a copy of this e-mail and attachments that includes a Word document with ADEC's comment and KNO's response and revised cost calculation spreadsheets. Could you take a look at the information provided on August 9, as it does not appear that this information was included in the draft TAR we received for the KNO PSD permit?

Let me know if you have any questions regarding the information we provided on August 9 in response to ADEC's request.

David R. Jordan, P.E.
Partner

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From: Dave Jordan
Sent: Friday, August 09, 2019 4:04 PM
To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>; ted.hartman@agrium.com
Cc: Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Jack, Jesse R (DEC) <jesse.jack@alaska.gov>; Plosay, James R (DEC) <jim.plosay@alaska.gov>; Stacy, Andrea <andrea_stacy@nps.gov>; catherine_collins@fws.gov
Subject: RE: Information Request for Agrium US Inc.'s Kenai Nitrogen Operations Construction Permit Application AQ0083CPT07

Dave,

Attached is a written response to questions raised in your July 26 e-mail. This response includes updated BACT cost spreadsheets, updated BACT text reports, and updated emission calculations.

Please let us know if you have questions regarding any of these documents.

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From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Friday, July 26, 2019 8:12 PM
To: ted.hartman@agrium.com
Cc: Dave Jordan <Dave.Jordan@erm.com>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Jack, Jesse R (DEC) <jesse.jack@alaska.gov>; Plosay, James R (DEC) <jim.plosay@alaska.gov>; Stacy, Andrea <andrea_stacy@nps.gov>; catherine_collins@fws.gov
Subject: Information Request for Agrium US Inc.'s Kenai Nitrogen Operations Construction Permit Application AQ0083CPT07

Dear Mr. Hartman,

The Alaska Department of Environmental Conservation (Department) has reviewed Agrium US Inc.'s (Agrium's) application dated May 16, 2019, for new Construction Permit AQ0083CPT07 at the Kenai Nitrogen Operations (KNO) Facility. Based upon its review, the Department is requesting additional information under AS 46.14.160(c) in order to prepare a preliminary permit decision.

The Department will continue to process Agrium's application to the extent it is possible while the requested information is being prepared; staff will subsequently notify Agrium if unable to proceed due to inadequate information. The Department is requesting that Agrium prepare a response to this request by Friday, August 9, 2019, or provide a request for additional time as needed.

1. Agrium's application contained a MS Excel spreadsheet for BACT cost estimates titled *Attachment C BACT Appendix B Cost Estmates.xlsx,* which has two sheets for estimating the costs of an oxidation catalyst on the combined turbines emissions units (EUs) 55a through 59a with their respective waste heat boilers EUs 50 through 54, as well as the package boilers EUs 44a, 48a, and 49a. In these spreadsheets, Agrium lists a reagent pump requiring 1,000 kW of electricity to run for each turbine/waste heat boiler pair and package boiler. Please explain this process if the inclusion of the reagent pump was not an error.

Discussion: Agrium's previous application for AQ0083CPT06 did not include reagent pumps in the oxidation catalyst cost estimates, nor has any other application for an oxidation catalyst that the Department has recently reviewed. What type of reagent is being used for this oxidation catalyst and at what flowrate is it injected into the catalyst bed? What are the costs associated with purchasing and disposing of this reagent? What device is powering these pumps? Please provide the vendor data for the oxidation catalyst systems and their respective reagent pumps.

2. Please provide a BACT analysis for an oxidation catalyst to control CO emissions from the primary reformer EU 12.

   Discussion: The Department has identified a stationary source in the RBLC (Emberclear Gas to Liquids, RBLC ID No. MS-0092) with a steam methane reformer using an oxidation catalyst to control CO emissions down to 5 ppmv at 3% oxygen. Therefore, a BACT analysis must be provided for your reformer.

3. The Department has calculated higher NOx and NH_3 emissions from flaring events based on ammonia throughput from a previously provided information request response (attached). Please verify the accuracy of these assumptions.

   Discussion: Agrium's application contained an excel spreadsheet for emission calculations titled *Attachment B Emission Calculations.xlsx.* In this spreadsheet Agrium has calculated NOx emissions for the small and emergency flares EUs 22 and 23, resulting from NH_3 throughput during flaring events. The Department has recalculated these NOx and NH_3 emissions in the attached spreadsheet (tabs 22 and 23) using the NH_3 throughput and NOx emission rates from the previously mentioned information request response from Agrium, and the previous BACT limit for the flares of 168 hours each per 12 consecutive month period.

Regards,

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