OXBOW CALCINING LLC

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VIA ELECTRONIC MAIL

March 7, 2022

Kendal Stegmann, Director
Air Quality Division
Oklahoma Dept. of Environmental Quality
707 N. Robinson
Oklahoma City, OK 73101

RE: Response to request for additional clarifications on Oxbow's 4-factor analysis on control scenarios under the Clean Air Act Regional Haze Program
Oxbow Calcining L.L.C. – Kremlin Calcined Coke Facility

Dear Ms. Stegmann:

In response to your January 31, 2022, letter requesting additional clarifications to our Regional Haze Reasonable Progress Analysis (FFA) submittal, Oxbow Calcining L.L.C. (Oxbow) is submitting this letter that we trust will address the questions that the Oklahoma Department of Environmental Quality (DEQ) received from the U.S. Environmental Protection Agency (EPA).

As certain information in this Response is confidential, trade secret business information pursuant to 27A O.S. 2-5-105(17) (*i.e.,* information that derives independent economic value from not being generally known or readily ascertainable by proper means by other persons or entities who could obtain economic value from its disclosure or use and for which Oxbow has exercised reasonable efforts to maintain the secrecy of such information), Oxbow is asserting a claim of confidentiality regarding such information. Accordingly, two versions of this Response are being provided: a Confidential Version which contains the confidential, trade secret business information, and a Nonconfidential Version from which the confidential, trade secret business information has been redacted. This is the Nonconfidential Version of the Response. The Confidential Version was submitted on March 7, 2022, under separate cover via hand delivery.

Pursuant to Oklahoma Administrative Code 252:4-1-5(d), Oxbow requests the DEQ determine the confidentiality of the confidential, trade secret business information identified in this Confidential Version of the Response and advise Oxbow of its determination via an affirmative statement in writing.

In order facilitate a clear and final response, we copied each comment and provided a response below it. Where the comment covers multiple subtopics, we broke the comment down and provided a response to each subsection.

COMMENT 1

The assumption of a 20-year remaining useful life in the cost evaluation of controls is not sufficiently supported with documentation. As discussed in EPA's August 2019 Guidance,[1] "annualized compliance costs are typically based on the useful life of the control equipment rather than the life of the source, unless the source is under an enforceable requirement to cease operation." (See, August 2019 Guidance at 33.) Based on what EPA has historically observed and available literature, an assumption of 30 years for the equipment life of scrubbers and dry sorbent injection (DSI) is reasonable and consistent with EPA's Control Cost Manual.

RESPONSE:

Oxbow assumes that the EPA's historical observation and literature reference of a 30-year equipment life for the scrubbers and DSI is taken from the wet FGD example cost estimate provided in Section 5, Chapter 1 of the Control Cost Manual (updated April 2021). In that example, EPA noted that although remaining life of the controlled unit may be a determining factor when deciding on the correct equipment life for calculating total annual costs, "we [EPA] expect an equipment life of 20 to 30 years for wet FGD systems." It is important to emphasize that EPA's own document specifies a range and the manual does not mandate using a 30-year equipment for all SO_2 and acid gas control technologies. (Control Cost Manual, Section 5, Chapter 1, April 2021).

Typically, in an economic evaluation, the design or economic life of a control system is considered to end when the capital cost of the equipment has fully depreciated and O&M costs become more representative of annual system costs. Section 1, Chapter 2 of the Control Cost Manual (updated in November 2017) notes that the equipment life used to annualize capital costs is the expected design or operational life of the control equipment, and that it is not an estimate of the economic life "for there are many parameters and plant-specific considerations that can yield widely differing estimates for a particular type of control equipment." However, just as there are many parameters and plant-specific considerations that can yield widely differing estimates of the economic life of a control technology, these same parameters and plant-specific considerations will affect the operational life of the control equipment. The operational life of emission control equipment will vary depending on process conditions, original design specifications, equipment operation and maintenance practices, site location, and other site-specific design and operating conditions. When comparing competing technologies and evaluating the cost-effectiveness of competing control technologies, the economic analysis should be based on an expected operational life of the equipment taking into consideration plant-specific design and operating conditions.

When process conditions are well established, an industry standard equipment operational life of 20 years is assumed to be representative of an economical equipment design. In other words,

1 USEPA, Guidance on Regional Haze State Implementation Plans for the Second Implementation Period, USEPA Office of Air Quality Planning and Standards, EPA-457/B-19-003, August 2019, available at: https://www.epa.gov/sites/default/files/2019-08/documents/8-20-2019_-_regional_haze_guidance_final_guidance.pdf

materials of construction, equipment components and other design aspects are engineered and selected for ensuring the supplied system will not require complete refurbishment outside of typical manufacturer directed maintenance program for the duration of a 20-year operational life; while, on the other hand, materials of construction, equipment components, and other design aspects of the system are not overdesigned. Equipment could be designed to achieve a longer operational life, one greater than industry standard, but would result in increased capital costs and skew the results of the control technology comparison.

Furthermore, due to the novel application of this equipment on the calcining process, the effects that the process flue gas characteristics will have on the operational life of the control equipment and how increased capital costs could be applied to achieve longer equipment lifespans is not well established. For these reasons, the 20-year operational life of the control technologies evaluated in the Oxbow FFA represents a reasonable estimate of equipment life taking into consideration site-specific process design and operating conditions, and should be used in the analysis to calculate emission reductions, amortized costs, and cost-effectiveness.

COMMENT 2

A 10% interest rate is used in the cost analysis and it is explained that this is "based [on] confidential company-specific capital market information." The redacted version of the four-factor analysis that is publicly available must specify whether this is a company-specific interest rate. The cost analysis should be based on either the bank prime rate or a company-specific interest rate for consistency with the Control Cost Manual.[2] If a company-specific interest rate is used to estimate the cost of controls, adequate documentation supporting that interest rate should be provided with the cost analysis. A letter from a chief financial officer for an institution that lends to the company, or another official with the company that is in a position to know the company's debt and equity, that documents the institution's commitment to lend at the specified interest rate would be considered sufficient documentation.

RESPONSE:

It appears from EPA's comment that the commenter is equating bank prime rate and company-specific interest rate as equal choices. This is an incorrect reading of EPA's Control Cost Manual. As a result, before responding to the substance of the comment, it is important to note that EPA's Control Cost Manual expresses a clear preference for company-specific interest rates – ". . . assessments of private cost **should be prepared using firm-specific interest rates if possible**, or the bank prime rate if firm-specific interest rates cannot be estimated or verified."[3] Further, EPA's Control Cost Manual cautions that "[a]nalysts **should use the bank prime rate with caution** as these base rates used by banks do not reflect entity and project specific characteristics and risks including the length of the project, and credit risks of the borrowers."[4] EPA's Control Cost Manual

2 See EPA Control Cost Manual at 15-17. The Control Cost Manual can be found at https://www.epa.gov/sites/production/files/2017-12/documents/epaccmcostestimationmethodchapter_7thedition_2017.pdf.

3 Id. at 16 (emphasis added).

4 Id. (emphasis added).

clearly favors using company-specific interest rates when available and Oxbow justified the use of the company-specific interest rates in its FFA submittal.

In its original FFA submittal, Oxbow provided a detailed evaluation prepared by its lead banker, Bank of America, that fully justified Oxbow's ability to qualify for financing the addition of a potential pollution control system. In your request, you ask for "[a] letter from a chief financial officer for [Bank of America], or another official with [Bank of America] that is in a position to know the company's debt and equity, that documents [Bank of America's] commitment to lend at the specified interest rate . . . " This is wholly unreasonable and suggests that EPA does not understand how the financial markets work for individual companies. Oxbow has no connection to the CFO of Bank of America and in Oxbow's original submittal it provided a detailed document prepared by "another official" of Bank of America documenting the interest rate which Oxbow qualified for if it were to undertake the potential pollution control project. It is not clear what EPA means by a "commitment to lend," but to the extent EPA is requesting a confirmation from Bank of America, that is not possible because the project has not been fully developed to the point where anyone would commit financing to it.

Further, it is our understanding that no other company presented the level of detail to justify its company-specific interest rate that Oxbow provided in its FFA submittal and we do not believe further justification is warranted. However, in order to address EPA's confusion, Oxbow attaches an Affidavit from its Treasurer providing additional proprietary confidential business information related to the request for financing done in 2020 in support of the FFA. In short, as Oxbow's Treasurer explains, Oxbow's financial position and the nature of the potential project dictated the parameters of the financing available and supported the company-specific interest rate of 10% used in the evaluations.

COMMENT 3

The four-factor analysis explains that average hourly SO_2 emission rates (measured at each kiln during the January 2015 to December 2019 period) and annual average SO_2 emission rates (during the January 2018 to December 2019 period) were used to determine annual capacity factors for the kilns for 2018 and 2019, and these in turn were used to estimate operation and maintenance cost of controls for 2020 and future years. The four-factor analysis also states that "capacity factors are based on historical operation and may not represent future operation." Please explain why the range of years used for the average hourly SO_2 emission rates and annual average SO_2 emission rates are not the same. For greater clarity, the four-factor analysis should also provide the calculations for the capacity factors, with redactions in the publicly available version if necessary. The four-factor analysis should provide further discussion related to the statement that the capacity factors may not represent future operation. For instance, please explain whether there are any recent enforceable requirements that are expected to cause the capacity factors to change in the future.

SUBCOMMENT

"Please explain why the range of years used for the average hourly SO_2 emission rates and annual average SO_2 emission rates are not the same."

RESPONSE:

Average hourly SO_2 emission rates used in the FFA are based on an evaluation of historical operating data from January 2015 to December 2019 and are representative of the wide range of operating conditions and fluctuations experienced at each kiln. Because it is difficult to predict fluctuations in the composition of green petroleum coke (GPC), the average hourly emission rates are used as the basis for the technical feasibility evaluation and O&M cost estimates, as they were determined to be representative of typical operating conditions and fluctuations experienced at each kiln.

Annual average SO_2 emission rates used in the FFA are based on historical operating data from January 2018 to December 2019, a period of time during which the kilns experienced somewhat higher sulfur GPC. During the extended baseline period of January 2015 to December 2019, the Kremlin facility's kilns processed GPC with a sulfur content ranging from [redacted] wt% to 6.0 wt% with an average of [redacted] wt%. Between January 2018 and December 2019, the average sulfur content of GPC processed increased to [redacted] wt%. Operating data from the facility demonstrates that the sulfur content of the GPC has increased over time and is likely to continue to increase in the future as refineries are required to meet specifications for lower-sulfur refined products. Because the generation of SO_2 is directly related to the sulfur content in the GPC, the more recent emissions data are expected to be more representative of future emissions, and were therefore used as the basis for the calculations of tons of SO_2 emissions removed and control technology cost effectiveness.

SUBCOMMENT

"the four-factor analysis should also provide the calculations for the capacity factors, with redactions in the publicly available version if necessary."

RESPONSE:

Because of the indirect correlation between kiln operation and corresponding SO_2 emissions, capacity factors were determined for each kiln by dividing the actual 12-month annual average SO_2 emissions from January 2018 to December 2019 (tpy) by the annual SO_2 emissions that would be generated based on the average hourly SO_2 emission rate from January 2015 to December 2019 (lb/hr) on a continuous operating basis (i.e., 8,760 hours/year). Capacity factors were calculated using following equation:

$$\text{Capacity Factor} = \frac{\textit{Annual Average Emission}, \frac{ton}{year}}{\frac{\textit{Annual Average Hourly Emission } lb}{hour} \times \frac{1\ ton}{2000\ lb} \times \frac{8760\ hours}{year}} \times 100$$

Capacity factors were calculated in this manner because the use of recent annual average emissions is meant to reflect potential SO_2 emissions from the units in the future. Emissions need to be estimated separately from a direct reference to kiln production rates because SO_2 emissions don't specifically correlate to kiln operation (such as a coal fired power plant).

SUBCOMMENT

"The four-factor analysis should provide further discussion related to the statement that the capacity factors may not represent future operation. For instance, please explain whether there are any recent enforceable requirements that are expected to cause the capacity factors to change in the future."

RESPONSE

The kilns at the Kremlin facility operate continuously 24 hours a day, 7 days a week at processing rates that range from a minimum of approximately [redacted]% of typical rates depending on customer specifications and GPC quality (i.e., the kilns are not typically operated at their design nameplate rating). Annual maintenance outages for each kiln and its supporting systems are scheduled to only have one kiln offline at a time in order to maintain maximum calcined petroleum coke (CPC) production flexibility in the remaining operating kilns. Given the range of factors impacting operation and, more importantly, the fluctuation in raw feed sulfur content, establishing a capacity factor based on kiln production rates does not accurately correlate to SO_2 emissions.

As mentioned previously, it is difficult to predict fluctuations in the GPC composition. Because no single source can supply GPC to meet all CPC customer specifications and quantities, GPC is purchased from various suppliers and blended together at appropriate percentages to meet individual customer specifications. Therefore, sourcing the correct raw material GPC is a critical aspect of Oxbow's business and selection parameters are closely monitored. The appropriate blend of different GPCs is metered at the appropriate feed rates into each rotary kiln. As a result, the GPC blends fed to the kilns at any given time can have a wide range of properties (e.g., volatile matter, moisture, sulfur, metals, etc.).

Products produced at the facility will change based on customers and their sulfur specifications. Customers are increasing their sulfur specification on the CPC they purchase to try to save money because the lower sulfur GPC raw material that yields a lower sulfur CPC is in short supply and is more expensive. In addition, the customers the facility has from year-to-year change based on competition from other calciners, availability of GPC and the GPC sulfur level, and economic conditions. Customers' requirements for CPC specifications will fluctuate based on the customers' production requirements at the time of the order. Although the capacity factors used are the best available, for all of the reasons provided in the original FFA and this additional explanation, they may not represent actual future operation. There are no recent enforceable requirements that may cause capacity factors to change in the future.

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If you have any questions regarding the submittal, please contact me at (561) 907-5576 or at scott.stewart@oxbow.com.

Sincerely,

Scott E. Stewart
VP, Environmental, Health & Safety

Attachment: Affidavit of Benjamin Klein, Treasurer
Oxbow Carbon LLC & Oxbow Calcining LLC

AFFIDAVIT OF BENJAMIN KLEIN

STATE OF FLORIDA §

COUNTY OF PALM BEACH §

Before me, the undersigned Notary Public in and for the State of Florida, personally appeared Benjamin Klein, the affiant, whose identity is known to me. After I administered an oath, affiant testified as follows:

1. My name is Benjamin Klein. I am over 18 years of age, of sound mind, and capable of making this affidavit. The facts in this affidavit are within my personal knowledge and are true and correct.

2. I am the duly appointed Treasurer of Oxbow Carbon LLC and its subsidiaries including Oxbow Calcining LLC (collectively referred to as "Oxbow"). In this capacity I am knowledgeable about the financial affairs of Oxbow including its liquidity and its ability to obtain debt financing.

3. During the summer of 2020 I was asked to provide guidance on how Oxbow could finance the construction of new pollution control equipment at our calciners (the "Project").

4. Oxbow's capital structure had following characteristics:

   a) Oxbow is considered a non-investment grade company based on ratings issued by both Moody's and Standard & Poor's (the "Rating Agencies").

   b) [redacted]

   c) [redacted]

   d) [redacted]

5. Given the limitation of Oxbow's capital structure, [redacted] all—in-yield (borrowing cost) of approximately 10%.

6. [redacted] Illustrative Financing Discussion, dated July 17, 2020, that reflects the financing options available to Oxbow for the Project and the yield (borrowing cost) of approximately 10% that would be required for Oxbow to finance the Project.

BENJAMIN KLEIN

Sworn and subscribed before me by Benjamin Klein on this 7 day of March, 2022, 2022.

Notary Public in and for the State of Florida

My commission expires:

NICOLINA SOLIMENE
Commission # HH 121108
Expires August 23, 2025
Bonded Thru Troy Fain Insurance 800-385-7019